

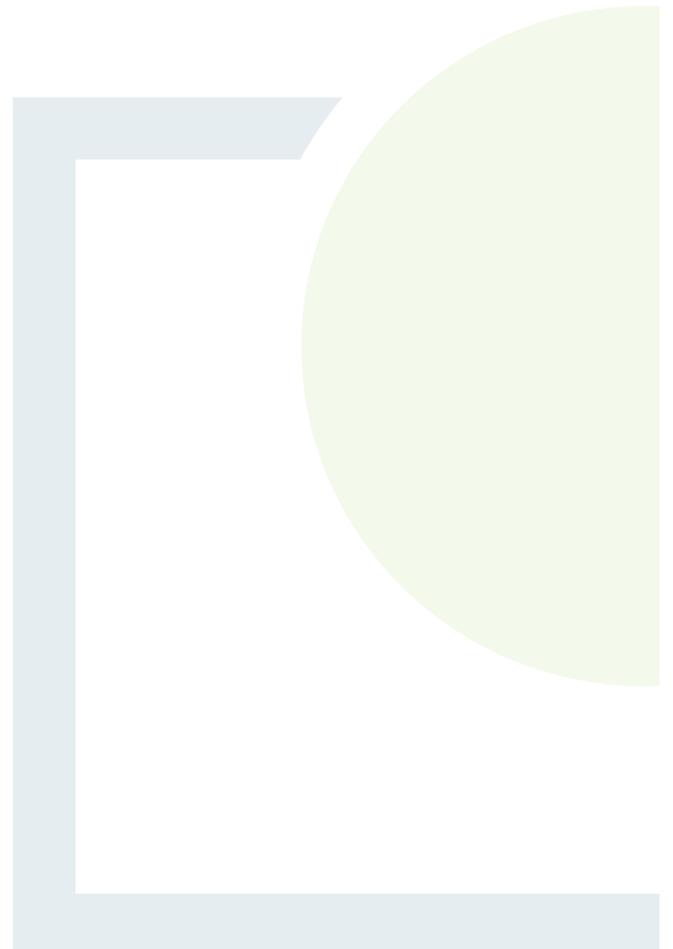


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APPENDIX 5.6

Natura Impact Statement (NIS)





CONSULTANTS IN ENGINEERING,
ENVIRONMENTAL SCIENCE &
PLANNING

THE PROPOSED BARNADIVANE WIND FARM & SUBSTATION, CO. CORK

REPORT TO INFORM THE APPROPRIATE
ASSESSMENT PROCESS (SCREENING AND
NATURA IMPACT STATEMENT)

Prepared for:

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Date: February 2023

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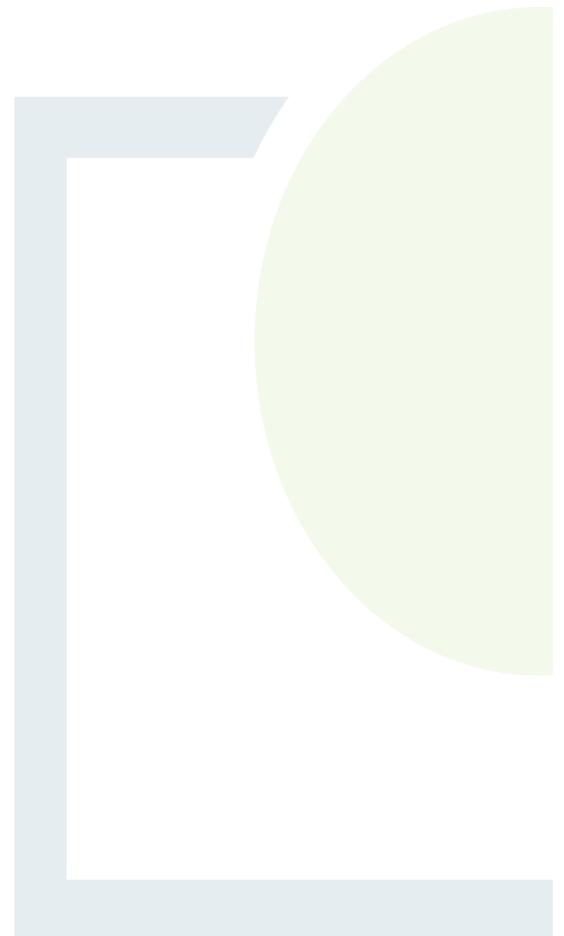


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Key Terminology

The Proposed Development is comprised of the following key elements:

- The wind farm site (also referred to in this report as ‘the Proposed Wind Farm’);
- The substation (within the site of the Proposed Wind Farm) (also referred to in this report as ‘the Proposed Substation’);
- Biodiversity Enhancement and Management Plan lands (also referred to as 'BEMP Lands')

The in-combination effects of the following elements are included in the assessment:

- The Turbine Delivery Route (also referred to in this report as ‘the Enabling TDR Works’); and
- The Alternative Grid Connection Route (also referred to in this report as 'the AGCR').



1. INTRODUCTION

This report has been prepared to inform the competent authority in completing their statutory obligations in relation to Appropriate Assessment under Council Directive 92/43/EEC (Habitats Directive) as implemented in Ireland under inter alia the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended), and Part XAB of the Planning and Development Act, 2000 (as amended).

1.1 Legislative Context

Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive) provides legal protection for habitats and species of European importance. The Directive requires that where a plan or project is likely to have a significant effect on a European Site, 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 European 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 site (Natura 2000 sites) but likely to have 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 the 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.

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'. In this case, the Proposed Development is not directly connected with or necessary to the management of any European site(s).

Article 6(3) of the Habitats Directive is implemented by the provisions of sections 177U and 177V of the Planning and Development Act, 2000 (as amended). Article 177U requires that before consent is given, the competent authority must carry out a screening for appropriate assessment to assess, in view of best scientific knowledge, if the development, individually or in combination with another plan or project is likely to have a significant effect on the European site. If it cannot be excluded, on the basis of objective information, that the Proposed Development, individually or in combination with other plans or projects, will have a significant effect on a European site, an appropriate assessment of its implications for the European Site(s) in view of the Site's conservation objectives is required to be carried out.

1.2 Statement of Competence

This report has been prepared by Kate Mahony and Jon Kearney of Fehily Timoney.

Jon is a Principal Ecologist with Fehily Timoney and has 17 years' experience in the field of ecological assessment. He holds a BSc (Hons) in Applied Ecology from University College Cork and MSc in Ecological Management and Biological Conservation from Queens University Belfast. In his time as an ecological consultant in both the UK and Ireland, he has worked on a broad diversity of projects including NIS's for several offshore renewable energy projects, circa. 50 wind farms projects, solar farms, road schemes and commercial developments. Jon as the lead ecologist has been the lead expert witness for biodiversity and Appropriate Assessment at several An Bord Pleanála Oral Hearings.



Kate Mahony is a Project Ecologist with Fehily Timoney. Kate holds a PhD in Zoology, MSc In Marine Biology and a BSc in Zoology from University College Cork. Kate has published research papers in peer-reviewed scientific journals and has a vast knowledge of Irish ecology and GIS. Kate is a Qualifying Member of the Chartered Institute of Ecology and Environmental Management (CIEEM). She has gained experience in Appropriate Assessment Screening reports and Natura Impact Statements for renewable energy projects at Fehily Timoney.

Habitat surveys and botanical surveys were conducted by Jason Guile and Chandra Walter.

Jason Guile was employed as Senior Ecologist with Fehily Timoney for this project. Jason has over 10 years' experience in ecological assessment and holds a BSc in Marine Biology/Oceanography from the University of Wales, Bangor and a HND in Coastal Conservation with Marine Biology from Blackpool and Fylde College. Jason has prepared Appropriate Assessment Screening reports and Natura Impact Statements for numerous large scale infrastructure projects in the commercial, energy and transport sectors.

Chandra Walter is a Project Ecologist working as part of the Energy and Environment Team at Fehily Timoney and Company. Chandra holds a BSc in Ecology from University College Cork and an MSc in Organic Horticulture from University College Cork (Both First Class Honours). Her degrees focused on nature conservation and included a wide variety of surveying skills, including habitat surveys, bird surveys and insect surveys, research skills and report writing.

Ecological walkover surveys and mammal surveys were carried out by David Daly and Kate O'Regan.

David Daly MSc BSc is a Project Ecologist with Fehily Timoney who completed the ecological walkover of the site. A large portion of his work is focused on the survey and assessment of proposed renewable energy and waste sites. He has carried out comprehensive ecological work on several sites, from flora and fauna surveys and habitat mapping. David also has experience in Ecological Appraisals, AA Screening Reports, Natura Impact Statement and Ecological Enhancement Plans. David has carried out AA Screening/ NIS reports for projects such wind farm grid connections, maintenance works to buildings, construction of commercial units, planning for retention, landfill remediation works and forestry felling licences.

Kate O'Regan is a Graduate Ecologist on the Energy and Planning Team at Fehily Timoney and Company. Kate holds a BSc in Zoology and MSc in Marine Biology from University College Cork. She has experience in a wide range of surveys such as habitat, intertidal, subtidal, bird, insect and mammal surveys. She further developed transferrable field skills through volunteer internships. Kate spent two summer seasons as a research volunteer with a sea turtle research organisation in Greece and also completed a three-month internship with ORCA Ireland conducting marine mammal surveys. Kate's MSc thesis involved GPS tagging of lesser-black-backed gulls on the Saltee islands and most recently she was awarded a SMART Marine Institute Research Vessel bursary to take part in the Celtic Sea herring acoustic monitoring survey. This range of experiences have enabled Kate to develop a diverse variety of research skills, applicable to different survey types.

Avifauna surveys were completed by Seán Ronayne, Barry O'Mahony and Aidan Duggan.

Seán Ronayne is a Survey Ecologist with Fehily Timoney & Company with extensive bird surveying experience. Seán holds a degree (BSc Zoology), and two masters from UCC (MSc Marine Biology + Ecological Assessment). Seán has worked in various ornithological roles both in Ireland and abroad and has been birdwatching for more than 20 years. Two of Seán's dissertations were of an ornithological nature, and he has also published several papers in peer-reviewed journals, most recently on: "An observation of vocal mimicry by Dupont's Lark *Chersophilus duponti* in Catalonia.", published in Revista Catalana d'Ornitologia. Seán is also a very keen sound-recordist and recorded over 200 species of birds in Catalunya, in 2020, about which he is writing a book. Seán is also working to sound record and catalogue all the resident and wintering bird species of Ireland.



Aidan Duggan has 16 years of experience working as a self-employed field surveyor specialising in bird surveys. As part of this work, he has undertaken Vantage Point surveys, Hen Harrier surveys (nest monitoring and winter roost watches), Red Grouse surveys, Merlin Surveys, White tailed Eagle surveys, breeding and wintering wader and wildfowl surveys, common bird census, countryside bird surveys, intertidal bird surveys, as well as transects and hinterland surveys. He has considerable experience conducting bird surveys on wind farms and power grid routes. Aidan has a lifelong interest in Ornithology and was a voting member of the Irish Rare Bird Committee (IRBC) from 1999 to 2005.

Barry O'Mahony has a life-long interest in birds and birdwatching and is a licensed Bird Ringer. He is a graduate of UCC with a B.Sc. (General) in Zoology and has been a self-employed freelance bird surveyor since 2007. He has worked as Research Assistant on studies of hen harrier, dipper and a variety of seabirds involving wing-tagging, the attachment and retrieval of data loggers and radio tracking. His survey work has included shorebird distribution monitoring, IWeBS, VP watches at wind farm sites, harrier roost watches, hinterland surveys and Vantage Point selection and Assessment.

1.3 Project Background

The current EIAR study area has been subject to previously permitted planning applications. There was a previously permitted planning permission for the development of 14 turbines and a substation at this site, this permission was valid until December 2016. The development comprised 14 turbines with a tip height of 105m, a meteorological mast, a 110kV substation and switching station and all associated access roads, handstands, drainage, cabling and ancillary infrastructure. The relevant planning references for this permitted development are Cork County Council (CCC) Pl. Ref. 05/5907, An Bord Pleanála (ABP): PL04.219620 and CCC PL. Ref. 11/6605 (extension of duration of permission).

Construction of the Previously Consented Development did not take place for various reasons of a commercial, economic and technical nature that were outside of the control of the developer, as acknowledged by Cork County Council in granting an extension for a period of 5 years under Section 42 of the 2000 Act (CCC: 11/6605).

Advances in turbine technology in the intervening years meant the Previously Consented Development had a number of limitations and in December 2014 the applicant submitted a new application to maximise the efficiency of the site. This application was for a 6 no. turbine wind farm and was made to replace CCC Pl. Ref. 05/5907 which was extended under CCC Pl. Ref.11/6605. The planning reference for this application was CCC Pl. Ref. 14/6760. The Proposed Wind Farm comprised 6 turbines with a tip height of 131 m, a meteorological mast, access roads and handstands, a new access junction and improvements to the public road, a temporary compound, a borrow pit, underground electrical cables and ancillary infrastructure. An Environmental Impact Statement (EIS) was submitted as part of the application.

In December 2014, a separate planning application for the Proposed Substation was submitted to Cork County Council (Pl. Ref. 14/557). A Planning and Environmental Report was submitted as part of the application. This application was required in order to meet current standards in substation design at that time. The substation was to replace the substation granted under CCC Pl. Ref. 05/5907 which was extended under CCC Pl. Ref.11/6605, and ABP PL04.219620. The decision was quashed by order of the High Court in November 2016 with the case reactivated in March 2017 (ABP PL04.248152) and granted permission in April 2019. This decision was quashed by order of the High Court in May 2020.

In November 2015, the applicant received a grant of permission by Cork County Council for a revised wind farm layout consisting of 6 no. wind turbines which was appealed to An Bord Pleanála (Ref: PL04.245824). The decision was quashed by order of the High Court in November 2016. It was ordered that the case be remitted back to the Board and the case was reactivated in March 2017 (ABP PL04.248153). and granted permission in April 2019. This decision was quashed by order of the High Court in May 2020.



These cases were remitted back to ABP for re-decision for the Proposed Wind Farm site (PL04.308210) and the Proposed Substation (PL04.308208). This EIAR has been produced in response to a request from An Bord Pleanála to provide an updated assessment given the passage of time since the submission of the 2014 applications.

In December 2014, a separate planning application was made by the applicant for improvements to the public road, to facilitate turbine delivery at the junction of the R585 and the local road, L6008, at Bengour West (CCC Pl. Ref. 146803 and ABP PL04.245034). A separate planning application was necessitated by Cork County Council, as the planning/land ownership boundary was not contiguous with that of the Proposed Wind Farm. However, where required, the potential impacts of these proposed road improvement works were considered within the EIS (EIAR) as part of CCC Pl. Ref. 14/6760, ABP PL04.245824 and ABP PL04.248153.

Underground grid connection cabling linking the Proposed Wind Farm to the Carrigarierk Wind Farm is also being cumulatively assessed as part of this Project. This is being assessed cumulatively as in the event that the loop-in loop-out connection to the 110kV overhead line (OHL) becomes unviable, the permitted underground cabling will provide an alternative means of connecting the Proposed Wind Farm to the National Grid at the Carrigdangan 110kV substation.



- Legend**
- Development Planning Boundary
 - Lands in Control of Applicant
 - Proposed Substation

TITLE:	Site Location		
PROJECT:	Barnadivane Wind Farm and Substation, Co. Cork		
FIGURE NO:	1-1		
CLIENT:	Barna Wind Energy Ltd. & Arran Windfarm Ltd.		
SCALE:	1:30000	REVISION:	0
DATE:	27/02/2023	PAGE SIZE:	A3

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1.4 Methodology

1.4.1 Guidance

The assessment was conducted in accordance with the following guidance:

- *Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*, Office for Official Publications of the European Communities, Luxembourg (European Commission, 2001)
 - This document was updated by *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 (European Commission, 2021)
- *Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities*. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin (2009, updated 2010) (Environment Heritage and Local Government, 2010)
- *Managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC*. European Commission (2019). Brussels, (2019/C 33/01). OJ C 33, 25.1.2019
- *Interpretation Manual of European Union Habitats*. Version EUR 28. (European Commission, 2013)
- *OPR Practice Note PN01 Appropriate Assessment Screening for Development Management*, (Office of the Planning Regulator, 2021).

1.4.2 Process

The process of determining the likelihood of significant effects from a proposed development on European sites is an iterative process centred around a Source-Pathway-Receptor assessment.

The assessment commences with a description of the project and the associated likely significant environmental effects. All elements of the project are presented including the project location and existing baseline environment. The type of impacts which are likely due to the project are identified having regard to the spatial and temporal scale of the project, resource requirements and likely emissions. The zone of influence (Zoi) of the project is therefore defined, and the potential source-pathway-receptor (S-P-R) connectivity to European Sites and their qualifying interests / special conservation interests are identified.

The potential for in-combination effects with other plans and projects is also assessed having regard to the identified impacts of the project.

The likelihood of significant effects on the European Sites within the Zoi is determined having regard to the sensitivity of the site to the impacts associated with the project on its own and in combination with other plans and projects.

Having regard to the European Commission Communication on the Precautionary Principle (EC, 2021) the:

“absence of scientific evidence on the significant negative effect of an action cannot be used as justification for approval of this action. When applied to Article 6(3) procedure, the precautionary principle implies that the absence of a negative effect on Natura 2000 sites has to be demonstrated before a plan or project can be authorised. In other words, if there is a lack of certainty as to whether there will be any negative effects, then the plan or project cannot be approved.”



Where significant effects are considered to be likely, or where there is uncertainty regarding the likelihood of significant effects, the project will be required under law to be subjected to Appropriate Assessment.

Section 3 of this report presents an assessment of whether the Proposed Wind Farm would be likely to have significant effects on European sites (either alone or in combination with other plans or projects). The Report has concluded that the potential for likely significant effects exists. As such, having regard to Article 177T(4) of the Planning and Development Act, 2000 (as amended) a Natura Impact Statement (NIS) has been prepared. The NIS is included in **Section 4**. of this report.

The European Commission Notice (2019): *'Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC'* prescribes the content of the Appropriate Assessment and notes the following:

- it must be ensured that the Appropriate Assessment addresses all elements contributing to the site's integrity as specified in the site's conservation objectives and Standard Data Form, and is based on the best available scientific knowledge in the field;
- the information required should be up to date;
- The Appropriate Assessment should also include a comprehensive identification of all the potential effects of the plan or project likely to be significant on the site, taking into account in-combination and other effects likely to arise as a result of the combined action of the plan or project under assessment with other plans or projects.
- It should apply the best available techniques and methods to assess the extent of the effects of the plan or project on the integrity of the site(s).

The NIS as presented has been developed to address these requirements to present sufficient and up-to-date information to allow the Competent Authority to give full consideration of all elements contributing to the site integrity of the relevant European sites and allowing identification of potential effects, mitigation measures and residual effects.

1.4.3 Information Consulted in the Preparation of this Report

A desk study was carried out to collate available information on the Proposed Development's natural environment. This comprised a review of the following publications, data and datasets:

- Cork County Development Plan 2022-2028
- Cork County Council Planning Enquiry System
- An Bord Pleanála Planning <https://www.pleanala.ie/en-ie/home/>
- Forestry applications forestry-maps.apps.rhos.agriculture.gov.ie/
- Environmental Protection Agency (EPA) (on-line map-viewer) <http://watermaps.wfdireland.ie/HydroTool/Authentication/Login.aspx?ReturnUrl=%2fHydroTool%2fDefault.aspx>
- EPA Geotool <https://gis.epa.ie/EPAMaps/AAGeoTool>
- Department of Housing, Planning, and Local Government – online land use mapping www.myplan.ie/en/index.html;
- Department of Housing, Planning, and Local Government- EIA Portal <https://www.housing.gov.ie/planning/environmental-assessment/environmental-impact-assessment-eia/eia-portal>
- Environmental Protection Agency (EPA) – Water Quality www.epa.ie, <http://gis.epa.ie/Envision>;



- Geological Survey of Ireland – Geology, soils and Hydrogeology www.gsi.ie;
- Water Framework Directive website – www.catchments.ie;
- National Biodiversity Action Plan 2017-2021
<https://www.npws.ie/sites/default/files/publications/pdf/National%20Biodiversity%20Action%20Plan%20English.pdf>;
- Draft National Biodiversity Action Plan 2023-2027
Public Consultation on Ireland’s 4th National Biodiversity Action Plan (www.gov.ie)
- National Parks and Wildlife Service – online European site network information, including site conservation objectives www.npws.ie;
- National Parks and Wildlife Service – Information on the status of EU protected habitats in Ireland (Article 17 and Article 12 Reports)
- National Biodiversity Data Centre – www.biodiversityireland.ie;
- Ordnance Survey of Ireland – Mapping and Aerial photography www.osi.ie; and
- Inland Fisheries Ireland - <https://www.fisheriesireland.ie/>.



2. DESCRIPTION OF THE PROJECT

2.1 Existing Environment of Proposed Development site.

2.1.1 Location

The Proposed Development (Proposed Wind Farm and Proposed Substation) are located in County Cork, approximately 3 km northeast of Coppeen and 10 km south of Macroom.

The Proposed Development is located in a rural area with low population density associated with sparse rural settlement. The nearest village is Teerelton, approximately 3 km to the north.

2.1.1.1 *Hydrology*

The Proposed Development is located within the Lee, Cork Harbour and Youghal Bay (ID 19) hydrometric areas (catchment) of the Irish River Network System. This is further defined as two sub-catchments by the Water Framework Directive (WFD)

- Lee[Cork]_SC_30
- Lee[Cork]_SC_50

The Proposed Development is situated within two sub-basins. These waterbodies are known as:

- Cummer_010 – IE_SW_19C020500 (Turbine 1 and 2)
- Bride(Lee)_010_IE_SW_19B040400 (Turbines 3, 4, 5 and 6)

The main hydrology features within the Proposed Development site are the River Cummer and River Bride.

An area of approximately 198 ha within the proposed landholding boundary drains into the River Bride and its tributaries. An area of approximately 76 ha within the Proposed Development boundary drains into this the River Cummer.

2.1.1.2 *Groundwater Vulnerability*

The Groundwater Vulnerability within the Proposed Development site is predominantly 'High' with some areas of 'Extreme' vulnerability and 'X - Rock at or near Surface'.

The Proposed Development site is located within the Ballinhassig East Groundwater Body (GWB). The GSI states that the Ballinhassig East GWB is predominantly underlain by a Locally Important Aquifer (LI) – Bedrock which is Moderately Productive only in Local Zones. The GSI states that diffuse discharge for Ballinhassig East GWB will occur via rainfall percolating through the subsoil or areas of outcropping rock.

The overburden deposits of till and peat have generally low permeability and may therefore act as a confining layer (where present), preventing the free movement of surface water to the underlying aquifer within the bedrock.



2.1.1.3 Habitats

The Proposed Development supports extensive areas of modified habitats including improved agricultural grassland (GA1) and wet grassland (GS4), with lesser areas of scrub (WS1), conifer plantation (WD4) and buildings and artificial surfaces (BL3). Linear features onsite include hedgerows (WL1), treelines (WL2), drainage ditches (FW4) and upland eroding rivers (FW1).

There are no habitats present that are listed on the Annex I of the EU Habitats Directive.

2.1.1.3.1 Invasive Non-Native Species

Himalayan knotweed (*Persicaria wallichii*), a Third Schedule high impact invasive alien plant species, was recorded along the unnamed local roadside within the Proposed Development site at the north-eastern boundary near the entrance to farm buildings.

Cherry laurel (*Prunus laurocerasus*) and Sycamore (*Acer pseudoplatanus*) was also recorded at this location.

Sitka spruce (*Picea sitchensis*) is present in treelines along farm tracks and field boundaries near T1 and T3 as well as small blocks of conifer plantation near T1.

Fuchsia (*Fuchsia magellanica*) and New Zealand holly (*Olearia macrodonta*) are also present in the hedgerow adjacent to T3.

2.1.1.4 Existing Soils and Geology

The subsoils present within the Proposed Development and wider Study Area comprise:

- Sandstone till (Devonian)
- Bedrock at Surface
- Blanket Peat

The majority of turbine locations and associated infrastructure are located within areas defined as Till derived from Devonian Sandstones, with frequent areas of 'bedrock outcrop or subcrop' of bedrock at surface. Isolated Blanket Peat is present in the west and south of the site, and is not within the footprint of turbines and associated infrastructure.



2.2 Proposed Project

2.2.1 Summary of Proposed Project

The applicant intends to undertake the following development:

- Proposed Wind Farm: The proposed 6 turbine wind farm will have a defined planning boundary which will include not only the turbines themselves but also ancillary infrastructure such as internal access roads, crane hardstandings, on-site underground cabling, a meteorological mast and borrow pit.
- Proposed Substation: A new 110kV grid connection substation that meets current EirGrid standards. The Proposed Substation has a defined planning boundary which will include a 110kV grid connection substation compound with associated control buildings and electrical equipment as well as ancillary infrastructure such as internal access roads and security fencing. The substation location is within the EIAR boundary for the Proposed Wind Farm. Although the grid connection for the Proposed Wind Farm, via the proposed 110kV substation is subject to a separate planning application, the relevant impacts have been assessed.
- A Biodiversity Enhancement and Management Plan is included in Appendix 6 and comprises land management commitments and monitoring for within the Proposed Wind Farm and Substation Site. **Note:** This is not being proposed as mitigation or compensation. It is being proposed as part of the project.

These developments interact during their operation, as a result, the developments will be considered to evaluate any in-combination effects that may arise.

In the event that the Proposed Substation is not permitted, an alternative underground grid connection (AGCR) relating to the Carrigarierk Windfarm (Cork County Council Ref. 15/730 & An Bord Pleanála Ref. PL04.246353) will be utilised. This Alternative Grid Connection Route will be assessed in-combination as it relates to an existing permitted development.

In order to deliver the large turbine components to site there will be a requirement to carryout enabling works within the townlands of Barnavidane (Kneeves), Lackareagh & Garranereagh. The works (Enabling TDR Works) will consist of construction of a private roadway, approximately 150 metres long, from the R585 to the L6008 and all associated works. These works have already been consented pursuant to Cork Co.Co. Ref. 14/6803 and the resultant in-combination effects are considered in-combination in this report.

In summary, the Project for AA purposes is made up of the Proposed Development which includes 6 no. wind turbines (1), a 110kV substation (2), and BEMP measures (3) for which planning consent is sought. The in-combination effects of other elements of the project for which permission has already been granted including enabling works to facilitate the delivery of turbines to site (Enabling TDR Works) (4) and if necessary an Alternative Grid Connection Route (AGCR) (5) are assessed in this report in-combination.

1. Proposed 6 no. turbine wind farm (pending under An Bord Pleanála planning ref. PL04.308208)
2. Proposed 110kv substation (pending under An Bord Pleanála planning ref. PL04.308210)
3. Biodiversity Enhancement Management Plan (BEMP measures)
4. Enabling TDR Works under Cork Co.Co. planning ref. 14/6803)
5. Potential Alternative Grid Connection Route (AGCR) (permitted under Cork Co.Co. planning ref. 15/730 & An Bord Pleanála Ref. PL04.246353)



2.2.2 Summary of the Proposed Wind Farm

In summary the Proposed Wind Farm assessed will consist of the following:

- Construction of 6 no. wind turbines with a blade tip height 131m, a hub height of 72.5m and a rotor diameter range of 117m;
- Construction of turbine foundations and crane pad hardstanding areas including associated drainage infrastructure;
- Construction of 2,346m of new permanent site tracks and associated drainage infrastructure;
- Upgrading of 1,381m of existing tracks and associated drainage infrastructure;
- Upgrade of 2 no. existing agricultural access junctions for construction and operational access from the local roads;
- 1 no. on site borrow pit and associated ancillary drainage within the townland of Barnadivane (Kneeves), Co. Cork;
- 1 no. temporary construction site compounds and associated ancillary infrastructure including parking;
- Installation of medium voltage underground electrical and communication cabling connecting the wind turbines to the proposed on-site substation and associated ancillary works;
- Erection of 1 no. permanent meteorological mast with a height of 90m above ground level and associated access track;
- All related site works and ancillary development including landscaping and drainage;
- A 25 year operational life from the date of commissioning of the entire wind farm is being sought.

2.2.3 Summary of the Proposed Substation

In summary the Proposed Substation assessed will consist of the following:

- Construction of 1 no. permanent on-site 110kV electrical substation (which is under a separate planning application under consideration by An Bord Pleanála, reference PL04.308208) including:
- 3 no. single storey control buildings with dimensions as follows:
 - Control Building A & B with an approximate floor area of 195m² and a maximum height of approx. 6.2m above finished ground level; and
 - Control Building C with an approximate floor area of 223m² and a maximum height of approx. 6.5m above finished ground level.
- an access track approx. 200m in length;
- 2 no. steel lattice mast structures located directly underneath the existing overhead 110kV line, with a maximum height of approx. 18m;
- electrical plant and equipment;
- welfare facilities;
- carparking;
- water and wastewater holding tanks;
- security fencing;
- lightning protection and telecommunications masts;



- security cameras;
- external lighting; and
- all associated infrastructure;
- Installation of a grid connection point from the Proposed Substation to the existing 110kV Macrooom to Dunmanway overhead line, the substation will be situated beneath this line.

2.2.4 Summary of the Biodiversity Enhancement Plan Measures

A Biodiversity Enhancement and Management Plan (BEMP) has been prepared to outline a set of land management prescriptions (commitments and monitoring) as part of, and to occur within the Proposed Development.

2.3 Project Description

2.3.1 Wind Turbines

Turbine General Description

Modern wind turbines from the main turbine manufacturers have evolved to share a common appearance and other major characteristics with only minor cosmetic differences differentiating one from another.

The wind turbines that will be installed on site will be conventional three-blade horizontal axis turbines, that will be designed to ensure the rotors of all turbines rotate in the same direction at all times.

The rotor blades are bolted to the central hub, which is connected to a generator located in the nacelle. The nacelle holds the following turbine components:

- Generator
- Electrical components
- Control unit

A glass fibre reinforced polyester hood covers the nacelle. Earthing and isolation protect all components from lightning strikes.

The proposed turbines will have a tip height of 131m, 72.5m hub height and a rotor diameter of 117m.

Turbine Blades

The blades of the proposed turbine are made up of glass fibre reinforced polyester consisting of 3 no. blades.

They turn at between 7.9 and 14.1 revolutions per minute depending on wind speed and in general will shut down at wind speeds greater than 25m/s. A yaw mechanism turns the nacelle and blades into and out of the wind. A wind vane on the nacelle controls the yaw mechanism. Blades are pitched to match the wind conditions.

Turbine Tower and Foundation

The tower of the turbine is a conical steel tube, with multiple painted finish. It is generally delivered to site in four or five sections. The first section is bolted to the steel base, which is cast into the concrete foundation. The proposed turbine foundations will be 22m in diameter and 3m in depth.



The base of the tower is approximately 4-4.5m in diameter, tapering to approximately 2-3m where it is attached to the nacelle. The first floor of the tower is approximately 2-3m above ground level and is accessed by a galvanised steel staircase and a steel hatch door which will be kept locked except during maintenance .

The turbine will be anchored to the foundation as per the turbine manufacturer's guidelines which will be incorporated in the civil foundation design.

The turbine foundations shall be constructed using standard reinforced concrete construction techniques.

In summary the works shall be carried out as follows:

- The extent of the excavation will be marked out.
- Around the perimeter of the foundation formation a shallow drain will be formed.
- The base of the foundations will be excavated to competent bearing strata.
- Excavated soil will be placed in the temporary storage areas adjacent to the turbines.
- A layer of concrete blinding will be laid approximately 75mm thick directly on top of the newly exposed formation.
- Formwork and reinforcement.
- Ductwork will be installed as required for cables, and formwork erected around the steel cage.
- Concrete will be placed using a concrete pump and compacted using vibrating pokers.
- Upon completion of the concreting works the foundation base will be covered from the elements.
- Steel shutters will be used to pour the upper plinth section.
- Once the concrete is set the earthing system is put in place and the foundation is backfilled with suitable material.
- The foundation will be backfilled with a cohesive material, where possible using the material arising during the excavation and landscaped using the top-soil set-aside during the excavation.

Turbine foundations will be designed to Eurocode Standards. Foundation loads will be provided by the wind turbine supplier, and factors of safety will be applied to these in accordance with European design regulations. The turbine foundation dimensions for this Proposed Development are 22m in diameter and 3m in depth.

Turbine Transformer

The turbines will have transformers located within the base of the tower, which shall step up the initial generating voltage from c.400V to either 20kV or 33kV, and will then connect to the Proposed Substation via a network of underground medium voltage cable circuits to be located adjacent to the proposed site track network.

Turbine Colour

The turbines have a multiple painted coating to protect against corrosion. They are coloured off-white or light grey to blend into the sky background. This minimises visual impact.



Turbine Erection

Once the turbine components arrive on site they will be placed on the hardstand and lay down areas prior to assembly. The towers will be delivered in sections and each blade will be delivered in a separate delivery. Once there is a suitable weather window the turbine will be assembled.

It is anticipated that each turbine will take approximately 3 to 4 days to erect (depending on the weather), requiring two cranes. Finally, the turbines will be commissioned and tested.

It is expected that the entire construction phase, including civil, electrical and grid works, and turbine assembly will take between approximately 12-18 months.

2.3.2 Proposed Wind Farm Internal Site Tracks

Access to the proposed turbines will be via the proposed internal site track network as shown on Figure 2-1. The proposed internal site track layout will permit access for vehicles during the construction phase, for maintenance during the operation phase, and for vehicles to decommission the turbines at the end of the life of the development.

Approximately 2.4 km of new site access tracks are proposed at the development site. All access tracks will be a minimum of 6m wide along straight sections but wider at bends (maximum 14m) as required.

The gradients of the site access tracks have where possible been limited to 10% to allow delivery of the turbines without towing.

The proposed access track will typically be constructed using conventional excavate and replace methods. This will generally involve placing compacted stone to a minimum 500mm depth on mineral soils or rock formation after removal of the topsoil. Depths would be increased for fill areas. The stone will be compacted in 200mm layers. Geogrids or similar may be used in certain areas of the site, depending on ground conditions. Material for the site tracks will be sourced on site from the proposed borrow pit shown on Figure 2-1 as much as possible. Otherwise, the material will be sourced locally where possible. Tracks will be finished with a well graded aggregate.

Sections of the internal access roads will need to be provided with edge protection especially in areas of fill or where the road approaches a steep section of the existing terrain. In general, earthen berm type edge protection will be provided.

2.3.3 Turbine Hardstandings

A turbine hardstanding area is will detailed at each turbine location under this application. This area will accommodate a main crane and an assist crane during the assembly of the turbine, as well as during occasional maintenance during the operation of the Proposed Wind Farm. The area of the hardstanding provided is deemed suitable for the assembly of a turbine with the proposed dimensions. The hardstanding areas will measure approximately 45m x 35m on plan, with blade fingers and tailing pad area.

2.3.4 Borrow Pit

The project shall include the opening of a borrow pit on site. The location of the proposed borrow pit is shown in Figure 2-1.

The proposed borrow pit location has been identified as a source of site won general fill for construction activities. The location was selected as potential sources of general fill (Class 1 material) using the criteria of no peat deposits, low landslide susceptibility and proximity to existing access tracks and proposed infrastructure.



The proposed borrow pit shall provide site-won stone that will significantly reduce the amount of construction aggregates that would need to be delivered to site. The proposed borrow pit shall also be reinstated with excavated soil material which will avoid the need to export excess spoil to off-site facilities.

The borrow pit shall have its own drainage network to be constructed prior to excavation.

The proposed borrow pit has a footprint area of approximately 0.36ha. This will provide a potential volume of approximately 11,489 m³ of site won general fill based on an aggregate resource thickness of 6.0m at the borrow pit.

2.3.5 Proposed Substation

A new permanent onsite electricity substation will be constructed within the Proposed Development site as shown in Figure 2-1.

This will provide a connection point between the Proposed Wind Farm and the proposed grid connection point to the existing 110kV Macroom to Dunmanway overhead line. The substation will be situated beneath this line.

The Proposed Substation location is within the EIAR boundary for the Proposed Wind Farm. Although the grid connection for the Proposed Wind Farm, via the proposed 110kV substation is subject to a separate planning application, the relevant environmental impacts have been appropriately assessed.

The Proposed Substation will cover an area of approximately 163m x 106m on plan including a buffer area to the perimeter. There will be three single storey control buildings on the site. The control buildings will be of standard masonry construction, rendered externally with a pitched roof. Finishes will be in keeping with the surrounding buildings. The floor area of Control Building A & B will be 195m², with the maximum floor area of Control Building C being 223m². The height of the Control Buildings A&B will be approximately 6.2m above finished ground level, and the height of Control Building C will be approximately 6.5m above finished ground level. The control buildings and electrical equipment will be enclosed by a 2.4m high steel palisade perimeter fence painted green encompassing an area of approximately 76m x 97m. The Proposed Substation will be connected to the public road via a short access track approximately 200m long.

The Proposed Substation will contain assorted electrical equipment including transformers, switch gear including circuit breakers, metering transformers, busbars, post insulators, lightning protection masts, line gantries, etc., all in accordance with EirGrid requirements. Two steel lattice mast structures will be located approximately 10m from the edge of the 110 kV compound and directly underneath the line of the existing 110 kV overhead line. They will have a maximum height of approximately 18m.

Although not permanently staffed, maintenance personnel will visit the Proposed Substation on average three to four times a week. Any general office waste will be regularly disposed of to a licensed facility.

Two underground foul water storage tanks will be provided within the Proposed Substation compound.

2.3.6 On-site Electrical Cabling

Electricity generated from the wind turbines shall be collected at medium voltage (20/33kV) by an internal circuit of buried cables which will follow on-site access tracks. This circuit shall be connected to the proposed onsite substation (or if not viable to the permitted AGCR). The Proposed Substation is shown on Figure 2-1 and the AGCR is shown on Figure 2-2.



The electricity will be an existing structure or transmitted as a three-phase power supply so there will be three individual conductors (or individual cables) in each cable circuit. The three conductors will each be laid in separate/single duct(s) which will usually be laid in a trefoil formation but may also be laid in a flat formation where conditions require it such as where the ducts need to cross culvert.

The width of the internal cable trench with a trefoil formation will be 600mm, a flat formation will require a wider trench width. The depth of cover to the ducts carrying the cables will be 750mm to the top of the upper ducts. The depth of trench for the cables will be 1,200mm. The diameter of the ducting will be selected to suit the range of cross-sectional areas of electrical cables and is likely to fall between 100mm and 200mm diameter.

2.3.7 Temporary Site Compound

During the construction phase, it will be necessary to provide temporary facilities for construction personnel. The location of the temporary site compound is shown on Figure 2-1.

Facilities to be provided in the temporary site compounds will include the following:

- site offices, of Portacabin type construction
- employee parking
- portaloos
- banded fuel storage
- bottled water for potable supply
- contractor lock-up facility
- a water tanker to supply water used for other purposes
- diesel generator
- canteen facilities
- waste management areas
- material/non-fuel storage areas

The temporary compound shall be constructed on aggregate hard standings surrounded by security fencing, located as shown on the accompanying drawings. Temporary facilities will be removed and the lands reinstated on completion of the construction phase.

2.3.8 Soil and Peat Management

The total volume of excavation required for turbine bases, hardstanding areas and site tracks is estimated to be of the order of 72,984 m³ and this material will be reused in the construction of the works on site and in the restoration of the borrow pit. Any further excess material will be utilised for the construction of landscape berms within the site.

The estimated volume of material required from the borrow pit is estimated at 11,489 m³.

2.3.9 Drainage

The drainage system will be constructed alongside all turbine hardstands, internal access tracks, substation (under separate application for consideration by ABP) and the temporary construction compound.



The drainage system for the existing tracks and field boundaries will be retained. Where the roads require widening, this will involve the re-location of existing roadside swales to allow for widening.

Access tracks are required to facilitate the construction of the Proposed Wind Farm site and to provide access to each of the turbines. Drainage infrastructure will be constructed in parallel with the access track construction.

The drainage system for the existing tracks and field boundaries will be retained. Where the roads require widening, this will involve the re-location of existing roadside swales to allow for widening.

A single manmade agricultural drain will be crossed using a 450mm diameter pipe

2.3.10 Permanent Meteorological Mast

A 90m permanent meteorological mast will be installed on site. This will allow independent monitoring of the Proposed Wind Farm performance. Anemometers and wind vanes will be mounted at various levels, and connected to a locked data-logger near the base of the mast, or connected to the site SCADA system.

The mast will be constructed with a shallow concrete foundation and will include a concrete base 8m by 8m and 1.5m in depth. The mast will be accessed from the proposed internal track. A turning head will be constructed adjacent the mast site. The met mast access track will be 3.5m in width and will include drainage.

The location of the proposed meteorological mast is shown in Figure 2-1.A construction sequence for the proposed mast is described below:

The works shall be carried out by a small crew in line with the following sequence of works:

- The site of the mast location shall be marked out and the necessary area cleared of vegetation.
- Mark out mast base in accordance with detailed design drawings.
- A temporary access track shall be extended towards the mast location from the existing agricultural track. The access track shall be up to 3.5m in width. Temporary and permanent drainage infrastructure shall be extended also.
- A temporary crane pad of approximately 10m x 10m in size shall be put in place in front of the proposed mast location.
- The foundation of the mast shall be excavated followed by shuttering, steel fixing and finally concrete pouring by ready mix truck.
- Following crane setup, the mast sections shall be delivered and unloaded by truck.
- Mast sections will be assembled on the ground.
- In accordance with an agreed lifting plan, mast sections shall be lifted by crane into place. Wind speeds shall be monitored at all times during lifting operations by the lead climber and crane operator.
- Mast sections shall be bolted together by climbers.
- Following erection of main mast sections, lightning protection and other ancillary components shall be fixed to the mast.



2.3.11 Grid Connection

Electricity generated from wind turbines shall be collected at medium voltage (20/33 kV) by an internal circuit of buried cables which will follow on-site access tracks. Underground cables from each of the turbines will connect to a new permanent onsite electricity substation within the Proposed Wind Farm site. The location of the Proposed Substation is shown in Figure 2-1. The Proposed Substation will provide a connection point between the wind farm and the proposed grid connection point on the existing 110kV Macroom to Dunmanway overhead line through a looped-in connection. The Proposed Substation will be situated beneath this line. No overhead lines or underground cables will therefore be required outside of the Proposed Wind Farm site, to connect this wind farm to the national grid, if this arrangement is progressed.

2.3.12 Biodiversity Enhancement and Management Plan (BEMP) Measures

The Biodiversity Enhancement Plan Measures will be taken to protect and enhance the habitats of local biodiversity value within the Proposed Development Site, and the species which utilise the same within the vicinity.

Higher value habitats will be actively managed to maintain and improve their value and lower value habitats will see specific interventions designed to improve their attractiveness for a wide range of species. Measures will include maintenance of bat buffers, hedgerow planting, scrub succession, pollinator planting and the provision of shelter habitats. Full details of measures and their implementation are detailed in Appendix 4.

The BEMP is not designed to mitigate or address particular potential impacts associated with the construction, operation or decommissioning of the Proposed Wind Farm and Substation. It is instead a commitment provided to yield a lasting biodiversity benefit within and surrounding the Proposed Development. It is expected that measures associated with the implementation of the proposed BEMP will be equivalent to standard agricultural activities and will be carried out, maintained, and monitored. The screening assessment has considered the potential for likely significant effects from implementation of the BEMP.

The following measures are proposed as part of the BEMP, and are described in full in Appendix 4:

- Maintenance of bat buffers
- Hedgerow and treeline planting
- Scrub succession
- Pollinator Planting
- Wildlife Ponds
- Shelter Habitats (Bee nest box, log piles, refugia/hibernacula, bat boxes, mammal boxes, bird boxes)
- Hedgerow maintenance
- Scrub fencing

2.3.13 Operation

During the operational period, the turbines will operate automatically on a day-to-day basis, responding by means of anemometry equipment and control systems to changes in wind speed and direction. The turbine manufacturer or a service company will carry out regular maintenance of the turbines. Scheduled services will typically occur twice a year.



The operation of the wind turbines will be monitored both remotely and on-site. An operative working from a remote headquarters will oversee the day to day running of the Proposed Wind Farm.

The applicant requests the grant of permission is on the basis of a 25-year operational period from the date of full operational commissioning of the Proposed Wind Farm. With permission for the proposed onsite substation (under separate application) sought in perpetuity given that the substation could form part of the national electricity network. Therefore, the Proposed Substation will be retained as a permanent structure and will not be removed.

25 years is the anticipated minimum useful lifespan of wind turbines which are being produced for the market today. The lifespan of wind turbines has been increasing steadily in recent years and allowing this duration will improve the overall carbon balance of the development, therefore maximising the amount of fossil fuel usage that will be offset by the Proposed Wind Farm. Leaving the wind turbines in-situ until the end of their useful lifespan would be optimum from an environmental viewpoint, particularly in relation to carbon savings. During this operational period the wind turbines will generally operate automatically, responding by means of anemometry equipment and control systems to changes in wind speed and direction.

Maintenance activities associated with the implementation of the proposed BEMP will be equivalent in nature to agricultural activities and will be carried out by the involved landowners. The BEMP measures are described in Appendix 4.

2.3.14 Decommissioning

On decommissioning, cranes will disassemble the above ground turbine components which will be removed off site for recycling. All the major component parts are bolted together, so this is a relatively straightforward process.

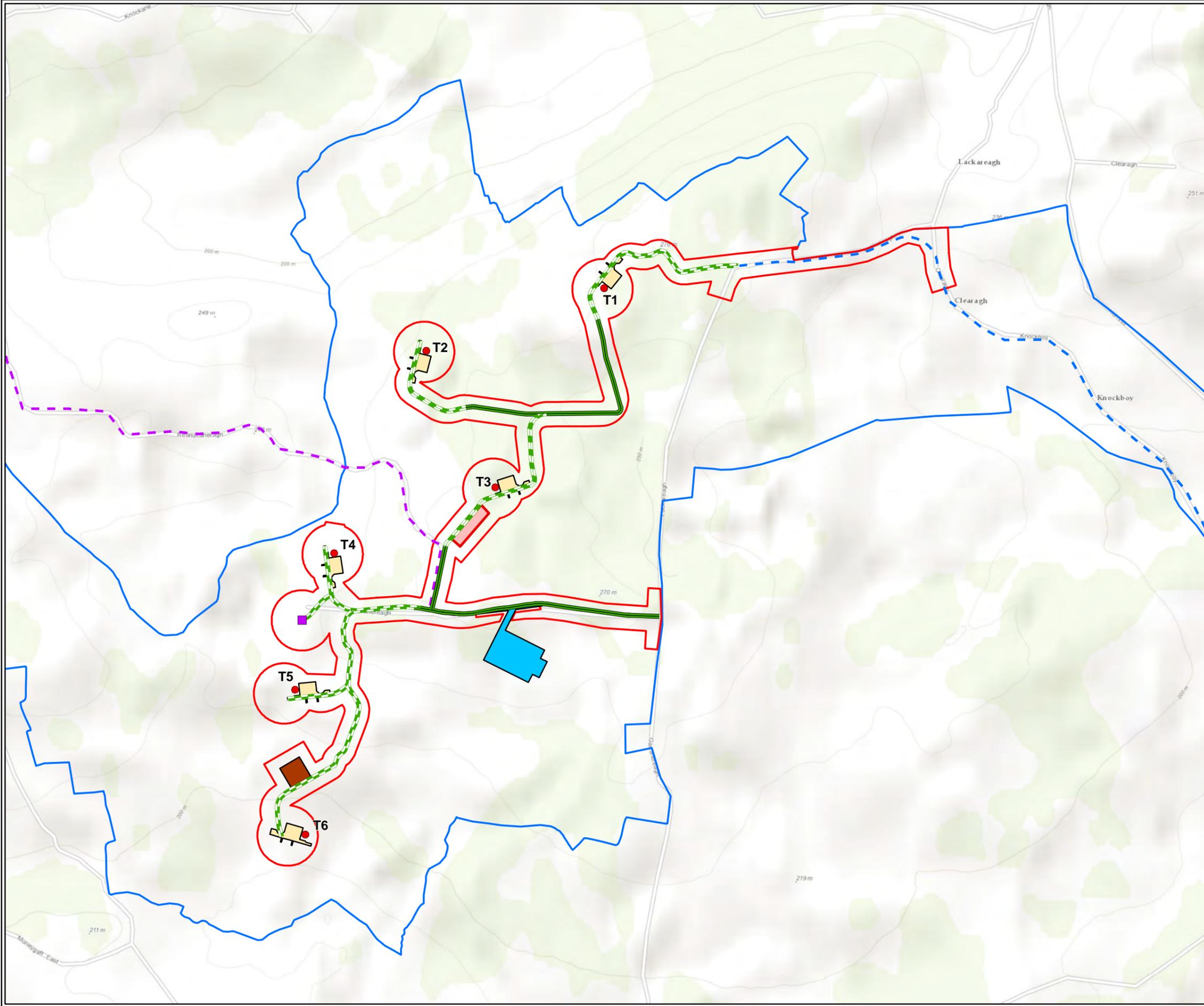
The foundations will be covered over and allowed to re-vegetate naturally.

It is proposed that the internal site access tracks and turbine hard standings will be left in place. The access tracks will continue to be used for agriculture access. Turbine hardstandings shall be covered over with topsoil and left to revegetate naturally.

It is expected that the temporary accommodation works along the TDR will not be required for the decommissioning phase as turbine components can be broken up on site and removed using standard HGVs.

Grid connection infrastructure including the Proposed Substation, internal cabling, and ancillary electrical equipment shall form part of the national grid and will be left in situ.

It is expected that the decommissioning phase will take no longer than 6 months to complete.



- Legend**
- Development Planning Boundary
 - Lands in Control of Applicant
 - Tracks-Proposed
 - Tracks-Existing
 - Proposed Substation
 - Turbine Hardstandings
 - Proposed Temporary Construction Compound
 - Proposed Borrow Pit
 - Proposed Met Mast
 - Proposed Turbine Layout
 - Alternative Grid Connection Route
 - Turbine Delivery Route

TITLE: Site Layout	
PROJECT: Barnadivane Wind Farm and Substation, Co. Cork	
FIGURE NO: 2-1	
CLIENT: Barna Wind Energy Ltd. & Arran Windfarm Ltd.	
SCALE: 1:10000	REVISION: 0
DATE: 27/02/2023	PAGE SIZE: A3



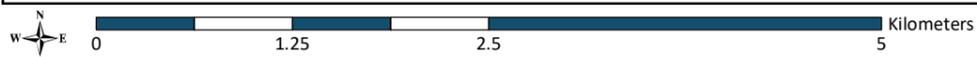


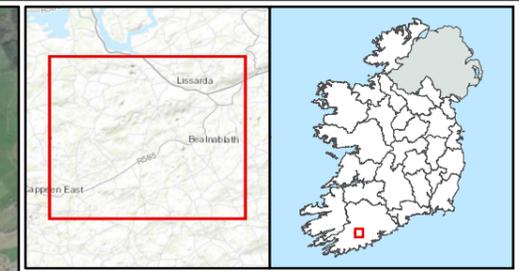
Legend

- Development Planning Boundary
- Lands in Control of Applicant
- Proposed Substation
- Proposed Turbine Layout
- Alternative Grid Connection Route

TITLE:	Alternative Grid Connection		
PROJECT:	Barnadivane Wind Farm and Substation, Co. Cork		
FIGURE NO:	2-2		
CLIENT:	Barna Wind Energy Ltd. & Arran Windfarm Ltd.		
SCALE:	1:45000	REVISION:	0
DATE:	23/02/2023	PAGE SIZE:	A3

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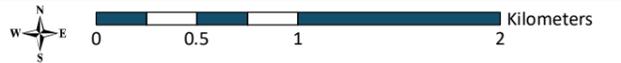




-  Development Planning Boundary
-  Lands in Control of Applicant
-  Proposed Substation
-  Turbine Delivery Route

TITLE: Turbine Delivery Route	
PROJECT: Barnadivane Wind Farm and Substation, Co. Cork	
FIGURE NO: 2-3	
CLIENT: Barna Wind Energy Ltd. & Arran Windfarm Ltd.	
SCALE: 1:35000	REVISION: 0
DATE: 23/02/2023	PAGE SIZE: A3

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2.4 Turbine Delivery Route (permitted under Cork Co.Co. planning ref. 14/6803)

2.4.1 Turbine Delivery and Construction Haul Route

Large components associated with the Proposed Wind Farm construction will be transported to the Proposed Wind Farm via the identified TDR. The TDR to the site is shown in Figure 2-3. It is likely that turbines will be delivered via the N22 Cork-Killarney road, as far as the junction with the R585 at Inchirahilly. From here, the route will follow the R585 road (Crookstown-Bantry) as far as the junction with the local road L6008, at Bengour West. From here it will follow the local road network through Lackareagh, as far as the proposed entrance to the site.

The TDR is confined to the public road corridor associated with the above roads with the exception of locations where temporary accommodation works will be required to facilitate the delivery of oversized loads. A grant of permission by Cork County Council was received for road improvement works at the junction of the R585 and L6088 at Bengour West (CCC Pl. Ref. 146803) (Enabling TDR Works).

The Enabling TDR Works will only be required during the operational phase in the unlikely event of a major turbine component replacement. It is expected that these temporary accommodation works will not be required for the decommissioning phase as turbine components can be broken up on site and removed using standard HGVs.

2.4.2 Watercourse Crossings Along the TDR

The TDR crosses a number of watercourses along the route between the N22 and the Proposed Wind Farm site. There are no specific accommodation works required at bridge points along the TDR.

2.5 Potential Alternative Grid Connection Route (permitted under Cork Co.Co. planning ref. 15/730 & An Bord Pleanála Ref. PL04.246353)

2.5.1 Alternative Grid Connection Route

Should the proposed looped-in connection prove not to be viable a consented 38kV grid connection cable route between the permitted Carrigarierk and Proposed Barnadivane Wind Farm will be developed.

The permitted underground AGCR option will consist entirely of underground 20/33kV cable and will connect the Proposed Barnadivane Wind Farm to the Carrigarierk Wind Farm (CCC reference: 15/730; ABP reference: PL04.246353). The Carrigarierk Wind Farm connects to the onsite Carrigdangan 110kV substation, which in turn will connect to the Dunmanway 110kV substation (CCC reference: 17/431; ABP reference: 301563-18).

The permitted AGCR is shown in Figure 2-2 No overhead lines are proposed for this connection.

As shown in Figure 2-2 the permitted AGCR travels:

- From the entrance of the proposed 110kV substation;
- Along the public road corridor to location 523,095E 562,474N (ITM) where it then enters the Carrigarierk Wind Farm site boundary;
- Joins and travels along an existing forestry road for 240m;
- Traverses approximately 280m of coniferous forestry to location 522,709E 562,203N (ITM) where it connects to the Carrigarierk Wind Farm onsite Carrigdangan 110kV Substation;



To note, due to the passage of time and development of the applicant's wind farm portfolio, the AGCR will not be developed to connect to the proposed 110kV substation (ABP case reference: PLO4.308208). In the event that the AGCR is developed, it will be developed as a tail-fed underground connection which will not require the construction of a substation onsite.

The AGCR will connect to the Site at between T3 and T4, as previously consented and as shown in Figure 2-2.

Connection works from the Proposed Wind Farm to Carrigarierk Wind Farm will involve the installation of ducting, joint bays and ancillary infrastructure and the subsequent running of cables along the existing road network. This will require delivery of plant and construction materials, followed by excavation, laying of cables and subsequent reinstatement of trenches and road surfaces.

2.5.2 Watercourse Crossings Along the AGCR

There are 15 no. main existing watercourse/culvert crossings located along the consented AGCR. The crossing methods are set out in the EIS/EIAR prepared for the cable works as consented pursuant to Cork Co.Co. Planning Ref. 15/730 and ABP Ref. 04.246353.

2.6 Potential Interactions of the Proposed Development with the Natural Environment

Having regard to the 'Habitats Directive assessment review package' set out in the guidance document 'Assessment of Plans and Projects significantly affecting Natura 2000 Sites: *Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*', (European Commission, 2021), the features of the Proposed Development with potential for interaction with the natural environment are set out relative to the following headings within Table 2-1:

- Size and scale;
- Land-take;
- Physical changes to the environment;
- Resource requirements;
- Emissions
- Transportation requirements
- In-combination

These project features are further examined in defining the likely Zone of Influence (ZoI) of the project and in determining likely significant effects through the Source-Pathway-Receptor assessment (Section 3.3.1).



Table 2-1: Potential Impacts of the Proposed Development

Project Feature	Description	Potential Impact
Size and scale/ Land-take	<p><i>Construction:</i> Construction of the Proposed Development will result in a permanent loss of habitat due to construction of hardstandings, turbines, substation, crane pads, access tracks, provision of tree-free buffers around turbines and all other proposed infrastructure.</p> <p><i>Operation:</i> The Proposed Development site will comprise of 6 no. wind turbines with a blade tip height of 131m, a hub height of 72.5m and a rotor diameter range of 117m. No further excavation works would be required and therefore there will be no further land-take required during the operational phase.</p> <p><i>Decommissioning:</i> Internal site access tracks, turbine hard standings, and grid connection infra-structure (including onsite sub-station and ancillary electrical equipment) will be left in place. Turbine hard standings will be covered over with topsoil and left to revegetate naturally.</p>	<p><i>Construction:</i> The construction of the Proposed Development will result in the permanent removal/alteration of improved agricultural grassland (5.29 Ha), wet grassland (1.05 Ha), scrub (0.89 Ha), conifer plantation (0.01 Ha), buildings and artificial surfaces (0.02 Ha, 0.9km), hedgerows (1.6km), treelines (0.24km), and drainage ditches (0.02km).</p> <p><i>Operation:</i> No further habitat will be removed during operation of the proposed development.</p> <p><i>Decommissioning:</i> No further habitat will be removed during decommissioning of the Proposed Development.</p> <p><i>Conclusion:</i> Therefore, due to possible removal of ex-situ areas for mobile species of any SPA/SAC (e.g., foraging areas for birds), there is a potential impact due to land take particularly during construction.</p>
Physical changes to the environment	<p><i>Construction:</i> Construction of the Proposed Development will result in a permanent loss of habitat due to construction of hardstandings, turbines, substation, crane pads, access tracks, drainage, provision of tree-free buffers around turbines and all other proposed infrastructure.</p> <p>The excavations for turbine foundations have potential to alter the local hydrology due to the depth required being 4m. The Scottish Environmental Protection Agency (2017) specifies the zone of influence for Ground Water</p>	<p><i>Construction:</i> There will be a permanent loss of habitats associated with the installation of the turbines, substation and their associated infrastructure. Along with indirect impacts to water quality and aquatic species (refer to emissions to water section below).</p> <p>Due to the depth of the foundations required for the turbines, impacts to groundwater dependent terrestrial ecosystems (GWDTE) may include change in water depth (dewatering), rate of flow and timing of the change.</p>



Project Feature	Description	Potential Impact
	<p>Dependent Terrestrial Ecosystems (GWDTE) from excavations deeper than 1m to be a 250m buffer around the works area.</p> <p>The proposed BEMP will require the creation of hedgerows/treelines, wildlife ponds and pollinator habitats which will require initial vegetation clearance and ground disturbance.</p> <p><i>Operation:</i> During the lifetime of the Proposed Development there will be an increased level of activity within the site with potential for disturbance to species. Following construction, the Proposed Development will result in the long-term reduction in habitats within the Proposed Development site in order to accommodate the construction of the proposed 6 no. wind turbines, substation and associated infrastructure.</p> <p><i>Decommissioning:</i> Turbines will be removed from the Proposed Development site. Internal site access tracks, turbine hard standings, grid connection infra-structure (including on-site sub-station and ancillary electrical equipment) will be left in place. Turbine hard standings will be covered over with topsoil and left to revegetate naturally.</p>	<p><i>Operation:</i> Ruddock & Whitfield (2007) notes that animals' avoidance of humans or human activities can have several adverse effects on their distribution and abundance. The development of the Proposed Wind Farm has the potential to result in displacement of birds / mammals (bats) due to on-site construction activities coupled with long-term loss of suitable feeding and/or breeding/wintering habitat associated with site clearance.</p> <p>Potential for bird collision with turbine towers, blades (moving or stationary) and/or associated infrastructure; and barrier to dispersal, regular movements or migration for migratory bird species.</p> <p><i>Decommissioning:</i> The decommissioning of the Proposed Development has the potential to result in temporary displacement of birds / mammals (bats) due to on-site construction activities.</p> <p><i>Conclusion:</i> Therefore, there is a potential impact during construction, operation and decommissioning, resulting from physical changes (i.e., habitat loss, displacement of species, bird collisions, groundwater changes, water quality) to the environment.</p>
Resource Requirements	<p><i>Construction:</i> Suitable site won material will be used as general fill in the construction of access tracks, hardstands and in reinstatement around turbine foundations.</p>	<p><i>Construction:</i> There are no resources required from European sites, so there is no potential for direct impacts.</p> <p>However, there is potential for indirect impacts to European Sites. The excavations for the borrow pits have potential to alter the local</p>



Project Feature	Description	Potential Impact
	<p>All materials shall be re-used onsite for other suitable purposes e.g.:</p> <ul style="list-style-type: none"> • Re-use of excavated materials (excluding peat). • Use of suitable site won material (bedrock) as general fill in the construction of access tracks, hardstands and in reinstatement around turbine foundations. • Surplus overburden will be re-used on site in the form of landscaping and for reinstatement purposes at the proposed borrow pit. • Any peat excavated for construction within the site will be re-used as fill for the borrow pits. • Topsoil will be re-used for landscaping and will also be used for reinstatement purposes around turbine bases and hardstanding areas. <p>The proposed borrow pit will have a footprint area of approximately 0.36ha (maximum assessed). This will provide a potential volume of approximately 11,489m³ of site won general fill based on an aggregate resource thickness of 6.0m.</p> <p><i>Operation:</i> No resource requirements during operation.</p> <p><i>Decommissioning:</i> Topsoil will be used for reinstating hardstandings but there are no resource requirements from any European sites during decommissioning.</p>	<p>hydrology. The Scottish Environmental Protection Agency (2017) specifies the zone of influence for Ground Water Dependent Terrestrial Ecosystems (GWDTE) from excavations deeper than 1m to be a 250m buffer around the works area.</p> <p>Indirect impacts include disruption of groundwater flow, dewatering of GWDTE and emissions to water (see below).</p> <p><i>Operation:</i> NA <i>Decommissioning:</i> NA</p> <p><i>Conclusion:</i> There is a potential for indirect impacts as a result of changes to groundwater flow during construction.</p>



Project Feature	Description	Potential Impact
Emissions	<p>Dust Emissions</p> <p><i>Construction:</i> The principal sources of potential air emissions during the construction of the Proposed Development will be from dust arising from earthworks, vegetation clearance, trench excavation, construction of the new access tracks, the temporary storage of excavated materials, the construction of the Proposed Substation, the movement of construction vehicles, loading and unloading of aggregates/materials and the movement of material around the Proposed Development site.</p> <p><i>Operation:</i> Once the Proposed Wind Farm and Proposed Substation are constructed there will be no significant direct emissions to atmosphere.</p> <p><i>Decommissioning:</i> There will be truck movements associated with removing the wind turbines from the Proposed Wind Farm resulting in vehicular emissions and dust. However, the number of truck movements would be significantly less than the construction phase. There will also be emissions from machinery on site including for the movement of soil to cover the foundations.</p>	<p><i>Construction:</i> The Institute of Air Quality Management 'Guidance on the Assessment of dust from demolition and construction' (Holman et al, 2014) states that</p> <p><i>"Dust can have two types of effect on vegetation: physical and chemical. Direct physical effects include reduced photosynthesis, respiration and transpiration through smothering. Chemical changes to soils or watercourses may lead to a loss of plants or animals for example via changes in acidity. Indirect effects can include increased susceptibility to stresses such as pathogens and air pollution. These changes are likely to occur only as a result of long-term demolition and construction works adjacent to a sensitive habitat. Often impacts will be reversible once the works are completed, and dust emissions cease".</i></p> <p>The guidance prescribes potential dust emission risk classes to ecological receptors. The guidance specifies that, for sensitive ecological receptors, sensitivity to dust is 'High' up to 20m from the source and reduces to 'Medium' over 50m from the source.</p> <p>The guidance (Holman et al, 2014) also stipulates that trackout (dirt, mud, or other debris tracked onto a paved public roadway by a vehicle leaving a construction site) may occur from roads up to 500 m from large sites, 200 m from medium sites and 50 m from small sites, as measured from the site exit. The Proposed Development site would be considered a large site, as such the dust effects from trackout are likely to occur within 500m from the site exit.</p> <p><i>Operation:</i> NA</p> <p><i>Decommissioning:</i> As per construction phase.</p>



Project Feature	Description	Potential Impact
Emissions	<p>Noise Emissions</p> <p><i>Construction:</i> The main aspects of the construction phase with the potential to generate noise include:</p> <ul style="list-style-type: none"> • the construction of the turbine foundations, • the erection of the turbines, • the excavation of trenches for cables, • excavation of the borrow pits, • vegetation removal • the construction of associated hard standings and access tracks, and construction of the substations, • the delivery of the turbine components, • the delivery of construction materials, notably aggregates, concrete and steel reinforcement. <p>The construction phase is anticipated to last 12-18 months.</p> <p><i>Operation:</i> Once the Proposed Wind Farm is constructed there will be both mechanical and aerodynamic noise emissions from the turbines. Mechanical noise is produced by components such as generators and gearboxes, and the aerodynamic noise comes from the movement of turbine blades. For all turbines, at a</p>	<p><i>Conclusion:</i></p> <p>Therefore, there is potential for impacts due to dust emissions up to 500m from the Proposed Development site, during construction and decommissioning.</p> <p><i>Construction:</i> Disturbance to noise varies between species and is dependent on the nature of the noise source and sensitivity of the species e.g., the potential effects of anthropogenic sound on fish can range from direct mortality to no obvious behavioural responses and are dependent on the class of sound i.e., either continuous or impulsive (Popper et al. 2014, Popper & Hawkins 2019). Similarly, for birds disturbance response (e.g., becoming alert or a flight response) can vary depending on season, species sensitivity, and weather.</p> <p><i>Operation:</i> Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Platteeuw & Henkensj 1997). Furthermore, hen harrier has been found to avoid habitats within 250m to 500m from an operational turbine (Pearce-Higgins et al., 2012). Therefore, displacement equates to habitat loss for the lifetime of the Proposed Wind Farm for these species.</p> <p><i>Decommissioning:</i></p> <p>There is potential for seasonal displacement of QI species (i.e., otter) due to disturbance during key seasonal stages of the lifecycle during the construction and decommissioning stages. Disturbance to otter can occur up to 150m from the proposed works area (NRA guidance 2008).</p>



Project Feature	Description	Potential Impact
	<p>standardised wind speed of 10m/s, the declared apparent sound power level is 105.7 dB.</p> <p>The operational phase is anticipated to last 25 years.</p> <p>Decommissioning: The main aspects of the decommissioning phase with the potential to generate noise are similar to that of the construction phase, however a number of elements will be left in situ (see above) therefore impacts from noise will be lesser than during construction.</p> <p>The decommissioning phase is anticipated to last 6 months.</p>	<p><i>Conclusion:</i></p> <p>The construction, operation and decommissioning of the Proposed Development has potential for noise disturbance to terrestrial and aquatic species along with bird species.</p>
Emissions	<p>Water Pollution</p> <p><i>Construction:</i> During construction of the Proposed Development, a ditch will be crossed by installing a precast culvert.</p> <p>Additionally, project elements including vegetation clearance, new access tracks, turbine hardstanding areas, the on-site substation, have the potential to contribute to the increase in runoff from the Proposed Wind Farm site. An increase in surface water runoff from the Proposed Wind Farm site during construction, particularly from areas of exposed soil, has the potential to result in increased sedimentation of the drains and watercourses within the Proposed Development site. Similarly, water in excavations could contain an increased concentration of suspended solids as a result of the disturbance of the</p>	<p><i>Construction:</i> Sedimentation of watercourses runoff has potential to temporarily degrade the quality of these watercourses and as such reduce the carrying capacity of the watercourses for aquatic species.</p> <p>The release of cement / concrete to an aquatic environment can have the effect of altering the levels of pH, nitrate, phosphate, total solids, total suspended solids, total dissolved solids, turbidity and biological oxygen demand in the water. Cement products are particularly harmful to aquatic life due to the associated change in alkalinity in the water, which can cause burns to fish skin.</p> <p>Hydrocarbons are toxic to flora and fauna, including fish, and these chemicals tend to be persistent in the environment. It is also a nutrient supply for adapted micro-organisms, which can rapidly deplete dissolved oxygen in waters, resulting in death of aquatic organisms.</p>



Project Feature	Description	Potential Impact
	<p>underlying soils, dewatering of excavations has a potential to result in sedimentation of nearby drains / watercourses.</p> <p>Cement based product will be used in turbine / substation foundations and hardstandings.</p> <p>Refuelling activities / storage of fuel could result in fuel spillages which could pollute underground and surface water.</p> <p><i>Operation:</i> Occasional maintenance works will occur during operation. . The main risk to watercourses is when oils and lubricants are used on the site. If such substances leaked from the turbines or maintenance areas or were disposed of inappropriately, there is a risk of water pollution. However, the likelihood of this occurring is very low. Due to revegetation of exposed surfaces, and the non-intrusive nature of operations, there is a negligible risk of sediment release to the watercourses during the operational stage.</p> <p>No evidence of slope instability was observed on the Proposed Development site. There will be no further disturbance of overburden post-construction. There is a low probability for slope failure during operation.</p> <p><i>Decommissioning</i> The internal site access tracks and turbine hard standings will be left in place. Grid connection infrastructure</p>	<p><i>Operation:</i> Operational wind farms are not normally considered to have the potential to significantly impact on the aquatic environment. The main risk to watercourses is via water quality impacts, when oils and lubricants are used on the site (e.g. infrastructure maintenance). If such substances leaked from the turbines or maintenance areas or were disposed of inappropriately, there is a risk of water contamination and subsequent impacts to aquatic ecology. However, the likelihood of this occurring is very low.</p> <p>Additionally during operation, there is potential for scouring the stream beds downstream of the operational Proposed Wind Farm due to increase flow rate from hard surfaces associated with the development.</p> <p><i>Decommissioning:</i> Potential for sedimentation and hydrocarbon release during decommissioning.</p> <p><i>Conclusions:</i> Therefore there are potential impacts associated with emissions to water, during construction, operation and decommissioning</p>



Project Feature	Description	Potential Impact
Emissions	<p>including substation and ancillary electrical equipment shall form part of the national grid and will be left in situ.</p> <p>Waste <i>Construction:</i> The following categories of waste will be generated during the construction of the Proposed Development:</p> <ul style="list-style-type: none"> • municipal solid waste (MSW) from the office and canteen • construction and demolition waste • waste oil/hydrocarbons • paper/cardboard • timber • steel <p>When possible, non-hazardous materials shall be re-used onsite for other suitable purposes e.g.:</p> <ul style="list-style-type: none"> • 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 etc. – where possible will be used as suitable fill elsewhere on site for site tracks, the hardstanding areas and embankments where possible; • excess subsoils from excavations shall be used to reinstate the borrow pit on site. 	<p><i>Construction/Operation/Decommissioning:</i> Sedimentation runoff has potential to temporarily degrade the quality of the watercourses and as such reduce the carrying capacity of the watercourse for aquatic species.</p> <p>The release of generated waste to an aquatic environment can have the effect of altering the levels of pH, nitrate, phosphate, total solid, total suspended solids, total dissolved solids, turbidity and biological oxygen demand in the water.</p> <p><i>Conclusions:</i> Therefore there are potential impacts associated with waste emissions to water.</p>



Project Feature	Description	Potential Impact
	<p>It is important to clarify that any excess excavated material that will be used for fill, reinstatement, or similar activities, within the Proposed Wind Farm site boundary is not categorised as a waste material under relevant waste legislation, rather this material is exempt from waste classification.</p> <p><i>Operation:</i> In general, no waste will be produced during the operation of the Proposed Development. However small amounts of waste may be generated during maintenance works.</p> <p><i>Decommissioning:</i> Waste produced during the decommissioning of the Proposed Development will be similar to that produced during construction, however, greatly reduced, primarily due to wind turbine components will be dismantled on site. Works at this stage are less intrusive and of a shorter duration.</p>	
Emissions	<p>Invasive Species <i>Construction, Operation and Decommissioning:</i> Invasive species, notably the Third Schedule Himalayan knotweed is present within the Proposed Development site boundary. There is potential for this species to be disturbed during construction, operation and decommissioning.</p>	<p><i>Construction, Operation and Decommissioning:</i> While no invasive species are currently present in the vicinity of the proposed turbines or site access tracks, they are present within the site boundary. Therefore the Precautionary Principle is considered, as invasive species may spread within the site in the time before/during construction of the Proposed Development.</p> <p>Construction works, machinery, and personnel can potentially disturb stands of invasive plants and/or soils contaminated with invasive plant material and cause them to spread onsite. In addition to lands within the proposed works areas, there is an identified risk of invasive plant</p>



Project Feature	Description	Potential Impact
Transportation Requirements	<p><i>Construction:</i> Approximately 2.4km of new site access tracks are proposed. All access tracks will be a minimum of 6m wide along straight sections but wider (maximum 14m) at bends as required. The proposed internal site track layout will permit access for vehicles during the construction phase, for maintenance during the operation phase, and for vehicles to decommission the turbines at the end of the life of the development.</p> <p>All transport (e.g., plant and deliveries etc.) for the Proposed Development will be via existing local roads.</p> <p>The estimated increase in traffic volumes includes 15 HGV trips (35.9 PCUs) per day estimated throughout most of the construction period, ramping up to 60 trips (144 PCUs) per day estimated for a relatively short period, during the concrete foundation pouring. This is considered Stage 1 (preparing the site to receive the turbines). Stage 2 will involve delivery the turbines and associated plant to site. The Stage 2 traffic volumes will include an increase of 5 extended articulated lorries per day (50 PCUs), 2 days per week over a duration of 5 weeks.</p>	<p>species being spread onto neighbouring lands and onto public roads, along watercourses and other locations.</p> <p><i>Conclusions:</i> Therefore, there are potential impacts associated with invasive species. These impacts would be most notable during excavation works during construction and decommissioning.</p> <p><i>Construction/Operation/Decommissioning:</i> Refer to the sections within this table (Size and scale/landtake, physical change to environment, emissions) for potential impacts from the construction of the access tracks.</p> <p>The increase in traffic volumes fall below the screening criteria set out in the UK DMRB guidance (UK Highways Agency 2007). The guidance states that road links meeting one or more of the following criteria can be defined as being ‘affected’ by a project and should be included in the local air quality assessment:</p> <ul style="list-style-type: none"> • Road alignment change of 5 metres or more • Daily traffic flow changes by 1,000 AADT or more • HGVs flows change by 200 vehicles per day or more; • Daily average speed changes by 10 km/h or more; or • Peak hour speed changes by 20 km/h or more. <p>None of the criteria set out in the UK DMRB are met. Therefore, the air quality assessment model is not required in this instance.</p> <p><i>Conclusions:</i> There are no potential impacts associated with transportation requirements.</p>



Project Feature	Description	Potential Impact
	<p><i>Operation:</i> Traffic associated with the operational phase of the Proposed Development will be associated with the Proposed Wind Farm owner/operator and grid network operator personnel visiting the substation, and maintenance staff. There will also be a limited infrequent attendance by routine environmental monitoring/compliance staff.</p> <p><i>Decommissioning:</i> Impacts associated with the decommissioning of the Proposed Development will be similar in nature to the construction stage but of a much lower magnitude primarily due to the following key reasons:</p> <ul style="list-style-type: none"> Proposed Wind Farm access tracks will be left in-situ and reinstated using material from the site The grid connection will form part of the grid network and will be left in place; Wind turbine components will be dismantled on site and can be removed on standard HGV's. Shorter duration of works. 	
In-combination	The potential impacts of the Proposed Development are considered in combination with other plans or projects within the zone of influence (refer to Table 3-1). This is to determine plans or projects which clearly have no connectivity to a European site's qualifying interests or where it can be excluded that the conservation objectives for the site's qualifying interests will be undermined despite a connection.	<i>Construction:</i> The construction phase of the Proposed Development has the greatest potential to contribute suspended solids/pollutants to nearby watercourses due to excavation works and general construction works (see above). If the construction phase of the Proposed Development were to occur in parallel with other plans or projects, in-combinations impacts may occur on the watercourses within the same sub-catchments.



Project Feature	Description	Potential Impact
	<p>The projects that have no connectivity/will not undermine the European site's conservation objectives, have been ruled out for assessment (refer to Appendix 1 for the full list of projects). All other plans or projects, including those where there is reasonable doubt as to the magnitude and nature of their effects to a European site's qualifying interests/ conservation objectives, are carried through to the next stage of assessment (Section 4).</p> <p>The plans and projects carried through to the next stage of assessment are outlined below. They have potential for in-combination effects with the Proposed Development due to the size, scale and/or potential connectivity to the Proposed Development or European site's within the zone of influence (refer to Table 3.1) of the proposed development.</p> <p><i>Related Projects (TDR and AGCR)</i></p> <ul style="list-style-type: none"> In the event that the proposed 110kv substation grid connection is not permitted, an alternative underground grid connection (AGCR) relating to the Carrigarierk Windfarm (Cork County Council Ref. 15/730 & An Bord Pleanála Ref. PL04.246353) will be utilized. 	<p>The Proposed Wind Farm site is predominantly located within agricultural land. Potential impacts could arise if previously fertilised land were to be disturbed and mismanagement allowing nutrients / sediment to escape the site. In-combination effects could occur if vegetation removal and construction activities at the Proposed Wind Farm site are undertaken in parallel with off-site forestry activities (particularly harvesting) and agricultural activities (particularly manure spreading) within the same catchment</p> <p><i>Operation:</i> Flight height or the flight heights that birds habitually use along either migration or local flight paths is an influencing factor in determining whether the Proposed Development will combine with additional wind farms to produce additive, synergistic or antagonistic effects. These effects include increased 'Barrier Effect' (potentially obstructing migratory flightpaths), increased 'collision risk' (through combined mortality in susceptible species) and increased 'disturbance' to birds utilising foraging grounds whilst on migration.</p> <p><i>Decommissioning:</i> As per construction.</p> <p><i>Conclusions:</i> In-combination effects could occur if construction/operation/decommissioning activities at the Proposed Wind Farm site are undertaken in parallel with off-site activities and development.</p>



Project Feature	Description	Potential Impact
	<ul style="list-style-type: none"> In order to deliver the large turbine components to site there will be a requirement to carryout enabling works within the townlands of Barnadivane (Kneeves), Lackareagh & Garranereagh. The works will consist of construction of a private roadway, approximately 150 metres long, from the R585 to the L6008 and all associated works. These works have already been consented pursuant to Cork Co.Co. Ref. 14/6803. <p><i>Large Scale Projects</i></p> <p>Planning searches (Cork County Council, Kerry County Council, An Bord Pleanála) were undertaken using the following online planning enquiry portals to search for large scale developments within 20km of the site. The following developments were considered due to groundwater/runoff pathways and scale:</p> <ul style="list-style-type: none"> Construction of 96 no. residential units, a creche and all ancillary works (CEPL Ltd.) 8.5km North Construction of 106 no. residential buildings and creche (Massey Development Ltd.) 8.5km North Wastewater treatment scheme (Irish Water) 11.5km North Proposed or operational windfarms within the vicinity of the Site. 	



Project Feature	Description	Potential Impact
	<p><i>Small Scale Projects</i></p> <p>A planning search was also conducted for smaller projects within 500m of the site. These projects include single dwelling houses, retention applications and agricultural buildings. A full list of these projects is included in Appendix 1.</p> <p><i>Plans</i></p> <ul style="list-style-type: none"> • Cork County Development Plan 2022-2028 • National Biodiversity Action Plan 2017-2021 • Draft 4th National Biodiversity Action Plan 2023-2027 • River Basin Management Plan for Ireland 2018 – 2021 • Draft River Basin Management Plan 2022-2027 	



3. SCREENING FOR APPROPRIATE ASSESSMENT

3.1 Introduction

This section of the report aims to assess if the Proposed Development is likely to have a significant effect upon European sites either alone or in combination with other plans or projects.

The screening assessment comprises the following steps:

- Description of the plan or project subject to assessment (Section 2. of this report)
- Existing baseline of the plan or project study area (Section 2.1 of this report)
- Identification of relevant European sites (Section 3.2 of this report)
- Assessment of the likely significant direct, indirect and in-combination effects on the conservation objectives of the European site(s) of concern in relation to the Proposed Development (Section 3.3 of this report)
- Screening conclusion (Section 3.4 of this report).

The Proposed Development and BEMP Lands are not directly connected with or necessary to the management of a European site.

3.2 Identification of European Sites that may be affected by the Proposed Development

European Commission Notice (2021) on the '*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*', states that in identifying European sites (Natura 2000 sites) which may be affected by the project, the following should be identified:

- any European sites geographically overlapping with any of the actions or aspects of the plan or project in any of its phases, or adjacent to them;
- any European sites within the likely zone of influence of the plan or project. European sites located in the surroundings of the plan or project (or at some distance) that could still be indirectly affected by aspects of the project, including as regards the use of natural resources (e.g., water) and various types of waste, discharge or emissions of substances or energy;
- European sites in the surroundings of the plan or project (or at some distance) which host fauna that can move to the project area and then suffer mortality or other impacts (e.g., loss of feeding areas, reduction of home range);
- European sites whose connectivity or ecological continuity can be affected by the plan or project.

There are no European sites geographically overlapping with the Proposed Development site or BEMP Lands.



The European sites within the likely zone of influence (Zol) of the project were identified having regard to CIEEM (2018) 'Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine'. This guideline defines the Zol as "... the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities." The likely spatial and temporal biophysical changes associated with the impacts (which was determined with reference to relevant published literature and guidance documents) are set out in Table 2-1. However, as a precautionary approach in defining the ecological features which may be affected, an initial buffer of 15km was first examined using Geographic Information System (GIS) Mapping (refer to Figure 3-1) and the conservation interests of these European sites were examined in order to ascertain whether there could be potential physical or ecological connectivity to the project and the associated likely project impacts. Additionally, any European sites beyond the initial 15km buffer with hydrological or physical connectivity were also identified for further examination. The findings of the Zol assessment are presented in Table 3-1.



Table 3-1: European Sites Within the Potential ZOI

European Site (code)	List of Qualifying Interest/Special Conservation Interest	Distance from closest turbine (km)	Pathway	Considered further in screening Y/N
<p>The Gearagh SAC (000108) https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000108.pdf Accessed 22/02/2023</p>	<p>Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260] Rivers with muddy banks with <i>Chenopodium rubri</i> p.p. and <i>Bidention</i> p.p. vegetation [3270] Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) [91E0] Otter (<i>Lutra lutra</i>) [1355]</p>	5.9km	<p>Otter is a mobile species present within the Gearagh SAC. Otters or otter evidence/signs were not observed within the Proposed Development, and while drainage ditches on site may provide commuting habitat for surrounding populations, they provide negligible foraging habitat. Furthermore, no holts were recorded along streams within the Proposed Development. Therefore, no ecological pathway is present between the Gearagh and the Proposed Development. The Gearagh SAC is located on a different tributary of the River Lee. It is approximately 6km upstream of the point where the Cummer 19 joins the Lee. Having regard to the spatial scale of the potential project impacts set out in Table 2-1 and given the distance of the European site from the Proposed Development, coupled with the fact that there is no connectivity between the non-mobile QI's and the Proposed Development site, the European Site is assessed as outside of the ZOI of the Proposed Development.</p>	N



European Site (code)	List of Qualifying Interest/Special Conservation Interest	Distance from closest turbine (km)	Pathway	Considered further in screening Y/N
<p>The Gearagh SPA (004109) https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004109.pdf Accessed 22/02/2023</p>	<p>Wigeon (<i>Anas penelope</i>) [A050] Teal (<i>Anas crecca</i>) [A052] Mallard (<i>Anas platyrhynchos</i>) [A053] Coot (<i>Fulica atra</i>) [A125] Wetland and Waterbirds [A999]</p>	<p>6km</p>	<p>Outside the core feeding range (a defined range according to SNH 2016 and Johnson et al 2014) of the SCI species Wigeon (<i>Anas penelope</i>) up to 5km, teal (<i>Anas crecca</i>) up to 8.4km. However, within the core feeding range for mallard (<i>Anas platyrhynchos</i>) identified as up to 15km (Johnson 2014). There is no identified core feeding range for this coot. Therefore, the based Precautionary Principle the SPA is within the Zol of the Proposed Wind Farm site.</p>	<p>Y</p>
<p>Bandon River SAC (002171) ConservationObjectives.rdl (npws.ie) Accessed 22/02/2023</p>	<p>Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) [91E0] Freshwater Pearl Mussel (<i>Margaritifera margaritifera</i>) [1029] Brook Lamprey (<i>Lampetra planeri</i>) [1096]</p>	<p>10.1km</p>	<p>The Bandon River SAC is located within a different catchment (Bandon-llyn) to the Proposed Development. Having regard to the spatial scale of the potential project impacts set out in Table 2-1 and given the distance of the European site from Proposed Development, coupled with the fact that there are no mobile conservation interests associated and there is no connectivity (physical or hydrological) between the QI's and the Proposed Development site, the European Site is assessed as outside of the Zol of the Proposed Development.</p>	<p>N</p>



European Site (code)	List of Qualifying Interest/Special Conservation Interest	Distance from closest turbine (km)	Pathway	Considered further in screening Y/N
Mullaghanish to Musheramore Mountains SPA (004162) https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004162.pdf Accessed 22/02/2023	Hen Harrier (<i>Circus cyaneus</i>) [A082]	13.9km	The Proposed Development is outside the foraging and migratory ranges (2-10km) of the species (having regard to and Scottish Natural Heritage, 2016). Furthermore, during Vantage Point surveys at the Proposed Development, hen harrier was only observed twice flying over the site, with only one observation in the surrounding hinterland. Therefore, this SPA is assessed as outside the Zol.	N
Cork Harbour SPA (004030) https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004030.pdf# Accessed 22/02/2023	Little Grebe (<i>Tachybaptus ruficollis</i>) [A004] Great Crested Grebe (<i>Podiceps cristatus</i>) [A005] Cormorant (<i>Phalacrocorax carbo</i>) [A017] Grey Heron (<i>Ardea cinerea</i>) [A028] Shelduck (<i>Tadorna tadorna</i>) [A048] Wigeon (<i>Anas penelope</i>) [A050] Teal (<i>Anas crecca</i>) [A052] Pintail (<i>Anas acuta</i>) [A054] Shoveler (<i>Anas clypeata</i>) [A056] Red-breasted Merganser (<i>Mergus serrator</i>) [A069] Oystercatcher (<i>Haematopus ostralegus</i>) [A130]	35km Direct Distance c.53km instream	There is hydrological connectivity between the proposed project and SPA. However, due to distance (c. 53km downstream within a tidal estuary) and dilution by Cork Harbour there is no potential for effects on the SCI Wetlands and Waterbirds. The SPA is protected for estuarine species; however, the Proposed Development is spatially removed from any estuarine habitats reducing the potential for effects during the breeding or winter season. The Proposed Development is outside the core foraging range for all species listed (e.g. great crested grebe, wigeon, shoveler, golden plover, dunlin, curlew, teal (Johnson, Schmidt, and	N



European Site (code)	List of Qualifying Interest/Special Conservation Interest	Distance from closest turbine (km)	Pathway	Considered further in screening Y/N
	<p>Golden Plover (<i>Pluvialis apricaria</i>) [A140]</p> <p>Grey Plover (<i>Pluvialis squatarola</i>) [A141]</p> <p>Lapwing (<i>Vanellus vanellus</i>) [A142]</p> <p>Dunlin (<i>Calidris alpina</i>) [A149]</p> <p>Black-tailed Godwit (<i>Limosa limosa</i>) [A156]</p> <p>Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157]</p> <p>Curllew (<i>Numenius arquata</i>) [A160]</p> <p>Redshank (<i>Tringa totanus</i>) [A162]</p> <p>Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179]</p> <p>Common Gull (<i>Larus canus</i>) [A182]</p> <p>Lesser Black-backed Gull (<i>Larus fuscus</i>) [A183]</p> <p>Common Tern (<i>Sterna hirundo</i>) [A193]</p> <p>Wetland and Waterbirds [A999]</p>		<p>Taylor, 2014, Scottish Natural Heritage, 2016, Gittings, 2017).</p> <p>Therefore, due to distance, dilution, and/or lack of suitable estuarine habitat, this SPA is assessed as outside the Zol.</p>	

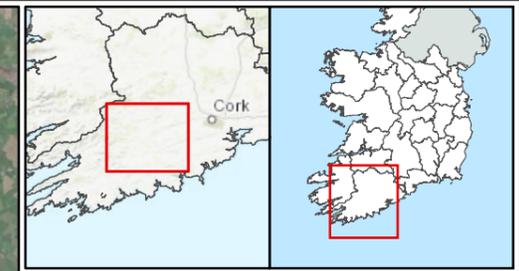
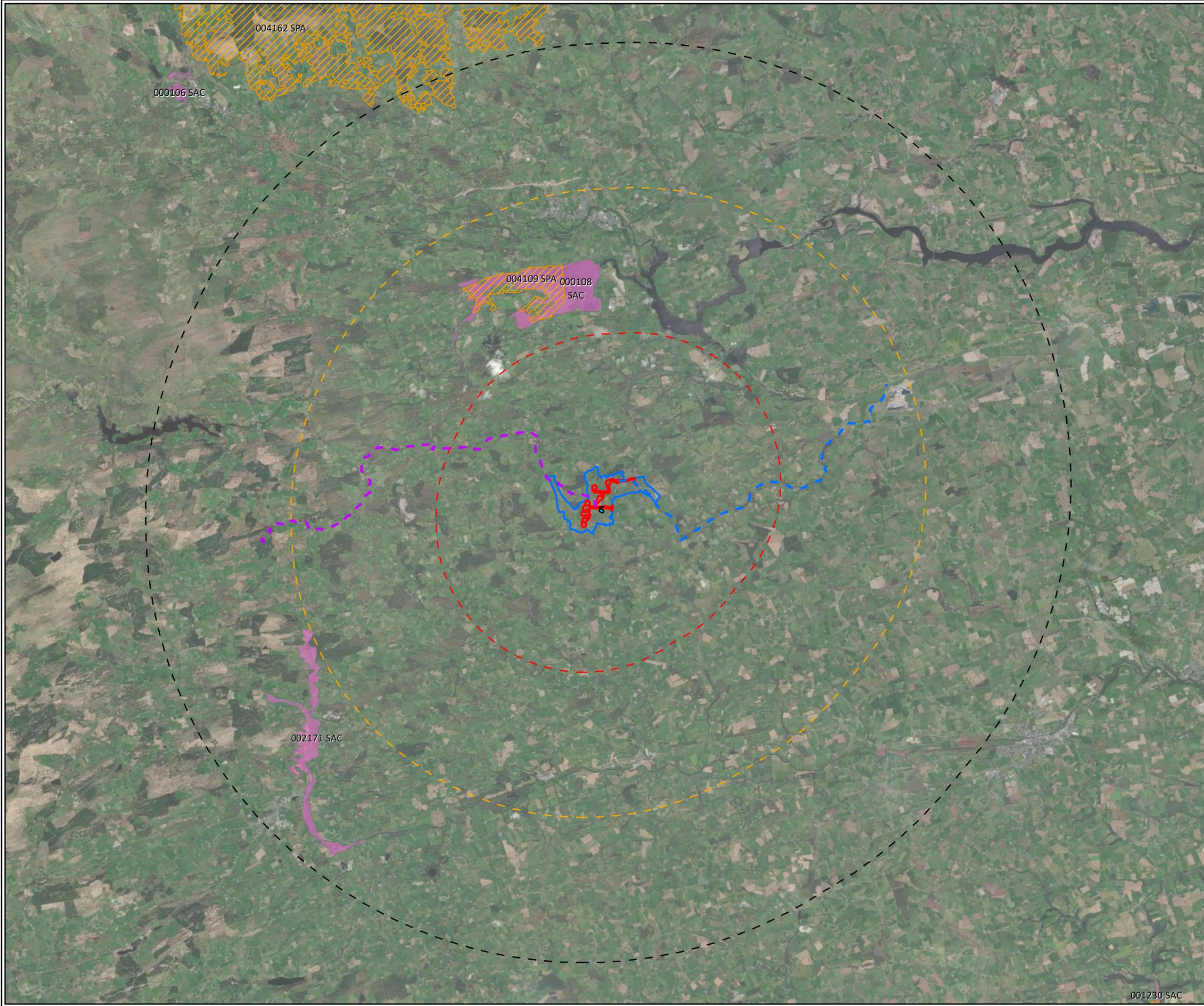


European Site (code)	List of Qualifying Interest/Special Conservation Interest	Distance from closest turbine (km)	Pathway	Considered further in screening Y/N
<p>Great Island Channel SAC</p> <p>https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001058.pdf</p> <p>Accessed 22/02/2023</p>	<p>Mudflats and sandflats not covered by seawater at low tide [1140]</p> <p>Atlantic salt meadows (<i>Glaucopuccinellietalia maritima</i>) [1330]</p>	<p>41km</p>	<p>While this SAC is within Cork Harbour, it is within a different estuarine system than that of the River Lee. Therefore, there is no direct connectivity with the Great Island Channel SAC and it is assessed as outside the ZOI.</p>	<p>N</p>



Having further examined the likely spatial and temporal biophysical changes associated with the project impacts, it was concluded that the Gearagh SPA (004109) is within the ZoI of the project:

Once the ZoI is defined, an assessment must be made of the sensitivity of the qualifying interests to such impacts and as such the potential for significant effects. To that end, a 'Source-Pathway-Receptor' model was applied to determine European sites which may potentially be significantly affected having regard to the pathway for impact and the sensitivity of the conservation interests to the effect of the impact (see Table 3-2).

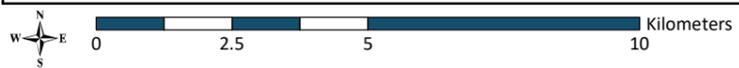


Legend

- Development Planning Boundary
- Lands in Control of Applicant
- Proposed Substation
- Alternative Grid Connection Route
- Turbine Delivery Route
- 15km of Proposed Development Boundary
- 10km of Proposed Development Boundary
- 5km of Proposed Development Boundary
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)

TITLE:	Designated Sites within 15km of the Proposed Site
PROJECT:	Barnadivane Wind Farm and Substation, Co. Cork
FIGURE NO:	3-1
CLIENT:	Barna Wind Energy Ltd. & Arran Windfarm Ltd.
SCALE:	1:130000
REVISION:	0
DATE:	23/02/2023
PAGE SIZE:	A3

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3.3 Assessment of Likely Significant Effects

3.3.1 Source-Pathway-Receptor Assessment & Potential for Significant Effects

The Office of the Planning Regulator's Practice Note PN01 recommends that the zone of influence of a project should be considered using the Source-Pathway-Receptor model.

European sites which may potentially be significantly affected by the Proposed Development are identified using the 'source-pathway-receptor' (S-P-R) conceptual model. The S-P-R model is a standard tool in environmental assessment to determine links between sensitive features and sources of impacts. In order for an effect to occur, all three elements of this mechanism must be in place. The absence of one of the elements of the mechanism means there is no likelihood for the effect to occur e.g., if there is no ecological pathway or functional link between the Proposed Development and the European site, there is no potential for impact and as such no potential for significant effects.

An impact may occur without having a significant effect. An impact is essentially the 'source' in the S-P-R assessment. It is the biophysical change caused to the environment by the project e.g., increase in sediment runoff due to ground disturbance. For the effect to be significant, the Qualifying Interests / Special Conservation Interests of the European site must be sensitive to the biophysical change. The likely impacts of the Proposed Development are set out in Section 2.6 of this report. The European sites within the Zone of Influence of these impacts are determined as outlined in Section 3.2. The potential for the Proposed Development to have significant effects on the Gearagh SPA sites is assessed hereunder on the basis of the source-pathway-receptor connectivity, and the sensitivity of the European sites qualifying interests to the effects of the impacts (Table 3-2).



Table 3-2: Potential for likely significant effects on the Gearagh SPA from the Proposed Development

Feature	Source	Pathway	Receptor	Likely Significant Effect
<p>Size and scale / Land-take</p>	<p><i>Construction:</i> The construction of the Proposed Development will result in the permanent removal/alteration of improved agricultural grassland (5.29 Ha), wet grassland (1.05 Ha), scrub (0.89 Ha), conifer plantation (0.01 Ha), buildings and artificial surfaces (0.02 Ha, 0.9km), hedgerows (1.6km), treelines (0.24km), and drainage ditches (0.02km).</p> <p><i>Operation:</i> No further habitat will be removed during operation of the Proposed Development.</p> <p><i>Decommissioning:</i> No further habitat will be removed during decommissioning of the Proposed Development.</p> <p><i>Conclusion:</i> Therefore, due to possible removal of ex-situ areas for mobile species of any SPA/SAC, there is a potential impact due to land take particularly during construction.</p>	<p>Ecological Pathway While the Proposed Development site is outside the core feeding range (a defined range according to SNH 2016 and Johnson et al 2014) of the SCI species wigeon and teal, there is potential for mallard and coot to utilise the Proposed Development site. Therefore there is an ecological pathway.</p>	<p>The Special Conservation Interests (SCIs) of the Gearagh SPA, in particular coot and mallard, are vulnerable to land take from ex-situ foraging habitats.</p>	<p>Likely significant effects.</p>
<p>Physical changes to the environment</p>	<p><i>Construction:</i> There will be a permanent loss of habitats associated with the installation of the turbines, substation and their associated infrastructure. Along with indirect impacts to water quality and aquatic species (refer to emissions to water section below).</p> <p>Due to the depth of the foundations required for the turbines, impacts to groundwater dependent terrestrial</p>	<p>Ecological Pathway While the Proposed Development site is outside the core feeding range (a defined range according to SNH 2016 and Johnson et al 2014) of the SCI species wigeon and teal, there is potential for mallard and coot to utilise the Proposed Development</p>	<p>The Special Conservation Interests (SCIs) of the Gearagh SPA, in particular coot and mallard, are vulnerable to physical changes to the environment (habitat loss and collision) if present in ex-situ foraging habitats within the</p>	<p>Likely significant effects.</p>



Feature	Source	Pathway	Receptor	Likely Significant Effect
	<p>ecosystems (GWDTE) may include change in water depth (dewatering), rate of flow and timing of the change.</p> <p><i>Operation:</i> Ruddock & Whitfield (2007) notes that animals' avoidance of humans or human activities can have several adverse effects on their distribution and abundance. The development of the Proposed Wind Farm has the potential to result in displacement of birds / mammals (bats) due to on-site construction activities coupled with long-term loss of suitable feeding and/or breeding/wintering habitat associated with site clearance.</p> <p>Potential for bird collision with turbine towers, blades (moving or stationary) and/or associated infrastructure; and barrier to dispersal, regular movements or migration for migratory bird species.</p> <p><i>Decommissioning:</i> The decommissioning of the Proposed Development has the potential to result in displacement of birds / mammals (bats) due to on-site construction activities.</p> <p><i>Conclusion:</i> Therefore, there is a potential impact during construction, operation and decommissioning, resulting from physical changes (i.e. habitat loss, displacement of species, bird collisions, groundwater changes, water quality) to the environment.</p>	<p>site. Therefore there is an ecological pathway.</p>	<p>Proposed site. Development</p>	



Feature	Source	Pathway	Receptor	Likely Significant Effect
Resource Requirements	<p><i>Construction:</i> There are no resources required from European sites, so there is no potential for direct impacts. However, there is potential for indirect impacts to European Sites. The excavations for the borrow pits have potential to alter the local hydrology. The Scottish Environmental Protection Agency (2017) specifies the zone of influence for Ground Water Dependent Terrestrial Ecosystems (GWDTE) from excavations deeper than 1m to be a 250m buffer around the works area.</p> <p>Indirect impacts include disruption of groundwater flow, dewatering of GWDTE and emissions to water (see below).</p> <p><i>Operation:</i> NA</p> <p><i>Decommissioning:</i> NA</p> <p><i>Conclusion:</i> There is a potential for indirect impacts as a result of changes to groundwater flow during construction.</p>	<p>No Pathway The Gearagh SPA is beyond the zone of influence (250m) from effects to GWDTE.</p>	No receptor	No significant effects. likely
Dust Emissions	<p><i>Construction:</i> The Institute of Air Quality Management 'Guidance on the Assessment of dust from demolition and construction' (Holman et al, 2014) states that "Dust can have two types of effect on vegetation: physical and chemical. Direct physical effects include reduced photosynthesis, respiration and transpiration through</p>	<p>No pathway The Gearagh SPA is beyond the zone of influence (500m) identified for dust emissions.</p>	No receptor	No significant effects. likely



Feature	Source	Pathway	Receptor	Likely Significant Effect
	<p><i>smothering. Chemical changes to soils or watercourses may lead to a loss of plants or animals for example via changes in acidity. Indirect effects can include increased susceptibility to stresses such as pathogens and air pollution. These changes are likely to occur only as a result of long-term demolition and construction works adjacent to a sensitive habitat. Often impacts will be reversible once the works are completed, and dust emissions cease”.</i></p> <p>The guidance prescribes potential dust emission risk classes to ecological receptors. The guidance specifies that, for sensitive ecological receptors, sensitivity to dust is ‘High’ up to 20m from the source and reduces to ‘Medium’ over 50m from the source.</p> <p>The guidance (Holman et al, 2014) also stipulates that trackout (dirt, mud, or other debris tracked onto a paved public roadway by a vehicle leaving a construction site) may occur from roads up to 500 m from large sites, 200 m from medium sites and 50 m from small sites, as measured from the site exit. The Proposed Wind Farm site would be considered a large site, as such the dust effects from trackout are likely to occur within 500m from the site exit.</p> <p><i>Operation: NA</i> <i>Decommissioning: As per construction phase.</i></p>			



Feature	Source	Pathway	Receptor	Likely Significant Effect
<p>Noise Emissions</p>	<p><i>Conclusion:</i> Therefore, there is potential for impacts due to dust emissions up to 500m from the Proposed Development site, during construction and decommissioning.</p> <p><i>Construction:</i> Disturbance to noise varies between species and is dependent on the nature of the noise source and sensitivity of the species e.g., the potential effects of anthropogenic sound on fish can range from direct mortality to no obvious behavioural responses and are dependent on the class of sound i.e., either continuous or impulsive (Popper et al. 2014, Popper & Hawkins 2019). Similarly, for birds' disturbance response (e.g., becoming alert or a flight response) can vary depending on season, species sensitivity, and weather.</p> <p><i>Operation:</i> Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Platteeuw & Henkensj 1997). Furthermore, hen harrier has been found to avoid habitats within 250m to 500m from an operational turbine (Pearce-Higgins et al., 2012). Therefore, displacement equates to habitat loss for the lifetime of the Proposed Wind Farm for these species.</p> <p><i>Decommissioning:</i> There is potential for seasonal displacement of QI species (i.e., otter) due to disturbance during key seasonal stages of the lifecycle during the construction and decommissioning stages. Disturbance to otter can occur</p>	<p>Ecological Pathway Noise impacts to bird species can occur up to 500m from the source. The Gearagh SPA is located 6km from the Proposed Development site. Therefore, there is no direct pathway for noise to the SCIs present at the Gearagh SPA. However, there is an indirect pathway via the bird species that may be foraging at or around the proposed development site.</p>	<p>The Special Conservation Interests (SCIs) of the Gearagh SPA, in particular coot and mallard, are vulnerable to noise if in situ foraging habitats within 500m of the Proposed Development site.</p>	<p>Likely Significant Effects.</p>



Feature	Source	Pathway	Receptor	Likely Significant Effect
	<p>up to 150m from the proposed works area (NRA guidance 2008).</p> <p><i>Conclusion:</i> The construction, operation and decommissioning of the Proposed Development has potential for noise disturbance to terrestrial and aquatic species along with bird species.</p>			
<p>Water Emissions</p>	<p><i>Construction:</i> Sedimentation of watercourses runoff has potential to temporarily degrade the quality of these watercourses and as such reduce the carrying capacity of the watercourses for aquatic species.</p> <p>The release of cement / concrete to an aquatic environment can have the effect of altering the levels of pH, nitrate, phosphate, total solids, total suspended solids, total dissolved solids, turbidity and biological oxygen demand in the water. Cement products are particularly harmful to aquatic life due to the associated change in alkalinity in the water, which can cause burns to fish skin.</p> <p>Hydrocarbons are toxic to flora and fauna, including fish, and these chemicals tend to be persistent in the environment. It is also a nutrient supply for adapted micro-organisms, which can rapidly deplete dissolved oxygen in waters, resulting in death of aquatic organisms.</p>	<p>No pathway There is no physical pathway between the Gearagh SPA and the Proposed Development site.</p>	<p>No Receptor</p>	<p>No likely Significant Effects.</p>



Feature	Source	Pathway	Receptor	Likely Significant Effect
<p>Invasive Species</p>	<p><i>Operation:</i> Operational wind farms are not normally considered to have the potential to significantly impact on the aquatic environment. The main risk to watercourses is via water quality impacts, when oils and lubricants are used on the site (e.g. infrastructure maintenance). If such substances leaked from the turbines or maintenance areas or were disposed of inappropriately, there is a risk of water contamination and subsequent impacts to aquatic ecology. However, the likelihood of this occurring is very low.</p> <p>Additionally during operation, there is potential for scouring the stream beds downstream of the operational Proposed Wind Farm due to increase flow rate from hard surfaces associated with the development.</p> <p><i>Decommissioning:</i> Potential for sedimentation and hydrocarbon release during decommissioning.</p> <p><i>Conclusions:</i> Therefore there are potential impacts associated with emissions to water, during construction, operation and decommissioning</p> <p><i>Construction, Operation and Decommissioning:</i> While no invasive species are currently present in the vicinity of the proposed turbines or site access tracks, they are present within the site boundary. Therefore the Precautionary Principle is considered, as invasive species may spread</p>	<p>No pathway While invasive species may spread along waterways, due to the distance (6km) and upstream position of the Gearagh SPA, it is unlikely that invasive species would</p>	<p>No Receptor</p>	<p>No Likely Significant Effects.</p>



Feature	Source	Pathway	Receptor	Likely Significant Effect
<p>In-combination</p>	<p>within the site in the time before/during construction of the Proposed Development.</p> <p>Construction works, machinery, and personnel can potentially disturb stands of invasive plants and/or soils contaminated with invasive plant material and cause them to spread onsite. In addition to lands within the proposed works areas, there is an identified risk of invasive plant species being spread onto neighbouring lands and onto public roads, along watercourses and other locations.</p> <p><i>Conclusions:</i> Therefore, there are potential impacts associated with invasive species. These impacts would be most notable during excavation works during construction and decommissioning.</p> <p><i>Construction:</i> The construction phase of the Proposed Development has the greatest potential to contribute suspended solids/pollutants to nearby watercourses due to excavation works and general construction works (see above). If the construction phase of the Proposed Development were to occur in parallel with other plans or projects, in-combinations impacts may occur on the watercourses within the same sub-catchments.</p> <p>The Proposed Wind Farm site is predominantly located within agricultural land. Potential impacts could arise if previously fertilised land were to be disturbed and mismanagement allowing nutrients / sediment to escape</p>	<p>reach this European Site. Therefore, there is no pathway.</p> <p>Ecological Pathway: Mismanagement of the Proposed Development could lead to increased noise and disturbance (see above). Turbines may impact migratory paths or foraging habits. Therefore there is an ecological pathway via the QI species. If this were to occur in parallel with other projects in-combination effects will be in-combination.</p>	<p>The Special Conservation Interests (SCIs) of the Gearagh SPA, in particular coot and mallard, are vulnerable to noise, disturbance, and collisions at the Proposed Development site and sites surrounding the Proposed Development site and the Gearagh SPA.</p>	<p>Likely Significant Effects.</p>



Feature	Source	Pathway	Receptor	Likely Significant Effect
	<p>the site. In-combination effects could occur if vegetation removal and construction activities at the Proposed Wind Farm site are undertaken in parallel with off-site forestry activities (particularly harvesting) and agricultural activities (particularly manure spreading) within the same catchment</p> <p><i>Operation:</i> Flight height or the flight heights that birds habitually use along either migration or local flight paths is an influencing factor in determining whether the proposed development will combine with additional wind farms to produce additive, synergistic or antagonistic effects. These effects include increased 'Barrier Effect' (potentially obstructing migratory flightpaths), increased 'collision risk' (through combined mortality in susceptible species) and increased 'disturbance' to birds utilising foraging grounds whilst on migration.</p> <p><i>Decommissioning:</i> As per construction.</p> <p><i>Conclusions:</i> In-combination effects could occur if construction/operation/decommissioning activities at the Proposed Wind Farm site are undertaken in parallel with off-site activities and development.</p>			



3.4 Screening Conclusion Regarding Likely Significant Effects

In the absence of mitigation measures (which have not been considered at this screening stage), likely significant effects on the qualifying interests of The Gearagh SPA cannot be excluded on the basis of objective scientific information.

A Natura Impact Statement has been completed (See Section 4) in respect of:

- The Gearagh SPA (004109).

No pathways for likely significant effects on any other European sites, were identified. Therefore, it can be concluded beyond reasonable scientific doubt, in view of best scientific knowledge on the basis of objective information and in light of the conservation objectives of the relevant European sites, that the proposed project individually or in combination with other plans and projects, will have no likely significant effect on the following European sites (or any other European sites):

- The Gearagh SAC (000108)
- Bandon River SAC (002171)
- Mullaghanish to Musheramore Mountains SPA (004162)
- Cork Harbour SPA (004030)
- Great Island Channel SAC (001508)

Therefore, these sites have been 'Screened Out' at Stage One of the AA process.



4. NATURA IMPACT STATEMENT

The screening assessment (Section 3 of this report) carried out to examine the likelihood of significant effects on European sites from the Proposed Development has concluded as follows:

In the absence of mitigation measures (which have not been considered at the screening stage), likely significant effects of the Proposed Development, individually or in combination with other plans or projects on the qualifying interests of The Gearagh SPA cannot be excluded on the basis of objective scientific information.

The likely significant effects result from:

- Land-take
- Physical changes to the environment
- Noise Emissions
- In-combination

Further consideration is given in this Natura Impact Statement (NIS) to the elements of the Proposed Development which may adversely affect the integrity of the aforementioned European sites with respect to each site's conservation objectives.

Refer to Section 2. for the project description and baseline environment.

4.1 European Sites Description

4.1.1 The Gearagh SPA

The site, located c. 2 km south-west of Macroom, comprises a stretch of the River Lee that was dammed in the 1950s as part of a hydroelectric scheme. The valley formerly held an extensive area of alluvial forest but only part of the forest now survives. The SPA extends from Annahala bridge westwards to Toon bridge. The principal habitat is now a shallow lake which is fringed by wet woodland, scrub and grassland that is prone to flooding. At times of low water, a diverse ephemeral pioneering plant community develops on the mud.

The site supports important populations of wintering waterfowl, including swans, dabbling duck, diving duck and some waders. Habitat quality is good and the site provides both feeding and roost sites for the birds. Six of the species have populations of national importance: Mute swan (*Cygnus olor*), wigeon, teal, shoveler (*Anas clypeata*), coot (*Fulica atra*) and golden plover (*Pluvialis apricaria*). Other species which occur regularly include whooper swan (*Cygnus cygnus*), tufted duck (*Aythya fuligula*) and lapwing (*Vanellus vanellus*). The site is a Nature Reserve, Ramsar site and Biogenetic Reserve.

The main threats and pressures that may impact the Gearagh SPA are set out in the Natura 2000 Data Form and are presented in Table 4-1.

The features of interest of the site include Annex I bird species under the EU Birds Directive as presented in Table 4-2.



Table 4-1: Threats, Pressures and Activities with Impacts on The Gearagh SPA

High Level (inside site)	High level (outside site)	Medium level (inside site)	Low Level (inside site)
J02: Human induced changes in hydraulic conditions	J02.04: Flooding modifications	A04: Grazing	F03.01: Hunting

Source: The Gearagh SPA (004109) Natura 2000 Data Form, <https://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=IE0004109>
 Accessed 09/02/2023

4.1.2 Avifauna Surveys

A suite of avifauna surveys was undertaken as part of the application effort (details are provided in Appendix 3).

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

- Vantage Point survey (breeding and non-breeding season; October 2020 to September 2021);
- Hinterland survey (October 2020 to September 2021);
- Breeding & winter bird transect survey (2020 and 2021);
- Breeding Wader Survey (2020 and 2021).

4.1.2.1 *Desk Study*

The search for historical records of bird species from NPWS and NBDC identified all SCI species (teal, wigeon, coot and mallard) present within a 10 km search radius of the site.

4.1.2.2 *Survey Results*

4.1.2.2.1 *Vantage Point Surveys*

A total of 52 avian species were recorded during summer VP surveys.

A total of four observations were made of mallard, one of these observations involved 2 birds landing on site (see Appendix 3 for flightline mapping).

The remaining SCI bird species teal, wigeon and coot were not recorded during the surveys undertaken by during the VP watches.

4.1.2.2.2 *All other surveys*

For the remaining surveys, none of the SCI bird species (mallard, teal, wigeon and coot) were recorded.



4.1.2.2.3 Hinterland

A total of 101 species were identified throughout the hinterland surveys, with the Gearagh included as one of the hinterland sites surveyed.

All the SCI bird species (teal, wigeon, coot and mallard) were observed during hinterland surveys.

Teal was most frequently seen at the Gearagh (7.5km north), where it was observed on 19 separate occasions, with up to 1040 birds observed. Four observations were made at Murragh Lake (9.3km southeast), three at Castlemoor (9km northeast), and one each at Castlelack Lake (13.8km southeast), Toon Flats (8km northwest), Desert Bridge (9.7km southeast) and Warren's Court (3.5km northeast).

Wigeon was also most frequently seen at the Gearagh (7.5km north) where it was noted on 16 occasions. At the Gearagh, wigeon was frequently seen in high numbers (up to 127). It was noted six times each at both Sullane Delta (7km northwest) and Inishcarra Reservoir (6.3km northeast), where between 31-128 Teal and between 3-59 Teal were seen respectively. Teal was seen on one occasion each at Warren's Court (3.5km northeast) and Castlelack Lake (3.5km northeast)

Up to 254 mallard were observed at the Gearagh (7.5km north), with 20 separate observations. A total of 13 observations occurred at Sullane Delta (7km northwest), with a peak of 48 individuals. Desert Bridge (9.7km southeast) also had observations of mallard on 13 separate occasions, with a high count of 31 individuals. Mallard was observed at Warren's Court (3.5km northeast) on 14 occasions and at Murragh Lake (9.3km southeast) on 12 separate occasions. At River Bandon SAC (9.5km southeast), mallard was noted on nine and at Inishcarra reservoir it was noted on six separate occasions. At Castlemoor (9km northeast) it was noted five times. Mallard was noted once at Toon flats (8km northwest) and once at Castlelack Lake (13.8km southeast). Additionally there were two records of mallard within a 2km radius of the site and once within a 5km radius of the site.

Coot was observed at Castlelack Lake (13.8km southeast), the Gearagh (7.5km north) and Murragh Lake (9.3km southeast), typically between one and 2 individuals. However, a maximum of 9 coot were observed at the Gearagh.

Table 4-2: Summary of the potential occurrence of Species of Conservation Interests of The Gearagh SPA within the area of the Proposed Development site.

Natura Code	Item Description	Occurence
A050	Wigeon (<i>Anas penelope</i>)	The Proposed Development is outside the core feeding range (a defined range according to SNH 2016 and Johnson et al 2014) of the SCI species wigeon, recorded as up to 2.8km (Johnson 2014). This species was also not identified on the Proposed Development site over the course of the two years of surveys.
A052	Teal (<i>Anas crecca</i>)	The Proposed Development is outside the core feeding range (a defined range according to SNH 2016 and Johnson et al 2014) of the SCI species wigeon, identified as up to 8.4km (Johnson 2014). This species was also not recorded on the Proposed Development site during the two years of surveys.



Natura Code	Item Description	Occurrence
A053	Mallard (<i>Anas platyrhynchos</i>)	The Proposed Development site is within the core feeding range for Mallard identified as up to 15km (Johnson 2014). A total of four observations were made of mallard, accounting for 0.013% of the overall survey time.
A125	Coot (<i>Fulica atra</i>)	While there is no identified core feeding range for this species, it was not identified on the Proposed Development site over the course of the two years of surveys.

Having regard to Table 4-2, the qualifying interests of The Gearagh SPA that may potentially be within the zone of influence of the Proposed Development site are:

- Mallard (*Anas platyrhynchos*) - identified as present within the Proposed Development site.

4.2 Potential for Adverse Effects on Site Integrity

The potential for the Proposed Development (in the absence of mitigation) to have an adverse effect on the integrity of the Gearagh SPA (004109) are assessed hereunder.

The assessment is made relative to the potential for the effects to impact the maintenance or restoration of the favourable conservation conditions of the qualifying interests within the zone of influence of the Gearagh SPA (mallard).

The conservation conditions required by these species are defined by attributes and targets set out in the Conservation Objectives Reports. No other qualifying interests of the aforementioned European sites were determined to be within the zone of influence of the Proposed Development having regard to the potential for the affected areas to support the qualifying features.

NPWS, in their Article 17 reporting (NPWS, 2019b) and Article 12 reporting (NPWS 2012) define the favourable conservation status of an Annex I habitat as achieved when:

- its natural range, and area it covers within that range, are stable or increasing,
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- the conservation status of its typical species is favourable.

The favourable conservation status of an Annex II species (Habitats Directive) and Annex I species (Birds Directive) is achieved when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and



- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

4.3 Potential Adverse Effects

The elements of the Proposed Development, during construction, operation and decommissioning, which were identified as posing a pressure on the qualifying interests of the European designated sites within the ZOI as stated above are identified as:

Collision Risk

Potential for collision with turbine towers, blades (moving or stationary) and/or associated infrastructure. These may also act as a barrier to dispersal during the operational phase.

Habitat Loss

Mallard landed on the site on one occasion, therefore habitat loss associated with the Proposed Development is a potential (although unlikely) impact.

4.4 In-Combination Effects

Article 6(3) of the Habitats Directive requires that:

“Any plan or project not directly connected with or necessary to the management of the 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”.

It is therefore required that the potential significant effects of the different aspects of the Proposed Development are considered in combination with any other plans or projects within the zone of influence.

Flight height or the flight heights which birds habitually use along either migration or local flight paths is an influencing factor in determining whether the Proposed Development will combine with additional wind farms to produce additive, synergistic or antagonistic effects. These effects include increased ‘Barrier Effect’ (potentially obstructing migratory flightpaths), increased ‘collision risk’ (through combined mortality in susceptible species) and increased ‘disturbance’ to birds utilising foraging grounds whilst on migration.

4.4.1 Plans / Project with potential for potential in combination effects with the Proposed Development

The plans and projects outlined below have potential for in-combination effects with the Proposed Development due to the size, scale and/or potential connectivity (pathway) to the Proposed Development or European site’s within the zone of influence (refer to Table 3-1) of the Proposed Development .

The following sources were referred:

- Cork County Council planning viewer <https://www.corkcoco.ie/en/planning/planning-enquiry-online-submissions>;



- An Bord Pleanála website (Strategic infrastructure development (SID) applications, Strategic Housing Development (SHD) applications and project applications including wind farms and planning appeals) <https://www.pleanala.ie/en-ie/home>;
- Irish Wind Energy Association (IWEA) <https://www.iwea.com/>
- Department of Department of Housing, Local Government and Heritage's EIA Portal <https://www.gov.ie/en/publication/9f9e7-eia-portal/>.

If the construction phase of the Proposed Development were to occur in parallel with other plans or projects resulting in habitat loss, in-combination impacts may occur on the qualifying interests of the identified European sites (refer to Table 4-2).

The following projects were identified for having potential for in-combination effects on the Gearagh SPA with the Proposed Development .

4.4.1.1 *Projects related to the Proposed Barnadivane Wind Farm*

In the event that the proposed 110kv substation grid connection is not permitted, an alternative underground grid connection (AGCR) relating to the Carrigarierk Windfarm (Cork County Council Ref. 15/730 & An Bord Pleanála Ref. PL04.246353) will be utilised. This Alternative Grid Connection Route will be assessed in-combination as it relates to an existing permitted development. An NIS accompanied this report, the Gearagh SPA was screened in due to a hydrological connection with the Carrigarierk Windfarm development. However, there is no direct hydrological connection between the Barnadivane Proposed Development and the Gearagh SPA. Furthermore, the NIS did not record mallard within the development site or within 2.5km. Therefore, this development will not adversely affect mallard within the Gearagh SPA.

In order to deliver the large turbine components to site there will be a requirement to carryout Enabling TDR Works within the townlands of Barnavidane (Kneeves), Lackareagh & Garranereagh. The works will consist of construction of a private roadway, approximately 150 metres long, from the R585 to the L6008 and all associated works. These works have already been consented pursuant to Cork Council Ref. 14/6803 and will be considered for in-combination effects. An AA Screening Report accompanied this application, and only a single mallard was recorded flying over the Proposed Development . Likely significant effects to the Gearagh SPA were ruled out due to the lack of SCI commuting over the Proposed Development. Therefore, this development does not have potential for impacts to mallard.

4.4.1.2 *Other Wind Farm Projects*

Planning searches (Cork County Council, Kerry County Council, An Bord Pleanála, SEAI) were undertaken using the following online planning enquiry portals to search for wind developments within 20km of the Proposed Development site, that are also within the 15km core foraging range of mallard from the Gearagh SPA.



Table 4-3: Wind Farms within 20km of the Site, and within the 15km core foraging range of mallard from the Gearagh SPA.

Wind Farm Name	Number of turbines	Distance and Direction from Proposed Development site	Status	Notes
Garranereagh Wind Farm	4	c. 1km west of site	Operational	No documents available.
Carrigarierk Wind Farm	5	c.11km west of site	Operational	The accompanying NIS screened in the Gearagh SPA due to a hydrological connection. The connection for the current Proposed Development is an ecological pathway, rather than hydrological.
Carrigarierk Extension	Up to 3	c.11km west of site	Proposed	The accompanying NIS states no mallard on site or within 2.5km. However, this project was screened in due to potential significant effects to water quality of the Gearagh.
Cleanrath Wind Farm	9	c.14km northwest	Operational	The Gearagh SPA was screened in due to water quality impacts in the absence of mitigation. However, the accompanying NIS did not determine any effects on mallard.
Shehymore Wind Farm	12	c.16km west of site	Operational	The Gearagh SPA was screened in due to water quality impacts in the absence of mitigation. The accompanying NIS did not record mallard at the development site.
Derragh Wind Farm	6	c.17.6km northwest of site	Operational	The accompanying NIS screened in the Gearagh SPA due to a hydrological connection. The connection for the current Proposed Development is an ecological pathway, rather than hydrological. Furthermore, mallard was not identified during surveys at the Derragh Wind Farm.
Bawnmore Wind Farm	5	c. 14km north of site	Operational	No documents available
Carriganimma Wind Farm	6	c. 19km northwest of the site	Operational	No documents available

For Carrigarierk Wind Farm and Extension, and Cleanrath Windfarm, mallard was not identified (or very rarely) within these other developments, therefore there is no potential for in-combination impacts resulting from construction (where applicable), operation or decommissioning. Furthermore, as the Proposed Development is downstream of the Gearagh SPA, there is no potential for impacts to water quality.



While no documents are available for Bawnmore Wind Farm, Garranereagh Wind Farm, and Carriganimma Wind Farm, they are already in operation therefore there is no potential for in-combination impacts resulting from construction. As for Derragh Wind Farm, Shehy More Wind Farm and Carriganimma Wind Farm, the decommissioning phase of these developments will not occur at the same time as that of the Proposed Development site, therefore there are no potential in-combination impacts resulting from decommissioning. During operation of the Proposed Development site, there is a large distance in the opposite direction from the Gearagh SPA to the Bawnmore Wind Farm and Carriganimma Wind Farm (14km and 19km respectively), therefore migratory or foraging paths will not overlap between these two wind farms. Therefore, there is no potential for in-combination impacts resulting from operation.

4.4.1.3 *Other Projects*

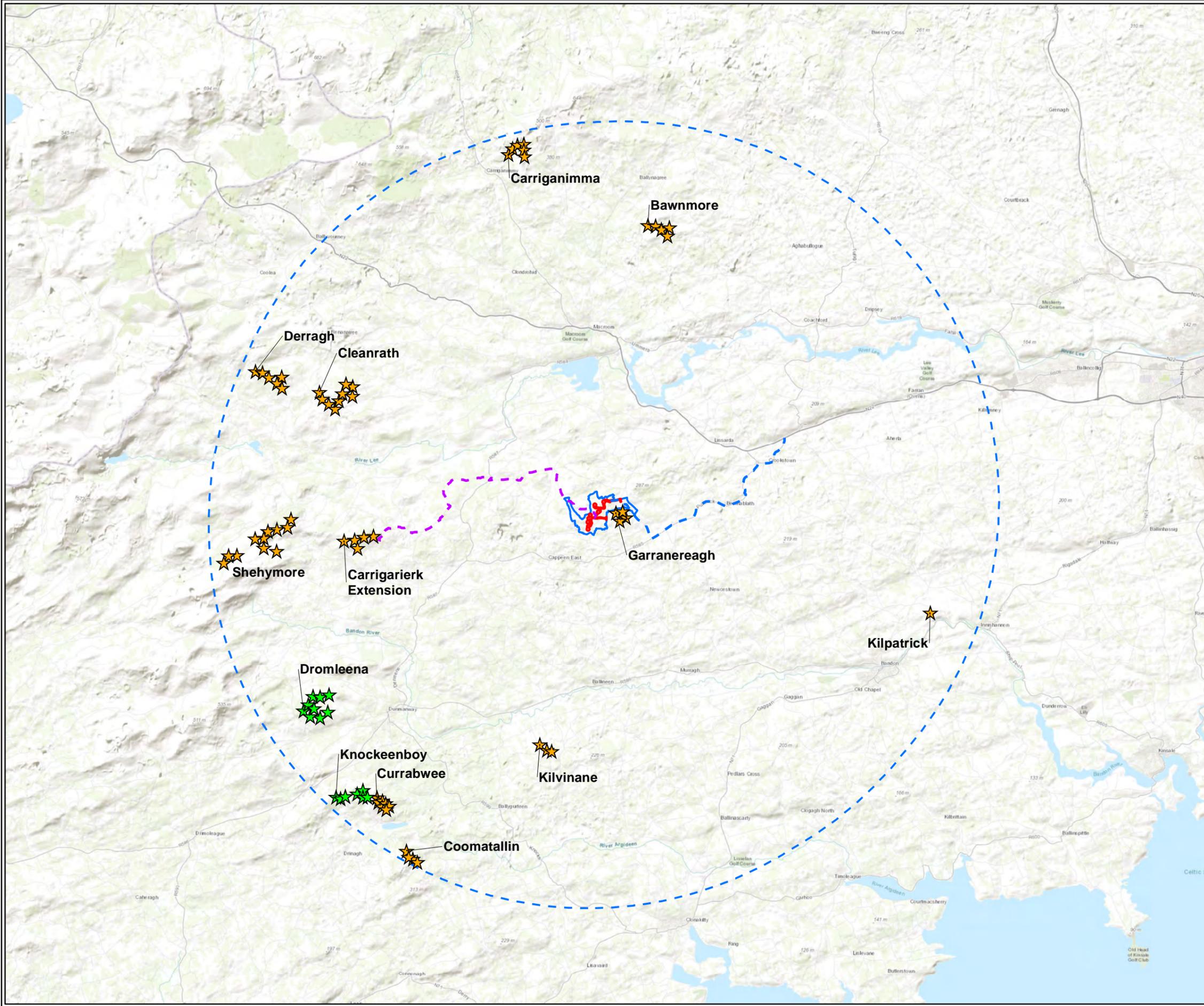
Planning searches (Cork County Council, Kerry County Council, An Bord Pleanála) were also undertaken using the following online planning enquiry portals to search for large scale developments within 20km of the site, and small projects within 500m of the site. The full list of planning applications is detailed in Appendix 1 and 2.

None of the other projects pose a collision risk for mallard, therefore they have no potential for in-combination impacts resulting from the construction, operation or decommissioning of the Proposed Development .

4.4.1.4 *Plans*

4.4.1.4.1 *Cork County Development Plan*

The current plan (2022-2028) includes several policies for the protection of wildlife and European sites, encouraging the appropriate assessment of potential effects from future development. The implementation of the policies and objectives of the County Development Plan in-combination with the design of the Proposed Development would have a positive effect for biodiversity in the local area.



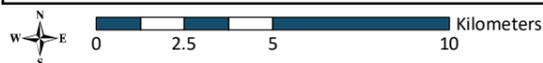
Legend

- Development Planning Boundary
- Lands in Control of Applicant
- Development Planning Boundary 20km Buffer Zone
- Alternative Grid Connection Route
- Turbine Delivery Route

Additional Surrounding Windfarms

- ★ Consented
- ★ Operational

TITLE: Wind Energy Developments in the Vicinity	
PROJECT: Barnadivane Wind Farm and Substation, Co. Cork	
FIGURE NO:	4-1
CLIENT: Barna Wind Energy Ltd. & Arran Windfarm Ltd.	
SCALE: 1:200000	REVISION: 0
DATE: 27/02/2023	PAGE SIZE: A3





4.5 Potential for Adverse Effects

An assessment of potential for the Proposed Development to have adverse effects on the integrity of the identified European sites is presented hereunder with respect to the SCI bird species (mallard) which have been identified to be within the likely zone of influence of the Proposed Development.



Table 4-4: Conservation Objectives and Structure and Functions for Relevant Qualifying Interests / Species of Conservation Interest with Potential for Adverse Effects on Site Integrity from the Main Site.

Species	Conservation Objective	Attribute	Measure	Target	Potential For Adverse Effects on Site Integrity from Proposed Development	Potential effect in-combination with other plans or projects	Duration of Effect in the absence of mitigation	Conclusion
Mallard (<i>Anas platyrhynchos</i>) [A053]	Generic conservation objectives To maintain or restore the favourable conservation condition of the bird species	N/A	N/A	N/A	No Potential for Adverse Effects Although the Proposed Development site is within the core foraging range of The Gearagh SPA for this species. Mallard was infrequently observed in very low numbers (typically 1-2 at any one time) and the Study Area does not support foraging, loafing or roosting features of significance for this species due to the absence of suitable habitats (e.g., wetlands, lakes). The potential impact to the species will be negligible and will not affect the conservation status.	No potential for in-combination effects with other plans and projects.	NA	No potential for the project to affect this target species either individually or in-combination with other plans or projects exists.



4.6 Residual Effects on the Integrity of the Sites within the Potential Zone of Influence of the Proposed Development

The Proposed Development will not have any adverse effect on the integrity the Gearagh SPA in light of the site's conservation objectives and status.

4.7 Conclusion

For the reasons set out in detail in this NIS, in the light of the best scientific knowledge in the field, all aspects of the Proposed Development which, by itself, or in combination with other plans or projects, may affect the relevant European Sites have been considered.

The NIS contains information which the competent authority, may consider in making its own complete, precise and definitive findings and conclusions and upon which it is capable of determining that all reasonable scientific doubt has been removed as to the effects of the Proposed Development on the integrity of the relevant European sites.

In the light of the conclusions of the assessment which it shall conduct on the implications for the European sites concerned, the competent authority is enabled to ascertain that the Proposed Development will not adversely affect the integrity of any European site.



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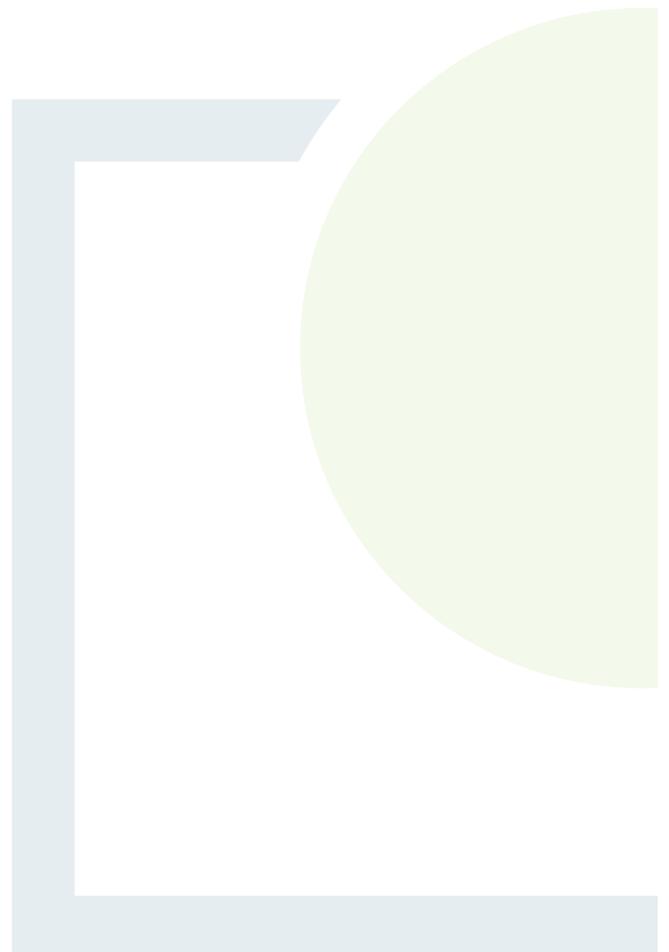
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CONSULTANTS IN ENGINEERING,
ENVIRONMENTAL SCIENCE
& PLANNING

APPENDIX 1

PLANNING SEARCH: LARGE
SCALE WITHIN 20KM



P.A. Ref. No.	Applicant	Address	Description	Decision	Appeal	Direction
225853	CEPL Limited	Gurteenroe, Macroom, Co.Cork	The demolition of an existing two storey dwelling house and single storey garage and the construction of a residential development of 96 no. residential units, a creche and all ancillary site development works. The proposed development comprises the construction of 8 no. 5 bedroom semi detached dwelling houses, 24 no. 4 bedroom semi-detached dwelling houses, 3 no 4 bedroom townhouses, 20 no. 3 bedroom semi-detached dwelling houses and 28 no. 3 bedroom town houses. The proposed development includes a 2-3 storey, split-level building with ground floor creche, 1 no 2 bedroom apartment and 1 no. 1 bedroom apartment with 11 no. 2 bedroom duplex townhouses at upper floors. Ancillary site works include hard and soft landscaping, servicing proposals, bicycle parking for the proposed creche and all other associated development works. Vehicular access to the proposed development will be provided via an upgraded vehicular entrance from new street (N22).	27/01/2023		N
194234	Massey Developments Ltd.	Meadowlands, Kilnagurteen, Masseytown, Co. Cork	The development will consist of revisions to development previously permitted under Ref No. 05/54023, 06/54047, 06/54059 to provide for alternative layout and house types on part of the site. The development will incorporate the replacement of 127 No. permitted dwellings with 106 No. new two storey house types comprising of 14 No. 4 bed semi-detached dwellings (1,424 sq.ft approx), 78 No. 3 bed semi detached dwellings (36 No. 1,149 sq. ft approx. & 42 No. 1,086 sq. ft approx) and 14 No. 2 bed terraced houses (886 sq. ft. approx). The total revised number of permitted and proposed dwelling on the overall site will be 176 No. dwellings comprised of 55 No. 4 bed dwellings, 100 No. 3 bed dwellings and 21 No. 2 bed dwellings along with the crèche as permitted. The application also seeks associated revisions to road layout and site development and landscape works. Extension of Duration of Permission granted under Planning Ref. No. 08/54057 and 14/5160	28/03/2019		N

P.A. Ref. No.	Applicant	Address	Description	Decision	Appeal	Direction
217385	Massey Developments Ltd	Meadowlands, Masseytown, Kilnagurteen, Macroom, Co. Cork	The development will consist of revisions to development previously permitted under Ref No. 05/54023, 06/54047, 06/54059 to provide for alternative layout and house types on part of the site. The development will incorporate the replacement of 127 No. permitted dwellings with 106 No. new two storey house types comprising of 14 No. 4 bed semi-detached dwellings (1,424 sq.ft approx), 78 No. 3 bed semi-detached dwellings (36 No. 1,149 sq. ft approx. & 42 No. 1,086 sq. ft approx) and 14 No. 2 bed terraced houses (886 sq. ft. approx). The total revised number of permitted and proposed dwelling on the overall site will be 176 No. dwellings comprised of 55 No. 4 bed dwellings, 100 No. 3 bed dwellings and 21 No. 2 bed dwellings along with the crèche as permitted. The application also seeks associated revisions to road layout and site development and landscape works. Extension of Duration of Permission granted under Planning Ref. No. 08/54057, 14/5160 and 19/04234.	17/02/2022		N
088770	Michael Murnane	Cahernafulla, Kilberrihert, Aghabullogue	An increase in hub height from 60 to 85 metres and rotor blade diameter from 66 to 82 metres as well as the addition of 1no. wind turbine to the permitted wind farm development at Cahernafulla. Associated changes to include relocation of permitted turbines, relocation of permitted substation & access tracks, and increase in site area to provide for new access road and entrance	Conditional 27/03/2009	THIRD PARTY WITHDRAWN	N
086149	Burren Energy Ltd. c/o Kevin Brogan	Cahernafulla, Kilberrihert, Aghabullogue	Completion of wind farm to include 7 no. turbines, substation and site tracks granted under pl . reg. no. 01/6529	Conditional: 09/06/2008		NW
204916	Reeve Wave Ltd	Ballytrasna, Lissarda, Co. Cork	A solar PV panel array consisting of up to 5400sqm of solar panels on ground mounted steel frames, electricity control room, power inverter unit, underground cable ducts, temporary laydown area, boundary security fence, site entrance, CCTV and all associated site works. Extension of Duration of permission granted under Planning Reference 14/06644 and (ABP 04.244539).	01/07/2020		NE

P.A. Ref. No.	Applicant	Address	Description	Decision	Appeal	Direction
206446	Mallow Contracts Limited	Former O'Regan Precast Quarry, Carhoo Lower and Coolnageearagh townlands, Coachford, Co. Cork	Permission for the development of a small-scale quarry with the extraction of rock using ripping and rock breaker and the on-site crushing and screening with mobile plant, and open storage of crushed rock. The installation and use of a mobile wheel wash and the continued use of the site access road, facility entrance from regional road R618, continued use of the existing weighbridge office, welfare facilities and existing septic tank and percolation area. The extraction of rock will extend to an area of 2.15 hectares. Following extraction, the site will be restored using stripped overburden, an eight-year quarry lifespan is sought.	Conditional 28/04/2021	THIRD PARTY ABP-310214-21 CONDITIONAL 18/01/2022	NE
216514	Grey Ruby Limited	Tullig More and, Knockane (townlands), Dripsey, Co. Cork	A twenty-year permission for the importation and recycling of up to 80,000 tonnes of construction and demolition (C&D) material per annum, including the construction of a new shed to manage/recycle the C&D material; and permission for the importation of up to 200,000 tonnes per annum of imported inert material (consisting of mainly soil/subsoil and stone) and the restoration/infilling of an existing quarry to provide agricultural/biodiversity uses, and all associated ancillary development works including tree planting and the provision of 4 no. bird/wildlife observation hides. The proposed development will utilise the existing quarry infrastructure including internal roads, site office, machinery shed, weighbridge, staff canteen and welfare facilities. An Environmental Impact Assessment Report (EiAR) will be submitted to the planning authority with the application. The application relates to development which comprises an activity requiring a waste licence (which has been provided by the Environmental Protection Agency under Licence Register No. W0255-02).	Conditional 08/07/2022		NE
187273	Tulligmore Quarry Solutions Limited	Tullig More (townland), Dripsey, Co. Cork	A ten-year permission for the continued use of an existing sand and gravel quarry with 2 no. new extraction areas measuring approximately 3.32ha combined and all associated ancillary development works including the implementation of a phased restoration programme	Conditional 15/04/2019	APPLICANT ABP-303901-19 MODIFIED 10/09/2019	NE

P.A. Ref. No.	Applicant	Address	Description	Decision	Appeal	Direction
196847	Amarenco Solar Cloghmacow Limited	Cloghmacow, Crookstown, Co. Cork	A 5 MW solar farm comprising approximately 22,200 photovoltaic panels on ground mounted frames within a site area of 8.12 hectares, 2 no. single storey inverter / transformer stations, 1 no. single storey delivery station, security fencing, CCTV, and all associated ancillary development works.	Conditional	THIRD PARTY ABP-307615-20 CONDITIONAL 16/12/2020	E
205074	Roadstone Limited	Castlemore Quarry, Crookstown, Co. Cork	The development will consist of quarrying activities within the red line application area of 40.17ha of an existing permitted quarry (06/13499 and PL04.226347). Development is sought for a period of 20 years. The proposed development will comprise the extension of the existing quarry excavation area vertically by an additional 2 X 18m high benches from the current floor level of ca.4mAOD to -32mAOD and a deepening of the quarry sump from the current level of ca -22mAOD to -36mAOD within the permitted extraction footprint area of 20.2ha. The proposed development will involve the stripping of overburden and its storage for use in environmental bunds and site restoration; the extraction of rock by means of blasting, the crushing and processing of rock. The proposed development will utilise the existing quarry infrastructure and other ancillaries to complete the works. An Environmental Impact Assessment Report and Natura Impact Statement will be submitted to the planning authority with this application.	Conditional	THIRD PARTY ABP-309891-21 CONDITIONAL 23/09/2021	E
176111	BNRG Neoen Holdings Ltd.	Townlands of Finnis and Mishells, Co. Cork, .	A ground mounted solar photovoltaic (PV) farm within a site area of approximately 40 hectares consisting of solar photovoltaic panels covering an area of up to 75,100sq.m on ground mounted steel frames, 1 no. on-site substation with 2 possible locations, option 1 identifies the substation location within the townland of Finnis and option 2 identifies the substation location within the townland of Mishells, up to 8 no. inverter/transformer stations, underground cables and ducts, boundary security fence, new internal tracks, CCTV cameras and all associated site services and works located within the townlands of Finnis and Mishells.	Conditional	THIRD PARTY ABP-301994-18 CONDITIONAL 25/03/2019	SE

P.A. Ref. No.	Applicant	Address	Description	Decision	Appeal	Direction
225234	BNRG Finnis Ltd	Finnis, Mishells, Bandon, Co Cork	2km of grid connection infrastructure on the public road and agricultural land to connect the approved Finnis Solar Farm (Planning reference 17/6111) to the existing Bandon Substation and to connect two parcels of land within the consented development comprising the laying of underground electricity cables, associated infrastructure and horizontal directional drilling.	Conditional 14/11/2022		SE
174098	Premier Solar Ltd	Callatrim, Bandon, Co.Cork	The development will consist of a solar PV array consisting of approximately 20,000 solar panels on ground mounted steel frames, 1 no. single storey delivery substation, 2 no. single storey inverter/transformer units, drainage swales, underground cable ducts on site, temporary construction compound (including site offices, portable toilets and parking area), boundary security fence, site entrance, access tracks, CCTV and all associated site works.	Conditional 12/06/2017		SE
18324	Carbery Food Ingredients Ltd. T/a Carbery Group	Carbery Group Plant, Carrigmore, Dromidiclogh West, Ballinkeen, Co. Cork	The demolition of an existing 2-storey detached dwelling and ancillary structures, including fencing, gates, and part of the existing front boundary walls; removal of existing signage; extensions to the main plant and warehouse building, to include: part single-storey/part 2-storey tank room/storage area, with upper floor laboratory/MCC room and lobby, to the south-western elevation; new door, part single-storey processing plant area, and 2-storey loading docks/office, to the southern elevation; new first floor processing/plant area to existing internal processing area; and new single-storey extension/infill to the existing internal open loading bay area, including increase in roof height. The proposed development will also consist of a single-storey extension to the existing chill water plant; signage: 5 no. car parking spaces; new doors/fire doors/roller shutter doors; 5 no. new storage vessels and associated pipe bridge; 10 no. existing storage vessels to be replaced and increased in height; additional roof-top plant (AHU's, extract fans, roof access ladders/gantry); all site development works, landscaping, drainage and ancillary development including: elevational	Conditional 16/10/2018		S

P.A. Ref. No.	Applicant	Address	Description	Decision	Appeal	Direction
17431	Keel Energy Limited	Shehy More, Coolcaum, Coolmountain, Tullagh, Lackabaun,, Clogher, Farrannahineeny, Crushterra, Gurteen, Gor, Carrigdangan, Inchincurka, Kilnadur, Aultaghreagh,	<p>treatment; revisions to the existing easternmost vehicular entrance, including erection of new retaining boundary wall and fencing; revisions to the westernmost vehicular access, including replacement and relocation of existing weighbridge and new single-storey weighbridge office and associated works; and the relocation of 3 no. flagpoles. The proposed development is for modifications to an establishment to which the Major Accidents Directive applies. This application relates to a development which comprises of an activity for which an Industrial Emissions License under part IV of the Environment comprising of an activity for which an Industrial Emissions License under part IV of the Environment Protection Agency 1992 (as amended) is required. An Environmental Impact Assessment Report (EiAR) has been prepared in respect of the proposed development.</p> <p>10 year permission for proposed development consisting of:</p> <p>(1) A 110kV electricity substation including 2 no. control buildings associated electrical plant and equipment, underground electricity cabling, fencing, alterations to a previously permitted borrow pit and temporary construction compound at the Carrigarierk Wind Farm (An Bord Pleanala Ref. PL04.246353, Cork County Council Ref. 15/730) in the townland of Carrigdangan; (2) 110kV underground electricity cabling connecting the proposed substation to the existing Dunmanway ESB substation in the townlands of Carrigdangan, Inchincurka, Kilnadur, Aultaghreagh, Aultagh, Ardcahan, Knockduff, Gurteenasowna and Ballyhalwick; (3) 33kV underground electricity cabling connecting the proposed substation to the permitted Carrigarierk Wind Farm through the townlands of Carrigdangan and Gortanavally and the permitted Shehy More Wind Farm (ABP Ref. PL04.243486; Cork County Council Ref. 13/551), through the townlands of Shehy More, Coolcaum, Coolmountain, Tullagh, Lackabaun, Clogher, Farrannahineeny, Crushterra, Gurteen and Carrigdangan.</p>	Conditional	THIRD PARTY ABP-301563-18 CONDITIONAL 21/06/2019	SW

P.A. Ref. No.	Applicant	Address	Description	Decision	Appeal	Direction
15730	Keel Energy Limited	Gurteen, Clogher, Derryleigh, Gortatanavally, Carr, Inchincurka, Johnstown, Haremont, Gorteenadrolane,, Coolaclevane, Carrigboy, Cooldorrageha, Deshure, Te, Reanacaheragh, Barnadivane, Barnadivane (Kneevies),	Together with all ancillary works and apparatus. The proposed development is located north of Dunmanway, Co. Cork. This application is accompanied by An Environmental Impact Statement (EIS) and a Natura Impact Statement (NIS). Ten year planning permission for the construction of a wind farm of up to 5 No. wind turbines, with a maximum ground to blade tip height of up to 140m, upgrading of existing and provision of new internal access roads, provision of a wind anemometry mast (height up to 90 metres), 2 no. borrow pits, underground electricity cabling, underground grid connection electrical cabling including all associated infrastructure, junction accommodation works for the proposed delivery route, 1 no. electricity sub-station with control building and associated equipment, 1 no. construction compound, upgrading of the existing site access junction, permanent signage and all ancillary site works.	Refused	THIRD PARTY PI.04.246353 CONDITIONAL 01/11/2016	SW
205438	Irish Water	Townland of Carrigleigh, Inchigeelagh, Co. Cork	The development will consist of the construction of a wastewater treatment scheme for the village of Inchigeelagh. Permission is sought for the following components of the scheme; 1. Below ground pumping station (PS) with emergency storage capacity, control kiosk and boundary treatment, to be located on the north bank of the River Lee, just to the east of Inchigeelagh Bridge. 2. Wastewater treatment plant (WWTP) for a population equivalent of 292 people with associated and ancillary development works including tanks, kiosks, inlet works, hardstanding and boundary fencing. 3. Outfall pipe to convey treated effluent from the WWTP to the River Lee. 4. Access road from the R584 road to the WWTP site with boundary treatment. 5. Access road from the WWTP site to the PS site. 6. All associated ancillary site development works above and below ground.	Conditional 01/06/2021		W

P.A. Ref. No.	Applicant	Address	Description	Decision	Appeal	Direction
156966	Cleanrath Windfarm Ltd	Cloontycarthy, Cleanrath North, Cleanrath South, D, Rathgaskig, Derragh, Augeris, Gorteenakilla, Carri, Co. Cork	The proposed wind farm will comprise the provision of a total of 11 no. wind turbines with a maximum ground to blade tip height of up to 150m, upgrading of existing and provision of new internal access roads, provision of a wind anemometry mast (height up to 100 metres), 2 no. borrow pits, underground electrical cabling, underground grid connection, electrical cabling including all associated infrastructure, junction accommodation works for the proposed turbine delivery route and provision of a temporary roadway to facilitate turbine component deliveries, 1 no. electricity sub-station with control building and associated equipment, 1 no. construction compound, upgrading of the existing site access junctions, permanent signage, and all ancillary site works. The proposed development comprises the redesign of a wind farm at this location previously considered by Cork County Council and An Bord Pleanala under pl. ref: 11/5245, and PL 04.240801 respectively.	Conditional	THIRD PARTY PL 04.246742 CONDITIONAL 19/05/2017	NE
18406	Amarengo Solar Clonakilty Limited	Beanhill South, Clonakilty, Co. Cork	A 5MW solar farm comprising approximately 22,200 photovoltaic panels on ground mounted frames within a site area of 11.7 hectares, 2 no. single storey inverter/transformer stations, 1 no. single storey delivery station, security fencing, CCTV, and all associated development works	Conditional 20/02/2019		S
187280	Engie Developments (Ireland) Limited	Berrings, Berrings, Co. Cork	The construction and operation of solar PV arrays mounted on metal frames on a 21.3ha site, inclusive of an electrical substation compound, up to 10 inverter units, a temporary construction area and ancillary facilities (inclusive of gross floor space of proposed works up to 248sqm). The planning application is accompanied by an environmental report and stage 1 screening for appropriate assessment.	Conditional 15/02/2019		NE
18242	Killaveenoge Windfarm Ltd.,	Curranashingane, Drinagh, Co. Cork	To construct a battery storage compound adjacent to the existing Killaveenoge electricity substation at Curranashingane, Drinagh, Co. Cork. The proposed works for which planning permission is sought will involve the construction of new palisade fencing, access track, bundled	Conditional	Third Party Appeal Case No. PL04.311503	SW

P.A. Ref. No.	Applicant	Address	Description	Decision	Appeal	Direction
19384	Organic Power Ltd	Dromleena, Inchanadreen and, Derrynasafagh, Dunmanway	Ten year permission for the erection of 11 wind turbines, borrow pit, electrical substation with ancillary hard standing and assembly area, install underground fibre optic cables and electrical cables and ancillary works. Install fibre optic cables and electrical cables along the public road to the 110KV electrical substation 1km east of Dunmanway town along the R586	Conditional 29/07/2019	Third Party Appealed and Granted 12/02/2019	SW
21902	Knockeenbui Wind Farm Limited	Knockeenboy, Kilonane West, Kilonane East, Moreagh, Nedinagh West, Acres and Ballyhalwick, Dunmanway, Co. Cork	A ten year planning permission for proposed development consisting of a 20 kilovolt (kV) electrical powerline grid connection, approximately 10,117 metres in overall length (made up of approximately 9,983 metres of underground cable and approximately 134 metres of Over Head Line with three wooden support single poles), connecting the approved electrical substation at Knockeenboy Wind Farm (Planning Register Reference No. 11/00059 & An Bord Pleanala Ref. PL88.240070) to the existing Dunmanway 110kV ESB Networks substation at Ballyhalwick; together with all ancillary works and apparatus. The grid connection will be developed from the approved substation through the townlands of Knockeenboy, Kilonane West, Kilonane East, Moreagh, Nedinagh West, Acres and Ballyhalwick townlands. The proposed development is located to the east, south and southwest of Dunmanway, Co. Cork. The planning application is accompanied by an Environmental Impact Assessment Report (EIAR) and by a Natura Impact Statement (NIS).	Conditional 16/05/2022		SW
185367	Cork Green Energy Ltd.	Gortnalicky, Clondrohid, Macroom, Co. Cork	Construction of combined heat and power plant consisting of a generator house, electrical room, external boiler and ancillary equipment.	Conditional 18/07/2018		SW
196016	Irish Water	Ballymakeery, Macroom, Co. Cork	(i) upgrade of the existing underground Ballymakeera pumping station and replacement of above ground kiosk; (ii)	Conditional 03/10/2019		NW

P.A. Ref. No.	Applicant	Address	Description	Decision	Appeal	Direction
194972	Knocknamork Ltd	Slieveraagh and Coomnaclohy, Ballyvourney, Co. Cork	creation of a new dedicated access to the pumping station site; (iii) decommissioning of an existing septic tank and gravity outfall pipe; and (iv) all ancillary development and associated temporary works including vehicle turning area, and perimeter fencing with access gate on to the public road. Renewable energy development consisting of the provision of a 7 turbine wind farm, solar photovoltaic array, electricity substation, battery storage compound and all associated works consisting of the following, i. Up to 7 wind turbines with an overall blade tip height of up to 150 metres and all associated foundations and hard-standing areas; ii. Up to 70,000sq.m solar photovoltaic array, with up to 17 associated inverters and 2 no. control cabins; iii. 1 no. borrow pit, iv. 1 No. permanent meteorological mast with a maximum height of up to 100 meters; v. Upgrade of existing and provision of new site access roads, vi. 1 no. 38kV electrical substation with 1 no. control building with welfare facilities, associated electrical plant and equipment security fencing and waste water holding tank; vii battery storage compound accommodating 4 no. battery storage containers, security fencing, and associated electrical plant and equipment, viii. Forestry felling ix. 1 no. temporary construction compound, x. Site drainage xi. All associated internal underground cabling; xii. 38kV underground grid connection cabling; xiii. All associated site development and ancillary works. The proposed development will have an operational life of 30 years from the date of commissioning of the development and the application seeks a ten year planning permission. An Environmental Impact Assessment Report (EiAR) and a Natura Impact Statement (NIS) have been prepared in respect of the proposed development.	Conditional (18/11/2019)	N/A	NW
185155	Roadstone Limited	Garryhesta Pit, Knockanemore, Ovens, Co. Cork	Development consists of restoration of part (c. 6.7 ha) of existing quarry (QR19 06/11798 & PL04.225332) by importation of up to 300,000 tonnes per annum of inert soil and stones and river dredging spoil (EWC 17-05-04 and 17-	Conditional 22/11/2018		E

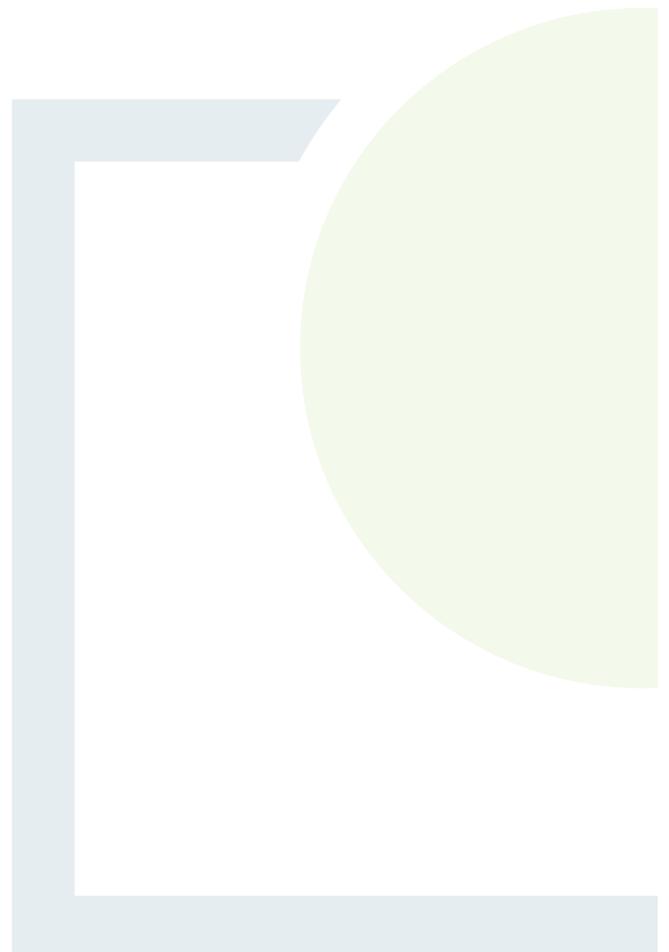
P.A. Ref. No.	Applicant	Address	Description	Decision	Appeal	Direction
			<p>05-06).The proposed soil recovery facility will utilise the permitted quarry infrastructure including internal roads, site office, welfare facilities and other ancillaries to complete the works. Access to the site will be from the permitted main entrance on the N22 National Primary Road. A wheel wash and weighbridge will be provided as part of the proposed development and the existing workshop will be utilised as a quarantine area. A hard-stand with drainage to oil interceptor will also be provided as a designated refuelling area. The total application area including the site infrastructure covers 7.9 ha of lands. The development will be subject to the requirements of the waste management licence. An Environmental Impact Assessment Report (EIAR) will be submitted to the Planning Authority with the application.</p>			



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APPENDIX 2

PLANNING SEARCH: SMALL
SCALE WITHIN 500M



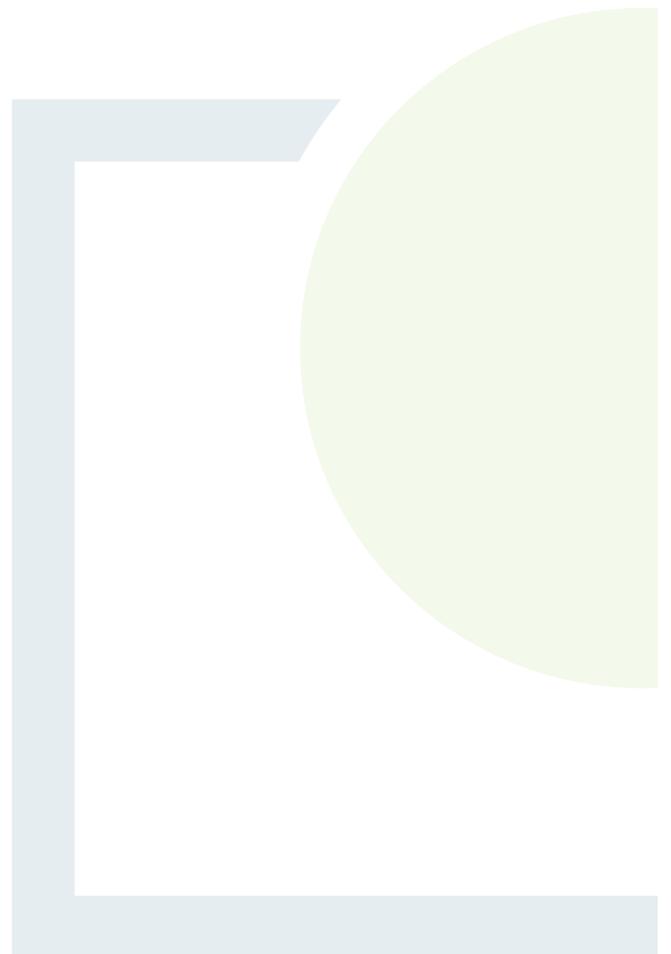
P.A. Ref. No.	Applicant	Address	Description	Decision
194909	Patrick O'Halloran, Eilish Delaney	Clearagh, Lissarda, Co. Cork,	A dwellinghouse, an effluent treatment system and associated site works (Change of house design granted under Planning Reg. No. 16/6200).	Conditional Permission
215620	Gerard and Mary Grainger	Lackareagh, Lissarda, Co. Cork,	a) Construction of a livestock shed consisting of cubicles, straw bedded area, flow channels and underground slatted tanks b) Modifications and extension to existing unroofed yard to include handling facilities and post milking yard and all associated si	Conditional Permission
216463	Diarmuid Cohalan	Garranereagh, Lissarda, Co. Cork,	Permission for retention of a) extension and alterations to existing dwelling (including attic conversions) and b) domestic garage/shed with loft area.	Conditional Permission
18440	Barry & Alan O'Sullivan	Kneeves House, Barnadivane, Terelton, Co Cork	Construction of a cattle house with underground slatted tanks and all associated site works	Conditional Permission
17118	Barna Wind Energy (B.W.E) Limited	Barnadivane (Kneeves), Teerelton, Co. Cork,	An 80m high temporary meteorological mast and all associated works. Retention planning permission is sought for a period of 18 months	Conditional Permission



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APPENDIX 3

BIRD REPORT





CONSULTANTS IN ENGINEERING,
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PLANNING

BARNADIVANE WIND FARM & SUBSTATION, CO CORK ORNITHOLOGICAL SURVEY

APPENDIX 5.3 BASELINE ORNITHOLOGICAL
SURVEYS - BARNADIVANE WIND FARM &
SUBSTATION:
WINTER 2020/2021, SUMMER 2021,
WINTER 2021/22, SUMMER 2022

Prepared for:

Barna Wind Energy (B.W.E.) Ltd & Arran Windfarm Ltd

Date: February 2023

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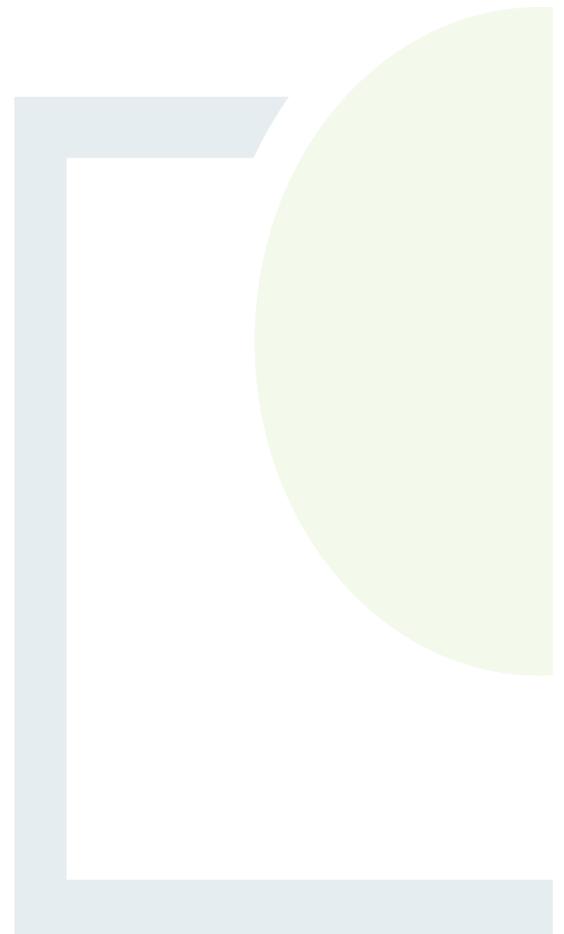


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EXECUTIVE SUMMARY

Ornithological surveys for the Proposed Development searched for and recorded all bird species, focusing primarily on the Proposed Development site but also taking in the surrounding region. Surveys covered the 2020-21 and 2021-22 non-breeding seasons, and the 2021 and 2022 breeding seasons.

The methodology for the ornithological surveys at the Proposed Development adhered to Scottish Natural Heritage guidance (SNH, 2017) for assessing the impact of proposed Wind Farm developments on the breeding and wintering populations of bird species in the study area. Two timed watches of three hours duration were carried out from each vantage point (VP) every month from April to September inclusive in 2021 and 2022 for breeding season surveys, totalling 36 hours of observation time per survey season at each VP. In July 2021 at VP2, half an hour of survey time less was conducted, totalling 35.5 hours of survey time at VP2 for the summer 2021 season.

Breeding bird transect surveys were carried out in April and June each summer season and breeding wader surveys were undertaken between April and July inclusive each summer season. VP surveys were carried out using the same methodology over the winter season, with two three-hour watches per month from October to March inclusive during the winter 2020/2021 and 2021/2022 seasons totalling 36 hours of observation time at each VP for each survey season. Winter transect surveys were carried out three times each winter season. Hinterland surveys were carried out each month throughout the two-year survey period.

Summer Surveys

During summer VP surveys, a total of 52 species of bird were recorded from April to September in 2021 and 2022 combined. Of these species six are Red-listed (Gilbert et al., 2021): Golden Plover, Kestrel, Meadow Pipit, Snipe, Stock Dove and Swift. A total of 12 species are Amber-listed: Goldcrest, Greenfinch, Herring Gull, House Martin, Lesser Black-backed Gull, Linnet, Mallard, Skylark, Starling, Swallow, Wheatear and Willow Warbler. The remaining 34 species are Green-listed. Two species are protected under Annex 1 of the EU Birds Directive: Golden Plover and Peregrine.

During hinterland surveys surrounding the Proposed Development site, seven Annex 1 species were noted: Golden Plover, Hen Harrier, Kingfisher, Little Egret, Peregrine, Ruff and Whooper Swan. A total of ten Red-listed species were recorded: Curlew, Golden Plover, Grey Wagtail, Kestrel, Lapwing, Meadow Pipit, Snipe, Stock Dove, Swift and Yellowhammer. Additionally, 30 Amber-listed species were noted, with the remaining 42 species recorded during Hinterland surveys over both summer seasons being Green-listed.

Snipe was the only species detected during breeding wader surveys. Breeding bird surveys recorded 34 species; within these, three species are red-listed: Meadow Pipit, Grey Wagtail and Kestrel. A total of six species are Amber-listed: Goldcrest, Lesser Black-backed Gull, Linnet, Starling, Swallow and Willow Warbler. The remaining 25 species noted during breeding birds surveys are Green-listed. There were no Annex 1 listed species recorded during breeding bird transects.

Winter Surveys

During winter VP surveys throughout the winter seasons 2020/21 and 2021/22, a total of 50 species were recorded. Seven Red-listed species were recorded: Golden Plover, Grey Wagtail, Kestrel, Meadow Pipit, Redwing, Snipe and Yellowhammer. A total of nine are Amber-listed: Goldcrest, Greenfinch, Hen Harrier, Lesser Black-backed Gull, Linnet, Mallard, Ringed Plover, Skylark and Starling. The remaining 34 are Green-listed. Three of the species recorded over the winter period are protected under the Annex 1 of the EU Birds Directive: Golden Plover, Hen Harrier and Peregrine.



During winter hinterland surveys 13 Red-listed species were recorded: Black-tailed Godwit, Curlew, Dunlin, Golden Plover, Goldeneye, Grey Wagtail, Kestrel, Lapwing, Meadow Pipit, Redwing, Shoveler, Snipe and Woodcock along with 24 Amber-listed species and 41 Green-listed species. Of these 78 species, eight are Annex 1 listed: Barnacle Goose, Golden Plover, Kingfisher, Little Egret, Peregrine, Ruff, Greenland White-fronted Goose and Whooper Swan.

A total of 30 species were recorded during winter transect surveys. Of these, three are Red-listed: Grey Wagtail, Meadow Pipit and Redwing. Four are Amber-listed: Goldcrest, Greenfinch, House Sparrow, and Starling. The remaining 23 are green listed. There were no Annex 1 listed species recorded during winter transect surveys.



1. INTRODUCTION

Fehily Timoney & Company (FT) was appointed by Barna Wind Energy (B.W.E.) Ltd & Arran Windfarm Ltd. (the Applicant) to undertake ornithological surveys at the Proposed Development site during 2020-2022. This report presents the results of two years of ornithological surveys and summarises the flight activity of target bird species as well as presence and distribution of all bird species on site and surrounding areas during the breeding and non-breeding survey periods in 2020, 2021 and 2022. The study area of the Proposed Development site is near Teerelton, south of Macroom, Co. Cork.

This avian assessment for surveys completed over two years in winter 2020/21, summer 2021, winter 2021/22 and summer 2022 includes the assessment of target bird species potentially occurring within the Proposed Development site boundary, and within the lands surrounding the Proposed Development site. Surveys adhered to Scottish Natural Heritage guidance (SNH, 2017). The following surveys were carried out:

- Vantage Point survey (breeding and non-breeding season);
- Hinterland survey;
- Breeding & winter bird transect survey;
- Breeding Wader Survey.

This report outlines the results of the above surveys to inform about avian usage of the Proposed Development site and surrounding areas.

1.1 Study Area

The Proposed Development site is located in the townlands of Lackareagh, Garranereagh and Barnadivane (Kneeves), near Teerelton, Co. Cork, approximately 8 km south of Macroom.

The Proposed Development is located on a ridgeline draining primarily to the Bride River valley. The site ranges in elevation from 180m on the southern boundary to 270m to the north of the site. The land to the south slopes downwards towards the River Bride and low-lying rolling farmland. To the north, the land slopes to the Cumber 19 River, which is a tributary of the River Lee.

According to Corine Land Cover (2018), the dominant land use within the Proposed Development site boundary is 231 - Agricultural Areas - Pastures with small areas of 312 - Coniferous forests and 324 - Transitional woodland scrub present in the surrounding area.

There are two SPAs within 15 km of the Proposed Development site boundary:

- The Gearagh SPA (004109)
- Mullaghanish to Musheramore Mountains SPA (004162)

The Gearagh, which is located ca. 6km north of the Proposed Development site is an important wetland site for birds and is designated for Wigeon, Teal, Mallard, Coot and Wetland and Waterbirds. All species listed as SCI species are Amber-listed.



Mullaghanish to Musheramore Mountains SPA is located ca. 14 km to the north of the Proposed Development site is designated for Hen Harrier, which is Amber-listed and an Annex 1 species.

There are two SACs within 15 km of the Proposed Development site boundary:

- The Gearagh SAC (000108)
- Bandon River SAC (002171)

The following protected national sites are within 15km of the proposed development:

- Killaneer House Glen pNHA (001062)
- Boylegrove Wood pNHA (001854)
- The Gearagh pNHA (000108)
- Bandon Valley South of Dunmanway pNHA (001035)
- Bandon Valley West of Bandon pNHA (001034)
- Lough Allua pNHA (001065)
- Lough Gal pNHA (001067)
- Prohus Wood pNHA (001248)
- Glashgarriff River pNHA (001055)

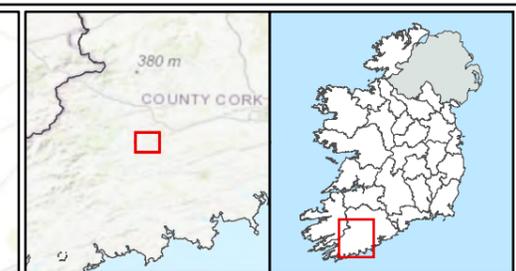
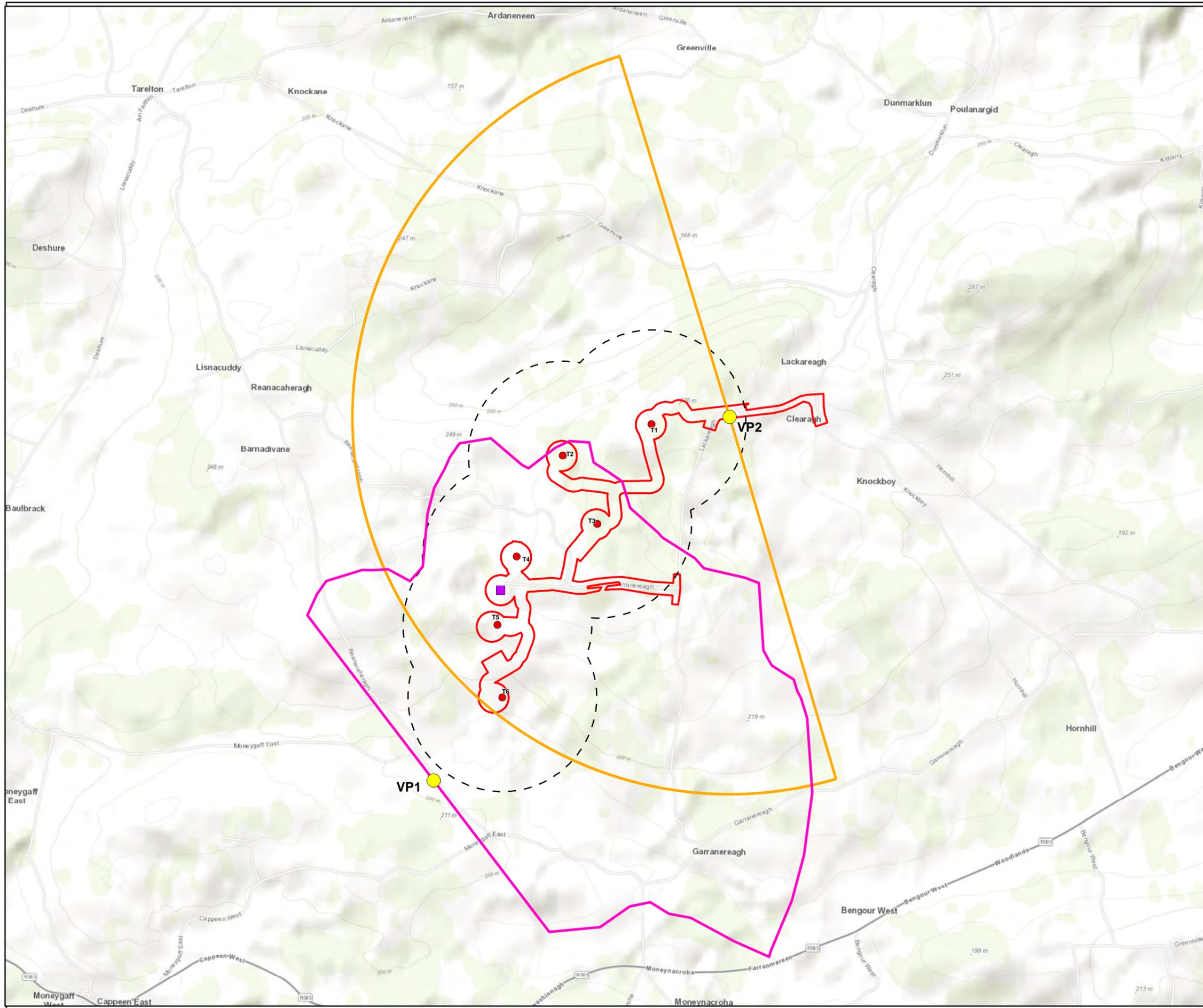
Four of the pNHAs listed above are noted to be important for bird species:

Killaneer House Glen pNHA is a relatively natural wood in an agricultural area. It is considered to support a rich avian community of about 20 regularly occurring bird species.

The Gearagh pNHA is a wetland which is important for a variety of bird species, particularly wetland species. The area is also designated as an SPA and SAC.

Bandon Valley West of Bandon pNHA has provides suitable habitat for a variety of bird species, such as Red-listed Lapwing and Curlew, Amber-listed Mallard, Teal and Cormorant and Green-listed Grey Heron.

Lough Gal pNHA is noted to be a good site for wildfowl, ducks, geese and swans.



Legend

- Development Planning Boundary
- Turbines 500m Buffer
- Proposed Met Mast
- Proposed Turbine Layout
- Viewpoints

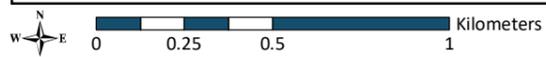
Viewsheds

Name

- VP1 Viewshed
- VP2 Viewshed

TITLE:	
Turbine and VP Locations	
PROJECT:	
Barnadivane Wind Farm and Substation, Co. Cork	
FIGURE NO: 1.1	
CLIENT: Barna Wind Energy Ltd. & Arran Windfarm Ltd.	
SCALE: 1:20000	REVISION: 0
DATE: 23/02/2023	PAGE SIZE: A3

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2. SURVEY METHODOLOGY

The following ornithological surveys were carried out:

- Vantage Point Surveys (breeding and non-breeding season);
- Hinterland survey;
- Breeding Wader survey;
- Breeding bird & winter transect survey.

The avian surveys carried out at the Proposed Development adhered to Scottish Natural Heritage guidance (SNH, 2017).

2.1 Target Species

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

- Species listed on Annex 1 of the Birds Directive;
- Red-listed birds of Conservation Concern (Gilbert *et al.* 2021);
- Schedule 1 of the Wildlife and Countryside Act 1981 (not applicable in Ireland); and
- Regularly occurring migratory species.

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

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

'Birds of Conservation Concern in Ireland' (BoCCI) are classified into three separate lists: red, amber and green. Red-listed species are of high conservation concern, Amber-listed species are of medium conservation concern and Green-listed species are considered not to be of conservation concern (Gilbert *et al.*, 2021). Note that during part of the surveys BoCCI list No.3 (Colhoun and Cummins, 2013) was in use, but for this report, the current version (Gilbert *et al.*, 2021) is utilised.

Additionally, a review of the bird species listed on Annex 1 on the EU Birds Directive (2009/147/EC) was undertaken in assessing the conservation status of birds. Annex 1 species are often afforded additional protection through the designation of Special Protection Areas (SPAs) throughout EU countries in addition to existing National legislation.

The target species/groups for these surveys were: all raptors and owls, all wild goose, swan and duck species, all waders, all gull species., herons, Great Spotted Woodpecker and Swift.



2.2 Vantage Point Surveys

Vantage Point (VP) surveys were carried out at the Proposed Development site from October 2020 to September 2022 (inclusive) during the breeding (summer) and non-breeding (winter) seasons, in accordance with Scottish Natural Heritage (SNH) methodology for onshore Wind Farms (SNH, 2017). These surveys were divided into summer (April - September) and winter (October - March) seasons.

Two fixed VP locations overlooking the Proposed Development study area were used during VP surveys (see Figure 1-1). These were chosen to cover a specific viewshed of the proposed development site encompassing the view of all proposed turbine locations and the SNH buffer zone around the maximum possible turbine layout of the Wind Farm. SNH (2017) guidance states that viewsheds should cover a 500 m circular buffer drawn around each proposed turbine location.

The main purposes of VP survey watches are to collect data on target species that will enable estimates to be made of:

- a) The time spent flying over the defined survey area;
- b) The relative use of different parts of the defined survey area; and
- c) The proportion of flying time spent within the upper and lower height limits as determined by the rotor diameter and rotor hub height.

Table 2-1: Vantage point viewshed and turbines encompassed

Site	Vantage Point	Turbine number(s) covered in viewshed
Proposed Development site	VP1	T2, T3, T4, T5, T6
	VP2	T1, T2, T3, T4, T5, T6

VP locations were based on observations from walkover/reconnaissance surveys, viewshed analysis (using GIS) and collated information on known feeding and roosting sites from both desktop review and consultation. The number and location of vantage points was selected in order to achieve visibility of the entire study area and important features for birds in close proximity to the Proposed Development site (e.g., lakes, wetlands, woodlands).

In line with recommended best practice (SNH, 2017 and Band *et al.* 2007), viewshed analysis was undertaken using ARCMAP 10.8.1, to calculate a theoretical zone of visibility from each vantage point. Visibility is calculated from each vantage point along an invisible layer suspended at the predicted lowermost height passed through by the rotor blade tips, using an observer height of 1.5 m.



We note the following from SNH guidance in respect of priority areas for viewshed analysis (emphasis added):

*“Where the key purpose is to estimate the risk of collision with turbines, **it is the visibility of the airspace to be occupied by the turbine rotors (the collision risk volume) that is of prime importance.** Therefore, it is recommended that visibility be calculated using the least visible part of this airspace, i.e. an imaginary layer suspended at the lowermost height passed through by the rotor blade tips (typically about 20-30m above ground level). Predicting visibility at this level is a simple task using GIS, however it should be noted that the baseline should take account of any forestry or other features that will potentially obstruct the view. For example, forestry may be 10-30m high and if viewshed height is taken as 20-30m ground level the visible area could be overestimated if there is forestry within the viewshed. Being able to view all or most of the site to ground level can be helpful in gauging overall bird activity and usage of the site but is not as important as being able to view the collision risk volume”*

Following SNH guidance (2017), watches were conducted to sample diurnal and crepuscular activity of target species and aligning with the required effort from SNH.

Data recorded included flight activity of target species (flight height, duration, directionality) in addition to metrics such as flock size (per recorded transit) and time of observation relative. Detailed notes of each observation of a target bird species were recorded including behaviour, gender (where possible), numbers, flight height, associated habitat and the period of time spent within the study area. Successful foraging events were also noted if they arose. Other bird species seen or heard during the VP surveys were also recorded on a casual basis and were considered separately in the analysis as additional species. Flight activity was annotated onto field maps. Details of flight-path observations are provided in Section 3. Binoculars and telescopes are used to scan for target species. Dictaphones are utilised to dictate bird heights whilst tracking flight events.

Flight heights are estimated visually as allowed for in SNH (2017) guidance. Flight height estimation using a clinometer or rangefinder is accepted as an alternative means of determining flight height however this is often not practicable (equipment may be clumsy and birds may be lost from view whilst trying to focus additional equipment on a target species rapidly moving out of sight); it should be noted that in practice many flocks of swans do not fly close enough to a surveyor for a rangefinder to be used, resulting in most flight heights being estimated in any case. As is often the case an experienced observer will be able to record accurate observations at a higher frequency, resulting in a more robust dataset for analysis.

As previously mentioned, VP surveys were carried out at the Proposed Development site from October 2020 to September 2022 inclusive and involved carrying out 2 x 3-hour VPs at each VP every month. As per SNH guidance (2017), 36 hours of vantage point effort was carried out at each vantage point during each breeding survey period, and 36 hours during each winter survey period. In July 2021, only 5.5 hours of observations were carried out at VP2, resulting in a total survey time of 35.5 hours for VP2 during the summer 2021 season. This change in survey effort is negligible and does not materially affect the robustness of the assessment. The proportion of survey time that activity was recorded inside and outside the Proposed Development site boundary was used as part of the overall analysis and assessment of target species usage of the study area. Vantage point locations can be found in Table 2-2 below. All surveys were conducted during suitable weather conditions.



Table 2-2: Grid References for VP locations at the Proposed Development site

Site	Vantage Point	Easting, Northing (ITM)
Proposed Development site	VP 1	533330, 561973
	VP 2	534900, 563900

2.3 Hinterland Surveys

The methodology used for wetland sites during the winter hinterland surveys followed I-WeBS (Irish Wetland Bird Survey) methodology (Lewis et al, 2019), whereby each location was surveyed for the duration necessary to identify and obtain a count for all target species present. The same approach was adapted for non-wetland sites. A hinterland survey for raptors was conducted in accordance with Raptors: a field guide to survey and monitoring (Hardey et al. 2013) to assess Hen Harrier and other raptor activity over the winter and breeding periods in the greater surroundings. Surveys for Hen Harrier breeding and roosting sites and breeding raptors were also carried out within 2km of the Proposed Development, fulfilling and exceeding the requirement set out in SNH Guidance (2017). The surveys were carried out in suitable habitats for birds (woodland, wetland, etc) in the area surrounding the Proposed Development site. Hinterland surveys included potential breeding wader habitat during summer 2021 and 2022 seasons.

Hinterland surveys comprised of a total of 11 hinterland vantage points (HVPs) within 10 km of the Proposed Development site over the survey period. These sites were chosen as they had suitable habitat for target species such as raptors, geese, swans, waterbirds and waders. Surveys were carried out each month throughout the survey period starting in October 2020 and ending in September 2022. Wading birds, waterfowl and raptors were monitored using short VP watches (of between 1hr and 2hr duration). Sightings of birds were also recorded for birds seen in the Barnadivane area within the following distance bands: 2km, 5km and 10km radius of the Proposed Development site.

Table 2-3 indicates the distance of each hinterland site location within the 15 km area around the Proposed Development, as shown in Figure 2-1. The hinterland survey results are discussed in Section 1. 3.6 and full results are detailed in Appendix 3.

Table 2-3: Hinterland site location and survey schedule

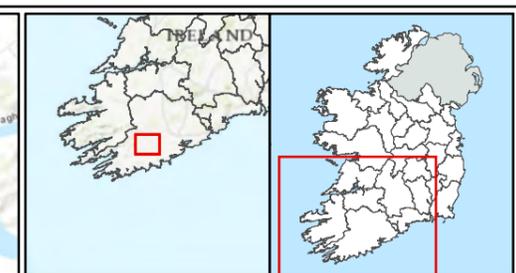
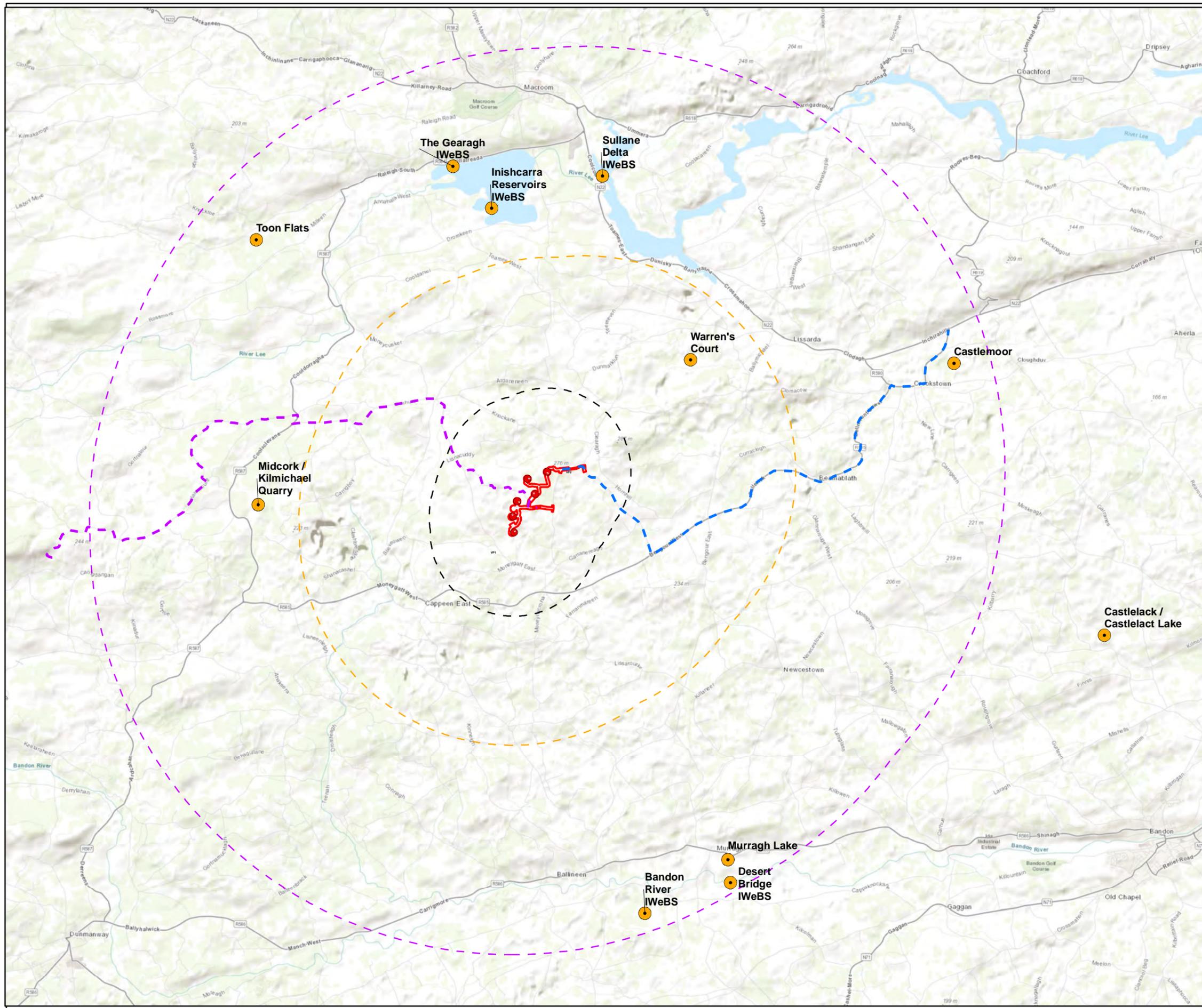
HVPs	Location	Distance from site	Dates visited		
1	Castlelack Lake	~ 13.8 km	26/01/2022		
2	Castlemoor	~ 9 km	23/11/2020 01/12/2020 14/12/2020	20/01/2021 03/02/2021 20/09/2021 16/10/2021	15/11/2021 31/12/2021 26/01/2022
3	Desert Bridge	~ 9.7 km	28/11/2020 01/12/2020 14/12/2020 20/01/2021 04/02/2021 03/03/2021	14/07/2021 03/08/2021 20/09/2021 15/11/2021 31/12/2021 26/01/2022	04/03/2022 01/04/2022 11/05/2022 01/06/2022 16/07/2022 04/08/2022



HVPs	Location	Distance from site	Dates visited		
			12/05/2021 10/06/2021	12/02/2022	12/09/2022
4	Inishcarra Reservoir	~ 6.3 km	23/11/2020 01/12/2020	20/01/2021 04/02/2021	03/03/2021
5	Kilmicheal/ Mid Cork Quarries	~ 5 km	12/05/2021 10/06/2021 14/07/2021	03/08/2021 16/10/2021 20/09/2021	11/05/2022 28/07/2022 31/08/2022
6	Murragh Lake	~ 9.3 km	28/11/2020 01/12/2020 14/12/2020 20/01/2021 04/02/2021 03/03/2021 12/05/2021 10/06/2021	14/07/2021 03/08/2021 20/09/2021 16/10/2021 15/11/2021 31/12/2021 12/02/2022 26/01/2022	04/03/2022 01/04/2022 11/05/2022 01/06/2022 16/07/2022 04/08/2022 12/09/2022
7	River Bandon SAC	~ 9.5 km	16/10/2021 15/11/2021 31/12/2021 26/01/2022	12/02/2022 04/03/2022 01/04/2022 11/05/2022	01/06/2022 16/07/2022 04/08/2022 12/09/2022
8	Sullane Delta	~ 7 km	23/11/2020 01/12/2020 14/12/2020 20/01/2021 03/02/2021 03/03/2021	15/11/2021 31/12/2021 26/01/2021 12/02/2022 04/03/2022 01/04/2022	11/05/2022 01/06/2022 16/07/2022 04/08/2022 12/09/2022
9	The Gearagh	~7.5 km	23/11/2020 01/12/2020 14/12/2020 20/01/2021 03/02/2021 03/03/2021 12/05/2021 10/06/2021	14/07/2021 03/08/2021 20/09/2021 16/10/2021 15/11/2021 31/12/2021 26/01/2021 12/02/2022	04/03/2022 01/04/2022 11/05/2022 01/06/2022 16/07/2022 04/08/2022 12/09/2022
10	Toon Flats	~ 8 km	23/11/2020 01/12/2020	14/12/2020 20/01/2021	03/02/2021 03/03/2021
11	Warren's Court	~ 3.5 km	23/11/2020 01/12/2020 16/04/2021 17/04/2021 12/05/2021	03/08/2021 20/09/2021 16/10/2021 15/11/2021 31/12/2021	04/03/2022 01/04/2022 11/05/2022 01/06/2022 16/07/2022



HVPs	Location	Distance from site	Dates visited		
			23/05/2021 10/06/2021 14/07/2021	26/01/2021 12/02/2022	04/08/2022 12/09/2022
12	Barnadivane 2km radius		12/05/2021 10/06/2021 14/07/2021 08/08/2021 20/09/2021	16/10/2021 15/11/2021 31/12/2021 12/02/2022	26/01/2022 04/03/2022 01/04/2022 11/05/2022
13	Barnadivane 5km radius		01/04/2022 11/05/2022	01/06/2022 16/07/2022	04/08/2022 12/09/2022
14	Barnadivane 10km radius		14/07/2021	03/08/2021	



Legend

- Development Planning Boundary
- Turbines 2km Buffer
- Development Planning Boundary - 5km Buffer
- Development Planning Boundary - 10km Buffer
- Turbine Delivery Route
- Alternative Grid Connection Route
- Proposed Turbine Layout
- Hinterland Sites

TITLE:	
Survey Area for Hinterland Sites	
PROJECT:	
Barnadivane Wind Farm and Substation, Co. Cork	
FIGURE NO:	2.1
CLIENT: Barna Wind Energy Ltd. & Arran Windfarm Ltd.	
SCALE: 1:90000	REVISION: 0
DATE: 24/02/2023	PAGE SIZE: A3





2.4 Breeding Wader Surveys

Surveys to assess the presence of the breeding wader species were conducted in between April and July in 2021 and 2022 with surveys conducted every month during this period, totalling four rounds of surveys each year. A number of methods were combined from published literature including Bibby *et al*, (2000), Gilbert *et al*, (1998), O’Brien & Wilson (2011) and SNH 2017 to estimate numbers of target species breeding within this envelope. This survey utilised transects walked through suitable habitat within 3 hours of dusk. A total of two no. ca. 1km transects were selected in the survey area. Table 2-4 indicates target wader species and associated suitable breeding habitat. Count units (see Table 2-5) were predefined for each target species and included in the method statement provided to surveyors.

Table 2-4: Target Species and Associated Suitable Breeding Habitat

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

Table 2-5: Count Units for each Wading Species

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

All species encountered (seen or heard) were recorded and their abundance, behaviour, sex/age and breeding status noted. Any species occurring more than 100 m from the observer, or flying over the Proposed Development site and not using it, were recorded as ‘additional’ species to further inform the baseline survey. Table 2-6 below, details the survey dates and weather conditions.



If they occurred, observations of breeding behaviour from each visit were annotated onto maps (locations of territories or breeding attempts) in order to produce a final summary map at the end of the survey season using ARCMAP 10.8.2. Breeding wader summary sheets were also compiled at the end of the breeding season, indicating in each case the minimum number of breeding pairs/occupied territories known to occur.

Table 2-6: Breeding Waders Survey Details

Date	Transects	Cloud (Okta)	Precipitation	Visibility	Wind
11/04/21	1&2	4/8	Dry	1km	F2
15/05/21	1&2	8/8	Dry	1km	F2
10/06/21	1&2	8/8	Dry	>5km	F3
27/07/21	1&2	7/8	Dry	3-5km	F2
26/04/22	1&2	1/8	Dry	>5km	F3
09/05/22	1&2	6/8	Dry	>5km	F2
14/06/22	1&2	5/8	Dry	>5km	F1
22/07/22	1&2	6/8	Dry	>5km	F2

2.5 Breeding Bird Transect Surveys

For general breeding birds the method utilised was based on the existing British Trust for Ornithology (BTO) Breeding Bird Survey (BBS or CBS; Bibby et al, 2000). The study area for this survey comprised a total of two no. c. 1 km transects which were selected and centred on different habitats present within the subject site (see Figure 2-2). Birds were counted over two rounds in each summer season (2021 and 2022) timed to coincide with the early breeding season (April to mid-May) and the later part of the breeding season (mid-May to June).

Surveyors recorded all birds seen or heard as they walked methodically along the transect routes. Birds were noted in three distance categories, measured at right angles to the transect line (within 25 m, between 25 m-100 m and over 100 m from the transect line) and those seen in flight only. Recording birds in distance bands gives a measure of bird detectability and allows relative population densities to be estimated if required (BTO, 2023).

The breeding bird transect schedule is available in Table 2-7. Detailed results of the breeding bird transect surveys can be viewed in Table 3-2 below.

Table 2-7: Breeding Bird Transect Survey Details

Date	Transect	Time	Weather Conditions
11/04/2021	1	19:50 – 20:23	Cloud: 4/8 oktas; rain: none; wind: W F2; visibility: 1km
	2	20:42 - 21:18	Cloud: 4/8 oktas; rain: none; wind: W F2; visibility: >5km
10/06/2021	1	08:31 - 09:01	Cloud: 8/8 oktas; rain: none; wind: SW F3; visibility: 3-5km



Date	Transect	Time	Weather Conditions
	2	07:50 – 08:16	Cloud: 8/8 oktas; rain: none; wind: SW F3; visibility: 3-5km
24/04/2022	1	14:16 - 14:44	Cloud: 8/8 oktas; rain: none; wind: NE F3; visibility: >5km
	2	15:55 - 15:46	Cloud: 8/8 oktas; rain: none; wind: NE F3; visibility: >5km
11/06/2022	1	08:00 - 08:29	Cloud: 8/8 oktas; rain: none; wind: SW F4; visibility: >5km
	2	07:18 - 07:44	Cloud: 8/8 oktas; rain: none; wind: SW F4; visibility: >5km

2.6 Winter Bird Transect Surveys

Over the winter seasons 2020/2021 and 2021/2022, general bird transect surveys were carried out at the same two transects as the breeding bird surveys in three rounds per season (one visit to each transect per round).

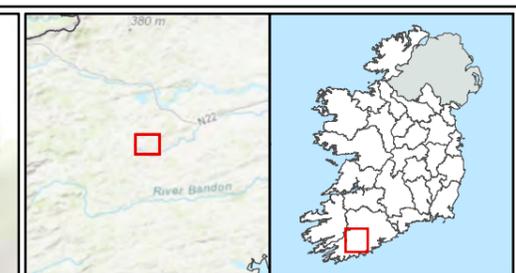
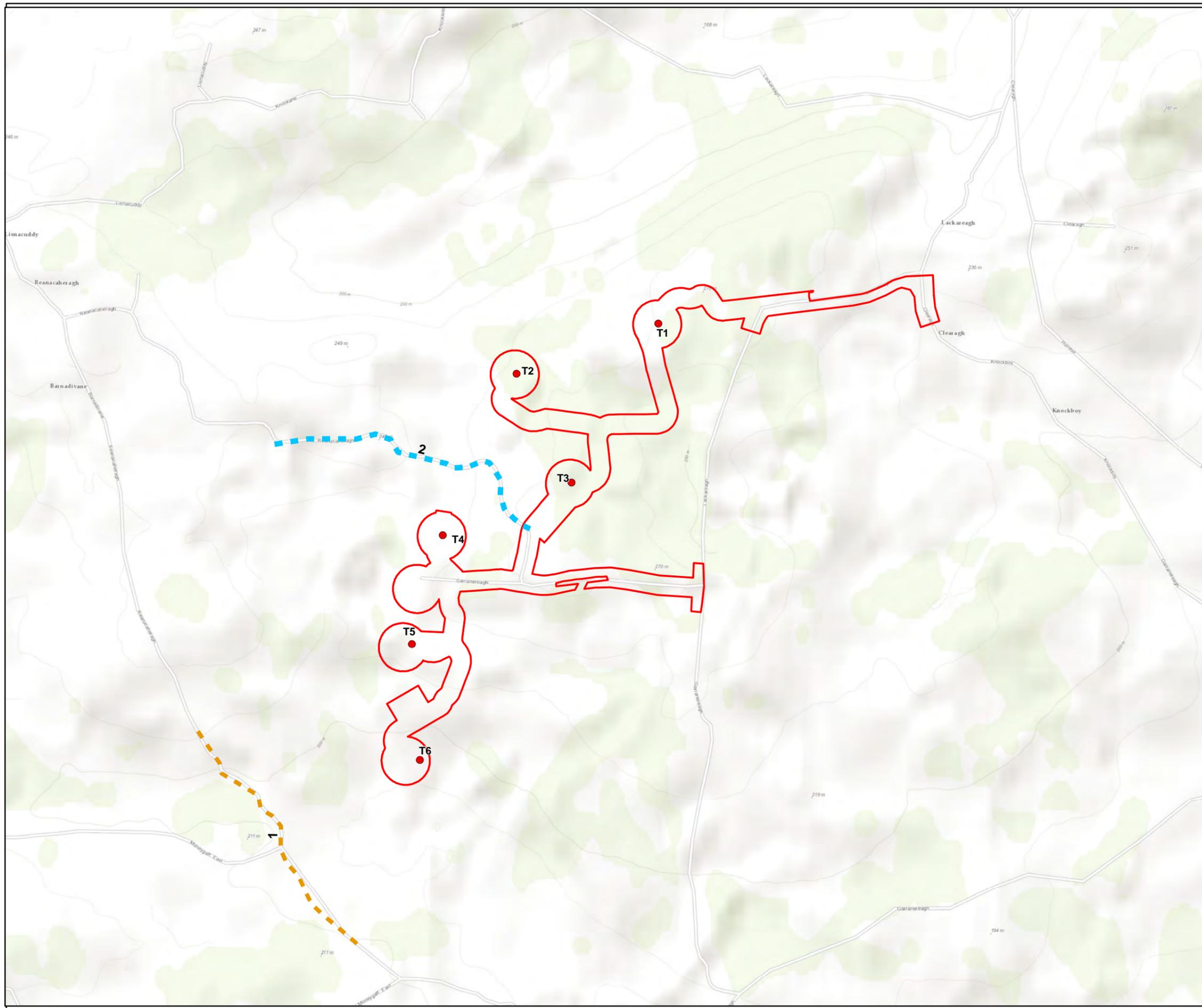
Surveyors recorded all birds seen or heard as they walked methodically along the transect routes. Birds were noted in three distance categories, measured at right angles to the transect line (within 25 m, between 25 m-100 m and over 100 m from the transect line) and those seen in flight only. Recording birds in distance bands gives a measure of bird detectability and allows relative population densities to be estimated if required (BTO, 2023). The winter transect survey details are available in Table 2-8 below. The results are presented in Table 3-3 and Table 3-4.

Table 2-8: Bird transect survey details - Winter Season

Date	Transect	Time	Weather Conditions
01/12/2020	1	11:15 - 12:20	Cloud: 4/8 oktas; rain: none; wind: N F2 visibility: 3-5km
	2	12:55 - 14:07	Cloud: 4/8 oktas; rain: none; wind: N F2; visibility: 3-5km
11/12/20	1	09:07 - 09:45	Cloud: 6/8 oktas; rain: none; wind: NW F1; visibility: 3-5km
21/12/20	2	10:18 - 11:00	Cloud: 8/8 oktas; rain: mist; wind: SW F3; visibility: 2km
04/02/2021	1	12:55 - 14:05	Cloud: 7/8 oktas; rain: none; wind: F2; visibility: 3-5km
	2	11:20 - 12:35	Cloud: 8/8 oktas; rain: none; wind: F3; visibility: 2km
10/11/2021	1	08:38 - 09:10	Cloud: 6/8 oktas; rain: none; wind: NE F2; visibility: >5km
02/11/2021	2	15:30 - 16:05	Cloud: 6/8 oktas; rain: none; wind: NW F4; visibility: >5km



Date	Transect	Time	Weather Conditions
19/01/2022	1	11:54 - 12:17	Cloud: 7/8 oktas; rain: none; wind: NW F4; visibility: >5km
12/01/2022	2	15:55 - 16:42	Cloud: 1/8 oktas; rain: none; wind: NW F1; visibility: >5km
02/03/2022	1	17:58 - 18:32	Cloud: 8/8 oktas; rain: none; wind: S F2-3; visibility: >3-5km
21/03/2022	2	17:24 - 18:08	Cloud: 8/8 oktas; rain: none; wind: SE F1-2; visibility: 3-5km



Legend

- Development Planning Boundary
- Proposed Turbine Layout

Bird Survey Transects

- 1
- 2

TITLE:	Transects - Breeding Birds - Breeding Waders - Winter		
PROJECT:	Barnadivane Wind Farm and Substation, Co. Cork		
FIGURE NO:	2-2		
CLIENT:	Barna Wind Energy Ltd. & Arran Windfarm Ltd.		
SCALE:	1:12500	REVISION:	0
DATE:	23/02/2023	PAGE SIZE:	A3





3. RESULTS

3.1 Avian usage of the Study Area- Vantage Point

Two timed watches of three hours duration (six hours in total per month) were carried out at both VPs every month from October 2020 to September 2022 inclusive. In July 2021 at VP2, half an hour of survey time less was conducted. This survey effort totals 144 hours of observation time at VP1 and 143.5 hours of observation time at VP2 over the survey period (see Appendix 1 for results and survey conditions). Bird activity was recorded from the VPs every month. In total there were 247 flights and two records of perched birds involving 13 target species recorded during the survey period.

A total of 60 bird species were recorded during VP surveys (see Table 3-1: Status of Species Observed during VP surveys Table 3-1). Of these species, three are protected under Annex 1 of the EU Birds Directive: Golden Plover, Hen Harrier and Peregrine. A total of nine are Red-listed under BoCCI No.4 (Gilbert et al., 2021); Golden Plover, Grey Wagtail, Kestrel, Meadow Pipit, Redwing, Snipe, Stock Dove, Swift and Yellowhammer. There were totals of 14 Amber-listed and 37 green listed species.

3.1.1 Winter (October 2020 to March 2021)

During this winter season, there were 43 individual flight lines of seven target species recorded. The number of observed flight lines per species was: Buzzard - 29; Golden Plover - 3; Kestrel - 1; Mallard - 1; Peregrine - 5; Snipe - 1; Sparrowhawk - 3. Buzzard was the most commonly observed target species during the winter season 2020/21 at the Proposed Development site. Golden Plover and Peregrine were the only bird species recorded during this period which are protected under the Annex 1 of the EU Birds Directive. A total of seven Red-listed species were noted during this winter season: Golden Plover, Grey Wagtail, Kestrel, Meadow Pipit, Redwing, Snipe and Yellowhammer. A further five Amber-listed species were recorded: Goldcrest, Greenfinch, Linnets, Mallard and Starling. The remaining 32 species noted throughout the winter 2020/21 season were Green-listed.

3.1.2 Summer (April to September 2021)

During this summer season, there were 68 individual flight lines of eight target species recorded. The number of observed flight lines per species was: Buzzard - 20; Golden Plover - 1; Grey Heron - 1; Herring Gull - 1; Kestrel - 18; Lesser Black-backed Gull - 21; Peregrine - 1; Sparrowhawk - 5. Lesser Black-backed Gull was the most frequently observed species, followed by Buzzard. Golden Plover and Peregrine were again the only Annex 1 species recorded. A total of five Red-listed species were noted during this summer season: Golden Plover, Kestrel, Meadow Pipit, Stock Dove and Swift. A further nine Amber-listed species were recorded: Goldcrest, Greenfinch, Herring Gull, House Martin, Lesser Black-backed Gull, Linnets, Starling, Swallow and Willow Warbler. The remaining 29 species noted throughout the summer 2021 season were Green-listed.

3.1.3 Winter (October 2021 to March 2022)

During this winter season, there were 41 individual flight lines of ten target species recorded. The number of observed flight lines per species was: Buzzard - 16; Golden Plover - 1; Grey Heron - 1; Hen Harrier - 2; Kestrel - 4; Lesser Black-backed Gull - 2; Mallard - 1; Peregrine - 2; Snipe - 6; Sparrowhawk - 6. Buzzard was again the most commonly observed target species during the winter season 2021/22 at the Proposed Development site. Bird species protected under the Annex 1 of the EU Birds Directive recorded during this period were Golden Plover, Hen Harrier and Peregrine. A total of six Red-listed species were noted during this winter season: Golden Plover, Grey Wagtail, Kestrel, Meadow Pipit, Redwing and Snipe. A further nine Amber-listed species were recorded: Goldcrest, Hen Harrier, Lesser Black-backed Gull, Linnets, Mallard, Ringed Plover, Skylark, Starling and Swallow. The remaining 30 species noted throughout the winter 2021/22 season were Green-listed.



3.1.4 Summer (April to September 2022)

During this summer season, there were 99 individual flight lines of eight target species recorded as well as one flightline each for Great Spotted Woodpecker and for Swift. The number of observed flight lines per species was: Buzzard - 28; Great Spotted Woodpecker - 1; Herring Gull - 4; Kestrel - 15; Lesser Black-backed Gull - 42; Mallard - 2; Peregrine - 1; Snipe - 1; Sparrowhawk - 4 and Swift - 1. Lesser Black-backed Gull was again the most frequently observed species during the summer season followed by Buzzard and Kestrel. During this season Peregrine was the only species observed which is protected under the Annex 1 of the EU Birds Directive. A total of four Red-listed species were noted during this summer season: Kestrel, Meadow Pipit, Snipe and Swift. A further 11 Amber-listed species were recorded: Goldcrest, Herring Gull, House Martin, Lesser Black-backed Gull, Linnets, Mallard, Skylark, Starling, Swallow, Wheatear and Willow Warbler. The remaining 30 species noted throughout the summer 2022 season were Green-listed.

3.2 Target Species Observations

3.2.1 Buzzard

3.2.1.1 *Winter 2020/2021*

There were 29 observations (of which 27 were birds in flight) of this Green-listed raptor species throughout the winter VP surveys in 2020/21. The presence of this species was recorded at both VPs, across the months of November 2020, January and March 2021. These were predominantly observations of individuals (14 observations) and of two birds flying together (11 observations), while three observations were of three birds flying together. On the 15th of March 2021, five Buzzards were observed flying together and calling for 152 seconds at heights between 100-150m. The longest observed flights were both recorded on the 7th of March 2021. One was of two birds flying together 779 seconds at heights above 20m, reaching heights of over 150m. The other observation was of two Buzzards flying in the same height range for 899 seconds. Most flight lines (21 flight lines) included time spent at heights greater than 20m. A total of eight flight lines were entirely below heights of 20m. A total of 20 flight lines were within or intersecting the SNH buffer. Two observations were of perched birds.

3.2.1.2 *Winter 2021/2022*

There were 16 observations of Buzzards throughout the winter VP surveys 2021/22. The presence of this species was recorded from both VPs and most records were of individuals (13 observations). Two Buzzards were mobbed by crows within the 30-100m height bands; this was observed for 230 seconds. A further event of mobbing by corvids was observed on the 15th of March 2022. A pair was observed in display and territorial flights for 1,680 seconds at heights between 20-185m. Three Buzzards were seen flying together at heights between 30-100m for 75 seconds on the 12th of March 2022. Hunting behaviour was noted once; this occurred on the 2nd of November 2021. All but one flight line included heights above 30m. One flight line was exclusively at heights up to 10m. A total of 12 flight lines were within or intersecting the SNH buffer.

3.2.1.3 *Summer 2021*

This Green-listed species was noted 20 times during the summer season of 2021. It was observed every month, from both VPs, with the exception of September. Most observations were of individuals (18 observations). Two birds were seen flying together for 360 seconds within the 50-100m height band on the 9th of April 2021. On the 11th of May 2021, two Buzzards were observed flying together for 180 seconds at heights between 30-50m. Of the observed flights, 18 flight lines included heights above 30m. Only two flight lines were exclusively low at heights up to 10m. A total of 19 flight lines were within or intersecting the SNH buffer.



3.2.1.4 *Summer 2022*

Buzzard was noted 27 times during the summer 2022 season. Observations were made from both VPs and across all summer months. Most observations (26 observations) were of individual birds. One observation of two birds flying over together at heights between 50-100m was recorded on the 26th of May 2022. Hunting behaviour was noted on ten occasions. Additionally, a Buzzard was seen carrying prey on the 7th of June 2022. An instance of a Buzzard being mobbed by Corvids was noted on the 22nd of April 2022; the birds involved were flying at heights between 30-50m and were observed for 45 seconds. Of the flight lines observed, 25 included flight time at heights above 30m, and three included flight time at heights between 20-30m. A total of 22 flight lines were within or intersecting the SNH buffer.

3.2.2 Golden Plover

3.2.2.1 *Winter 2020/2021*

During this winter season, Golden Plover was noted three times, with all observations being from VP2. One observation was of a flock of 60 Plovers flying at heights between 0-50m on the 2nd of February 2021. The other two observations were from the 15th of March 2021. One observation was of just one Golden Plover. The second observation on this date was of 100 Golden Plovers flying at heights between 100 -150m. Only one observed flight line was within/intersecting the SNH buffer. A flock of 80 Golden Plovers was additionally recorded landing in a field, descending from heights of 120m; this observation was made on the way to VP2 before the VP watch on the 15th of March 2021.

3.2.2.2 *Winter 2021/2022*

In this season, one observation of Golden Plover was made from VP2 on December 21st, 2021. A total of six Plovers were observed flying at heights between 30-100m. This flight line was within/intersecting the SNH buffer.

3.2.2.3 *Summer 2021*

During the summer of 2021, one observation of Golden Plover was made from VP2. On the 9th of April 2021, a total of 60 Plovers were seen flying at heights between 100-185m for 300 seconds. This flight line was within/intersecting the SNH buffer.

3.2.2.4 *Summer 2022*

There were no observations of this Red-listed Annex 1 species during the summer season of 2022.

3.2.3 Great Spotted Woodpecker

3.2.3.1 *Winter 2020/2021*

There were no observations of this Green-listed Woodpecker species during the winter season of 2020/2021.

3.2.3.2 *Winter 2021/2022*

There were no observations of this Green-listed Woodpecker species during the winter season of 2021/2022.



3.2.3.3 *Summer 2021*

There were no observations of this Red-listed Annex 1 species during the summer season of 2021.

3.2.3.4 *Summer 2022*

During the summer of 2021, one observation of Great Spotted Woodpecker was made. This occurred on the 12th of August 2022, as an individual was seen flying at heights between 20-50m from VP2. This flight line was within/intersecting the SNH buffer.

3.2.4 Grey Heron

3.2.4.1 *Winter 2020/2021*

There was one observation of Green-listed Grey Heron during the winter of 2020/2021. This bird seen from VP1 on the 11th of December 2020 was not observed in flight.

3.2.4.2 *Winter 2021/2022*

On the 15th of December 2021, a single Grey Heron was observed from VP1. The Heron was seen flying at heights below 10m. This flight line was within/intersecting the SNH buffer.

3.2.4.3 *Summer 2021*

There was one observation of Grey Heron on the 2nd of August 2021 from VP1. On this occasion a Heron was seen flying at heights between 10-20m. This flight line was within/intersecting the SNH buffer.

3.2.4.4 *Summer 2022*

There were no observations of Grey Heron during the summer season of 2022.

3.2.5 Hen Harrier

3.2.5.1 *Winter 2020/2021*

There were no Hen Harrier observations recorded during the winter season 2020/21.

3.2.5.2 *Winter 2021/2022*

There were two Hen Harrier observations recorded during the winter season 2021/22, both from VP2. The first observation was on the 2nd of November 2021, when a male Hen Harrier was seen commuting at heights between 20-100m for 360 seconds. The second observation was from the 21st of December 2021, when a ringtail was seen flying at heights between 20-50m for 86 seconds. These flight lines were within/intersecting the SNH buffer.

3.2.5.3 *Summer 2021*

There were no Hen Harrier observations recorded during the summer season 2021.



3.2.5.4 *Summer 2022*

There were no Hen Harrier observations recorded during the summer season 2022.

3.2.6 Herring Gull

3.2.6.1 *Winter 2020/2021*

There were no Herring Gull observations recorded during the winter season 2020/21.

3.2.6.2 *Winter 2021/2022*

There were no Herring Gull observations recorded during the winter season 2021/22.

3.2.6.3 *Summer 2021*

There was one observation of Herring Gull during the summer 2021 season from VP1. On this occasion one Herring Gull was seen flying at heights between 20-30m for 20 seconds. This flight line did not intersect the SNH buffer.

3.2.6.4 *Summer 2022*

There were three observations of Herring Gull over the summer 2022 season. One observation was made on the 27th of April 2022 when one Gull was seen flying at heights between 0-50m. The other two observations were made in June 2022. Both of these observations were of two Gulls flying together; one flight line was between 30-100m, and one was at heights between 20-50m. Only one observed flight line (27th April described above) was within/intersecting the SNH buffer.

3.2.7 Kestrel

3.2.7.1 *Winter 2020/2021*

There was just one observation of Kestrel during the winter season of 2020/21 (2nd of November 2020). This observation was from VP1 and was of an individual flying from a perch at heights up to 10m. This flight line was within/intersecting the SNH buffer.

3.2.7.2 *Winter 2021/2022*

This Red-listed raptor species was observed four times throughout the winter season of 2020/21 and all observations were of individual Kestrels. The first observation was on the 2nd of November 2021 from VP2, when a Kestrel was seen hunting at heights between 20-50m. On the 10th of November 2021 a male Kestrel was seen from VP1, hunting within the 20-50m height bands. Another Kestrel was observed from VP1 on 15th November 2021, flying low over grassland at heights not exceeding 10m. The final observation of the season was on the 12th of March 2022 of a male Kestrel hunting at heights between 20-30m. Only one observed flight was within/intersecting the SNH buffer.



3.2.7.3 *Summer 2021*

Kestrel was observed 18 times throughout the summer 2021 season, with observations made from both VPs. Most observations were of individual Kestrels, with just two observations of two Kestrels flying together. On the 2nd of July 2021 a Kestrel was observed hunting for 120 seconds at heights up to 50m, and was observed catching prey and eating it. Males were identified on three occasions. Hunting behaviour was noted on 13 occasions. The majority of flight lines (17 flight lines) included flight time at heights greater than 30m. Just one flight was restricted to heights below 30m. A total of 16 flight lines were within or intersecting the SNH buffer.

3.2.7.4 *Summer 2022*

This raptor species was observed 15 times throughout the summer of 2022. Observations were made from both VPs. All observations were of individual Kestrels. Males were identified on two occasions and a female was identified on one occasion. Hunting behaviour was observed ten times. On the 8th of June 2022, a Kestrel was seen carrying prey. On the 13th of July 2022, a Kestrel was seen landing on a pole but was not seen leaving. Eight flight lines included time at heights above 30m and just one flight line was entirely below 20m. The longest duration a Kestrel was observed during this season was on the 5th of April 2022 when a Kestrel was observed hunting for 240 seconds. A total of 12 flight lines were within or intersecting the SNH buffer.

3.2.8 Lesser Black-backed Gull

3.2.8.1 *Winter 2020/2021*

There were no Lesser Black-backed Gull observations recorded during the winter season 2020/21.

3.2.8.2 *Winter 2021/2022*

There were two observations of this Amber-listed Gull species in October 2021. On the 8th of October, four Gulls were seen from VP1, flying at heights between 20-50m. On the 17th of October 2021 a flock of 70 Gulls was seen flying at heights between 20-50m. Both flight lines were within or intersecting the SNH buffer.

3.2.8.3 *Summer 2021*

There were 21 observations of Lesser Black-backed Gull throughout all months of the summer 2021 season and from both VPs. On the 9th of April 2021, ten Gulls were seen from VP1 flying at heights between 0-100m. They landed in a field with 63 other Gulls. On the same day a further four Gulls landed in the field, descending from heights of 50m. On the 9th of May 2021 a flock of 27 Gulls were seen from VP1, flying at heights between 30-100m. On the 11th of May 2021, 31 Gulls were seen from VP2 flying at heights between 30-100m. On the 16th of June a flock of 60 Gulls was seen flying at heights of 100-185m for 240 seconds; this observation was made from VP1. All other observations were of individuals and groups up to five Gulls. A total of 17 flight lines were within or intersecting the SNH buffer.



3.2.8.4 *Summer 2022*

This Amber-listed Gull species was recorded 43 times throughout all months of summer of 2022 except for July. A total of 42 flight lines were recorded. For one observation (24th of May 2022), no flight was observed. The largest flock (61 Gulls) was observed for 60 seconds on the 26th of May 2022 from VP1, flying at heights between 50-100m. On the same day a flock of 29 Gulls was seen flying over at heights between 50-100m. The second largest flock of 47 Gulls was observed from VP1 for 40 seconds, flying over the Proposed Development site at heights between 30-50m. Other observations were of individuals, small groups and flocks up to 26 individuals. The majority of flight lines (34 flight lines) included time within the 30-185m height bands. A further six flight lines included observation time within the 20-30m height band. A total of 33 flight lines were within or intersecting the SNH buffer.

3.2.9 Mallard

3.2.9.1 *Winter 2020/2021*

There was one observation of Mallard in this winter season on the 7th of March 2021 from VP1. On this occasion two birds, a male and a female, were seen at heights below 20m. This flight line was within the SNH buffer.

3.2.9.2 *Winter 2021/2022*

There was one sighting of Mallard during this winter season on the 12th of March 2022 from VP1. On this occasion a pair was seen flying at heights between 30-50m. This flight line did not intersect the SNH buffer.

3.2.9.3 *Summer 2021*

There were no observations of Mallard during the summer season 2021.

3.2.9.4 *Summer 2022*

There were two observations of Mallard during this summer season, both recorded from VP1. The first was on the 6th of April 2022, when two Mallards were seen flying below 10m. On the 17th of May 2022, three Mallards were seen flying at heights between 30-100m. One of these flight lines intersected the SNH buffer. The other was outside the buffer.

3.2.10 Peregrine

3.2.10.1 *Winter 2020/2021*

Throughout this winter season, this Green-listed raptor species was observed on five occasions. These flights all were viewed from VP2 and involved individual Peregrines. Four observations were from the 14th of January 2021. Two of these were Peregrines flying below 20m, and two were Peregrines flying at heights between 20-50m. The fifth observation was made on the 15th of March 2021 and was of a Peregrine flying at heights between 20-50m. All these flight lines were within/intersecting the SNH buffer.



3.2.10.2 *Winter 2021/2022*

Throughout this winter season, this raptor species was observed on two occasions. These flights were all viewed from VP2 and involved individual Peregrines. The first observation was from the 19th of January 2022, involving a Peregrine flying at heights between 50-185m. The second observation was from the 16th of February 2022, when a male Peregrine was recorded flying at heights between 20-100m. Both flight lines were within/intersecting the SNH buffer.

3.2.10.3 *Summer 2021*

During the summer season of 2021, there was one observation of Green-listed Peregrine made from VP2 on the 1st of August 2021. A juvenile was seen flying at heights between 20-30m. This flight line was within/intersecting the SNH buffer.

3.2.10.4 *Summer 2022*

During the summer season of 2022, one observation of Peregrine was recorded. This observation was made from VP2 on the 8th of June 2022 and involved a female flying at heights between 10-20m. This flight line was within/intersecting the SNH buffer.

3.2.11 Snipe

3.2.11.1 *Winter 2020/2021*

This Red-listed wader species was observed once from VP1 on the 9th of November 2020. On this occasion eight Snipe were seen flying below 10m. This flight line did not intersect the SNH buffer.

3.2.11.2 *Winter 2021/2022*

Throughout this winter season, Snipe was observed on six occasions. On the 8th of October 2021 a flock of 23 Snipe were seen from VP1, flying at heights between 30-100m. On the 12th of March 2022 three Snipe were observed from VP1, flying at heights between 0-100m. The remaining four observations were of individual Snipe: one flying below 10m, one flying at heights between 20-30m, one flying at heights between 0-100m, and one flying at heights between 0-185m. A total of four flight lines were within/intersecting the SNH buffer.

3.2.11.3 *Summer 2021*

There were no observations of Snipe during the summer season 2021.

3.2.11.4 *Summer 2022*

During the summer season 2022, there was one observation of Snipe recorded from VP2 on the 25th of September 2022. One Snipe was seen flying over at heights between 30-100m. This flight line did not intersect the SNH buffer.



3.2.12 Sparrowhawk

3.2.12.1 *Winter 2020/2021*

Sparrowhawk was observed three times during the winter season 2020/21, with all observations being from VP2 and of individual birds. On the 21st of December 2020 a Sparrowhawk was seen flying below 10m, mobbing a female Peregrine. On the 14th of January 2021, Sparrowhawk was observed twice, flying below 10m on both occasions. A total of two flight lines were within/intersecting the SNH buffer.

3.2.12.2 *Winter 2021/2022*

Sparrowhawk was observed on six occasions throughout the winter season 2020/21 from both VPs. All observations were of individual birds. Of these observations, four were of birds flying below 10m. One flight was at heights between 20-30m. On the 19th of January, a Sparrowhawk was observed in flight for 300 seconds at heights between 50-185m. Three of the observations were of Sparrowhawks hunting. A total of five flight lines were within/intersecting the SNH buffer.

3.2.12.3 *Summer 2021*

This Green-listed species was observed five times throughout the summer of 2021 from both VPs. These observations were all of individual birds. On the 16th of June 2021, a female was seen flying with prey at heights between 10-20m. On the 2nd of July 2021, a Sparrowhawk was seen flying with prey at heights between 30-50m. On the 1st of August, a Sparrowhawk was seen interacting with a Peregrine at heights between 20-30m. Two flights were recorded in April 2021 and on both occasions flight paths included heights between 50-100m. All these flight lines were within/intersecting the SNH buffer.

3.2.12.4 *Summer 2022*

This Green-listed species was observed four times throughout the summer of 2022, from VP1 only. On the 17th of May 2022, two Sparrowhawks were seen flying over together at heights up to 50m. On the 13th of July 2022 a male was seen hunting at heights between 0-10m. On the 18th of August 2022, a female was observed being mobbed by Swallows at heights between 30-185m. On the 28th of September 2022, a Sparrowhawk was flying over at heights between 50-185m. A total of three flight lines were within/intersecting the SNH buffer.

3.2.13 Swift

3.2.13.1 *Winter 2020/2021*

There were no observations of Swift during the winter season 2020/21.

3.2.13.2 *Winter 2021/2022*

There were no observations of Swift during the winter season 2021/22.

3.2.13.3 *Summer 2021*

This species was noted as being present on the 17th of June 2021. No flight data was recorded on this occasion.



3.2.13.4 Summer 2022

During this summer season, there was one observation of this Red-listed species from VP2. On the 23rd of May 2022, four Swifts were seen flying at heights between 20-100m for 110 seconds. This flight line was within/intersecting the SNH buffer.

Table 3-1: Status of Species Observed during VP surveys

Common Name	Scientific Name	*BoCCI Status	**Annex 1 Status
Blackbird	<i>Turdus merula</i>	Green	No
Blackcap	<i>Sylvia atricapilla</i>	Green	No
Blue Tit	<i>Cyanistes caeruleus</i>	Green	No
Bullfinch	<i>Pyrrhula pyrrhula</i>	Green	No
Buzzard	<i>Buteo buteo</i>	Green	No
Chaffinch	<i>Fringilla coelebs</i>	Green	No
Chiffchaff	<i>Phylloscopus collybita</i>	Green	No
Crossbill	<i>Loxia curvirostra</i>	Green	No
Coal Tit	<i>Periparus ater</i>	Green	No
Dunnock	<i>Prunella modularis</i>	Green	No
Feral Pigeon	<i>Columba livia</i>	Green	No
Fieldfare	<i>Turdus pilaris</i>	Green	No
Goldcrest	<i>Regulus regulus</i>	Amber	No
Golden Plover	<i>Pluvialis apricaria</i>	Red	Yes
Goldfinch	<i>Carduelis carduelis</i>	Green	No
Great Spotted Woodpecker	<i>Dendrocopos major</i>	Green	No
Great Tit	<i>Parus major</i>	Green	No
Greenfinch	<i>Chloris chloris</i>	Amber	No
Grey Heron	<i>Columba livia</i>	Green	No
Grey Wagtail	<i>Motacilla cinerea</i>	Red	No
Hen Harrier	<i>Circus cyaneus</i>	Amber	Yes
Herring Gull	<i>Larus argentatus</i>	Amber	No
Hooded Crow	<i>Corvus cornix</i>	Green	No



Common Name	Scientific Name	*BoCCI Status	**Annex 1 Status
House Martin	<i>Delichon urbicum</i>	Amber	No
Jackdaw	<i>Coloeus monedula</i>	Green	No
Jay	<i>Garrulus glandarius</i>	Green	No
Kestrel	<i>Falco tinnunculus</i>	Red	No
Lesser Black-backed Gull	<i>Larus fuscus</i>	Amber	No
Lesser Redpoll	<i>Carduelis cabaret</i>	Green	No
Linnet	<i>Linaria cannabina</i>	Amber	No
Long-tailed Tit	<i>Aegithalus caudatus</i>	Green	No
Magpie	<i>Pica pica</i>	Green	No
Mallard	<i>Anas platyrhynchos</i>	Amber	No
Meadow Pipit	<i>Anthus pratensis</i>	Red	No
Mistle Thrush	<i>Turdus viscivorus</i>	Green	No
Peregrine	<i>Falco peregrinus</i>	Green	Yes
Pheasant	<i>Phasianus colchicus</i>	Green	No
Pied Wagtail	<i>Motacilla alba</i>	Green	No
Raven	<i>Corvus corax</i>	Green	No
Redwing	<i>Turdus iliacus</i>	Red	No
Reed Bunting	<i>Emberiza schoeniclus</i>	Green	No
Ringed Plover	<i>Charadrius hiaticula</i>	Amber	No
Robin	<i>Erithacus rubecula</i>	Green	No
Rook	<i>Corvus frugilegus</i>	Green	No
Siskin	<i>Carduelis spinus</i>	Green	No
Skylark	<i>Alauda arvensis</i>	Amber	No
Snipe	<i>Gallinago gallinago</i>	Red	No
Song thrush	<i>Turdus philomelos</i>	Green	No
Sparrowhawk	<i>Accipiter nisus</i>	Green	No
Starling	<i>Sturnus vulgaris</i>	Amber	No



Common Name	Scientific Name	*BoCCI Status	**Annex 1 Status
Stock Dove	<i>Columba oenas</i>	Red	No
Stonechat	<i>Saxicola torquatus</i>	Green	No
Swallow	<i>Hirundo rustica</i>	Amber	No
Swift	<i>Apus apus</i>	Red	No
Treecreeper	<i>Certhia familiaris</i>	Green	No
Wheatear	<i>Oenanthe oenanthe</i>	Amber	No
Willow Warbler	<i>Phylloscopus trochilus</i>	Amber	No
Woodpigeon	<i>Columba palumbus</i>	Green	No
Wren	<i>Troglodytes troglodytes</i>	Green	No
Yellowhammer	<i>Emberiza citrinella</i>	Red	No

* refers to the conservation status of the species according to Birds of Conservation Concern in Ireland

**refers to species listed on Annex 1 of the EU Birds Directive

3.3 Breeding Wader Surveys

A total of two wader records resulted from the eight wader surveys carried out at the Proposed Development site across the breeding seasons of 2021 and 2022. These records were both from the 11th of April 2021. At 20:20 from TR1 one Snipe was heard calling while flying over farmland; it was not seen. At 20:50 from TR2 another Snipe was heard calling while flying over heath bog; it was not seen. These records are not indicative of breeding Snipe (observations of chipping or drumming birds are required to confirm breeding). As such, no confirmed breeding wader activity or occupied territories were recorded at the Proposed Development site.

3.4 Breeding Bird Transects

A total of 34 species were recorded along both transects across the breeding seasons of 2021 and 2022. Among these were three Red-listed species: Meadow Pipit, Grey Wagtail and Kestrel. A single Grey Wagtail was noted in April 2022 within 25m of TR1. Meadow Pipit was noted across the early and late breeding seasons in both 2021 and 2022 and across both transects.

There were six Amber-listed species recorded during the breeding bird transect surveys: Goldcrest, Lesser Black-backed Gull, Linnets, Starling, Swallow and Willow Warbler. The remaining 25 species recorded during the summer seasons were Green-listed.

Target species recorded during breeding bird surveys were Kestrel, Buzzard and Lesser Black-backed Gull. There was one record of a Kestrel flyover from the 11th of April 2021. Buzzard also had a recorded flyover on the 24th of April 2022. Lesser Black-backed Gull flyovers were noted on two separate dates, the 24th of April and the 11th of June 2022, on both dates they were seen from both transects. On the 24th of April a large flock of 150 Lesser Black-backed Gulls was seen flying over from Transect 1.

For detailed results of the breeding bird transect surveys, see Table 3-2 below.



Table 3-2: Breeding Bird Transect Results

Common Name	Scientific Name	T1			T2			T1			T2								
		April 2021			June 2021			April 2021			June 2021								
		0-25m	25-100m	100+/FO	0-25m	25-100m	100+/FO	0-25m	25-100m	100+/FO	0-25m	25-100m	100+/FO						
Blackbird	<i>Turdus merula</i>	0	4	0	1	2	0	1	1	2	0	2	0	0	0	1	0	0	1
Blackcap	<i>Sylvia atricapilla</i>	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Blue Tit	<i>Cyanistes caeruleus</i>	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Buzzard	<i>Buteo buteo</i>	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Chaffinch	<i>Fringilla coelebs</i>	2	0	0	2	1	0	0	0	2	0	1	1	0	0	1	0	1	0
Coal Tit	<i>Parus ater</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Duncock	<i>Prunella modularis</i>	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0
Goldcrest	<i>Regulus regulus</i>	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Goldfinch	<i>Carduelis carduelis</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	1	0	0
Great Tit	<i>Parus major</i>	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0
Grey Wagtail	<i>Motacilla cinerea</i>	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Hooded Crow	<i>Corvus cornix</i>	1	0	0	0	0	2	0	1	2	0	0	0	0	0	6	0	2	0
Jackdaw	<i>Corvus monedula</i>	0	0	3	0	0	2	0	4	0	6	12	0	0	0	0	0	3	0
Kestrel	<i>Falco tinnunculus</i>	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lesser Black-backed Gull	<i>Larus fuscus</i>	0	0	0	0	0	0	0	0	0	0	0	1	0	150	0	0	1	4
Lesser Redpoll	<i>Carduelis cabaret</i>	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Linnet	<i>Linaria cannabina</i>	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0



3.5 Winter Bird Transect Survey

A total of 30 species were recorded along the two transects across the winter seasons of 2020/21 and 2021/22. The Red-listed species, Meadow Pipit was noted in each round throughout both winter seasons. Red-listed Redwing was noted throughout both winter seasons. It was recorded each round during the winter of 2020/21, while it was only noted three times across the first two rounds of the winter season of 2021/22. Red-listed Grey Wagtail was only noted once, on the 12th of January 2022.

A total of four Amber-listed species were observed: Goldcrest, Greenfinch, House Sparrow and Starling. The remaining 23 species were Green-listed.

The only record of a target species across both winter seasons was a Buzzard flyover on the 2nd of November 2021.

Detailed results of the winter bird surveys are shown in Table 3-3 and Table 3-4.



Table 3-3: Winter Bird Transect Results 2020/2021

Common Name	Scientific Name	T1						T2									
		December 1		December 2		February		December 1		December 2		February					
		0-25m	25-100m	100+/FO	0-25m	25-100m	100+/FO	0-25m	25-100m	100+/FO	0-25m	25-100m	100+/FO				
Blackbird	<i>Turdus merula</i>	3	0	0	2	1	0	0	1	0	0	1	0	0	5	4	1
Blue Tit	<i>Cyanistes caeruleus</i>	0	0	0	2	0	0	0	1	0	0	0	0	0	4	0	1
Chaffinch	<i>Fringilla coelebs</i>	2	0	0	1	0	0	8	3	1	2	0	0	5	10	0	2
Coal Tit	<i>Periparus ater</i>	1	0	0	0	0	0	3	0	0	2	0	0	0	1	0	0
Duncock	<i>Prunella modularis</i>	1	0	0	1	0	0	1	3	0	0	0	0	0	2	3	0
Fieldfare	<i>Turdus pilaris</i>	10	0	70	0	2	0	12	0	3	1	2	0	0	202	0	2
Goldcrest	<i>Regulus regulus</i>	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0
Greenfinch	<i>Carduelis chloris</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
Great Tit	<i>Parus major</i>	2	0	0	0	0	0	0	0	0	0	1	0	0	9	2	0
Hooded Crow	<i>Corvus cornix</i>	0	0	0	0	0	3	2	2	7	1	1	0	2	1	1	4
House Sparrow	<i>Passer domesticus</i>	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Jackdaw	<i>Corvus monedula</i>	0	0	4	0	0	4	10	0	5	8	0	10	46	0	8	17
Magpie	<i>Pica pica</i>	0	0	0	0	3	0	0	2	1	1	0	0	0	0	1	0
Meadow Pipit	<i>Anthus pratensis</i>	0	0	0	0	2	0	0	0	1	1	5	1	1	0	0	13
Pheasant	<i>Phasianus colchicus</i>	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Pied Wagtail	<i>Motacilla alba</i>	2	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0
Robin	<i>Erithacus rubecula</i>	2	0	0	1	1	0	5	4	1	3	0	0	1	0	11	0
Redwing	<i>Turdus iliacus</i>	1	0	0	1	32	0	22	13	30	3	0	0	0	0	0	0
Raven	<i>Corvus corax</i>	0	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0
Rook	<i>Corvus frugilegus</i>	2	0	22	3	2	16	0	2	4	2	3	8	64	0	48	8
Stonechat	<i>Saxicola rubicola</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Starling	<i>Sturnus vulgaris</i>	15	0	0	6	3	0	10	27	16	0	0	0	15	1	17	204
Song Thrush	<i>Turdus philomelos</i>	1	0	0	0	0	1	2	0	2	0	0	0	0	1	4	5
Woodpigeon	<i>Columba palumbus</i>	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	2



Common Name	Scientific Name	T1						T2													
		December 1		December 2		February		December 1		December 2		February									
		0-25m	25-100m	100+FO	0-25m	25-100m	100+FO	0-25m	25-100m	100+FO	0-25m	25-100m	100+FO								
Wren	<i>Troglodytes troglodytes</i>	0	0	0	1	0	0	4	4	0	0	3	0	0	0	3	1	0	5	3	1

Table 3-4: Winter Bird Transect Results 2021/2022

Common Name	Scientific Name	T1						T2																
		November		January		March		November		January		March												
		0-25m	25-100m	100+FO	0-25m	25-100m	100+FO	0-25m	25-100m	100+FO	0-25m	25-100m	100+FO											
Blackbird	<i>Turdus merula</i>	1	2	1	1	3	0	0	0	0	0	2	1	5	0	0	0	0	0	0	0	0		
Bullfinch	<i>Pyrrhula pyrrhula</i>	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Blue Tit	<i>Cyanistes caeruleus</i>	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Buzzard	<i>Buteo buteo</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Chaffinch	<i>Fringilla coelebs</i>	9	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
Coal Tit	<i>Parus ater</i>	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Duncock	<i>Prunella modularis</i>	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fieldfare	<i>Turdus pilaris</i>	0	0	0	60	0	1	0	0	0	0	0	40	0	0	2	0	0	0	0	0	0	0	0
Goldcrest	<i>Regulus regulus</i>	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grey Wagtail	<i>Motacilla cinerea</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Great Tit	<i>Parus major</i>	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hooded Crow	<i>Corvus cornix</i>	1	0	1	3	0	1	0	0	5	1	3	1	0	0	1	1	0	0	0	1	1	1	1
Jackdaw	<i>Corvus monedula</i>	0	0	0	1	0	3	0	2	0	3	0	0	0	2	21	0	2	0	0	0	0	0	2
Magpie	<i>Pica pica</i>	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Meadow Pipit	<i>Anthus pratensis</i>	0	0	0	23	0	0	2	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0



Common Name	Scientific Name	T1						T2									
		November		January		March		November		January		March					
		0-25m	25-100m	100+/FO	0-25m	25-100m	100+/FO	0-25m	25-100m	100+/FO	0-25m	25-100m	100+/FO	0-25m	25-100m	100+/FO	
Mistle Thrush	<i>Turdus viscivorus</i>	2	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0
Pied Wagtail	<i>Motacilla alba</i>	0	0	0	1	0	0	0	0	0	0	0	0	3	0	0	1
Robin	<i>Erithacus rubecula</i>	1	2	0	1	0	1	4	0	0	0	0	0	1	1	0	4
Redwing	<i>Turdus iliacus</i>	3	1	0	33	0	0	0	0	0	0	0	0	0	0	0	0
Raven	<i>Corvus corax</i>	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Rook	<i>Corvus frugilegus</i>	0	2	0	0	0	2	0	1	1	1	1	0	0	0	6	0
Stonechat	<i>Saxicola rubicola</i>	2	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0
Starling	<i>Sturnus vulgaris</i>	0	0	0	30	0	10	0	40	0	0	0	0	0	0	0	14
Siskin	<i>Carduelis spinus</i>	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Song Thrush	<i>Turdus philomelos</i>	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
Woodpigeon	<i>Columba palumbus</i>	0	0	8	0	0	1	0	2	0	19	0	0	0	0	0	0
Wren	<i>Troglodytes troglodytes</i>	1	0	0	1	0	0	1	0	0	0	0	0	2	0	0	3



3.6 Hinterland Survey

Hinterland surveys to establish breeding and wintering occupancy within a 10km radius of the Proposed Development site were carried out each month over the four surveyed seasons across 11 HVPs. See Table 2-3 for exact survey dates of each Hinterland site. A total of 101 species were identified during hinterland surveys. Throughout Hinterland surveys, there were nine species recorded which are protected under Annex 1 of the EU Birds Directive. These are: Barnacle Goose, Golden Plover, Hen Harrier, Kingfisher, Little Egret, Peregrine, Ruff, White-fronted Goose (Greenland) and Whooper Swan. A total of 16 species are Red-listed: Black-tailed Godwit, Curlew, Dunlin, Golden Plover, Goldeneye, Grey Wagtail, Kestrel, Lapwing, Meadow Pipit, Redwing, Shoveler, Snipe, Stock Dove, Swift, Woodcock and Yellowhammer. A further 35 species are Amber-listed, and the remaining 50 species are Green-listed. For a full list and conservation status of each species, see Table 3-5.

During the winter 2020/2021 season a total of 38 species were identified. Of these, six were Annex 1 species: Barnacle Goose, Golden Plover, Kingfisher, Little Egret, White-fronted Goose (Greenland) and Whooper Swan. A total of ten Red-listed species were noted: Black-tailed Godwit, Curlew, Dunlin, Golden Plover, Goldeneye, Grey Wagtail, Lapwing, Shoveler, Snipe, Woodcock. Additionally, 17 Amber-listed species were noted as well as 11 Green-listed species.

Throughout the winter 2021/2022 season a total of 70 species were noted. Of these seven were Annex 1 species: Barnacle Goose, Golden Plover, Kingfisher, Little Egret, Peregrine, Ruff, Whooper Swan. Ten Red-listed species were recorded: Black-tailed Godwit, Curlew, Dunlin, Golden Plover, Grey Wagtail, Kestrel, Lapwing, Meadow Pipit, Redwing and Snipe. Additionally, 22 Amber-listed and 38 Green-listed species were identified.

During the 2021 summer season, 69 species were noted. Of these, five were Annex 1 species: Golden Plover, Hen Harrier, Peregrine, Ruff and Whooper Swan. A total of nine Red-listed species were identified: Curlew, Golden Plover, Grey Wagtail, Kestrel, Lapwing, Meadow Pipit, Snipe, Stock Dove and Swift. Additionally, 24 Amber-listed and 36 Green-listed species were noted.

During Hinterland surveys in the summer 2022 season, a total of 74 species were identified. Of these, three were Annex 1 species: Kingfisher, Little Egret and Whooper Swan. A total of eight Red-listed species: Curlew, Grey Wagtail, Kestrel, Lapwing, Meadow Pipit, Snipe, Stock Dove and Yellowhammer. Additionally, 26 Amber-listed and 40 Green-listed species were noted.

Species of conservation concern that were recorded are discussed in more detail in this section. Species have been selected for detailed discussion on the basis of conservation status, vulnerability to wind farm developments and species being recorded on or near the Proposed Development site, which will indicate potential links between species recorded at the Proposed Development site and the surrounding environment. Distances of Hinterland sites from the Proposed Development site can be viewed in Table 2-3.

3.6.1 Buzzard

There were two records of this Green-listed raptor species during the winter 2020/21 hinterland surveys; both observations were from Toon flats. Three observations of Buzzard were made during the winter 2021/22 season. One of these observations was from The Gearagh, while another two were made within 2km of the Proposed Development site boundary.

This species was recorded on six occasions during the summer 2021 season. Two of these observations were from Desert Bridge, one was from Warren's Court, one was from The Gearagh, one was within a 2km radius of the Proposed Development site boundary, and the last was within a 10km radius of the site. During the summer season of 2022, Buzzard was seen on four occasions: twice at the River Bandon SAC, once within the 2km site boundary radius and once within the 5km site boundary radius. On most occasions one Buzzard was noted. On two occasions, two individuals were seen together.



3.6.2 Golden Plover

This Red-listed and Annex 1 wader species was recorded on five occasions throughout the winter 2020/21 season during hinterland surveys. Of these, two sightings were at The Gearagh, where 40 Plovers were seen on the 23d of November 2020 and just two were seen on January 20th, 2021. Two further observations were at Inishcarra Reservoir, where one Golden Plover was seen on the 20th of 2021 and 30 birds were noted on the 3rd of March 2021. The largest flock of this season, 58 birds, was seen at Sullane Delta on the 20th of January 2021.

Golden Plover was recorded twice during the winter 2021/22 season. The first occasion was on the 15th of November at The Gearagh, where 1300 birds were observed. On the 4th of March 2022 a smaller flock of 300 Plovers was noted at the same hinterland site.

During the Summer 2021 season, there was one observation of Golden Plover at Warren's Court on the 16th of April 2021, where 311 birds were seen. In the summer 2022 season, there were no sightings of Golden Plover.

3.6.3 Grey Heron

This Green-listed species was commonly observed at most hinterland sites and throughout all survey seasons. It was most commonly seen at The Gearagh, where it was noted on 19 occasions throughout all survey seasons, this is also the site where the highest numbers of this species were most consistently seen, where on six occasions numbers between four to nine Herons were counted. Inishcarra Reservoir, where five observations were recorded, also had a count of nine Herons on one occasion in the winter 2020/21 season. Sullane Delta had 14 records of Grey Heron across the winter 2020/21 and 2021/22 seasons as well as the summer 2022 season.

Other sites with Heron sightings were Desert Bridge with eight observations across winter 2020/21, summer 2021 and summer 2022; River Bandon SAC with seven observations across winter 2021/22 and summer 2022; Murragh Lake with six records across all survey seasons; Warren's Court with six records across winter 2020/21, winter 2021/22 and summer 2022. Castlemoor and Toon Flats had one record each, both in the 2020/21 winter season.

3.6.4 Hen Harrier

This Annex 1 raptor species was recorded once during Hinterland surveys. A male was seen flying over a field from Warren's Court on the 16th of April 2021.

3.6.5 Herring Gull

There were two observations of this Amber-listed Gull species during Hinterland surveys. Both observations were recorded at The Gearagh in the Summer of 2021. These sightings were from the 12th of May 2021 and the 14th of July 2021 and on both occasions single Gulls were noted.

3.6.6 Kestrel

This Red-listed raptor species was recorded on six occasions throughout Hinterland surveys. Two of these observations were at Desert Bridge, the first was on the 14th of July 2021 when one Kestrel was seen, the second on the 20th of September 2021 when two Kestrels were seen. One record was from The Gearagh, where a Kestrel was seen on the 20th of September 2021. The other three sightings were from within a 2km radius around the Proposed Development site, with the first on the 3rd of August 2021, the second on the 12th of February 2022 and the last on the 1st of June 2022, when a Kestrel was seen with prey.



3.6.7 Lesser Black-backed Gull

This Amber-listed Gull species was frequently observed across all survey seasons. It was most often recorded at The Gearagh, with 13 observations across winter 2021/22, summer 2021 and summer 2022. This is also the site with the largest flock numbers. On the 12th of September 2022 a flock of 254 Lesser Black-backed Gulls was recorded at The Gearagh. Flocks ranging from 36 - 54 birds were seen at The Gearagh on three occasions. At the River Bandon SAC there were four sightings of this Gull species across the winter 2021/22 and summer 2022 seasons. On three occasions, flocks of between 19-30 individuals were observed.

There were four sightings of this species at Sullane Delta, all from the summer 2022 season. On three occasions less than five birds were seen there, while on the 1st of June 2022, a total of 13 Gulls were observed. At Desert Bridge there were three sightings across the winter 2020/21 and 2021/22 seasons, where two observations both recorded 14 Gulls. At Warren's Court there were two sightings of Lesser Black-backed Gull; both in the summer of 2021. On the first occasion in April, 28 Gulls were seen, while on the second occasion in September 12 Gulls were noted. There was just one record of an individual gull, observed at Castlemoor on the 20th of September 2021. Five further sightings of this species were noted within a 2km site radius across the summer of 2021 and winter of 2021/22.

3.6.8 Mallard

This Amber-listed duck was frequently observed across all survey seasons and all Hinterland sites with the exception of Kilmicheal/ Mid Cork Quarries. The five highest counts of Mallard (ranging between 51 and 254 ducks) all occurred at The Gearagh, where this bird species was noted on 20 separate occasions across all four survey seasons. Sullane Delta also had high counts of 48 and 37 individuals on two occasions and Mallard was observed at this site on 13 separate occasions throughout both winter seasons and the summer 2022 season. Desert Bridge had observations of Mallard on 13 separate occasions, with a high count of 31 individuals, this bird species was noted here across all survey seasons.

Mallard was observed at Warren's Court on 14 occasions and at Murragh Lake on 12 occasions across all survey seasons. At River Bandon SAC, Mallard was noted on nine occasions across the winter 2021/22 and summer 2022 seasons. At Inishcarra reservoir, it was noted on six separate occasions throughout the winter 2020/21 season. At Castlemoor it was noted five times across both winter seasons. It was noted once at Toon flats in the 2020/21 winter season and once at Castlelack Lake in the winter 2021/22 season. Additionally, there were two records of Mallard within the 2km site radius and one within the 5km site radius.

3.6.9 Peregrine

A total of five observations of this Annex 1 raptor species were recorded throughout the survey period and all records were of individual Peregrines. On the 3rd of August 2021, a male was seen perching on a cliff at Kilmicheal/Mid Cork Quarries. There were two sightings of this species at The Gearagh in winter 2021/22 - one on the 12th of February 2022 and the other on the 26th of January 2022. One observation was made at the River Bandon SAC on the 26th of January 2022. On the 4th of August 2022, Peregrine was noted within the 5km site radius.

3.6.10 Snipe

This Red-listed wader species was noted on nine occasions across all survey seasons. Of these, five observations were at The Gearagh: On the 20th of September 2021, four Snipe were seen there; on the 16th of October 2021 four Snipe were again observed; on November 15th, 2021, a total of 13 Snipe were counted, and on the 26th of January 2022 only one individual was detected. On the 12th of September 2022 a high count of 30 Snipe was recorded at The Gearagh.



Snipe was detected at Sullane Delta on two occasions: four birds were seen there on the 15th of November 2021 and one Snipe was seen on the 12th of September 2022. A total of three birds were seen at Inishcarra Reservoir on the 20th of January 2021 and one Snipe was seen at Castlemoor on the 26th of January 2022.

3.6.11 Sparrowhawk

This Green-listed raptor species was noted on six occasions across both summer seasons and the winter 2021/22 season. A female was observed at Kilmichael/Mid Cork Quarries on the 3rd of August 2021. There was a sighting of Sparrowhawk at The Gearagh on the 20th of September 2021 and a sighting at Castlemoor on the 15th of November 2021.

Three sightings were made within the 2km site radius. On the 3rd of August 2021, two Sparrowhawks were seen flying together. Two further sightings of individuals occurred on the 31st of December 2021 and on the 4th of August 2022.

3.6.12 Swift

This Red-listed hirundine was noted twice at hinterland sites in the summer 2021 season. One observation was of four birds was at The Gearagh on the 12th of May 2021. The other observation, involving four birds was at Warren's Court on the 10th of June 2021.

3.6.13 Annex 1 species

In addition to the species already discussed (Golden Plover, Hen Harrier and Peregrine), there were six additional Annex 1 species recorded during Hinterland surveys. These were Barnacle Goose, Greater White-fronted Goose (Greenland), Kingfisher, Little Egret, Ruff and Whooper Swan. None of these species were recorded at the Proposed Development site during VP surveys.

Barnacle Goose was observed five times across both winter seasons. It was observed at Toon Flats, Inishcarra Reservoir and Sullane Delta. On each occasion between one and three geese were observed.

Greater White-fronted Goose was noted four times across the winter 2020/21 season, three times at Toon Flats and once at Inishcarra Reservoir.

Kingfisher was noted on ten occasions across both winter seasons and the summer 2022 season. On each occasion either one or two birds were seen. Four of the sightings were at Desert Bridge, three were at The Gearagh, and one sighting each occurred at Inishcarra Reservoir, Warren's Court and Sullane Delta.

Little Egret was frequently observed across both winter seasons, while just one observation made in April 2022, at Sullane Delta. This small Heron species was most frequently observed at The Gearagh where ten observations were made, and a high count of 18 birds was recorded. Four observations of Little Egret were made at Toon Flats, where a high count of 18 birds was recorded. Three observations each were from Inishcarra Reservoir, Desert Bridge River Bandon SAC and Sullane Delta.

Ruff was observed twice at The Gearagh, three birds were seen on the 20th of September 2021, and two Ruff were noted on the 16th of October 2021.



Whooper Swan was frequently noted across both winter seasons, with two additional observations in the summer 2021 season and one observation in the summer 2022 season. At The Gearagh there were eight observations of this swan species with a high count of 59 Whooper Swan on the 31st of December 2021. Other observations here were of six swans or less. Flocks of Whooper Swan were observed on six occasions at Toon Flats, with flock sizes between 22 and 75 swans. At River Bandon SAC, five separate observations of Whooper Swan were made with flock sizes between 17 to 48 swans. A total of five observations were made at Desert Bridge with counts ranging from 4 - 42 birds. A further two observations of one Whooper Swan each were made at Murragh Lake and one observation of three swans at Inishcarra Reservoir.

3.6.14 Red-listed target species

In addition to the species already discussed above, seven further Red-listed target species were recorded during hinterland surveys. These were Black-tailed Godwit, Curlew, Dunlin, Goldeneye, Lapwing, Shoveler and Woodcock. None of these species were recorded at the Proposed Development site during VP or Transect surveys.

Black-tailed Godwit was noted twice, once at Inishcarra Reservoir on the 20th of January 2021 where two birds were seen, and once at The Gearagh on the 15th of November 2021 where 12 birds were seen.

Curlew was frequently seen throughout both winter seasons, with additional summer season records at The Gearagh on the 20th of September 2021 and the 12th of September 2022. There was also a record of Curlew at Sullane Delta on the 12th of September 2022. This wader species was most frequently seen at The Gearagh, with 12 separate observations and a high count of 149 Curlew. At Sullane Delta, six observations of Curlew were recorded, with a high count of 129 birds. A total of two records were from Inishcarra Reservoir with a high count of 120 Curlew. Two further records of Curlew were from River Bandon SAC with a high count of 26 birds.

Dunlin was noted throughout both winter seasons only. It was most frequently seen at The Gearagh, with a total of seven records. On each occasion between 67 and 206 of these waders were seen. Dunlin was seen once at Inishcarra Reservoir, where 80 birds were counted, and twice at Sullane Delta, where between 25-53 birds were counted.

Lapwing was frequently noted throughout both winter seasons, with occasional records during both summer seasons. It was most often seen at The Gearagh and Sullane Delta, with 11 observations at each site. At Sullane Delta a high count of 726 Lapwing was made on the 26th of January 2022. At The Gearagh, a high count of 417 was made on the 12th of February 2022. Lapwing was seen at Inishcarra Reservoir on four separate occasions throughout the winter of 2020/2021, where a high count of 579 birds was recorded on the 4th of February 2021. Lapwing was seen twice at Toon Flats in the winter season of 2020/2021 where on one occasion 60 birds were counted.

Shoveler, a Red-listed duck species, was observed once on the 3rd of March 2021 at Inishcarra Reservoir, where an individual was noted. Woodcock, a woodland wader species was also noted just once on the 20th of January 2021 at Sullane Delta where an individual was observed.

3.6.15 Amber-listed target species

In addition to the species already discussed above, 11 further Amber-listed target species were recorded during hinterland surveys. These were Black-headed Gull, Brent Goose, Common Sandpiper, Cormorant, Gadwall, Garganey, Greylag Goose, Mute Swan, Teal, Tufted Duck and Wigeon.



Black-headed Gull was frequently observed across both winter seasons, with occasional records throughout both summer seasons. This Gull species was observed on 16 separate occasions across all seasons at The Gearagh, with a high count of 120 on the 16th of October 2021. At Sullane Delta, this species was observed on 12 separate occasions, with a high count of 216 Gulls on the 26th of January 2022 followed by a count of 160 birds on the 31st of December 2021. At Inishcarra Reservoir, seven observations were made in the winter 2020/21 season with counts of up to 22 Gulls. Single observations of Black-headed Gull were made at Toon Flats and Castlelack Lake.

A single Brent Goose was noted on the 3rd of February 2021 at Toon Flats.

Common Sandpiper was noted twice during Hinterland surveys in the summer 2022 season; both records were at Sullane delta.

Cormorant was frequently noted across both winter seasons and the summer 2022 season, with occasional records in the summer 2021 season. It was seen 11 times at both Sullane Delta and The Gearagh, seven times at Inishcarra, four times both at Desert Bridge and River Bandon SAC, three times at Castlemoor and twice at Muragh Lake.

Gadwall was noted twice during hinterland surveys, with both observations from The Gearagh. On the 15th of November 2021, three Gadwall were seen and on the 1st of April 2022 two birds were noted. Garganey was also recorded at The Gearagh, where one male was seen on the 11th of May 2022.

Greylag Goose was noted across all four survey seasons. At The Gearagh it was noted on seven separate occasions, with a high count of 203 geese on the 20th of September 2021. It was noted five times at Toon Flats with flock sizes ranging between 6-57 individuals. Greylag Goose was noted once at Inishcarra Reservoir, where a flock of 93 birds was seen on the 20th of January 2021. Three further observations of one to three geese were recorded at Warren's Court.

Mute Swan was frequently observed at Hinterland sites across all four survey seasons. It was observed on 15 separate occasions at The Gearagh, where on the 4th of August 2022 a heigh count of 112 swans was achieved, and a further four flocks with more than 20 individuals were noted. This swan species was observed 12 times at Warren's Court, where numbers did not exceed 12 birds per observation. Five observations of small numbers of swans were each made at Desert Bridge and River Bandon SAC. There were three observations of low numbers of swans at Sullane Delta, and one observation each at Inishcarra Reservoir and Castlelack Lake. At Murragh Lake, Mute Swan was observed on nine separate occasions; during each observation, one or two birds were seen at a time. At Toon Flats, Mute Swan were noted on five occasions where flock sizes ranged between 5-49 swans.

Teal was noted frequently throughout both winter seasons and occasionally during both summer seasons over the Hinterland survey period. This duck species was most frequently seen at The Gearagh, where it was observed on 19 separate occasions. On the 15th of November 2021, 1,040 Teal were counted at The Gearagh, and on six other occasions between 111 and 735 ducks were counted. Seven observations were made at both Inishcarra Reservoir and Sullane Delta, where high counts of 55 and 49 Teal were made respectively. Four observations were made at Murragh Lake, three at Castlemoor, and one each at Castlelack Lake, Toon Flats, Desert Bridge and Warren's Court.

Tufted Duck was seen across all four survey seasons, though it was most frequently noted throughout both winter seasons. It was observed nine times at Warren's Court, seven times at Castlemoor and six times at Murragh Lake. The largest number (26 ducks) was seen at Warren's Court on the 1st of April 2022.



Wigeon was noted frequently throughout both winter seasons and occasionally during both summer seasons. It was most frequently seen at The Gearagh where it was noted on 16 occasions. At The Gearagh, Wigeon was frequently seen in high numbers, with the largest number of 127 Wigeon counted on the 15th of November 2021. It was noted six times each at both Sullane Delta and Inishcarra Reservoir, where between 31-128 Wigeon and between 3-59 Wigeon were seen respectively. Wigeon was seen on one occasion each at Warren's Court and Castlelack Lake.

Green-listed target species In addition to the species already discussed above, eight further Green-listed target species were recorded during hinterland surveys. These were, Egyptian Goose, Great Black-backed Gull, Great White Egret, Green Sandpiper, Greenshank, Little Grebe, Pink-footed Goose and Whimbrel. None of these species were picked up at the Proposed Development site during VP or Transect surveys.

and A single Egyptian Goose was observed at The Gearagh on the 20th of September 2021, which was considered to be feral.

Great Black-backed Gull was occasionally observed throughout all survey seasons. It was seen in numbers between one and four Gulls. It was observed six times at Sullane Delta, three times at The Gearagh and Inishcarra Reservoir and once at the River Bandon SAC.

Great Egret was observed twice throughout Hinterland surveys, both times at The Gearagh. One Egret was observed on the 20th of September 2021 and three Great White Egrets were seen on the 15th of November 2021. Green Sandpiper was seen on three occasions, and each time an individual was observed. These sightings were at Inishcarra Reservoir, Sullane Delta and River Bandon SAC. Greenshank was observed just once at The Gearagh on the 23rd of November 2020. Little Grebe was seen on three occasions; seven individuals were seen on two separate occasions at Murragh Lake, and an individual was seen at Warren's Court. Pink-footed Goose was observed on three occasions in the winter 2020/2021 season; individuals were seen on each occasion. Two observations of this goose species were at Toon Flats and one observation was at Inishcarra Reservoir. Whimbrel was noted just once, at The Gearagh on the 11th of May 2022.

Table 3-5: Status of Bird Species recorded during Hintterland surveys

Common Name	Scientific Name	Conservation Status	
		BoCCI*	Annex 1**
Barnacle Goose	<i>Branta leucopsis</i>	Amber	Yes
Blackbird	<i>Turdus merula</i>	Green	No
Blackcap	<i>Sylvia atricapilla</i>	Green	No
Black-headed Gull	<i>Chroicocephalus ridibundus</i>	Amber	No
Black-tailed Godwit	<i>Limosa limosa</i>	Red	No
Blue Tit	<i>Cyanistes caeruleus</i>	Green	No
Brambling	<i>Fringilla montifringilla</i>	Amber	No
Brent Goose	<i>Branta bernicla</i>	Amber	No



Common Name	Scientific Name	Conservation Status	
		BoCCI*	Annex 1**
Bullfinch	<i>Pyrrhula pyrrhula</i>	Green	No
Buzzard	<i>Buteo buteo</i>	Green	No
Chaffinch	<i>Fringilla coelebs</i>	Green	No
Chiffchaff	<i>Phylloscopus collybita</i>	Green	No
Coal Tit	<i>Parus ater</i>	Green	No
Collared Dove	<i>Streptopelia decaocto</i>	Green	No
Common Crossbill	<i>Loxia curvirostra</i>	Green	No
Common Sandpiper	<i>Actitis hypoleucos</i>	Amber	No
Coot	<i>Fulica atra</i>	Amber	No
Cormorant	<i>Phalacrocorax carbo</i>	Amber	No
Curlew	<i>Numenius arquata</i>	Red	No
Dipper	<i>Cinclus cinclus</i>	Green	No
Dunlin	<i>Calidris alpina</i>	Red	No
Dunnock	<i>Prunella modularis</i>	Green	No
Egyptian Goose	<i>Alopochen aegyptiaca</i>	Green	No
Fieldfare	<i>Turdus pilaris</i>	Green	No
Gadwall	<i>Anas strepera</i>	Amber	No
Garden Warbler	<i>Sylvia borin</i>	Green	No
Garganey	<i>Anas querquedula</i>	Amber	No
Goldcrest	<i>Regulus regulus</i>	Amber	No
Golden Plover	<i>Pluvialis apricaria</i>	Red	Yes



Common Name	Scientific Name	Conservation Status	
		BoCCI*	Annex 1**
Goldeneye	<i>Bucephala clangula</i>	Red	No
Goldfinch	<i>Carduelis carduelis</i>	Green	No
Goosander	<i>Mergus merganser</i>	Amber	No
Great Black-backed Gull	<i>Larus marinus</i>	Green	No
Great Crested Grebe	<i>Podiceps cristatus</i>	Amber	No
Great Tit	<i>Parus major</i>	Green	No
Great White Egret	<i>Ardea alba</i>	Green	No
Green Sandpiper	<i>Tringa ochropus</i>	Green	No
Greenfinch	<i>Carduelis chloris</i>	Amber	No
Greenshank	<i>Tringa nebularia</i>	Green	No
Grey Heron	<i>Ardea cinerea</i>	Green	No
Grey Wagtail	<i>Motacilla cinerea</i>	Red	No
Greylag Goose	<i>Anser anser</i>	Amber	No
Hen Harrier	<i>Circus cyaneus</i>	Amber	Yes
Herring Gull	<i>Larus argentatus</i>	Amber	No
Hooded Crow	<i>Corvus cornix</i>	Green	No
House Martin	<i>Delichon urbicum</i>	Amber	No
House Sparrow	<i>Passer domesticus</i>	Amber	No
Jackdaw	<i>Corvus monedula</i>	Green	No
Jay	<i>Garrulus glandarius</i>	Green	No
Kestrel	<i>Falco tinnunculus</i>	Red	No



Common Name	Scientific Name	Conservation Status	
		BoCCI*	Annex 1**
Kingfisher	<i>Alcedo atthis</i>	Amber	Yes
Lapwing	<i>Vanellus vanellus</i>	Red	No
Lesser Black-backed Gull	<i>Larus fuscus</i>	Amber	No
Lesser Redpoll	<i>Carduelis cabaret</i>	Green	No
Linnet	<i>Carduelis cannabina</i>	Amber	No
Little Egret	<i>Egretta garzetta</i>	Green	Yes
Little Grebe	<i>Tachybaptus ruficollis</i>	Green	No
Long-tailed Tit	<i>Aegithalos caudatus</i>	Green	No
Magpie	<i>Pica pica</i>	Green	No
Mallard	<i>Anas platyrhynchos</i>	Amber	No
Meadow Pipit	<i>Anthus pratensis</i>	Red	No
Mistle Thrush	<i>Turdus viscivorus</i>	Green	No
Moorhen	<i>Gallinula chloropus</i>	Green	No
Mute Swan	<i>Cygnus olor</i>	Amber	No
Peregrine	<i>Falco peregrinus</i>	Green	Yes
Pheasant	<i>Phasianus colchicus</i>	Green	No
Pied/White Wagtail	<i>Motacilla alba</i>	Green	No
Pink-footed Goose	<i>Anser brachyrhynchus</i>	Green	No
Raven	<i>Corvus corax</i>	Green	No
Redwing	<i>Turdus iliacus</i>	Red	No
Reed Bunting	<i>Emberiza schoeniclus</i>	Green	No



Common Name	Scientific Name	Conservation Status	
		BoCCI*	Annex 1**
Robin	<i>Erithacus rubecula</i>	Green	No
Rook	<i>Corvus frugilegus</i>	Green	No
Ruff	<i>Philomachus pugnax</i>	Amber	Yes
Sand Martin	<i>Riparia riparia</i>	Amber	No
Sedge Warbler	<i>Acrocephalus schoenobaenus</i>	Green	No
Shoveler	<i>Anas clypeata</i>	Red	No
Siskin	<i>Carduelis spinus</i>	Green	No
Skylark	<i>Alauda arvensis</i>	Amber	No
Snipe	<i>Gallinago gallinago</i>	Red	No
Song Thrush	<i>Turdus philomelos</i>	Green	No
Sparrowhawk	<i>Accipiter nisus</i>	Green	No
Starling	<i>Sturnus vulgaris</i>	Amber	No
Stock Dove	<i>Columba oenas</i>	Red	No
Stonechat	<i>Saxicola rubicola</i>	Green	No
Swallow	<i>Hirundo rustica</i>	Amber	No
Swift	<i>Apus apus</i>	Red	No
Teal	<i>Anas crecca</i>	Amber	No
Treecreeper	<i>Certhia familiaris</i>	Green	No
Tufted Duck	<i>Aythya fuligula</i>	Amber	No
Water Rail	<i>Rallus aquaticus</i>	Green	No
Wheatear	<i>Oenanthe oenanthe</i>	Amber	No



Common Name	Scientific Name	Conservation Status	
		BoCCI*	Annex 1**
Whimbrel	<i>Numenius phaeopus</i>	Green	No
White-fronted Goose	Anser albifrons	Amber	Yes
Whooper Swan	<i>Cygnus cygnus</i>	Amber	Yes
Wigeon	<i>Anas penelope</i>	Amber	No
Willow Warbler	<i>Phylloscopus trochilus</i>	Amber	No
Woodcock	<i>Scolopax rusticola</i>	Red	No
Woodpigeon	<i>Columba palumbus</i>	Green	No
Wren	<i>Troglodytes troglodytes</i>	Green	No
Yellowhammer	<i>Emberiza citrinella</i>	Red	No

* refers to the conservation status of the species according to Birds of Conservation Concern in Ireland

** refers to species listed on Annex 1 of the EU Birds Directive



4. DISCUSSION

FT carried out two full years of ornithological surveys at the Proposed Development site between October 2020 and September 2022 inclusive. The following surveys were undertaken: Vantage point surveys, winter transect surveys, general breeding bird and breeding wader surveys and hinterland surveys.

In total there were 247 flights of 13 target species observed during the survey period. Detailed records of two stationary birds (both Buzzards) were also recorded. Additional records were made of birds heard or seen perched or on the ground for Golden Plover, Grey Heron and Lesser Black-backed Gull.

Buzzard was the target species most frequently sighted across all seasons during VP surveys with between 16-29 sightings per season. Lesser Black-backed Gull was observed the next most frequently with 66 observations, of which 64 occurred during the second year of surveys. Kestrel was also seen in good numbers during the second year of surveys with a total of 33 observations during this period and just five observations during the first year of surveys. There was a total of 18 observations of Sparrowhawk, with a few records from each season. All other target species had less than ten records throughout VP surveys.

Buzzard was frequently observed hunting during VP surveys and was also seen carrying prey. Birds were observed in territorial displays and a pair of adult Buzzards was observed chasing off another Buzzard from their territory in January 2021. These records were from the winter seasons. Due to the territorial behaviour observed and activity levels recorded, Buzzard are considered likely to be breeding in the area in which the Proposed Development site is located. No nest sites were observed during surveys. Buzzard is established in the area, as evidenced by the regularity of sightings during VP surveys and hinterland surveys.

Hen Harrier is an infrequent visitor to the area. This species was only observed twice during VP surveys and once during hinterland surveys. Both VP observations were in the winter 2021/2022 season with one observation of a male commuting over the Proposed Development site from north to south and one ringtail hunting over the Proposed Development site, also moving north to south. A male was observed flying over a field at Warren's Court in April 2021 during hinterland surveys. Warren's Court is approximately 3.5 km from the Proposed Development site. There was no indication of any breeding behaviour associated with this record.

Kestrel activity during VP and hinterland surveys was mostly observed throughout the summer months. Kestrel was frequently observed hunting over the Proposed Development site and was seen carrying and consuming prey. It was observed within 2km of the Proposed Development site boundary during hinterland surveys, as well as at the Gearagh and Desert Bridge. Based on activity patterns observed, Kestrel may be breeding in the area surrounding the Proposed Development site. No nest sites were observed during surveys.

Peregrine activity recorded during VP and hinterland surveys was predominantly during the winter months. It was not recorded hunting and only individuals were observed. One male Peregrine was observed perching on a cliff in August 2021 at Kilmichael/ Mid Cork Quarries (c. 5 km from the Proposed Development site). Quarries often provide potential nesting habitat for this species. No breeding activity or potential breeding habitat was observed at or near the Proposed Development site.

Sparrowhawk was observed throughout the summer and winter seasons during VP surveys. Sparrowhawk was observed hunting over the Proposed Development site and on one occasion a bird was seen with a prey item. Most observations were of individual Sparrowhawks, except for one instance where two Sparrowhawks were seen commuting over the Proposed Development site in May 2022. Sparrowhawk was also recorded during hinterland surveys in the 2km site buffer, at Kilmichael/ Mid Cork Quarries, the Gearagh and Castlemoor, with no indications of breeding activity recorded at those sites. Due to the limited size of Sparrowhawk territories and the activity patterns recorded during VP surveys, it is considered likely that this species breeds in the area in which the Proposed Development site is located. No nest sites were observed during surveys.



Golden Plover, Lesser Black-backed Gull, Herring Gull and Mallard were observed landing/foraging in fields on and near the Proposed Development site. Snipe was flushed on one occasion from near VP1. Some of the fields in and around the Proposed Development site have moderate suitability as foraging habitat for these species.

Breeding bird transects recorded 34 bird species including Red-listed Meadow Pipit, Grey Wagtail and Kestrel. Species recorded in the 0-25m distance band were Red-listed Meadow Pipit and Grey Wagtail as well as Amber-listed Goldcrest, Linnet, Starling, Swallow and Willow Warbler and a number of Green-listed species. The higher-quality, unmanaged hedgerows onsite are suitable for a number of breeding passerines, and areas of rougher grassland are suitable for breeding Meadow pipit.

Swift is emerging as a species which is susceptible to turbine collision and was recorded during VP surveys in the summer seasons of both 2021 and 2022, with flight activity details recorded from 2022. The Swift activity recorded is negligible however, with only two records over two years and no suitable breeding habitat present at the Proposed Development site.

A flock of eight Snipe was seen flying over fields to the west of the Proposed Development site in November 2020, and a flock of 23 Snipe was seen flying along the southern tip of the Proposed Development site in October 2021. These records are indicative of migratory movements. During March and April 2021, potential migratory movements of Golden Plover were observed when 100 and 60 plovers respectively were seen flying over the Proposed Development site. Another possible migratory movement of Golden Plover was picked up at Warren's Court in April 2021 when 311 Plovers were seen flying past the Proposed Development site to the east at a height of ca. 150m.

During breeding wader surveys Snipe was the only target species detected. Both records were of Snipe heard calling in April 2021. There were no records of Snipe drumming or chipping. The absence of any breeding displays and absence of further records for Snipe indicate this species does not breed at the Proposed Development site.

Hinterland surveys were conducted to show the general breeding occupancy and bird occupancy throughout the survey period in a c. 10 km radius around the Proposed Development site. During these surveys a total of 101 species of bird were observed. Among these were eight Annex 1 species, 16 Red-listed species and 33 Amber-listed species.

Hinterland sites identified as being of high value to bird species of conservation interest are The Gearagh (distance to site: c. 7.5 km), Sullane Delta (distance to site: c. 7 km), Inishcarra Reservoir (distance to site: c. 6.3 km), Desert Bridge (distance to site: c. 9.7 km), Murragh Lake (distance to site: c. 9.3 km), Bandon River SAC (distance to site: c. 9.5 km), Warren's Court (distance to site: c. 3.5 km) and Toon Flats (distance to site: c. 8 km). Mid-Cork Quarry supports some raptor activity. There are several Hinterland sites which support large numbers and a good diversity of waterfowl and gulls. Most of these species were not recorded during VP surveys; however, occasional flyovers of these species cannot be ruled out. The species recorded at both the Proposed Development site and nearby hinterland sites are discussed below.

Target species which were seen during both VP surveys and at the closest hinterland sites to the Proposed Development (Warren's Court and Kilmichael/ Mid Cork Quarries) were: Golden Plover, Hen Harrier, Lesser Black-backed Gull, Mallard, Peregrine and Swift. These species are likely to use the habitat mosaic provided by the wider landscape in which the Proposed Development site is located.



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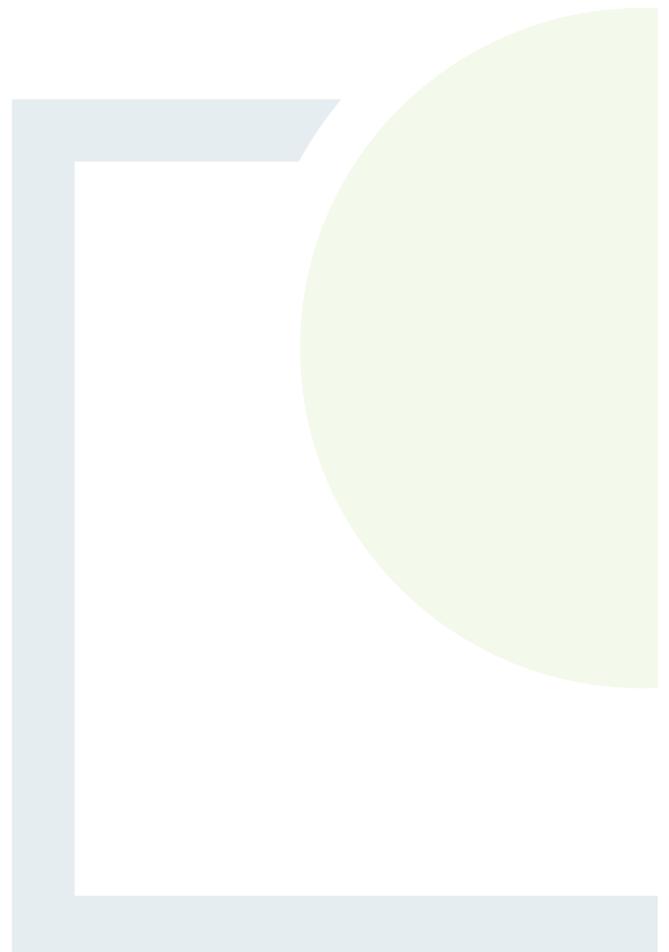
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APPENDIX 1

VP - Target Species Results
and Survey Conditions



VP - Survey Conditions

VP	Date	Start	End	Cloud (/8)	Is the viewshed fully Visible?	Rain	Wind Speed (Beaufort)	Wind Direction
1	02/11/2020	10:10	13:40	3	Yes	Showers	4	
1	09/11/2020	11:00	13:30	8	Yes	Heavy showers	2	SE
2	09/11/2020	14:30	16:30	8	Yes	Dry	3	SE
2	13/11/2020	12:05	16:05	8	Yes	Dry	4	SE
1	20/11/2020	10:25	16:25	8	Yes	Drizzle	3	SW
2	30/11/2020	09:10	15:10	8	Yes	Light rain	2	W
1	11/12/2020	10:05	16:05	6	Yes	Drizzle and rain	1	NW
2	21/12/2020	10:00	16:00	8	Yes	Mist & fog	3	SW
1	13/01/2021	09:00	12:00	8	Yes	Mist	3	SW
2	14/01/2021	09:30	12:30	4	Yes	Dry	4	N
2	14/01/2021	13:00	16:00	3	Yes	Dry	4	N
2	14/01/2021	09:30	12:30	4	Yes	Dry	4	N
2	01/02/2021	08:30	11:30	8	Yes	Dry	2	
2	02/02/2021	12:00	15:00	7	Yes	Heavy showers	4	S
1	07/03/2021	10:00	13:00	8	Yes	Light showers	3	SW
2	15/03/2021	09:45	12:45	6	Yes	Dry	3	W
2	15/03/2021	13:15	16:15	7	Yes	Drizzle	3	W
1	09/04/2021	15:55	17:55	8	Yes	Showers	2	NW
1	11/04/2021	08:31	12:31		Yes	Dry	2	NW
2	08/04/2021	10:13	11:13	6	Yes	Dry	3	SW
2	09/04/2021	09:30	14:30	8	Yes	Dry	2	N
1	09/05/2021	13:25	17:25	8	Yes	Showers	4	S
1	15/05/2021	18:25	20:21	8	Yes	Showers	3	SE
2	11/05/2021	09:18	12:18	5	Yes	Dry/Showers	4	S

VP	Date	Start	End	Cloud (/8)	Is the viewshed fully Visible?	Rain	Wind Speed (Beaufort)	Wind Direction
2	11/05/2021	13:03	16:03	5	Yes	Dry	4	S
2	17/06/2021	13:05	19:05	4	Yes	Dry	4	NW
1	16/06/2021	09:56	15:56	8	Yes	Dry	2	SW
2	05/07/2021	08:16	12:46	2	Yes	Dry	3	SW
2	05/07/2021	14:22	15:22	2	Yes	Dry	2	SW
1	02/07/2021	09:15	12:45	8	Yes	Dry	2	SE
1	02/07/2021	14:20	16:50	8	Yes	Dry	2	SE
2	01/08/2021	08:20	14:20	8	Yes	Dry	3	N
1	02/08/2021	08:58	12:58	7	Yes	Dry	2	NW
1	02/08/2021	16:31	18:31	8	Yes	Dry	1	NW
1	03/09/2021	09:40	15:40	8	Yes	Dry	2	NE
1	08/10/2021	09:26	12:26	8	Yes	Showers	3	S
1	30/10/2021	08:28	11:28	2	Yes	Dry	1	SW
1	10/11/2021	09:16	13:31	6	Yes	Dry	1	NE
1	10/11/2021	14:58	16:53	7	Yes	Dry	2	NE
1	15/12/2021	08:29	13:14	8	Yes	Drizzle/Dry	2	SW
1	15/12/2021	14:30	15:45	8	Yes	Dry	3	SW
2	02/11/2021	12:16	15:16	6	Yes	Dry	4	NW
2	06/11/2021	08:07	11:07	8	Yes	Drizzle	4	SW
2	06/09/2021	10:20	16:20	8	Yes	Dry	2	SE
2	17/10/2021	09:25	15:25	3	Yes	Dry	3	SW
2	21/12/2021	08:42	11:42	8	Yes	Dry	4	SE
2	21/12/2021	12:58	15:58	8	Yes	Dry	4	SE
2	12/01/2022	08:20	11:20	2	Yes	Dry	1	NW
1	12/01/2022	11:50	14:50	1	Yes	Dry	1	NW
2	19/01/2022	08:35	11:35	7	Yes	Dry	4	NW

VP	Date	Start	End	Cloud (/8)	Is the viewshed fully Visible?	Rain	Wind Speed (Beaufort)	Wind Direction
1	19/01/2022	12:20	13:20	7	Yes	Dry	4	NW
1	19/01/2022	14:31	16:31	8	Yes	Dry	3	NW
1	02/02/2022	08:45	12:45	7	Yes	Dry	2	SW
2	16/02/2022	15:12	17:12	5	Yes	Showers	5	SW
1	02/02/2022	14:33	17:33	8	Yes	Dry	2	SW
1	05/02/2022	10:28	13:28	8	Yes	Dry	5	SW
1	02/03/2022	14:53	17:53	8	Yes	Showers	4	S
1	12/03/2022	11:32	13:23	8	Yes	Dry followed by heavy rain	0	
1	15/03/2022	11:54	12:54	8	Yes	Dry	3	S
1	15/03/2022	08:40	11:40	8	Yes	Dry	4	S
1	18/03/2022	14:31	17:31	7	Yes	Dry	4	SE
1	05/04/2022	13:54	15:54	7	Yes	Dry	4	SW
1	06/04/2022	13:45	16:45	7	Yes	Showers	5	SW
1	27/04/2022	09:49	10:49	0	Yes	Dry	2	E
2	03/04/2022	09:26	11:26	0	Yes	Dry	2	NW
2	22/04/2022	13:03	15:03	7	Yes	Dry	5	NE
2	27/04/2022	11:04	13:04	4	Yes	Dry	4	E
1	17/05/2022	17:39	19:39	8	Yes	Dry	4	S
1	25/05/2022	18:32	20:32	7	Yes	Dry	3	W
1	26/05/2022	19:14	21:14		Yes	Dry	3	W
2	20/05/2022	19:30	20:40	4	Yes	Dry	4	SW
2	23/05/2022	16:59	19:59		Yes	Dry	5	NW
2	24/05/2022	17:31	19:21	8	Yes	Dry	5	W
2	08/06/2022	08:14	11:14	3	Yes	Dry	3	SW
2	08/06/2022	09:25	12:25	7	Yes	Dry	2	SW
1	07/06/2022	08:29	11:29	8	Yes	Dry	2	SE

VP	Date	Start	End	Cloud (/8)	Is the viewshed fully Visible?	Rain	Wind Speed (Beaufort)	Wind Direction
2	14/06/2022	09:25	12:25	7	Yes	Dry	2	SW
1	19/06/2022	11:25	14:25	8	Yes	Dry	5	N
2	11/07/2022	18:50	21:50	7	Yes	Dry	2	SE
2	27/07/2022	18:32	21:32	8	Yes	Dry	3	SE
1	13/07/2022	14:17	17:17	4	Yes	Dry	3	NW
1	21/07/2022	17:42	20:42	7	Yes	Dry	2	NE
1	13/08/2022	08:22	11:22	0	Yes	Dry	2	N
1	18/08/2022	17:12	20:12	2	Yes	Dry	4	W
2	11/08/2022	16:45	17:45		Yes	Dry	1	SE
2	12/08/2022	09:28	12:28		Yes	Dry	3	E
2	15/09/2022	14:16	17:16	8	Yes	Dry	4	NE
2	21/09/2022	07:47	09:47	8	Yes	Dry	3	SW
2	25/09/2022	11:14	12:14	8	Yes	Dry	2	W
1	21/09/2022	17:28	19:28	8	Yes	Dry	4	SW
1	28/09/2022	12:27	15:27	7	Yes	Dry	4	NW
1	28/09/2022	17:05	18:05	5	Yes	Dry	4	NW

VP - Target Species Survey Results (height bands 0-20m/20-50m/50-100m/100-150m)

VP	Date	Mapnote / Flightline No.	Map Name	Species	No.	Start	In/ Out	Duration (s)	0- 20m (s)	20- 50m (s)	50- 100m (s)	100- 150m (s)	>150m (s)
2	14/01/21	10	SH	Sparrowhawk	1	10:22	In	20	20				
2	14/01/21	10	SH	Sparrowhawk	1	10:22	Out	10	10				
2	14/01/21	11	PE	Peregrine	1	10:22	In	20	20				
2	14/01/21	11	PE	Peregrine	1	10:22	Out	10	10				
2	14/01/21	12	BZ	Buzzard	1	10:28	In	55		55			
2	14/01/21	12	BZ	Buzzard	1	10:28	out	32		32			
2	14/01/21	13	BZ	Buzzard	2	11:10	Out	64		64			
2	14/01/21	14	PE	Peregrine	1	11:17	In	53		53			
2	14/01/21	15	BZ	Buzzard	2	11:20	Out	243			243		
2	14/01/21	16	BZ	Buzzard	2	11:28	In	28		28			
2	14/01/21	16	BZ	Buzzard	2	11:28	Out	120		120			
2	14/01/21	17	PE	Peregrine	1	11:42	In	47	47				
2	14/01/21	17	PE	Peregrine	1	11:42	Out	6	6				
2	14/01/21	18	BZ	Buzzard	3	13:13	In	50		50			
2	14/01/21	18	BZ	Buzzard	3	13:13	Out	233		233			
2	14/01/21	19	BZ	Buzzard	1	14:25	In	97		97			
2	14/01/21	19	BZ	Buzzard	1	14:25	Out	10		10			
2	14/01/21	20	SH	Sparrowhawk	1	14:31	In	38	38				
2	14/01/21	21	PE	Peregrine	1	14:50	In	67		67			
2	14/01/21	21	PE	Peregrine	1	14:50	out	90		90			
2	14/01/21	22	BZ	Buzzard	1	15:13	in	25	25				
2	14/01/21	22	BZ	Buzzard	1	15:13	out	35	35				
2	14/01/21	23	BZ	Buzzard	2	15:23	in	83			83		

VP	Date	Mapnote / Flightline No.	Map Name	Species	No.	Start	In/ Out	Duration (s)	0- 20m (s)	20- 50m (s)	50- 100m (s)	100- 150m (s)	>150m (s)
2	14/01/21	23	BZ	Buzzard	2	15:23	out	110			110		
2	14/01/21	24	BZ	Buzzard	2	15:37	in	114			114		
2	14/01/21	24	BZ	Buzzard	2	15:37	out	90			90		
2	02/02/21	25	GP	Golden Plover	60	12:19	In		30	28			
1	07/03/21	26	BZ	Buzzard	2	11:17	In	600		60	120	360	60
1	07/03/21	26	BZ	Buzzard	2	11:17	Out	179		25	25	120	9
1	07/03/21	27	BZ	Buzzard	2	11:17	in	720		60	150	480	30
1	07/03/21	27	BZ	Buzzard	2	11:17	OUT	257		17	60	120	60
1	07/03/21	28	MA	Mallard	2	12:18	in	17	17				
2	15/03/21	29	BZ	Buzzard	1	09:50	in	120	120				
2	15/03/21	30	BZ	Buzzard	1	09:56	IN	222			222		
2	15/03/21	31	BZ	Buzzard	3	09:56	IN	20			20		
2	15/03/21	31	BZ	Buzzard	3	09:56	OUT	60			60		
2	15/03/21	32	BZ	Buzzard	2	10:36	in	141		141			
2	15/03/21	32	BZ	Buzzard	2	10:36	OUT	100		100			
2	15/03/21	33	BZ	Buzzard	1	11:44	IN	360	360				
2	15/03/21	34	BZ	Buzzard	1	11:50	IN	28	28				
2	15/03/21	35	GP	Golden Plover	1	12:09	OUT	70					
2	15/03/21	36	PE	Peregrine	1	12:19	OUT	96		96			
2	15/03/21	36	PE	Peregrine	1	12:19	IN	36		36			
2	15/03/21	37	BZ	Buzzard	2	12:24	IN	300	30	120	30	30	90
2	15/03/21	37	BZ	Buzzard	2	12:24	OUT	52					52
2	15/03/21	38	BZ	Buzzard	1	12:34	IN	96	10	30	56		
2	15/03/21	39	GP	Golden Plover	100	13:36	out	229				229	
2	15/03/21	40	BZ	Buzzard	2	14:18	IN	137			137		

VP	Date	Mapnote / Flightline No.	Map Name	Species	No.	Start	In/ Out	Duration (s)	0- 20m (s)	20- 50m (s)	50- 100m (s)	100- 150m (s)	>150m (s)
2	15/03/21	41	BZ	Buzzard	3	15:00	OUT	74		74			
2	15/03/21	42	BZ	Buzzard	1	15:27	IN	5	5				
2	15/03/21	43	BZ	Buzzard	5	15:59	OUT	60			60		
2	15/03/21	43	BZ	Buzzard	5	15:59	IN	192			192		
2	15/03/21	N/A	GP	Golden Plover									

VP - Target Species Survey Results (height bands 0-10m/10-20m/20-30m/30-50m/50-100m/100-185m)

VP	Date	Mapnote / Flightline No.	Map Name	Species	Quantity	Start	In/ Out	Duration (s)	0- 10m (s)	10- 20m (s)	20- 30m (s)	30- 50m (s)	50- 100m (s)	100- 185m (s)
1	02/11/20	1	K.	Kestrel	1	10:33	In	48	48					
1	02/11/20	2	BZ	Buzzard	1	11:53	In	74	71	3				
1	02/11/20	3	BZ	Buzzard	1	12:25	In	39	35	4				
1	02/11/20	4	BZ	Buzzard	2	12:48	out	540			250	290		
1	02/11/20	5	BZ	Buzzard	1	13:27	out	236		94	142			
1	02/11/20	6	BZ	Buzzard	1	13:41	out	15	15					
1	02/11/20	7	BZ	Buzzard	1	13:50	out	168		14	24	130		
1	09/11/20	8	SN	Snipe	8	13:09	In	38	38					
1	11/12/20	N/A	H.	Grey Heron										
2	21/12/20	9	SH	Sparrowhawk	1	14:05	Out	4	4					
1	09/04/21	44	LB	Lesser Black-backed Gull	10	16:59	IN	75	15	10	10	10	30	
1	09/04/21	45	LB	Lesser Black-backed Gull	4	17:32	IN	40	10	10	10	10		

VP	Date	Mapnote / Flightline No.	Map Name	Species	Quantity	Start	In/ Out	Duration (s)	0- 10m (s)	10- 20m (s)	20- 30m (s)	30- 50m (s)	50- 100m (s)	100- 185m (s)
1	09/04/21	46	LB	Lesser Black-backed Gull	3	17:38	IN	15				15		
1	09/04/21	46	LB	Lesser Black-backed Gull	3	17:38	OUT	20					20	
1	11/04/21	47	LB	Lesser Black-backed Gull	2	08:33	IN	55					45	10
1	11/04/21	48	SH	Sparrowhawk	1	11:46	IN	51		10	10	10	21	
1	11/04/21	49	LB	Lesser Black-backed Gull	3	12:26	IN	70					70	
1	11/04/21	50	K.	Kestrel	1	12:26	IN	20			20			
1	11/04/21	50	K.	Kestrel	1	12:26	out	32				32		
2	08/04/21	51	BZ	Buzzard	1	10:46	IN	150			30	120		
2	08/04/21	52	BZ	Buzzard	1	11:02	IN	20			10	10		
2	09/04/21	53	BZ	Buzzard	1	11:24	IN	160				100	60	
2	09/04/21	54	BZ	Buzzard	1	11:45	IN	210					140	70
2	09/04/21	54	BZ	Buzzard	1	11:45	OUT	10						10
2	09/04/21	55	SH	Sparrowhawk	1	11:57	IN	180				180		
2	09/04/21	56	BZ	Buzzard	1	13:01	IN	480				80	300	100
2	09/04/21	57	GP	Golden Plover	60	13:50	OUT	300						300
2	09/04/21	58	BZ	Buzzard	2	14:19	IN	360					360	
2	09/04/21	59	K.	Kestrel	1	14:20	IN	200						200
1	09/05/21	60	LB	Lesser Black-backed Gull	1	14:37	IN	45					45	
1	09/05/21	61	HG	Herring Gull	1	14:42	OUT	20			20			
1	09/05/21	62	LB	Lesser Black-backed Gull	27	15:05	OUT	50				50		

VP	Date	Mapnote / Flightline No.	Map Name	Species	Quantity	Start	In/Out	Duration (s)	0- 10m (s)	10- 20m (s)	20- 30m (s)	30- 50m (s)	50- 100m (s)	100- 185m (s)
1	09/05/21	62	LB	Lesser Black-backed Gull	27	15:05	IN	100					100	
1	09/05/21	63	BZ	Buzzard	1	15:24	OUT	60					60	
1	09/05/21	63	BZ	Buzzard	1	15:24	IN	360			60	100	160	40
1	09/05/21	64	BZ	Buzzard	1	16:04	IN	35				35		
1	09/05/21	65	K.	Kestrel	2	16:06	IN	48			10	20	18	
1	09/05/21	66	BZ	Buzzard	1	17:09	OUT	20				20		
1	15/05/21	67	LB	Lesser Black-backed Gull	1	19:13	IN	45			25	20		
1	15/05/21	68	BZ	Buzzard	1	19:16	IN	15				15		
1	15/05/21	68	BZ	Buzzard	1	19:16	OUT	10				10		
2	11/05/21	69	LB	Lesser Black-backed Gull	1	09:35	IN	140		30	50	40	20	
2	11/05/21	70	K.	Kestrel	1	10:14	IN	20				20		
2	11/05/21	71	BZ	Buzzard	2	12:03	OUT	30				30		
2	11/05/21	71	BZ	Buzzard	2	12:03	IN	150	20	20	60	50		
2	11/05/21	72	LB	Lesser Black-backed Gull	2	14:04	IN	90				90		
2	11/05/21	73	LB	Lesser Black-backed Gull	31	14:19	IN	240				140	100	
2	17/06/21	74	LB	Lesser Black-backed Gull	5	14:07	IN	60					60	
2	17/06/21	74	LB	Lesser Black-backed Gull	5	14:07	OUT	33					33	
2	17/06/21	75	BZ	Buzzard	1	14:39	IN	200			40	30	130	
2	17/06/21	75	BZ	Buzzard	1	14:39	OUT	40				40		
2	17/06/21	76	BZ	Buzzard	1	15:55	IN	45				45		

VP	Date	Mapnote / Flightline No.	Map Name	Species	Quantity	Start	In/ Out	Duration (s)	0- 10m (s)	10- 20m (s)	20- 30m (s)	30- 50m (s)	50- 100m (s)	100- 185m (s)
2	17/06/21	77	LB	Lesser Black-backed Gull	1	17:21	IN	240			50	100	50	
2	17/06/21	77	LB	Lesser Black-backed Gull	1	17:21	OUT	60				30	30	
2	17/06/21	78	K.	Kestrel	1	18:48	IN	120			50	70		
2	17/06/21	79	K.	Kestrel	1	18:54	in	155				100	55	
2	17/06/21	80	BZ	Buzzard	1	17:01	IN	30			20	10		
2	17/06/21	N/A	SI	Swift										
1	16/06/21	81	BZ	Buzzard	1	12:17	IN	90					90	
1	16/06/21	81	BZ	Buzzard	1	12:17	OUT	90			30	30	30	
1	16/06/21	82	LB	Lesser Black-backed Gull	60	12:43	IN	240						240
1	16/06/21	83	K.	Kestrel	1	13:40	IN	45			30	15		
1	16/06/21	84	SH	Sparrowhawk	1	14:11	IN	15		15				
1	16/06/21	85	K.	Kestrel	1	14:56	in	75					55	20
1	16/06/21	86	K.	Kestrel	2	15:15	IN	50			20	30		
2	05/07/21	87	BZ	Buzzard	1	10:47	IN	10	10					
1	02/07/21	88	LB	Lesser Black-backed Gull	1	09:51	OUT	30					30	
1	02/07/21	89	LB	Lesser Black-backed Gull	1	10:52	IN	10		10				
1	02/07/21	89	LB	Lesser Black-backed Gull	1	10:52	OUT	10		10				
1	02/07/21	90	BZ	Buzzard	1	10:58	IN	90				90		
1	02/07/21	90	BZ	Buzzard	1	10:58	OUT	90				90		
1	02/07/21	91	K.	Kestrel	1	11:28	IN	120	60	20	20	20		

VP	Date	Mapnote / Flightline No.	Map Name	Species	Quantity	Start	In/ Out	Duration (s)	0- 10m (s)	10- 20m (s)	20- 30m (s)	30- 50m (s)	50- 100m (s)	100- 185m (s)
1	02/07/21	92	LB	Lesser Black-backed Gull	1	14:32	IN	10	10					
1	02/07/21	92	LB	Lesser Black-backed Gull	1	14:32	OUT	10	10					
1	02/07/21	93	K.	Kestrel	1	14:51	IN	45				20	25	
1	02/07/21	94	SH	Sparrowhawk	1	14:55	IN	15				15		
1	02/07/21	95	BZ	Buzzard	1	16:50	IN	100				40	60	
1	02/07/21	95	BZ	Buzzard	1	16:50	OUT	40					40	
2	01/08/21	96	LB	Lesser Black-backed Gull	4	08:41	IN	38	18	10	10			
2	01/08/21	97	K.	Kestrel	1	08:47	IN	180			40	100	40	
2	01/08/21	98	K.	Kestrel	1	09:48	IN	240			100	140		
2	01/08/21	99	BZ	Buzzard	1	11:33	OUT	36			16	20		
2	01/08/21	99	BZ	Buzzard	1	11:33	IN	60				60		
2	01/08/21	100	PE	Peregrine	1	11:37	IN	18			18			
2	01/08/21	101	SH	Sparrowhawk	1	11:37	IN	5			5			
2	01/08/21	102	K.	Kestrel	1	13:26	out	190				190		
2	01/08/21	102	K.	Kestrel	1	13:26	in	10				10		
1	02/08/21	103	BZ	Buzzard	1	10:58	IN	15	15					
1	02/08/21	104	K.	Kestrel	1	11:28	OUT	115				70	45	
1	02/08/21	105	H.	Grey Heron	1	16:10	IN	56		56				
1	02/08/21	106	K.	Kestrel	1	18:21	OUT	20						
1	02/08/21	106	K.	Kestrel	1	18:01	IN	400	20	40	60	200	80	
1	03/09/21	107	K.	Kestrel	1	12:08	IN	35				35		
1	03/09/21	107	K.	Kestrel	1	12:08	OUT	10				10		

VP	Date	Mapnote / Flightline No.	Map Name	Species	Quantity	Start	In/ Out	Duration (s)	0- 10m (s)	10- 20m (s)	20- 30m (s)	30- 50m (s)	50- 100m (s)	100- 185m (s)
1	03/09/21	108	LB	Lesser Black-backed Gull	1	12:39	OUT	76					76	
1	03/09/21	109	K.	Kestrel	1	13:46	IN	25			25			
1	03/09/21	109	K.	Kestrel	1	13:46	OUT	7		7				
1	08/10/21	110	SN	Snipe	23	09:57	IN	20				15	5	
1	08/10/21	111	LB	Lesser Black-backed Gull	4	10:04	IN	40				40		
1	08/10/21	111	LB	Lesser Black-backed Gull	4	10:04	OUT	5			5			
1	08/10/21	112	BZ	Buzzard	1	10:16	IN	80			20	50	10	
1	08/10/21	112	BZ	Buzzard	1	10:16	OUT	30				30		
1	30/10/21	113	SH	Sparrowhawk	1	09:09	IN	13						
1	30/10/21	114	BZ	Buzzard	1	10:18	IN	10						
1	30/10/21	115	BZ	Buzzard	1	11:11	IN	240			40	100	100	
1	10/11/21	116	SH	Sparrowhawk	1	10:06	IN	15						
1	10/11/21	117	K.	Kestrel	1	11:54	IN	45			20	25		
1	15/12/21	118	K.	Kestrel	1	12:39	OUT	10						
1	15/12/21	119	H.	Grey Heron	1	15:38	IN	10						
2	02/11/21	120	K.	Kestrel	1	12:53	OUT	45			20	25		
2	02/11/21	121	BZ	Buzzard	1	13:23	IN	170		30	40	80		
2	02/11/21	122	BZ	Buzzard	1	13:39	IN	120			30	90		
2	02/11/21	123	HH	Hen Harrier	1	14:39	IN	360			60	250	50	
2	06/09/21	124	LB	Lesser Black-backed Gull	2	11:22	OUT	25				25		
2	06/09/21	125	LB	Lesser Black-backed Gull	2	12:21	IN	60			30	30		

VP	Date	Mapnote / Flightline No.	Map Name	Species	Quantity	Start	In/ Out	Duration (s)	0- 10m (s)	10- 20m (s)	20- 30m (s)	30- 50m (s)	50- 100m (s)	100- 185m (s)
2	06/09/21	125	LB	Lesser Black-backed Gull	2	12:21	OUT	27				10	17	
2	17/10/21	126	LB	Lesser Black-backed Gull	70	10:29	IN	50			20	30		
2	17/10/21	127	SN	Snipe	1	11:59	IN	20			20			
2	17/10/21	128	BZ	Buzzard	2	12:34	OUT	230				100	130	
2	21/12/21	129	BZ	Buzzard	1	10:44	IN	50				50		
2	21/12/21	130	GP	Golden Plover	6	11:32	IN	30			30			
2	21/12/21	130	GP	Golden Plover	6	11:32	OUT	58				20	38	
2	21/12/21	131	HH	Hen Harrier	1	15:46	IN	86			46	40		
2	19/01/22	132	SN	Snipe	1	08:48	IN	8	8					
2	19/01/22	133	BZ	Buzzard	2	09:45	IN	1680			100	580	1000	
2	19/01/22	134	SH	Sparrowhawk	1	10:10	IN	300					150	150
2	19/01/22	135	PE	Peregrine	1	11:12	IN	300					240	60
1	02/02/22	136	SH	Sparrowhawk	1	08:47	IN	3	3					
1	02/02/22	137	SN	Snipe	1	09:01	IN	66	10	10	10	10	10	16
2	16/02/22	138	BZ	Buzzard	1	15:30	IN	33				33		
2	16/02/22	139	SH	Sparrowhawk	1	15:44	IN	5	5					
2	16/02/22	140	PE	Peregrine	1	17:05	IN	20			10	10		
2	16/02/22	140	PE	Peregrine	1	17:05	OUT	19					19	
1	02/02/22	141	SH	Sparrowhawk	1	15:00	OUT	33			33			
1	05/02/22	142	BZ	Buzzard	1	11:14	IN	300			40	100	100	60
1	05/02/22	142	BZ	Buzzard	1	11:14	OUT	60						60
1	02/03/22	143	SN	Snipe	1	15:04	OUT	28	5	5	10	5	3	
1	12/03/22	144	BZ	Buzzard	3	11:38	IN	75				50	25	

VP	Date	Mapnote / Flightline No.	Map Name	Species	Quantity	Start	In/ Out	Duration (s)	0- 10m (s)	10- 20m (s)	20- 30m (s)	30- 50m (s)	50- 100m (s)	100- 185m (s)
1	12/03/22	145	MA	Mallard	2	11:50	OUT	28				28		
1	12/03/22	146	K.	Kestrel	1	11:51	OUT	40			40			
1	12/03/22	147	SN	Snipe	3	12:22	OUT	49	3	5	5	10	26	
1	15/03/22	148	BZ	Buzzard	1	11:56	IN	90					90	
1	15/03/22	149	BZ	Buzzard	1	12:46	IN	36				200	160	
1	15/03/22	149	BZ	Buzzard	1	12:46	OUT	10				10		
1	18/03/22	150	BZ	Buzzard	1	15:32	OUT	35				35		
1	18/03/22	151	BZ	Buzzard	1	16:29	IN	75				50	25	
1	18/03/22	152	BZ	Buzzard	1	16:56	IN	180				80	100	
1	05/04/22	153	K.	Kestrel	1	15:22		240			100	140		
1	05/04/22	154	K.	Kestrel	1	15:36		40					100	60
1	05/04/22	155	LB	Lesser Black-backed Gull	2	15:42		160					100	60
1	06/04/22	156	LB	Lesser Black-backed Gull	11	15:15		250				80	100	70
1	06/04/22	157	BZ	Buzzard	2	15:34		240				130	80	70
1	06/04/22	158	MA	Mallard	2	16:23		12	12					
1	27/04/22	159	LB	Lesser Black-backed Gull	2	10:01		75					75	
1	27/04/22	160	LB	Lesser Black-backed Gull	1	10:25		60				60		
1	27/04/22	161	K.	Kestrel	1	10:38		180				130	50	
2	22/04/22	162	LB	Lesser Black-backed Gull	6	13:41		45				45		
2	22/04/22	163	LB	Lesser Black-backed Gull	1	13:49		40			10	30		

VP	Date	Mapnote / Flightline No.	Map Name	Species	Quantity	Start	In/ Out	Duration (s)	0- 10m (s)	10- 20m (s)	20- 30m (s)	30- 50m (s)	50- 100m (s)	100- 185m (s)
2	22/04/22	164	BZ	Buzzard	1	13:57		45				45		
2	22/04/22	165	LB	Lesser Black-backed Gull	2	14:39		120				40	80	
2	27/04/22	166	LB	Lesser Black-backed Gull	1	11:13		50		5	5	40		
2	27/04/22	167	LB	Lesser Black-backed Gull	26	11:29		70				50	20	
2	27/04/22	168	HG	Herring Gull	1	12:39		35	5	5	20	5		
1	17/05/22	169	LB	Lesser Black-backed Gull	1	17:48		30				30		
1	17/05/22	170	MA	Mallard	3	17:53		33				20	13	
1	17/05/22	171	BZ	Buzzard	1	18:00		25				25		
1	17/05/22	172	BZ	Buzzard	1	18:09		180				100	80	
1	17/05/22	173	SH	Sparrowhawk	2	18:17		60	10	20	20	10		
1	17/05/22	174	BZ	Buzzard	1	18:49		240				140	100	
1	17/05/22	175	LB	Lesser Black-backed Gull	4	19:03		45					45	
1	25/05/22	176	LB	Lesser Black-backed Gull	11	16:59		60					60	
1	25/05/22	177	BZ	Buzzard	1	17:16		300					150	150
1	25/05/22	178	LB	Lesser Black-backed Gull	1	17:38		70					70	
1	26/05/22	179	LB	Lesser Black-backed Gull	2	19:38		150					100	50
1	26/05/22	180	BZ	Buzzard	2	20:32		30					30	
1	26/05/22	181	LB	Lesser Black-backed Gull	61	20:50		60					60	

VP	Date	Mapnote / Flightline No.	Map Name	Species	Quantity	Start	In/ Out	Duration (s)	0- 10m (s)	10- 20m (s)	20- 30m (s)	30- 50m (s)	50- 100m (s)	100- 185m (s)
1	26/05/22	182	LB	Lesser Black-backed Gull	29	20:52		45					45	
2	20/05/22	183	LB	Lesser Black-backed Gull	1	20:09		15			15			
2	20/05/22	184	LB	Lesser Black-backed Gull	6	20:39		10		10				
2	23/05/22	185	SI	Swift	4	17:18		110			20	40	50	
2	23/05/22	186	LB	Lesser Black-backed Gull	1	17:28		60		20	40			
2	23/05/22	187	BZ	Buzzard	1	18:13		360					300	60
2	23/05/22	188	BZ	Buzzard	1	18:51		420					320	100
2	23/05/22	189	LB	Lesser Black-backed Gull	8	19:36		300						300
2	24/05/22	190	LB	Lesser Black-backed Gull	1	18:18		35		15	20			
2	24/05/22	191	LB	Lesser Black-backed Gull	1	18:49		20			20			
2	24/05/22	N/A	LB	Lesser Black-backed Gull										
2	08/06/22	192	BZ	Buzzard	1	08:16		20			20			
2	08/06/22	193	K.	Kestrel	1	08:38		30			30			
2	08/06/22	194	K.	Kestrel	1	09:28		20			20			
2	08/06/22	195	BZ	Buzzard	1	09:59		40			10	30		
2	08/06/22	196	LB	Lesser Black-backed Gull	1	10:09		70				70		
2	08/06/22	197	BZ	Buzzard	1	10:22		720			270	500		
2	08/06/22	198	PE	Peregrine	1	10:33		13		13				

VP	Date	Mapnote / Flightline No.	Map Name	Species	Quantity	Start	In/ Out	Duration (s)	0- 10m (s)	10- 20m (s)	20- 30m (s)	30- 50m (s)	50- 100m (s)	100- 185m (s)
1	07/06/22	199	BZ	Buzzard	1	9:54		620				220	400	
2	07/06/22	200	BZ	Buzzard	1	10:40		60				20	40	
2	14/06/22	201	BZ	Buzzard	1	9:29		50				50		
2	14/06/22	202	HG	Herring Gull	2	09:52		240				40	200	
1	19/06/22	203	LB	Lesser Black-backed Gull	2	12:51		30				30		
1	19/06/22	204	BZ	Buzzard	1	13:10		120				60	60	
1	19/06/22	205	HG	Herring Gull	2	13:36		35			20	15		
1	19/06/22	206	LB	Lesser Black-backed Gull	1	13:38		20			20			
1	19/06/22	207	LB	Lesser Black-backed Gull	1	14:06		36					36	
2	11/07/22	208	BZ	Buzzard	1	18:59		45			45			
2	27/07/22	209	BZ	Buzzard	1	19:05		20						
1	13/07/22	210	BZ	Buzzard	1	14:32		50				50		
1	13/07/22	211	SH	Sparrowhawk	1	14:40		5	5					
1	13/07/22	212	K.	Kestrel	1	14:43		15			15			
1	13/07/22	213	K.	Kestrel	1	15:13		45			20	25		
1	13/07/22	214	BZ	Buzzard	1	15:45		50			40	10		
1	13/07/22	215	K.	Kestrel	1	16:09		40			40			
1	13/07/22	216	BZ	Buzzard	1			90					90	
1	21/07/22	217	BZ	Buzzard	1	17:03		40				40		
1	21/07/22	218	K.	Kestrel	1	19:37		150			30	80	40	
1	13/08/22	219	BZ	Buzzard	1	10:03		120				80	40	
1	13/08/22	220	BZ	Buzzard	1	11:00		180						180

VP	Date	Mapnote / Flightline No.	Map Name	Species	Quantity	Start	In/ Out	Duration (s)	0- 10m (s)	10- 20m (s)	20- 30m (s)	30- 50m (s)	50- 100m (s)	100- 185m (s)
1	13/08/22	221	K.	Kestrel	1	11:17		25			25			
1	18/08/22	222	SH	Sparrowhawk	1	20:01		54				20	20	14
2	12/08/22	223	GS	Great Spotted Woodpecker	1	10:31		50			30	20		
2	12/08/22	224	LB	Lesser Black-backed Gull	1	10:36		30				30		
2	12/08/22	225	BZ	Buzzard	1	10:53		480	450	15	15			
2	12/08/22	226	LB	Lesser Black-backed Gull	1	11:29		190					90	100
2	12/08/22	227	LB	Lesser Black-backed Gull	19	11:57		150					50	100
2	15/09/22	228	K.	Kestrel	1	14:42		80		40	40			
2	15/09/22	229	K.	Kestrel	1	14:49		30			30		160	
2	15/09/22	230	BZ	Buzzard	1	15:22		360			80	120	160	
2	15/09/22	231	LB	Lesser Black-backed Gull	8	15:29		180				100	80	
2	21/09/22	232	LB	Lesser Black-backed Gull	1	08:36		10		10				
2	21/09/22	233	LB	Lesser Black-backed Gull	1	09:05		96			96			
2	25/09/22	234	BZ	Buzzard	1	11:17		50				50		
2	25/09/22	235	LB	Lesser Black-backed Gull	4	11:37		25			15	10		
2	25/09/22	236	SN	Snipe	1	11:50		40				20	20	
1	21/09/22	237	LB	Lesser Black-backed Gull	21	17:54		30					30	

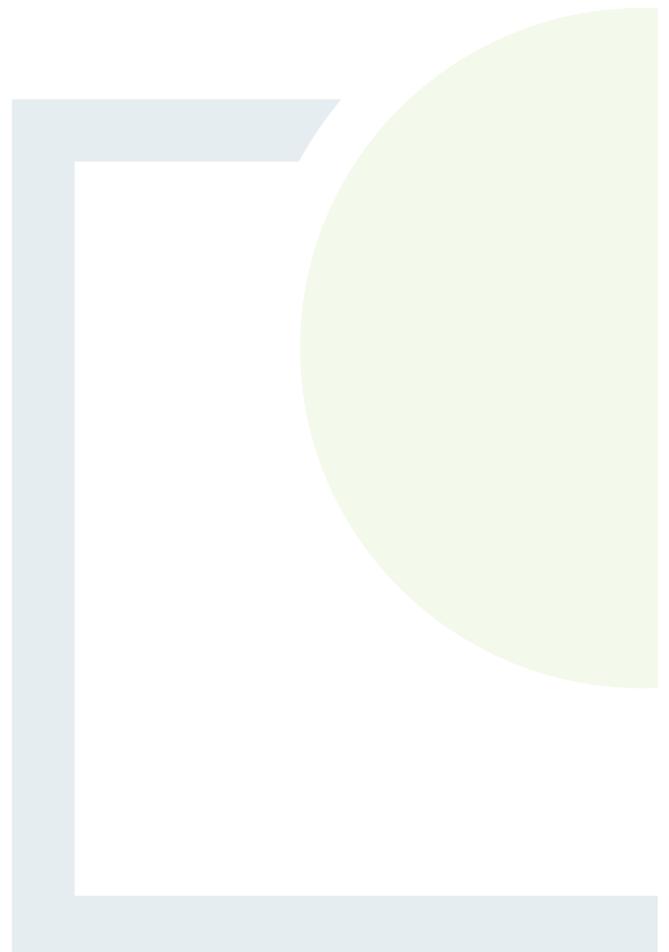
VP	Date	Mapnote / Flightline No.	Map Name	Species	Quantity	Start	In/ Out	Duration (s)	0- 10m (s)	10- 20m (s)	20- 30m (s)	30- 50m (s)	50- 100m (s)	100- 185m (s)
1	21/09/22	238	LB	Lesser Black-backed Gull	5	18:00		30					30	
1	21/09/22	239	LB	Lesser Black-backed Gull	4	18:19		50				10	40	
1	21/09/22	240	LB	Lesser Black-backed Gull	1	18:29		25				25		
1	21/09/22	241	LB	Lesser Black-backed Gull	6	18:42		40					40	
1	28/09/22	242	LB	Lesser Black-backed Gull	3	12:53		40				40		
1	28/09/22	243	K.	Kestrel	1	13:15		120				80	40	
1	28/09/22	244	LB	Lesser Black-backed Gull	16	14:05		50					50	
1	28/09/22	245	K.	Kestrel	1	14:35		110				110		
1	28/09/22	246	SH	Sparrowhawk	1	14:41		238					100	138
1	28/09/22	247	LB	Lesser Black-backed Gull	47	17:08		40				40		
1	28/09/22	248	K.	Kestrel	1	17:19		57			57			
1	28/09/22	249	LB	Lesser Black-backed Gull	1	17:51		64			30	34		

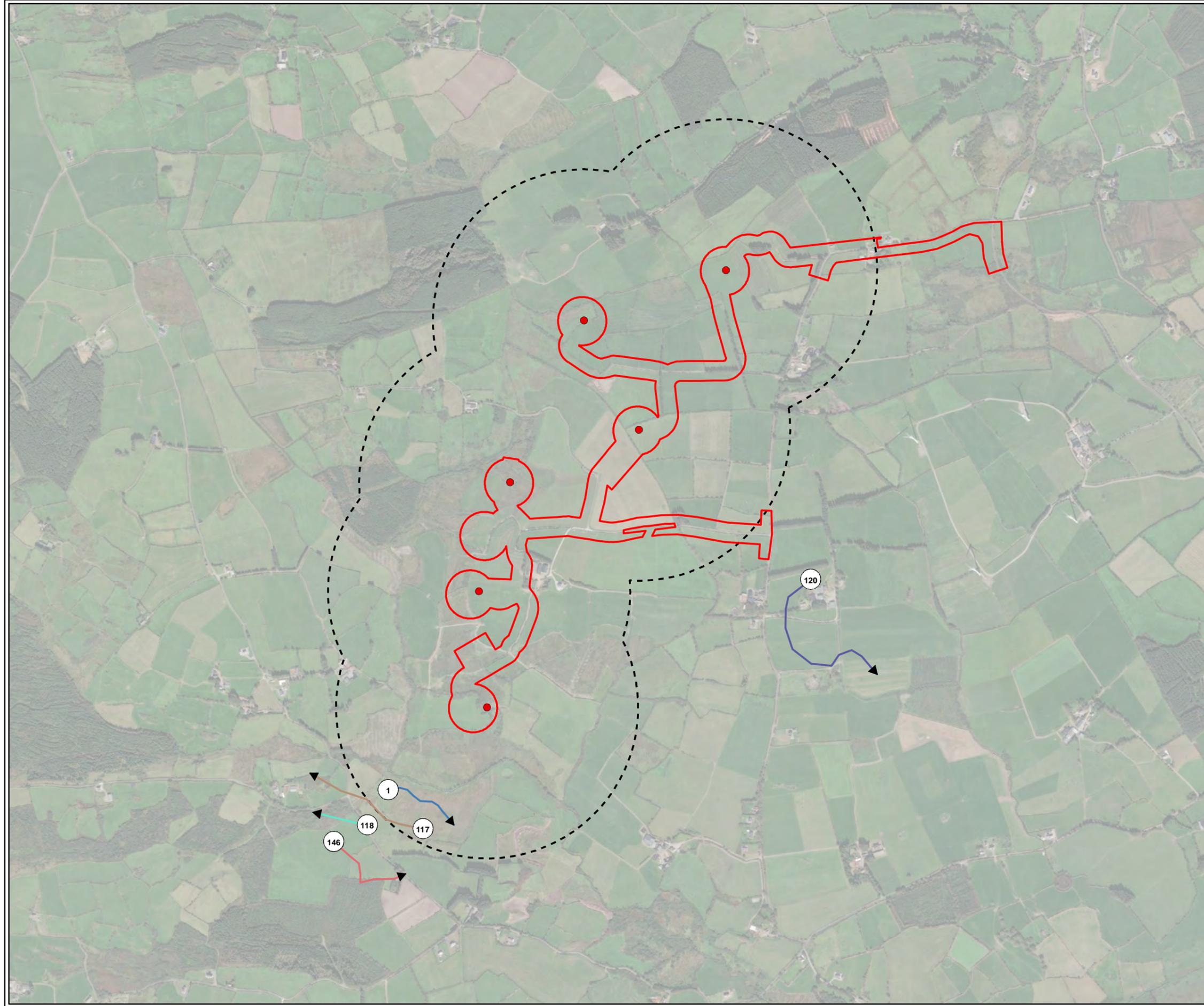


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APPENDIX 2

Flight Line Maps





Legend

- Development Planning Boundary
- SNH Buffer
- Proposed Turbine Layout

Flightlines

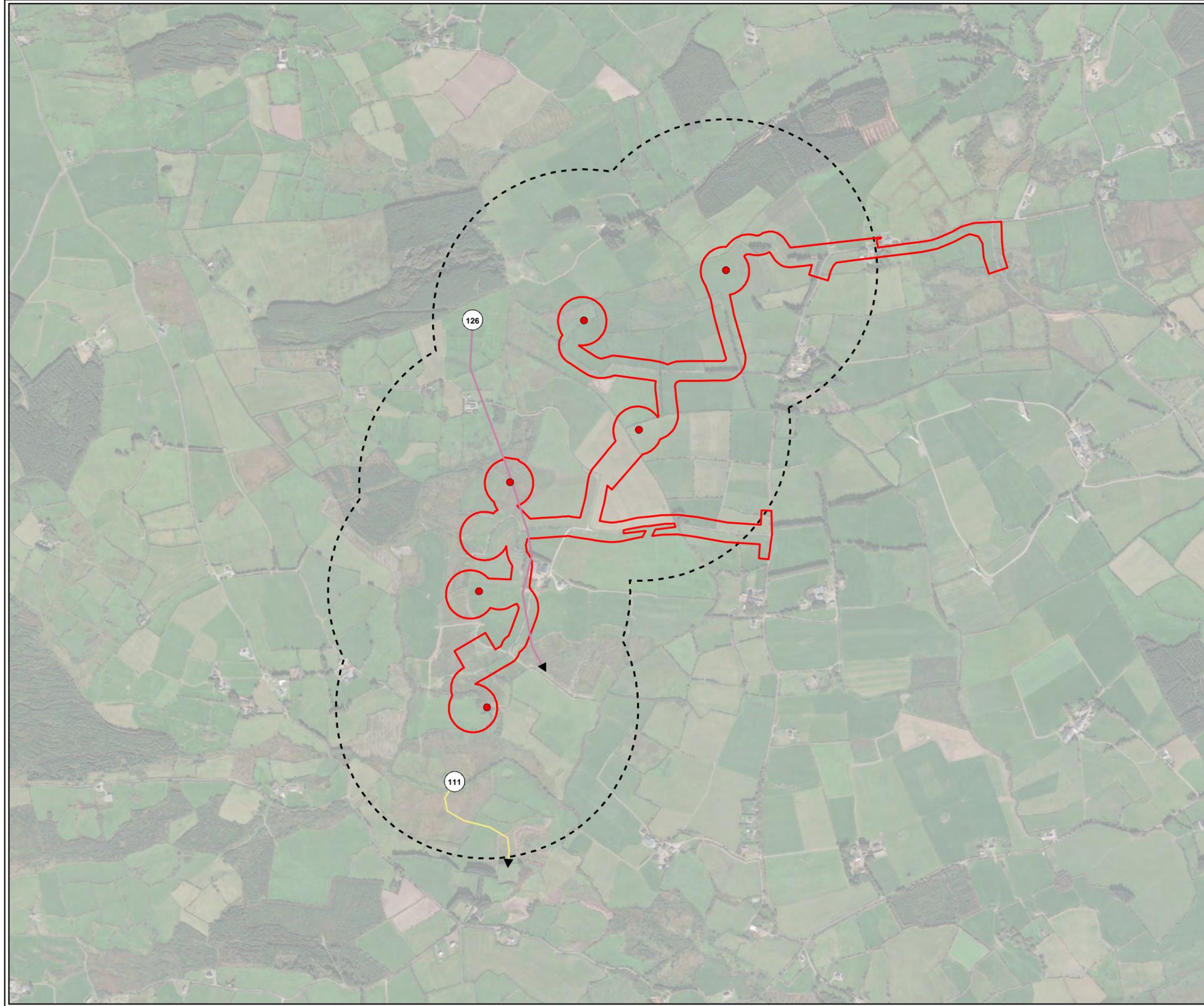
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- 117, 10/11/2021, 11:54:00
- 118, 15/12/2021, 12:39:00
- 120, 02/11/2021, 12:53:00
- 146, 12/03/2022, 11:51:00

TITLE: Winter 2020/2021 and 2021/2022 Kestrel	
PROJECT: Barnadivane Wind Farm and Substation, Co. Cork	
FIGURE NO.: -	
CLIENT: Barna Wind Energy Ltd. & Arran Windfarm Ltd.	
SCALE: 1:12500	REVISION: 0
DATE: 23/02/2023	PAGE SIZE: A3

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Legend

- Development Planning Boundary
- SNH Buffer
- Proposed Turbine Layout

Flightlines

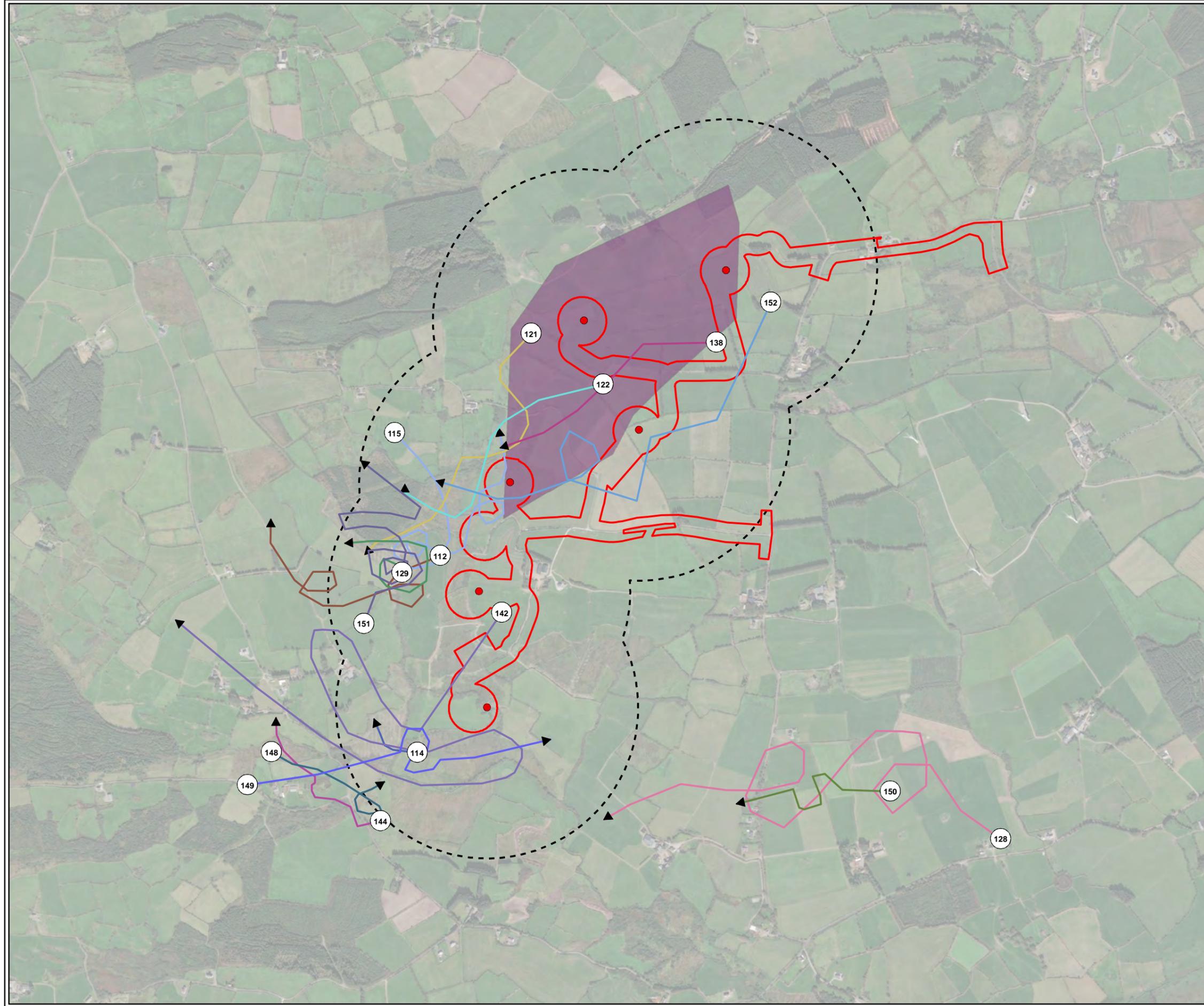
FlightNo, Date, Time

- 111, 08/10/2021, 10:04:00
- 126, 17/10/2021, 10:29:00

TITLE:	Winter 2021/2022 Lesser Black-backed Gull		
PROJECT:	Barnadivane Wind Farm and Substation, Co. Cork		
FIGURE NO:	-		
CLIENT:	Barna Wind Energy Ltd. & Arran Windfarm Ltd.		
SCALE:	1:12500	REVISION:	0
DATE:	23/02/2023	PAGE SIZE:	A3

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Legend

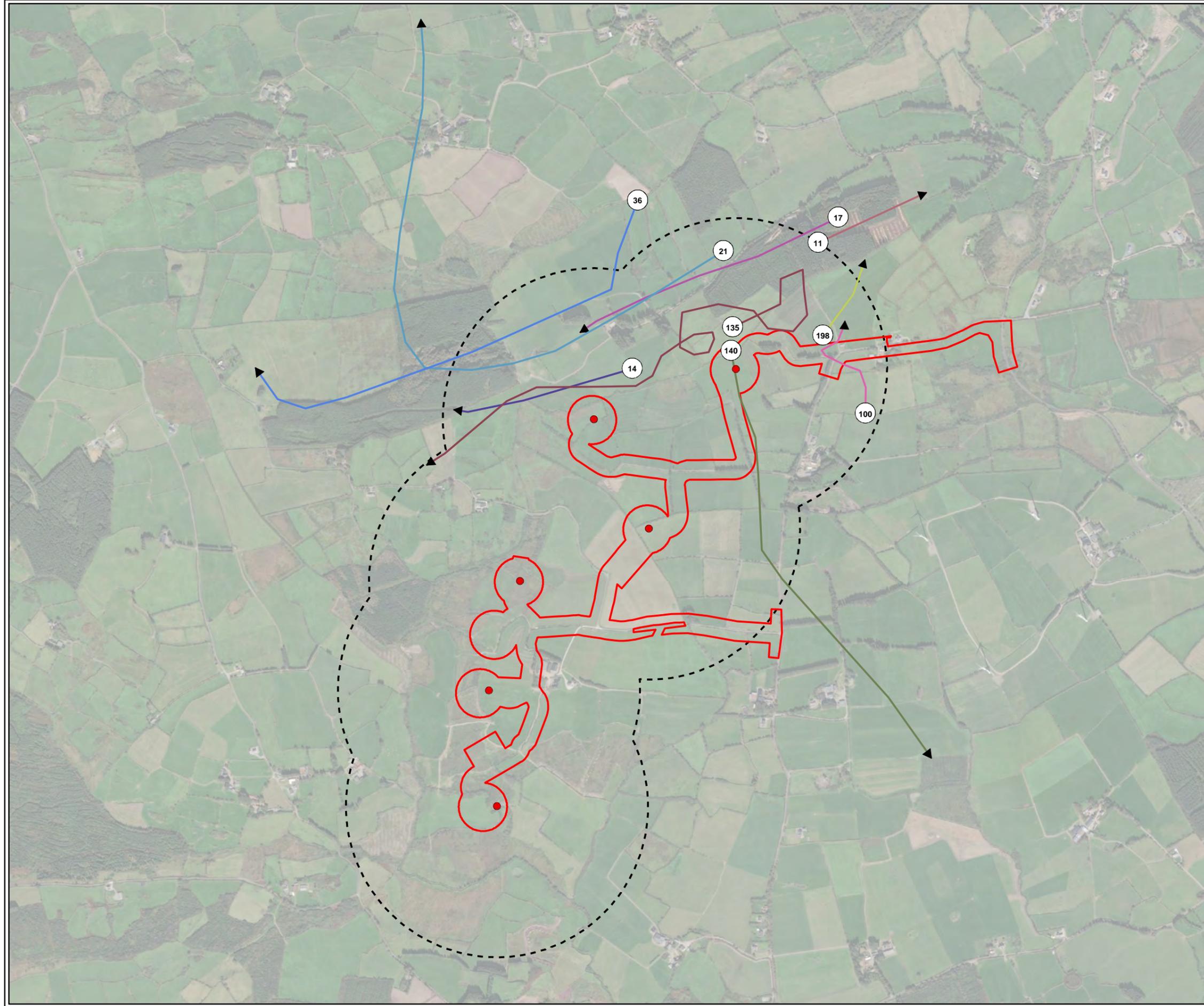
- Development Planning Boundary
- SNH Buffer
- Proposed Turbine Layout

Flightlines
FlightNo, Date, Time

- ▶ 112, 08/10/2021, 10:16:00
- ▶ 114, 30/10/2021, 10:18:00
- ▶ 115, 30/10/2021, 11:11:00
- ▶ 121, 02/11/2021, 13:23:00
- ▶ 122, 02/11/2021, 13:39:00
- ▶ 128, 17/10/2021, 12:34:00
- ▶ 129, 21/12/2021, 10:44:00
- ▶ 138, 16/02/2022, 15:30:00
- ▶ 142, 05/02/2022, 11:14:00
- ▶ 144, 12/03/2022, 11:38:00
- ▶ 148, 15/03/2022, 11:56:00
- ▶ 149, 15/03/2022, 12:46:00
- ▶ 150, 18/03/2022, 15:32:00
- ▶ 151, 18/03/2022, 16:29:00
- ▶ 152, 18/03/2022, 16:56:00
- 133, 19/01/2022, 09:45:00

TITLE:	Winter 2021/2022 Buzzard		
PROJECT:	Barnadivane Wind Farm and Substation, Co. Cork		
FIGURE NO.:	-		
CLIENT:	Barna Wind Energy Ltd. & Arran Windfarm Ltd.		
SCALE:	1:12500	REVISION:	0
DATE:	23/02/2023	PAGE SIZE:	A3

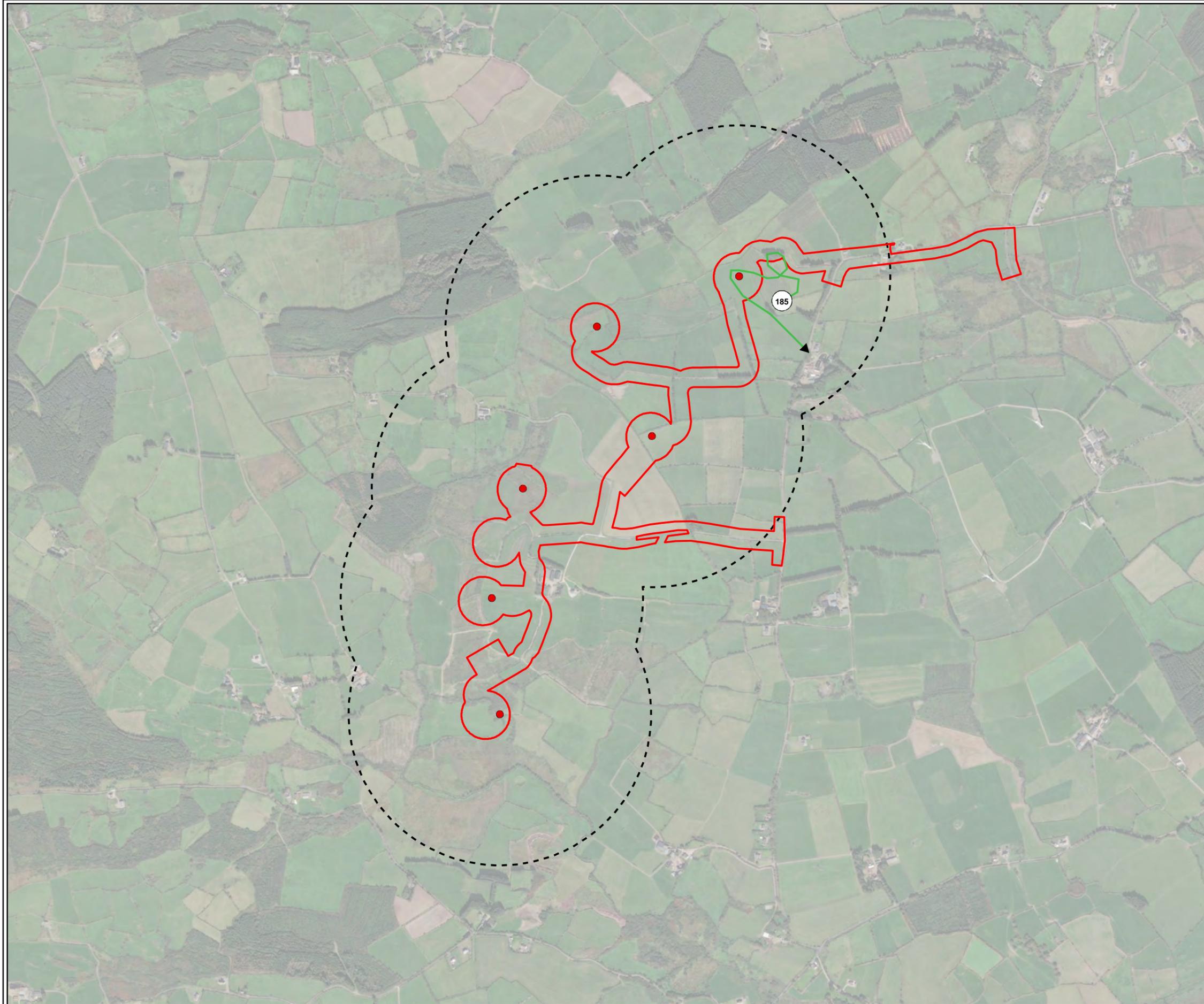




- Legend**
- Development Planning Boundary
 - SNH Buffer
 - Proposed Turbine Layout
- Flightlines**
- FlightNo, Date, Time**
- ▶ 11, 14/01/2021, 10:22:00
 - ▶ 14, 14/01/2021, 11:17:00
 - ▶ 17, 14/01/2021, 11:42:00
 - ▶ 21, 14/01/2021, 14:50:00
 - ▶ 36, 15/03/2021, 12:19:00
 - ▶ 100, 01/08/2021, 11:37:00
 - ▶ 135, 19/01/2022, 11:12:00
 - ▶ 140, 16/02/2022, 17:05:00
 - ▶ 198, 08/06/2022, 10:33:00

TITLE:	Peregrine
PROJECT:	Barnadivane Wind Farm and Substation, Co. Cork
FIGURE NO.:	-
CLIENT:	Barna Wind Energy Ltd. & Arran Windfarm Ltd.
SCALE:	1:12500
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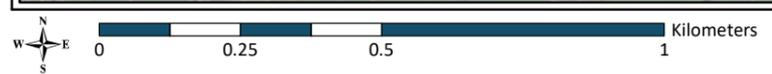
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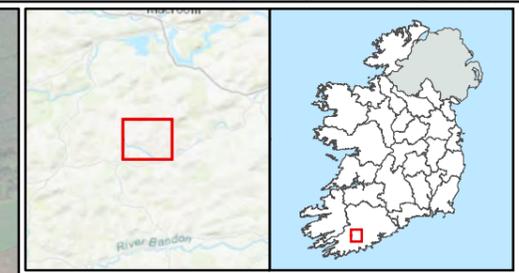
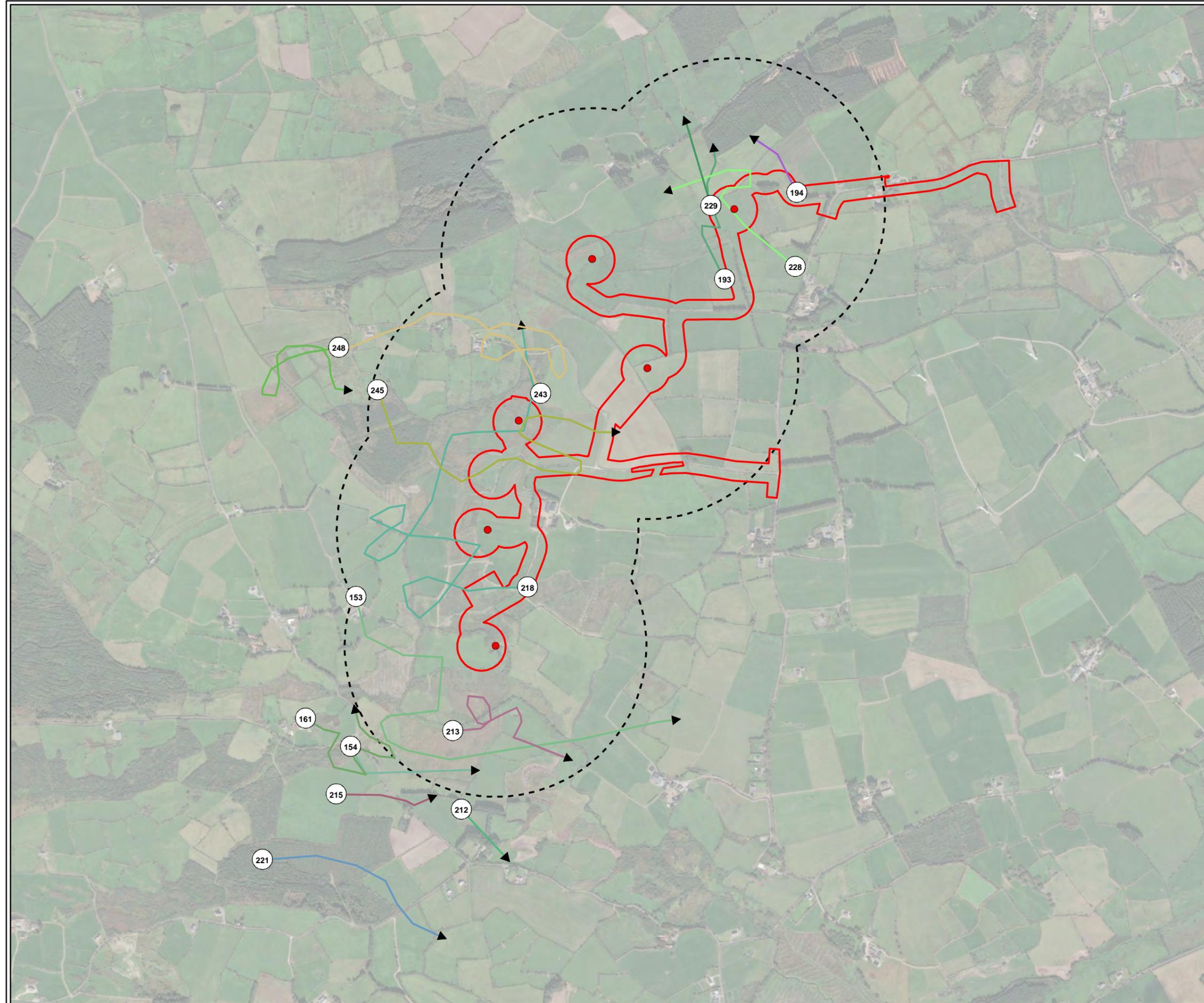
- Development Planning Boundary
- SNH Buffer
- Proposed Turbine Layout

Flightlines
FlightNo, Date, Time

- 185, 23/05/2022, 17:18:00

TITLE:	Swift
PROJECT:	Barnadivane Wind Farm and Substation, Co. Cork
FIGURE NO:	-
CLIENT:	Barna Wind Energy Ltd. & Arran Windfarm Ltd.
SCALE:	1:12500
REVISION:	0
DATE:	23/02/2023
PAGE SIZE:	A3





Legend

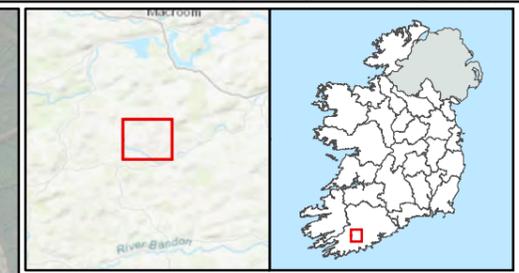
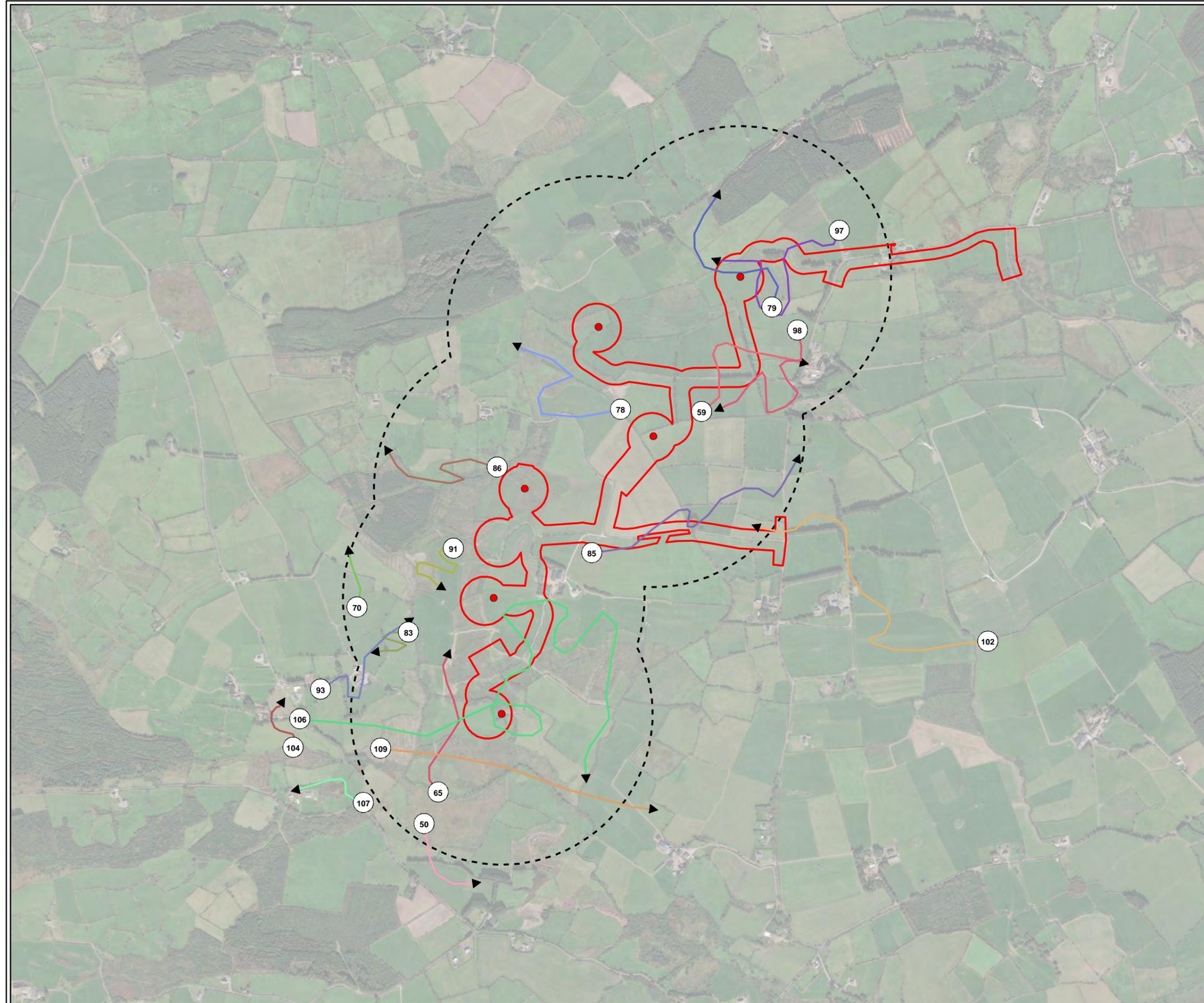
- Development Planning Boundary
- SNH Buffer
- Proposed Turbine Layout

Flightlines
FlightNo, Date, Time

- ▶ 153, 05/04/2022, 15:22:00
- ▶ 154, 05/04/2022, 15:36:00
- ▶ 161, 27/04/2022, 10:38:00
- ▶ 193, 08/06/2022, 08:38:00
- ▶ 194, 08/06/2022, 09:28:00
- ▶ 212, 13/07/2022, 14:43:00
- ▶ 213, 13/07/2022, 15:13:00
- ▶ 215, 13/07/2022, 16:09:00
- ▶ 218, 21/07/2022, 19:37:00
- ▶ 221, 13/08/2022, 11:17:00
- ▶ 228, 15/09/2022, 14:42:00
- ▶ 229, 15/09/2022, 14:49:00
- ▶ 243, 28/09/2022, 13:15:00
- ▶ 245, 28/09/2022, 14:35:00
- ▶ 248, 28/09/2022, 17:19:00

TITLE:	Summer 2022 Kestrel
PROJECT:	Barnadivane Wind Farm and Substation, Co. Cork
FIGURE NO.:	-
CLIENT:	Barna Wind Energy Ltd. & Arran Windfarm Ltd.
SCALE:	1:12500
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DATE:	23/02/2023
PAGE SIZE:	A3





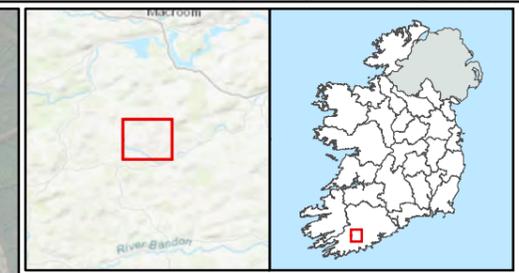
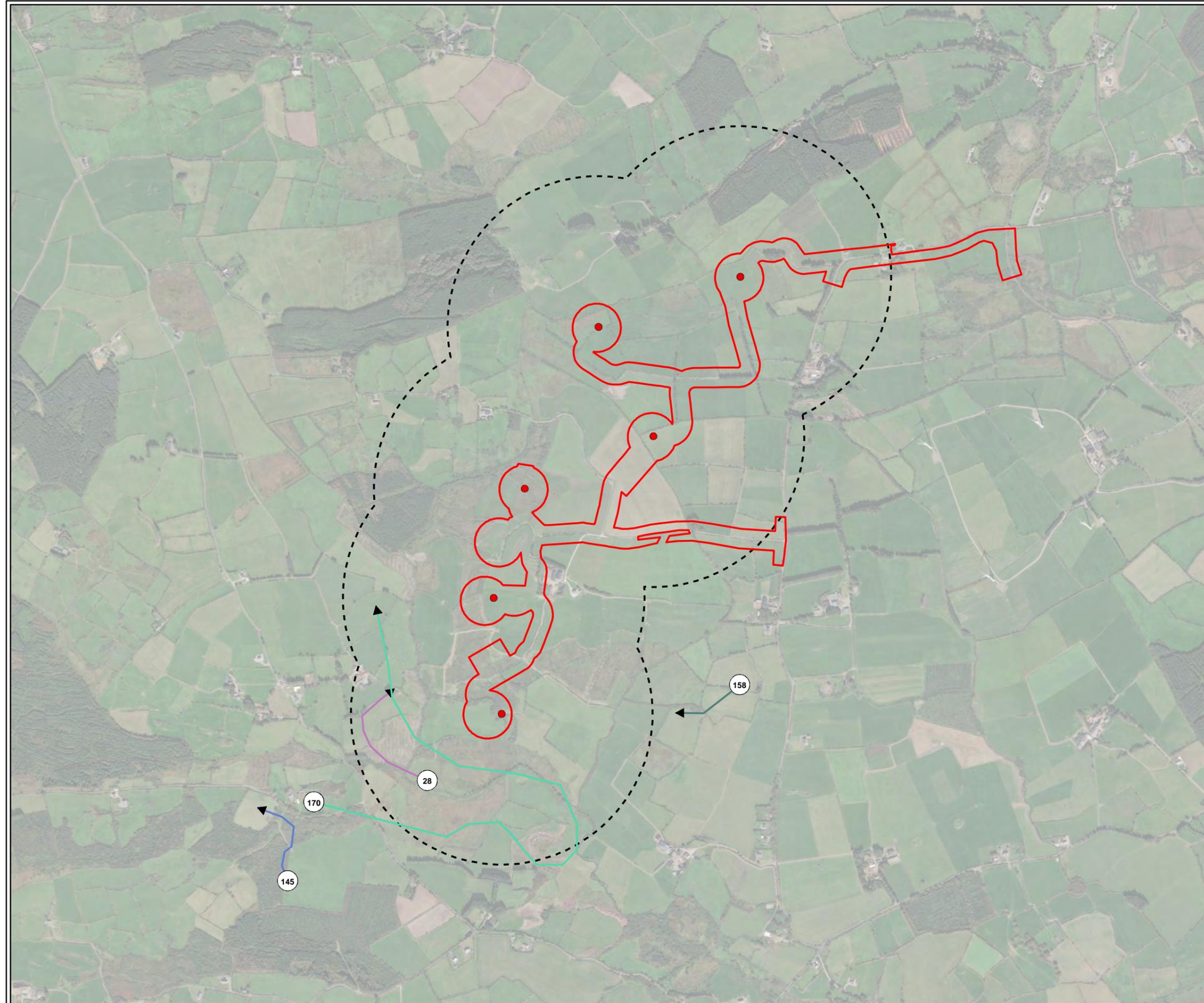
- Legend**
- Development Planning Boundary
 - SNH Buffer
 - Proposed Turbine Layout

Flightlines
FlightNo, Date, Time

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▶	59, 09/04/2021, 14:20:00
▶	65, 09/05/2021, 16:06:00
▶	70, 11/05/2021, 10:14:00
▶	78, 17/06/2021, 18:48:00
▶	79, 17/06/2021, 18:54:00
▶	83, 16/06/2021, 13:40:00
▶	85, 16/06/2021, 14:56:00
▶	86, 16/06/2021, 15:15:00
▶	91, 02/07/2021, 11:28:00
▶	93, 02/07/2021, 14:51:00
▶	97, 01/08/2021, 08:47:00
▶	98, 01/08/2021, 09:48:00
▶	102, 01/08/2021, 13:26:00
▶	104, 02/08/2021, 11:28:00
▶	106, 02/08/2021, 18:21:00
▶	107, 03/09/2021, 12:08:00
▶	109, 03/09/2021, 13:46:00

TITLE:	Summer 2021 Kestrel
PROJECT:	Barnadivane Wind Farm and Substation, Co. Cork
FIGURE NO:	-
CLIENT:	Barna Wind Energy Ltd. & Arran Windfarm Ltd.
SCALE:	1:12500
REVISION:	0
DATE:	23/02/2023
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Legend

- Development Planning Boundary
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Flightlines

FlightNo, Date, Time

- ➔ 28, 07/03/2021, 12:18:00
- ➔ 145, 12/03/2022, 11:50:00
- ➔ 158, 06/04/2022, 16:23:00
- ➔ 170, 17/05/2022, 17:53:00

TITLE:	Mallard
PROJECT:	Barnadivane Wind Farm and Substation, Co. Cork
FIGURE NO:	-
CLIENT: Barna Wind Energy Ltd. & Arran Windfarm Ltd.	
SCALE: 1:12500	REVISION: 0
DATE: 23/02/2023	PAGE SIZE: A3

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Legend

- Development Planning Boundary
- SNH Buffer
- Proposed Turbine Layout

Flightlines

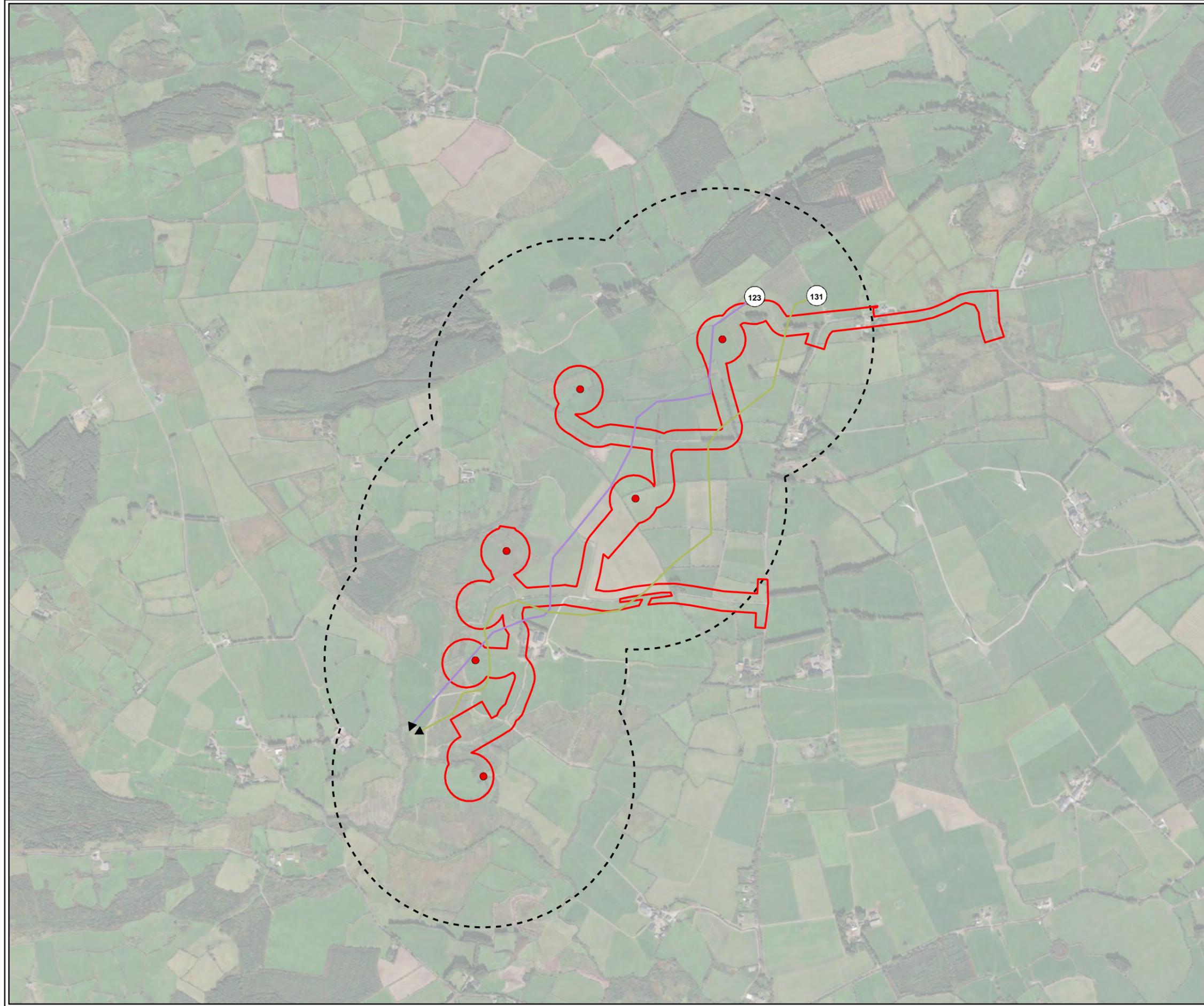
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- ▶ 168, 27/04/2022, 12:39:00
- ▶ 202, 14/06/2022, 09:52:00
- ▶ 205, 19/06/2022, 13:36:00

TITLE:	Herring Gull
PROJECT:	Barnadivane Wind Farm and Substation, Co. Cork
FIGURE NO:	-
CLIENT:	Barna Wind Energy Ltd. & Arran Windfarm Ltd.
SCALE:	1:12500
REVISION:	0
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Legend

- Development Planning Boundary
- SNH Buffer
- Proposed Turbine Layout

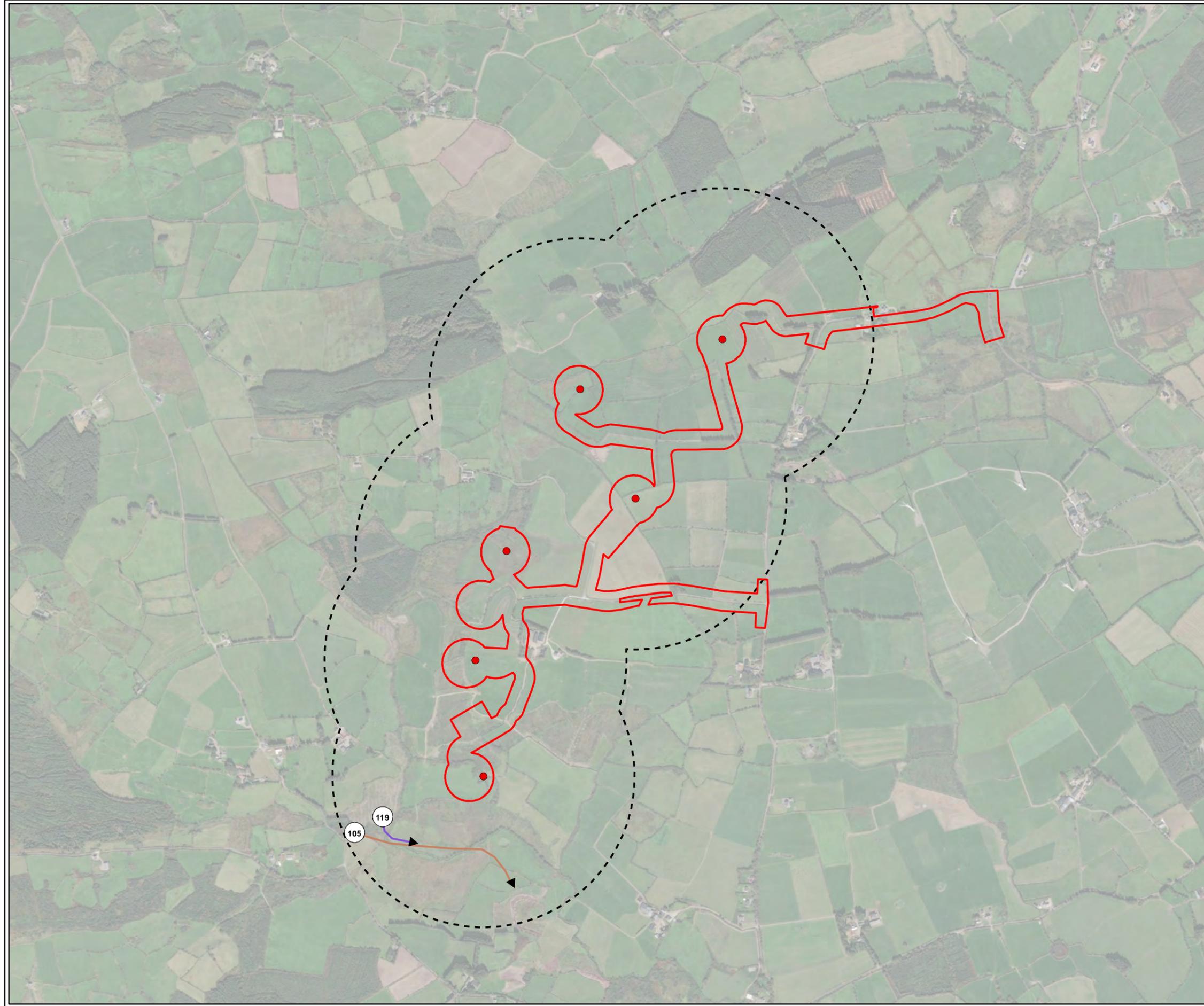
Flightlines

FlightNo, Date, Time

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- ▶ 131, 21/12/2021, 15:46:00

TITLE:	
Hen Harrier	
PROJECT:	
Barnadivane Wind Farm and Substation, Co. Cork	
FIGURE NO:	
-	
CLIENT: Barna Wind Energy Ltd. & Arran Windfarm Ltd.	
SCALE: 1:12500	REVISION: 0
DATE: 23/02/2023	PAGE SIZE: A3





Legend

- Development Planning Boundary
- SNH Buffer
- Proposed Turbine Layout

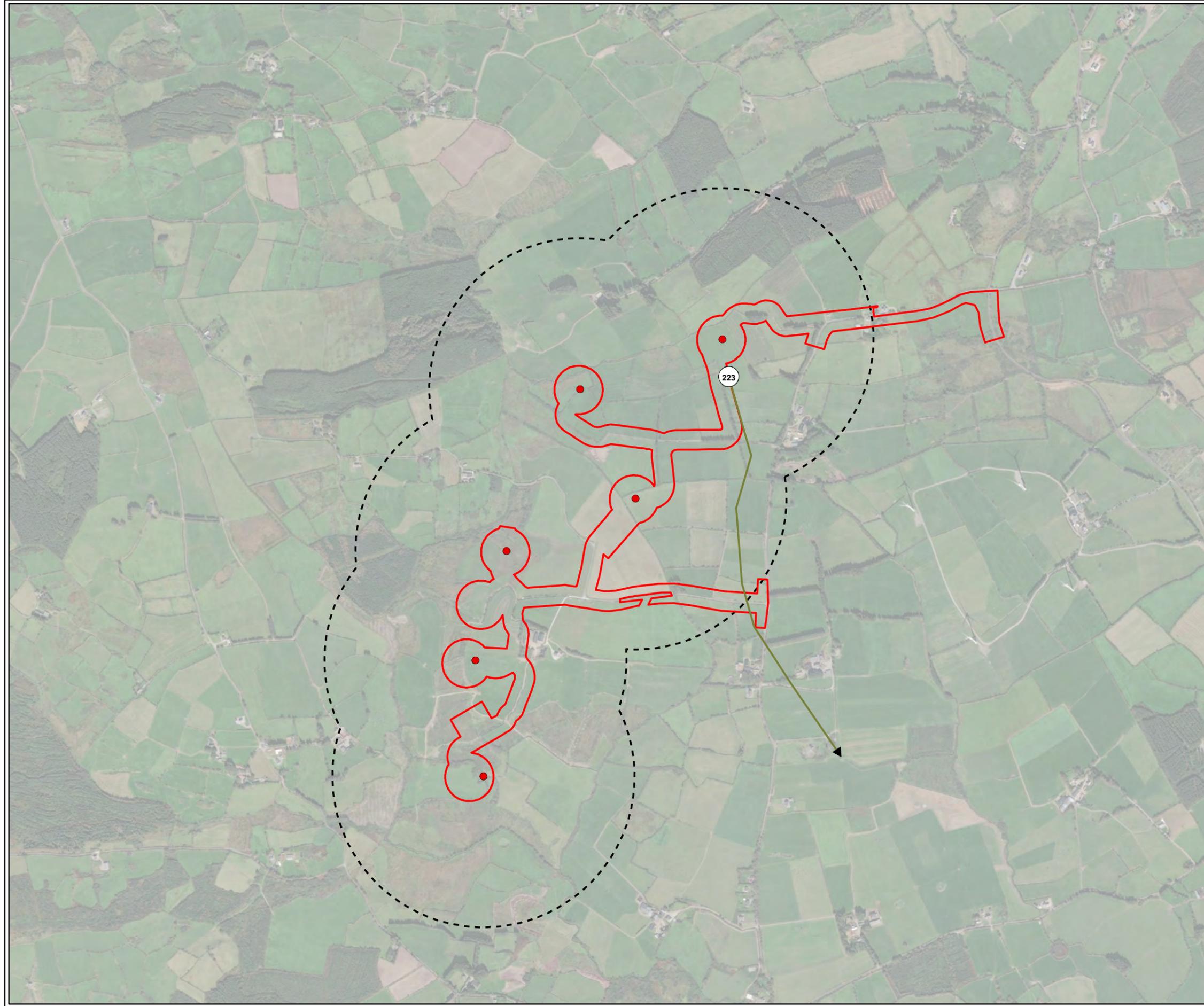
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FlightNo, Date, Time

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- 119, 15/12/2021, 15:38:00

TITLE:	
Grey Heron	
PROJECT:	
Barnadivane Wind Farm and Substation, Co. Cork	
FIGURE NO:	
-	
CLIENT: Barna Wind Energy Ltd. & Arran Windfarm Ltd.	
SCALE: 1:12500	REVISION: 0
DATE: 23/02/2023	PAGE SIZE: A3





Legend

- Development Planning Boundary
- SNH Buffer
- Proposed Turbine Layout

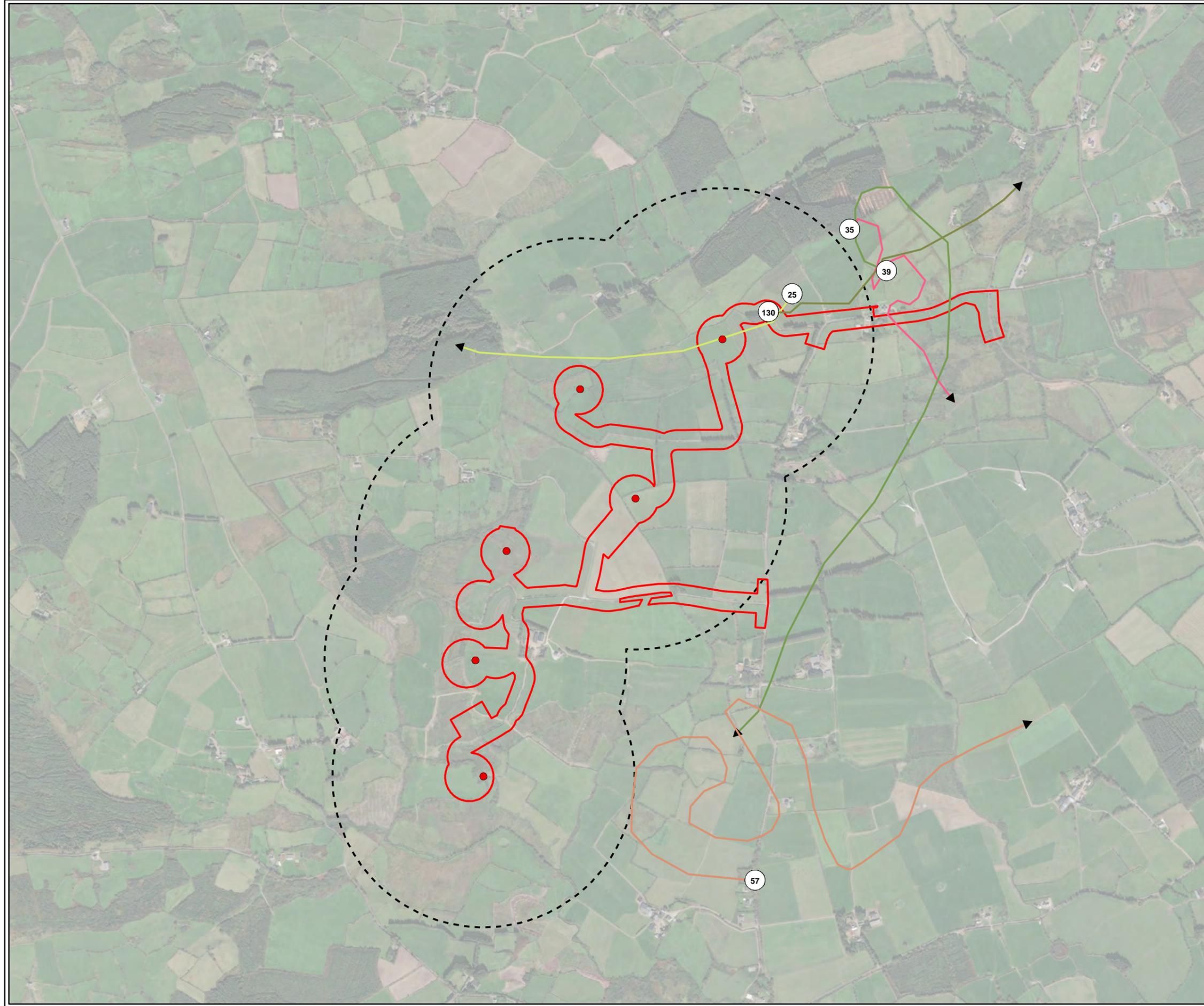
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TITLE:	Great Spotted Woodpecker		
PROJECT:	Barnadivane Wind Farm and Substation, Co. Cork		
FIGURE NO.:	-		
CLIENT:	Barna Wind Energy Ltd. & Arran Windfarm Ltd.		
SCALE:	1:12500	REVISION:	0
DATE:	23/02/2023	PAGE SIZE:	A3

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Legend

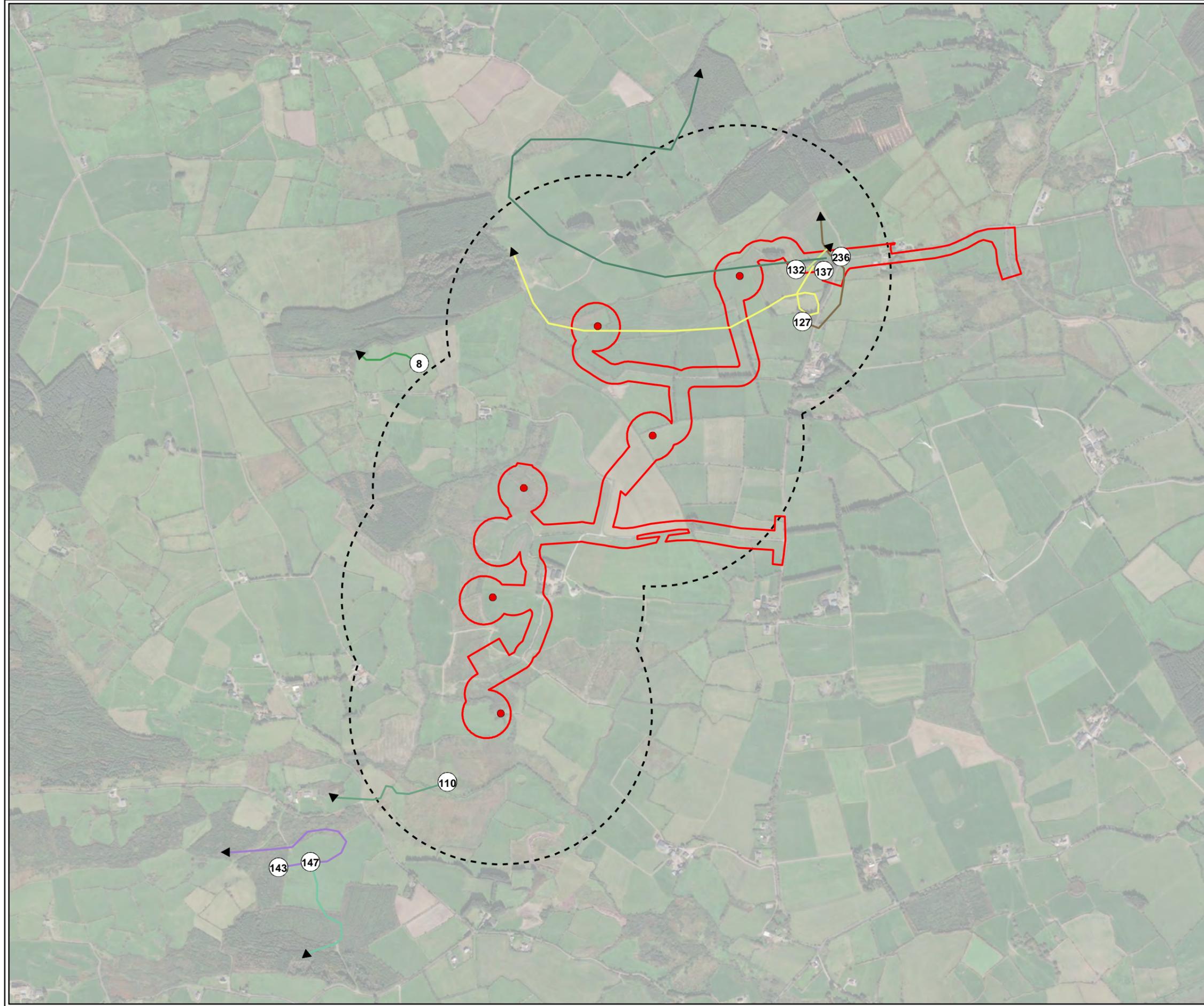
- Development Planning Boundary
- SNH Buffer
- Proposed Turbine Layout

Flightlines
FlightNo, Date, Time

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- ▶ 35, 15/03/2021, 12:09:00
- ▶ 39, 15/03/2021, 13:36:00
- ▶ 57, 09/04/2021, 13:50:00
- ▶ 130, 21/12/2021, 11:32:00

TITLE:	Golden Plover
PROJECT:	Barnadivane Wind Farm and Substation, Co. Cork
FIGURE NO.:	-
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SCALE:	1:12500
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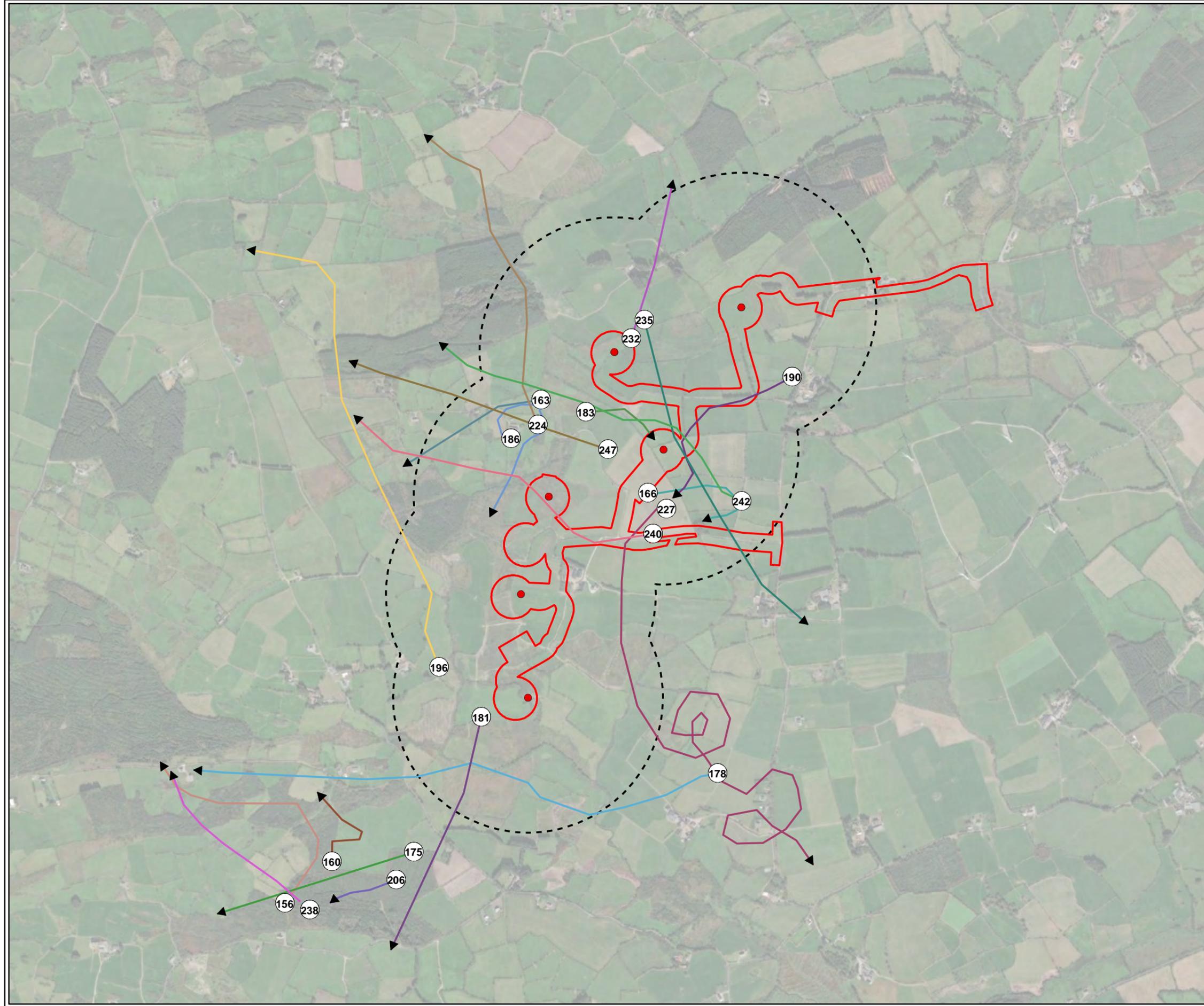




- Legend**
- Development Planning Boundary
 - SNH Buffer
 - Proposed Turbine Layout
- Flightlines**
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 - ➔ 110, 08/10/2021, 09:57:00
 - ➔ 127, 17/10/2021, 11:59:00
 - ➔ 132, 19/01/2022, 08:48:00
 - ➔ 137, 02/02/2022, 09:01:00
 - ➔ 143, 02/03/2022, 15:04:00
 - ➔ 147, 12/03/2022, 12:22:00
 - ➔ 236, 25/09/2022, 11:50:00

TITLE:	
Snipe	
PROJECT:	
Barnadivane Wind Farm and Substation, Co. Cork	
FIGURE NO:	
-	
CLIENT: Barna Wind Energy Ltd. & Arran Windfarm Ltd.	
SCALE: 1:12500	REVISION: 0
DATE: 23/02/2023	PAGE SIZE: A3
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Legend

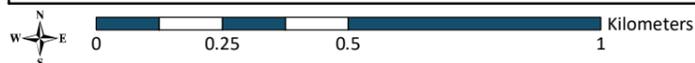
- Development Planning Boundary
- SNH Buffer
- Proposed Turbine Layout

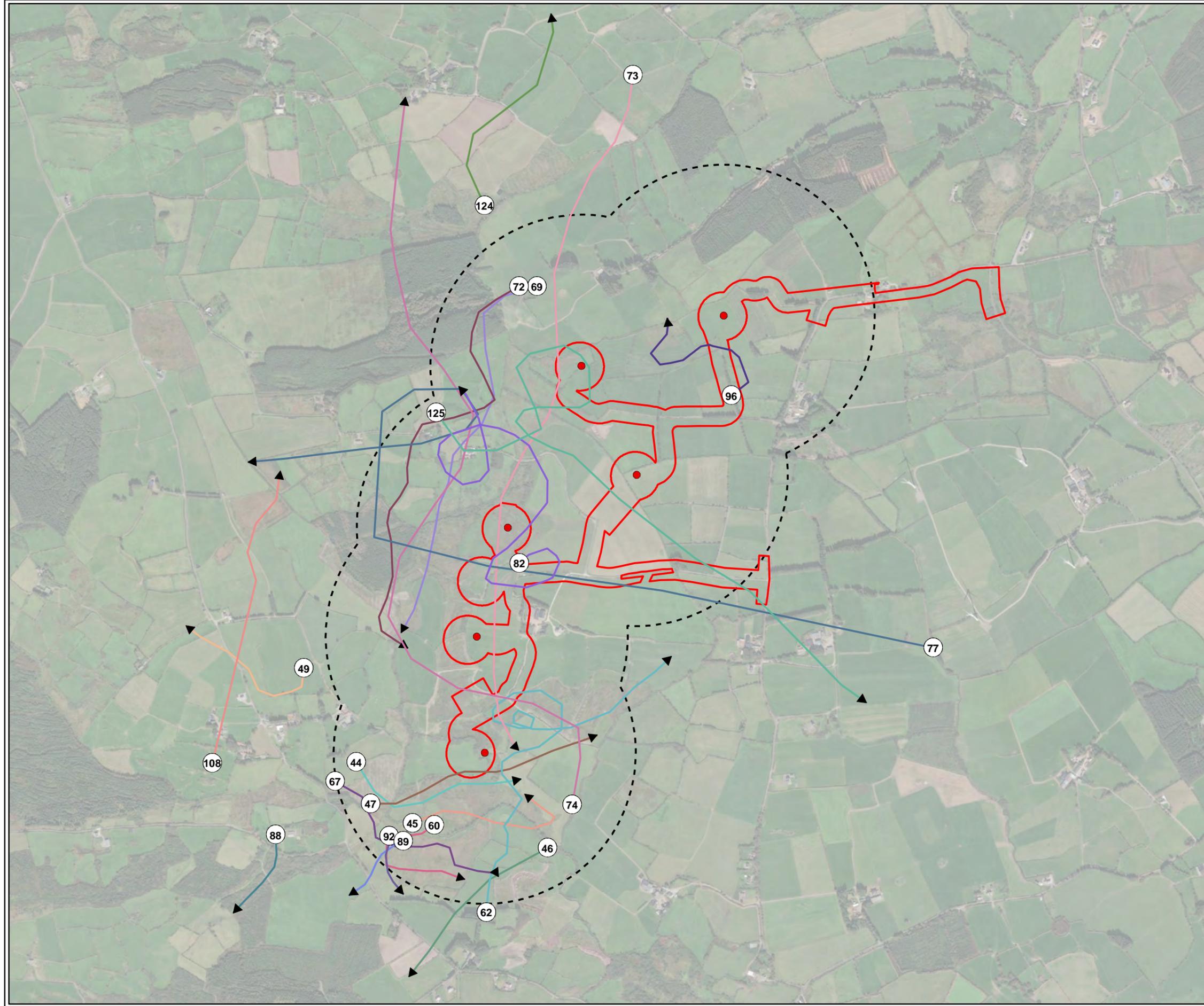
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- ▶ 163, 22/04/2022, 13:49:00
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- ▶ 175, 17/05/2022, 19:03:00
- ▶ 178, 25/05/2022, 17:38:00
- ▶ 181, 26/05/2022, 20:50:00
- ▶ 183, 20/05/2022, 20:09:00
- ▶ 186, 23/05/2022, 17:28:00
- ▶ 190, 24/05/2022, 18:18:00
- ▶ 196, 08/06/2022, 10:09:00
- ▶ 206, 19/06/2022, 13:38:00
- ▶ 224, 12/08/2022, 10:36:00
- ▶ 227, 12/08/2022, 11:57:00
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- ▶ 235, 25/09/2022, 11:37:00
- ▶ 238, 21/09/2022, 18:00:00
- ▶ 240, 21/09/2022, 18:29:00
- ▶ 242, 28/09/2022, 12:53:00
- ▶ 247, 28/09/2022, 17:08:00

TITLE:	Summer 2022 Lesser Black-backed Gull 2
PROJECT:	Barnadivane Wind Farm and Substation, Co. Cork
FIGURE NO.:	-
CLIENT:	Barna Wind Energy Ltd. & Arran Windfarm Ltd.
SCALE:	1:14000
REVISION:	0
DATE:	23/02/2023
PAGE SIZE:	A3





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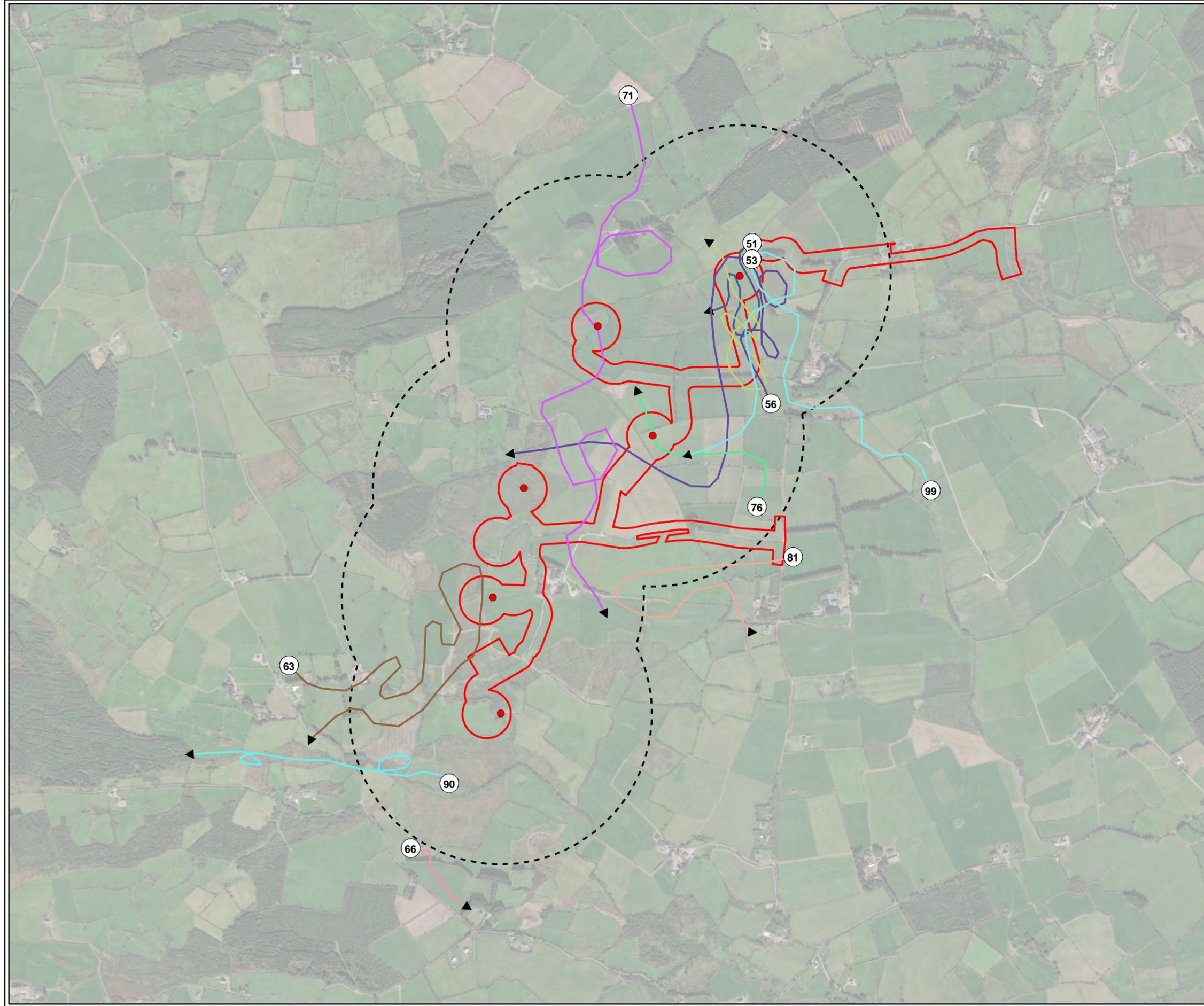
- Development Planning Boundary
- SNH Buffer
- Proposed Turbine Layout

Flightlines
FlightNo, Date, Time

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- ▶ 45, 09/04/2021, 17:32:00
- ▶ 46, 09/04/2021, 17:38:00
- ▶ 47, 11/04/2021, 08:33:00
- ▶ 49, 11/04/2021, 12:26:00
- ▶ 60, 09/05/2021, 14:37:00
- ▶ 62, 09/05/2021, 15:05:00
- ▶ 67, 15/05/2021, 19:13:00
- ▶ 69, 11/05/2021, 09:35:00
- ▶ 72, 11/05/2021, 14:04:00
- ▶ 73, 11/05/2021, 14:19:00
- ▶ 74, 17/06/2021, 14:07:00
- ▶ 77, 17/06/2021, 17:21:00
- ▶ 82, 16/06/2021, 12:43:00
- ▶ 88, 02/07/2021, 09:51:00
- ▶ 89, 02/07/2021, 10:52:00
- ▶ 92, 02/07/2021, 14:32:00
- ▶ 96, 01/08/2021, 08:41:00
- ▶ 108, 03/09/2021, 12:39:00
- ▶ 124, 06/09/2021, 11:22:00
- ▶ 125, 06/09/2021, 12:21:00

TITLE:	Summer 2021 Lesser Black-backed Gull
PROJECT:	Barnadivane Wind Farm and Substation, Co. Cork
FIGURE NO.:	-
CLIENT:	Barna Wind Energy Ltd. & Arran Windfarm Ltd.
SCALE:	1:12500
REVISION:	0
DATE:	23/02/2023
PAGE SIZE:	A3





Legend

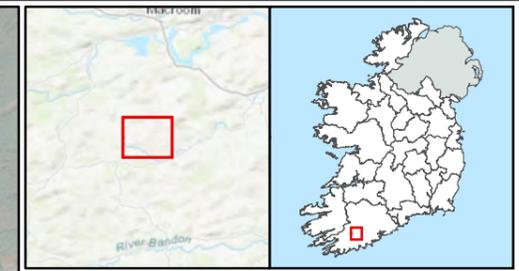
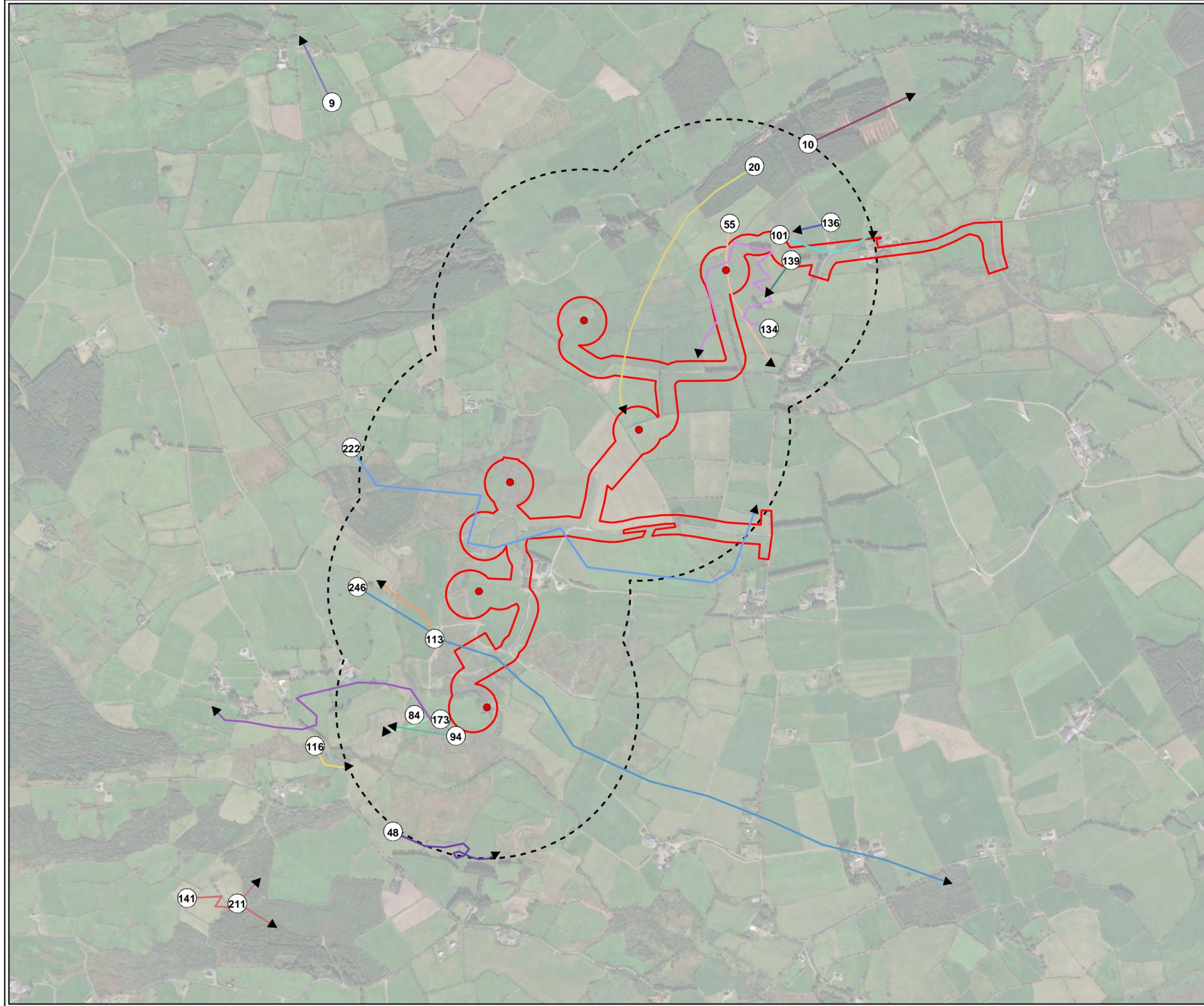
- Development Planning Boundary
- SNH Buffer
- Proposed Turbine Layout

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- 56, 09/04/2021, 13:01:00
- 63, 09/05/2021, 15:24:00
- 66, 09/05/2021, 17:09:00
- 71, 11/05/2021, 12:03:00
- 76, 17/06/2021, 15:55:00
- 81, 16/06/2021, 12:17:00
- 90, 02/07/2021, 10:58:00
- 99, 01/08/2021, 11:33:00

TITLE:	Summer 2021 Buzzard 1
PROJECT:	Barnadivane Wind Farm and Substation, Co. Cork
FIGURE NO:	-
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PAGE SIZE:	A3





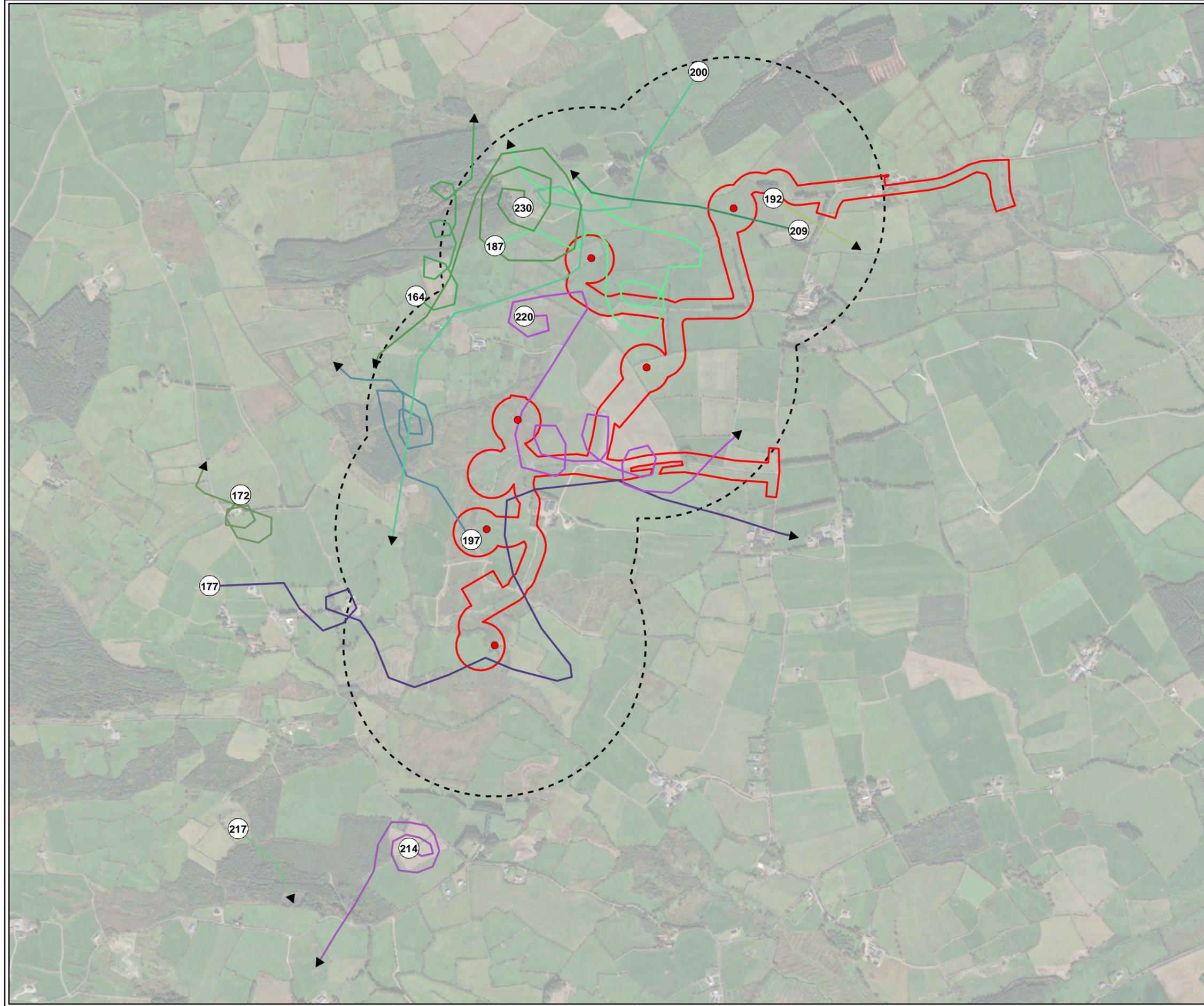
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- Development Planning Boundary
 - SNH Buffer
 - Proposed Turbine Layout

Flightlines
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▶	48, 11/04/2021, 11:46:00
▶	55, 09/04/2021, 11:57:00
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▶	113, 30/10/2021, 09:09:00
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▶	134, 19/01/2022, 10:10:00
▶	136, 02/02/2022, 08:47:00
▶	139, 16/02/2022, 15:44:00
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▶	173, 17/05/2022, 18:17:00
▶	211, 13/07/2022, 14:40:00
▶	222, 18/08/2022, 20:01:00
▶	246, 28/09/2022, 14:41:00

TITLE:		Sparrowhawk	
PROJECT:		Barnadivane Wind Farm and Substation, Co. Cork	
FIGURE NO:		-	
CLIENT: Barna Wind Energy Ltd. & Arran Windfarm Ltd.			
SCALE: 1:12500	REVISION: 0		
DATE: 23/02/2023	PAGE SIZE: A3		





Legend

- Development Planning Boundary
- SNH Buffer
- Proposed Turbine Layout

Flightlines
FlightNo, Date, Time

- ▶ 164, 22/04/2022, 13:57:00
- ▶ 172, 17/05/2022, 18:09:00
- ▶ 177, 25/05/2022, 17:16:00
- ▶ 187, 23/05/2022, 18:13:00
- ▶ 192, 08/06/2022, 08:16:00
- ▶ 197, 08/06/2022, 10:22:00
- ▶ 200, 07/06/2022, 10:40:00
- ▶ 209, 27/07/2022, 19:05:00
- ▶ 214, 13/07/2022, 15:45:00
- ▶ 217, 21/07/2022, 17:03:00
- ▶ 220, 13/08/2022, 11:00:00
- ▶ 230, 15/09/2022, 15:22:00

TITLE:	Summer 2022 Buzzard 2
PROJECT:	Barnadivane Wind Farm and Substation, Co. Cork
FIGURE NO.:	-
CLIENT:	Barna Wind Energy Ltd. & Arran Windfarm Ltd.
SCALE:	1:12500
REVISION:	0
DATE:	23/02/2023
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Legend

- Development Planning Boundary
- SNH Buffer
- Proposed Turbine Layout

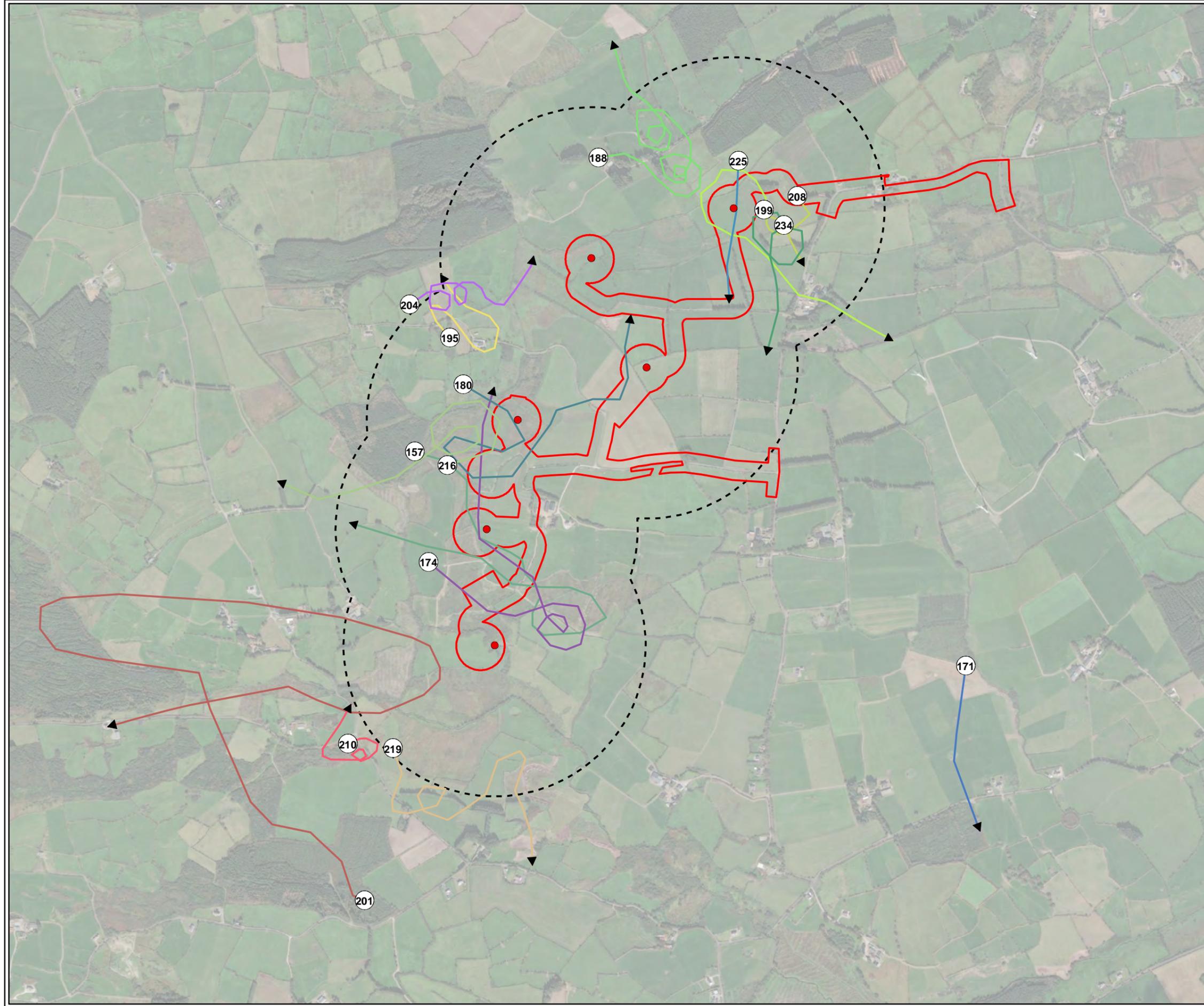
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- 68, 15/05/2021, 19:16:00
- 75, 17/06/2021, 14:39:00
- 80, 17/06/2021, 17:01:00
- 87, 05/07/2021, 10:47:00
- 95, 02/07/2021, 16:50:00
- 103, 02/08/2021, 10:58:00

TITLE:	Summer 2021 Buzzard 2
PROJECT:	Barnadivane Wind Farm and Substation, Co. Cork
FIGURE NO:	-
CLIENT:	Barna Wind Energy Ltd. & Arran Windfarm Ltd.
SCALE:	1:12500
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DATE:	23/02/2023
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Legend

- Development Planning Boundary
- SNH Buffer
- Proposed Turbine Layout

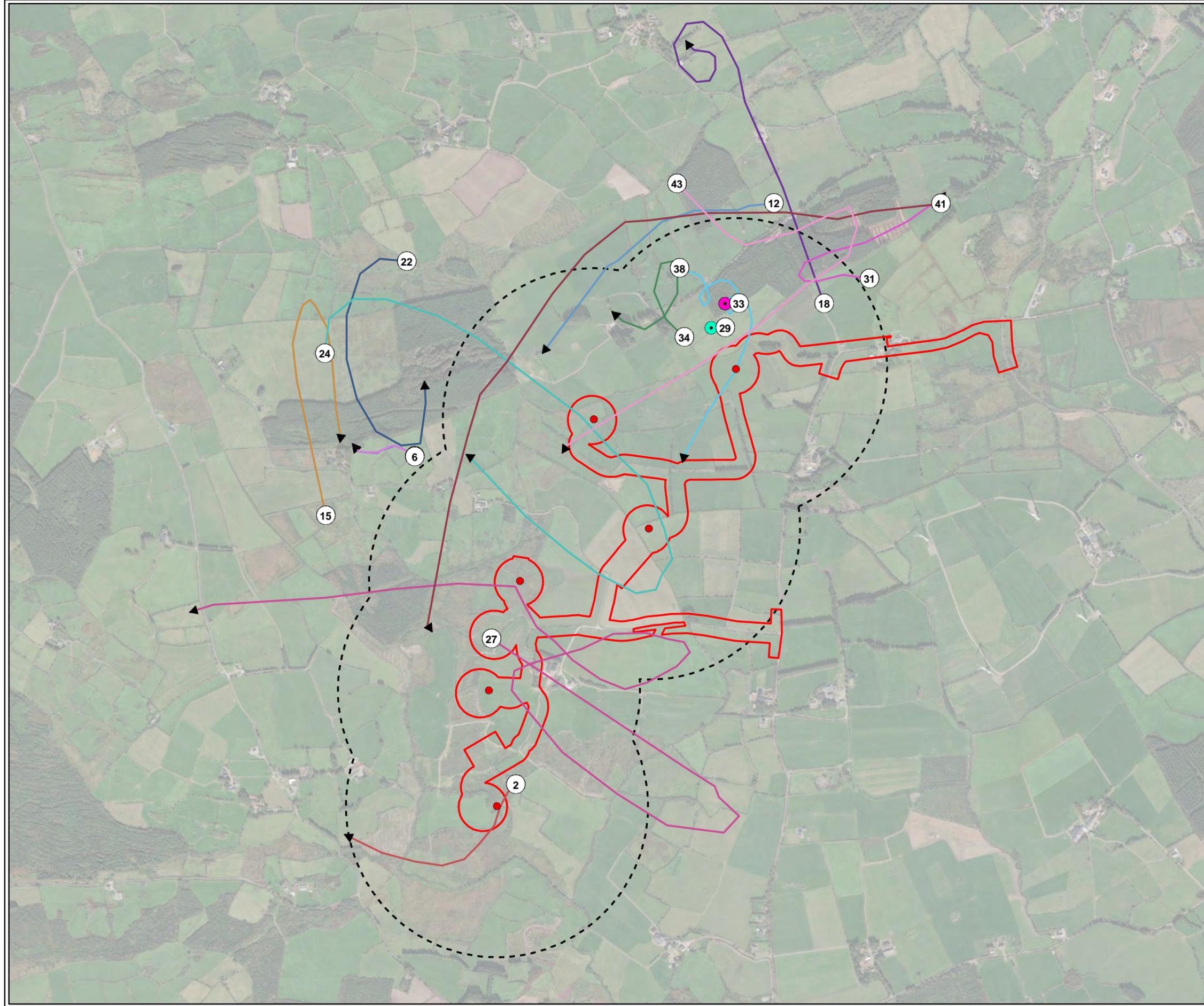
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- 180, 26/05/2022, 20:32:00
- 188, 23/05/2022, 18:51:00
- 195, 08/06/2022, 09:59:00
- 199, 07/06/2022, 09:54:00
- 201, 14/06/2022, 09:29:00
- 204, 19/06/2022, 13:10:00
- 208, 11/07/2022, 18:59:00
- 210, 13/07/2022, 14:32:00
- 216, 13/07/2022,
- 219, 13/08/2022, 10:03:00
- 225, 12/08/2022, 10:53:00
- 234, 25/09/2022, 11:17:00

TITLE:	Summer 2022 Buzzard 1
PROJECT:	Barnadivane Wind Farm and Substation, Co. Cork
FIGURE NO:	-
CLIENT:	Barna Wind Energy Ltd. & Arran Windfarm Ltd.
SCALE:	1:12500
REVISION:	0
DATE:	23/02/2023
PAGE SIZE:	A3





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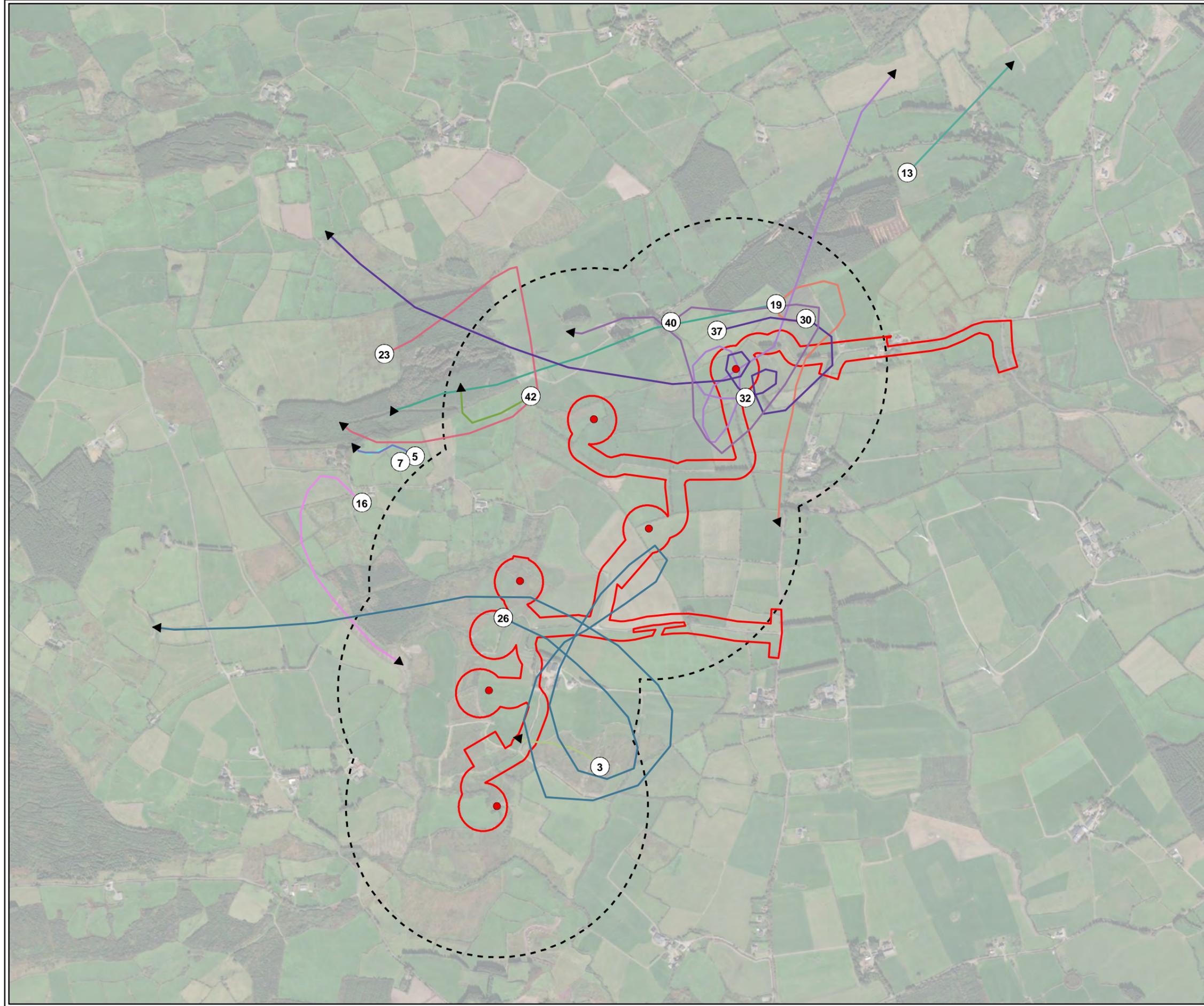
- Development Planning Boundary
- SNH Buffer
- Proposed Turbine Layout

Flightlines
FlightNo, Date, Time

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- 4, 02/11/2020, 12:48:00
- 6, 02/11/2020, 13:41:00
- 12, 14/01/2021, 10:28:00
- 15, 14/01/2021, 11:20:00
- 18, 14/01/2021, 13:13:00
- 22, 14/01/2021, 15:13:00
- 24, 14/01/2021, 15:37:00
- 27, 07/03/2021, 11:17:00
- 31, 15/03/2021, 09:56:00
- 34, 15/03/2021, 11:50:00
- 38, 15/03/2021, 12:34:00
- 41, 15/03/2021, 15:00:00
- 43, 15/03/2021, 15:59:00
- 29, 15/03/2021, 09:50:00
- 33, 15/03/2021, 11:44:00

TITLE:	Winter 2020/2021 Buzzard 1
PROJECT:	Barnadivane Wind Farm and Substation, Co. Cork
FIGURE NO.:	-
CLIENT:	Barna Wind Energy Ltd. & Arran Windfarm Ltd.
SCALE:	1:12500
REVISION:	0
DATE:	23/02/2023
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- Legend**
- Development Planning Boundary
 - SNH Buffer
 - Proposed Turbine Layout
- Flightlines**
- FlightNo, Date, Time**
- ▶ 3, 02/11/2020, 12:25:00
 - ▶ 5, 02/11/2020, 13:27:00
 - ▶ 7, 02/11/2020, 13:50:00
 - ▶ 13, 14/01/2021, 11:10:00
 - ▶ 16, 14/01/2021, 11:28:00
 - ▶ 19, 14/01/2021, 14:25:00
 - ▶ 23, 14/01/2021, 15:23:00
 - ▶ 26, 07/03/2021, 11:17:00
 - ▶ 30, 15/03/2021, 09:56:00
 - ▶ 32, 15/03/2021, 10:36:00
 - ▶ 37, 15/03/2021, 12:24:00
 - ▶ 40, 15/03/2021, 14:18:00
 - ▶ 42, 15/03/2021, 15:27:00

TITLE:	Winter 2020/2021 Buzzard 2
PROJECT:	Barnadivane Wind Farm and Substation, Co. Cork
FIGURE NO.:	-
CLIENT:	Barna Wind Energy Ltd. & Arran Windfarm Ltd.
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DATE:	23/02/2023
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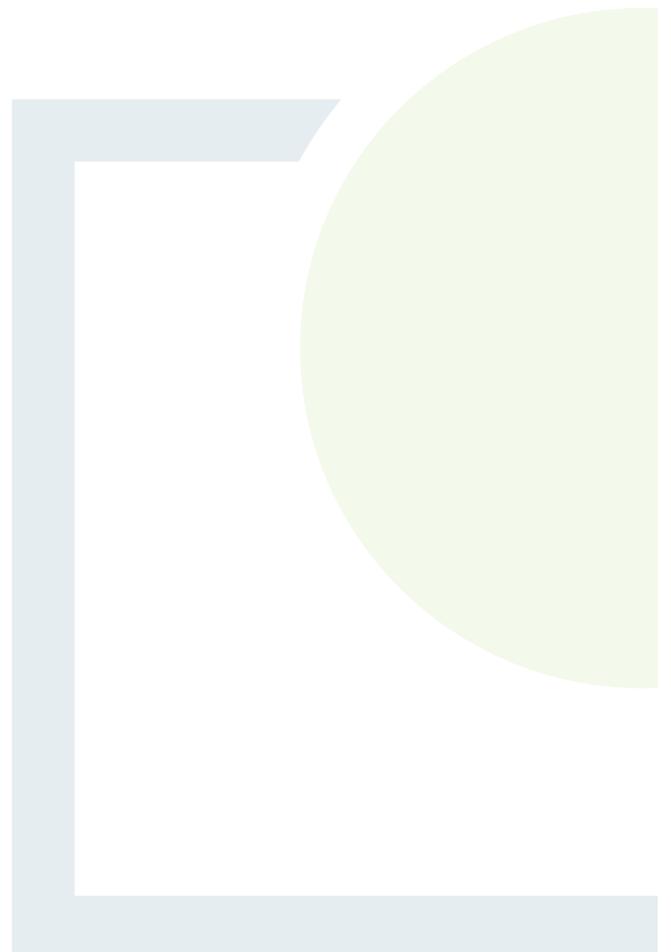




CONSULTANTS IN ENGINEERING,
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APPENDIX 3

Hinterland Results



Site Name	Date	Common name	No ¹
Castlemoor	23/11/2020	Mallard	5
Castlemoor	23/11/2020	Tufted Duck	5
Warren's Court	23/11/2020	Mallard	4
Warren's Court	23/11/2020	Grey Heron	1
Inishcarra Reservoir	23/11/2020	Mallard	17
Inishcarra Reservoir	23/11/2020	Black-headed Gull	22
Inishcarra Reservoir	23/11/2020	Grey Heron	1
Inishcarra Reservoir	23/11/2020	Great Black-backed Gull	1
Inishcarra Reservoir	23/11/2020	Lapwing	43
Inishcarra Reservoir	23/11/2020	Teal	16
Inishcarra Reservoir	23/11/2020	Little Egret	1
Inishcarra Reservoir	23/11/2020	Cormorant	7
Sullane delta	23/11/2020	Grey Heron	2
Sullane delta	23/11/2020	Black-headed Gull	57
Sullane delta	23/11/2020	Mallard	2
Sullane delta	23/11/2020	Lapwing	20
Sullane delta	23/11/2020	Cormorant	1
The Gearagh	23/11/2020	Mallard	64
The Gearagh	23/11/2020	Teal	247
The Gearagh	23/11/2020	Wigeon	106
The Gearagh	23/11/2020	Cormorant	6
The Gearagh	23/11/2020	Little Egret	18
The Gearagh	23/11/2020	Dunlin	67
The Gearagh	23/11/2020	Lesser Black-backed Gull	3
The Gearagh	23/11/2020	Curlew	149
The Gearagh	23/11/2020	Greenshank	1
The Gearagh	23/11/2020	Lapwing	192
The Gearagh	23/11/2020	Whooper Swan	1
The Gearagh	23/11/2020	Grey Heron	6
The Gearagh	23/11/2020	Golden Plover	40
The Gearagh	23/11/2020	Black-headed Gull	26
The Gearagh	23/11/2020	#N/A	1
Toon Flats	23/11/2020	Whooper Swan	39
Toon Flats	23/11/2020	Mute Swan	30

¹ Counts for non-target species as well as species noted within 2,5 &10 km of the Proposed Development site boundary are generally not provided

Site Name	Date	Common name	No ¹
Toon Flats	23/11/2020	Greylag Goose	6
Toon Flats	23/11/2020	Lapwing	60
Murragh Lake	28/11/2020	Mallard	2
Murragh Lake	28/11/2020	Teal	1
Desert Bridge	28/11/2020	Whooper Swan	11
Sullane delta	01/12/2020	Cormorant	2
Sullane delta	01/12/2020	Wigeon	5
Sullane delta	01/12/2020	Grey Heron	1
Sullane delta	01/12/2020	Black-headed Gull	35
Warren's Court	01/12/2020	Mallard	10
Inishcarra Reservoir	01/12/2020	Cormorant	3
Inishcarra Reservoir	01/12/2020	Black-headed Gull	20
Inishcarra Reservoir	01/12/2020	Mallard	8
Inishcarra Reservoir	01/12/2020	Wigeon	35
Inishcarra Reservoir	01/12/2020	Teal	25
Inishcarra Reservoir	01/12/2020	Grey Heron	2
Toon flats	01/12/2020	Grey Heron	3
Toon flats	01/12/2020	Greylag Goose	43
Toon flats	01/12/2020	Whooper Swan	38
Toon flats	01/12/2020	Mute Swan	24
Toon flats	01/12/2020	Lapwing	15
The Gearagh	01/12/2020	Wigeon	80
The Gearagh	01/12/2020	Teal	132
The Gearagh	01/12/2020	Black-headed Gull	10
The Gearagh	01/12/2020	Little Egret	7
The Gearagh	01/12/2020	Whooper Swan	1
The Gearagh	01/12/2020	#N/A	2
The Gearagh	01/12/2020	Grey Heron	1
The Gearagh	01/12/2020	Curlew	12
The Gearagh	01/12/2020	Lapwing	90
The Gearagh	01/12/2020	Dunlin	150
Murragh Lake	01/12/2020	Mallard	7
Desert Bridge	01/12/2020	Whooper Swan	4
Desert Bridge	01/12/2020	Little Egret	1
Castlemoor	01/12/2020	Mallard	4
Castlemoor	01/12/2020	Tufted Duck	6
Castlemoor	01/12/2020	Cormorant	1

Site Name	Date	Common name	No ¹
Castlemoor	14/12/2020	Tufted Duck	8
Inishcarra Reservoir	14/12/2020	Lapwing	15
Inishcarra Reservoir	14/12/2020	Black-headed Gull	21
Inishcarra Reservoir	14/12/2020	Wigeon	14
Inishcarra Reservoir	14/12/2020	Teal	13
Inishcarra Reservoir	14/12/2020	Moorhen	2
Inishcarra Reservoir	14/12/2020	Mallard	3
Inishcarra Reservoir	14/12/2020	Cormorant	4
Sullane Delta	14/12/2020	Grey Heron	1
The Gearagh	14/12/2020	Mallard	28
The Gearagh	14/12/2020	Wigeon	26
The Gearagh	14/12/2020	Black-headed Gull	2
The Gearagh	14/12/2020	Little Egret	3
The Gearagh	14/12/2020	Teal	2
The Gearagh	14/12/2020	Moorhen	2
The Gearagh	14/12/2020	Grey Heron	1
Toon Flats	14/12/2020	Mute Swan	49
Toon Flats	14/12/2020	Little Egret	2
Toon Flats	14/12/2020	Whooper Swan	22
Toon Flats	14/12/2020	Greylag Goose	32
Toon Flats	14/12/2020	Barnacle Goose	1
Toon Flats	14/12/2020	White-fronted Goose	1
Desert Bridge	14/12/2020	Whooper Swan	14
Desert Bridge	14/12/2020	Little Egret	2
Murragh Lake	14/12/2020	#N/A	n/a
Murragh Lake	20/01/2021	Tufted Duck	7
Murragh Lake	20/01/2021	Little Grebe	7
Murragh Lake	20/01/2021	Coot	4
Murragh Lake	20/01/2021	Moorhen	1
Murragh Lake	20/01/2021	Grey Heron	1
Desert Bridge	20/01/2021	Grey Heron	5
Desert Bridge	20/01/2021	Mallard	10
Desert Bridge	20/01/2021	Whooper Swan	29
Desert Bridge	20/01/2021	Mute Swan	1
Desert Bridge	20/01/2021	Lesser Black-backed Gull	1
Desert Bridge	20/01/2021	Little Egret	7
Castlemoor	20/01/2021	Tufted Duck	2

Site Name	Date	Common name	No ¹
Castlemoor	20/01/2021	Mallard	12
Castlemoor	20/01/2021	Teal	14
Inishcarra Reservoir	20/01/2021	Curlew	21
Inishcarra Reservoir	20/01/2021	Black-tailed Godwit	2
Inishcarra Reservoir	20/01/2021	Cormorant	5
Inishcarra Reservoir	20/01/2021	Teal	38
Inishcarra Reservoir	20/01/2021	Wigeon	61
Inishcarra Reservoir	20/01/2021	Kingfisher	1
Inishcarra Reservoir	20/01/2021	Snipe	3
Inishcarra Reservoir	20/01/2021	Black-headed Gull	9
Inishcarra Reservoir	20/01/2021	Mallard	1
Inishcarra Reservoir	20/01/2021	Grey Heron	3
Inishcarra Reservoir	20/01/2021	Lapwing	162
Sullane Delta	20/01/2021	Golden Plover	58
Sullane Delta	20/01/2021	Lapwing	285
Sullane Delta	20/01/2021	Woodcock	1
The Gearagh	20/01/2021	Goosander	1
The Gearagh	20/01/2021	Black-headed Gull	9
The Gearagh	20/01/2021	Whooper Swan	3
The Gearagh	20/01/2021	Lapwing	105
The Gearagh	20/01/2021	Wigeon	56
The Gearagh	20/01/2021	Teal	65
The Gearagh	20/01/2021	Mallard	2
The Gearagh	20/01/2021	Curlew	2
The Gearagh	20/01/2021	Grey Heron	5
The Gearagh	20/01/2021	Golden Plover	2
The Gearagh	20/01/2021	Little Egret	5
The Gearagh	20/01/2021	Kingfisher	1
The Gearagh	20/01/2021	#N/A	3
Inishcarra Reservoir	20/01/2021	Teal	2
Inishcarra Reservoir	20/01/2021	Golden Plover	1
Inishcarra Reservoir	20/01/2021	Whooper Swan	3
Inishcarra Reservoir	20/01/2021	Greylag Goose	93
Inishcarra Reservoir	20/01/2021	Pink-footed Goose	1
Inishcarra Reservoir	20/01/2021	Barnacle Goose	1
Inishcarra Reservoir	20/01/2021	White-fronted Goose	1
Toon flats	20/01/2021	Little Egret	11

Site Name	Date	Common name	No ¹
Toon flats	20/01/2021	Teal	3
Toon flats	20/01/2021	Buzzard	1
Toon flats	20/01/2021	Whooper Swan	59
Toon flats	20/01/2021	Mute Swan	31
Toon flats	03/02/2021	Little Egret	18
Toon flats	03/02/2021	Black-headed Gull	3
Toon flats	03/02/2021	Whooper Swan	75
Toon flats	03/02/2021	Mute Swan	29
Toon flats	03/02/2021	Greylag Goose	57
Toon flats	03/02/2021	Brent Goose	1
Toon flats	03/02/2021	Pink-footed Goose	1
Toon flats	03/02/2021	White-fronted Goose	1
The Gearagh	03/02/2021	Wigeon	3
The Gearagh	03/02/2021	Cormorant	1
The Gearagh	03/02/2021	Goldeneye	3
The Gearagh	03/02/2021	Teal	4
The Gearagh	03/02/2021	Coot	1
The Gearagh	03/02/2021	Grey Heron	1
The Gearagh	03/02/2021	Moorhen	1
The Gearagh	03/02/2021	Goosander	2
Inishcarra Reservoir	03/02/2021	Wigeon	18
Inishcarra Reservoir	03/02/2021	Great Crested Grebe	2
Sullane Delta	03/02/2021	Black-headed Gull	16
Castlemoor	03/02/2021	Grey Heron	4
Castlemoor	03/02/2021	Cormorant	6
Castlemoor	03/02/2021	Mallard	20
Castlemoor	03/02/2021	Teal	13
Castlemoor	03/02/2021	Tufted Duck	1
Inishcarra Reservoir	04/02/2021	Lapwing	579
Inishcarra Reservoir	04/02/2021	Cormorant	12
Inishcarra Reservoir	04/02/2021	Wigeon	3
Inishcarra Reservoir	04/02/2021	Mallard	22
Inishcarra Reservoir	04/02/2021	Teal	40
Inishcarra Reservoir	04/02/2021	Grey Heron	9
Inishcarra Reservoir	04/02/2021	Great Black-backed Gull	2
Inishcarra Reservoir	04/02/2021	Black-headed Gull	5
Inishcarra Reservoir	04/02/2021	Curlew	120

Site Name	Date	Common name	No ¹
Inishcarra Reservoir	04/02/2021	Dunlin	80
Inishcarra Reservoir	04/02/2021	Mute Swan	1
Murragh Lake	04/02/2021	Coot	2
Murragh Lake	04/02/2021	Mute Swan	2
Murragh Lake	04/02/2021	Moorhen	1
Murragh Lake	04/02/2021	#N/A	2
Desert Bridge	04/02/2021	Whooper Swan	42
Desert Bridge	04/02/2021	Teal	1
Desert Bridge	04/02/2021	Grey Heron	1
Toon Flats	03/03/2021	Greylag Goose	11
Toon Flats	03/03/2021	Whooper Swan	87
Toon Flats	03/03/2021	Mute Swan	5
Toon Flats	03/03/2021	Barnacle Goose	1
Toon Flats	03/03/2021	White-fronted Goose	1
Toon Flats	03/03/2021	Pink-footed Goose	1
Toon Flats	03/03/2021	Buzzard	2
Toon Flats	03/03/2021	Mallard	2
Toon Flats	03/03/2021	Little Egret	2
The Gearagh	03/03/2021	Wigeon	71
The Gearagh	03/03/2021	Black-headed Gull	4
The Gearagh	03/03/2021	Teal	26
The Gearagh	03/03/2021	Curlew	9
The Gearagh	03/03/2021	Little Egret	8
The Gearagh	03/03/2021	Grey Heron	9
The Gearagh	03/03/2021	Mute Swan	3
The Gearagh	03/03/2021	Cormorant	2
The Gearagh	03/03/2021	Mallard	9
The Gearagh	03/03/2021	#N/A	3
The Gearagh	03/03/2021	Whooper Swan	2
The Gearagh	03/03/2021	Magpie	5
The Gearagh	03/03/2021	Water Rail	1
The Gearagh	03/03/2021	Kingfisher	1
Inishcarra Reservoir	03/03/2021	#N/A	2
Inishcarra Reservoir	03/03/2021	Little Egret	1
Inishcarra Reservoir	03/03/2021	Cormorant	1
Inishcarra Reservoir	03/03/2021	Golden Plover	30
Inishcarra Reservoir	03/03/2021	Black-headed Gull	1

Site Name	Date	Common name	No ¹
Sullane Delta	03/03/2021	Little Egret	1
Sullane Delta	03/03/2021	Black-headed Gull	3
Sullane Delta	03/03/2021	Mallard	3
Inishcarra Reservoir	03/03/2021	Black-headed Gull	12
Inishcarra Reservoir	03/03/2021	Wigeon	59
Inishcarra Reservoir	03/03/2021	Great Black-backed Gull	2
Inishcarra Reservoir	03/03/2021	Shoveler	1
Inishcarra Reservoir	03/03/2021	Mallard	1
Inishcarra Reservoir	03/03/2021	Grey Heron	3
Inishcarra Reservoir	03/03/2021	Great Crested Grebe	10
Inishcarra Reservoir	03/03/2021	Cormorant	10
Inishcarra Reservoir	03/03/2021	Little Egret	1
Inishcarra Reservoir	03/03/2021	Teal	55
Inishcarra Reservoir	03/03/2021	Grey Wagtail	2
Inishcarra Reservoir	03/03/2021	Green Sandpiper	1
Castlemoor	03/03/2021	Cormorant	2
Castlemoor	03/03/2021	Teal	5
Murragh Lake	03/03/2021	Mallard	9
Murragh Lake	03/03/2021	Moorhen	2
Murragh Lake	03/03/2021	Teal	7
Murragh Lake	03/03/2021	Tufted Duck	3
Murragh Lake	03/03/2021	#N/A	1
Desert Bridge	03/03/2021	Kingfisher	1
Desert Bridge	03/03/2021	Mallard	3
Desert Bridge	03/03/2021	Grey Heron	2
Desert Bridge	03/03/2021	Cormorant	4
Warren's Court	16/04/2021	Hen Harrier	1
Warren's Court	16/04/2021	Buzzard	1
Warren's Court	16/04/2021	Golden Plover	311
Warren's Court	16/04/2021	Dipper	1
Warren's Court	17/04/2021	Grey Wagtail	1
Warren's Court	17/04/2021	Greylag Goose	2
Warren's Court	17/04/2021	Sand Martin	100
Warren's Court	17/04/2021	Lesser Black-backed Gull	28
Warren's Court	17/04/2021	Moorhen	1
Warren's Court	17/04/2021	Mallard	2
Barnadivane 2km radius	12/05/2021	Robin	-

Site Name	Date	Common name	No ¹
Barnadivane 2km radius	12/05/2021	Song Thrush	-
Barnadivane 2km radius	12/05/2021	Woodpigeon	-
Barnadivane 2km radius	12/05/2021	Dunnock	-
Barnadivane 2km radius	12/05/2021	Chaffinch	-
Barnadivane 2km radius	12/05/2021	Hooded Crow	-
Barnadivane 2km radius	12/05/2021	Meadow Pipit	-
Barnadivane 2km radius	12/05/2021	Willow Warbler	-
Barnadivane 2km radius	12/05/2021	Rook	-
Barnadivane 2km radius	12/05/2021	Swallow	-
Barnadivane 2km radius	12/05/2021	Starling	-
Barnadivane 2km radius	12/05/2021	Jackdaw	-
Barnadivane 2km radius	12/05/2021	Blackbird	-
Barnadivane 2km radius	12/05/2021	House Sparrow	-
Barnadivane 2km radius	12/05/2021	Sedge Warbler	-
Barnadivane 2km radius	12/05/2021	Wren	-
Barnadivane 2km radius	12/05/2021	Lesser Black-backed Gull	-
Barnadivane 2km radius	12/05/2021	Linnet	-
Barnadivane 2km radius	12/05/2021	Mallard	1
Barnadivane 2km radius	12/05/2021	Goldfinch	-
Barnadivane 2km radius	12/05/2021	Coal Tit	-
Barnadivane 2km radius	12/05/2021	Magpie	-
Barnadivane 2km radius	12/05/2021	Chiffchaff	-
Barnadivane 2km radius	12/05/2021	Pheasant	-
Barnadivane 2km radius	12/05/2021	Blackcap	-
Murragh Lake	12/05/2021	Mute Swan	2
Desert Bridge	12/05/2021	House Martin	2
Desert Bridge	12/05/2021	Sand Martin	1
Desert Bridge	12/05/2021	Grey Wagtail	1
Desert Bridge	12/05/2021	Buzzard	2
Kilmicheal/Mid Cork Quarries	12/05/2021	Sand Martin	6
Kilmicheal/Mid Cork Quarries	12/05/2021	Raven	-
Kilmicheal/Mid Cork Quarries	12/05/2021	Siskin	-
The Gearagh	12/05/2021	Moorhen	4
The Gearagh	12/05/2021	Mute Swan	9
The Gearagh	12/05/2021	Mallard	26
The Gearagh	12/05/2021	Teal	1

Site Name	Date	Common name	No ¹
The Gearagh	12/05/2021	Sand Martin	-
The Gearagh	12/05/2021	Swift	4
The Gearagh	12/05/2021	Great Crested Grebe	26
The Gearagh	12/05/2021	Great Black-backed Gull	3
The Gearagh	12/05/2021	Whooper Swan	2
The Gearagh	12/05/2021	Blackcap	-
The Gearagh	12/05/2021	Sedge Warbler	-
The Gearagh	12/05/2021	Lesser Black-backed Gull	8
The Gearagh	12/05/2021	Herring Gull	1
Warren's Court	12/05/2021	Greylag Goose	1
Warren's Court	12/05/2021	Mallard	1
Warren's Court	12/05/2021	Sand Martin	30
Warren's Court	12/05/2021	House Martin	8
Warren's Court	23/05/2021	Greylag Goose	3
Barnadivane 2km radius	10/06/2021	Sedge Warbler	1
Barnadivane 2km radius	10/06/2021	Rook	-
Barnadivane 2km radius	10/06/2021	Meadow Pipit	-
Barnadivane 2km radius	10/06/2021	Robin	-
Barnadivane 2km radius	10/06/2021	Blackbird	-
Barnadivane 2km radius	10/06/2021	Jackdaw	-
Barnadivane 2km radius	10/06/2021	Wren	-
Barnadivane 2km radius	10/06/2021	Dunnock	-
Barnadivane 2km radius	10/06/2021	Willow Warbler	-
Barnadivane 2km radius	10/06/2021	Starling	-
Barnadivane 2km radius	10/06/2021	Swallow	-
Barnadivane 2km radius	10/06/2021	Chaffinch	-
Barnadivane 2km radius	10/06/2021	Pied/White Wagtail	-
Barnadivane 2km radius	10/06/2021	Woodpigeon	-
Barnadivane 2km radius	10/06/2021	Great Tit	-
Barnadivane 2km radius	10/06/2021	Blackcap	-
Barnadivane 2km radius	10/06/2021	Hooded Crow	-
Barnadivane 2km radius	10/06/2021	Blue Tit	-
Barnadivane 2km radius	10/06/2021	Magpie	-
Barnadivane 2km radius	10/06/2021	Song Thrush	-
Barnadivane 2km radius	10/06/2021	Mistle Thrush	-
Murragh Lake	10/06/2021	Grey Heron	1

Site Name	Date	Common name	No ¹
Murragh Lake	10/06/2021	Woodpigeon	-
Murragh Lake	10/06/2021	Chaffinch	-
Murragh Lake	10/06/2021	Moorhen	2
Murragh Lake	10/06/2021	Swallow	-
Murragh Lake	10/06/2021	Meadow Pipit	-
Murragh Lake	10/06/2021	Willow Warbler	-
Murragh Lake	10/06/2021	Blackbird	-
Murragh Lake	10/06/2021	Robin	-
Murragh Lake	10/06/2021	Rook	-
Desert Bridge	10/06/2021	Sand Martin	12
Desert Bridge	10/06/2021	Swallow	4
Desert Bridge	10/06/2021	Willow Warbler	-
Desert Bridge	10/06/2021	Blackbird	-
Desert Bridge	10/06/2021	Hooded Crow	-
Kilmicheal/Mid Cork Quarries	10/06/2021	Sand Martin	30
Kilmicheal/Mid Cork Quarries	10/06/2021	Willow Warbler	-
Kilmicheal/Mid Cork Quarries	10/06/2021	Swallow	-
Kilmicheal/Mid Cork Quarries	10/06/2021	Blackbird	-
Kilmicheal/Mid Cork Quarries	10/06/2021	Dunnock	-
Kilmicheal/Mid Cork Quarries	10/06/2021	Chaffinch	-
Kilmicheal/Mid Cork Quarries	10/06/2021	Hooded Crow	-
The Gearagh	10/06/2021	Reed Bunting	-
The Gearagh	10/06/2021	Willow Warbler	-
The Gearagh	10/06/2021	Bullfinch	1
The Gearagh	10/06/2021	Chiffchaff	-
The Gearagh	10/06/2021	Mallard	2
The Gearagh	10/06/2021	Wren	-
The Gearagh	10/06/2021	Chaffinch	-
The Gearagh	10/06/2021	Teal	2
The Gearagh	10/06/2021	Cormorant	1
The Gearagh	10/06/2021	Great Black-backed Gull	4
The Gearagh	10/06/2021	Swallow	30
The Gearagh	10/06/2021	House Martin	10
The Gearagh	10/06/2021	Sand Martin	18
The Gearagh	10/06/2021	Blackbird	-
The Gearagh	10/06/2021	Goldcrest	-

Site Name	Date	Common name	No ¹
The Gearagh	10/06/2021	Song Thrush	-
The Gearagh	10/06/2021	Mute Swan	39
The Gearagh	10/06/2021	Sedge Warbler	1
The Gearagh	10/06/2021	Grey Heron	2
The Gearagh	10/06/2021	Great Crested Grebe	23
The Gearagh	10/06/2021	Greylag Goose	8
The Gearagh	10/06/2021	Lesser Black-backed Gull	3
The Gearagh	10/06/2021	Moorhen	3
The Gearagh	10/06/2021	Pheasant	1
Warren's Court	10/06/2021	Moorhen	1
Warren's Court	10/06/2021	Sand Martin	15
Warren's Court	10/06/2021	House Martin	4
Warren's Court	10/06/2021	Swallow	30
Warren's Court	10/06/2021	Swift	4
Barnadivane 2km radius	14/07/2021	Blackcap	3
Barnadivane 2km radius	14/07/2021	Mistle Thrush	1
Barnadivane 2km radius	14/07/2021	Buzzard	1
Barnadivane 2km radius	14/07/2021	Wren	2
Barnadivane 2km radius	14/07/2021	Magpie	1
Barnadivane 2km radius	14/07/2021	Jackdaw	3
Barnadivane 2km radius	14/07/2021	Rook	-
Barnadivane 2km radius	14/07/2021	Goldfinch	6
Barnadivane 2km radius	14/07/2021	Swallow	-
Barnadivane 2km radius	14/07/2021	Dunnock	1
Barnadivane 2km radius	14/07/2021	Blackbird	4
Barnadivane 2km radius	14/07/2021	Willow Warbler	2
Barnadivane 2km radius	14/07/2021	Robin	2
Barnadivane 2km radius	14/07/2021	Siskin	1
Barnadivane 2km radius	14/07/2021	Woodpigeon	4
Barnadivane 2km radius	14/07/2021	House Martin	5
Barnadivane 2km radius	14/07/2021	Meadow Pipit	5
Barnadivane 2km radius	14/07/2021	Chaffinch	1
Barnadivane 2km radius	14/07/2021	Lesser Black-backed Gull	2
Barnadivane 2km radius	14/07/2021	Linnet	4
Barnadivane 2km radius	14/07/2021	Reed Bunting	1
Barnadivane 2km radius	14/07/2021	Stonechat	2
Barnadivane 2km radius	14/07/2021	Sedge Warbler	1

Site Name	Date	Common name	No ¹
Barnadivane 2km radius	14/07/2021	Song Thrush	1
Barnadivane 2km radius	14/07/2021	Hooded Crow	2
Barnadivane 2km radius	14/07/2021	Chiffchaff	1
Barnadivane 10km radius	14/07/2021	Starling	-
Barnadivane 10km radius	14/07/2021	Song Thrush	1
Barnadivane 10km radius	14/07/2021	Magpie	-
Barnadivane 10km radius	14/07/2021	Jackdaw	-
Barnadivane 10km radius	14/07/2021	Rook	-
Barnadivane 10km radius	14/07/2021	Goldfinch	6
Barnadivane 10km radius	14/07/2021	House Martin	2
Barnadivane 10km radius	14/07/2021	Woodpigeon	-
Barnadivane 10km radius	14/07/2021	Meadow Pipit	-
Barnadivane 10km radius	14/07/2021	Hooded Crow	-
Barnadivane 10km radius	14/07/2021	Buzzard	1
Barnadivane 10km radius	14/07/2021	Chaffinch	-
Barnadivane 10km radius	14/07/2021	Wren	-
Barnadivane 10km radius	14/07/2021	Swallow	-
Barnadivane 10km radius	14/07/2021	Blackbird	1
Murragh Lake	14/07/2021	Mallard	3
Murragh Lake	14/07/2021	Moorhen	1
Murragh Lake	14/07/2021	Mute Swan	2
Desert Bridge	14/07/2021	Buzzard	1
Desert Bridge	14/07/2021	Kestrel	1
Desert Bridge	14/07/2021	Reed Bunting	1
Desert Bridge	14/07/2021	Hooded Crow	-
Desert Bridge	14/07/2021	Rook	-
Desert Bridge	14/07/2021	Jackdaw	-
Desert Bridge	14/07/2021	Magpie	-
Desert Bridge	14/07/2021	Wren	-
Desert Bridge	14/07/2021	Swallow	-
Desert Bridge	14/07/2021	Chaffinch	-
Desert Bridge	14/07/2021	Pied/White Wagtail	-
Kilmicheal/Mid Cork Quarries	14/07/2021	Sand Martin	30
Kilmicheal/Mid Cork Quarries	14/07/2021	Willow Warbler	1
Kilmicheal/Mid Cork Quarries	14/07/2021	Blackcap	1
Kilmicheal/Mid Cork Quarries	14/07/2021	Lesser Redpoll	2
Kilmicheal/Mid Cork Quarries	14/07/2021	Wren	1

Site Name	Date	Common name	No ¹
Kilmicheal/Mid Cork Quarries	14/07/2021	Blackbird	1
Kilmicheal/Mid Cork Quarries	14/07/2021	Swallow	-
The Gearagh	14/07/2021	Great Crested Grebe	21
The Gearagh	14/07/2021	Grey Heron	1
The Gearagh	14/07/2021	Black-headed Gull	12
The Gearagh	14/07/2021	Lesser Black-backed Gull	36
The Gearagh	14/07/2021	#N/A	1
The Gearagh	14/07/2021	Herring Gull	1
The Gearagh	14/07/2021	Moorhen	1
The Gearagh	14/07/2021	Sedge Warbler	1
The Gearagh	14/07/2021	Blackcap	2
The Gearagh	14/07/2021	Swallow	-
The Gearagh	14/07/2021	Woodpigeon	-
The Gearagh	14/07/2021	Wren	-
The Gearagh	14/07/2021	Bullfinch	-
The Gearagh	14/07/2021	Reed Bunting	1
The Gearagh	14/07/2021	Magpie	-
The Gearagh	14/07/2021	Mallard	4
The Gearagh	14/07/2021	Mute Swan	4
Warren's Court	14/07/2021	Tufted Duck	5
Warren's Court	14/07/2021	Mallard	9
Warren's Court	14/07/2021	Mute Swan	5
Barnadivane 2km radius	03/08/2021	Sparrowhawk	2
Barnadivane 2km radius	03/08/2021	Chiffchaff	1
Barnadivane 2km radius	03/08/2021	Swallow	-
Barnadivane 2km radius	03/08/2021	Rook	-
Barnadivane 2km radius	03/08/2021	Robin	3
Barnadivane 2km radius	03/08/2021	Wren	1
Barnadivane 2km radius	03/08/2021	House Martin	7
Barnadivane 2km radius	03/08/2021	Song Thrush	1
Barnadivane 2km radius	03/08/2021	Blackbird	4
Barnadivane 2km radius	03/08/2021	Dunnock	1
Barnadivane 2km radius	03/08/2021	Hooded Crow	-
Barnadivane 2km radius	03/08/2021	Stock Dove	1
Barnadivane 2km radius	03/08/2021	Meadow Pipit	3
Barnadivane 2km radius	03/08/2021	Linnet	1
Barnadivane 2km radius	03/08/2021	Bullfinch	1

Site Name	Date	Common name	No ¹
Barnadivane 2km radius	03/08/2021	Chaffinch	10
Barnadivane 2km radius	03/08/2021	Starling	-
Barnadivane 2km radius	03/08/2021	Woodpigeon	-
Barnadivane 2km radius	03/08/2021	Willow Warbler	3
Barnadivane 2km radius	03/08/2021	Goldfinch	2
Barnadivane 2km radius	03/08/2021	Lesser Black-backed Gull	2
Barnadivane 2km radius	03/08/2021	Kestrel	1
Barnadivane 2km radius	03/08/2021	Magpie	1
Barnadivane 2km radius	03/08/2021	Jackdaw	1
Barnadivane 10km radius	03/08/2021	Magpie	2
Barnadivane 10km radius	03/08/2021	House Sparrow	9
Barnadivane 10km radius	03/08/2021	Jackdaw	-
Barnadivane 10km radius	03/08/2021	Rook	-
Barnadivane 10km radius	03/08/2021	Swallow	-
Barnadivane 10km radius	03/08/2021	Wren	1
Barnadivane 10km radius	03/08/2021	Blackbird	1
Barnadivane 10km radius	03/08/2021	Dunnock	1
Barnadivane 10km radius	03/08/2021	Hooded Crow	1
Barnadivane 10km radius	03/08/2021	Starling	-
Barnadivane 10km radius	03/08/2021	Willow Warbler	1
Barnadivane 10km radius	03/08/2021	Goldfinch	2
Barnadivane 10km radius	03/08/2021	Linnet	1
Barnadivane 10km radius	03/08/2021	Woodpigeon	-
Desert Bridge	03/08/2021	Grey Heron	2
Desert Bridge	03/08/2021	Swallow	-
Desert Bridge	03/08/2021	Woodpigeon	-
Desert Bridge	03/08/2021	Wren	1
Murragh Lake	03/08/2021	Mallard	7
Murragh Lake	03/08/2021	Moorhen	3
Murragh Lake	03/08/2021	Mute Swan	2
Murragh Lake	03/08/2021	Swallow	-
Murragh Lake	03/08/2021	Willow Warbler	1
Murragh Lake	03/08/2021	House Martin	11
Murragh Lake	03/08/2021	Woodpigeon	-
Kilmicheal/Mid Cork Quarries	03/08/2021	Peregrine	1
Kilmicheal/Mid Cork Quarries	03/08/2021	Sparrowhawk	1
Kilmicheal/Mid Cork Quarries	03/08/2021	Willow Warbler	1

Site Name	Date	Common name	No ¹
Kilmicheal/Mid Cork Quarries	03/08/2021	Woodpigeon	2
The Gearagh	03/08/2021	Sedge Warbler	1
The Gearagh	03/08/2021	Mallard	14
The Gearagh	03/08/2021	Mute Swan	13
The Gearagh	03/08/2021	Great Crested Grebe	22
The Gearagh	03/08/2021	Grey Heron	2
The Gearagh	03/08/2021	Willow Warbler	1
The Gearagh	03/08/2021	Chiffchaff	1
The Gearagh	03/08/2021	Chaffinch	1
The Gearagh	03/08/2021	Hooded Crow	2
The Gearagh	03/08/2021	Rook	1
The Gearagh	03/08/2021	Swallow	-
The Gearagh	03/08/2021	Wren	1
The Gearagh	03/08/2021	Blue Tit	1
Warren's Court	03/08/2021	Moorhen	1
Warren's Court	03/08/2021	Mallard	2
Warren's Court	03/08/2021	House Martin	2
Warren's Court	03/08/2021	Swallow	-
Castlemoor	16/10/2021	#N/A	n/a
Warren's Court	16/10/2021	Mute Swan	6
The Gearagh	16/10/2021	Mallard	98
The Gearagh	16/10/2021	Teal	186
The Gearagh	16/10/2021	Lapwing	60
The Gearagh	16/10/2021	Snipe	4
The Gearagh	16/10/2021	Curlew	16
The Gearagh	16/10/2021	Grey Heron	3
The Gearagh	16/10/2021	Mute Swan	14
The Gearagh	16/10/2021	Ruff	2
The Gearagh	16/10/2021	Garden Warbler	-
The Gearagh	16/10/2021	#N/A	1
The Gearagh	16/10/2021	Little Egret	9
The Gearagh	16/10/2021	Moorhen	1
The Gearagh	16/10/2021	Black-headed Gull	120
The Gearagh	16/10/2021	Lesser Black-backed Gull	54
The Gearagh	16/10/2021	Wigeon	35
The Gearagh	16/10/2021	Cormorant	6
Kilmicheal/Mid Cork Quarries	16/10/2021	Reed Bunting	2

Site Name	Date	Common name	No ¹
Kilmicheal/Mid Cork Quarries	16/10/2021	Jackdaw	6
Barnadivane 2km radius	16/10/2021	Chaffinch	20
Barnadivane 2km radius	16/10/2021	Rook	-
Barnadivane 2km radius	16/10/2021	Hooded Crow	-
Barnadivane 2km radius	16/10/2021	Magpie	2
Barnadivane 2km radius	16/10/2021	Wren	5
Barnadivane 2km radius	16/10/2021	Bullfinch	2
Barnadivane 2km radius	16/10/2021	Meadow Pipit	40+
Barnadivane 2km radius	16/10/2021	Linnet	20
Barnadivane 2km radius	16/10/2021	Blue Tit	1
Barnadivane 2km radius	16/10/2021	Lesser Black-backed Gull	4
Barnadivane 2km radius	16/10/2021	Dunnock	1
Barnadivane 2km radius	16/10/2021	Jackdaw	17
Barnadivane 2km radius	16/10/2021	Goldfinch	2
Barnadivane 2km radius	16/10/2021	Pheasant	1
Barnadivane 2km radius	16/10/2021	Robin	6
Barnadivane 2km radius	16/10/2021	Woodpigeon	20
Barnadivane 2km radius	16/10/2021	Starling	-
Barnadivane 2km radius	16/10/2021	Buzzard	1
Murragh Lake	16/10/2021	Mute Swan	2
Desert Bridge	16/10/2021	Mallard	2
Desert Bridge	16/10/2021	Mallard	31
River Bandon SAC	16/10/2021	Lesser Black-backed Gull	28
River Bandon SAC	16/10/2021	Grey Wagtail	1
River Bandon SAC	16/10/2021	Little Egret	5
The Gearagh	20/09/2021	Kestrel	1
The Gearagh	20/09/2021	Swallow	2
The Gearagh	20/09/2021	Great White Egret	1
The Gearagh	20/09/2021	Egyptian Goose	1
The Gearagh	20/09/2021	Black-headed Gull	69
The Gearagh	20/09/2021	Mallard	254
The Gearagh	20/09/2021	Reed Bunting	1
The Gearagh	20/09/2021	Robin	1
The Gearagh	20/09/2021	Chaffinch	5
The Gearagh	20/09/2021	Woodpigeon	1
The Gearagh	20/09/2021	Coot	9
The Gearagh	20/09/2021	Snipe	4

Site Name	Date	Common name	No ¹
The Gearagh	20/09/2021	Ruff	3
The Gearagh	20/09/2021	Blue Tit	1
The Gearagh	20/09/2021	Grey Heron	7
The Gearagh	20/09/2021	Wigeon	14
The Gearagh	20/09/2021	Whooper Swan	2
The Gearagh	20/09/2021	Greylag Goose	203
The Gearagh	20/09/2021	Teal	48
The Gearagh	20/09/2021	Lapwing	50
The Gearagh	20/09/2021	Great Crested Grebe	27
The Gearagh	20/09/2021	Buzzard	1
The Gearagh	20/09/2021	Sparrowhawk	1
The Gearagh	20/09/2021	Mute Swan	13
The Gearagh	20/09/2021	Blackbird	1
The Gearagh	20/09/2021	Lesser Black-backed Gull	37
The Gearagh	20/09/2021	Curlew	1
The Gearagh	20/09/2021	Moorhen	3
Kilmicheal/Mid Cork Quarries	20/09/2021	Magpie	1
Kilmicheal/Mid Cork Quarries	20/09/2021	Rook	1
Kilmicheal/Mid Cork Quarries	20/09/2021	Hooded Crow	2
Kilmicheal/Mid Cork Quarries	20/09/2021	Swallow	1
Kilmicheal/Mid Cork Quarries	20/09/2021	Blackbird	1
Kilmicheal/Mid Cork Quarries	20/09/2021	Dunnock	1
Kilmicheal/Mid Cork Quarries	20/09/2021	Meadow Pipit	4
Murragh Lake	20/09/2021	Cormorant	1
Murragh Lake	20/09/2021	Coot	1
Murragh Lake	20/09/2021	Grey Heron	1
Murragh Lake	20/09/2021	Dunnock	1
Murragh Lake	20/09/2021	Woodpigeon	1
Desert Bridge	20/09/2021	Mute Swan	1
Desert Bridge	20/09/2021	Dipper	1
Desert Bridge	20/09/2021	Mallard	4
Desert Bridge	20/09/2021	Woodpigeon	13
Desert Bridge	20/09/2021	Kestrel	2
Desert Bridge	20/09/2021	Grey Heron	1
Desert Bridge	20/09/2021	Jackdaw	6
Desert Bridge	20/09/2021	Goldfinch	2
Desert Bridge	20/09/2021	Rook	2

Site Name	Date	Common name	No ¹
Desert Bridge	20/09/2021	Hooded Crow	2
Desert Bridge	20/09/2021	Cormorant	1
Desert Bridge	20/09/2021	Chaffinch	1
Desert Bridge	20/09/2021	Magpie	1
Desert Bridge	20/09/2021	Swallow	9
Barnadivane 2km radius	20/09/2021	Meadow Pipit	-
Barnadivane 2km radius	20/09/2021	Jackdaw	-
Barnadivane 2km radius	20/09/2021	Rook	-
Barnadivane 2km radius	20/09/2021	Hooded Crow	-
Barnadivane 2km radius	20/09/2021	Goldfinch	-
Barnadivane 2km radius	20/09/2021	Wren	-
Barnadivane 2km radius	20/09/2021	Starling	-
Barnadivane 2km radius	20/09/2021	Swallow	-
Barnadivane 2km radius	20/09/2021	Robin	-
Barnadivane 2km radius	20/09/2021	Dunnock	-
Barnadivane 2km radius	20/09/2021	Great Tit	-
Barnadivane 2km radius	20/09/2021	Blue Tit	-
Barnadivane 2km radius	20/09/2021	Chaffinch	-
Barnadivane 2km radius	20/09/2021	Lesser Black-backed Gull	-
Barnadivane 2km radius	20/09/2021	Raven	-
Barnadivane 2km radius	20/09/2021	Robin	-
Barnadivane 2km radius	20/09/2021	Woodpigeon	-
Barnadivane 2km radius	20/09/2021	Magpie	-
Barnadivane 2km radius	20/09/2021	Stonechat	-
Barnadivane 2km radius	20/09/2021	Pied/White Wagtail	-
Barnadivane 2km radius	20/09/2021	Wheatear	1
Warren's Court	20/09/2021	Tufted Duck	3
Warren's Court	20/09/2021	Lesser Black-backed Gull	12
Warren's Court	20/09/2021	Mallard	2
Warren's Court	20/09/2021	Mute Swan	1
Castlemoor	20/09/2021	Lesser Black-backed Gull	1
Sullane Delta	15/11/2021	Wigeon	49
Sullane Delta	15/11/2021	Green Sandpiper	1
Sullane Delta	15/11/2021	Curlew	14
Sullane Delta	15/11/2021	Lapwing	125
Sullane Delta	15/11/2021	Great Black-backed Gull	1
Sullane Delta	15/11/2021	Cormorant	10

Site Name	Date	Common name	No ¹
Sullane Delta	15/11/2021	Mallard	48
Sullane Delta	15/11/2021	Black-headed Gull	37
Sullane Delta	15/11/2021	Grey Heron	3
Sullane Delta	15/11/2021	Snipe	4
Sullane Delta	15/11/2021	Teal	38
The Gearagh	15/11/2021	Golden Plover	1300
The Gearagh	15/11/2021	Whooper Swan	6
The Gearagh	15/11/2021	Great White Egret	3
The Gearagh	15/11/2021	Lapwing	348
The Gearagh	15/11/2021	Black-tailed Godwit	12
The Gearagh	15/11/2021	Curlew	68
The Gearagh	15/11/2021	Dunlin	102
The Gearagh	15/11/2021	Great Black-backed Gull	1
The Gearagh	15/11/2021	Teal	1040
The Gearagh	15/11/2021	Mallard	51
The Gearagh	15/11/2021	Mute Swan	19
The Gearagh	15/11/2021	Cormorant	7
The Gearagh	15/11/2021	Grey Heron	4
The Gearagh	15/11/2021	Wigeon	127
The Gearagh	15/11/2021	Lesser Black-backed Gull	26
The Gearagh	15/11/2021	Black-headed Gull	50
The Gearagh	15/11/2021	Gadwall	3
The Gearagh	15/11/2021	Snipe	13
Warren's Court	15/11/2021	Kingfisher	2
Warren's Court	15/11/2021	Tufted Duck	3
Warren's Court	15/11/2021	Wigeon	3
Warren's Court	15/11/2021	Mute Swan	3
Warren's Court	15/11/2021	Grey Heron	1
Warren's Court	15/11/2021	Treecreeper	1
Warren's Court	15/11/2021	Goldcrest	1
Castlemoor	15/11/2021	Sparrowhawk	1
Castlemoor	15/11/2021	Raven	1
Castlemoor	15/11/2021	Blue Tit	1
Barnadivane 2km radius	15/11/2021	Buzzard	1
Murragh Lake	15/11/2021	Tufted Duck	3
Murragh Lake	15/11/2021	Magpie	1
Murragh Lake	15/11/2021	Blackbird	2

Site Name	Date	Common name	No ¹
Murragh Lake	15/11/2021	Jackdaw	2
Desert Bridge	15/11/2021	Cormorant	1
Desert Bridge	15/11/2021	Mute Swan	1
Desert Bridge	15/11/2021	Mallard	4
Desert Bridge	15/11/2021	Lesser Black-backed Gull	14
River Bandon SAC	15/11/2021	Whooper Swan	17
River Bandon SAC	15/11/2021	Mute Swan	4
River Bandon SAC	15/11/2021	Grey Heron	1
River Bandon SAC	15/11/2021	Little Egret	1
River Bandon SAC	15/11/2021	Mallard	2
Sullane Delta	31/12/2021	Grey Heron	1
Sullane Delta	31/12/2021	Teal	37
Sullane Delta	31/12/2021	Wigeon	31
Sullane Delta	31/12/2021	Mallard	6
Sullane Delta	31/12/2021	Black-headed Gull	160
Sullane Delta	31/12/2021	Dunlin	25
Sullane Delta	31/12/2021	Lapwing	46
Sullane Delta	31/12/2021	Curlew	105
The Gearagh	31/12/2021	Grey Heron	2
The Gearagh	31/12/2021	Lapwing	163
The Gearagh	31/12/2021	Cormorant	1
The Gearagh	31/12/2021	Mallard	27
The Gearagh	31/12/2021	Wigeon	68
The Gearagh	31/12/2021	Teal	29
The Gearagh	31/12/2021	Mute Swan	5
The Gearagh	31/12/2021	Greylag Goose	2
The Gearagh	31/12/2021	Curlew	5
The Gearagh	31/12/2021	Dunlin	78
The Gearagh	31/12/2021	Black-headed Gull	80
The Gearagh	31/12/2021	Whooper Swan	59
Castlemoor	31/12/2021	Tufted Duck	12
Castlemoor	31/12/2021	Mallard	7
Warren's Court	31/12/2021	Mute Swan	2
Warren's Court	31/12/2021	Moorhen	1
Barnadivane 2km radius	31/12/2021	Dipper	1
Barnadivane 2km radius	31/12/2021	Sparrowhawk	1
Barnadivane 2km radius	31/12/2021	Redwing	40

Site Name	Date	Common name	No ¹
Barnadivane 2km radius	31/12/2021	Blackbird	3
Barnadivane 2km radius	31/12/2021	Chaffinch	1
Barnadivane 2km radius	31/12/2021	Fieldfare	12
Barnadivane 2km radius	31/12/2021	Hooded Crow	2
Barnadivane 2km radius	31/12/2021	Starling	40
Murragh Lake	31/12/2021	Little Grebe	7
Murragh Lake	31/12/2021	Cormorant	1
Murragh Lake	31/12/2021	Grey Heron	1
Desert Bridge	31/12/2021	Cormorant	1
Desert Bridge	31/12/2021	Mute Swan	1
Desert Bridge	31/12/2021	Mallard	4
Desert Bridge	31/12/2021	Lesser Black-backed Gull	14
River Bandon SAC	31/12/2021	Whooper Swan	34
River Bandon SAC	31/12/2021	Mute Swan	3
River Bandon SAC	31/12/2021	Redwing	20
River Bandon SAC	31/12/2021	Robin	1
River Bandon SAC	31/12/2021	Mallard	15
River Bandon SAC	31/12/2021	Cormorant	1
River Bandon SAC	31/12/2021	Woodpigeon	1
River Bandon SAC	31/12/2021	Blackbird	1
River Bandon SAC	31/12/2021	Curlew	16
River Bandon SAC	31/12/2021	Grey Heron	4
River Bandon SAC	31/12/2021	Great Black-backed Gull	1
River Bandon SAC	31/12/2021	Lesser Black-backed Gull	19
Sullane Delta	12/02/2022	Barnacle Goose	3
Sullane Delta	12/02/2022	Teal	29
Sullane Delta	12/02/2022	Cormorant	12
Sullane Delta	12/02/2022	Wigeon	128
Sullane Delta	12/02/2022	Grey Heron	1
Sullane Delta	12/02/2022	Curlew	129
Sullane Delta	12/02/2022	Great Crested Grebe	11
Sullane Delta	12/02/2022	Mallard	4
Sullane Delta	12/02/2022	Lapwing	300
The Gearagh	12/02/2022	Dunlin	206
The Gearagh	12/02/2022	Lapwing	417
The Gearagh	12/02/2022	Black-headed Gull	56
The Gearagh	12/02/2022	Curlew	46

Site Name	Date	Common name	No ¹
The Gearagh	12/02/2022	Lesser Black-backed Gull	26
The Gearagh	12/02/2022	Goosander	2
The Gearagh	12/02/2022	Teal	158
The Gearagh	12/02/2022	Wigeon	72
The Gearagh	12/02/2022	Grey Heron	1
The Gearagh	12/02/2022	Cormorant	1
The Gearagh	12/02/2022	Buzzard	1
The Gearagh	12/02/2022	Mallard	12
The Gearagh	12/02/2022	Peregrine	1
Warren's Court	12/02/2022	Tufted Duck	18
Warren's Court	12/02/2022	Teal	2
Warren's Court	12/02/2022	Mute Swan	5
Warren's Court	12/02/2022	Grey Heron	1
Barnadivane 2km radius	12/02/2022	Goldfinch	-
Barnadivane 2km radius	12/02/2022	Blue Tit	-
Barnadivane 2km radius	12/02/2022	Dunnock	-
Barnadivane 2km radius	12/02/2022	Chaffinch	-
Barnadivane 2km radius	12/02/2022	Siskin	-
Barnadivane 2km radius	12/02/2022	Magpie	-
Barnadivane 2km radius	12/02/2022	Robin	-
Barnadivane 2km radius	12/02/2022	Wren	-
Barnadivane 2km radius	12/02/2022	Treecreeper	1
Barnadivane 2km radius	12/02/2022	Song Thrush	-
Barnadivane 2km radius	12/02/2022	Bullfinch	-
Barnadivane 2km radius	12/02/2022	Blackbird	-
Barnadivane 2km radius	12/02/2022	Rook	-
Barnadivane 2km radius	12/02/2022	Hooded Crow	-
Barnadivane 2km radius	12/02/2022	Starling	-
Barnadivane 2km radius	12/02/2022	Kestrel	-
Murragh Lake	12/02/2022	Tufted Duck	2
Murragh Lake	12/02/2022	Teal	3
Murragh Lake	12/02/2022	Coot	1
Murragh Lake	12/02/2022	Moorhen	1
Murragh Lake	12/02/2022	Grey Heron	2
Murragh Lake	12/02/2022	Long-tailed Tit	2
Murragh Lake	12/02/2022	Great Tit	1
Murragh Lake	12/02/2022	Blue Tit	1

Site Name	Date	Common name	No ¹
Murragh Lake	12/02/2022	Robin	1
Murragh Lake	12/02/2022	Chaffinch	2
Murragh Lake	12/02/2022	Jackdaw	4
Murragh Lake	12/02/2022	Blackbird	1
Desert Bridge	12/02/2022	Grey Wagtail	1
Desert Bridge	12/02/2022	Chaffinch	2
Desert Bridge	12/02/2022	Dunnock	1
River Bandon SAC	12/02/2022	Whooper Swan	27
River Bandon SAC	12/02/2022	Mute Swan	5
River Bandon SAC	12/02/2022	Curlew	26
River Bandon SAC	12/02/2022	Little Egret	1
River Bandon SAC	12/02/2022	Cormorant	1
River Bandon SAC	12/02/2022	Rook	-
River Bandon SAC	12/02/2022	Fieldfare	-
River Bandon SAC	12/02/2022	Redwing	-
River Bandon SAC	12/02/2022	Woodpigeon	-
River Bandon SAC	12/02/2022	Starling	-
Warren's Court	01/04/2022	Tufted Duck	26
Warren's Court	01/04/2022	Mallard	1
Warren's Court	01/04/2022	Sand Martin	2
Warren's Court	01/04/2022	Mute Swan	3
Warren's Court	01/04/2022	Song Thrush	1
Warren's Court	01/04/2022	Dunnock	2
Warren's Court	01/04/2022	Chiffchaff	2
Warren's Court	01/04/2022	Blackbird	2
Warren's Court	01/04/2022	Woodpigeon	1
Sullane Delta	01/04/2022	Grey Heron	2
Sullane Delta	01/04/2022	Cormorant	7
Sullane Delta	01/04/2022	Teal	7
Sullane Delta	01/04/2022	Mallard	2
Sullane Delta	01/04/2022	Lapwing	1
Sullane Delta	01/04/2022	Little Egret	4
Sullane Delta	01/04/2022	Sand Martin	8
Sullane Delta	01/04/2022	Great Black-backed Gull	1
Sullane Delta	01/04/2022	Lesser Black-backed Gull	1
The Gearagh	01/04/2022	Greylag Goose	16
The Gearagh	01/04/2022	Mute Swan	9

Site Name	Date	Common name	No ¹
The Gearagh	01/04/2022	Teal	38
The Gearagh	01/04/2022	Wigeon	51
The Gearagh	01/04/2022	Cormorant	6
The Gearagh	01/04/2022	Great Crested Grebe	8
The Gearagh	01/04/2022	Gadwall	2
The Gearagh	01/04/2022	Lesser Black-backed Gull	4
The Gearagh	01/04/2022	Sand Martin	1
The Gearagh	01/04/2022	Mallard	2
Murragh Lake	01/04/2022	Coot	2
Murragh Lake	01/04/2022	Teal	2
Murragh Lake	01/04/2022	Mallard	1
Murragh Lake	01/04/2022	Whooper Swan	1
Desert Bridge	01/04/2022	Grey Wagtail	2
Desert Bridge	01/04/2022	Mallard	2
River Bandon SAC	01/04/2022	Mute Swan	1
River Bandon SAC	01/04/2022	Lesser Black-backed Gull	30
River Bandon SAC	01/04/2022	Mallard	4
River Bandon SAC	01/04/2022	Cormorant	2
Barnadivane 5km radius	01/04/2022	Brambling	1
Barnadivane 5km radius	01/04/2022	House Sparrow	-
Barnadivane 5km radius	01/04/2022	Starling	-
Barnadivane 5km radius	01/04/2022	Rook	-
Barnadivane 5km radius	01/04/2022	Blue Tit	-
Barnadivane 5km radius	01/04/2022	Great Tit	-
Barnadivane 5km radius	01/04/2022	Hooded Crow	-
Barnadivane 5km radius	01/04/2022	Coal Tit	-
Barnadivane 5km radius	01/04/2022	Robin	-
Barnadivane 5km radius	01/04/2022	Woodpigeon	-
Barnadivane 5km radius	01/04/2022	Magpie	-
Barnadivane 5km radius	01/04/2022	Dunnock	-
Barnadivane 5km radius	01/04/2022	Wren	-
Barnadivane 5km radius	01/04/2022	Chiffchaff	-
Barnadivane 5km radius	01/04/2022	Jackdaw	-
Barnadivane 5km radius	01/04/2022	Chaffinch	-
Barnadivane 2km radius	01/04/2022	Wren	-
Barnadivane 2km radius	01/04/2022	Stonechat	-
Barnadivane 2km radius	01/04/2022	Mallard	2

Site Name	Date	Common name	No ¹
Barnadivane 2km radius	01/04/2022	Woodpigeon	-
Barnadivane 2km radius	01/04/2022	Chaffinch	-
Barnadivane 2km radius	01/04/2022	Rook	-
Barnadivane 2km radius	01/04/2022	Hooded Crow	-
Barnadivane 2km radius	01/04/2022	Jackdaw	-
Barnadivane 2km radius	01/04/2022	Blackbird	-
Barnadivane 2km radius	01/04/2022	Dunnock	-
Barnadivane 2km radius	01/04/2022	Starling	-
Barnadivane 2km radius	01/04/2022	Robin	-
Barnadivane 2km radius	01/04/2022	Chaffinch	-
Barnadivane 2km radius	01/04/2022	Greenfinch	1
Barnadivane 2km radius	01/04/2022	Blue Tit	-
Barnadivane 2km radius	11/05/2022	Magpie	-
Barnadivane 2km radius	11/05/2022	Dunnock	-
Barnadivane 2km radius	11/05/2022	Robin	-
Barnadivane 2km radius	11/05/2022	Wren	-
Barnadivane 2km radius	11/05/2022	Chaffinch	-
Barnadivane 2km radius	11/05/2022	Common Crossbill	-
Barnadivane 2km radius	11/05/2022	Blue Tit	-
Barnadivane 2km radius	11/05/2022	Blackbird	-
Barnadivane 2km radius	11/05/2022	Woodpigeon	-
Barnadivane 2km radius	11/05/2022	Meadow Pipit	-
Barnadivane 2km radius	11/05/2022	Great Tit	-
Barnadivane 2km radius	11/05/2022	Siskin	-
Barnadivane 2km radius	11/05/2022	Rook	-
Barnadivane 2km radius	11/05/2022	Hooded Crow	-
Barnadivane 5km radius	11/05/2022	Common Crossbill	-
Barnadivane 5km radius	11/05/2022	Great Tit	-
Barnadivane 5km radius	11/05/2022	Chaffinch	-
Barnadivane 5km radius	11/05/2022	Blue Tit	-
Barnadivane 5km radius	11/05/2022	Dunnock	-
Barnadivane 5km radius	11/05/2022	Magpie	-
Barnadivane 5km radius	11/05/2022	Hooded Crow	-
Barnadivane 5km radius	11/05/2022	Mallard	2
Barnadivane 5km radius	11/05/2022	Rook	-
Barnadivane 5km radius	11/05/2022	Blackbird	-

Site Name	Date	Common name	No ¹
Barnadivane 5km radius	11/05/2022	Siskin	-
Barnadivane 5km radius	11/05/2022	Bullfinch	-
Barnadivane 5km radius	11/05/2022	Wren	-
Barnadivane 5km radius	11/05/2022	Woodpigeon	-
Barnadivane 5km radius	11/05/2022	Robin	-
Barnadivane 5km radius	11/05/2022	Pheasant	-
Barnadivane 5km radius	11/05/2022	Song Thrush	-
Barnadivane 5km radius	11/05/2022	Jackdaw	-
Barnadivane 5km radius	11/05/2022	Blackcap	-
Barnadivane 5km radius	11/05/2022	Linnet	-
Barnadivane 5km radius	11/05/2022	Swallow	-
Barnadivane 5km radius	11/05/2022	Willow Warbler	-
Barnadivane 5km radius	11/05/2022	Starling	-
Barnadivane 5km radius	11/05/2022	Sedge Warbler	-
Barnadivane 5km radius	11/05/2022	Pied/White Wagtail	-
Barnadivane 5km radius	11/05/2022	Goldfinch	-
River Bandon SAC	11/05/2022	Grey Wagtail	2
River Bandon SAC	11/05/2022	Sand Martin	2
River Bandon SAC	11/05/2022	Mallard	16
River Bandon SAC	11/05/2022	Grey Heron	1
Desert Bridge	11/05/2022	Dipper	1
Desert Bridge	11/05/2022	Mallard	1
Murragh Lake	11/05/2022	Moorhen	1
Murragh Lake	11/05/2022	Mallard	1
Murragh Lake	11/05/2022	Mute Swan	1
Warren's Court	11/05/2022	Mute Swan	1
Warren's Court	11/05/2022	Moorhen	2
Warren's Court	11/05/2022	Mallard	1
Sullane Delta	11/05/2022	Grey Heron	1
Sullane Delta	11/05/2022	Mute Swan	2
Sullane Delta	11/05/2022	Mallard	7
Sullane Delta	11/05/2022	Sand Martin	-
Sullane Delta	11/05/2022	Great Black-backed Gull	1
Sullane Delta	11/05/2022	Cormorant	1
Sullane Delta	11/05/2022	Lesser Black-backed Gull	3
The Gearagh	11/05/2022	Garganey	1
The Gearagh	11/05/2022	Great Crested Grebe	27

Site Name	Date	Common name	No ¹
The Gearagh	11/05/2022	Moorhen	2
The Gearagh	11/05/2022	Whimbrel	1
The Gearagh	11/05/2022	Mute Swan	25
The Gearagh	11/05/2022	Teal	4
The Gearagh	11/05/2022	Wigeon	2
The Gearagh	11/05/2022	Greylag Goose	14
The Gearagh	11/05/2022	Mallard	21
The Gearagh	11/05/2022	Lesser Black-backed Gull	27
The Gearagh	11/05/2022	Cormorant	1
The Gearagh	11/05/2022	Grey Heron	2
Kilmicheal/Mid Cork Quarries	11/05/2022	Sand Martin	0
Barnadivane 2km radius	01/06/2022	Bullfinch	-
Barnadivane 2km radius	01/06/2022	Wren	-
Barnadivane 2km radius	01/06/2022	Blackcap	-
Barnadivane 2km radius	01/06/2022	Robin	-
Barnadivane 2km radius	01/06/2022	Rook	-
Barnadivane 2km radius	01/06/2022	Chaffinch	-
Barnadivane 2km radius	01/06/2022	Jackdaw	-
Barnadivane 2km radius	01/06/2022	Starling	-
Barnadivane 2km radius	01/06/2022	Swallow	-
Barnadivane 2km radius	01/06/2022	Willow Warbler	-
Barnadivane 2km radius	01/06/2022	Blackbird	-
Barnadivane 2km radius	01/06/2022	Meadow Pipit	-
Barnadivane 2km radius	01/06/2022	Chiffchaff	-
Barnadivane 2km radius	01/06/2022	Pheasant	-
Barnadivane 2km radius	01/06/2022	Pied/White Wagtail	-
Barnadivane 2km radius	01/06/2022	Hooded Crow	-
Barnadivane 2km radius	01/06/2022	Song Thrush	-
Barnadivane 2km radius	01/06/2022	Lesser Redpoll	-
Barnadivane 2km radius	01/06/2022	Reed Bunting	-
Barnadivane 2km radius	01/06/2022	Magpie	-
Barnadivane 2km radius	01/06/2022	Blue Tit	-
Barnadivane 2km radius	01/06/2022	Woodpigeon	-
Barnadivane 2km radius	01/06/2022	Goldfinch	-
Barnadivane 2km radius	01/06/2022	Stonechat	-
Barnadivane 2km radius	01/06/2022	Coal Tit	-

Site Name	Date	Common name	No ¹
Barnadivane 2km radius	01/06/2022	Goldcrest	-
Barnadivane 2km radius	01/06/2022	Dunnock	-
Barnadivane 2km radius	01/06/2022	Mistle Thrush	-
Barnadivane 2km radius	01/06/2022	Kestrel	-
Barnadivane 2km radius	01/06/2022	House Martin	-
Barnadivane 5km radius	01/06/2022	Blackcap	-
Barnadivane 5km radius	01/06/2022	Goldfinch	-
Barnadivane 5km radius	01/06/2022	Chaffinch	-
Barnadivane 5km radius	01/06/2022	House Sparrow	-
Barnadivane 5km radius	01/06/2022	Great Tit	-
Barnadivane 5km radius	01/06/2022	Willow Warbler	-
Barnadivane 5km radius	01/06/2022	Blackbird	-
Barnadivane 5km radius	01/06/2022	Robin	-
Barnadivane 5km radius	01/06/2022	Dunnock	-
Barnadivane 5km radius	01/06/2022	Buzzard	-
Barnadivane 5km radius	01/06/2022	Hooded Crow	-
Barnadivane 5km radius	01/06/2022	Magpie	-
Barnadivane 5km radius	01/06/2022	Jackdaw	-
Barnadivane 5km radius	01/06/2022	Song Thrush	-
Barnadivane 5km radius	01/06/2022	Pied/White Wagtail	-
Barnadivane 5km radius	01/06/2022	Pheasant	-
Barnadivane 5km radius	01/06/2022	Chiffchaff	-
Barnadivane 5km radius	01/06/2022	Starling	-
Barnadivane 5km radius	01/06/2022	Swallow	-
Barnadivane 5km radius	01/06/2022	House Sparrow	-
Barnadivane 5km radius	01/06/2022	Rook	-
Barnadivane 5km radius	01/06/2022	Jackdaw	-
Barnadivane 5km radius	01/06/2022	Magpie	-
Barnadivane 5km radius	01/06/2022	Goldfinch	-
Barnadivane 5km radius	01/06/2022	Wren	-
Barnadivane 5km radius	01/06/2022	Raven	-
Barnadivane 5km radius	01/06/2022	Long-tailed Tit	-
Barnadivane 5km radius	01/06/2022	Jay	-
Barnadivane 5km radius	01/06/2022	Goldcrest	-
Murragh Lake	01/06/2022	Mallard	2
Murragh Lake	01/06/2022	Moorhen	1

Site Name	Date	Common name	No ¹
Desert Bridge	01/06/2022	Grey Heron	1
Desert Bridge	01/06/2022	Mallard	1
River Bandon SAC	01/06/2022	Mallard	1
Warren's Court	01/06/2022	House Martin	-
Warren's Court	01/06/2022	Moorhen	-
Warren's Court	01/06/2022	Mallard	4
Sullane Delta	01/06/2022	Mute Swan	1
Sullane Delta	01/06/2022	Lapwing	2
Sullane Delta	01/06/2022	Mallard	16
Sullane Delta	01/06/2022	Grey Heron	4
Sullane Delta	01/06/2022	Cormorant	1
Sullane Delta	01/06/2022	Black-headed Gull	1
Sullane Delta	01/06/2022	Lesser Black-backed Gull	13
Sullane Delta	01/06/2022	Great Black-backed Gull	1
Sullane Delta	01/06/2022	House Martin	-
The Gearagh	01/06/2022	Grey Heron	3
The Gearagh	01/06/2022	Great Crested Grebe	17
The Gearagh	01/06/2022	Mallard	21
The Gearagh	01/06/2022	Coot	1
The Gearagh	01/06/2022	Mute Swan	36
The Gearagh	01/06/2022	Moorhen	2
The Gearagh	01/06/2022	Lesser Black-backed Gull	9
The Gearagh	01/06/2022	Greylag Goose	6
Warren's Court	26/01/2022	Tufted Duck	10
Warren's Court	26/01/2022	Mallard	3
Warren's Court	26/01/2022	Mute Swan	5
Warren's Court	26/01/2022	Grey Heron	1
Warren's Court	26/01/2022	Blackbird	3
Warren's Court	26/01/2022	Song Thrush	2
Warren's Court	26/01/2022	Robin	4
Warren's Court	26/01/2022	Great Tit	1
Warren's Court	26/01/2022	Hooded Crow	2
Warren's Court	26/01/2022	Wren	2
Castlemoor	26/01/2022	Tufted Duck	8
Castlemoor	26/01/2022	Collared Dove	2
Castlemoor	26/01/2022	Woodpigeon	1
Castlemoor	26/01/2022	Robin	1

Site Name	Date	Common name	No ¹
Castlemoor	26/01/2022	Jackdaw	3
Castlemoor	26/01/2022	Hooded Crow	1
Castlemoor	26/01/2022	Snipe	1
Castlelack Lake	26/01/2022	Mute Swan	7
Castlelack Lake	26/01/2022	Wigeon	12
Castlelack Lake	26/01/2022	Coot	2
Castlelack Lake	26/01/2022	Teal	24
Castlelack Lake	26/01/2022	Mallard	18
Castlelack Lake	26/01/2022	Black-headed Gull	1
Castlelack Lake	26/01/2022	Jackdaw	2
Murragh Lake	26/01/2022	Tufted Duck	3
Murragh Lake	26/01/2022	Coot	1
Murragh Lake	26/01/2022	Mallard	8
Murragh Lake	26/01/2022	Goldcrest	2
Murragh Lake	26/01/2022	Jackdaw	4
Murragh Lake	26/01/2022	Chiffchaff	1
Murragh Lake	26/01/2022	Robin	1
Desert Bridge	26/01/2022	Dipper	1
Desert Bridge	26/01/2022	Chaffinch	1
River Bandon SAC	26/01/2022	Whooper Swan	38
River Bandon SAC	26/01/2022	Robin	4
River Bandon SAC	26/01/2022	Hooded Crow	4
River Bandon SAC	26/01/2022	Jackdaw	3
River Bandon SAC	26/01/2022	Chaffinch	1
River Bandon SAC	26/01/2022	Dunnock	1
River Bandon SAC	26/01/2022	Blackbird	3
River Bandon SAC	26/01/2022	Mallard	3
River Bandon SAC	26/01/2022	Fieldfare	30
River Bandon SAC	26/01/2022	Redwing	5
River Bandon SAC	26/01/2022	Grey Heron	1
River Bandon SAC	26/01/2022	Pied/White Wagtail	1
River Bandon SAC	26/01/2022	Starling	26
River Bandon SAC	26/01/2022	Magpie	1
River Bandon SAC	26/01/2022	Peregrine	1
Barnadivane 2km radius	26/01/2022	Blackbird	2
Barnadivane 2km radius	26/01/2022	Hooded Crow	1
Barnadivane 2km radius	26/01/2022	Wren	1

Site Name	Date	Common name	No ¹
Barnadivane 2km radius	26/01/2022	Blue Tit	2
Barnadivane 2km radius	26/01/2022	Woodpigeon	6
Barnadivane 2km radius	26/01/2022	Robin	2
Barnadivane 2km radius	26/01/2022	Jackdaw	20
Barnadivane 2km radius	26/01/2022	Chaffinch	10
Barnadivane 2km radius	26/01/2022	Dunnock	1
Barnadivane 2km radius	26/01/2022	Fieldfare	25
Barnadivane 2km radius	26/01/2022	Pied/White Wagtail	2
Barnadivane 2km radius	26/01/2022	Starling	20
Barnadivane 2km radius	26/01/2022	Redwing	1
The Gearagh	26/01/2022	Lapwing	61
The Gearagh	26/01/2022	Curlew	44
The Gearagh	26/01/2022	Dunlin	86
The Gearagh	26/01/2022	Snipe	1
The Gearagh	26/01/2022	Black-headed Gull	1
The Gearagh	26/01/2022	Teal	68
The Gearagh	26/01/2022	Little Egret	1
The Gearagh	26/01/2022	Wigeon	26
The Gearagh	26/01/2022	Grey Heron	1
The Gearagh	26/01/2022	Peregrine	1
Sullane Delta	26/01/2022	Barnacle Goose	2
Sullane Delta	26/01/2022	Teal	6
Sullane Delta	26/01/2022	Lapwing	726
Sullane Delta	26/01/2022	Curlew	39
Sullane Delta	26/01/2022	Mallard	9
Sullane Delta	26/01/2022	Dunlin	53
Sullane Delta	26/01/2022	Wigeon	78
Sullane Delta	26/01/2022	Black-headed Gull	216
Sullane Delta	26/01/2022	Grey Heron	2
Sullane Delta	26/01/2022	Cormorant	19
Warren's Court	04/03/2022	Tufted Duck	14
Warren's Court	04/03/2022	Little Grebe	1
Warren's Court	04/03/2022	Mute Swan	5
Barnadivane 2km radius	04/03/2022	Hooded Crow	-
Barnadivane 2km radius	04/03/2022	Rook	-
Barnadivane 2km radius	04/03/2022	Dunnock	-
Barnadivane 2km radius	04/03/2022	Goldfinch	-

Site Name	Date	Common name	No ¹
Barnadivane 2km radius	04/03/2022	Magpie	-
Barnadivane 2km radius	04/03/2022	Redwing	-
Barnadivane 2km radius	04/03/2022	Blackbird	-
Barnadivane 2km radius	04/03/2022	Wren	-
Barnadivane 2km radius	04/03/2022	Chaffinch	-
Barnadivane 2km radius	04/03/2022	Starling	-
Barnadivane 2km radius	04/03/2022	Robin	-
Barnadivane 2km radius	04/03/2022	Mistle Thrush	-
Barnadivane 2km radius	04/03/2022	Raven	-
Barnadivane 2km radius	04/03/2022	Long-tailed Tit	-
Barnadivane 2km radius	04/03/2022	Jackdaw	-
Barnadivane 2km radius	04/03/2022	Goldcrest	-
Barnadivane 2km radius	04/03/2022	Meadow Pipit	-
Barnadivane 2km radius	04/03/2022	Skylark	-
Barnadivane 2km radius	04/03/2022	Fieldfare	-
River Bandon SAC	04/03/2022	Whooper Swan	48
Desert Bridge	04/03/2022	Kingfisher	1
Desert Bridge	04/03/2022	Blackbird	1
Desert Bridge	04/03/2022	Redwing	2
Desert Bridge	04/03/2022	Chaffinch	11
Desert Bridge	04/03/2022	Wren	1
Desert Bridge	04/03/2022	Rook	4
Desert Bridge	04/03/2022	Woodpigeon	2
Desert Bridge	04/03/2022	Mallard	2
Desert Bridge	04/03/2022	Dunnock	1
Murragh Lake	04/03/2022	Tufted Duck	4
Murragh Lake	04/03/2022	Whooper Swan	1
Murragh Lake	04/03/2022	Mute Swan	2
Murragh Lake	04/03/2022	Coot	1
Murragh Lake	04/03/2022	Moorhen	1
Sullane Delta	04/03/2022	Wigeon	71
Sullane Delta	04/03/2022	Mallard	7
Sullane Delta	04/03/2022	House Sparrow	2
Sullane Delta	04/03/2022	Little Egret	1
Sullane Delta	04/03/2022	Teal	36
Sullane Delta	04/03/2022	Cormorant	8
Sullane Delta	04/03/2022	Great Black-backed Gull	1

Site Name	Date	Common name	No ¹
Sullane Delta	04/03/2022	Great Crested Grebe	19
Sullane Delta	04/03/2022	Black-headed Gull	2
Sullane Delta	04/03/2022	Grey Heron	2
Sullane Delta	04/03/2022	Curlew	19
Sullane Delta	04/03/2022	Pied/White Wagtail	-
Sullane Delta	04/03/2022	Song Thrush	-
Sullane Delta	04/03/2022	Magpie	-
Sullane Delta	04/03/2022	Wren	-
Sullane Delta	04/03/2022	Robin	-
Sullane Delta	04/03/2022	Hooded Crow	-
Sullane Delta	04/03/2022	Moorhen	2
The Gearagh	04/03/2022	Mallard	6
The Gearagh	04/03/2022	Teal	111
The Gearagh	04/03/2022	Wigeon	61
The Gearagh	04/03/2022	Curlew	16
The Gearagh	04/03/2022	Little Egret	2
The Gearagh	04/03/2022	Golden Plover	300
The Gearagh	04/03/2022	Dunlin	130
The Gearagh	04/03/2022	Black-headed Gull	52
Barnadivane 2km radius	16/07/2022	Hooded Crow	-
Barnadivane 2km radius	16/07/2022	Blackbird	-
Barnadivane 2km radius	16/07/2022	Jackdaw	-
Barnadivane 2km radius	16/07/2022	Swallow	-
Barnadivane 2km radius	16/07/2022	Willow Warbler	-
Barnadivane 2km radius	16/07/2022	Pied/White Wagtail	-
Barnadivane 2km radius	16/07/2022	Chaffinch	-
Barnadivane 2km radius	16/07/2022	Meadow Pipit	-
Barnadivane 2km radius	16/07/2022	Linnet	-
Barnadivane 2km radius	16/07/2022	Great Tit	-
Barnadivane 2km radius	16/07/2022	Magpie	-
Barnadivane 2km radius	16/07/2022	Woodpigeon	-
Barnadivane 2km radius	16/07/2022	Wren	-
Barnadivane 2km radius	16/07/2022	Rook	-
Barnadivane 2km radius	16/07/2022	Robin	-
Barnadivane 5km radius	16/07/2022	Jay	-
Barnadivane 5km radius	16/07/2022	Blue Tit	-

Site Name	Date	Common name	No ¹
Barnadivane 5km radius	16/07/2022	Great Tit	-
Barnadivane 5km radius	16/07/2022	Goldfinch	-
Barnadivane 5km radius	16/07/2022	Greenfinch	-
Barnadivane 5km radius	16/07/2022	Woodpigeon	-
Barnadivane 5km radius	16/07/2022	Blackbird	-
Barnadivane 5km radius	16/07/2022	Song Thrush	-
Barnadivane 5km radius	16/07/2022	Willow Warbler	-
Barnadivane 5km radius	16/07/2022	Dunnock	-
Barnadivane 5km radius	16/07/2022	Magpie	-
Barnadivane 5km radius	16/07/2022	Rook	-
Barnadivane 5km radius	16/07/2022	House Martin	-
Barnadivane 5km radius	16/07/2022	Goldfinch	-
Barnadivane 5km radius	16/07/2022	Swallow	-
Barnadivane 5km radius	16/07/2022	Stonechat	-
Barnadivane 5km radius	16/07/2022	Meadow Pipit	-
Barnadivane 5km radius	16/07/2022	Wren	-
Barnadivane 5km radius	16/07/2022	Yellowhammer	-
Barnadivane 5km radius	16/07/2022	Stock Dove	-
Murragh Lake	16/07/2022	Mallard	16
Murragh Lake	16/07/2022	Mute Swan	1
Murragh Lake	16/07/2022	Moorhen	1
Desert Bridge	16/07/2022	Dipper	1
Desert Bridge	16/07/2022	Mallard	1
Desert Bridge	16/07/2022	Grey Heron	1
River Bandon SAC	16/07/2022	Mallard	13
River Bandon SAC	16/07/2022	Mute Swan	1
River Bandon SAC	16/07/2022	Grey Wagtail	2
River Bandon SAC	16/07/2022	Grey Heron	2
Warren's Court	16/07/2022	Tufted Duck	3
Warren's Court	16/07/2022	Mallard	2
Warren's Court	16/07/2022	Grey Heron	1
Sullane Delta	16/07/2022	Little Egret	1
Sullane Delta	16/07/2022	Grey Heron	1
Sullane Delta	16/07/2022	Lapwing	3
Sullane Delta	16/07/2022	Black-headed Gull	9
Sullane Delta	16/07/2022	Common Sandpiper	1
Sullane Delta	16/07/2022	Great Black-backed Gull	3

Site Name	Date	Common name	No ¹
Sullane Delta	16/07/2022	Lesser Black-backed Gull	4
Sullane Delta	16/07/2022	Mallard	1
The Gearagh	16/07/2022	Cormorant	1
The Gearagh	16/07/2022	Stock Dove	1
The Gearagh	16/07/2022	Mute Swan	48
The Gearagh	16/07/2022	Lapwing	19
The Gearagh	16/07/2022	Black-headed Gull	12
The Gearagh	16/07/2022	Great Crested Grebe	17
The Gearagh	16/07/2022	Teal	3
The Gearagh	16/07/2022	Mallard	22
The Gearagh	16/07/2022	Grey Heron	2
The Gearagh	16/07/2022	Little Egret	2
Kilmicheal/Mid Cork Quarries	28/07/2022	Raven	-
Kilmicheal/Mid Cork Quarries	28/07/2022	Wren	-
Kilmicheal/Mid Cork Quarries	28/07/2022	Dunnock	-
Kilmicheal/Mid Cork Quarries	28/07/2022	Lesser Redpoll	-
Barnadivane 2km radius	04/08/2022	Sparrowhawk	1
Barnadivane 2km radius	04/08/2022	House Martin	2
Barnadivane 2km radius	04/08/2022	Pied/White Wagtail	1
Barnadivane 2km radius	04/08/2022	Jackdaw	8
Barnadivane 2km radius	04/08/2022	Hooded Crow	2
Barnadivane 2km radius	04/08/2022	Woodpigeon	-
Barnadivane 2km radius	04/08/2022	Chiffchaff	1
Barnadivane 2km radius	04/08/2022	Meadow Pipit	-
Barnadivane 2km radius	04/08/2022	Blue Tit	1
Barnadivane 2km radius	04/08/2022	Stonechat	2
Barnadivane 2km radius	04/08/2022	Swallow	-
Barnadivane 2km radius	04/08/2022	Linnet	3
Barnadivane 2km radius	04/08/2022	Goldfinch	1
Barnadivane 2km radius	04/08/2022	Rook	20
Barnadivane 2km radius	04/08/2022	Magpie	-
Barnadivane 2km radius	04/08/2022	Starling	-
Barnadivane 5km radius	04/08/2022	Yellowhammer	1
Barnadivane 5km radius	04/08/2022	Peregrine	1
Barnadivane 5km radius	04/08/2022	Dunnock	1
Barnadivane 5km radius	04/08/2022	Blackbird	1
Barnadivane 5km radius	04/08/2022	Meadow Pipit	-

Site Name	Date	Common name	No ¹
Barnadivane 5km radius	04/08/2022	Blue Tit	1
Barnadivane 5km radius	04/08/2022	Great Tit	1
Barnadivane 5km radius	04/08/2022	Jay	1
Barnadivane 5km radius	04/08/2022	Greenfinch	3
Barnadivane 5km radius	04/08/2022	Mistle Thrush	2
Barnadivane 5km radius	04/08/2022	Hooded Crow	-
Barnadivane 5km radius	04/08/2022	Rook	-
Barnadivane 5km radius	04/08/2022	Coal Tit	1
Barnadivane 5km radius	04/08/2022	Magpie	-
Barnadivane 5km radius	04/08/2022	Chaffinch	-
Barnadivane 5km radius	04/08/2022	Lesser Redpoll	1
Barnadivane 5km radius	04/08/2022	Bullfinch	2
Barnadivane 5km radius	04/08/2022	Goldfinch	-
Barnadivane 5km radius	04/08/2022	Meadow Pipit	-
Barnadivane 5km radius	04/08/2022	Starling	-
Barnadivane 5km radius	04/08/2022	Woodpigeon	-
Barnadivane 5km radius	04/08/2022	Willow Warbler	-
Barnadivane 5km radius	04/08/2022	Swallow	-
Murragh Lake	04/08/2022	Mallard	7
Murragh Lake	04/08/2022	Moorhen	1
Murragh Lake	04/08/2022	Mute Swan	2
Murragh Lake	04/08/2022	Sand Martin	1
Desert Bridge	04/08/2022	Grey Heron	1
Desert Bridge	04/08/2022	Mallard	12
Desert Bridge	04/08/2022	Dipper	1
Desert Bridge	04/08/2022	Sand Martin	2
Desert Bridge	04/08/2022	Kingfisher	1
River Bandon SAC	04/08/2022	Grey Wagtail	1
River Bandon SAC	04/08/2022	Grey Heron	1
River Bandon SAC	04/08/2022	Mallard	11
River Bandon SAC	04/08/2022	Buzzard	1
River Bandon SAC	04/08/2022	Sand Martin	4
River Bandon SAC	04/08/2022	Swallow	8
Warren's Court	04/08/2022	Mallard	2
Warren's Court	04/08/2022	Moorhen	1
Warren's Court	04/08/2022	Mute Swan	2
Warren's Court	04/08/2022	Sand Martin	1

Site Name	Date	Common name	No ¹
Sullane Delta	04/08/2022	Lapwing	5
Sullane Delta	04/08/2022	Black-headed Gull	26
Sullane Delta	04/08/2022	Mallard	2
Sullane Delta	04/08/2022	Grey Heron	2
Sullane Delta	04/08/2022	Sand Martin	50
Sullane Delta	04/08/2022	Swallow	30
Sullane Delta	04/08/2022	House Martin	1
Sullane Delta	04/08/2022	Cormorant	1
The Gearagh	04/08/2022	Mute Swan	112
The Gearagh	04/08/2022	Sand Martin	14
The Gearagh	04/08/2022	Black-headed Gull	17
The Gearagh	04/08/2022	Lesser Black-backed Gull	13
The Gearagh	04/08/2022	Great Crested Grebe	7
The Gearagh	04/08/2022	Mallard	1
Kilmicheal/Mid Cork Quarries	31/08/2022	Robin	1
Kilmicheal/Mid Cork Quarries	31/08/2022	Wren	1
Kilmicheal/Mid Cork Quarries	31/08/2022	Blackbird	1
Kilmicheal/Mid Cork Quarries	31/08/2022	Hooded Crow	1
Kilmicheal/Mid Cork Quarries	31/08/2022	Woodpigeon	1
The Gearagh	12/09/2022	Little Egret	13
The Gearagh	12/09/2022	Lapwing	80
The Gearagh	12/09/2022	Teal	735
The Gearagh	12/09/2022	Kingfisher	1
The Gearagh	12/09/2022	Grey Heron	7
The Gearagh	12/09/2022	Black-headed Gull	42
The Gearagh	12/09/2022	Mallard	138
The Gearagh	12/09/2022	Moorhen	1
The Gearagh	12/09/2022	Snipe	30
The Gearagh	12/09/2022	Wigeon	12
The Gearagh	12/09/2022	Curlew	21
The Gearagh	12/09/2022	Mute Swan	14
The Gearagh	12/09/2022	Lesser Black-backed Gull	254
The Gearagh	12/09/2022	Greylag Goose	79
The Gearagh	12/09/2022	#N/A	2
Sullane Delta	12/09/2022	Common Sandpiper	2
Sullane Delta	12/09/2022	Kingfisher	2
Sullane Delta	12/09/2022	Lapwing	63

Site Name	Date	Common name	No ¹
Sullane Delta	12/09/2022	Mallard	37
Sullane Delta	12/09/2022	Teal	49
Sullane Delta	12/09/2022	Moorhen	2
Sullane Delta	12/09/2022	Black-headed Gull	72
Sullane Delta	12/09/2022	Grey Heron	2
Sullane Delta	12/09/2022	Cormorant	8
Sullane Delta	12/09/2022	Moorhen	1
Sullane Delta	12/09/2022	Snipe	1
Sullane Delta	12/09/2022	Curlew	23
Sullane Delta	12/09/2022	Mute Swan	3
Warren's Court	12/09/2022	Tufted Duck	1
Warren's Court	12/09/2022	Grey Heron	2
Warren's Court	12/09/2022	Mute Swan	12
Warren's Court	12/09/2022	Mallard	2
Barnadivane 2km radius	12/09/2022	Grey Wagtail	1
Barnadivane 2km radius	12/09/2022	Hooded Crow	3
Barnadivane 2km radius	12/09/2022	Rook	6
Barnadivane 2km radius	12/09/2022	#N/A	1
Barnadivane 2km radius	12/09/2022	Woodpigeon	6
Barnadivane 2km radius	12/09/2022	Magpie	2
Barnadivane 2km radius	12/09/2022	Blackbird	2
Barnadivane 2km radius	12/09/2022	Pheasant	1
Barnadivane 2km radius	12/09/2022	Buzzard	1
Barnadivane 2km radius	12/09/2022	Starling	1
Barnadivane 2km radius	12/09/2022	Goldfinch	4
Barnadivane 2km radius	12/09/2022	Dunnock	1
Barnadivane 2km radius	12/09/2022	Jackdaw	4
Barnadivane 2km radius	12/09/2022	Meadow Pipit	10
Barnadivane 2km radius	12/09/2022	Wren	1
Barnadivane 5km radius	12/09/2022	Jackdaw	-
Barnadivane 5km radius	12/09/2022	Blackbird	-
Barnadivane 5km radius	12/09/2022	Goldfinch	-
Barnadivane 5km radius	12/09/2022	Starling	-
Barnadivane 5km radius	12/09/2022	Hooded Crow	-
Barnadivane 5km radius	12/09/2022	Rook	-
Barnadivane 5km radius	12/09/2022	Woodpigeon	-
Barnadivane 5km radius	12/09/2022	Robin	-

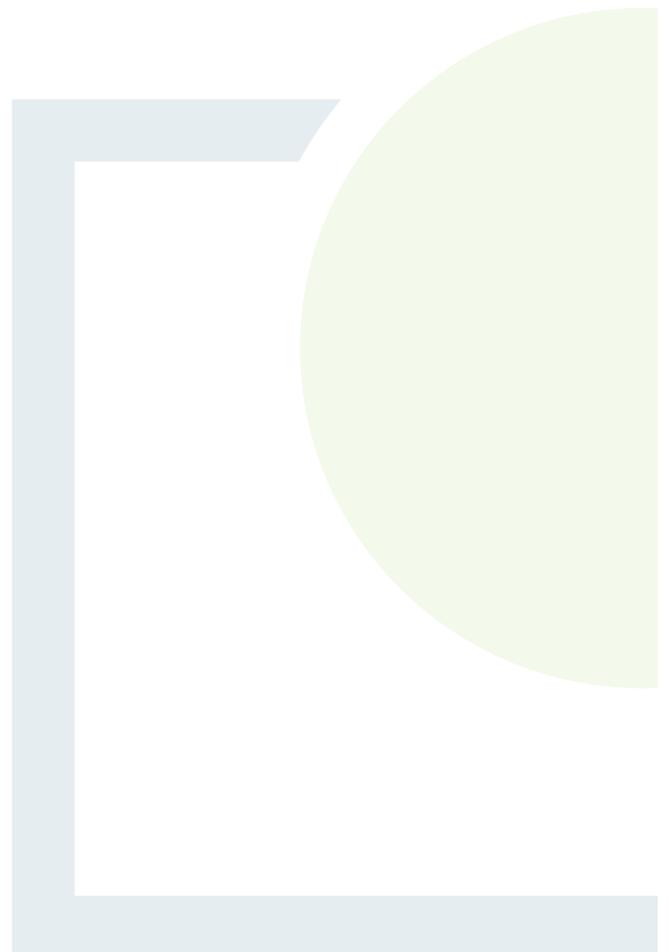
Site Name	Date	Common name	No ¹
Barnadivane 5km radius	12/09/2022	Blue Tit	-
Barnadivane 5km radius	12/09/2022	Goldcrest	-
Barnadivane 5km radius	12/09/2022	Song Thrush	-
Barnadivane 5km radius	12/09/2022	Dunnock	-
Barnadivane 5km radius	12/09/2022	Stonechat	-
Barnadivane 5km radius	12/09/2022	Meadow Pipit	-
Barnadivane 5km radius	12/09/2022	Pied/White Wagtail	-
Barnadivane 5km radius	12/09/2022	Swallow	-
Barnadivane 5km radius	12/09/2022	House Martin	-
Barnadivane 5km radius	12/09/2022	Great Tit	-
Murragh Lake	12/09/2022	Mallard	2
Murragh Lake	12/09/2022	Grey Heron	1
Murragh Lake	12/09/2022	Grey Wagtail	1
Desert Bridge	12/09/2022	Kingfisher	1
Desert Bridge	12/09/2022	Dipper	1
Desert Bridge	12/09/2022	Mute Swan	1
River Bandon SAC	12/09/2022	Green Sandpiper	1
River Bandon SAC	12/09/2022	Buzzard	1
River Bandon SAC	12/09/2022	Lesser Black-backed Gull	1
River Bandon SAC	12/09/2022	House Martin	50
River Bandon SAC	12/09/2022	Sand Martin	15
River Bandon SAC	12/09/2022	Swallow	20
River Bandon SAC	12/09/2022	Grey Heron	2
River Bandon SAC	12/09/2022	Little Egret	2
River Bandon SAC	12/09/2022	Cormorant	1
River Bandon SAC	12/09/2022	Mallard	16



CONSULTANTS IN ENGINEERING,
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& PLANNING

APPENDIX 4

BIODIVERSITY ENHANCEMENT
AND MANAGEMENT PLAN





CONSULTANTS IN ENGINEERING,
ENVIRONMENTAL SCIENCE
& PLANNING

BARNADIVANE WIND FARM & SUBSTATION

APPENDIX 5.7 - BIODIVERSITY ENHANCEMENT & MANAGEMENT PLAN

Prepared for:

Barna Wind Energy (B.W.E) Ltd. & Arran Windfarm Ltd.

Date: February 2023

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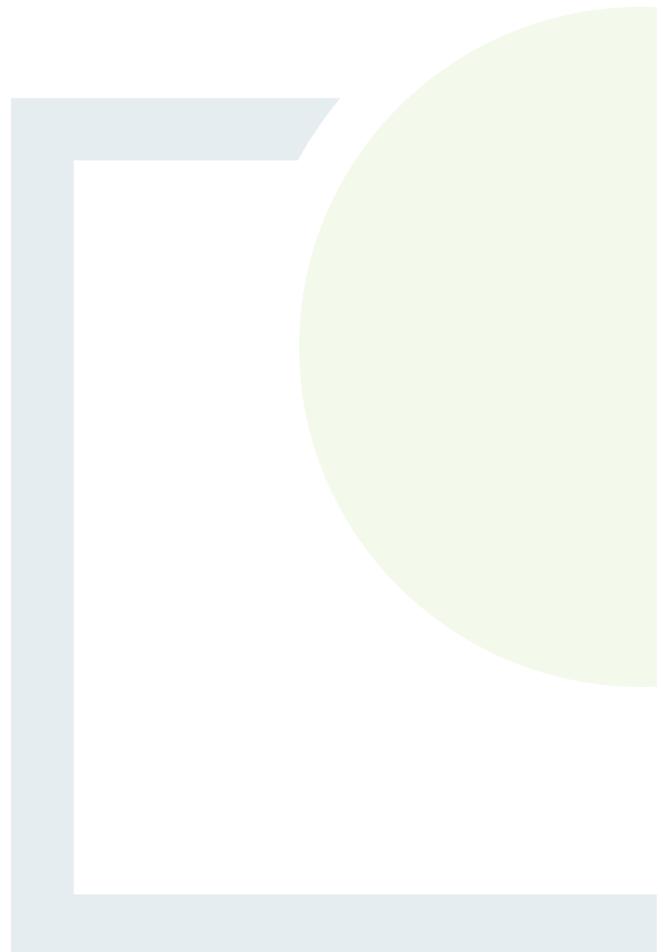


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1. INTRODUCTION

This Biodiversity Enhancement & Management Plan (BEMP) sets out the implementation of biodiversity enhancement features at the Proposed Development. The BEMP includes both mitigation and enhancement measures, which are clearly differentiated. Additionally, maintenance measures are detailed. All mitigation, enhancement and maintenance measures included in this BEMP will be implemented in full.

The measures contained in this BEMP include those designed to protect and enhance existing habitats. Higher value habitats will be actively managed to maintain and improve their value and lower value habitats will see specific interventions designed to improve their attractiveness for a range of species. Appropriate planting will increase the available feeding, roosting and nesting cover for wildlife. The BEMP includes the following:

- Details of all measures to be taken to protect and enhance habitats of local biodiversity value occurring at the site and the species which utilise the same within the vicinity;
- A description of target habitats and range of species appropriate to the site;
- Appropriate strategies for maintaining existing and targeted habitats and species;
- Timelines for new planting and habitat creation;
- Details of ecological oversight and monitoring;
- A map identifying the areas to be managed; and
- The plan is cognisant of potential operational impacts on species and habitats as a result of the proposal.

1.1 Study Area

The Lands in Control of the Applicant for the BEMP includes lands in the townlands of Lackareagh, Garranereagh and Barnadivane (Kneeves). The Lands in Control of the Applicant extend beyond the Proposed Development Site. The Proposed Development site includes the Proposed Wind Farm and Proposed Substation, see EIAR Chapter 2- Description of the Proposed Development.

1.2 Designated Nature Conservation Sites

A separate Natura Impact Statement was prepared to ascertain if the Proposed Project (either alone or in combination with other plans or projects) will not adversely affect the integrity of a European site.

The following European Sites are within the potential Zol of the Proposed Development:

- The Gearagh SPA.

The Biodiversity Chapter (Chapter 5 Volume 2 of the EIAR) assessed the potentials direct, indirect and cumulative effects during all phases (construction, operation and decommissioning) of the Proposed Development.

The following potential Natural Heritage Areas are within the potential Zol of the Proposed Development:

- The Gearagh pNHA;
- Lough Gal Pnha.



1.3 Habitats

The following habitats (Figure 1-1) are located within the study area, as classified by Fossitt (2000):

- Improved agricultural grassland (GA1);
- Wet grassland (GS4);
- Scrub (WS1);
- Conifer plantation (WD4);
- Buildings and artificial structures (BL3);
- Hedgerows (WL1);
- Treelines (WL2);
- Drainage ditches (FW4);
- Eroding upland river (FW4).

1.3.1 Target Habitats

Within the habitats listed above, a number are targeted by the measures proposed in this management plan. These habitats and the applicable measures are summarised in Table 1-1, and described in detail below:

Table 1-1: Target Habitats

Habitat	Proposed Measures
Hedgerows (WL1) Treelines (WL2)	New planting and enhancement of existing hedgerows (to prevent loss of hedgerow, provide alternative bat foraging/commuting routes, provide alternative hunting areas for kestrel).
Scrub (WS1)	Area where scrub will be allowed to develop through exclusion of grazers and mowers (to prevent loss of hedgerow, provide alternative bat foraging/commuting routes, provide alternative hunting areas for kestrel).

1.4 Target Species and Groups

Following extensive desk studies and field studies a range of key ecological receptors were identified at the site. These are detailed within EIAR Chapter 5: Biodiversity. The enhancement and mitigation measures detailed here will protect these species, in addition to improving the biodiversity value of the site generally.

1.4.1 Bats

A total of nine bat species have been recorded as present within the study area during the 2021/2022 bat surveys. The measures that will be implemented to protect bats are:

- Bat Buffer Maintenance;
- Alternative Bat Commuting Routes;
- New Hedgerow/Treeline Planting;
- Installation of bat boxes.



1.4.2 Bees

Bees will benefit from the wildflower and hedgerow planting.

Earth banks will be created to provide nesting habitat for mining bees, which in Ireland are represented by the genera *Andrena* and *Nomada*. Mining bees, and pollinators in general, will also benefit from the wildflower strips and hedgerow planting.

1.4.3 Insects (general)

A range of insect species will benefit from measures which create and enhance semi-natural habitats at the site. These include the creation of pollinator-friendly habitats described above, in addition to the creation of log piles and wildlife ponds which will provide insect habitats.

1.4.4 Mammals

A range of measures including seasonal restrictions, buffer zone vegetation clearance are proposed to ensure mammals are not negatively impacted by the Proposed Development.

Hedgehog have been previously recorded within the vicinity of the Proposed Development. Hedgehog houses (no.=5) will be placed within the Proposed Development, in/ adjacent to suitable habitat, such as scrub and hedgerows.

Red squirrel have been previously recorded within the vicinity of the Proposed Development. Red squirrel boxes (no.=5) will be placed within the Proposed Development, in/ adjacent to suitable habitat, such as scrub and hedgerows.

Small mammals such as wood mouse and pygmy shrew will benefit from new hedgerow planting, pollinator planting and areas where scrub will be allowed to develop. These features will provide increased cover and food for these animals.

The abovementioned species, in addition to other small mammals such as hedgehog, will also benefit from the installation of Hibernacula which will provide shelter.

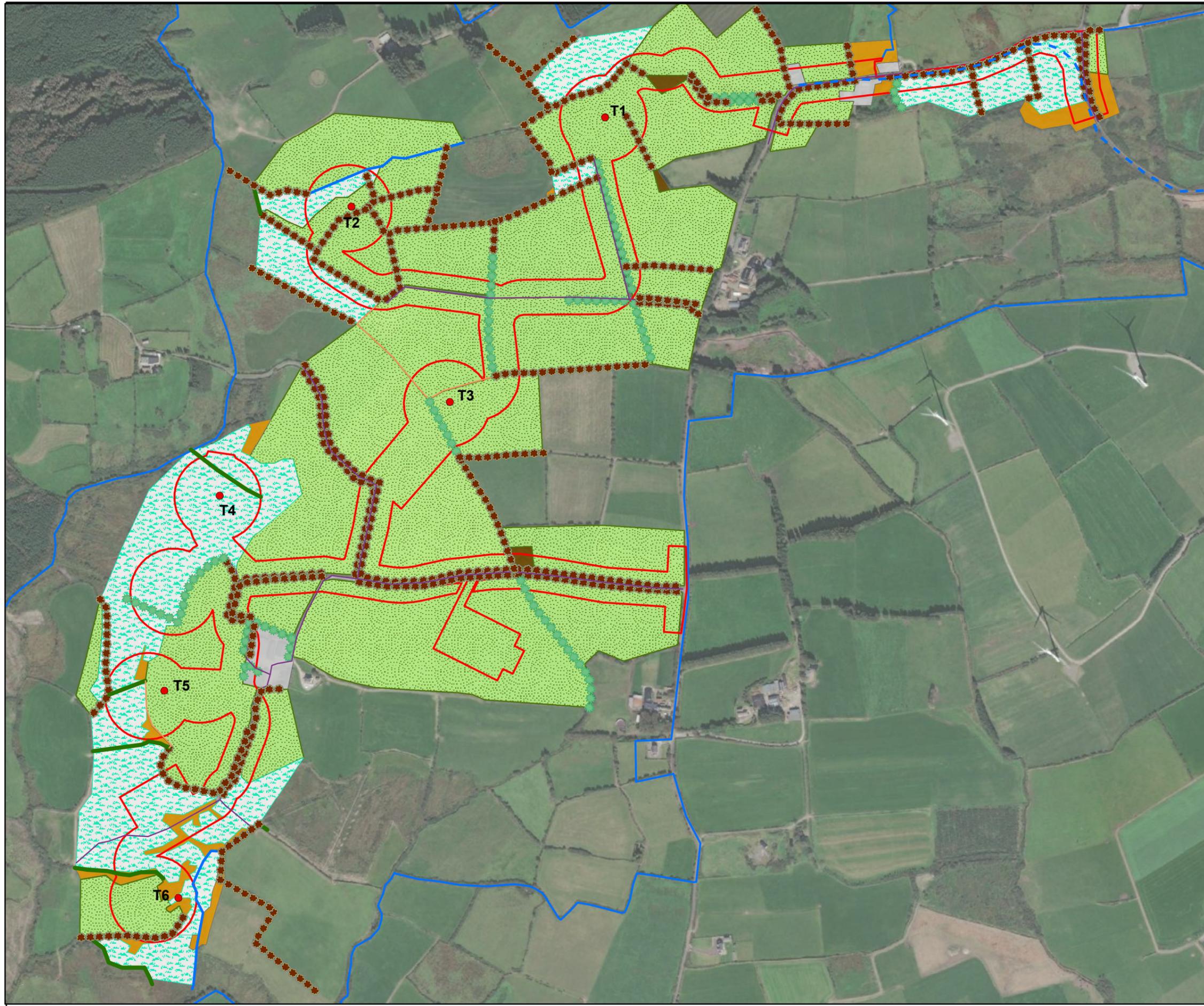
1.4.5 Raptors

Birds such as kestrel, sparrowhawk and buzzard will benefit from new hedgerow planting and provision of scrub areas through increased abundance of small mammal prey in the area.

Kestrel will benefit from the installation of two kestrel nest boxes.

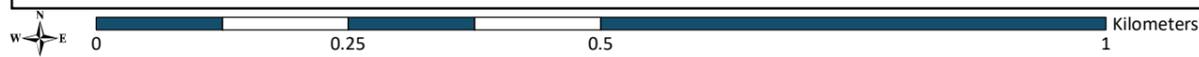
1.4.6 Small Passerines

Small passerines as a general grouping will benefit from nature friendly management of the site including hedgerow planting. Passerines, notably birds of conservation concern in Ireland (BoCCI) species such as goldcrest, grey wagtail, linnet, skylark, starling and yellowhammer, will benefit from the installation of a variety of bird boxes.



- Legend**
- Proposed Turbine Layout
 - - - Turbine Delivery Route
 - Proposed Substation
 - Development Planning Boundary
 - Lands in control of Applicant
- Habitats**
- Fossitt Code**
- BL3, Buildings and artificial surfaces
 - GA1, Improved agricultural grassland
 - GS4, Wet grassland
 - WD4, Conifer plantation
 - WS1, Scrub
 - BL3, Buildings and Artificial Surfaces
 - FW1, Upland/eroding rivers
 - FW4, Drainage Ditches
 - WL1, Hedgerows
 - WL1/FW4, Hedgerows/Drainage Ditches
 - WL2, Treelines

TITLE:	Habitats		
PROJECT:	Barnadivane Wind Farm and Substation, Co. Cork		
FIGURE NO:	1.1		
CLIENT:	Barna Wind Energy Ltd. & Arran Windfarm Ltd.		
SCALE:	1:7000	REVISION:	0
DATE:	23/02/2023	PAGE SIZE:	A3





2. MITIGATION MEASURES

2.1 Maintenance of Bat Buffers

The areas surrounding turbines will be actively managed to discourage foraging by bats. The buffer extent around each turbine has been calculated based on proposed turbine dimension options and the height of surrounding trees (see EIA Chapter 5: Biodiversity). Where buffers overlap both hedgerows/treelines or scrub and open habitats, the full circular buffer will be applied to both the hedgerows/treelines or scrub and adjacent open habitat as the area to be managed to discourage bat foraging. Buffer sizes for turbines in hedgerows/treelines or scrub are 84.9m from the turbine base. Where no hedgerows/treelines or scrub is present, conservative buffers matching those for adjacent areas has been applied within which grassland will be managed as required to discourage foraging bats. Additionally, a section of drainage ditch will be cleared of vegetation extending beyond the bat vegetation clearance buffer of T2, to discourage bats travelling along this drainage ditch towards T2 and to redirect them along existing hedgerows onsite, see Figure 3-2 for location. Vegetation will be cleared along c. 132m of this drainage ditch.

Tree-free buffers will be maintained around all turbines to reduce risks to bats. These bat vegetation clearance buffers will be maintained by keeping vegetation short, which will minimise insect abundance. This will be achieved by mechanical means only, as pesticides and toxic substances shall not be utilised. The buffers shall be cut twice per year, in spring, prior to March, and summer, after August, as required (outside nesting bird season). This is applicable primarily to areas where trees will be removed, but mowing will be implemented in existing grassland within buffers as required if regular grazing is not occurring.

2.2 Hedgerow & Treeline Planting

This measure provides mitigation in four specific areas:

- No net loss of treelines and hedgerows habitats;
- Directs bats away from tree-free buffers along alternative commuting routes;
- No net loss of linear bat foraging and commuting features;
- No net loss of foraging habitat for birds.

Where hedgerows or treelines are affected by bat buffers, bats will be directed away from tree-free buffers along an alternative commuting route. This will be achieved by planting new pollinator-friendly hedgerows (see Figure 3-1, Table 2-1). Willow will be included in these hedgerows due to its rapid growth rate which will accelerate establishment.

The combined length of proposed new hedgerows and treelines is c. 1,804km. In addition to the mitigating functions detailed above, the proposed hedgerow planting will also enhance connectivity in the landscape for wildlife, which has been impacted in some areas by intensive agricultural management.

It is proposed to create closely-spaced double lines of hedgerow, with willow on one side, and pollinator-friendly hedgerow species listed in Table 2-1 on the other. Planting of these species will be staggered to prevent excessive shading and aid establishment of the hedgerows. Young trees will require protection until established.

All proposed hedgerow planting is required to use plants of native provenance (local if possible). The landscaping contractor is required to be informed well in advance to allow the acquisition of suitable native stock. 2–3-year- willow trees are required for hedgerows to help accelerate establishment. These will be supplemented with planting of whips.



Table 2-1: Species to be planted in new hedgerows/ treelines

Linear Feature	Species
1	Oak, rowan, holly, grey willow
2	Oak, rowan, holly, grey willow
3	Oak, rowan, birch, grey willow, hawthorn, holly
4	Oak, rowan, birch, grey willow, hawthorn, holly
5	Holly, grey willow, rowan, bilberry
6	Holly, grey willow, rowan, bilberry
7	Hawthorn, elder, holly, grey willow
8	Hawthorn, holly, grey willow

Where practical, gaps in the existing hedgerows will be filled via laying which is a method of rejuvenating hedgerows. An existing stretch (c.670m) of low growing, species poor (dominated by sparse gorse) hedgerow has been identified for enhancement. Laying involves cutting hedgerow stems partly through near ground level and bending the stem to the required position to fill a gap. New growth then is produced from the cut which thickens the hedge base and rejuvenates it. Where gaps are too large and to enhance the diversity of the hedgerow, native whips will be planted using hawthorn.

2.3 Scrub Succession

An area of scrub will be allowed to establish. These will be areas not subject to grazing or mowing that will be allowed to succeed to rough grassland and then into scrub naturally. These areas will be cordoned off to prevent livestock access. These areas will provide food and cover for mammals, birds and insects at the rough grassland and scrub phases of their succession.



3. ECOLOGICAL ENHANCEMENT

3.1 Pollinator Planting

Meadow planting will be carried out along access track margins in the areas shown on Figure 3-1. These areas will be seeded with a native wildflower meadow seed mixture. Wildflower seed mixes are required to be of native provenance; mainstream commercially available mixes are not acceptable.

The wildflower seed mix should comprise a mixture of the following species: Cottongrass, Devil's Bit Scabious, Eyebright, Foxglove, Marsh Bedstraw, Marsh Cinquefoil, Marsh Ragwort, Meadow Buttercup, Meadowsweet, Ox-eye Daisy, Purple Loosestrife, Ragged Robin, Red Bartsia, Red Campion, Woundwort, Angelica, Carrot, Common Valerian, Yellow Rattle.

Mechanical mowing will be used to maintain the wildflower/meadow access track in margins. One cut and lift per year between October – February is required. This can be split into rotational mowing where half is cut late in the year and half is cut early the following year, however all areas will only be cut once per year. These new meadows will need to be managed by a contractor for the first 2 - 3 years after sowing to ensure they become fully established.

3.2 Wildlife Ponds

Wildlife ponds will be created within the footprints of the settlement ponds along the access tracks, outside the bat buffers.

These ponds will be created in such a way as to provide a deep central area surrounded by shallow margins to facilitate the establishment of wetland vegetation and allow wildlife to safely access the pond. The best wildlife ponds have very gently sloping sides, providing extensive areas of very shallow water (just a few centimetres in depth); this allows a wide band of emergent vegetation to become established around the margins of the pond (See Plate 1 and Plate 2). Also, the variation in depth will produce varying habitats providing breeding areas for the common frog, as well as damselflies, dragonflies and other insects associated with wetlands.

The ponds will include a broad (5m) undulating drawdown zone around the margins. Common reed *Phragmites australis* and soft rush *Juncus effusus* will be planted in these margins. This will create an optimal habitat for spawning frogs and aquatic insects.

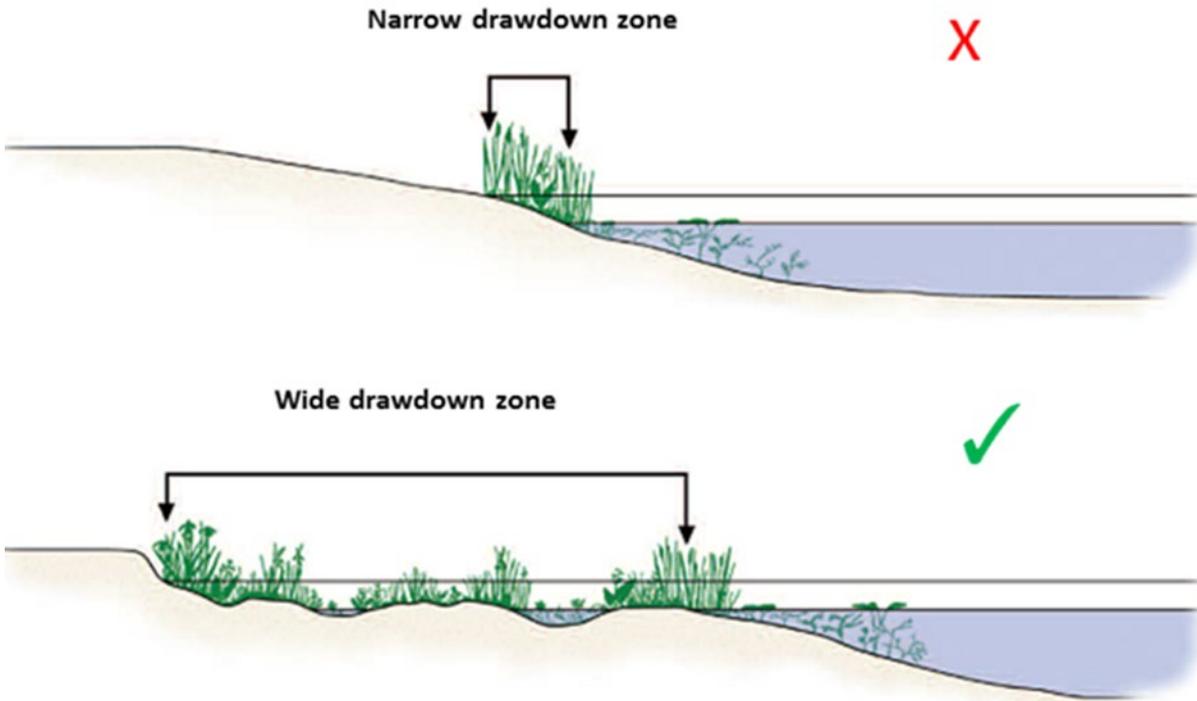


Plate 3-1: Create broad undulating drawdown zones, a valuable area for wildlife (Freshwater Habitats Trust, 2016).

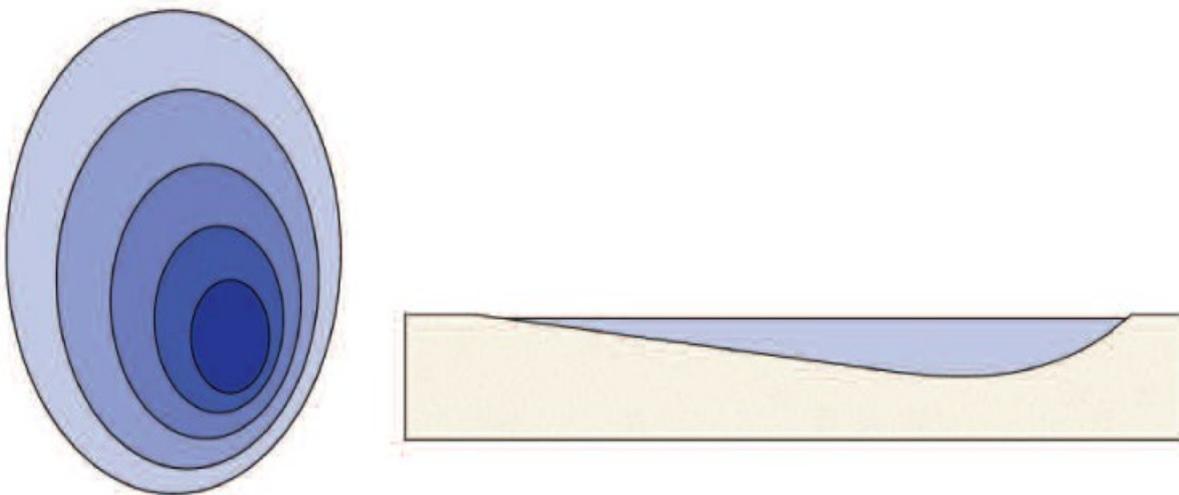


Plate 3-2: Asymmetric profile- useful to combine shallow water areas with great depth (Freshwater Habitats Trust, 2016).



3.3 Shelter habitats

3.3.1 Bee nest box

Nest boxes for above-ground cavity nesting bees are created by drilling 10-30 holes in a piece of a wood and hanging this on a tree, at least 1m above ground facing east, south or west. The holes should be between 4 and 10mm in width and 10cm in depth. The boxes (no.=15) will be placed on trees near the pollinator planting strips.



Source: Pollinators.ie

Plate 3-3: Bee nest box hung on tree.

3.3.2 Log Piles

A proportion of the timber being removed (substantial pieces of timber-tree trunk/branches) will be salvaged by cutting into logs to create log stacks/piles in the areas specified in Figure 3-1. These piles will be used by insects as the timber decays. Logs of different sizes can be stacked on top of each-other or positioned vertically in a pile. It is important to ensure that the logs remain damp and do not dry out by part-burying (some) logs and placing in a partly shaded location within the Proposed Development site.

3.3.3 Refugia/Hibernacula

Refugia piles and hibernacula will be created. These provide sheltering locations for a wide range of wildlife, including reptiles, amphibians, small mammals and invertebrates. Refugia piles are produced by piling natural materials such as logs, sticks and leaves; that can be supported by additional materials such as rubble and bricks to form a structure with many cracks and crevices for sheltering. Hibernacula are produced in a similar way, but often require setting into the ground in a shallow pit and topping with soil to enclose the structure and creating a more stable microclimate suitable for hibernating species. These structures will be installed near hedgerows and in areas of woodland within the site, where they are less likely to be disturbed. Locations are specified in Plate 3-4.



(Source: Green Mumbles accessed Dec 2022)

Plate 3-4: Example of a hibernacula

3.3.4 Bat boxes

Bat boxes will be located at three different locations, at a minimum of 500m from the closest turbine. Five boxes will be installed at each location at different facing different directions (south, south-east and south-west). These should be placed at least 4m above ground on a tree or building, with a clear fly path free from overhanging branches and away from artificial light sources. Marnell & Mullen 20022 recommend woodcrete (cement and sawdust) bat boxes over wooden boxes as they are more durable and need less maintenance, as well as a mixture of bat box types per tree should to cater for seasonal and species requirements. A combination of crevice type boxes (for Pipistrelle spp. And Leisler’s bat) and cavity type boxes (for Myotis spp. And brown-long eared bat), or those designed for both crevice and cavity dwellers, Plate 3-5 will be used to accommodate to bat species present within the surrounding area.



Plate 3-5: Schwegler woodcrete bat box for cavity and crevice dwelling bats



3.3.5 Mammal boxes

Red squirrel nest boxes (no.=5) will be placed in suitable habitat, within woodland or along treelines. These boxes will be placed in trees at least 3 metres from the ground, facing away from direct sunlight.



Source: NHBS website <https://www.nhbs.com/>

Plate 3-6: Example of red squirrel nest box

Hedgehog houses will (no.=5) will be placed in suitable habitat, within scrub or along treelines.



Source: NHBS website <https://www.nhbs.com/>

Plate 3-7: Example of hedgehog house



3.3.6 Bird boxes – kestrel

Kestrel boxes (no=2) will be located on either side of the Lands in control of Applicant, at least 500m for the closest turbines. These boxes should be located 3-5m up a tree with a clear flight path without overhanging branches. The opening of the box should be positioned away from the prevailing wind.



Source: NHBS website <https://www.nhbs.com/>

Plate 3-8: Example of kestrel nest

3.3.7 Bird boxes – passerines

A variety of bird boxes will be used onsite to accommodate the different passerine species onsite, see Plate 3-9 to Plate 3-12. Species specific bird boxes will be installed for grey wagtail (no.=1) and starling (no.=6). Nest roosting pockets (no.=5) will be installed for smaller species such as goldcrest, as well as robin and wren. General bird boxes (no=10) will be installed for other species, including linnet, skylark and yellowhammer. The entrance hole for these general bird boxes will need to be at least 3cm in diameter to allow access to these species.



Source: NHBS website <https://www.nhbs.com/>

Plate 3-9: Nest roosting pockets



Source: NHBS website <https://www.nhbs.com/>

Plate 3-10: Grey wagtail nest box



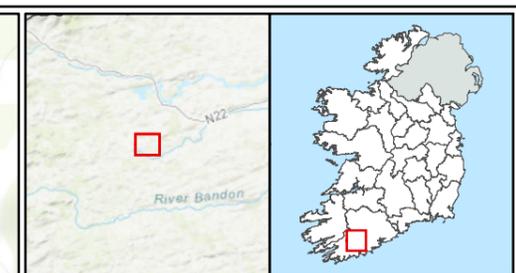
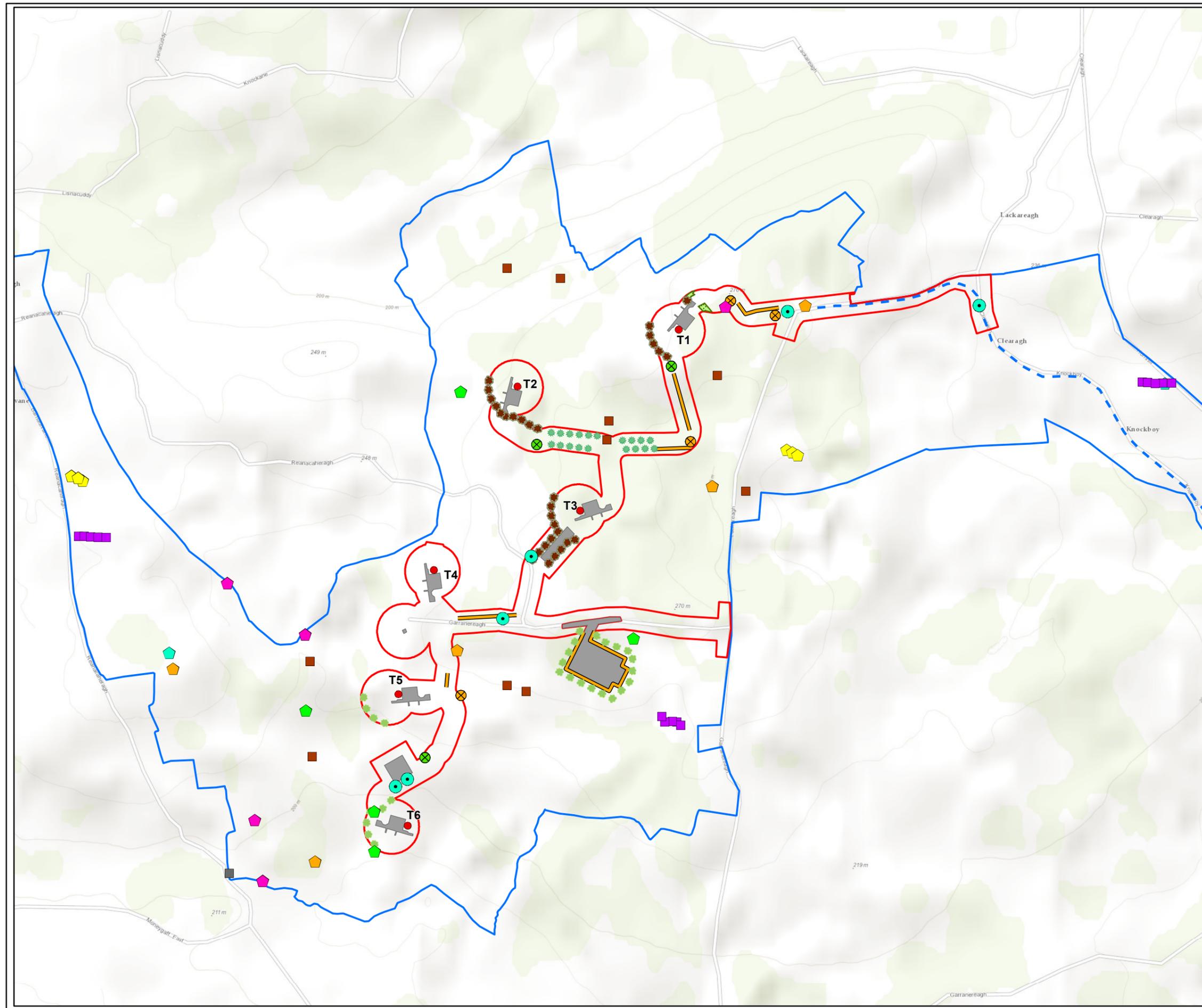
Source: NHBS website <https://www.nhbs.com/>

Plate 3-11: General bird nest box



Source: NHBS website <https://www.nhbs.com/>

Plate 3-12: Starling nest box



Legend

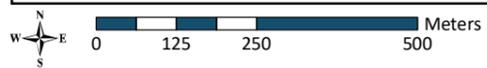
- Development Planning Boundary
- Lands in control of Applicant
- Proposed Project Infrastructure
- Proposed Turbine Layout
- Turbine Delivery Route
- Scrub

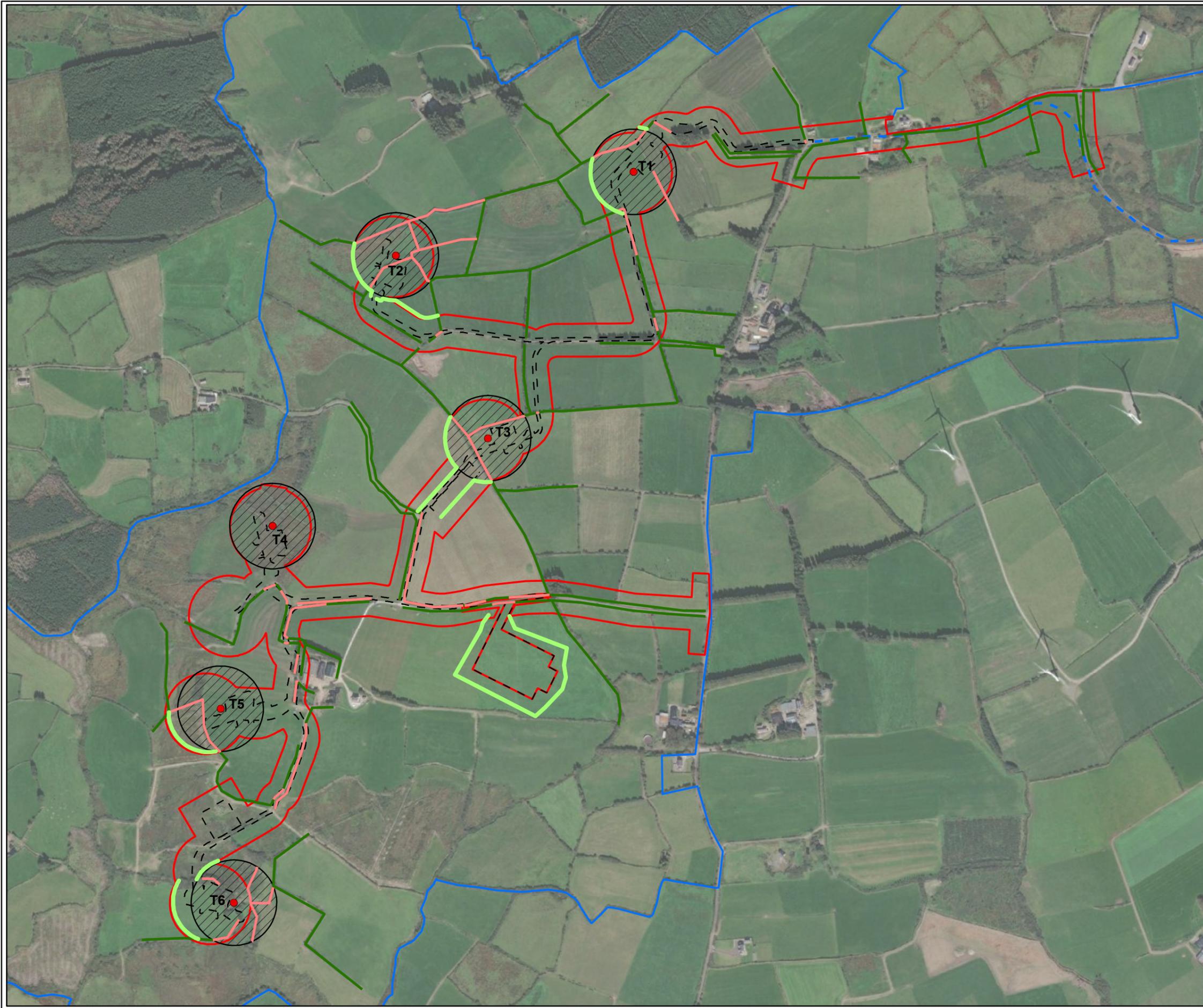
Habitat Enhancement Measures

Measure

- Bat box
- Bird box
- Bird box - grey wagtail
- Goldcrest nest roost
- Hedgehog house
- Kestrel nest box
- Log pile
- Red squirrel nest box
- Refugia/ hibernacula
- Starling nest box
- Wildlife pond
- Existing Hedgerow Enhancement
- New hedgerow
- New treeline
- Pollinator planting

TITLE:	
Locations of Enhancement Features	
PROJECT:	
Barnadivane Wind Farm and Substation, Co. Cork	
FIGURE NO:	3.1
CLIENT: Barna Wind Energy Ltd. & Arran Windfarm Ltd.	
SCALE: 1:11000	REVISION: 0
DATE: 23/02/2023	PAGE SIZE: A3





- Legend**
- Development Planning Boundary
 - Lands in control of Applicant
 - Proposed Substation
 - Bat Vegetation Clearance Buffer
 - Habitat Loss Buffer
 - Turbine Delivery Route
 - Proposed Turbine Layout
 - New Proposed Hedgerows and Treelines
 - Existing Vegetated Linear Habitats
 - Vegetated Linear Habitat Loss

TITLE:	Locations of vegetated linear habitats (existing, proposed and to be removed)		
PROJECT:	Barnadivane Wind Farm and Substation, Co. Cork		
FIGURE NO:	3.2		
CLIENT:	Barna Wind Energy Ltd. & Arran Windfarm Ltd.		
SCALE:	1:7500	REVISION:	0
DATE:	23/02/2023	PAGE SIZE:	A3

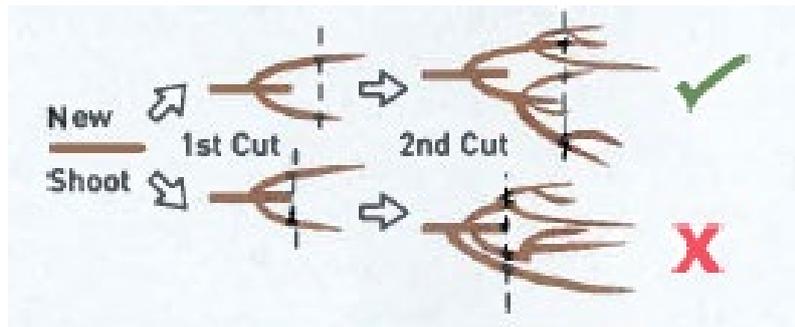




4. MAINTENANCE

4.1 Hedgerow Maintenance

Tightly cut hedgerows with flat tops provide little benefit to wildlife, taller and bulky hedgerows are recommended as this provides more shelter for wildlife. When the hedgerows are maintained, stems will be cut a little above the last cut (see Plate 4-1) as cutting back to the exact same point depletes the energy of the hedgerow, forms a build-up of scar tissue which discourages new growth.



Source: Teagasc

Plate 4-1: Hedgerow Level of Cut

Light annual cutting of hedgerows is not good for wildlife as it limits the production of flowers and fruit. The sites hedgerows will be cut every three to four years in rotation as this will leave areas of undisturbed hedgerows. Cutting equipment used will be sharp so as not to shatter or fray the hedge. Shattering and fraying allows for disease to enter plants and can lead to decay and weaken the vigour of the hedgerow. A finger-bar cutter is recommended as the most appropriate tool to minimise fraying and smashing of branches (Heritage Council, 2017). A flail-type hedge cutter is unsuitable for hedge trimming in situations where hedgerow health is a priority.

Hedgerow maintenance will not be carried out between the 1st of March and 31st of August as this is the nesting period for birds and any maintenance at this time may disturb breeding; this is in keeping with the Wildlife Act 1976 (as amended).

4.2 Scrub Fencing

Proactive maintenance of the fencing will be required to ensure it's continued effectiveness. Regular inspections along the entire length will be required, at minimum monthly. Inspections following storm events are also required, as this is the most likely time for fencing to be damaged (falling trees or limbs can open up gaps in the fencing).

Repairs will be carried out immediately where required, and a stock of fencing materials will be kept on hand.

Fencing gaps for mammals will be checked twice per year, and where required maintained to ensure their continued function.



5. MONITORING

Commencing in year 1 of operation the status of the habitats created, enhanced hedgerows and the species enhancement measures will be checked as per Table 5-1 below. Monitoring will be undertaken by a qualified ecologist appointed by the developer/operator of the Proposed Development. The timing of monitoring is provided in Table 5-1 below. This will follow implementation of the plan to confirm whether habitats have successfully established and to identify any issues that need to be addressed. Following these monitoring visits, a short status report will be prepared. This will identify any necessary actions to ensure the success of the BEMP, which will be implemented on foot of the report findings.

A final assessment of the condition and success of the various biodiversity management and enhancement prescriptions will also be undertaken in Year 25 (i.e., in the year before the final year of operation).



Table 5-1: Summary of Biodiversity Enhancement & Management Measures

Measure	Target Species/Habitat	Implementation Timeline	Monitoring	Ongoing management
Mitigation				
Bat Buffer Maintenance	All bat species occurring onsite	Buffers to be cleared prior to turbine installation. Clearance will take place outside the bird breeding season (March-August inclusive)	Annual monitoring throughout lifespan of wind farm (mid- late summer)	Ensure vegetation is kept low
New Hedgerows & Hedgerow enhancement	All bat species occurring onsite pollinators	From project initiation	Years 1, 2, 3, 5, 7, 10, 15, 20 and 25	Ensure establishment; ensure hedgerows are not cut back excessively and are maintained as a viable corridor.
Scrub Succession	Scrub WSI	To be fenced off and left to natural succession from project initiation	Years 1, 2, 3, 5, 7, 10, 15, 20 and 25 Fencing maintenance: monthly inspections & inspections after storm events	Ensure establishment and succession, ensure continued cordoning off from livestock
Enhancement				
Pollinator Planting	Small mammals Insects	Following wind farm completion	Years 1, 2, 3, 5, 7, 10, 15, 20 and 25	Ensure establishment; ensure wildflowers are not cut back excessively.
Bee Nest Boxes	Mining bees	Following wind farm completion	Years 1, 2, 3, 5, 7, 10, 15, 20 and 25	Ensure continued presence; add material as required
Log Piles	Small mammals Insects	Following access track construction	Years 1, 2, 3, 5, 7, 10, 15, 20 and 25	Ensure continued presence; add material as required
Refugia/Hibernacula	Small mammals Insects	Following access track construction	Years 1, 2, 3, 5, 7, 10, 15, 20 and 25	Ensure continued presence; add material as required



Measure	Target Species/Habitat	Implementation Timeline	Monitoring	Ongoing management
Wildlife Pond	Insects and amphibian species	Following access track construction	Years 1, 2, 3, 5, 7, 10, 15, 20 and 25	Ensure establishment; ensure ponds do not become infilled. Ecologist to recommend actions if ponds become infilled.
Bat boxes	All bat species occurring onsite	From project initiation	Years 1, 2, 3, 5, 7, 10, 15, 20 and 25	Ensure continued presence; add material as required
Mammal boxes	Red squirrel and hedgehog	Following wind farm completion	Years 1, 2, 3, 5, 7, 10, 15, 20 and 25	Ensure continued presence; add material as required
Bird boxes	Kestrel and small passerines	Following wind farm completion	Annual monitoring throughout lifespan of wind farm (outside nesting season)	Ensure continued presence; remove old material as required (outside nesting season March-August)



6. REFERENCES AND BIBLIOGRAPHY

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