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BUILT ON KNOWLEDGE

Bord na Móna

Derryadd, Derryaroge and Lough Bannow Bogs – Application for Substitute Consent

Remedial Natura Impact Statement

March 2025

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1. INTRODUCTION

1.1 BACKGROUND

This remedial Natura Impact Statement (rNIS), prepared by TOBIN on behalf of Bord na Móna, assesses the potential for significant adverse effects on European sites[1] (i.e. Special Areas of Conservation [SACs] and Special Protection Areas [SPAs]) resulting from peat extraction and ancillary activities (herein referred to as the "Project") undertaken between 1994 and 2019 at the Derryadd, Derryaroge, and Lough Bannow Bogs in Co. Longford (herein referred to as the 'Application Site'). June1994 is date when the Habitats Directive was required to be transposed into Irish law, and therefore the earliest date that Appropriate Assessment would have been required, while 2019 is the year when peat extraction at the Application Site ceased. This rNIS also considers potential effect of the Project in-combination with other past, current and planned projects and plans. This rNIS has been prepared to support Bord na Móna's application for Substitute Consent for peat extraction and all ancillary activities undertaken at the Application Site.

The application for Substitute Consent is also supported by a remedial Appropriate Assessment Report (rAASR) (included here in Appendix 1, and summarised in Section 3). The rAASR assessed the likely significant effects on European sites from peat extraction and ancillary activities at the Application Site since 1994.

The rAASR also assessed the likely significant effects on European sites due to the implementation of the Cutaway Bog Decommissioning and Rehabilitation Plans proposed for the Application Site. The plans are required to be prepared and implemented under Condition 10 of the Environmental Protection Agency (EPA) Integrated Pollution Control (IPC) Licence (P0504-01). The rAASR concluded that the activities undertaken from 2019 to present day have not resulted in likely significant negative effects to European sites. Similarly, the rAASR concluded that the Cutaway Bog Decommissioning and Rehabilitation Plans will not result in likely significant negative effect on European sites.

The application for Substitute Consent is also supported by a remedial Environmental Impact Assessment Report (rEIAR). The rEIAR considered the environmental effect of peat extraction and ancillary activities undertaken at the Application Site from July 1988, when the Environmental Impact Assessment (EIA) was required to be transposed into Irish law, through to present day. The rEIAR also assessed the potential environmental effects associated with the Cutaway Bog Decommissioning and Rehabilitation Plans. All elements of Bord na Móna peat extraction and ancillary works at the Application Site are described in Chapter 4 – Project Description of the rEIAR which is included in **Error! Reference source not found.**1. All elements of peat extraction and ancillary activities at the Application Site are referred to in the rEIAR collectively as the 'Project'.

[1] SACs and SPAs are respectively designated under the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (commonly referred to as the Habitats Directive) and Council Directive 79/409/EEC on the conservation of wild birds, which was later amended by Directive 2009/147/EC) (commonly referred to as the Habitats Directive). Collectively, SACs and SPAs comprise the Natura 2000 network of protected sites. SACs and SPAs are referred to as European site under national legislation. It should be noted that the terms, Natura 2000 Sites and European are often used interchangeably in national guidance on Appropriated Assessment.

Derryadd, Derryaroge, and Lough Bannow Bogs form part of a larger bog group, owned and operated by Bord na Móna, known as the Mountdillon Bog Group. The lands at the Application Site have been used historically primarily to produce milled peat to supply the Lanesborough Power Station, and subsequently the Lough Ree Power Station, both of which were/are owned and operated by the ESB. The Application Site occupies an area of 2,244 hectares (ha), comprising primarily of cutaway bog and bare peat, buildings, yards, railway lines, and surface water drainage systems including silt ponds and drainage channels. Since peat extraction ceased in 2019, activities at the Application Site have shifted from peat extraction to ongoing decommissioning efforts, primarily focused on the removal of peat stockpiles, the decommissioning of infrastructure and the routine maintenance of existing drainage, which will allow for the implementation of rehabilitation measures at the Application Site in line with IPC Licence requirements.

Section 177G of the Planning and Development Act 2000 (as amended) states that a 'revised Natura Impact Statement[2]' prepared for Substitute Consent applications shall contain:

- *'a statement of the significant effects, if any, on the relevant European site which have occurred, or which are occurring or which can reasonably be expected to occur because the development the subject of the application for substitute consent was carried out;*
- *details of any appropriate remedial or mitigation measures undertaken or proposed to be undertaken by the applicant to remedy or mitigate any significant effects on the environment or on the European site;*
- *details of the period of time within which any such proposed remedial or mitigation measures shall be carried out by or on behalf of the applicant'.*

This rNIS address requirements of Section 177G of the Planning & Development Act 2000 (as amended) for the Substitute Consent applications.

The rAASR for the Project (see Appendix 1) has been prepared in compliance with the provisions of Section 177U of the Planning and Development Act 2000 (as amended). The rAASR identified the European sites with potential to have been, and to be, significantly affected by peat extraction activities and all ancillary works from 1994 to present, as well as the implementation of future proposed rehabilitation plans for the Application Site. 1994 is the date when the Habitats Directive was required to be transposed into Irish law, although it was not transposed into Irish law until 1997, through the European Communities (Natural Habitats) Regulations 1997 (S.I. No. 94 of 1997), and Appropriate Assessment (AA) became a legal requirement, onwards. The European sites upon which potential likely significant effects could not be excluded, and are assessed in this rNIS, are:

- Lough Ree SAC (Site code: 000440)
- Lough Ree SPA (Site code: 004064)
- Ballykenny-Fishertown Bog SPA (Site code: 004101)

Specifically, the rAASR assessed likely significant effects of the Project on the European sites under the following three distinct Project phases:

[2] Section 177G of the Planning and Development Act 2000 (as amended) refers to 'revised Natura Impact Statement' with respect to Substitute Consent applications. While not referenced in the Act the term 'remedial Natura Impact Statement' is used here.

- **Peat Extraction Phase (June 1994 – July 2019) -** includes all works undertaken from 1994 to the cessation of peat extraction in July 2019. As outlined above, June 1994 is the earliest date by which AA would have been required.
- **Current Phase (July 2019 – Present Day)** - includes all ongoing and future decommissioning activities and site management at the Application Site since the cessation of peat extraction in July 2019 to the present day.
- **Remedial Phase (Future)** – future implementation of the proposed rehabilitation plans for the Application Site, as required under Condition 10 of its EPA Licence P0504-01, following the cessation of peat extraction.

As outlined above the rAASR concluded that the activities undertaken from 2019 to present day have not resulted in likely significant negative effects to European sites. The rAASR also concluded that the Cutaway Bog Decommissioning and Rehabilitation Plans will not result in likely significant negative effect on European sites.

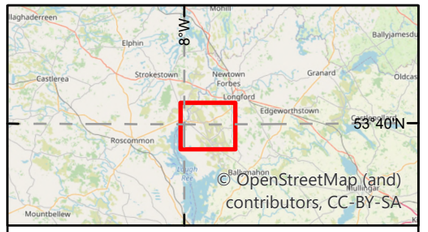
The purpose of the rNIS is to assess the implications of the Project activities undertaken between 1994 and 2019 (i.e. the Peat Extraction Phase), alone and in-combination with other projects or plans, on the integrity of European sites in view of the sites' conservation objectives.

This rNIS has been prepared in compliance with Part XAB of the Planning and Development Act 2000 (as amended), the Planning and Development Regulations 2001 (as amended) and relevant jurisprudence of the European and Irish Courts. It was also prepared in accordance with all relevant guidance including the following:

- 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 (European Commission (EC), 2021)
- Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (EC, 2018)
- Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (Department of the Environment, December 2009, amended 11 February 2010)
- Appropriate Assessment Screening for Development Management (Office of the Planning Regulator (OPR), 2021)

Bord na Móna is in the process of preparing a planning application for a proposed wind farm development which is proposed to be sited on lands within the Application Site. The proposed wind farm project is called the Derryadd Wind Farm. The consent application for the proposed wind farm project will be accompanied by an Environmental Impact Assessment Report (EIAR) and Natura Impact Statement (NIS), which outlines the potential environmental effects of the proposed wind farm and detail where necessary mitigation measures to minimise adverse environmental effects. To inform the assessments of effects required for the EIAR and NIS, a series of detailed desk studies and multidisciplinary field surveys have been undertaken. These include investigations into bird populations, flora, and fauna, as well as habitat mapping, to evaluate the potential environmental impacts and inform the development of appropriate mitigation strategies. While the majority of the proposed Derryadd Wind Farm site overlaps with the Application Site, the boundaries do not align completely (see Figure 1.2). Areas of the Application Site that fall outside of the proposed Derryadd Wind Farm site were not surveyed as part of the wind farm development. However, where appropriate the data and findings from

the investigations undertaken for the proposed wind farm EIA and NIS have been reviewed to inform this rNIS, alongside investigations specifically conducted for this rNIS, and rEIAR that accompany the Substitute Consent application for the Project.



Legend

Application Site

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Kilometers

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING\
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE\
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY \ WORK COMMENCES\
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Rev	Date	Description	By	Chkd
A	05/03/2025	First issue	S.P	C.N

Client: Bord na Móna

Project: Derryadd, Derryaroge and Lough Bannow Bogs - Application for Substitute Consent

Title: Figure 1-1 Boundary of the Application Site

Scale @ A3: 1:40,000

Prepared by:	Checked by:	Date:
S.Pezzetta	C.Naughton	March 2025

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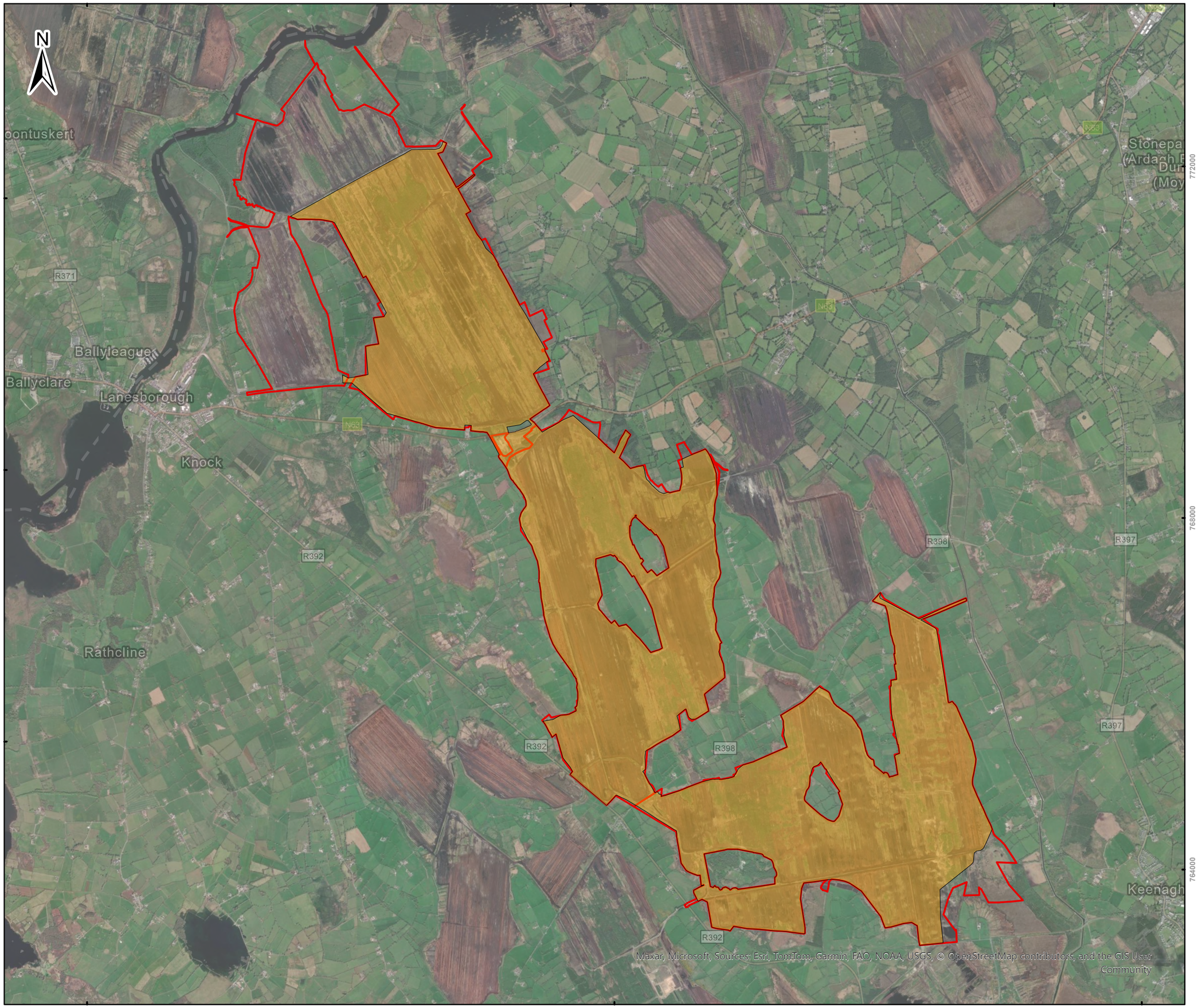
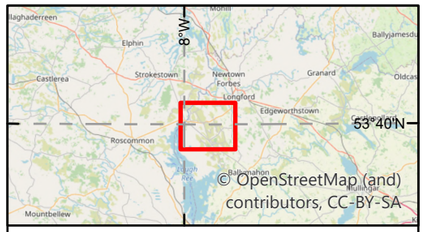
Map Ref: 11400-001.AASr-S.BO-AE-TOB-A

Draft: A





Legend

- Application Site
- Derryadd Wind Farm Boundary

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Kilometers

NOTES

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Rev	Date	Description	By	Chkd
A	25/02/2025	First issue	S.P	C.N

Client: Bord na Móna

Project: Derryadd, Derryaroge and Lough Bannow Bogs - Application for Substitute Consent

Title: Figure 1-2 Boundaries of the Application Site and proposed Derryadd Wind Farm

Scale @ A3: 1:40,000

Prepared by:	Checked by:	Date:
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Map Ref: 11400-040-P.APP.BO-DADD.WF-TOB-A

Draft: A

1.2 STATEMENT OF AUTHORITY

This rNIS was authored by Senior Ecologists Joao Martins (B.E. (Hons), M.Sc.) and Dr. James Forde (B.Sc. (Hons), M.Sc., Ph.D., MCIEEM), and reviewed by Senior Ecologist Áine Sands (B.Sc. (Hons), MCIEEM).

Joao is a Senior Ecologist in TOBIN's Environment and Planning (E&P) division and holds a B.E. (Hons) in Environmental and Natural Resources Engineering and an M.Sc. in Environmental Engineering (Freshwater ecology). Joao has over 14 years' experience in freshwater ecology, associated with monitoring for the EU Water Framework Directive (e.g. macroinvertebrates, habitat/hydromorphology) and projects of scientific nature, in Germany, Portugal and Ireland. He has worked for over 7 years in environmental consultancy, developing his expertise in AA, Ecological Impact Assessments (EcIA) and Environmental Impact Assessment Reports (EIAR). Joao has also conducted and coordinated bird surveys (e.g. Irish Wetland Bird Survey (I-WeBS), Vantage Point (VP), Countryside Bird Surveys (CBS) Woodcock (*Scolopax rusticola*) surveys etc.), botanical and habitat surveys, mammal surveys (bats and non-volant) and inland fisheries (electrofishing).

James is Senior Ecologist and Technical Director of the TOBIN E&P division. James holds a B.Sc. (hons) and M.Sc. degrees in marine ecology, and a Ph.D. in ecology. James is also a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM). James has almost 20 years' academic and environmental consultancy experience. He has an extensive understanding of ecology and appreciation of the objectives and mechanisms of national and international environmental legislation and policy. He has significant experience in preparing and reviewing ecological reports including Screenings for AA, NIS and EcIA reporting, and EIAR. James has provided strategic technical and environmental advice for developments across a wide range of sectors, including onshore and offshore renewables, telecommunications, flood relief schemes, port and harbour developments, energy generation and transmission.

This report was senior reviewed by Áine Sands B.E. B.Sc. (Hons). Áine is a Senior Ecologist in the TOBIN E&P division, with ten years of post-graduate experience in ecology and environmental consultancy. Áine has predominantly been involved in large renewable energy projects, such as wind, solar and hydrogen developments, where she has acted as Lead Ecologist. Áine has extensive experience in preparing and reviewing ecological reports such as AA Screening and NIS reports, and EcIAs. Áine also has a strong understanding of National and European legislation associated with biodiversity and is cognisant of relevant rulings by the Court of Justice of the European Union (CJEU). Áine also has experience with undertaking ecological surveys for protected habitats and species.

2. APPROPRIATE ASSESSMENT PROCESS

The following section provides a brief overview of the AA process, including AA Screening and the preparation of this rNIS report, outlining the steps involved in evaluating potential impacts on protected European sites and ensuring compliance with the Habitats Directive.

2.1 STAGE 1 SCREENING FOR APPROPRIATE ASSESSMENT

Screening is a fundamental process used to determine whether an AA is required for a particular plan or project. According to Part XAB of the Planning and Development Act 2000, as amended, the screening process must be carried out by the Competent Authority. In line with Section 177U of the Act, it states:

- *'A screening for appropriate assessment shall be carried out by the competent authority to assess, based on the best available scientific knowledge, whether the land use plan or proposed development, either alone or in combination with other plans or projects, is likely to have a significant effect on a European site'.*

The screening process is critical in ensuring that any potential **likely significant effects** on European sites are adequately considered before progressing with any development activities.

The Competent Authority's decision to determine if an AA is necessary must be based on objective, reliable, and verifiable information, and it should be properly recorded for transparency. If needed, the Competent Authority has the right to request further information from the project proponent or consultant to facilitate the screening process and ensure that a thorough assessment is undertaken.

The EC's '*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'* (EC, 2021) provides a clear and structured approach to Stage 1 Screening, which consists of the following four main steps:

1. **Ascertain if the plan or project is directly connected to, or necessary for, the management of a European site**.
   This step seeks to determine whether the proposed plan or project is specifically linked to the management or conservation efforts of the European site, and whether it is an essential part of maintaining the site's conservation objectives.
   European sites comprise SACs and SPAs, designated under the EU Habitats Directive and EU Birds Directive respectively.
2. **Provide a detailed description of the plan or project and its potential impact factors.**
   This step involves provision of a clear and comprehensive description of the proposed plan or project, including its scope, activities, and potential impacts. This will help in identifying possible interactions between the development and European sites, and how these could influence the conservation values of the sites.
3. **Identify which European site may be impacted by the plan or project.**
   This step involves identifying all the European sites that could potentially be affected by the proposed plan or project. This includes evaluating the geographical proximity and the nature of any potential impacts on the European sites.

4. **Assess whether likely significant effects can be ruled out in light of the conservation objectives set for the European sites.**
   The final step evaluates whether the proposed plan or project is likely to have significant effects on European sites, considering their specific conservation objectives. If no likely significant effects to the European sites are identified, the Competent Authority may determine that an AA is not required.

AA Screening for the Project

For the application for Substitute Consent for the Project a rAASR has been prepared and is provided in this document as Appendix 1. The rAASR has been prepared in compliance with the provisions of Section 177U of the Planning and Development Act 2000 (as amended).

2.2 Stage 2 Appropriate Assessment

Where it cannot be excluded beyond reasonable scientific doubt at the Screening stage, that a plan or project, individually or in combination with other plans and projects, would have a significant effect on the conservation objectives of a European site, an AA is required, or in this case a remedial Appropriate Assessment.

Where an AA is required, the Competent Authority may require the applicant to prepare a NIS. An NIS, as defined in Section 177T of the Planning and Development Act, 2000 as amended, is a statement for the purposes of Article 6(3) of the Habitats Directive of the implications of a proposed development, on its own and in combination with other plans and projects, for a European site in view of its conservation objectives. Stage 2 AA considers potential **adverse effects** and the **integrity** of the site.

The NIS, where required, should be underpinned by the best scientific knowledge, objective information and analysis necessary to reach a definitive determination as to:

1. the implications of the plan or project, alone or in combination with other plans and projects, for a European site in view of its conservation objectives, and
2. whether there will be **adverse effects on the integrity** of a European site.

Section 177G of the Planning & Development Act 2000 (as amended) states the following with respect to the **revised NIS** for Substitute Consent applications shall contain:

- *'a statement of the significant effects, if any, on the relevant European site which have occurred or which are occurring or which can reasonably be expected to occur because the development the subject of the application for substitute consent was carried out*
- *details of any appropriate remedial or mitigation measures undertaken or proposed to be undertaken by the applicant to remedy or mitigate any significant effects on the environment or on the European site;*
- *details of the period of time within which any such proposed remedial or mitigation measures shall be carried out by or on behalf of the applicant.*

rNIS for the Project

This rNIS has been prepared to address requirements of Section 177G of the Planning & Development Act 2000 (as amended) for the Substitute Consent application for the Project.

3. SUMMARY OF REMEDIAL AASR AND ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

3.1 OVERVIEW

Historic activities at the Application Site from the 1940s to 2019 led to hydrological changes, disrupting natural drainage patterns that altered water retention at the bogs, while peat extraction caused significant habitat loss and degradation. The activities also resulted in increased sedimentation and nutrient runoff, impacting watercourses at the Application Site and downstream water bodies. Although the legacy of these changes has shaped the Application Site, the cessation of peat extraction in 2019 has allowed for a gradual ecological transition in some areas, from bare peat to early-stage or pioneer habitats, with early colonising species such as rushes and patchy scrub. This cessation has also reduced risks to water quality and eliminated the potential for further significant habitat loss at the site..

Ongoing routine maintenance of existing drainage infrastructure since 2019 is expected to have had only limited effects on water quality of watercourses at the Application Site and downstream water bodies. Future rehabilitation efforts, which focus on restoring hydrological functions, will provide several key benefits. By reestablishing natural water flow and improving water retention, the rehabilitation efforts will help minimise sediment and nutrient runoff, ultimately leading to improved water quality within the site and eliminating negative impacts on downstream water bodies. This will contribute to the improvement of aquatic ecosystem restoration, enhancing habitat conditions for various species and boosting overall ecological health. Restoring the natural hydrology of the bogs will benefit local ecosystems by promoting more favourable conditions for species that rely on stable water levels.. Additionally, enhancing habitat conditions through the rehabilitation of wetland areas and vegetation restoration will improve biodiversity by providing suitable environments for a wide range of species, including those dependent on watercourses and bog habitats. Over time, these efforts will promote the recovery of sensitive species, enhance ecological resilience, and contribute to the overall health of the landscape.

The rAASR considered the potential for activities associated with the Project from 1994 to the present day, as well as future rehabilitation efforts, to result in significant effect on the three designated European sites. These 'relevant' European sites are listed in Table 3.1. The locations of the European sites in relation to the Application Site, as well as Water Framework Directive (WFD) Surface Water Bodies (SWB), including River Water Bodies (RWBs) and Lake Water Bodies (LWBs), are illustrated in Figure 3.1 while WFD Ground Water Bodies (GWB) and Groundwater Dependent Terrestrial Ecosystems (GWDTEs) are shown in Figure 3.2.

Section 3.2 assesses the potential likely significant effects of activities at the Application Site on European sites from 1994 to the present days, including future rehabilitation efforts. It outlines these effects and examines the mechanisms through which they have occurred or may arise.

Table 3.1: Relevant European Sites

European Site (Site code)	Distance from Application Site	References (accessed February 2025)	Year Designated
Lough Ree SPA (004064)	0.9km southwest	NPWS, 2022a[3], 2015[4]	1995[5]
Lough Ree SAC (000440)	0.9km southwest	NPWS, 2016[6], 2019[7]	2002[8]
Ballykenny-Fishertown Bog SPA (004101)	4.4km northeast	NPWS, 2022b[9], 2012[10]	1996[11]

3.2 IMPACT SOURCES AND PATHWAYS

3.2.1 Peat Extraction Phase (June 1994 – July 2019)

Between 1994 and 2019, industrial peat extraction was the primary activity ongoing at the Application Site, leading to potential impacts on hydrology, water quality, and habitat quality. These activities disrupted natural drainage patterns and altered water retention.

All watercourses within the Application Site ultimately discharge to the River Shannon or to Lough Ree, which are hydrologically linked to the Lough Ree SPA and Lough Ree SAC. Given this hydrological link, activities undertaken during the Peat Extraction Phase had the potential to cause sedimentation, peat silt, and nutrient runoff, which may have deteriorated water quality in these European sites resulting in likely significant in-situ effects to sensitive aquatic habitats and their associated species of the European sites.

Operational noise and human activity during the Peat Extraction Phase had the potential to disturb mobile qualifying interests (QI) from the Lough Ree SAC and special conservation interests (SCI) of the Lough Ree SPA, and the Ballykenny-Fisherstown Bog SPA that may have been using the Application Site. This disturbance may have resulted in likely significant ex-situ effects on species foraging, breeding, and movement patterns.

Following the precautionary principle, the potential for likely significant effects of Peat Extraction Phase activities on QIs and SCIs of the Lough Ree SPA, Lough Ree SAC and the Ballykenny-Fisherstown SPA are assessed in this rNIS.

[3] Lough Ree SPA - Fist Order Site-specific Conservation Objectives. https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004064.pdf
[4] Lough Ree SPA - Site Synopsis. https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY004064.pdf
[5] Lough Ree SPA - Natura 2000 - Standard Data Form - https://eunis.eea.europa.eu/sites/IE0004064
[6] Lough Ree SAC - Site-specific Conservation Objectives - https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000440.pdf
[7] Lough Ree SAC – Site Synopsis. https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY000440.pdf
[8] Lough Ree SAC - Natura 2000 - Standard Data Form - https://www.npws.ie/sites/default/files/protected-sites/natura2000/NF000440.pdf
[9] Ballykenny-Fisherstown Bog SPA - Fist Order Site-specific Conservation Objectives. https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004101.pdf
[10] Ballykenny-Fisherstown Bog SPA- Site Synopsis. https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY004101.pdf
[11] Ballykenny-Fisherstown Bog SPA – Natura 2000 - Standard Data Form - https://www.npws.ie/sites/default/files/protected-sites/natura2000/NF004101.pdf

3.2.2 Current Phase (July 2019 – Present Day)

Since July 2019, activities at the Application Site have focused on removing peat stockpiles, decommissioning infrastructure, rehabilitation efforts, and maintenance of existing drainage infrastructure as required. The cessation of peat extraction activity greatly reduced the potential for suspended sediments and water pollution. Activities during the Current Phase are unlikely to transfer pollutants at levels that would significantly deteriorate water quality in the European sites affect aquatic habitats or species. Consequently, no likely significant in-situ effects on the European sites are anticipated to have occurred or will occur from activities undertaken during the Current Phase.

Similarly, the cessation of peat extraction activity has significantly reduced potential noise and human disturbances. As a result, past and ongoing activities during the Current Phase have not and will not lead to likely significant ex-situ effects to mobile QI and SCI species from the from the Lough Ree SAC, Lough Ree SPA, and the Ballykenny-Fisherstown Bog SPA that may the Application Site or nearby surrounding areas..

Consequently, no likely significant effects on European sites are anticipated to have occurred or will occur from activities undertaken during the Current Phase. Therefore, further assessment of activities associated with the Current Phase in the rNIS is not required.

3.2.3 Remedial Phase (Future)

Future rehabilitation efforts at the Application Site during the Remedial Phase will improve water retention at the bogs, aiding habitat rehabilitation which will further reduce potential erosion and sediment laden run off. As a result, no negative impact on the quality of water quality flowing from the Application Site to European sites is expected to occur from activities. Consequently, no likely significant in-situ effects at the European sites will occur.

The activities during the Remedial Phase will bring ecological benefits not only to the Application Site itself but also to mobile QIs and SCIs species from the European sites that may utilise the Application Site for foraging and breeding.

While rehabilitation activities will introduce some disturbances to the local environment at the Application Site, any disturbance will be at a low level and transient in nature and will not significantly disrupt species at the site including mobile QIs and SCIs species from the European sites that may be using the Application Site. Consequently, no likely significant ex-situ effects on mobile species from the European sites that may be using the Application Site will occur.

Consequently, no likely significant effects on the European sites are anticipated from activities during the Current Phase. Therefore, further assessment of the Remedial Phase in the rNIS is not required.

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7°41'10"W
53°44'0"N
53°35'50"N
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752000
592000
608000
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Kilglass And Grange Loughs pNHA
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Lough Forbes Complex pNHA
Ardakillin Lough pNHA
Carrickglass Demesne pNHA
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Royal Canal pNHA
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Corbo Bog pNHA
Lough Bannow pNHA
Lough Ree pNHA
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Lough Bawn pNHA
Derry Lough pNHA

Elphin
Tulsk
Strokestown
Scramoge
Whitehall
Newtown Forbes
Termonbarry
Doughill Forest
Cloontuskert
Killashee
Stonepark
Edgeworthstown
Bornacoola
Drumlish
Ennybegs
Ballinalee
Melview
Cullyfad
Moydow
Ardagh
Ballycloghan
Keenagh
Legan
Barry
Colehill
Tashinny
Abbeyshrule
Ballymahon
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Moyvore
Roscommon
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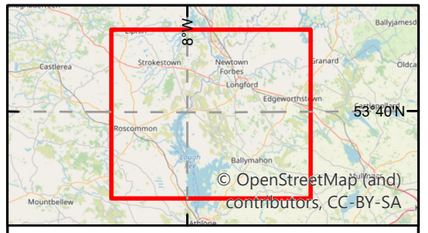

Legend

- Application Site
- 15km Zone of Influence
- proposed Natural Heritage Areas (pNHAs)
- WFD - Lake Water Bodies
- WFD - River Water Bodies

0 2.5 5
Kilometers

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING\
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE\
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES\
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

A	28/03/2025	First issue	S.P	C.N
Rev	Date	Description	By	Chkd

Client: Bord na Móna

Project: Derryadd, Derryaroge and Lough Bannow Bogs - Application for Substitute Consent

Title: Figure 3.1 pNHAs surrounding the Application Site Relative to WFD RWB and LWB

Scale @ A3: 1:145,000

Prepared by:	Checked by:	Date:
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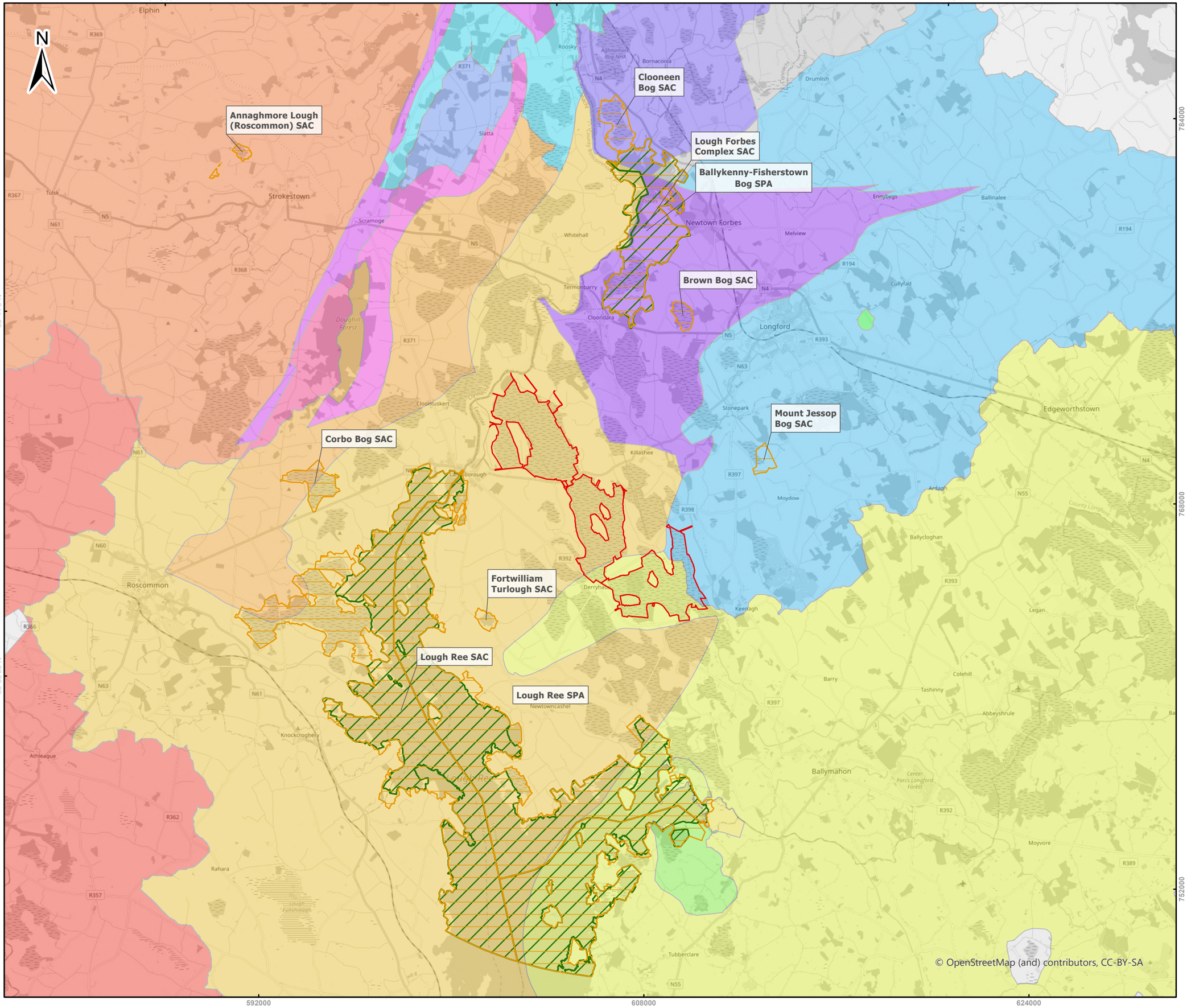
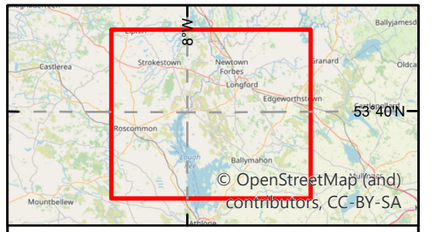
Map Ref: 11400-004.AASr-pNHA-RWB..LWB-TOB-A

Draft: A





Legend

- Application Site
- Special Areas of Conservation (SACs)
- Special Protection Areas (SPAs)

WFD - Groundwater Bodies

- Annaghmore
- Carrick on Shannon
- Curraghroe
- Funshinagh
- GWDTE-Lough Ree Fen 10 (SAC000440)
- GWDTE-Lough Ree Fen 12 (SAC000440)
- GWDTE-Lough Ree Fen 9 (SAC000440)
- Historic Waste Facility (S22-02489)
- Inny
- Kilglass Dromod
- Longford Ballinalee
- Lough Ackrick
- Mohill
- Newtown Forbes
- Scramoge North
- Scramoge South
- Slieve Bawn Telton
- Suck South

0 2.5 5
Kilometers

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING\
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE\
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES\
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Rev	Date	Description	By	Chkd
A	05/03/2025	First issue	S.P	C.N

Client: Bord na Móna

Project: Derryadd, Derryaroge and Lough Bannow Bogs - Application for Substitute Consent

Title: Figure 3-2 European Sites surrounding the Application Site relative to WFD GWB

Scale @ A3: 1:145,000

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Map Ref: 11400-003.AASr-EU.S-GWB-TOB-A

Draft: A

4. DESCRIPTION OF THE PROJECT

Section 4.1 and Section 4.2 below presents a summary of the Project at the Application Site. This summary is based on the detailed description of the Project presented in Chapter 4 - Project Description of the rEIAR prepared to support the application for Substitute Consent. Chapter 4 of the rEIAR chapter is included in Appendix 1 of this report.

The rEIAR adopts July 1988 as the assessment baseline, as this was the year when the European Communities EIA Directive was required to be transposed into Irish law. Prior to this date, EIA was not a legal requirement. While the description of the Project provided in the rEIAR includes extensive information on activities at the Application Site from 1949[12] onwards, this rNIS only assesses activities undertaken within the Application Site from 1994 when the Habitats Directive came into force (as described in Section 1 above) until the cessation of peat extraction activity in 2019. It should be noted, however, that the majority of the information presented in the rEIAR to establish the 1988 baseline is relevant for establishing the 1994 baseline, as assessing peat extraction activity that continued until 2019. Specifically, Chapter 4 of the rEIAR chapter (see Appendix 1) includes descriptions of:

- Activities at the Application Site from 1949 at the onset of site preparation up to July 1988.
- the rEIAR baseline as of July 1988.
- activities from 1988 to the cessation of peat extraction in June of 2019.
- management of the Application Site since June 2019.
- activities intended to be carried out at the Application Site into the future.

4.1 DESCRIPTION OF THE APPLICATION SITE

The Application Site, covering 2,244 ha, consists of three bogs Derryaroge Bog to the north, Derryadd Bog in the centre, and Lough Bannow Bog to the south that form part of a larger bog group, known as the Mountdillon Bog Group.

Derryaroge Bog

Derryaroge Bog (approximately 863ha) is located 1km east of Lanesborough, County Longford. It is divided into western and eastern sections by a privately owned mineral island, which lies outside the Application Site boundary. Derryaroge Bog is separated from the Derryadd Bog to the southeast of Lanesborough by the N63 road. The main access point to Derryaroge Bog was off the N63.

Derryaroge Bog was in subject peat production since the 1950s. Aerial imagery from 1988 and 1995 shows that at those times, the bog consisted largely of cutover areas dominated by bare peat, supported by established drainage and rail infrastructure. Aerial imagery (Appendix 1) further highlights the extent of cutover bog and peat extraction at Derryaroge, Derryadd and Lough Bannow bogs during this period.

[12] 1949 marks the year of the commencement of the installation of drainage at the Application Site in preparation for peat extraction which commenced at the site in the 1950s.

Drainage of the bog to facilitate peat extraction was already in place by 1988, predominantly orientated in a northwest-southeast direction and several pumps were in operation.

Railway infrastructure was laid in the bog (since the 1950s), terminating at the Mountdillon Works, which included canteens, workshops, welfare facilities, and fixed fuel tanks.

A pumped drainage system in operation in 1994 at Derryaroge Bog remains in place, with nine surface water pumps. There were artificial silt ponds, and surface water emission points which remain in situ today.

Derryadd Bog

Derryadd Bog (approximately 649ha) lies 4km southeast of Lanesborough. The bog is separated from Derryaroge Bog by the N63 road. It is a single peatland block with two privately owned mineral islands (Annaghmore).

A rail link connects Derryadd Bog to both Derryaroge (to the north) and Lough Bannow (to the south). In addition, a rail line running in an east-west direction, dividing the bog into a larger northern section and a smaller southern section, remain in-situ today. Hydrological management, historically supporting industrial peat extraction, continues through active pumping infrastructure.

Lough Bannow Bog

Lough Bannow Bog (approximately 731ha) is situated 7km southeast of Lanesborough. It is bordered by the R392 Regional Road to the west, the R398 Regional Road to the north, and the L1136 Local Access Road (Keenagh Road) to the south. The Royal Canal and Greenway are located 500m east.

Two large privately owned mineral islands exist within the site. A rail line crosses the southern part of the bog in an east-west direction.

Lough Bannow Bog had hydrological management via pumping to support peat extraction. Pumping continues today, with three pumps (one to the south and two along the northern boundary). Some eastern drains have been excavated down to limestone bedrock.

Drainage works and clearance of vegetation commenced at the Application Site from 1949 in Derryaroge Bog and from 1960 in Derryadd and Lough Bannow Bogs. Prior to this time the Application Site would have likely consisted of uncut raised bog, however, no survey data are available for this time period.

By 1994, the Application Site was well established as an industrial peat extraction area, with all bogs fully drained, sod and milled peat extraction underway in most locations, and railway infrastructure in place. In 1994 the once natural bog landscape was dominated by cutover bog and drained peatlands, where large sections of the bog were subject to peat extraction, leaving behind areas of bare peat. Milled peat extraction was ongoing in most locations, with a network of drainage channels installed to facilitate the process. The presence of railway infrastructure further reinforced the site's industrial character, allowing for the transportation of extracted peat. Despite the widespread disturbance, some remnant peatland vegetation likely remained,

particularly along the drainage margins and in areas that had not yet been subject to the installation of drainage or peat extraction. These remnants of bog, however, would have been degraded due to the impact of drainage and peat extraction. In some of the abandoned or less intensively worked sections, early signs of recolonisation by pioneer species may have been evident, with mosses, grasses, and low shrubs possibly establishing in areas.

The landscape and habitats in 1994 were characterised by cutover bog, bare peat areas and drained peatlands, with the site continuing to support peat extraction as the dominant activity.

Currently the majority of the Application Site consists of cutaway bog, where the vegetation was cleared, and peat has been removed. There are several smaller areas of various habitats remaining including coniferous forestry, cutover bog with all vegetation cleared but some peat remaining and uncut bog. The Application Site also includes small areas of remnant raised bog.

The Application Site is situated at the boundary between two Water Framework Directive (WFD) sub-catchments:

- Upper Shannon 26C – Covers most of the site, with surface water primarily draining into this catchment.
- Upper Shannon 26E – Extends to the south, receiving drainage from the southern part of the site.

These catchments define the flow of surface water within and around the site, impacting local rivers, streams, and lakes. The WFD ensures that water quality in these catchments is regularly monitored and assessed against ecological and chemical standards.

Key surface water bodies within these catchments include:

- Shannon (Upper) and its tributaries – Located to the north and northwest of the site.
- Ballynakill River – Found north and east of the Derryadd and Derryaroge bogs.
- Lough Bannow Stream and its tributaries – Located west of Lough Bannow.
- Fallan River – Situated 1 km east of the site, draining into the River Shannon at Cloondara.
- Ledwithstown (Bilberry) River – Originates near Lough Bannow's southern boundary, flowing southwest into Lough Ree

4.2 Overview of Peat Extraction at the Application Site

This section provides an overview of the temporal changes in the spatial extent of peat extraction activities at the Application Site, focusing on the period from 1994 onwards. Aerial imagery of the Application Site are available for the years 1973, 1988, 1995, 2004, and 2019. The data serve as the baseline reference for evaluating changes in peat extraction over time highlighting the Application Site has evolved over the years and underscores the potential improvement in ecological conditions at the Application Site over time since the cessation of all peat extraction in 2019.

Between 1973 and 2019, the extent of peat extraction at the Application Site underwent significant changes, as detailed in Table 4.1. The area of the Application Site subject to greatest extent of extraction peaked in 1988, covering an area of 1,963.0ha. However, from that point onward, the areas of peat extraction gradually decreased to 269.4ha at the point of the

cessation of peat extraction in 2019. This reflects a clear transition from active peat extraction to the areas no longer subject to peat extraction, allowing for potential habitat regeneration and gradual ecological transition in some areas from bare peat to early-stage or pioneer habitats, with early colonising species such as rush and patchy scrub.

The reduction in peat extraction area extents from 1988 onwards, through 1995 to 2019 has allowed some rehabilitation of previously disturbed areas. While earlier 1988 imagery is of limited resolution, it is still evident that the site began undergoing significant ecological changes after this time, with high-resolution aerial imagery from 1995 to 2019 confirming some transition Appendix 1).

Further details on the peat extraction activities during the assessment period are provided in Appendix 1.

Table 4.1: Bord na Móna Estimates of Peat Extraction Extents (ha) at the Application Site

Area Type	1973	1988	1995	2004	2019
Neither drained nor subject to peat extraction	12.93	12.93	12.93	12.93	12.93
Subject to peat extraction	1,907.6	1,963	1,826.7	1,353.2	269.4
Drained but not subject to peat extraction	56.7	0	136.3	610.4	1,695.38

4.3 PEAT EXTRACTION VOLUMES 1994-2019

Bord na Móna records indicate that from 1994 to 1999 (inclusive) the average extraction was at the Application Site was approximately 274,756 tonnes per year, with a total of 7,143,656 tonnes extracted over the period (see Table 4.2).

Further details of peat extraction activity at the Application Site during the period are provided in Appendix 1.

Table 4.2: Annual peat production quantities for the period 1994 to 2019

Year	Extraction (Tonnes)	Year	Extraction (Tonnes)
1994	291,430	2007	241,904
1995	600,739	2008	253,686
1996	386,862	2009	171,506
1997	167,239	2010	375,757
1998	134,561	2011	265,415
1999	395,820	2012	151,635
2000	355,023	2013	437,822
2001	361,257	2014	269,654
2002	124,952	2015	179,391
2003	329,375	2016	154,839
2004	348,936	2017	199,266

Year	Extraction (Tonnes)	Year	Extraction (Tonnes)
2005	312,112	2018	268,062
2006	282,405	2019	84,008*
Total	**7,143,656**		

***** Peat extraction at the Application Site came to an end in mid-2019, resulting in significantly lower extraction volumes compared to previous year

5. CHARACTERISTICS OF THE RECEIVING ENVIRONMENT

5.1 DESK STUDIES AND CONSULTATIONS

The following sections detail the available information reviewed regarding the Application Site and its surrounding area, as well as the consultations undertaken for the Project,

5.1.1 Desk Studies

The desk study undertaken for this assessment included a thorough review of available data pertaining to the Application Site and surrounding area, as well information pertaining to the 'relevant' European Sites identified in Section 3 above.

The purpose of the desk study was to obtain information on the baseline ecological conditions for the following time periods:

- **1994:** the year the Habitats Directive came into force (although, the Directive was not transposed into Irish law until 1997 [see Section 1 for details]).
- **1995**[13]**:** Lough Ree SPA (004064) was first designated
- **1996**[14]**:** Ballykenny-Fishertown Bog SPA (004101) was first designated
- **2002**[15]**:** Lough Ree SAC (000440) was first designated
- **Present day**: Current status of these designations

Sources of information included the following:

- Bord na Móna ecology surveys at the Application Site (see Appendix 1)
  - The Application Site was subject to detailed habitat surveys by Bord na Móna ecologists between 2010 - 2012 as outlined below .
    - Derryaroge Bog: Site surveyed on 01/07/2012.
    - Derryadd Bog: Site surveyed on 26/07/2012 and 27/07/2012.
    - Lough Bannow Bog: Site surveyed on 27/07/2010 and 29/07/2010.
- Bord na Móna Cutaway Bog Decommissioning and Rehabilitation Plans (included in Appendix 1)
    - Derryaroge Bog –Cutaway Bog Decommissioning and Rehabilitation Plan 2023.
    - Derryaroge Bog – Draft Cutaway Bog Decommissioning and Rehabilitation Plan 2025.
    - Derryadd Bog - Draft Cutaway Bog Decommissioning and Rehabilitation Plan 2025
    - Lough Bannow Bog – Draft Cutaway Bog Decommissioning and Rehabilitation Plan 2025.
- Aerial Maps from 1973 to 2019 (included in Appendix 1).

[13] Lough Ree SPA - Natura 2000 - Standard Data Form - https://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=IE0004064
[14] Ballykenny-Fisherstown Bog SPA – Natura 2000 - Standard Data Form - https://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=IE0004101
[15] Lough Ree SAC - Natura 2000 - Standard Data Form - https://www.npws.ie/sites/default/files/protected-sites/natura2000/NF000440.pdf

- Review of historic 6 inch and 25 inch maps of the Application Site and surrounding area available through Ireland's National Geospatial Data Hub[16].
- Review of the publicly available National Biodiversity Data Centre (NBDC) web-mapper[17].
- Review of online web-mappers and datasets from key environmental agencies, including the National Parks and Wildlife Service (NPWS)[18], EPA[19,20], and Inland Fisheries Ireland[21] (IFI).
- Review of NPWS Article 17 reporting and mapping for 2019[22], 2013[23] and 2007[24].
- Review of NPWS Article 12 mapping data for 2013 - 2018[25] and 2008 to 2012[26],
- IFI Reports, where available.
- Review of relevant of publically available Plans, including the:
    - Ireland's 4th National Biodiversity Action Plan 2023-2030 [27].
    - Longford County Development Plan 2021–2027[28]
    - Longford County Development Plan 2015–2021[29]
    - Longford County Development Plan 2009–2015[30]
    - Longford County Development Plans dated from 1990 onwards. Chapter 2 - Methodology of the rEIAR prepared for the Substitute Consent provides a summary of historic plans.

Bord na Móna is preparing a planning application in respect of the proposed Derryadd Wind Farm at the Application Site. That application will be accompanied by an EIAR and NIS. To assess potential environmental effects and necessary mitigation, detailed desk studies and field surveys on biodiversity, including birds, flora, fauna, and habitats, have been conducted. The EIAR and NIS prepared for the proposed wind farm, and the rEIAR prepared for the Substitute

[16] Available at: https://www.geohive.ie/. Accessed January 2025.
[17] Available at: https://maps.biodiversityireland.ie/Map. Accessed February 2025.
[18] Available at: https://www.npws.ie/maps-and-data. Accessed January 2025.
[19] Available at: https://gis.epa.ie/EPAMaps/. Accessed January 2025.
[20] Available at: https://www.catchments.ie/maps/. Accessed February 2025.
[21] Available at: https://www.fisheriesireland.ie/Research/interactive-mapping.html. Accessed July 2024.
[22] Available at: https://www.npws.ie/maps-and-data/habitat-and-species-data/article-17. Accessed February 2025.
[23] Available at: https://www.npws.ie/publications/article-17-reports/article-17-reports-2013. Accessed January 2025.
[24] Available at: https://www.npws.ie/publications/article-17-reports/article-17-reports-2007. Accessed January 2025.
[25] Available at: https://www.npws.ie/sites/default/files/files/Article12_Birds_BreedingDistribution_2013_2018.zip. Accessed December 2024.
[26] Available at: https://www.npws.ie/sites/default/files/general/Art12BirdsAllBreedingGridMappinge.zip. Accessed December 2024.
[27] Available at: https://assets.gov.ie/233057/f1a92f68-e668-498d-a56c-df777a19b549.pdf. Accessed February 2025.
[28] Available at: https://www.longfordcoco.ie/services/planning/longford-county-development-plan-2021-2027/volume-1-compressed.pdf. Accessed February 2025.
[29] Available at: https://www.longfordcoco.ie/services/planning/previous-plans-county-town-local-area-/development-plan-2015-2021/. Accessed February 2025.
[30] Available at: https://www.longfordcoco.ie/services/planning/previous-plans-county-town-local-area-/county-development-plan-2009-2015/. Accessed February 2025.

Consent application have been used to inform this rNIS, and the rAASR which is included here as Appendix 1.

5.1.2 Scoping and Consultation

TOBIN undertook a scoping and consultation exercise in 2022 and again in 2024 during preparation of the Substitute Consent application. Consultation with the Development Application Unit (DAU) was of relevance to the AA of the Project. The full consultation response from the DAU is provided in Appendix 1 while a brief summary of elements of consultation is included in Table 5.1 below.

Table 5.1: Scoping and Consultation Response from DAU

Consultee	Response/ Observations/ Recommendations
Development Application Unit (DAU), Department of Housing, Local Government and Heritage (DoHLGH)	A response was received from the DAU on 22/08/2024 acknowledging receipt of the consultation request. The DAU response outlined the following key 'heritage-related observations/recommendations': • AA and NIS must be detailed, scientifically robust, and leave no uncertainty regarding impacts on conservation objectives. • Historical, current, and future water level management should be assessed for ecological impacts, particularly on wintering and breeding birds. • Baseline field surveys are needed to assess the ecological effects of drainage and its connection to Natura 2000 sites.

5.1.3 European Sites

The results of a review of the NPWS Site-Specific Conservation Objectives documents, Site Synopsis documents and Natura 2000 standard data forms for the relevant European sites identified in Section 3 above, are presented in the following sections. NPWS SSCO mapping data for the site was also used[31].

5.1.3.1 Lough Ree SAC

Lough Ree SAC was designated in 2002. The QIs for which the site is designated, and their associated conservation objectives (NPWS, 2016) are presented in Table 5.2.

Table 5.2: Qualifying Interest and Conservation Objectives

Qualifying Interest	Conservation Objective
Natural Eutrophic Lakes [3150]	To maintain the favourable conservation condition of Natural Eutrophic Lakes in Lough Ree SAC.
Orchid-rich Calcareous Grassland [6210]*	To restore the favourable conservation condition of Orchid-rich Calcareous Grassland in Lough Ree SAC.
Active Raised Bog [7110]*	To restore the favourable conservation condition of Active Raised Bog in Lough Ree SAC.
Degraded Raised Bog [7120]	To restore the favourable conservation condition of Degraded Raised Bog in Lough Ree SAC.

[31] Site-specific Conservation Objectives Shapefiles (updated April 2022; Available at https://www.npws.ie/maps-and-data/habitat-and-species-data. Accessed January 2025.

Qualifying Interest	Conservation Objective
Alkaline Fens [7230]	To maintain the favourable conservation condition of Alkaline Fens in Lough Ree SAC.
Limestone Pavement [8240]*	To maintain the favourable conservation condition of Limestone Pavement in Lough Ree SAC.
Bog Woodland [91D0]*	To restore the favourable conservation condition of Bog Woodland in Lough Ree SAC.
Alluvial Forests [91E0]*	To restore the favourable conservation condition of Alluvial Forests in Lough Ree SAC.
Otter (*Lutra lutra*) [1355]	To maintain the favourable conservation condition of Otter (*Lutra lutra*) in Lough Ree SAC.

* indicates priority habitats under the E.U. Habitats Directive.

5.1.3.1.1 Main Pressures and Threats

The NPWS Natura 2000 – Standard Data Form for Lough Ree SAC[32] contains a description of the SAC, along with ecological information regarding its features and the species it supports. It also identifies the main threats and pressures to the SAC (see Table 5.3).

Table 5.3: Threats and Pressures

Rank	Code	Threats and Pressures	Inside/Outside
H	H01	Pollution to surface waters (limnic, terrestrial, marine & brackish)	Inside
H	J02.15	Other human-induced changes in hydraulic conditions	Inside
H	E02	Industrial or commercial area	Inside
H	I01	Invasive non-native species	Inside
H	E03.04	Other discharges	Inside
M	G02.10	Other sport / leisure complexes	Inside
M	A07	Use of biocides, hormones and chemicals	Inside
M	A08	Fertilisation	Inside
M	A05.02	Stock feeding	Outside
M	G01	Outdoor sports and leisure activities, recreational activities	Inside
M	A01	Cultivation	Inside
M	A10.01	Removal of hedges and copses or scrub	Inside
M	C01.01	Sand and gravel extraction	Inside
M	G05.06	Tree surgery, felling for public safety, removal of roadside trees	Inside

[32] Lough Ree SAC – EEA Natura 2000 - Standard Data Form - https://www.npws.ie/sites/default/files/protected-sites/natura2000/NF000440.pdf

Rank	Code	Threats and Pressures	Inside/Outside
M	G05	Other human intrusions and disturbances	Inside
M	E05	Storage of materials	Inside
M	E01.04	Other patterns of habitation	Inside
M	J02.11	Siltation rate changes, dumping, depositing of dredged deposits	Inside
M	J02.10	Management of aquatic and bank vegetation for drainage purposes	Inside
M	D01.02	Roads, motorways	Inside
M	E03.02	Disposal of industrial waste	Inside
M	J02	Human-induced changes in hydraulic conditions	Inside
L	D01.05	Bridge, viaduct	Inside

5.1.3.1.2 Qualifying Interests

Information on the QIs for which the site is designated is provided below. The information is based on the Site Specific Conservation Objective (SSCO) document and the Site Synopsis document for the site (NPWS, 2016[33], 2019[34]).

5.1.3.1.2.1 Natural Eutrophic Lakes [3150]

Lough Ree is a predominantly shallow lake with depths of less than 10m, except for six deeper troughs reaching up to 36m west of Inchmore. The lake's water is strongly peat-stained, which limits macrophyte growth to depths under 2m, restricting them to sheltered bays. The flora includes species such as Intermediate Bladderwort (*Utricularia intermedia*), various pondweeds (*Potamogeton* spp.), Quillwort (*Isoetes lacustris*), Greater Duckweed (*Spirodela polyrhiza*), stoneworts (*Chara* spp., including *C. pedunculata*), and Arrowhead (*Sagittaria sagittifolia*), the latter being scarce and mainly confined to the Shannon Basin.

Lough Ree is an important lake for biodiversity, supporting extensive reedbeds and diverse aquatic vegetation. The lake's margins contain significant areas of wetland habitat, including alkaline fens and wet woodland.

The Natural Eutrophic Lake habitat [3150] at Lough Ree SAC extends across the entire lake, with key ecological areas concentrated along the shallow, nutrient-rich margins and bays. In relation to the Application Site:

- The shortest water distance from the Application Site to the northernmost boundary of the SAC is approximately 5.3 km.
- In a direct line (as the crow flies), the distance is less than 1.5km.

[33] Lough Ree SAC - Site-specific Conservation Objectives - https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000440.pdf
[34] Lough Ree SAC – Site Synopsis. https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY000440.pdf

This spatial relationship highlights the hydrological connectivity between the Application Site and Lough Ree SAC.

*5.1.3.1.2.2 Orchid-rich Calcareous Grassland [6210]**

The Site Synopsis document for the site indicates area of dry calcareous grasslands occur in scattered areas around the lake shore, supporting species such as Yellow-wort (*Blackstonia perfoliata*), Carline Thistle (*Carlina vulgaris*), and Quaking-grass (*Briza media*). Orchid species, including Bee Orchid (*Ophrys apifera*) and Common Spotted-orchid (*Dactylorhiza fuchsii*), are also present in this habitat. Areas of calcareous grassland are present support a rich diversity of plant species characteristic of lime-rich soils.

The SSCO document for the site indicates mapped 6210 areas occur along the eastern and western shore, approximately 11km south of the northernmost boundary of the SAC.

The Funshinagh GWB underlies the Lough Ree SAC, reinforcing the hydrological connectivity between the Application Site and Lough Ree SAC. The hydrological relationship between GWBs, adjacent lakes, and orchid-rich calcareous grasslands is influenced by groundwater flow dynamics, aquifer characteristics, and local geology. The maintenance of groundwater quality and hydrological stability is essential for:

- Protecting lake ecosystems and adjacent habitats from eutrophication.
- Preserving the diverse plant communities of calcareous grasslands.

This highlights the critical hydrological linkages between the Application Site and Lough Ree SAC, emphasising the need for sustainable groundwater.

5.1.3.1.2.3 Active Raised Bog [7110] and Degraded Raised Bog [7120]*

Active raised bog at Clooncraff/ Cloonlarge Bogs located along the north-western shores of Lough Ree, approximately 6-7km from the northernmost boundary of the SAC. These raised bogs are situated between the Clooneigh and Hind rivers on the extern boundary of the SAC. Their proximity and linkage to Lough Ree underscores their ecological significance within the SAC.

Raised bogs are groundwater-dependent ecosystems, meaning they rely heavily on the supply and quality of groundwater for their structure, function, and biodiversity. The active raised bog coincides with the Funshinagh GWB.

The raised bogs at the SAC are among the most ecologically significant raised bogs in Ireland, supporting an array of characteristic bog species such as Bog Rosemary (*Andromeda polifolia*), Cranberry (*Vaccinium oxycoccos*), and Sundews (*Drosera spp.*). Degraded raised bogs within the SAC have the potential to regenerate into active raised bogs if appropriate restoration measures are undertaken.

The importance of these raised bogs for their biodiversity value and role in carbon sequestration.

There are areas of degraded raised bog that show potential for recovery. The vegetation in these regions is generally dominated by species typical of raised bogs, including Cross-leaved Heath (Erica tetralix), Heather (*Calluna vulgaris*), Hare's-tail Cottongrass (*Eriophorum vaginatum*),

Bog Asphodel (*Narthecium ossifragum*), and Deergrass (*Scirpus cespitosus*). These degraded bogs usually have a sparse cover of peat-forming mosses (*Sphagnum* spp.).

Both the SAC and the Application Site are underlain by the Funshinagh Groundwater Body (GWB), establishing a potential hydrogeological connection between these areas. This linkage suggests that any changes in groundwater quality, flow patterns, or contamination at the Application Site could have downstream effects on the sensitive habitats and species within the SAC.

5.1.3.1.2.4 Alkaline Fens [7230]

The Site Synopsis document for the sites indicates extensive reedbeds of Common Reed (*Phragmites australis*) occur in sheltered areas of Lough Ree. Single-species swamps with Common Club-rush (*Scirpus lacustris*), Slender Sedge (*Carex lasiocarpa*), and Great Fen-sedge (*Cladium mariscus*) are present in suitable locations. Some of these swamps transition into species-rich alkaline fens containing Black Bog-rush (*Schoenus nigricans*) and Whorl-grass (*Catabrosa aquatica*). The Alkaline Fen habitat [7230] at the SAC is known to be located in Killinure and Coosan Loughs and Ballaghkeeran Bay. Killinure Lough is located on the western side of Lough Ree and is part of the SAC. Coosan Lough lies to the south-west of Killinure Lough and is also located within the Lough Ree SAC area, while Ballaghkeeran Bay is situated along the southern shore of Lough Ree near Ballaghkeeran. Alkaline fens occur in areas of groundwater seepage around the lake and are an important habitat for a variety of plant species, including orchids and rare sedges. Killinure and Coosan Loughs and Ballaghkeeran Bay are located approximately 12 – 14km south of the northernmost boundary of the SAC. As well as supporting rush vegetation the fens also provide habitat for invertebrates of conservation interest.

Given that both the SAC and the Application site are underlain by the Funshinagh GWB, there is a potential hydrogeological link between the two areas, reinforcing the importance of assessing any potential impacts on water quality and habitat integrity. This hydrogeological linkage suggests that any changes in groundwater quality, flow patterns, or contamination at the Application Site could have downstream effects on the sensitive habitats and species within the SAC. Given the ecological significance of the alkaline fens, reedbeds, and wetland communities within Lough Ree SAC, maintaining water quality and hydrological stability is crucial. As a result, it is essential to assess potential impacts arising from historical and ongoing activities at the Application Site to ensure that groundwater-dependent habitats and species are not adversely affected.

*5.1.3.1.2.5 Limestone Pavement [8240]**

The Site Synopsis document indicate Limestone pavement occurs in certain locations around the lake shore, with the most notable area at Rathcline in the northeast of the SAC approximately 2 - 3km south of the northernmost boundary of the Lough Ree SAC. Despite afforestation since the 1950s, this habitat retains diverse limestone pavement features, including formations, large blocky pavements, and scattered boulders. The vegetation is dominated by a bryophyte-rich flora, with Ivy (*Hedera helix*) and a scrub layer of Ash (*Fraxinus excelsior*), Hazel (*Corylus avellana*), and some Spindle (*Euonymus europaeus*). The ground flora is variable but species-rich in certain areas. Limestone pavement is highly permeable, facilitating significant groundwater movement through the rock, which is crucial for the hydrological

connectivity between groundwater and surface water. The water that percolates through the limestone, along with the water that moves upwards from below, may plays a role in sustaining the local water balance and contribute to the water quality.

Limestone pavement is an Annex I priority habitat and areas of this habitat support a diverse range of species, including ferns and mosses adapted to the shaded microclimate of the formations.

Both the SAC and the Application Site share the Funshinagh Groundwater Body (GWB), creating a hydrogeological connection that necessitates careful assessment of potential impacts on water quality and habitat integrity. Groundwater-dependent habitats, such as limestone pavement, fens, and raised bogs, rely on stable hydrological conditions for their ecological function. Any changes in groundwater flow or quality at the Application Site could affect these sensitive ecosystems. Therefore, monitoring and mitigation measures are essential to protect the SAC's designated habitats from potential disturbances linked to past and ongoing activities.

5.1.3.1.2.6 Bog Woodland [91D0] and* Alluvial Forests [91E0]

Dry broadleaved semi-natural woodland is present in several areas around Lough Ree, particularly at St John's Wood and on Hare Island. St John's Wood, located on the eastern shore of Lough Ree supports both Bog Woodland and Alluvial Forest habitats. These woodlands are situated approximately 4-5 km south of the northernmost boundary of the SAC. The Alluvial Forests here thrive along the riverine margins, benefiting from the nutrient-rich, waterlogged conditions of the floodplain, while the Bog Woodlands occupy the wetter, more acidic areas.

St John's Wood is recognised as the largest and most natural woodland in the Midlands. The canopy is dominated by Hazel, Pedunculate Oak (*Quercus robur*), Holly (*Ilex aquifolium*), and Ash, with other species such as Wych Elm (*Ulmus glabra*), Yew (*Taxus baccata*), Wild Cherry (*Prunus avium*), and Irish Whitebeam (*Sorbus hibernica*). The ground flora is variable and can be rich in species in certain locations.

Further south, Hare Island, located near the central part of Lough Ree, also contains areas of both Bog Woodland and Alluvial Forest. The Bog Woodland habitats are found along the island's shores, while the Alluvial Forests are found in the floodplains. Hare Island lies approximately 6-7km south of the northernmost boundary of the SAC.

Both habitats play vital roles in maintaining the hydrological balance and biodiversity of Lough Ree SAC, contributing to water quality regulation and providing critical ecosystems for various species.

No clear direct and measurable interaction between the peat extraction activities and significant changes in groundwater or surface water patterns that would affect the habitats at Lough Ree. Therefore, at this stage, it can be concluded that the extraction activities have not resulted in a clear and identifiable disruption of the hydro-hydrogeological balance within the SPA.

5.1.3.1.2.7 Otter (Lutra lutra) [1355]

Lough Ree SAC supports a significant population of Otter , a species listed under Annex II of the EU Habitats Directive. The SAC provides extensive wetland habitats, including rivers, streams, and riparian vegetation, which are used by the species for foraging and breeding.

The Site Synopsis document states that Otters are widely distributed throughout the SAC and use a combination of riverbanks, lakeshores, and wetland areas for resting and denning. The species benefits from the high fish biomass present in the lake.

The Application Site is hydrologically connected to Lough Ree SAC through drainage pathways that ultimately discharge into the lake. Given that Lough Ree SAC supports a significant population of Otter, any changes in water quality or habitat conditions caused by drainage from the Application Site have the potential to affect this species.

In addition, machinery and human activity may have resulted in disturbance effects to the Otter using the Application Site for foraging and transit. The noise, movement, and general disruption associated with peat extraction activities could potentially drive Otters away from their foraging areas or interfere with their movement corridors. Otters are sensitive to disturbances, and any disruption to their habitat can lead to reduced access to food sources, increased stress, and potential displacement from areas within the Application Site used by the species.Lough Ree SPA

Lough Ree SPA was designated in 1995. The SCIs for which the site is designated are listed as in NPWS, 2022a are presented in Table 5.2.

NPWS 2022a does not include specific conservation objectives for each SCI but indicates that the goal is to maintain or restore the favourable conservation condition of SCIs.

Table 5.4: Special Conservation and Conservation Objectives

Special Conservation Interest	Conservation Objective
Little Grebe (*Tachybaptus ruficollis*) [A004]	To maintain or restore the favourable conservation condition of Little Grebe in Lough Ree SPA.
Whooper Swan (*Cygnus cygnus*) [A038]	To maintain or restore the favourable conservation condition of Whooper Swan in Lough Ree SPA.
Wigeon (*Anas penelope*) [A050]	To maintain or restore the favourable conservation condition of Wigeon in Lough Ree SPA.
Teal (*Anas crecca*) [A052]	To maintain or restore the favourable conservation condition of Teal in Lough Ree SPA.
Mallard (*Anas platyrhynchos*) [A053]	To maintain or restore the favourable conservation condition of Mallard in Lough Ree SPA.
Shoveler (*Anas clypeata*) [A056]	To maintain or restore the favourable conservation condition of Shoveler in Lough Ree SPA.
Tufted Duck (*Aythya fuligula*) [A061]	To maintain or restore the favourable conservation condition of Tufted Duck in Lough Ree SPA.
Common Scoter (*Melanitta nigra*) [A065]	To maintain or restore the favourable conservation condition of Common Scoter in Lough Ree SPA.

Special Conservation Interest	Conservation Objective
Goldeneye (*Bucephala clangula*) [A067]	To maintain or restore the favourable conservation condition of Goldeneye in Lough Ree SPA.
Coot (*Fulica atra*) [A125]	To maintain or restore the favourable conservation condition of Coot in Lough Ree SPA.
Golden Plover (*Pluvialis apricaria*) [A140]	To maintain or restore the favourable conservation condition of Golden Plover in Lough Ree SPA.
Lapwing (*Vanellus vanellus*) [A142]	To maintain or restore the favourable conservation condition of Lapwing in Lough Ree SPA.
Common Tern (*Sterna hirundo*) [A193]	To maintain or restore the favourable conservation condition of Common Tern in Lough Ree SPA.
Wetland and Waterbirds [A999]	To maintain or restore the favourable conservation condition of Wetland and Waterbirds in Lough Ree SPA.

5.1.3.1.3 Main Pressures and Threats

The NPWS Natura 2000 – Standard Data Form for Lough Ree SPA[35] lists the main threats and pressures to the SPA (see Table 5.5).

Table 5.5: Threats and Pressures

Rank	Code	Threats and Pressures	Inside/Outside
H	J02.11.02	Other human-induced changes in hydraulic conditions	Outside
M	H01.08	Pollution to surface waters (limnic, terrestrial, marine & brackish)	Both
H	K03.05	Use of fertilizers	Inside
M	A04	Other agricultural activities	Inside
M	F03.01	Forestry activities	Inside
M	B02	Invasive species	Both
M	H02.06	Human-induced changes in hydrological conditions	Both
M	G01.01	Human-induced disturbance to habitats	Inside
L	G01.02	Groundwater abstraction	Inside
L	J02.04	Drainage	Both
L	L08	Habitats modification	Inside
M	A03.03	Agricultural pollution	Inside
L	D03.01.02	Changes in land management	Inside

[35] Lough Ree SPA – EEA Natura 2000 - Standard Data Form - https://www.npws.ie/sites/default/files/protected-sites/natura2000/NF004064.pdf

Rank	Code	Threats and Pressures	Inside/Outside
L	H06.03	Tourism infrastructure development	Outside
M	E01.03	Waste disposal	Outside
M	F02.03	Pollution from industrial sources	Inside
M	A08	Agricultural practices	Both
H	I01	Invasive non-native species	Both

5.1.3.1.4 Special Conservation Interests

Information on the SCIs for which the site is designated is provided below. The information is based on the Site Synopsis document for the site (NPWS, 2015[36]).

The current phase of peat extraction poses various risks to SCI, primarily through water quality degradation and habitat alteration.

5.1.3.1.4.1 Little Grebe (Tachybaptus ruficollis) [A004]

According to the Site Synopsis document for this SPA, the population of Little Grebe is nationally important with a three-year mean peak of 52 individuals recorded during the period 1997/98 to 1999/2000. The site supports a significant wintering population of this species. The Site Synopsis document also highlights that Lough Ree is one of the most important Midland sites for wintering waterfowl, including Little Grebe. Additionally, the SPA provides suitable breeding habitat for this species. Little Grebes require clear, vegetated waters for feeding and nesting. Increased sedimentation in water bodies used by the species from peat extraction could potentially have reduced water clarity, making it more difficult for them to catch aquatic prey.

5.1.3.1.4.2 Whooper Swan (Cygnus cygnus) [A038]

The SPA supports a nationally important population of Whooper Swan, with a three-year mean peak of 139 individuals recorded during the period 1997/98 to 1999/2000. This species is a SCI for the site. The Site Synopsis document notes that Whooper Swan is one of the key species for which the SPA is designated. The SPA provides important wintering habitat for this species. Peat extraction can lead to water quality degradation and nutrient levels which could have potentially affected food supply for the species.

5.1.3.1.4.3 Wigeon (Anas penelope) [A050]

Wigeon is one of the most abundant species at the site, with a three-year mean peak of 2,070 individuals recorded during the period 1997/98 to 1999/2000. The species is an SCI for this site. The Site Synopsis document emphasises the importance of Lough Ree for wintering Wigeon. The SPA provides suitable feeding and roosting habitat for this species. As a grazing duck, Wigeon depends on healthy aquatic vegetation for feeding. Peat extraction potentially led to increased suspended solids, reducing the growth of submerged plants, and potentially affecting food supply for the species.

[36] Lough Ree SPA - Site Synopsis. https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY004064.pdf

5.1.3.1.4.4 Teal (Anas crecca) [A052]

The population of Teal at the site is nationally important, with a three-year mean peak of 1,474 individuals recorded during the period 1997/98 to 1999/2000. This species is a SCI for the SPA. The Site Synopsis document highlights the significant wintering population of Teal at Lough Ree. The SPA provides suitable feeding and roosting habitat for this species. Teal, like Wigeon, rely on shallow waters with abundant plant material for feeding. Decline in the quality of water used by the species due to peat runoff could potentially reduce their foraging efficiency.

5.1.3.1.4.5 Mallard (Anas platyrhynchos) [A053]

Mallard is another species with a nationally important population at the site, with a three-year mean peak of 1,087 individuals recorded during the period 1997/98 to 1999/2000. The site supports a significant wintering population of this species. The Site Synopsis document notes the importance of Lough Ree for wintering Mallard. The SPA provides suitable feeding and roosting habitat for this species. Mallards are adaptable but still require stable feeding and roosting areas. Peat extraction-related habitat changes could have disrupted their food sources, particularly if water quality declines due to nutrient runoff. Machinery and human disturbance could also have potentially displace the species from areas at the Application Site previously used by the species.

5.1.3.1.4.6 Shoveler (Anas clypeata) [A056]

The SPA supports a nationally important population of Shoveler, with a three-year mean peak of 54 individuals recorded during the period 1997/98 to 1999/2000. This species is of SCI for the site. The Site Synopsis document mentions the significant wintering population of Shoveler at Lough Ree. The SPA provides suitable feeding and roosting habitat for this species. Shovelers feed on plankton and invertebrates, filtering them from the water. An increase in sediment levels from peat runoff can potentially have altered water chemistry and food availability, potentially reducing suitable habitat for this species.

5.1.3.1.4.7 Tufted Duck (Aythya fuligula) [A061]

Tufted Duck is well-represented at the site, with a three-year mean peak of 1,012 individuals recorded during the period 1997/98 to 1999/2000. The Site Synopsis document highlights the importance of Lough Ree for wintering Tufted Duck. The SPA provides suitable feeding and roosting habitat for this species. Tufted Ducks dive for molluscs and aquatic invertebrates. If sedimentation from peat extraction reduced water clarity, it may have affected the species ability to locate prey.

5.1.3.1.4.8 Common Scoter (Melanitta nigra) [A065]

Lough Ree is one of the two main sites in the country for breeding Common Scoter, a Red Data Book species. The site supports a nationally important population of this species. The Site Synopsis document emphasises the significance of Lough Ree for breeding Common Scoter. The SPA provides suitable breeding habitat for this species. As one of the few sites in Ireland where Common Scoters breed, Lough Ree provides critical habitat for this species. Changes in water quality at Lough Ree, particularly pollution or eutrophication, could have affected on their foraging and nesting success.

5.1.3.1.4.9 Goldeneye (Bucephala clangula) [A067]

The population of Goldeneye at the site is nationally important, with a three-year mean peak of 205 individuals recorded during the period 1997/98 to 1999/2000. The Site Synopsis document notes the importance of Lough Ree for wintering Goldeneye. The SPA site provides suitable feeding and roosting habitat for this species. Goldeneye rely on undisturbed waters with abundant invertebrate life. Increased sedimentation could potentially have affected water quality and reduced prey availability.

5.1.3.1.4.10 Coot (Fulica atra) [A125]

Coot is another species with a nationally important population at the site, with a three-year mean peak of 338 individuals recorded during the period 1997/98 to 1999/2000. The Site Synopsis document highlights the importance of Lough Ree for wintering Coot. The SPA provides suitable feeding and roosting habitat for this species. Coots depend on aquatic vegetation and invertebrates, both of which may have been affected by changes in water clarity and nutrient levels due to peat extraction runoff.

5.1.3.1.4.11 Golden Plover (Pluvialis apricaria) [A140]

The SPA supports a nationally important population of Golden Plover, with a three-year mean peak of 3,058 individuals recorded during the period 1997/98 to 1999/2000. The Site Synopsis document emphasises the significance of Lough Ree for wintering Golden Plover. The SPA provides suitable feeding and roosting habitat for this species. Golden Plovers roost in open wetlands and require suitable feeding grounds. Machinery and human disturbance could have potentially displaced the species from suitable foraging areas at the Application Site previously sue by the species.

5.1.3.1.4.12 Lapwing (Vanellus vanellus) [A142]

Lapwing is well-represented at the site, with a three-year mean peak of 5,793 individuals recorded during the period 1997/98 to 1999/2000. The Site Synopsis document highlights the importance of Lough Ree for wintering Lapwing. The SPA provides suitable feeding and roosting habitat for this species. Lapwings, like Golden Plovers, require undisturbed wetland edges for feeding and roosting. Alteration to water quality from peat extraction could have affected their habitat.

5.1.3.1.4.13 Common Tern (Sterna hirundo) [A193]

The site supports a nationally important population of Common Tern, with 90 pairs recorded in 1995. This species is of special conservation interest for the SPA. The Site Synopsis document notes the significance of Lough Ree for breeding Common Tern. The SPA provides suitable breeding habitat for this species. Common Terns rely on stable fish populations for feeding. If peat extraction leads to reduced water quality, it could impact fish stocks and, consequently, the ability of terns to sustain their chicks.

5.1.3.1.4.14 Wetland and Waterbirds [A999]

The SPA is of conservation interest for Wetland and Waterbirds, acknowledging the importance of Ireland's wetlands to wintering waterbirds. The Site Synopsis document emphasises the

significance of Lough Ree for supporting a diverse range of wetland and waterbird species. The SPA provides suitable feeding, roosting, and breeding habitats for these species.

The Current Phase of peat extraction has the potential to disrupt the ecological balance of Lough Ree SPA. Water quality degradation due to increased sedimentation and nutrient runoff has the potential to alter the availability of food sources for many of the listed species. Increased human activity, noise, and machinery use may drive sensitive species away from habitats at the Application previously used by SCI for foraging.

5.1.3.2 Ballykenny-Fishertown Bog SPA

5.1.3.2.1 Main Pressures and Threats

The NPWS Natura 2000 – Standard Data Form for the SPA[37] contains a description of the SPA as well as ecological information on the SPA and identifies the main threats and pressures to the SPA (see Table 5.3).

Table 5.6: Threats and Pressures

Rank	Code	Threats and Pressures	Inside/Outside
L	F03.01	Hunting and collection of wild animals (terrestrial)	Inside
M	B	Other human intrusions and disturbances	Inside
M	A04	Grazing	Outside
L	F02.03	Fishing and harvesting aquatic resources	Inside
M	G01.01	Outdoor sports and leisure activities, recreational activities	Inside
M	A04	Grazing	Inside

5.1.3.2.2 Special Conservation Interests

Information on the SCIs for which the site is designated is provided below. The information is based on the Site Synopsis document for the site (NPWS, 2012[38])

5.1.3.2.2.1 Greenland White-fronted Goose (Anser albifrons flavirostris) [A395]

The Greenland White-fronted Goose is SCI for which the site is designated. The conservation objectives aim to maintain or restore the favourable conservation condition of the Greenland White-fronted Goose, which is defined by the attributes and targets specified in the document. The population target is to maintain the long-term population trend of the species at the site. The species is a winter visitor to Ireland, with significant numbers recorded at the site. The site supports a nationally important population of this species. The geese breed in west Greenland and migrate via Iceland to winter in Ireland and Britain. The site provides crucial feeding and

[37] Ballykenny-Fisherstown Bog SPA – Natura 2000 - Standard Data Form - https://www.npws.ie/sites/default/files/protected-sites/natura2000/NF004101.pdf

[38] Ballykenny-Fisherstown Bog SPA- Site Synopsis. https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY004101.pdf

roosting habitats for the geese during the winter months. The population of Greenland White-fronted Goose at the site has been monitored over the years, with efforts to protect and manage their habitats. The site is part of a network of important wintering sites for this species in Ireland, contributing to the overall conservation of the population.

Although the Ballykenny-Fisherstown Bog SPA is upstream and not directly influenced by the Application Site's hydrology, it may still provide wintering habitat for Greenland White-fronted Geese. Research indicates the species prefers bogland habitats, which are present within both the Application Site and its surroundings, offering foraging and resting opportunities.

NatureScot (SNH, 2016) guidance on ecological connectivity suggests that if an SPA is within a species' core foraging range (5–8 km for this species. Given the geese's habitat preference and typical foraging distances, individuals from the SPA could use the Application Site, highlighting its potential role in supporting the SPA's population

5.1.4 Water Framework Directive Water Body Status

The information in this section provides a description of the hydrological, hydrogeological and water quality baseline environment of the Application site and surrounding area.

5.1.4.1 Regulatory Context

The Water Framework Directive (WFD), established under EU Directive 2000/60/EC and amended by subsequent directives, is implemented in Ireland via the European Communities (Water Policy) Regulations 2003 (S.I. No. 722/2003). No WFD data is available for 1994 (the baseline year used for this rNIS); thus, the 2007-2009 WFD Status Reports are used to infer the 1994 baseline conditions, along with more recent reporting periods.

5.1.4.2 Overview Hydrological Pathway

The Application Site is situated at the boundary between two WFD sub-catchments:

- Upper Shannon 26C – Covers most of the site, with surface water primarily draining into this catchment.
- Upper Shannon 26E – Extends to the south, receiving drainage from the southern part of the site.

These catchments define the flow of surface water within and around the site, impacting local rivers, streams, and lakes. The WFD ensures that water quality in these catchments is regularly monitored and assessed against ecological and chemical standards.

Key surface water bodies within these catchments include:

- Shannon (Upper) and its tributaries – Located to the north and northwest of the site.
- Ballynakill River – Found north and east of the Derryadd and Derryaroge bogs.
- Lough Bannow Stream and its tributaries – Located west of Lough Bannow.
- Fallan River – Situated 1 km east of the site, draining into the River Shannon at Cloondara.
- Ledwithstown (Bilberry) River – Originates near Lough Bannow's southern boundary, flowing southwest into Lough Ree.

Each of these surface water bodies is classified under the WFD, with their water quality status assessed using EPA monitoring programs (e.g., Biological Q-Rating and chemical sampling). The WFD framework ensures that any potential water quality impacts are identified and managed.

The Upper Shannon (26E) Catchment covers an area of 581km² and is characterised by a flat landscape underlain by limestones and includes Lough Ree. Lough Ree is currently at Good ecological status.

In addition to SWB, the Application Site to potentially connected to the following three Ground Water Bodies (GWB):

- Funshinagh (IE_SH_G_091) – A karstified aquifer with high transmissivity, allowing rapid groundwater flow, discharging into Ree Lake.
- Inny (IE_SH_G_110) – Another karstified aquifer with relatively fast groundwater movement, contributing to surface water features, including Ree Lake.
- Longford Ballinalee (IE_SH_G_149) – Underlain by poorly productive bedrock, leading to slower groundwater movement and feeding into local rivers and streams that eventually discharge into Ree Lake.

Groundwater bodies play a critical role in sustaining surface water ecosystems, as they provide baseflow to rivers and lakes. The groundwater quality standards ensure that these aquifers remain protected from contamination and excessive abstraction, maintaining their 'Good' status and supporting overall water resource sustainability

5.1.4.3 Baseline Water Quality

5.1.4.3.1 Historic EPA Biological Q-Rating Monitoring and WFD Monitoring

The historical water quality at the Application Site is assessed using two key datasets:

1. **EPA Rivers Ecology Monitoring Results** – A 3-year rolling program evaluating biological water quality (Q Value System), based on national surveys dating back to 1971 (with publicly available data from 1992 onwards).
2. **WFD Monitoring** – Implemented in 2003 (S.I. 722/2003), replacing the EPA Rivers Ecology Monitoring program. The first WFD monitoring cycle (2010–2015) assessed all classified water bodies (rivers, lakes, groundwater, transitional, and coastal waters).

The Biological Q-Rating System evaluates river water quality under the WFD using biological surveys, classifying watercourses as follows:

- Class A – Unpolluted (Q5, 4-5, 4)
- Class B – Slightly Polluted (Q3-4)
- Class C – Moderately Polluted (Q3, 2-3)

Class D – Seriously Polluted (Q2, 1-2, 1)

5.1.4.3.2 Historical Q-Rating Data

No Q-rating data exists for 1988. The earliest EPA monitoring data available is 1992 for the Fallan River and 1999 for the Shannon River. These monitoring efforts coincide with the reduction of peat extraction at the Application Site, leading up to its cessation in 2019.

Table 5.7 presents the EPA Monitoring of Biological Quality of Waters at four key locations along the Fallan and Shannon Rivers from 1992 to 2017. The locations include:

- West of Curry Bridge on the Fallan River,
- Bridge South of Kilmore Upper on the Fallan River,
- 1 km downstream of Tarmonbarry on the Shannon River, and
- Ballyleague Bridge, Lanesborough on the Shannon River

The water quality of the Fallan River and Shannon River varied over time, with Q3-4 and Q4 ratings indicating slightly polluted to unpolluted conditions. Data availability was inconsistent in the earlier years, particularly for the Shannon River. However, the monitoring results generally suggest that the water quality in these areas has fluctuated between slightly polluted and unpolluted states, with improvements in some years, such as 2011

Table 5.7: EPA Monitoring of Biological Quality of Waters

Location	W of Curry Bridge	Br S of Kilmore Upper	1km downstream of Tarmonbarry	Ballyleague Br Lanesboro
River	Fallan	Fallan	Shannon	Shannon
Station Code	RS26F0100040	RS26F010200	RS26S021530	RS26S021600
2017	Q3-4	Q4	Q3	ND
2014	Q3-4	Q4	Q3-4	Q3
2011	Q3-4	Q4	Q4	Q3-4
2008	Q3-4	Q4	Q3-4	ND
2005	Q3-4	Q3-4	ND*	Q3
2002	Q4	ND	ND	Q3
1999	Q3-4	Q3-4	ND	Q3
1996	Q3-4	Q3-4	ND	ND

*'ND' indicates 'No Data'

5.1.4.3.3 WFD Monitoring

EPA Biological Q-Value monitoring data postdates 2019, with Q-Values across the monitoring stations outlined in Table 5.8. No significant change in Q-values has occurred in 2020 or 2023 (the Current Phase) in comparison to the Peat Extraction.

Q-Values within the River Fallan vary between Q3-Q4 'Slightly Polluted' status and with 'Unpolluted' status -Q4. The EPA monitoring points on the River Shannon indicate that the overall water quality in this area is Q3-'Moderately Polluted' at Lanesborough and that the water quality upstream of the Application Site is Q3-Q4 'Slightly Polluted'.

Table 5.8: Q-Values Current Phase (July 2019- Present Day)

Location	W of Curry Bridge	Br S of Kilmore Upper	1km downstream of Tarmonbarry	Ballyleague Br Lanesboro
River	Fallan	Fallan	Shannon	Shannon
Station Code	RS26F0100040	RS26F010200	RS26S021530	RS26S021600
2023	Q4	-	Q3-4	Q3
2020	Q3-4	Q4	Q4	Q3

5.1.4.3.4 Conclusion

This section provides a clear and thorough overview of the hydrological, hydrogeological, and water quality conditions, utilising both historical and current data. Historically, water quality in the area has fluctuated, but overall, the monitoring data reflects a trend toward improving conditions. While the cessation of peat extraction may have contributed to some improvements in water quality, other local activities and environmental factors are also likely influencing the changes observed. A gradual improvement in water quality is likely to occur in line with the implementation of all WFD program of measures

5.2 FIELD SURVEYS

5.2.1 Overview

In addition to the desk study described above, the ecology at the Application Site was informed by ecological surveys undertaken on various dates between 2021 and 2024.

The surveys undertaken are listed in Table 5.9 while Section 5.2.2 through Section 5.2.5 provide summaries of the surveys and provide details of the methodologies, and guidance followed, while survey limitations are highlighted in Section 5.2.6.

Section 5.3 presents the findings from the field surveys, offering a detailed analysis of the data collected during the ecological surveys. The section includes observations on the flora and fauna, habitat conditions, and any notable ecological features.

Table 5.9: Summary of Surveys used in to inform the Baseline Described in this rNIS

Survey	Date	Conducted by:
Multidisciplinary Surveys	August 2022 and July 2023 - Multidisciplinary Surveys	TOBIN
Aquatic Surveys	June 2022 - River Habitat Survey	TOBIN
	September 2022 - Water Quality Assessment	Stillwaters Consultancy
Bird Surveys	Breeding Season 2021 (April 2021 – September 2021) Non-breeding Season 2021/2022 (October 2021 – March 2022)	Fehily Timoney

Survey	Date	Conducted by:
Non-Volant Mammal Surveys	August 2022 and July 2023	TOBIN

5.2.2 Multidisciplinary Surveys

5.2.2.1 Habitat Surveys

For the proposed Derryadd Wind Farm site multidisciplinary walkover survey was carried out in August 2022 by TOBIN ecologists. This survey was complemented by a second visit in July 2023, by the same team of ecologists. Habitats were surveyed and mapped with particular focus dedicated to the areas where the infrastructure associated with the proposed Derryadd Wind Farm is to be located. Some marginal habitats were not surveyed, but were mapped based on historic survey effort in the area (i.e. TOBIN Consulting Engineers, 2019).

Habitats surveyed were classified upon the qualitative consideration of:

- plant species abundance and diversity
- protection status
- vegetation structure
- topography
- drainage conditions
- evidence for disturbance and/or management

Habitats were classified according to Fossitt (2000), while satellite imagery was used to inform habitat delineation and interpretation, following Smith *et al.* (2011). Surveys considered plant species protected under the Flora Protection Order (S.I. No. 235/2022), listed in Irish Red List Series (King *et al.*, 2011; Lockhart *et al.*, 2012; Wyse Jackson *et al.*, 2016).

A search for Invasive Alien Plant Species (IAPS) listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011, as amended) was also conducted.

The findings of the habitat surveys are presented in 5.3.1.1 below

5.2.3 Otter Surveys

During the multidisciplinary walkover surveys, TOBIN ecologists conducted searches for non-volant mammals following the methodologies outlined in NRA Survey Guidelines (2009a). These searches focused on identifying mammal signs such as spraints, scat, prints, couches, holts, and dens. The survey findings were used in conjunction with reported observations of otter activity made by Bord na Móna during ecology surveys at the bogs.

The findings of the surveys are presented in Section 5.3.3.1 below

5.2.4 Bird Surveys

Field surveys were conducted by Fehily Timoney for the breeding season 2021 and the non-breeding season 2021/2022for the proposed Derryadd Wind Farm. The aim of the surveys was to collect accurate data on the presence of target species following best practice survey

methodologies (e.g. BirdWatch Ireland (BWI), 2008; Gilbert *et al.*, 2011; Countryside Bird Survey (CBS), 2012; Hardey *et al.*, 2013; Scottish Natural Heritage (SNH), 2017). Survey reports for the surveys undertaken are included in full in this document in Appendix 4. Key component surveys undertaken for the proposed Derryadd Wind Farm that are relevant to the Project include:

- Breeding wader surveys.
- Waterbird surveys.

The findings of the relevant surveys are presented in Section 5.3.1.2 below.

Table 5.10: Ornithological Surveys used to Inform the Characterisation of the Proposed Development Baseline for the rNIS

Season	Survey	Period	Appendix
Breeding 2021	Breeding Waders	May 2021 - September 2021	Appendix 4a and Appendix 4b[39]
Non-breeding 2021/2022	I-WeBS	September 2021 – March 2022	

5.2.5 Aquatic Surveys

5.2.5.1 River Habitat Survey

In June 2022, at 12 sampling sites, a 50m reach of river was selected as representative of the local habitat and hydromorphological conditions, and relevant aquatic and riparian features were recorded. The features recorded included:

- Bank characteristics: bank height; width; habitat classification (Fossitt, 2000); riparian vegetation; land use;
- Aquatic habitat: wetted width; depth; water level (qualitative); flow velocity (qualitative); flow typology; substrate composition; instream vegetation (macrophyte; filamentous algae); and
- Local pressures.

These features were used to assess the physical suitability of each channel for supporting salmonids, lampreys and other fish species, a macroinvertebrate assemblage typical of equivalent *Good* WFD water quality status streams, and to ascertain an ecological evaluation at the survey sites. The survey results are presented in detail in Section 5.3.4.1 below.

5.2.6 Survey Limitations

Seasonal factors that affect distribution patterns and habits of species were taken into account when conducting the field surveys that were undertaken to establish the current ecology of the Application Site.

Where required, surveys, studies, analysis, and reporting have been conducted in accordance with the appropriate guidelines. The habitats and species survey were readily identifiable during

[39] Appendix 4a and Appendix 4b includes reports on all ornithological surveys undertaken by Fehily Timoney for the proposed Derryadd Wind Farm for the breeding season 2021 and non-breeding season 2021/2022 season. Breeding wader and I-WeBS surveys undertaken during this period are of particular relevance to this rNIS.

site visits, allowing for comprehensive assessments, and no significant limitations were identified in this regard.

There are a number of limitations inherent to field-based bird surveying. These may relate to the availability of suitable weather conditions for completing surveys, with good visibility and limited wind or rain conditions of paramount importance. As such, when undertaking and completing fieldwork, careful consideration and planning was made to ensure optimal weather conditions during survey periods. To this effect, it is considered that there were no significant constraints, and the survey data presented herein provides accurate detail on the baseline ornithology on the site and environs.

Information gathered during the surveys described above provided information on the nature of the habitats at present in areas where peat extraction had recently ceased, in areas where peat cutting had ceased for some time and in areas of remnant raised bog which had never been subject to peat extraction. Using this information, it is possible to infer what the ecological baseline at the Application Site was likely to have been in 1994. However, no detailed, site specific ecology and habitat surveys from that time are available to inform the description.

5.3 RESULTS – FIELD SURVEYS

5.3.1 Habitat Surveys

5.3.1.1 Habitats

During August 2022 and July 2023 multidisciplinary surveys were undertaken as part of the Derryadd Wind Fram development. The habitats found reflect historic land-use, as well as the first signs of habitat transition. The survey results also reflect ecology surveys undertaken by Bord na Móna in 2010 to 2012 (see Appendix 1). Table 5.11 list various habitats recorded.

7°58'0"W

7°56'0"W

53°42'0"N

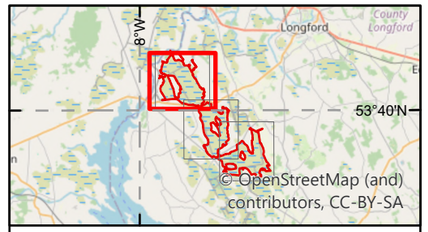
53°41'0"N

772000

770000

602500

605000



Legend

- Application Site

Habitats

- FW4 - Drainage ditches
- WL1 - Hedgerows
- WL2 - Treelines
- WS1 - Scrub
- BC1 - Arable crops
- BL2/FS1
- BL2/WS1
- BL3 - Buildings and artifical surfaces
- ED1 - Exposed sand, gravel or till
- ED2 - Spoil and bare ground
- ED3 - Recolonising bare ground
- FL8 - Other artificial lakes and ponds
- FL8/PF2
- FP1 - Calcareous springs
- FS1 - Reed and large sedge swamps
- FW4 - Drainage ditches
- GA2/GS2
- GS1 - Dry calcareous
- GS4 - Wet grassland
- GS4/WS1
- GS4/WS1
- HD1 - Dense bracken
- HH1 - Dry siliceous heath
- HH1/WS1
- PB1 - Raised bog
- PB4 - Cutover bog
- PB4/WS1
- PF1 - Rich fen and flush
- PF2 - Poor fen and flush
- WD2 - Mixed broadleaved/ conifer woodland
- WD3 - (Mixed) conifer woodland
- WD4 - Conifer plantation
- WN2 - Oak-ash-hazel woodland
- WN7 - Bog woodland
- WN7/PB4
- WS1 - Scrub
- WS1/GS4
- WS1/WS2
- WS2 - Immature Woodland

0 0.5 1
Kilometers

NOTES

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4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Rev	Date	Description	By	Chkd.
A	27/02/2025	First issue	S.P	C.N

Client: Bord na Móna

Project: Derryadd, Derryaroge and Lough Bannow Bogs - Application for Substitute Consent

Title: Figure 5-1 Habitats Page 1 of 3

Scale @ A3: 1:16,000

Prepared by:	Checked by:	Date:
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Map Ref: 11400-014-HAB-S.BO-TOB-A

Draft: A

7°56'0"W

7°54'0"W

53°40'0"N

53°39'0"N

53°38'0"N

768000

766000

605000

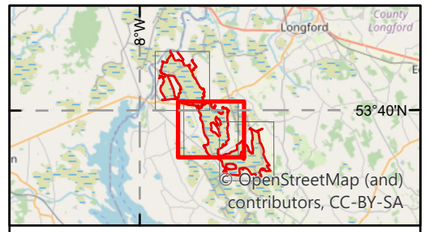
607500

N

N63

R392

R398



Legend

- Application Site
- Habitats
- FW2 - Depositing/ lowaland rivers
- FW4 - Drainage ditches
- WL1 - Hedgerows
- WL2 - Treelines
- WS1 - Scrub
- BL2 - Earth banks
- BL2/WS1
- BL3 - Buildings and artifical surfaces
- ED2 - Spoil and bare ground
- ED3 - Recolonising bare ground
- FL8 - Other artificial lakes and ponds
- FS1 - Reed and large sedge swamps
- FW4 - Drainage ditches
- GA2/GS2
- GS3 - Dry-humid acid grassland
- GS4 - Wet grassland
- GS4/WN7
- HH1 - Dry siliceous heath
- PB1 - Raised bog
- PB4 - Cutover bog
- PB4/GS4
- PF2 - Poor fen and flush
- WD1 - (Mixed) broadleaved woodland
- WD2 - Mixed broadleaved/ conifer woodland
- WD3 - (Mixed) conifer woodland
- WD4 - Conifer plantation
- WN5 - Riparian woodland
- WN6 - Wet willow-alder-ash woodland
- WN7 - Bog woodland
- WN7/PB4
- WS1 - Scrub
- WS2 - Immature Woodland

0 0.5 1
Kilometers

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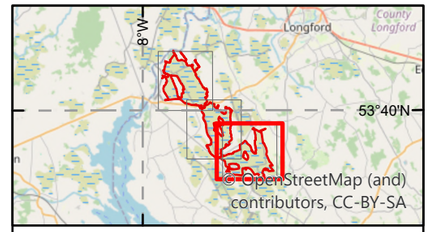
Draft: A

7°54'0"W
7°52'0"W
7°50'0"W
53°39'0"N
53°38'0"N
53°37'0"N
766000
764000
607500
610000
N
R398
R392
L1138
L5239



Legend

- Application Site
- Habitats
- FW2 - Depositing/ lowaland rivers
- FW4 - Drainage ditches
- WL2 - Treelines
- BL2 - Earth banks
- BL3 - Buildings and artifical surfaces
- FL8 - Other artificial lakes and ponds
- FL8/PF2
- FS1 - Reed and large sedge swamps
- FW4 - Drainage ditches
- GS2 - Dry meadows and grassy verges
- GS3 - Dry-humid acid grassland
- GS4 - Wet grassland
- PB1 - Raised bog
- PB4 - Cutover bog
- PB4/GS4
- PB4/WS1
- PF2 - Poor fen and flush
- PF3 - Transition mire and quaking bog
- WD1 - (Mixed) broadleaved woodland
- WD4 - Conifer plantation
- WD4/WN7
- WN5 - Riparian woodland
- WN6 - Wet willow-alder-ash woodland
- WN7 - Bog woodland
- WS1 - Scrub

0 0.5 1
Kilometers

NOTES

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Client: Bord na Móna

Project: Derryadd, Derryaroge and Lough Bannow Bogs - Application for Substitute Consent

Title: Figure 5-3 Habitats Page 3 of 3

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Draft: A

Table 5.11: Summary of Habitats (Fossitt, 2000) within the Proposed Wind Farm Site

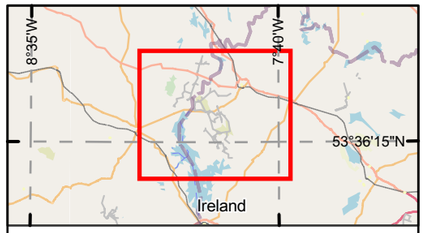
Code	Habitat Name	Area (ha) or Length (m /km)
PB4	Cutover bog	1,128.16ha
WN7	Bog woodland	423.73ha
FL8	Other artificial lakes and ponds	78.33ha
PB1	Raised bog	52.39ha
WD4	Conifer plantation	44.39ha
WS1	Scrub	34.99ha
FS1	Reed and large sedge swamps	33.75ha
WS2	Immature woodland	20.26ha
BL3	Buildings and artificial surfaces	20.10ha
ED2	Spoil and bare ground	12.28ha
GS4	Wet grassland	8.70ha
PF3	Transition mire and quaking bog	7.87ha
PF2	Poor fen and flush	4.90ha
HD1	Dense bracken	3.54ha
GS3	Dry humid acid grassland	3.18ha
ED1	Exposed sand, gravel or till	2.51ha
WD1	(Mixed) broadleaved woodland	2.01ha
ED3	Recolonising bare ground	2.01ha
GS2	Dry meadows and grassy verges	1.65ha
HH1	Dry siliceous heath	1.30ha
WN6	Wet willow-alder-ash woodland	1.15ha
WD3	(Mixed) conifer woodland	0.99ha
BL2	Earth banks	0.60ha
WD2	Mixed broadleaved/conifer woodland	0.60ha
WN2	Oak-Ash-Hazel woodland	0.58
GA2	Amenity grassland (improved)	0.30ha

Code	Habitat Name	Area (ha) or Length (m /km)
FP1	Calcareous springs	0.16ha
GS1	Dry calcareous and neutral grassland	0.13ha
WS3	Ornamental/non-native shrub	0.07ha
FW2	Depositing/ lowland rivers	931m
FW4	Drainage ditches	1,233.83km
WL1	Hedgerows	521m
WL2	Treelines	1,596m

5.3.1.2 Invasive Alien Species

Multiple shrubs of Rhododendron, an IAPS listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011, as amended), were recorded within a Hedgerow (WL2) adjacent to the N63. It is most likely that the shrubs were planted intentionally in the past as they are growing in a linear alignment. No suckers (i.e. smaller plant emerging from the roots of the parent plant) were present, which suggests that there is no current likelihood of this species spreading aggressively throughout the surrounding area.

8°5'30"W
7°53'15"W
7°41'0"W
53°46'30"N
53°39'45"N
53°33'0"N
780000
770000
760000
592000
604800
617600



Legend

- Application Site
- 2km buffer from the application site
- 10km buffer from the application site
- Surveyed wetlands

0 2.5 5
Kilometres

NOTES

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Title: Figure 5-4 Study Areas for Winter Bird Surveys

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Map Ref: 11400-046-WB..SUR-S.BO-TOB-A

Draft: A

5.3.2 Bird Surveys

Field surveys conducted from the breeding season 2021 through to the breeding 2024 for the proposed Derryadd Wind Farm illustrate the significant ecological importance of the Application Site for bird activity. During I-WeBS and breeding wader surveys the following species listed in Annex I of the Birds Directive were recorded:

- Common Tern
- Golden Plover
- Hen Harrier
- Merlin
- Ringed Plover
- Whooper Swan

5.3.2.1 Winter Bird Activity (Winter of 2021/2022)

The breeding bird surveys conducted across during the winter of 2021/2022 identified a total of 83 bird species. Among these, there was a notable presence of wader species, which are typically associated with wetlands environments. The Study Area for Winter Bird surveys is shown in Figure 5.4. Of the 83 bird species recorded, including 7 species protected under Annex I of the EU Birds Directive were identified:

- **Golden Plover** – Seen on 37 occasions, often in flocks up to 500 individuals.
- **Lapwing (Red-listed)** – Recorded 49 times, with groups averaging 52 individuals **Whooper Swan** – Frequently observed in flight and foraging.
- **Hen Harrier** – Observed hunting on 11 occasions.
- Other notable Annex I species included **Peregrine. Merlin** and, **Shoveler**.

5.3.2.2 Breeding Bird Activity

The breeding bird surveys conducted at the site recorded a total of 58 bird species, highlighting a diverse avian community. Among these, there was a particularly strong presence of waders, along with other key species indicative of the habitat's ecological value.

Notably, two Annex I species under the EU Birds Directive were recorded:

- **Peregrine Falcon** was observed in the wider landscape, indicating the presence of suitable foraging or nesting habitat in the surrounding area.
- **Common Tern** was identified during the surveys, this species depends on specific nesting sites, often near water.

The presence of these species underlines the ecological significance of the surveyed area, particularly for birds of conservation concern.

5.3.3 Non-Volant Mammals

5.3.3.1 Otter

Otter is a species for which the Lough Ree SAC is designated Lough Ree SAC. In addition to protection under the Habitats Directive, Otter and its breeding/resting sites (holts, couches) are protected under the Wildlife Act 1976 (as amended), and listed on the Annex II and Annex IV of

the Habitats Directive (Council Directive 92/43/EEC). The multidisciplinary walkover surveys confirmed the presence of Otter, where several tracks identified across. Although no Otter holts or couches have been recorded, Otter tracks were observed near the northern boundary of Lough Bannow Bog.

5.3.4 Aquatic Survey

5.3.4.1 River Habitat Survey

The analysis of the full dataset of the results of the River Habitat Survey carried out in June 2022 show the sites surveyed reflect the local historical land-use, where peat extraction activities were carried out for decades. Thus, the majority of these watercourses show signs of having been regulated (i.e. the river channel shows signs of being man-made, or having been straightened/excavated in the past), noticeable by the presence of high banks (an average bank height across all the sampling sites of almost 3m), and a limited extent between the water edge and respective bank, reflective of the existing limited riparian gallery lateral extent (average of 1m as the difference between the average bank width and average wetted width, across all sampling sites. Moreover, the riparian vegetation on each site, beyond limited in its lateral extent, also reflects the local land use pressures on the wider landscape (e.g. pasture, peat extraction), where ruderal species occupy most of the lower vegetation *stratum* at the sampling sites (e.g. Bramble, *Rubus fruticosus* agg; Nettle, *Urtica dioica*), while more than half of those sampled reaches had little to no canopy cover.

5.3.5 National Biodiversity Data Centre Records

Table 5.12 and Table 5.13 below present the results of a search for records (historical and current) from the Biodiversity Ireland website[40] of Bird Directive and Habitats Directive species from the area surrounding the Application Site, with a focus on 10x10km hectads N06, N07 and N16 within which the Application Site is located.

In addition, Table 5.14 outline records of invasive species listed under the EU Invasive Alien Species Regulation or listed on the Third Schedule of the Wildlife (Amendment) Act are highlighted, as they may pose ecological threats.

[40] Available at: https://maps.biodiversityireland.ie/Map. Accessed February 2025.

Table 5.12: NBDC Records - Birds Directive Species within N06, N07 and N16 Grid Squares

Species name	(Hectad – No. Record – Last Record Date)	Annex I Birds Directive species (Y/N)	Number of SPAs designated for species	Designated feature of 'relevant' SPA
Birds				
Northern Pintail (*Anas acuta*)	(N06 1 31/12/01)	Y	11	-
Barnacle Goose (*Branta leucopsis*)	(N06 1 31/12/01)	N	22	
Gadwall (*Anas strepera*)	(N06 1 31/12/11)	N	4	
Tufted Duck (*Aythya fuligula*)	(N06 10 31/12/11) (N07 2 29/02/84)	Y	11	Lough Ree SPA
Common Coot (*Fulica atra*)	(N06 16 26/02/23) (N07 6 31/12/11)	N	12	
Ringed Plover (*Charadrius hiaticula*)		N	15	
Bewick's Swan (*Cygnus columbianus subsp. bewickii*)	(N06 2 31/12/01)	N	3	-
Dunlin (*Calidris alpina*)	(N06 2 31/12/01)	Y	23	-
Black-tailed Godwit (*Limosa limosa*)	(N06 2 31/12/01)	Y	25	-
Common Redshank (*Tringa totanus*)	(N06 23 23/03/22) (N07 15 31/12/11) (N16 1 31/07/72)	N	21	
Common Goldeneye (*Bucephala clangula*)	(N06 3 31/12/11)	N	4	Lough Ree SPA
Black-headed Gull (*Larus ridibundus*)	(N06 3 31/12/11) (N07 2 20/04/19) (N16 1 29/02/84)	N	21	-
Herring Gull (*Larus argentatus*)	(N06 4 31/12/11) (N07 3 31/12/11)	N	20	-

Species name	(Hectad – No. Record – Last Record Date)	Annex I Birds Directive species (Y/N)	Number of SPAs designated for species	Designated feature of 'relevant' SPA
Common Pochard (*Aythya ferina*)	(N06 6 31/12/01)	Y	6	-
Northern Shoveler (*Anas clypeata*)	(N06 7 31/12/11) (N07 2 15/02/23)	N	15	Lough Ree SPA
Eurasian Wigeon (*Anas penelope*)	(N06 7 31/12/11) (N07 4 09/01/23)	N	25	Lough Ree SPA
Greater White-fronted Goose (*Anser albifrons*)	(N07 1 29/02/84)	Y	29	Ballykenny-Fishertown Bog SPA
Great Black-backed Gull (*Larus marinus*)	(N07 1 29/02/84)	N	1	-
Great Cormorant (*Phalacrocorax carbo*)	(N07 1 29/02/84) (N06 7 06/08/22)	N	24	-
Lesser Black-backed Gull (*Larus fuscus*)	(N07 27 16/04/23) (N06 10 10/07/21)	N	16	-
Great Crested Grebe (*Podiceps cristatus*)	(N07 3 31/12/11) (N06 8 28/05/22)	N	9	-
Little Grebe (*Tachybaptus ruficollis*)	(N07 6 31/07/91) (N16 1 31/07/72) (N06 9 31/12/11)	N	6	Lough Ree SPA
				-
Hen Harrier (*Circus cyaneus*)	(N16 1 31/07/72) (N06 2 15/12/17) (N07 2 31/12/11)	Y	8	-
Corn Crake (*Crex crex*)	(N16 1 31/07/72) (N06 2 31/07/91) (N07 2 31/07/91)	Y	10	-
European Golden Plover (*Pluvialis apricaria*)	(N16 1 31/12/11) (N06 5 31/12/11) (N07 1 29/02/84)	Y	36	Lough Ree SPA

Species name	(Hectad – No. Record – Last Record Date)	Annex I Birds Directive species (Y/N)	Number of SPAs designated for species	Designated feature of 'relevant' SPA
Eurasian Teal (*Anas crecca*)	(N16 2 22/08/16) (N06 8 22/08/16) (N07 3 31/12/11)	N	21	Lough Ree SPA
Eurasian Curlew (*Numenius arquata*)	(N16 2 29/02/84) (N06 11 14/08/20) (N07 7 31/07/91)	Y	19	-
Northern Lapwing (*Vanellus vanellus*)	(N16 2 29/02/84) (N06 16 04/12/22) (N07 14 26/04/23)	N	10	Lough Ree SPA
Whooper Swan (*Cygnus cygnus*)	(N16 3 30/11/18) (N06 78 19/03/23) (N07 42 17/04/23)	Y	22	Lough Ree SPA
Merlin (*Falco columbarius*)	(N16 3 31/07/91) (N06 1 19/04/23)	Y	7	-
Mallard (*Anas platyrhynchos*)	(N16 4 31/12/11) (N06 19 14/03/23) (N07 12 13/04/23)	N	9	Lough Ree SPA
Common Kingfisher (*Alcedo atthis*)	(N16 5 29/08/22)	N	2	-

Table 5.13: NBDC Records - Habitats Directive Species within N06, N07 and N16 Grid Squares

Species name	(Hectad – No. Record – Last Record Date)	Annex II Habitats Directive species (Y/N	Number of SACs designated for species	Designated feature of 'relevant' SAC
Mammal				
European Otter (*Lutra lutra*)	(N06 2 17/06/10) (N07 3 14/08/11) (N16 1 02/09/10)	Y	45	Lough Ree SAC
Mammal				
Freshwater White-clawed Crayfish (*Austropotamobius pallipes*)	(N07 3 15/06/11)	Y	15	-
Lepidoptera				

Species name	(Hectad – No. Record – Last Record Date)	Annex II Habitats Directive species (Y/N	Number of SACs designated for species	Designated feature of 'relevant' SAC
Marsh Fritillary (*Euphydryas aurinia*)	(N16 1 13/06/05) (N06 2 14/03/23)	Y	12	-
Mollusc				
Desmoulin's Whorl Snail (*Vertigo* (Vertigo) *moulinsiana*)	(N06 2 09/09/14) (N07 5 03/08/17)	Y	8	-
Geyer's Whorl Snail (*Vertigo* (Vertigo) *geyeri*)	(N07 2 04/05/06)	Y	13	-

Table 5.14: NBDC Records - Invasive Species within N06, N07 and N16 Grid Squares

Species name	(Hectad – No. Record – Last Record Date)	Designation
Japanese Knotweed (*Fallopia japonica*)	(N06 1 31/12/99) (N07 5 17/07/17)	High Impact Invasive Species | Wildlife Act Schedule 3
Rhododendron ponticum	(N06 2 06/05/17) (N07 5 03/11/21)	High Impact Invasive Species | Wildlife Act Schedule 3
Wall Cotoneaster (*Cotoneaster horizontalis*)	(N06 2 14/03/23)	Medium Impact Invasive Species | Wildlife Act Schedule 3
Canadian Waterweed (*Elodea canadensis*)	(N07 3 15/06/11) (N16 3 13/06/05)	High Impact Invasive Species
Traveller's-joy (*Clematis vitalba*)	(N16 1 13/06/05)	Medium Impact Invasive Species | Wildlife Act Schedule 3
Zebra Mussel (*Dreissena* (Dreissena) *polymorpha*)	(N06 2 29/06/22) (N07 14 29/06/22)	High Impact Invasive Species | Regulation S.I. 477
Jenkins' Spire Snail (*Potamopyrgus antipodarum*)	(N06 3 01/06/13) (N07 1 03/08/72) (N16 4 22/08/17)	Medium Impact Invasive Species | Regulation S.I. 477
Common Garden Snail (*Cornu aspersum*)	(N06 3 29/06/22) (N07 19 29/08/23) (N16 1 13/04/68)	Medium Impact Invasive Species | Regulation S.I. 477
Corbicula fluminea	(N07 2 07/06/20) (N16 1 26/08/16)	High Impact Invasive Species | Wildlife Act Schedule 3 | Regulation S.I. 477

6. ASSESSMENT OF POTENTIAL EFFECTS IN-SITU AND EX-SITU EFFECTS TO EUROPEAN SITES

This section provides an assessment of the potential effects of the Project at the Application Site on relevant European Sites identified in Section 3 above. The relevant European sites are Lough Ree SPA (Site code: 004064), Lough Ree SAC (Site code: 000440) and Ballykenny-Fishertown Bog SPA (Site code: 004101).

The assessment determines whether the peat extraction activities and ancillary activities at the Application Site, as well as the implementation of rehabilitation plans, have impacted or will impact the integrity of the European Sites, considering their conservation objectives. Specifically, the potential effects of the Project on the European sites are considered under the following three phases:

- **Peat Extraction Phase (June 1994 – July 2019) -** includes all works undertaken from 1994 to the cessation of peat extraction in July 2019. As outlined above, June 1994 is the earliest date by which AA would have been required. It also includes the site management measures that were established with the issuance of EPA Licence P0504-01 for the application sites in 2000.
- **Current Phase (July 2019 – Present Day)** - includes all ongoing and future decommissioning activities at the Application Site since the cessation of peat extraction in July 2019 to the present day.
- **Remedial Phase (Future)** – future implementation of the proposed rehabilitation plans for the Application Site, as required under Condition 10 of its EPA Licence P0504-01.

The activities at the Application Site have changed over time, and with these changes, the potential in-situ and ex-situ impacts on QIs, and SCIs of European Sites have also changed.

The rAASR (presented in Appendix 1 and discussed in Section 3) concluded that activities undertaken during the Current Phase (July 2019 to Present Day) and the Remedial Phase (Future) have not and will not result in significant negative in-situ or ex-situ effects on QI and SCI species and habitats of the Lough Ree SPA, the Lough Ree SAC, and the Ballykenny-Fishertown Bog SPA. In contrast, activities during the Peat Extraction Phase (June 1994 – July 2019) have resulted in likely significant negative in-situ and ex-situ effects on QI and SCI species and habitats of these European sites. The QI and SCI for which likely significant effects are deemed to exist are highlighted in **bold** in Table 6.1 and Table 6.2 below. The assessment of in-situ and ex-situ effects on the QI and SCI is presented in Section 6.1 and Section 6.2.

*Table 6.1: Summary of In-situ Effects. QIs and SCIs affected in **bold.***

European site	QI / SCI [Code] * indicates priority habitat	Peat Extraction Phase	Current Phase	Remedial Phase
Lough Ree SAC [Site code: 00440] (NPWS, 2016)	**Natural Eutrophic Lakes [3150]** **Orchid-rich Calcareous Grassland [6210]*** **Active Raised Bog [7110]*** **Degraded Raised Bog [7120]** **Alkaline Fens [7230]** **Limestone Pavement [8240]*** **Bog Woodland [91D0]*** **Alluvial Forests [91E0]*** **Otter [1355]**	Potential likely significant in-situ effects to QI habitats and species due to water quality degradation from peat extraction and drainage. Water flowing from the extraction site could result in pollutants entering hydrologically connected watercourses, affecting the aquatic habitats and species dependent on them.	No likely significant in-situ effects expected.	No likely significant in-situ effects expected.
Lough Ree SPA [Site code: 004064] (NPWS, 2022)	**Little Grebe [A004]** **Whooper Swan [A038]** **Wigeon [A050]** **Teal [A052]** **Mallard [A053]** **Shoveler [A056]** **Tufted Duck [A061]** **Common Scoter [A065]** **Goldeneye [A067]** **Coot [A125]** **Golden Plover [A140]** **Lapwing [A142]** **Common Tern [A193]** **Wetland and Waterbirds [A999]**	Potential likely significant in-situ effects due to water quality degradation from peat extraction and drainage activities.	No likely significant in-situ effects expected.	No likely significant in-situ effects expected.
Ballykenny-Fisherstown Bog SPA [Site code: 004101] (NPWS, 2022)	Greenland White-fronted Goose [A395]	No significant likely in-situ effects expected.	No likely significant in-situ effects expected.	No likely significant in-situ effects expected.

*Table 6.2: Summary of Ex-situ Effect. QIs and SCIs affected in **bold.***

Site	QI / SCI * indicates priority habitat	Peat Extraction Phase	Current Phase	Remedial Phase
Lough Ree SAC [Site code: 00440] (NPWS, 2016)	Natural Eutrophic Lakes [3150] Orchid-rich Calcareous Grassland [6210]* Active Raised Bog [7110]* Degraded Raised Bog [7120] Alkaline Fens [7230] Limestone Pavement [8240]* Bog Woodland [91D0]* Alluvial Forests [91E0]* **Otter [1355]**	Potential likely significant ex-situ effects to Otter from disturbances due to extraction and habitat loss.	No likely significant ex-situ effects expected.	No likely significant ex-situ effects expected.
Lough Ree SPA [Site code: 004064] (NPWS, 2022)	**Little Grebe [A004]** **Whooper Swan [A038]** **Wigeon [A050]** **Teal [A052]** **Mallard [A053]** **Shoveler [A056]** **Tufted Duck [A061]** **Common Scoter [A065]** **Goldeneye [A067]** **Coot [A125]** **Golden Plover [A140]** **Lapwing [A142]** **Common Tern [A193]** **Wetland and Waterbirds [A999]**	Potential likely significant ex-situ effects to SCIs using the Application Site and surrounding areas may arise due to disturbances caused by ongoing activities.	No likely significant ex-situ effects expected.	No likely significant ex-situ effects expected.
Ballykenny-Fisherstown Bog SPA [Site code: 004101] (NPWS, 2022)	**Greenland White-fronted Goose [A395]**	Potential likely significant indirect ex-situ effects from land-use changes, disturbance, and habitat suitability issues for SCI species.	No likely significant ex-situ effects expected.	No likely significant ex-situ effects expected.

6.1 IN-SITU EFFECTS

The Application Site, which includes lands at Derryadd, Derryaroge, and Lough Bannow Bogs, is located entirely outside the boundaries of any European site. However, the drainage ditches and watercourses at the Application Site ultimately discharge into the River Shannon or Lough Ree, both of which are hydrologically connected to the Lough Ree SPA and Lough Ree SAC. This hydrological connectivity means that activities within the Application Site during the Peat Extraction Phase (July 1994 – July 2019) could have impacted on the QI and SCIs of the Lough Ree SAC and Lough Ree SPA.

One of the key concerns is the degradation of water quality resulting from the release of suspended sediments, nutrients, and other pollutants into hydrologically linked watercourses. Increased sedimentation can smother aquatic vegetation and benthic habitats, reducing habitat suitability for species dependent on clear water conditions. Nutrient enrichment may also lead to eutrophication, disrupting the ecological balance of key habitats, including SCI and QI habitats within the SPA and SAC, particularly Wetland and Waterbirds [A999] at the SPA and Natural Eutrophic Lakes [3150] at the Lough Ree SAC.

Hydrological modifications, such as altered drainage patterns, could impact water levels and flow regimes, leading to habitat degradation within the European sites. These changes may negatively affect Wetland and Waterbirds [A999] at the SPA, wetland-dependent species, and the overall ecological functioning of key QI habitats at the SAC, such as Alkaline Fens [7230], Active Raised Bogs [7110], Natural Eutrophic Lakes [3150], and Degraded Raised Bog [7120]. Furthermore, species-rich terrestrial habitats within the SAC, including Orchid-rich Calcareous Grassland [6210], Limestone Pavement [8240], Bog Woodland [91D0], and Alluvial Forests [91E0], may have been indirectly affected by changes in water availability or quality, potentially altering vegetation composition, hydrological conditions, and habitat stability. These habitats support a variety of specialist flora and fauna that depend on stable hydrological regimes and nutrient balances. Changes in water levels and runoff patterns from peat extraction could have negatively impacted Orchid-rich Calcareous Grassland [6210] by altering soil chemistry and nutrient availability, making conditions less suitable for the diverse orchid species and other calcareous grassland flora. Similarly, increased sedimentation or altered hydrology could have impacted Limestone Pavement [8240].

Bog Woodland [91D0] and Alluvial Forests [91E0] are highly sensitive to hydrological changes, as their survival depends on stable water tables and specific moisture conditions. Increased drainage and sedimentation may have resulted in drier soil conditions, leading to shifts in species composition and potential declines in characteristic bog woodland species such as Downy Birch (*Betula pubescens*) and Willow (*Salix* spp.). Alluvial Forests [91E0]*, which thrive in seasonally flooded conditions, may have suffered from reduced flooding regimes due to drainage alterations, affecting the recruitment and establishment of characteristic tree species such as Alder (*Alnus glutinosa*) and Ash (*Fraxinus excelsior*). These indirect effects, combined with potential changes in nutrient dynamics, could have long-term consequences for the structure and function of these habitats.

The influx of pollutants could have degraded water quality within the European sites, leading to habitat degradation for aquatic species and the ecological communities they support. The QI habitats at the Lough Ree SAC, including Natural Eutrophic Lakes [3150], along with Otter

[1355] and various SCI waterfowl species in the SPA, may have been impacted by sedimentation, nutrient enrichment, and hydrological disruptions. These changes could have altered the suitability of habitats for key species, potentially reducing their reproductive success and population stability. For example, sedimentation can smother aquatic plants essential for macrophyte stability, while eutrophication can lead to excessive phytoplankton growth, reducing water transparency and affecting ecosystem balance.

Similarly, Otter [1355], a QI species of the Lough Ree SAC, may have been affected by historical peat extraction and drainage activities, which could have impacted their foraging, breeding, and sheltering habitats. Given the hydrological connectivity between the Application Site and the SAC, the degradation of water quality and potential reductions in fish populations, an essential component of the Otter's diet, may have forced individuals to expand their foraging range, increasing energy expenditure and exposure to threats such as road traffic or competition. A decline in fish populations due to changes in water quality could also have had cascading effects on other predator-prey interactions within the ecosystem, potentially altering the distribution of other aquatic species.

In addition, the water quality attributes critical for maintaining the integrity of Natural Eutrophic Lakes [3150]—such as water transparency, phytoplankton composition, and macrophyte status—may have been compromised due to elevated nutrient levels and sedimentation from the peat extraction process. Reduced water transparency and shifts in phytoplankton communities could have negatively affected submerged macrophyte populations, leading to alterations in habitat structure and a decline in the biodiversity associated with these lakes. Increased turbidity and dissolved organic carbon (DOC) levels could further impact aquatic organisms by reducing light penetration and altering the oxygen balance of the water body, potentially leading to localised hypoxic conditions that affect fish and invertebrate communities.

As outlined above, the Lough Ree SPA and Lough Ree SAC were designated in 1995 and 2002, respectively. The fact that the site was designated as European sites while extraction activities were ongoing suggests that, at the time of designation, the SCIs (wetland habitats and species) at the Lough Ree SPA and the QIs (habitats and species) at the Lough Ree SAC were considered to be of sufficient conservation value to warrant designation.

6.1.1 Impact Assessment

Without effective control and mitigation measures, the peat extraction activities and ancillary activities at the Application Site have the potential may have caused potentially significant in-situ effects at Lough Ree SAC and Lough Ree SPA.

Specifically, activities before the cessation of peat extraction could potentially deteriorate water quality within the SAC and SPA due to the release of pollutants such as suspended sediments, nutrients, and contaminants from the peat extraction process. This pollution can harm aquatic habitats by smothering vegetation, degrading water clarity, and altering the water quality, negatively affecting the species that depend on these ecosystems for survival. Such changes could compromise the ecological health of the Lough Ree SAC and Lough Ree SPA threatening conservation objectives.

Without adequate mitigation measures to address these risks, there is potential for effect on the long-term integrity and ecological functionality of these European sites.

6.2 EX-SITU EFFECTS

6.2.1 QI Species Otter [1335]

During the multidisciplinary walkover surveys, the presence of Otters was confirmed through the identification of several Otter tracks. While no Otter holts or couches were recorded, Otter tracks were observed in the vicinity of the northern boundary of Lough Bannow Bog. During the Peat Extraction Phase, the operational noise and increased human activity had the potential to disturb Otters, which are QI species within the Lough Ree SAC. The disturbance caused by machinery, personnel, and the general activities associated with peat extraction could have interfered with Otter foraging, breeding, and movement patterns. This disruption may have led to the temporary displacement of Otters from their preferred habitats, affecting their access to vital resources. Furthermore, changes to drainage patterns and water flow regimes during the extraction process may have had a significant impact on the riparian and wetland habitats that Otters rely on. These alterations could have reduced the availability of suitable resting, breeding, and foraging sites, which are critical for Otter.

The degradation of these habitats at the Application Site used by the species would have further reduced the cover and reducing opportunities that Otters need for shelter and protection. The degradation of these habitats, including potential loss of vegetation along watercourses, would reduce the availability of shelter and protection..

6.2.2 SCI Species [various]

A total of five SCI species of the Lough Ree SPA were recorded during the bird surveys (see Section 5.3.1.2) conducted during the winter 2021/2022, breeding season, and migratory period highlighting the significance of the Application Site area as a habitat for several notable bird species. Among the species observed were the Whooper Swan, Golden Plover, Lapwing, Shoveler, and Teal. Their presence suggests that the area may be frequented by protected SCI species from the European site, underlining its potential value as to habitat network for these birds. While no direct records of other SCI species of the Lough Ree SPA were noted during these surveys, the observation of the aforementioned species suggests that the site is suitable for hosting protected species. Although Greenland White-fronted Geese, an SCI of the Ballykenny-Fisherstown Bog SPA, were not recorded at the Application Site, the site lies within their foraging range (4–8 km). The proximity of the European site to the Application Site introduces the potential for the species to use the area, particularly during migratory or wintering periods when they rely on suitable foraging grounds.

Operational noise and increased human activity during the Peat Extraction Phase potentially disturbed bird species from Lough Ree SPA and Ballykenny-Fisherstown Bog SPA that may have been using the Application Site. This disturbance could have impacted on their foraging, breeding, and movement patterns, potentially displacing species from suitable habitats.

6.2.3 Impact Assessment

Given the potential presence of QI species within the Lough Ree SAC and SCI bird species from the Lough Ree SPA, the peat extraction Phase activities and associated works at the Application Site may have already caused potential impacts to the Lough Ree SAC and the Lough Ree SPA.

Specifically, past activities could have led to a loss of habitat and deterioration in water quality at areas used by the species, including key foraging, breeding, and resting sites. The release of pollutants such as suspended sediments, nutrients, and contaminants from the peat extraction process can smother aquatic vegetation, reduce oxygen levels, and disrupt the delicate balance of these ecosystems.

Additionally, noise and disturbance from the machinery and human activities may cause disruption to mobile species such as otters and birds from the European sites occurring within the Application Site and nearby surrounding areas, potentially displacing them from the area. As a result, the species that use these habitats and may experience reduced access to suitable habitats, leading to displacement negatively impacting the species.

The effects of these disturbances could significantly impact the conservation status of the Lough Ree SAC and SPA.. Without the implementation of effective mitigation measures, these risks remained, particularly with respect to water quality, that could potentially affect the long-term integrity and ecological functionality of the European sites.

7. CONTROL MEASURES

This section summarises the operational actions and management strategies undertaken by Bord na Móna to reduce the risk of environmental impact during the Peat Extraction Phase (Section 7.1). These actions and strategies have been set in place for the Current Phase and will continue as standard practice throughout the Remedial Phase (Future).

This section also introduces the IPC Licence that was issued in 2000. The IPC License covers all emissions from the Project and its environmental management (see Section 7.2). The IPC Licence has been in effect during the Peat Extraction Phase since 2000.

It should be noted that the control measures described here are not taken into account when in the initial assessment of effects of the Project in Section 6; they are only considered when evaluating the Adverse Effects (Section 8).

7.1 PRE-IPC LICENCE

Prior to the imposition of IPC Licence conditions in 2000, Bord na Móna set in place standard operating procedure and best practice during operations that managed the environmental risks associated with peat extraction, specifically in relation to suspended solids and potential contamination. The company implemented a series of operational actions and strategies to minimise the environmental impact of their activities, ensuring that water quality in the surrounding areas remained protected.

One of the key measures involved the regular maintenance and cleaning of internal drainage systems across the site. Bord na Móna employed draglines and excavators to clear the drains, ensuring they remained efficient in channelling water and preventing sediment buildup. This regular upkeep played a crucial role in maintaining the integrity of the drainage network and preventing blockages that could lead to water quality issues.

Additionally, silt ponds were strategically placed across the Application Site to capture sediment from water discharge. These ponds were upgraded in the mid-1980s to enhance their capacity and effectiveness, ensuring that the sediment capture process was as efficient as possible. To prevent any overflow or sediment buildup within the silt ponds, Bord na Móna conducted desludging operations twice annually, ensuring that sediment levels were kept under control.

In terms of machinery management, Bord na Móna established robust maintenance procedures to minimise the risk of equipment-related contamination and ensure efficient operation. Machinery was stored, cleaned, inspected, and serviced at the Mountdillon Works to ensure it operated in optimal condition. This not only helped prevent any malfunctions that could lead to contamination but also reduced the risk of pollutants being introduced into the environment.

Refuelling operations were primarily carried out at the Mountdillon Works site, which was equipped with procedures to mitigate the risk of accidental spills. In the event of a spill, Bord na Móna had emergency response procedures in place, which included isolating the spill to prevent it from entering drains or watercourses. Absorbent materials were also used to soak up any spilled hydrocarbons, further reducing the potential for environmental damage.

Furthermore, Bord na Móna implemented rigorous waste management practices to ensure that all waste materials, including hydrocarbons and other potentially hazardous substances, were

safely stored and disposed of. The company worked with licensed contractors to ensure that waste was handled and disposed of in accordance with environmental regulations, further minimising the risk of contamination.

Taken together, these measures helped to reduce the risk of environmental contamination from peat extraction activities. While there were still inherent risks associated with such operations, Bord na Móna's diligent efforts to manage water quality and mitigate potential contaminants played an essential role in protecting the surrounding ecosystem.

7.2 IPC Licence – Mountdillon Bog Group - P0504-01

The EPA issued an Integrated Pollution Control (IPC) Licence (P0504-01) in 2000, amended in 2012, to regulate peat extraction activities within the Mountdillon Bog Group, which includes Derryaroge, Derryadd, and Lough Bannow bogs. The IPC licence is included in Appendix 6 The IPC licence primarily focuses on controlling and monitoring emissions to water. Given the nature of the activity, peat extraction has significant potential to increase suspended solids in surface water due to soil disturbance, drainage, and sediment runoff. The extraction process exposes bare peat surfaces, which are highly susceptible to erosion and washout, especially during heavy rainfall. This can lead to:

- **Increased turbidity**, reducing water quality and affecting aquatic life.
- **Deposition of fine sediments**, which can smother fish spawning areas and invertebrate habitats.
- **Potential transport of nutrients/contaminants**, contributing to downstream pollution.

Given these potential environmental impacts, the IPC licence sets an emission limit value of 35mg/l for suspended solids at all surface water outfalls to regulate and mitigate potential adverse effects.

The IPC licence requires the submission of an Annual Environmental Report (AER) detailing emissions to water, waste management, resource consumption, air emissions, surface water monitoring, de-silting programmes, and bog rehabilitation progress. The licence also requires regular visual inspections and maintenance of silt ponds, upgrades to sedimentation pond treatment systems, and installation of oil interceptors for surface water discharges from workshop areas.

8. ASSESSMENT OF ADVERSE EFFECTS

The following sections present a detailed assessment of the adverse effects specific to the Application Site in relation to the SCIs of the Lough Ree SPA and the Ballykenny-Fishertown Bog SPA and the QIs of the Lough Ree SAC. This assessment takes into consideration the control measures outlined in Section 7.

Site-specific conservation objectives were set for Lough Ree SAC in 2016[41]. The potential for adverse effects on QIs is assessed in view of the Conservation Objectives set for the habitats and species is assessed in Section 8.1.

Conservation Objectives have not been formally defined for the Lough Ree SPA or Ballykenny-Fishertown SPA. Instead, First Order Site-Specific Conservation Objectives have been defined for the Lough Ree SPA[42] in 2022 and for the Ballykenny-Fishertown Bog SPA[43] in 2022.

First Order Site-Specific Conservation Objectives provide generic conservation objectives (GCOs) that focus on maintaining or restoring the favourable conservation status of the QIs and SCIs for which European sites are designated. These objectives provide a broad framework for habitat and species protection, ensuring that key ecological functions and biodiversity values are preserved in alignment with the requirements of the Habitats and Birds Directive.

The potential for adverse effects on the SCIs of the Lough Ree SPA and for the Ballykenny-Fishertown Bog SPA sites are assessed in view of the GCO (see Section 8.2 and Section 8.3).

This assessment of adverse effect on of SCIs of the Lough Ree SPA and the Ballykenny-Fishertown Bog SPA and the QIs of the Lough Ree SAC considers the operational actions and management strategies undertaken by Bord na Móna to reduce the risk of environmental impact during operations (summarised in Section 7.1) and the measures set in place for the IPC Licence (see Section 7.2) which were put in place to mitigate and prevent adverse effects on water quality both within the Application Site and in the surrounding downstream areas. These protective measures are crucial in ensuring that the ongoing and past activities do not negatively impact the ecological integrity of the European sites.

The Lough Ree SPA, the Ballykenny-Fishertown Bog SPA, and the Lough Ree SAC were designated in 1995, 1996 and 2002, respectively. It is critical to note that the peat extraction activities, along with all ancillary works, at the Application Site were conducted according to operational actions and management strategies defined by Bord na Móna (summarised in Section 7.1) and also under the measures set in place to meet the IPC license requirements (Section 7.2) before the designation of the European sites.

[41] Lough Ree SAC Conservation Objectives - https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000440.pdf
[42] Lough Ree SPA First Order Site-specific Conservation Objectives https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004064.pdf
[43] Ballykenny-Fishertown Bog SPA First Order Site-specific Conservation Objectives https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004101.pdf

8.1 LOUGH REE SAC

8.1.1 Background to QI Interests and Site Specific Conservation Objectives

The Lough Ree SAC is located approximately 0.9km from the Application Site.

Lough Ree SAC is a designated SAC due to its ecologically significant habitats, which support a diverse assemblage of species. The site comprises a complex of wetlands, floodplains, reedbeds, and aquatic vegetation, all of which play a crucial role in maintaining biodiversity, hydrological balance, and water quality. The QI habitats and species for which the SAC is designated are listed in Table 8.1 below, alongside SSCOs set for the QIs.

As the Application Site does not overlap with the SAC there is no direct habitat loss due to past activities. In contrast, there is potential risk from indirect effects, water quality deterioration, and disturbance to bird species.

8.1.2 Assessment of Adverse Effect

8.1.2.1 Potential In-situ Effects of Peat Extraction on Lough Ree SAC

Table 8.1 below presents an assessment of adverse in-situ effects to QI of the SAC in light of the conservation objectives set for habitats.

Table 8.1: Qualifying Interest Habitats, Site Specific Conservation Objectives and Assessment of Potential Adverse Effects

Attribute	Target	Assessment
Natural Eutrophic Lakes [3150]		
Habitat area	Area stable or increasing, subject to natural processes.	All historic peat extraction activities and associated ancillary works are confined to the Application Site with no activities conducted within the boundaries of the SAC. As a result, the Project has not had any impact on the area or distribution of Natural Eutrophic Lakes [3150] at the SAC.
Habitat distribution	No decline, subject to natural processes.	
Typical species	Typical species present, in good condition, and demonstrating typical abundances and distribution.	The primary risk posed by peat extraction activities from 1994 through to the site's designation in 2002, and up until 2000, when the IPC Licence was implemented, included: • Surface Water Pathways: The presence of drainage systems could have facilitated the movement of suspended solids, nutrients, or other contaminants over a distance of 5.3km through connected watercourses.
Vegetation composition: characteristic zonation	All characteristic zones should be present, correctly distributed and in good condition.	

Attribute	Target	Assessment
Vegetation distribution: maximum depth	Maintain, or where necessary restore, as close as possible to natural or semi-natural, drainage conditions.	• Groundwater Connectivity: Peat extraction and drainage had the potential to alter groundwater flow patterns and introduce contaminants, which could have impacted the hydrological condition of the SAC and resulted in pollutant inputs to the system. These impact pathways had the potential to degrade water quality and disrupt the ecological balance of the QI within the SAC. Increased turbidity could have reduced water clarity, affecting aquatic life dependent on light penetration, while the deposition of fine sediments posed a risk to aquatic habitats due to smothering effects. Additionally, the transport of nutrients and contaminants through surface water and groundwater connections could have contributed to pollution, further impacting the hydrological and ecological integrity of the SAC. The IPC Licence, which was set in place in 2000, played a crucial role in mitigating these risks. The licence regulated water management practices, ensuring that drainage systems and runoff controls minimised the risk of impacts occurring, thereby safeguarding water quality. Annual Environmental Reporting, as required under the IPC Licence, indicates that activity at the Application Site did not negatively influence key water quality indicators, including turbidity, water colour, dissolved organic carbon (DOC) levels, or acidification status, indicating that the that the regulatory framework and operational controls in place have helped effectively safeguard water quality.
Hydrological regime: water level fluctuations	Maintain appropriate natural hydrological regime necessary to support the habitat	
Lake substratum quality	Maintain appropriate substratum type, extent and chemistry to support the vegetation.	
Water quality: transparency	Maintain/restore appropriate Secchi transparency. There should be no decline in Secchi depth/transparency	
Water quality: nutrients	Maintain the concentration of nutrients in the water column to sufficiently low levels to support the habitat and its typical species	
Water quality: phytoplankton biomass	Maintain appropriate water quality to support the habitat, including good chlorophyll a status	
Water quality: phytoplankton composition	Maintain appropriate water quality to support the habitat, including good phytoplankton composition status	
Water quality: attached algal biomass	Maintain trace/absent attached algal biomass (<5% cover) and good phytobenthos status	
Water quality: macrophyte status	Restore good macrophyte status	

Attribute	Target	Assessment
Acidification status	Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes	
Water colour	Maintain appropriate water colour to support the habitat	
Dissolved organic carbon (DOC)	Maintain appropriate organic carbon levels to support the habitat	
Turbidity	Maintain appropriate turbidity to support the habitat	
Fringing habitat: area	Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of the lake habitat	
Conclusion: There is no potential for adverse effects on the QI of the SAC as a result of the Peat Extraction Phase of the Project.		
Orchid-rich Calcareous Grassland [6210]*		
Habitat area	Area stable or increasing, subject to natural processes.	Peat extraction and related activities have been confined to the Application Site with no activities conducted within the boundaries of the SAC. As a result, these activities have not had any impact on the area or distribution of the Orchid-rich Calcareous Grassland [6210] within the SAC.
Habitat distribution	No decline, subject to natural processes.	
Vegetation composition: typical species	Maintain soil pH and nutrient status within natural ranges.	Orchid-rich Calcareous Grassland [6210] within the Lough Ree SAC relies on a delicate balance of hydrological conditions, with water levels and nutrient availability playing key roles in maintaining its unique vegetation. This habitat is closely connected to the adjacent Lough Ree lake system, which helps regulate water flow and nutrient dynamics through hydrological linkage. Altered drainage patterns or hydrological modifications, such as changes in water levels or flow regimes, could disrupt this connection, leading to reduced water supply or changes in water quality that may degrade the habitat.
Vegetation composition: typical species	At least seven positive indicator species present, including two "high quality" species	
Vegetation composition: negative indicator species	Negative indicator species collectively not more than 20% cover, with cover by an individual species not more than 10%	

Attribute	Target	Assessment
Vegetation composition: nonnative species	Cover of non-native species not more than 1%	The application site and the Lough Ree SAC share a hydrological link through the GWB, which is a key aspect of the shared water system. The hydrological conditions of the GWB are integral to maintaining water levels and flow regimes in the SAC, ensuring that water quality is stable and conducive to the health of this and other habitats within the SAC. Through appropriate management control by Bord na Móna and the implementation of Integrated Pollution Control (IPC) measures, the potential for risk of impacts to the GWB and the associated habitats were significantly reduced. Bord na Móna management practices, including careful monitoring of hydrological conditions and water quality within the shared GWB, help ensure that water quality is preserved and any disruptions to the natural water flow are minimised. The IPC measures regulate and mitigate potential pollutants that could affect water quality, preventing any significant shifts in vegetation or degradation of the habitat. This preserves the nutrient balance and the hydrological link to Lough Ree, ensuring stable conditions for the Orchid-rich Calcareous Grassland without inducing significant change in the characterising vegetation or compromising habitat quality. In addition, the cessation of peat extraction activities at the application site has further reduced the potential for impacts that may have been present in the past. The discontinuation of these activities minimises any risks of further disruption to the water quality or hydrological conditions within the shared GWB, ensuring that no new disturbances will affect the Orchid-rich Calcareous Grassland or other sensitive habitats in the SAC. Furthermore, there is no physical disturbance to the Orchid-rich Calcareous Grassland [6210] as the application site and associated activities are located outside the boundaries of the SAC. This ensures that the proposed project will not cause direct impacts on the physical integrity of the habitat
Vegetation composition: woody species and bracken	Cover of woody species (except certain listed species) and bracken (*Pteridium aquilinum*) not more than 5% cover	
Vegetation structure: broadleaf herb: grass ratio	Broadleaf herb component of vegetation between 40 and 90%	
Vegetation structure: sward height	At least 30% of sward between 5cm and 40cm tall	
Vegetation structure: litter	Litter cover not more than 25%	
Physical structure: bare soil	Not more than 10% bare soil	
Physical structure: disturbance	Area showing signs of serious grazing or other disturbance less than 20m^2	
Conclusion: There is no potential for adverse effects on the QI of the SAC as a result of the Peat Extraction Phase.		
*indicates priority habitat		

Attribute	Target	Assessment
Degraded Raised Bog [7120]		
Habitat area	Restore area of active raised bog to 70.1ha, subject to natural processes	Peat extraction and related activities have been confined to the Application Site with no activities conducted within the boundaries of the SAC. As a result, these activities have not had any impact on the area or distribution of Degraded Raised Bog [7120] within the SAC.
Habitat distribution	Restore the distribution and variability of active raised bog across the SAC. See map 6 of SSCO document for distribution in 2003	
High bog area	No decline in extent of high bog necessary to support the development and maintenance of active raised bog. See map 5 of SSCO document	The Degraded Raised Bog [7120] within the Lough Ree SAC is a critical habitat that depends on a stable hydrological regime for its continued ecological health. The Application Site, encompassing lands at Derryadd, Derryaroge, and Lough Bannow Bogs, is situated outside the boundaries of the SAC, yet its hydrological connection to the SAC is significant. The drainage ditches and watercourses at the Application Site discharge into the River Shannon and Lough Ree, which are both hydrologically linked to the SAC, contributing water quality within the SAC. Additionally, the Application Site and the SAC share a groundwater body (GWB), further linking the hydrological conditions of both areas. Given this connection, activities on the Application Site could potentially affect water quality of the SAC, which may in turn impact the Degraded Raised Bog [7120] and other key habitats within the SAC. Peat extraction activities may have led to the release of suspended sediments, nutrients, and pollutants into the watercourses that discharge into the River Shannon and Lough Ree. These impacts could have affected the water quality within the SAC, which is crucial for the health of the Degraded Raised Bog [7120]. Increased sedimentation from suspended particles could smother the bog surface, disrupting the regeneration of the bog ecosystem. Nutrient enrichment, on the other hand, could alter the soil chemistry, encouraging the growth of opportunistic species that compete with the characteristic vegetation of the raised bog, thereby further degrading the habitat. The operational actions and management strategies implemented by Bord na Móna, as outlined in Section 7.1 have been designed to
Hydrological regime: water levels	Restore appropriate water levels throughout the site	
Hydrological regime: flow patterns	Restore, where possible, appropriate high bog topography, flow directions and slopes. See map 7 of SSCO document for current situation	
Transitional areas between high bog and adjacent mineral soils (including cutover areas)	Restore adequate transitional areas to support/protect active raised bog and the services it provides	
Vegetation quality: central ecotope, active flush, soaks, bog woodland	Restore 35.1ha of central ecotope/active flush/soaks/bog woodland as appropriate	
Vegetation quality: microtopographical features	Restore adequate cover of high quality microtopographical features	
Vegetation quality: bog moss (Sphagnum) species	Restore adequate cover of bog moss (*Sphagnum*) species to ensure peatforming capacity	

Attribute	Target	Assessment
Typical ARB species: flora	Restore, where appropriate, typical active raised bog flora	proactively address potential environmental risks associated with peat extraction and related activities. These strategies include measures to control water quality, minimise sedimentation, manage waste, and reduce disturbances to sensitive habitats and species. Additionally, the measures required to meet IPC (Integrated Pollution Control) Licence requirements, as detailed in see Section 7.2), further ensure that the activities comply with environmental standards. Collectively, the operational actions, management strategies and control measure significantly reduced the risk of environmental impact during operations, ensuring that no significant potential effects on water quality and integrity.
Typical ARB species: fauna	Restore, where appropriate, typical active raised bog fauna	
Elements of local distinctiveness	Maintain features of local distinctiveness, subject to natural processes	
Negative physical indicators	Negative physical features absent or insignificant	
Vegetation composition: native negative indicator species	Native negative indicator species at insignificant levels	
Vegetation composition: nonnative invasive species	Non-native invasive species at insignificant levels and not more than 1% cover	
Air quality: nitrogen deposition	Air quality surrounding bog close to natural reference conditions. The total N deposition should not exceed 5kg N/ha/yr	
Water quality	Water quality on the high bog and in transitional areas close to natural reference conditions	
Conclusion: There is no potential for adverse effects on the QI of the SAC as a result of the Peat Extraction Phase.		
Alkaline Fens [7230]		
Habitat area	Area stable or increasing, subject to natural processes.	Peat extraction and related activities have been strictly confined to the Application Site, with no activities taking place within the boundaries of the SAC. As a result, these activities have not affected the area or distribution of Alkaline Fens [7230] within the SAC.
Habitat distribution	No decline, subject to natural processes.	
Hydrological regime	Appropriate natural hydrological regimes necessary to support the natural structure and functioning of the habitat	Alkaline Fens [7230] within the Lough Ree SAC represent an ecologically important habitat. Maintenance of its biodiversity and ecological integrity is dependent on a stable and natural hydrological regime. The Application Site, located outside the boundaries of the SAC but within its hydrological catchment, is linked to the SAC
Peat formation	Active peat formation, where appropriate	

Attribute	Target	Assessment
Water quality: nutrients	Appropriate water quality to support the natural structure and functioning of the habitat	through both surface and groundwater connections. Watercourses and drainage ditches at the Application Site discharge directly into the River Shannon and Lough Ree, which are part of the SAC's hydrological network. Historically, peat extraction activities at the Application Site, coupled with drainage works, had the potential to have a significant impact on the surrounding hydrology and water quality. Between 1994 and 2019, these activities may have contributed to the release of suspended sediments, nutrients, and pollutants into the watercourses that discharged into the River Shannon and Lough Ree, and in turn to the SAC from 2002. The effects of these activities potentially led to the smothering of aquatic vegetation in the SAC, while nutrient enrichment may have altered the soil chemistry, promoting the growth of opportunistic species and disrupting the delicate balance of the Alkaline Fens. The disruption of the natural hydrological regime and the degradation of water quality had the potential to severely compromise the habitat's integrity. The operational actions and management strategies implemented by Bord na Móna, as outlined in Section 7.1, are designed to proactively manage environmental risks associated with peat extraction and related activities. These included measures to control water quality, minimise sedimentation, manage waste, and reduce disturbances to sensitive habitats and species. Additionally, the measure set in place for the IPC Licence issued in 2000 (see Section 7.2), ensure compliance with environmental standards. Collectively, these actions, strategies, and control measures significantly reduced the risk any significant effects on water quality and ecological integrity.
Vegetation structure: typical species	Maintain vegetation cover of typical species including brown mosses and vascular plants	
Vegetation composition: trees and shrubs	Cover of scattered native trees and shrubs less than 10%	
Physical structure: disturbed bare ground	Cover of disturbed bare ground less than 10%. Where tufa is present, disturbed bare ground less than 1%	
Physical structure: drainage	Areas showing signs of drainage as a result of drainage ditches or heavy trampling less than 10%	
Conclusion: There is no potential for adverse effects on the QI of the SAC as a result of the Peat Extraction Phase.		
Limestone Pavements [8240]*		
Habitat area	Area stable or increasing, subject to natural processes.	Peat extraction and related activities have been strictly confined to the Application Site, with no activities taking place within the boundaries of the SAC. As a result, these activities have not affected the area or distribution of Limestone Pavements [8240] within the SAC.
Habitat distribution	No decline, subject to natural processes.	

Attribute	Target	Assessment
Vegetation composition: typical species	At least seven positive indicator species present	The Limestone Pavements [8240] within the Lough Ree SAC represent a crucial habitat requiring effective management and restoration to preserve its ecological integrity. These limestone pavements are characterised by exposed rock surfaces, often interspersed with deep crevices and fissures, which create a unique habitat for various specialised plant species, including mosses, lichens, and grasses. The structure of these pavements supports a diverse range of species, many of which are adapted to the specific microclimates and soil conditions found in the cracks and crevices of the limestone. Limestone pavement is highly permeable, allowing for significant groundwater movement through the rock. This is important for the hydrological connectivity between groundwater and surface water. The water that percolates through (and vice versa) the limestone may be important for local water balance in the Lough Ree SAC and contribute to the water quality. Like the Alkaline Fens, the Limestone Pavements within the SAC are closely connected to their surrounding hydrological environment. Although the Application Site lies outside the SAC boundary, it is hydrologically linked to it via watercourses that drain into the River Shannon and Lough Ree, both of which influence the hydrology of the SAC. Additionally, both the Application Site and the SAC share a common groundwater body, meaning that changes in water quality or hydrological conditions at the Application Site could have far-reaching implications for the Limestone Pavements within the SAC. Bord na Móna's operational actions and management strategies, detailed in Section 7.1, including water quality control, sediment management, waste handling, habitat protection, and compliance with IPC Licence requirements in Section 7.2 from 2000, are designed to address and minimise environmental risks associated with peat extraction, effectively reducing the potential for impacts and safeguarding water quality and ecological integrity.
Vegetation composition: bryophyte layer	Bryophyte cover at least 50% on wooded pavement	
Vegetation composition: negative indicator species	Collective cover of negative indicator species on exposed pavement not more than 1%	
Vegetation composition: nonnative species	Cover of non-native species not more than 1% on exposed pavement; on wooded pavement not more than 10% with no regeneration	
Vegetation composition: scrub	Scrub cover no more than 25% of exposed pavement	
Vegetation composition: bracken cover	Bracken (*Pteridium aquilinum*) cover no more than 10% on exposed pavement	
Vegetation structure: woodland canopy	Canopy cover on wooded pavement at least 30%	
Vegetation structure: dead wood	Sufficient quantity of dead wood on wooded pavement to provide habitat for saproxylic organisms	
Physical structure: disturbance	No evidence of grazing pressure on wooded pavement	
Indicators of local distinctiveness	Indicators of local distinctiveness are maintained	
Conclusion: There is no potential for adverse effects on the QI of the SAC as a result of the Peat Extraction Phase.		
*indicates priority habitat		
Bog Woodland [91D0]		

Attribute	Target	Assessment
Habitat area	Area stable or increasing, subject to natural processes.	Peat extraction and related activities have been strictly confined to the Application Site, with no activities taking place within the boundaries of the SAC. As a result, these activities have not affected the area or distribution of Bog Woodland [91D0] within the SAC.
Habitat distribution	No decline, subject to natural processes. See map 6 of SSCO document for location.	
Vegetation composition: positive indicator species	Birch (Betula pubescens), bog moss (*Sphagnum* species) and at least five other species present.	Bog Woodland [91D0] at the Lough Ree SAC, characterised by its biodiversity and role in supporting various species. This woodland type is typically associated with areas that have a stable hydrological regime, providing the necessary moisture for the growth of both ground vegetation and tree species. The trees and vegetation in Bog Woodland help to stabilise the soil and prevent erosion, which is particularly important in areas with vulnerable hydrological conditions. The presence of Bog Woodland plays an essential role in maintaining the water quality and hydrological balance within the SAC. The trees act as a buffer, filtering nutrients and pollutants from surface water before they can enter the groundwater or watercourses, helping to preserve the natural water quality essential for the overall ecological integrity of the SAC. Fens. With the implementation of Bord na Móna's operational actions and management strategies, detailed in Section 7.1, including water quality control, sediment management, waste handling, habitat protection, and compliance with IPC Licence requirements from 2000 onward (see Section 7.2), environmental risk to water associated with peat extraction are effectively minimised, reducing potential impacts and ensuring the protection of water quality and ecological integrity.
Vegetation composition: negative indicator species	Both native and non-native invasive species absent or under control. Total cover should be less than 10%	
Woodland structure: cover and height of birch	A minimum 30% cover of birch (*Betula pubescens*) with a median canopy height of 4m	
Woodland structure: dwarf shrub cove	Dwarf shrub cover not more than 50%	
Woodland structure: ling cover	Ling (*Calluna vulgaris*) cover not more than 40%	
Woodland structure: bryophyte cove	Bryophyte cover at least 50%, with bog moss (*Sphagnum* spp.) cover at least 25%	
Woodland structure: tree size classes	Each size class present	
Woodland structure: senescent and dead wood	Senescent or dead wood present	
Conclusion: There is no potential for adverse effects on the QI of the SAC as a result of the Peat Extraction Phase.		

Old sessile oak woods [91A0]
SSCO document outlines that '*the status of Old sessile oak woods with Ilex and Blechnum in the British Isles as a qualifying Annex I habitat for the Lough Ree SAC is currently under review. The outcome of this review will determine whether a site-specific conservation objective is set for this habitat*'.

Old sessile oak woods [91A0]
NPWS SSCO mapping data[44] shows an areas of *Old sessile oak woods with Ilex and Blechnum in the British Isles* on eastern and western shores of Lough Ree, within the SAC boundary. The western shore areas are located in the northern part of the SAC, while the eastern shore areas are situated approximately 12km from its northernmost boundary of the SAC.. This oak woodland type typically thrives in nutrient-poor, rocky soils, supporting a diverse range of acid-loving plants such as holly and ferns. The habitat is not primarily groundwater-dependent, as it typically occurs on acidic, nutrient-poor soils, often on slopes, rocky terrains, or well-drained land. Given that this habitat type is less reliant on groundwater, and that no EPA mapped watercourses traverse the woodland area including none leading from the SAC it is concluded that there is no likely connectivity to the Project. However, even if the habitat were linked to the Application Site by groundwater or waters from the SAC, the implementation of Bord na Móna's operational actions and management strategies (as detailed in Section 7.1), and compliance with IPC Licence requirements from 2000 (see Section 7.2) effectively minimises environmental risks associated with peat extraction, eliminating potential effect and ensuring the protection of water quality and ecological integrity.
Conclusion: There is no potential for adverse effects on the Old sessile oak woods [91A0] as a result of the Peat Extraction Phase.

Active raised bogs [7110]
Active raised bogs [7110] are listed as a QI of the site on NPWS website (i.e. https://www.npws.ie/protected-sites/sac/000440). However, the SSCO document does not include conservation objective for the habitat, nor does the document include mapping of 7110 within the SAC. NPWS SSCO mapping data shows areas of *Active raised bogs* on in the northwest of the SAC. The areas of *Active raised bogs* are fragmented and spread and have hydrological or ecological interactions with the SAC. Due to the hydrological and hydrogeological connections between the Application Site and the SAC, there was potential that activities during the Peat Extraction Phase, in the absence of control measures, would have negatively impacted the water quality of the SAC. This could, in turn, affect the Active Raised Bogs [7110] within the SAC. However, with the implementation of Bord na Móna's operational actions and management strategies (see Section 7.1), and compliance with IPC Licence requirements from 2000 (Section 7.2) effectively minimised environmental risks of effect to water quality associated with peat extraction, ensuring that adverse effects would not have occurred, and ecological integrity was preserved.
Conclusion: There is no potential for adverse effects on Active raised bogs [7110] of the SAC as a result of the Peat Extraction Phase.

8.1.2.2 Potential Ex-situ and In-situ Effects of Peat Extraction on Lough Ree SPA

Table 8.2 below presents an assessment of adverse in-situ and ex-situ effects to QI species Otter of the SAC in light of the conservation objectives.

[44] Site-specific Conservation Objectives Shapefiles (updated April 2022; Available at https://www.npws.ie/maps-and-data/habitat-and-species-data. Accessed January 2025.

Table 8.2: Qualifying Interest Species, Site Specific Conservation Objectives and Assessment of Potential Adverse Effects

Attribute	Target	Assessment
Otter [1335]		
Distribution	No significant decline.	As the activities at the Application Site do not occur within the Lough Ree SAC, they have not had impact on the distribution of Otters within the European site. Similarly, given that the activities at the Application Site do not coincide with the SAC, there is no potential for impact on the extent of habitat used by the species. The extent of habitat within the SAC, including both terrestrial and freshwater (river and lake) areas, will continue to remain unaffected by activities at the Application Site. Therefore, the core habitats that Otters rely on for foraging, commuting, and resting are preserved, and no disturbance from the Application Site is likely to alter the spatial distribution of Otters or their habitat use within the SAC.
Extent of terrestrial habitat	No significant decline. Length mapped and calculated as 22.7km	
Extent of freshwater (river) habitat	No significant decline. Length mapped and calculated as 22.7km	
Extent of freshwater (lake) habitat	No significant decline. Area mapped and calculated as 2097.4ha	
No significant decline. Length mapped and calculated as 22.7km	No significant decline	
Fish biomass available	No significant decline	The proximity of the European site, Lough Ree SAC, to the Application Site is an important factor in determining the potential for disturbance and impacts on the otter population, particularly in relation to commuting and foraging ranges. Otters are known to have a home range that can extend up to several kilometers, depending on the availability of resources such as prey and suitable resting sites (Loy et al., 2024). Given the proximity of the application site to the SAC, Otters from the SAC may use the area for commuting between different sections of the SAC, as well as for foraging in nearby waters. Otters are reliant on clean water, sufficient prey, and undisturbed riparian environments (Loy et al., 2024). Barriers to connectivity, such as habitat fragmentation, pollution, or increased human presence, could limit the ability of Otters to navigate between critical areas. Aquatic surveys of the Application Site have indicated limited fish populations and low crayfish abundance, suggesting that prey availability within the Application Site is already constrained. Despite this, an Otter survey conducted by TOBIN confirmed the species' presence, with tracks recorded at the north of Lough Bannow Bog, indicating that Otters are using the area. Given the low prey availability, it is possible, however, that the Application Site functions primarily as a commuting corridor rather than a core foraging area, with Otters using the area for commuting purposes,
Barriers to connectivity	No significant increase. For guidance, see map 9	

Attribute	Target	Assessment
Otter [1335]		
		moving between foraging areas, resting sites, and commuting to different parts of the SAC. Otters are vulnerable to ex-situ effects of disturbance from activities at the Application Site, as increased human activity or habitat modification could disrupt movement patterns and reduce habitat connectivity. Barriers to connectivity could further exacerbate these challenges, making it more difficult for Otters to move freely. Additionally, ex-situ effects due to water pollution or habitat degradation at the Application Site could further impact the species by reducing prey availability or altering key movement routes. Management actions implemented by Bord na Móna have played a crucial role in reducing pollutant loads entering watercourses, thereby reducing the potential transfer of waterborne contaminants from the Application Site to the SAC. The measures implanted also included for the regular servicing and upkeep of machinery to ensure optimal working order, reducing the risk of excessive noise. Since 2010, with the implementation of measures under the Integrated Pollution Control (IPC) framework, these efforts have likely improved overall water quality and also reduced the risk of impact on waters within the SAC. This has likely helped to sustain the ecological conditions necessary for Otters and their prey species, ensuring the long-term viability of the habitat within the SAC
Conclusion: There is no potential for adverse effects on the QI of the SAC as a result of the Peat Extraction Phase.		

8.2 LOUGH REE SPA

8.2.1 Background to Special Conservation Interests and Generic Conservation Objectives

The SCIs of Lough Ree SPA are waterbird species that use the wetlands within the designated area. These include:

- Waterfowl species:
  - Little Grebe
  - Whooper Swan
  - Wigeon
  - Teal
  - Mallard
  - Shoveler
  - Tufted Duck
  - Common Scoter

    - Goldeneye
    - Coot
- Wading and shorebird species:
    - Golden Plover
    - Lapwing
- Breeding species:
    - Common Tern

These species depend on open water, floodplains, reedbeds, and adjacent wetland areas for feeding, roosting, and breeding. Given the Application Site is located outside the SPA, there is no potential for direct habitat loss. The potential impacts of primarily relate to effects on water quality, and disturbance, which can indirectly affect these species.

The Generic Conservation Objectives (GCOs) for the site are:

- To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.

The GCO document for the European site defines that the favourable conservation status of a species 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.

Wetland at the site play a crucial role in supporting wintering waterbirds, providing essential feeding, roosting, and breeding grounds for numerous migratory species. Recognising this ecological importance, Wetland and Waterbirds [A999] are designated as a SCI for certain the European site. This designation is particularly relevant for SPAs identified for wintering waterbirds that encompass wetland habitats of significant importance to one or more species of conservation concern.

Wetlands within these SPAs contribute to maintaining the overall biodiversity of the site by supporting a diverse range of waterbird species, ensuring the ecological integrity of the habitat, and facilitating the survival of migratory populations. These habitats provide critical ecosystem services, such as water filtration, carbon storage, and flood mitigation, further underscoring their value.

Given the significance of Lough Ree SPA as a key wetland site for wintering and migratory waterbirds, the generic GCO for Wetland and Waterbirds [A999] is:

- To maintain or restore the favourable conservation condition of the wetland habitat at Lough Ree SPA, ensuring it remains a high-quality resource for the regularly occurring migratory waterbirds that rely on it. This includes preserving the ecological balance, water quality, and habitat structure necessary to support these bird populations throughout their seasonal movements.

By implementing appropriate conservation measures, such as habitat management, pollution control, and hydrological monitoring, this objective aims to safeguard the long-term viability of

Lough Ree SPA as a critical refuge for waterbirds, in line with national and European biodiversity commitments.

8.2.2 Assessment of Adverse Effect

8.2.2.1 Overview

As outlined above, Lough Ree SPA is designated for the protection of a range of waterbird species and their supporting wetland habitats. This section examines the potential adverse effects of Peat Extraction Phase of the Project at the Application Site on the GCOs.

All peat extraction activities and associated ancillary works conducted from 19954, when the site was proposed as a SPA and continuing through to 2019, have remained entirely within the boundaries of the Application Site. Since the Project is located outside the SPA, there will have been no direct in-situ loss of suitable habitat at the SPA which supports the SCIs. However, potential indirect effects (water quality deterioration, and disturbance to bird species) must be carefully considered in relation to the SPA's conservation objectives.

8.2.2.2 Potential In-situ Effects of Peat Extraction Phase on Lough Ree SPA

The Application Site is located approximately 0.9km southwest of Lough Ree SPA, had the potential to influence water quality, and habitat conditions of the surrounding landscape, including the wetland habitats that support key waterbird species. The shortest water distance from the Application Site to the northernmost boundary of the SPA is approximately 5.3km downstream.

If runoff from the Application Site entered watercourses that flow to Lough Ree SPA, increased turbidity and sedimentation could have negatively affected aquatic habitats used by the SCI species. Suspended sediments from disturbed peat could have reduced water clarity, impacting the growth of aquatic vegetation and invertebrates that serve as food sources for waterbirds. Such changes could have affected species like Goldeneye (*Bucephala clangula*) and Tufted Duck (*Aythya fuligula*) at the European site, which rely on clear waters for foraging. In addition to these risks, pollution from machinery, such as fuel spills or chemical runoff, could have further degraded water quality, posing direct and indirect threats to the ecological health of the SPA.

As part of best practice, Bord na Móna implemented robust machinery maintenance procedures to minimise potential disturbances caused by mechanical activity. Regular servicing, cleaning, and upkeep ensured machinery remained in optimal working order, reducing the risk of pollution impacting the receiving environment. Machinery was carefully managed through regular inspections to prevent leaks and malfunctions, with tightly controlled refuelling practices to minimise spill risks. Emergency response procedures were in place to contain and clean up accidental spills. Other key operational actions included the regular maintenance of internal drainage systems, such as clearing drains with draglines and excavators to prevent sediment buildup and blockages. Silt ponds were strategically placed and upgraded to improve sediment capture, with desludging conducted twice annually to maintain efficiency. Strict adherence to these practices ensured operations minimised potential impacts on water quality..

Further supporting these efforts, the measures implemented under the IPC Licence in 2000 played a crucial role in regulating water management practices. The licence mandated strict environmental controls, including monitoring requirements and compliance measures, ensuring that drainage

systems, sediment control, and pollution prevention strategies were effectively managed to safeguard water quality throughout the Peat Extraction Phase.

Together, these measures significantly reduced the risk of to water quality from peat extraction, helping to protect the surrounding ecosystem despite the inherent environmental challenges of such operations.

Conclusion: There is no potential for adverse in-situ effects on the SCIs as a result of the Peat Extraction Phase of the Project.

8.2.2.3 Potential Ex-situ Effects of Peat Extraction Phase on Lough Ree SPA

Cutover bog habitat provides suitable breeding and foraging opportunities for a variety of bird species including several species listed as SCIs of the Lough Ree SPA. Ecology surveys conducted by Bord na Móna ecologists between 2010 and 2012 identified Lapwing (*Vanellus vanellus*) and Mallard (*Anas platyrhynchos*) at the Application Site (see **Error! Reference source not found.**). There is potential that these individuals formed part of the Lough Ree SPA SCI populations and may have been using the Application Site and surrounding areas for foraging, movement, and other ecological functions during the Peat Extraction Phase. If this was the case, these species may have experienced disturbances from machinery noise and human activity during the Peat Extraction Phase. Such disturbances could have effected species foraging and potentially displaced the species from the habitats they were using. This disturbance to the species using the Application Site and nearby surrounding areas would have been particularly critical during winter or migration periods when the birds require high-energy intake to survive. Prolonged avoidance of these potential feeding grounds could have resulted in decreased health, energy levels, and overall survival rates. It should be noted, however, that the majority of peat extraction activity would have taken place during the drier summer months, and outside of the winter season. Consequently, given the timing of these peat extraction activities and the fact that winter is the most sensitive period for potential disturbance effects on bird species, it is unlikely that peat extraction activities resulted in significant adverse noise disturbance impacts to the SCIs. In addition, Bord na Móna machinery maintenance procedures would have minimised potential disturbances caused by noise and mechanical activity. Regular servicing and upkeep of machinery ensured optimal working order, reducing the risk of excessive noise. As a result, any ex-situ disturbance effects on SCI species that may have been using the Application Site during the Peat Extraction Phase were likely minimised, and significant adverse effect did not occur.

Beyond noise disturbances, peat extraction activities could have led to negative effects on water quality within the Application Site and surrounding waters. These activities could have altered surface water runoff, increased sedimentation, or contributed to nutrient loading. If species from the SPA, such as Goldeneye, Lapwing, or Mallard, were using these areas for foraging or other ecological functions, there is potential for significant ex-situ effects. For example, species like Goldeneye, which depend on clear water for foraging, would have been affected if increased turbidity or pollutants compromised the suitability of their feeding areas. Similarly, species like Lapwing and Mallard, which utilise wetlands for both foraging and breeding, could have faced disruptions due to deterioration in water quality. As described above, standard operational actions, management strategies undertaken by Bord na Móna and measure set in place as required under the IPC Licence which was issued for the Application Site in 2000 ensured no significant negative

effects on the water environment; consequently, there would have been no adverse impacts on the SCIs of the Lough Ree SPA that may have occurred within the Application Site during the Peat Extraction Phase.

Conclusion: There is no potential for adverse ex-situ effects on the SCIs as a result of the of Peat Extraction Phase of the Project.

8.3 BALLYKENNY-FISHERSTOWN BOG SPA

8.3.1 Background to Special Conservation Interests and Generic Conservation Objectives

The Ballykenny-Fisherstown Bog SPA is designated for Greenland White-fronted Goose. This species uses wetland habitats at the SPA and surrounding areas for feeding and roosting.

The GCOs for the site are:

- To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.

The GCO document for the European site defines that the favourable conservation status of a species 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.

8.3.2 Assessment of Adverse Effect

8.3.2.1 Overview

The Ballykenny-Fisherstown SPA is located upstream of the Application Site. The SPA is designated for the protection of wintering Greenland White-fronted Geese. As the Application Site is located outside the designated SPA boundaries, there is no potential in-situ direct habitat loss nor impact on water quality at the SPA due to the upstream location of the European site.

Greenland White-fronted Geese show a preference for bog habitats (Fox et al., 2006). While the Application Site in 1994 was largely characterised by cut over bog and pare peat the site also included smaller areas of remnant bog habitat. Given that the foraging range of Greenland White-fronted Geese extends from 5 to 8km there is potential that individuals from the SPA may have used the Application Site for foraging and roosting and thereby have been affected by disturbances from peat extraction activities leading to disruption. This disruption had the potential to result in reduced access to food sources and affect the geese's overall health, energy levels, and reproductive success.

While the Greenland White-fronted Geese do show a preference for grassland habitats surrounding the Application Site, such wet grasslands areas and bogs (e.g. Fox et al., 2006), the ecological surveys undertaken by Bord na Móna ecologists between 2010 and 2012 (see **Error! Reference source**

not found.) and the bird surveys conducted at the between 2021 and 2022 did not record the presence of the species at the site (see Section 5.2.4). This absence of the species on the site during the surveys , however, does not necessarily imply that the site was not used by the geese at all during the Peat Extraction Phase. The absence may be a result of temporary factors, such as seasonal variations in habitat availability, or the disturbance caused by previous peat extraction activities. If the species had been using the Application Site and surrounding areas during the Peat Extraction Phase, they may have experienced disturbances from machinery noise and human activity during the Peat Extraction Phase. Adopting a precautionary approach, it is assumed that these species may have been present in the area, and therefore, the potential for adverse effects is assessed below.

8.3.2.2 Potential Ex-situ Effects of Peat Extraction Phase on Ballykenny-Fisherstown SPA

There is potential that the presence of heavy machinery, noise, and human activity during the Peat Extraction Phase may have caused the Greenland White-fronted Geese to be displaced from the Application Site area. This avoidance could have forced the geese to travel further to find suitable feeding grounds, which may have affected their foraging efficiency and overall well-being. Such disturbance could have had long-term consequences for the local population, potentially impacting their health, energy levels, and reproductive success. Similarly, the Application Site could have also served as part of a wider movement corridor for the species migrating between wetland areas. Disruption to these corridors due to activities disturbance , increased human presence, or vehicular traffic could have forced species to alter their travel routes. Such changes could have led to increased energy expenditure, longer migration distances, and greater vulnerability. Furthermore, disruption of key movement corridors could have limited access to habitats used for feeding or breeding'.

As noted above, peat extraction activities primarily occurred during the drier summer months, outside the winter season. Greenland White-fronted Geese are migratory, migrating from their breeding grounds in Greenland to Ireland during the winter months (typically from October to April). Given the timing of the species' migration and the Peat Extraction Phase, which occurred primarily in the summer, it is unlikely that the extraction activities had a significant direct impact on the Greenland White-fronted Geese during their wintering period. Consequently, any potential disturbance from machinery noise or other activities would not have coincided with the critical wintering period for these geese, reducing the risk of adverse effects to take advantage of the milder climate and abundant food sources; consequently, significant adverse impacts during the Peat Extraction Phase would not have occurred.

Water quality changes, while not directly impacting the Ballykenny-Fisherstown SPA due to the lack of hydrological connectivity, could still have had indirect effects on species using the Application Site. If peat extraction activities led to increased sedimentation or nutrient loading locally, it could have affected species using the Application Site that rely on clean, stable water sources for feeding. For instance, species like Greenland White-fronted Geese could have been impacted if changes in water quality reduced the availability of essential food sources, such as aquatic vegetation. Fuel spills, chemical runoff, or waste leakage from machinery operations could have contaminated nearby watercourses or wetland areas, potentially affecting species that rely on these habitats. For example, if pollutants entered local waterways, species that forage in these areas could have been exposed to harmful substances, leading to impaired health, reduced reproductive success, or

disruptions in feeding behaviour. As described above, Bord na Móna's operational actions, management strategies, and measures required under the IPC Licence are designed to protect the water environment, ensuring no significant negative impacts or adverse ex-situ effect to the SCI species.

Conclusion: There is no potential for adverse ex-situ effects on the SCI as a result of the Peat Extraction Phase of the Project.

8.4 Conclusion of Assessment of Adverse Effects

The comprehensive assessment of the available data, including an assessment of scientific literature, conservation objectives, it is clear that no significant negative adverse effects have occurred or will occur on the integrity of any European site as a result of the Peat Extraction Phase of the Project at the Application Site.

Before the imposition of IPC Licence conditions in 2000, Bord na Móna implemented standard operating procedures and best practices which have been set in place for the entire Peat Extraction Phase, to manage environmental risks from peat extraction, particularly regarding suspended solids and contamination, ensuring the protection of water quality, and minimise the risk of noise disturbance. These pre-IPC Licence measures were successful in managing the risk of impact on water quality and noise disturbance, and no significant adverse effects are anticipated to have occurred to the Lough Ree SPA and Ballykenny-Fishertown Bog SPA in the years after the designation of the sites in 1995 and 1996 respectively.

In 2000, following the introduction of the IPC Licence in 2000, stricter environmental controls, including monitoring, sediment control, and pollution prevention measures, were enforced at the Application Sites. to further safeguard water quality during the Extraction Phase. Given the effective regulation of peat extraction activities under the IPC License and the consistent compliance with these conditions over a 24-year period, it is reasonable to conclude that there has been no significant impact on water quality.

Implementation Bord na Móna standard operating procedures and best practices, and measures to meet IPC Licence conditions, have, collectively, help ensure that , the integrity of the Lough Ree SPA and Ballykenny-Fishertown Bog SPA and the Lough Ree SAC (which was designated in 2002) has not been compromised.

Conclusion, based on a thorough evaluation of the available evidence, it can be confidently stated that there is no risk of adverse effects on the integrity of any European Site as a result of the Peat Extraction Phase of the Project.

9. LIKELY IN-COMBINATION WITH OTHER PLANS AND PROJECTS

9.1 ASSESSMENT PROCESS

An evaluation of the potential **in-combination effects** of peat extraction activities and all associated works at the Application Site was conducted, taking into account both the **existing and proposed plans** listed in Table 9.1 and **projects** listed in Table 9.2 in the surrounding area.

In-Combination Effects specifically refer to the impact that arises from the interaction of impact sources of two or more projects, plans, or activities. While a single project may not have significant effects, its combined effect with other projects, plans, or activities could give rise to significant effects that would not have occurred if the projects were assessed in isolation. In this context, the assessment focused on how the Project and plans and other projects that might interact to produce effects that would not have been anticipated from individual projects alone.

9.2 ASSESSMENT OF PLANS

The review of relevant plans focused on evaluating policies and objectives that have the potential for impacting European sites in-combination with the peat extraction and associated activities at the Application Site. The sources of information on such policies and objectives were:

- Objectives relevant to ecology and biodiversity in:
  - Longford County Development Plan 2021–2027[45]
  - Longford County Development Plan 2015–2021[46]
  - Longford County Development Plan 2009–2015[47]
- Relevant policies in Ireland's 4th National Biodiversity Action Plan 2023-2030 (DoCHG, 2024).

This assessment aimed to determine how existing regulatory frameworks support ecological preservation and mitigate potential environmental impacts. In addition to biodiversity-focused policies, the review examined objectives related to peatland conservation and sustainable land use practices, particularly those that influence the maintenance and enhancement of surface water quality.

To provide a structured summary of the findings, an overview of relevant plans and their key environmental considerations is presented in Table 9.1. This table outlines how various planning documents incorporate conservation principles, highlighting their relevance to biodiversity protection, peatland management, and water quality preservation. The insights gained from this review contribute to a broader understanding of the policy landscape influencing land-use decisions and environmental management in areas of ecological sensitivity.

[45] https://www.longfordcoco.ie/services/planning/longford-county-development-plan-2021-2027/volume-1-compressed.pdf. Accessed January 2025.
[46] https://www.longfordcoco.ie/services/planning/previous-plans-county-town-local-area-/development-plan-2015-2021/. Accessed January 2025.
[47] https://www.longfordcoco.ie/services/planning/previous-plans-county-town-local-area-/county-development-plan-2009-2015/. Accessed January 2025

A detailed review of the Longford County Development Plans was conducted, including examining policies related to conservation and the protection of European sites. This assessment aimed to determine how these policies apply to historical and ongoing land-use activities within the Application Site and their alignment with broader environmental objectives. The peat extraction activities, which took place from 1994 until 2019 at varying levels of intensity across different sections of the bog, were carefully evaluated in this context. Based on this analysis, these activities are not considered to be in conflict with the relevant policies and objectives outlined in the Longford County Development Plans.

Table 9.1: Assessment of Plans

Plan	Key Relevant Objectives	Assessment
Longford County Development Plan 2021–2027	The following provide summary of key relevant County Policy Objectives (CPOs) listed in Chapter 12 - Natural Heritage and Environment • **General Natural Heritage Protection** ▪ **CPO 12.1 - 12.4:** Protect and enhance biodiversity, habitats, landscapes, and geological sites. Promote public awareness and conduct habitat mapping. • **Protection of Designated Sites** ▪ **CPO 12.5 - 12.14:** Safeguard SACs, SPAs, NHAs, and proposed NHAs. Ensure developments comply with Appropriate Assessment (AA) and EU conservation laws. Establish buffer zones and undertake habitat surveys. • **Conservation of Wetlands, Turloughs, and Watercourses** ▪ **CPO 12.29 - 12.33:** Protect wetlands from degradation and require mitigation measures for developments near sensitive water habitats. Prevent unauthorized drainage of wetlands. • **Peatland Conservation** ▪ **CPO 12.50 - 12.55:** Conserve designated peatlands and support National Peatlands Strategy. Work with stakeholders for sustainable peatland management and require planning permission for wetland modifications. • **Trees, Woodlands, and Hedgerows** ▪ **CPO 12.72 - 12.81:** Protect and expand tree cover, hedgerows, and native woodlands. Enforce Tree Preservation Orders (TPOs) and promote community forestry projects. • **Invasive Species Management** ▪ **CPO 12.82 - 12.85**: Implement control measures, increase public awareness, and require invasive species management in development projects.	The peat extraction activities, along with ancillary works, were carried out at varying levels of intensity at the Application Site during the Peat Extraction Phase (July 1988 to July 2019). The overall environmental impacts on biodiversity were considered to be limited in extent to the Application and not significant enough to breach the Policies and Objectives outlined in the County Development Plans, which aim to protect biodiversity, conserve habitats, and safeguard designated areas. During the Current Phase (July 2019 – Present), the activities at the Application Site have been compliant with the environmental safeguards specified in these Policies and Objectives, ensuring that no adverse effects have occurred on biodiversity, or European sites and pNHAs. The implementation of the Cutaway Bog Decommissioning and Rehabilitation Plans will lead to substantial ecological improvements across the Application Site. These efforts will rehabilitate habitats, enhance water retention and quality, and support the recovery of local biodiversity. The long-term positive effects on both terrestrial and aquatic environments, including improved conditions for fauna and surrounding sensitive areas, highlight the significant environmental benefits of this phase. The overall impact is expected to be positive, supporting the sustainability and ecological integrity of the Application Site and European sites and pNHAs into the future. The Cutaway Bog Decommissioning and Rehabilitation Plans align with and actively support the Policies and Objectives outlined in the County Development Plans. These plans are designed to restore and enhance local biodiversity, improve water quality, and rehabilitate degraded habitats, all of which are key priorities in the County's environmental policies. By focusing on habitat rehabilitation, water retention, and the long-term ecological sustainability of the Application Site, the rehabilitation efforts are fully consistent with

Plan	Key Relevant Objectives	Assessment
	• **Biodiversity and Nature Conservation** ▪ **CPO 12.57 - 12.70:** Support national biodiversity plans, require ecological assessments for developments, and promote habitat restoration, wildlife corridors, and native planting initiatives	the County's objectives for biodiversity conservation, habitat protection, and the safeguarding of designated sites. The implementation of these plans will contribute positively to the goals set forth in the County Development Plans, ensuring the continued preservation and enhancement of the natural environment
Longford County Development Plan 2015–2021	Longford County's Development Plan 2015-2021 includes several objectives aimed at conserving and enhancing biodiversity. Policies and plans highlight the County's commitment to environmental sustainability. The Longford County Council Biodiversity Action Plan Discussion Paper outlines the steps needed to develop a comprehensive biodiversity strategy. This aligns with the National Biodiversity Action Plan and includes securing funding, forming a biodiversity working group, and engaging the public in consultations to ensure effective implementation. Additionally, the Longford County Council Climate Action Plan 2024-2029 sets out key biodiversity goals, such as promoting nature-based climate solutions, protecting green infrastructure, and restoring peatlands. Specific actions include appointing a Biodiversity Officer, implementing a Local Biodiversity Action Plan, and continuing efforts to control invasive species. These initiatives demonstrate Longford County's commitment to integrating biodiversity considerations into its planning and development strategies.	
Longford County Development Plan 2009–2015	The Longford County Development Plan 2009-2015 outlines several objectives aimed at protecting and enhancing the county's biodiversity and natural heritage. Key objectives include: • **Protection and Enhancement:** Safeguarding and improving biodiversity, encompassing wildlife (flora and fauna), habitats, landscapes, and natural resources such as water. • **Appropriate Management:** Encouraging proper management and enhancement of the county's natural heritage.	

Plan	Key Relevant Objectives	Assessment
	• **Public Access and Awareness:** Promoting access to and understanding of natural heritage areas. • **Geological Conservation:** Protecting significant geological and geomorphological sites, including those proposed as Natural Heritage Areas (NHAs). • **Habitat Mapping and Wetland Survey:** Collaborating with the National Parks and Wildlife Service to develop habitat mapping and conduct wetland surveys. • **Protection of Designated Sites:** Safeguarding sites designated under national and European legislation, such as SACs and SPAs.	
Ireland's 4th National Biodiversity Action Plan (NBAP) for 2023-2030	Five strategic objectives to guide biodiversity conservation efforts: 1. **Adopt a Whole of Government, Whole of Society Approach to Biodiversity**: This objective emphasises the need for collective action across all sectors of government and society to effectively address biodiversity challenges. 2. **Meet Urgent Conservation and Restoration Needs**: Focusing on immediate actions required to conserve and restore Ireland's biodiversity, this objective aims to halt further loss and promote recovery of vital ecosystems. 3. **Secure Nature's Contribution to People**: Recognising the essential services that nature provides, this objective seeks to ensure the sustainable use of natural resources, benefiting both people and the environment. 4. **Enhance the Evidence Base for Action on Biodiversity**: This objective highlights the importance of strengthening scientific research and data collection to inform effective biodiversity policies and actions. 5. **Strengthen Ireland's Contribution to International Biodiversity Initiatives**: Aiming to bolster Ireland's role in global biodiversity efforts, this objective focuses on active participation and contribution to international conservation initiatives.	Ireland's 4th National Biodiversity Action Plan (NBAP) for 2023-2030 set out objectives to address conservation and restoration needs. During the Current Phase (July 2019 – Present), activities at the Application Site has been in compliance with the policies and objectives outlined in the NBAP, ensuring that no adverse effects have occurred on biodiversity or European sites and pNHAs. Looking forward, the implementation of the Cutaway Bog Decommissioning and Rehabilitation Plans will contribute substantially to achieving several of the NBAP's strategic objectives. These plans will rehabilitate habitats, enhance water retention and quality, and support the recovery of local biodiversity. The long-term positive effects on both terrestrial and aquatic environments, including improved conditions for fauna and surrounding sensitive areas, highlight the significant environmental benefits of this phase. The overall impact is expected to be positive, supporting the sustainability and ecological integrity of the Application Site, while aligning with national goals for biodiversity conservation.

Plan	Key Relevant Objectives	Assessment
	These objectives collectively aim to deliver transformative changes in how Ireland values and protects its natural heritage. The NBAP also introduces a public sector duty on biodiversity, as mandated by the Wildlife (Amendment) Act 2023. This legislation requires all public service bodies, including government departments, agencies, and local authorities, to integrate biodiversity considerations into their plans, policies, and programs, and to report on their progress.	

9.3 ASSESSMENT OF PROJECTS

A list of the projects consider in this assessment are summarised in Table 9.2 below.

In assessing the projects below, the potential **cumulative** effects of their interaction, as well as **in-combination** impacts arising from their spatial and temporal overlap with the Application Site's activities, have been carefully considered to determine their combined impact.

During the Peat Extraction Phase (July 1988 – July 2019), extraction activities and ancillary works were carried out at varying levels of intensity across the Application Site. These activities caused environmental impacts, particularly on habitats and water quality, but these effects remained largely confined to the site. The overall impact on biodiversity was considered limited in extent, with no significant adverse effects extending beyond the immediate area.

Given the spatial extent of environmental impacts from activities at the Application Site, the cumulative in-combination effects of the Project with other projects have been assessed. Based on this assessment, no significant adverse cumulative effects with other projects are anticipated. **Decommissioning and Rehabilitation Plans for the Application Site**

The implementation of the Cutaway Bog Decommissioning and Rehabilitations Plan for the Application Site is expected to yield significant ecological benefits, contributing positively to European sites. Additionally, the rehabilitation of the bog will enhance ecosystem functions, including carbon sequestration and water retention, further supporting regional conservation efforts. In particular, the rehabilitation plans also has the potential to generate positive effects on nearby European sites that are hydrologically connected to the Application Site. The restoration of natural hydrological conditions is expected to improve water quality, reduce sedimentation, and enhance habitat conditions for aquatic and wetland species. By minimising habitat fragmentation and mitigating historical environmental disturbances, the rehabilitation process will contribute to broader conservation objectives of the European sites. These anticipated outcomes align closely with the policies and objectives outlined within the Development Plans, reinforcing commitments to sustainable land management, biodiversity protection, and ecological resilience.

The rehabilitation plans will positively impact the peatland ecosystem by enhancing habitat diversity and functionality through interventions like drain-blocking and natural recolonisation. While there may be temporary habitat loss, the plans aim to create stable, self-sustaining ecosystems that support a wider range of species. Species that may benefit include Greenland White-fronted Goose of the Ballykenny-Fisherstown Bog SPA. Additionally, the plans will improve the surface water hydrology and water quality, and aquatic habitats of water flowing from the Application Site to the European sites, benefiting sensitive areas such as the Lough Ree SAC and Lough Ree SPA.

As the proposed Cutaway Bog Decommissioning and Rehabilitations Plan for the Application Site will ensure the protection and enhancement of these protected areas, and no negative in-combination effects are anticipated,

Future use of lands at the Application Site

The future use of the lands within the Application Site will be separate and standalone projects. Therefore, they are considered projects for the purpose of this application. It is intended to develop lands at the Application Site in the future for renewable energy development and to

carry out enhanced rehabilitation on the bogs as part of Peatland Climate Action Scheme[48,49] (PCAS), where relevant.

In combination, the PCAS and the Decommissioning and Rehabilitation Plans will have a positive effect on the Application Site. The rehabilitation efforts under both plans will work synergistically to restore and enhance the peatland habitats, improve biodiversity, and promote better water management. The PCAS will support the long-term environmental sustainability of the site, while the Decommissioning and Rehabilitation Plans will address any remaining impacts from previous peat extraction activities. Together, these initiatives will lead to a more resilient and ecologically diverse landscape, with positive long-term environmental outcome. Consequently, no significant adverse cumulative effects anticipated

Derryadd Wind Farm

The proposed future development of the lands for renewable energy, referred to as the Derryadd Wind Farm, will be subject to a separate planning consent application. This application will be accompanied by an EIAR which will include an assessment of the implementation of the rehabilitation measures at the Application Site in conjunction with the construction, operation, and decommissioning of the proposed wind farm.

The future development of the Derryadd Wind Farm and the ongoing rehabilitation of the Application Site represent a significant shift towards sustainable land use, transitioning from historical peat extraction to climate-positive initiatives. These projects are expected to have positive in-combination effects on the surrounding European sites, including the Lough Ree SAC and Lough Ree SPA, reinforcing both national and EU commitments to biodiversity conservation and climate action.

No significant in-combination effects are anticipated, as careful planning and mitigation measures will be implemented for the Derryadd Wind Farm will safeguard the integrity of the European sites.

33kV Grid Connection Cable

A planning permission has been obtained by Harmony Solar Longford Ltd. for the construction of an underground 33kV grid connection cable, which passes through Derryaroge Bog. The future construction of this development has the potential to interact with the planned future rehabilitation of the site as well as the planned renewable energy development and is therefore also considered within this assessment of in-combination effects.

Planning permission has been obtained by Harmony Solar Longford Ltd. for the construction of an underground 33kV grid connection cable, which passes through Derryaroge Bog. The future construction of this development has the potential to interact with the planned future rehabilitation of the site as well as the planned renewable energy development and is therefore also considered within this assessment of in-combination effects. Temporary soil stripping and excavations required for the cable trenching will result in localised effect. while the construction of the 33kV grid connection cable has the potential to cause localised disturbances through soil

[48] Information available at: https://www.bnmpcas.ie/. Accessed January 2025

[49] Information available at: https://cieem.net/wp-content/uploads/2021/05/The-Peatlands-Climate-Action-Scheme-%E2%80%93-New-developments-in-peatland-rehabilitation.pdf. Accessed January 2025

stripping and excavation, the temporary nature of the potential effects suggests that no significant in-combination effects on the European sites will occur.

Table 9.2: Assessment of Projects

Planning Authority	App Ref.	Proposal	Address	Grant Date
Longford County Council	00405	Permission for the construction of car showrooms.	Ballyminion Faranyoogan, Cloontirm Longford	03/01/2001
Longford County Council	01151	Permission for housing development of 30 no. dwelling houses, garages, access road, formation of new entrance, boundary walls, prop. waste water treatment plant, percolation area & ancillary works.	Killashee and Aghakeeran, Killashee, Co. Longford	08/04/2002
Longford County Council	01492	Permission for 33 detached two-storey dwellings and 5 no. two-storey block of coach houses and all associated development.	The Old Workhouse Site, Ballymahon, Co. Longford	08/08/2002
Longford County Council	0281	Permission to development a new 110 KV Station Control Building, including additional control cable ducting, and all associated works.	Lanesboro Generating Stat, Aghamore Td., Lanesboro Co. Longford	28/05/2002
Longford County Council	0481	Permission for a railway level crossing to facilitate the haulage of milled peat.	Templeton Glebe, Killashee , Co. Longford	13/07/2004
Longford County Council	04272	Permission to demolish existing mushroom tunnels and to erect housing development consisting of 12 no. two storey, three b/r semi-detached dwellings, 1 no. two storey three b/r detached dwelling, 6 no. two storey four b/r semi-detached dwellings and 12 no. two storey two b/r semi-detached dwellings, and all associated development.	Knock, Lanesboro, Co. Longford	15/08/2005
Longford County Council	04733	Permission to construct 8 No. semi-detached two storey dwellings, 4 No. single storey detached dwellings, formation of entrance onto public road, access roadway (estate roadway), waste water pumping station, rising main situate in public road verge, connection to adjoining utility services, site services, landscaping, boundary walls/fences and ancillary site works.	Mosstown, Kenagh, Co. Longford	10/05/2005

Planning Authority	App Ref.	Proposal	Address	Grant Date
Longford County Council	04700071	Permission to construct 27 No. two storey dwellings and all ancillary site works.	Abbeycartron TD, Longford	26/09/2005
Longford County Council	04884	Permission for housing development for 23 No. dwelling houses consisting of 22 No. two storey semi-detached dwelling houses, 1 No. two storey type dwelling house, formation of access road and entrance, boundary fence/wall, onsite sewerage treatment system with percolation area, connection to public watermain, decommissioning of existing septic tank servicing existing dwelling house and connection of existing dwelling house to onsite sewerage treatment system servicing the proposed development and ancillary site works.	Killashee, Co. Longford	22/02/2005
Longford County Council	05217	Permission for a filling station and shop, forecourt c/w fuel pumps, canopy and ancillaries for sale of fuels, fuel storage tanks and ancillaries, car wash facilities and ancillaries, car parking, formation of new entrances onto public road, storm water drainage attenuation and infiltration system, proposed foul drainage system and ancillaries including connection to adjoining pump station and raising main approved under PL04/733 and site works.	Mosstown, Kenagh , Co. Longford	29/08/2006
Longford County Council	05438	Permission for the extension between existing Battery Room and existing Switch Room at Aghamore 38kv Station.	Knock, Lanesboro, Co. Longford	23/11/2005
Longford County Council	0673	Permission for retention and completion of existing disposal site. Materials to be disposed of will be inert materials, soils and subsoil and whereby it is proposed to increase the existing ground level of the site so that the new ground level will be approximately level with the existing adjacent public road and complete the filling of the site within two years.	Cloonfiugh, Killashee, Co. Longford	23/02/2007

Planning Authority	App Ref.	Proposal	Address	Grant Date
Longford County Council	0688	Permission to deposit/recycle sub-soil on site and raise the level to not less 0.3 m below road level together with all necessary site works.	Tullyvrane & Lehery, Lanesboro, Co. Longford	17/05/2006
Longford County Council	06533	Permission for housing development consisting of 5 no. dormer bungalows, 8 no. two storey detached dwellings, 18 no. two storey semi-detached dwellings, formation of a new entrance onto the N63, pumping station, connection to mains services, associated signage and site works.	Knock, Lanesboro, Co. Longford	27/11/2006
Longford County Council	08/623	Grant of permission for a wind monitoring mast at Derryaroge. This permission was for a period of five years.	Derryaroge, Lanesborough, Co. Longford.	20/03/2009
Roscommon County Council	10/507 (ABP-PL20.239743)	Windfarm of 20 wind turbines and communications masts, etc.	21 townlands,Strokestown, Co. Roscommon	27/03/2012
Longford County Council	14/35	Grant of permission for retention of a wind monitoring mast at Derryaroge. This refers to the same mast as permitted under 08/623. This revised permission was granted for a period of 10 years.	Derryaroge Bog, Derryaroge, Co. Longford.	06/05/2014
Longford County Council	15/86	Grant of permission (dated 25/08/15) for a wind monitoring mast at Derrynaskea (Lough Bannow Bog). This permission was granted for a period of five years.	Lough Bannow Bog, Derrynaskea, Co. Longford	25/08/2015

Planning Authority	App Ref.	Proposal	Address	Grant Date
Longford County Council	16256	Permission for development of a distillery and visitor centre on 0.2814ha site including refurbishment works and all associated works.	The Old Post Office, Main Street, Lanesboro	31/01/2017
Longford County Council	16303 (ABP-249090)	Demolish all existing pig/livestock houses and ancillary structures and to construct 3. No. pig houses and 2. No. ancillary manure storage tanks in accordance with animal welfare and nitrates regulations together with all ancillary works.	Ballynakill, Killashee , Co. Longford	16/05/2018
Longford County Council	1747 (ABP-248470)	Ten year permission for a solar farm with an export capacity of 11.1MW.	Cleggil, Longford, Co. Longford	22/03/2018
Longford County Council	17198	Permission for enabling works at the existing Ballymahon 38kV electrical substation and all associated works.	Cornacarta, Ballymahon , Co. Longford	16/10/2017
Roscommon County Council	ABP-300493	Permission for N5 Ballaghaderreen to Scramoge Road Development and associated CPO.	Ballaghaderreen to Scramoge, Co. Roscommon	16/01/2019
Longford County Council	17320	Permission to the capacity of the operational Ash Disposal Facility to allow for the deposition of 130,000 tonnes of dry ash over and above the 550,000 tonnes permitted under Longford County Council Reg. Ref. 01/115.	Derraghan Beg and Derraghan More, Co. Longford	28/03/2018
Longford County Council	18139	Permission for development along the existing Cloon to Lanesboro 110 kV Overhead Line which is approximately 65 kilometres long and all associated works.	Aghamore (Rathcline By), Co. Longford	27/09/2018
Roscommon County Council	10/507 (ABP-PL20.239743)	Windfarm of 20 wind turbines and communications masts, etc.	21 townlands, Strokestown, Co. Roscommon	27/03/2012
Longford County Council	16256	Permission for development of a distillery and visitor centre on 0.2814ha site including refurbishment works and all associated works.	The Old Post Office, Main Street, Lanesboro	31/01/2017

Planning Authority	App Ref.	Proposal	Address	Grant Date
Longford County Council	16303 (ABP-249090)	Demolish all existing pig/livestock houses and ancillary structures and to construct 3. No. pig houses and 2. No. ancillary manure storage tanks in accordance with animal welfare and nitrates regulations together with all ancillary structures.	Ballynakil, Killashee, Co. Longford.	16/05/2018
Longford County Council	1747 (ABP-248470)	Ten-year permission for a solar farm with an export capacity of 11.1MW.	Cleggil, Longford, Co. Longford.	22/03/2018
Longford County Council	17198	Permission for enabling works at the existing Balyymahon 38kV electrical substation nd all associated works.	Cornacarta, Ballymahon , Co. Longford	16/10/2017
Roscommon County Council	ABP-300493	Permission for N5 Ballaghaderreen to Scramoge Road Development and associated CPO.	Ballaghaderreen to Scramoge, Co. Roscommon	16/01/2019
Longford County Council	17320	Permission to the capacity of the operational Ash Disposal Facility to allow for the deposition of 130,000 tonnes of dry ash over and above the 550,000 tonnes permitted under Longford County Council Reg. Ref. 01/115.	Derraghan Beg and Derraghan More, Co. Longford	28/03/2018
Longford County Council	18139	Permission for development along the existing Cloon to Lanesboro 110 kV Overhead Line which is approximately 65 kilometres long and all associated works.	Aghamore (Rathcline By), Co. Longford.	27/09/2018
Longford County Council	1888 (ABP-302554)	Permission for the extension to an existing manufacturing facility consisting of warehousing , offices and ancillary staff areas.	Longford Business & Technology Park, Ballinalee Road, Longford, N39 V880.	24/01/2019
Roscommon County Council	18320 (ABP-302597)	Permission for development along the existing Cloon to Lanesboro 110 kV Overhead Line which is approximately 65 kilometres long and all associated works.	Ballyleague, Co. Roscommon	19/03/2019
Longford County Council	18157 (ABP-303611)	Permission for a battery energy storage system (BESS)	Ballykenny, Co. Longford.	06/06/2019

Planning Authority	App Ref.	Proposal	Address	Grant Date
Roscommon County Council	19311	Permission for development consisting of change of use planning application to convert existing Waterways Ireland storage shed to an outdoor recreational centre/lake access centre facility to Lough Ree.	Ballyleague , Lanesborough , Co. Roscommon	12/09/2019
Longford County Council	19201	Permission for the redevelopment of the existing Lanesboro 110kV AIS substation with a new 110 kV Gas Insulated Switchgear (GIS) substation and all associated works.	Aghamore, Lanesborough, Longford	01/07/2020
Roscommon County Council	19546	Permission for the upgrade of the Tarmonbarry Wastewater Treatment Plant and all associated works.	Tarmonbarry Wastewater Treatment Plant, Ballytoohey Townland, Tarmonbarry	29/01/2020
Longford County Council	19222 (ABP-305969)	Ten year permission for a 9MW solar farm and associated works.	Ballykenny, Co Longford	08/05/2020
Longford County Council	2020	Permission for the development consisting of a single-storey retail unit; six number two-storey three bedroomed semi-detached houses, one detached two-storey three bedroomed house; and all associated works.	Mosstown, Kenagh, Co Longford	16/04/2021
Longford County Council	20152	Permission to dispose of materials which will be inert materials, soils & subsoil on the lands to which this application relates so as to raise the existing ground level by a maximum of two meters, creation of entrance with access road all associated ancillary works.	Ballyclare, Killashee, Co Longford	29/09/2020
Longford County Council	20183	Continued use of an existing guyed wind monitoring mast, with instruments, 100m in height for a further period of three years, the purpose of the mast is to assess the suitability of the company's adjacent lands for wind farm development, previous planning application number 15/86.	Lough Bannow Bog, Derrynaskea, Co Longford	05/11/2020

Planning Authority	App Ref.	Proposal	Address	Grant Date
Longford County Council	2074 (ABP-307880)	Permission for the construction of 37 dwelling houses.	Dunaras & Marian Terrace/Marian Villas, Ballymahon, Co Longford	14/12/2020
Longford County Council	20215	Permission to dispose of material which will be inert waste material on land 17000 cubic metres of (Class 1) (Table 1) so to raise the existing ground level by a maximum of one 1.5 mts into cells and return land back to agricultural use and all associated works.	Carrowmanagh, Killashee, Co Longford	14/12/2020
Longford County Council	20302	Permission for the construction of 5 no. houses and all associated works.	Tailors Lawn, Kenagh, Co Longford	07/04/2021
Roscommon County Council	21417	PART 8 development - Provision of Public Realm Enhancement Scheme. Redesign the existing carriageway & paved area along the N5 within the Village to provide a traffic calming effect & improve pedestrian infrastructure & safety.	N5 Termonbarry, Co Roscommon	
Longford County Council	21225	Ten year permission for a solar farm and all associated works.	Townlands of Ballynakill, Bunacloy and Middleton, near Killashee	20/10/2021
Roscommon County Council	21529	Part 8 development - Mid-Shannon Wilderness Park Greenway and associated works.	Cloontuskert , Ballyleague , Co. Roscommon	
Longford County Council	2275 (ABP-315485)	Permission for the demolition of Lough Ree Power Station (previously approved under ABP ref. PL14.125540). Construct and operate electricity grid services consisting of a battery storage system (BESS) and a synchronous condenser (Sync Con) and associated site works.	Aughamore, And Lanesborough , Co Longford	13/10/2023
Longford County Council	22160	Permission to demolish all existing pig/livestock houses and ancillary structures and to construct 3. No. pig houses and 2. No. ancillary manure storage tanks in accordance with animal	Ballynakill, Killashee, Co. Longford	24/08/2022

Planning Authority	App Ref.	Proposal	Address	Grant Date
		welfare and nitrates regulations together with all ancillary structures.		
Roscommon County Council	22581	Permission to demolish and dispose of existing structures on site consisting of 21 no. mushroom houses and an office building and store rooms and permission to construct 26 no. houses and all associated works.	Ballyleague Td., Lanesboro , Co. Roscommon	20/12/2023
Longford County Council	22275	Permission for an underground electrical cable and transformer compound which will connect permitted solar farms to the national grid via the proposed transformer compound at Lough Ree Power Station.	Kilnacarrow Ballynakill Cloonkeel Derryaroge Cloonbearla Mount Davys Cloonbony Aghamore, Lanesborough , Co Longford	19/05/2023
Longford County Council	22290 (ABP-316270)	Permission for the provision of 10 No. prefabricated glamping pods and all associated works.	Glebe, Cloondara, Co Longford	03/09/2024
Longford County Council	2360056	Permission for the construction of a Gas Insulated Switchgear (GIS) compound and all associated works.	Existing Lanesboro Air Insulted Switchgear Substation and site of the former Lanesborough Power Station, townlands of Aghamore and Lanesborough, Lanesborough County Longford	15/09/2023
Longford County Council	2360108	Permission for the replacement (“restringing”) of the existing overhead line circuit conductor wires with a new higher capacity conductor and all associated works.	Lanesborough Town , and Aghamore Townland , County Longford	27/10/2023
Roscommon County Council	23342	Permission for works to uprate the existing Lanesboro - Sliabh Bawn 100kV overhead line (OHL).	Sliabh Bawn, Co Roscommon	10/11/2023

Planning Authority	App Ref.	Proposal	Address	Grant Date
Longford County Council	23/108	Continued use of an existing guyed wind monitoring mast, with instruments, 100m in height for a further period of three years. The purpose of the mast is to assess the suitability of the company's adjacent lands for wind farm development. Previous planning application numbers: 15/86 and 20/183 on its lands.	Lough Bannow Bog, Derrynaskea, Co. Longford	09/01/2024
Longford County Council	2360124	Permission for the replacement ("restringing") of the existing overhead line circuit conductor wires with a new higher capacity conductor and all associated works.	Lanesborough Aghamore Knock Gorteengar Tullyvrane Lehery Magheraveen Cloonfore Derrygeel Derryshannoge Derraghan More Derraghan Beg Derryad Derrylough Derryweagh Foygh Cornacarta Tirlickeen Lismacmurrogh Lislom Moygh Drinan, Knappoge Barry Agharanag	17/11/2023
Longford County Council	ABP-318314	Permission for a 500 seat outdoor community amphitheatre.	Former Council Depot at Commons North Lime Quarry, Lanesborough, Co. Longford.	Undecided
Longford County Council	245	Permission for the construction of a holiday lodge site consisting of 9 no. 3 bed lodges, 4 no. 2 bed lodges, a manager's office, plant room and laundry, site entrance, internal road & footpaths, lighting, play area, boundary fence, wastewater treatment system and all associated works.	Foygh, Keenagh, Co. Longford	27/08/2024

Planning Authority	App Ref.	Proposal	Address	Grant Date
Longford County Council	2460040	Permission for the construction of an indoor equestrian arena and associated works	Derryshannogue, Lanesborough, Longford	22/05/2024
Longford County Council	2460132	Permission for the delivery of a network of walking and cycling trails on Bord Na Móna lands.	Bord Na Móna lands within the townlands of Cloonbony, Kilnacarrow Ballynakill Begnagh Corragarrow, and Cloonmore County Longford	07/01/2025
Longford County Council	2460168	Permission for a new Water Pumping Station (WPS) and associated infrastructure.	Lands off the L1164, east of Turreen Cross in the townlands of Lehery and Turreen, in County Longford	22/10/2024
Longford County Council	2460164 (ABP-320882)	Permission for change of use and building works to alter the building to create 11 apartments with all associated site development works.	Lands at Market Square, Longford Town, Co. Longford	Undecided
Roscommon County Council	2460534	Permission for the proposed construction of a floating jetty together with associated jetty ramp & footpath and all ancillary works.	Ballyleague, Lanesborough, Co. Roscommon.	Undecided
Longford County Council	2453	Permission to construct a steel framed community gym and all ancillary site works	Ballyrevagh, Newtowncashel, Co. Longford	12/02/2025
Roscommon County Council	2460559	Permission for works to uprate approximately 35.7km of the overall 35.82km of the existing Athlone to Lanesboro 110 kV overhead line (OHL) circuit.	Athlone 110kV substation in the townland of Monksland , Knockrocghery Moher Gardentown Toberreeoge Toberdan Feamore Corraclogh Kilteevan Kellybrook Srah Corboley Curry Cloontogher	Undecided

Planning Authority	App Ref.	Proposal	Address	Grant Date
			Derrycarbry Carrigeens Cloonaddra Clonsellan Lisfelim Coolshaghtena Co	
Longford County Council	2460287	Permission for works to uprate approximately 35.7km of the overall 35.82km of the existing Athlone to Lanesboro 110 kV overhead line (OHL) circuit.	Lanesboro 110 kV substation townlands of Aghamore and Lanesborough, Co. Longford	22/01/2025
Longford County Council	2460302	Permission for the demolition of existing out-buildings and the construction of 28no.residential units and all associated works.	Lands adjacent to Cois Abhann, Cloondara, Co.Longford	Undecided
Longford County Council	2460315	Permission for a battery energy storage system (BESS) comprising up to 896 no. battery energy storage enclosures and all associated works.	a c. 4.63 ha site within the former Lough Ree Power (LRP) Station , in the townlands of Aghamore and Lanesborough, Lanesborough (Lanesboro) Co. Longford	Undecided
Longford County Council	2460325	A 10 Year Planning Permission for a solar farm and energy storage compound with a total area of circa 130 hectares and all associated works.	Cornacarta Doonacurry Foygh Kilcommock Glebe Ledwithstown and Tirlickeen, Keenagh and Ballymahon, County Longford	Undecided

9.4 Conclusion of Assessment on Cumulative and In-combination Effects

The detailed assessment has been determined that the Project has neither caused nor will cause, adverse effects on the integrity of European Sites. A thorough evaluation of other developments within the vicinity, as described above, found no indication that this Project has contributed or could contribute to any adverse effects to European site when considered alongside other plans or projects.

This comprehensive analysis confirmed the absence of ecological or hydrological linkages that might result in additional or amplified negative effects. Furthermore, no potential for unforeseen consequences arising from interactions between this Project and other initiatives has been identified.

Looking ahead, the Remedial Phase of the Project will focus on rehabilitating the site by implementing rewetting and revegetation measures, facilitating the process of natural succession. The implementation of the proposed restoration plan is anticipated to deliver long-term ecological benefits within the Application Site, particularly through habitat regeneration and biodiversity enhancement. Additionally, these measures will promote improved downstream water quality, ensuring no detrimental effects on European Sites, even when assessed in conjunction with other projects and plans.

10. CONCLUDING STATEMENT

This rNIS provides an assessment of potential adverse effects on European Sites.

As outlined above, the Lough Ree SPA, the Ballykenny-Fishertown Bog SPA and the Lough Ree SAC, which were designated in 1995, 1996 and 2002 respectively. At the time of designation, peat extraction and associated activities were well established at the Application Site, resulting in a landscape dominated by cutover bog and bare peat.

Since 2000, the Application Site has been regulated by the EPA under IPC Licence Registration No. P0504-01 and has been subject to the conditions of that licence. The IPC licence primarily focuses on controlling and monitoring emissions to water. Given the nature of the activity, peat extraction has significant potential to increase suspended solids in surface water due to soil disturbance, drainage, and sediment runoff. The extraction process exposes bare peat surfaces, which are highly susceptible to erosion and washout, especially during heavy rainfall. This can lead to increased turbidity, reducing water quality and affecting aquatic life, deposition of fine sediments, which can smother fish spawning areas and invertebrate habitats, and potential transport of nutrients/contaminants, contributing to downstream pollution. The IPC licence requires the submission of an AER detailing emissions to water, waste management, resource consumption, air emissions, surface water monitoring, de-silting programmes, and bog rehabilitation progress. A review of 21 AERs, obtained through an EPA request, revealed no breaches of license conditions.

After a thorough examination, evaluation, and analysis, conducted in accordance with the best scientific knowledge and the conservation objectives of the European Sites, it has been determined, based on objective information, that the peat extraction activities and all associated works at the Application Site during the Extraction Phase have not adversely affect the integrity of any European Site. This conclusion holds true both in isolation and in combination with other plans or projects.

The assessment considered numerous factors, including the potential impacts on habitat quality, species populations, and ecosystem functions. The findings indicate that the measures in place are sufficient to prevent any significant negative effects on the designated conservation areas. Furthermore, the proposed rehabilitation plans are designed to enhance the ecological value of the site, ensuring that any potential risks are mitigated effectively.

Additionally, the proposed rehabilitation efforts are expected to contribute positively to the ecological value of the site and surrounding area, enhancing habitat conditions for protected species and restoring natural hydrological functions. These measures align with broader conservation goals, ensuring that any effects from past activities are mitigated and that future ecological integrity is maintained.

In summary, the comprehensive analysis confirms that the activities at the Application Site are compatible with the conservation goals of the European Sites, safeguarding their ecological integrity now and in the future.

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Appendix 1 REMEDIAL APPROPRIATE ASSESSMENT SCREENING REPORT

Appendix 2 DERRYROGUE SUBSITE SURVEY - FITZGERALD ECOLOGY

Habitat Survey at Derryadd Proposed Wind Farm Subsite, Lanesborough, Co. Longford

Report for Bord na Móna

By Alexis FitzGerald, *FitzGerald Ecology*

May 2023

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1. INTRODUCTION

TOBIN Consulting Engineers commissioned FitzGerald Ecology to produce a habitat study of a subsite within a proposed wind farm site in Derryadd, near Lanesborough, Co. Longford, in April 2023. This study will inform ecological impact and appropriate assessments being carried out on the proposed development.

A full habitat mapping and assessment study of the habitats (including EU Habitats Directive Annex I habitats, if present) on site was conducted, along with a detailed summary report outlining and describing the various habitats present on the subsite, including detailed habitat maps and species lists. This report is presented herein.

The study area for this habitat survey is displayed in Figure 1. The subsite encompasses a *c.* 12 hectare area of cutover raised bog, which has been gradually recolonised by areas of scrub, (immature) woodland, grassland and wetlands, including fen. The proposed wind farm site is generally flat in aspect.

2. SURVEY METHODOLOGY

The habitat/plant walkover surveys were carried out by Alexis FitzGerald B.A. M.Sc. on the 14th April 2023. All of the habitats within the subsite were mapped on GIS according to Fossitt (2000) Level 3 classification, and with reference to Smith *et al.* (2011). The abundance of each vascular plant species (and also some relevant bryophyte indicator species) present in each habitat was recorded using the Domin scale[1]. EU Habitats Directive Annex I habitats were classified as per the European Commission (2013), also with reference to the corresponding national habitat survey reports and descriptions, particularly NPWS (2019) and Perrin *et al.* (2014). The nomenclature for the Annex I habitats also follows the European Commission (2013), with any abbreviated names for the habitats following NPWS (2019). Vascular plant taxonomy and nomenclature follows Stace (2019), whilst bryophyte taxonomy and nomenclature follow Atherton *et al.* (2010). Ecological evaluations were made according to the criteria as set out by the National Roads Authority (2009) (Appendix II). All of the relevant data were recorded within the shapefile metadata.

3. SURVEY RESULTS

Legally Protected and Rare Flora

No plant species listed on the *Flora (Protection) Order 2022* were recorded during the field survey in 2023. One locally rare native species was recorded just outside the study area to the south and south-east, namely, *Juncus subnodulosus*. It was found in exposed peat and scrub habitats. According to the plant distribution maps of Botanical Society of Britain and Ireland (2023), this species should be considered rare in Co. Longford. This species is listed as Least Concern (LC) by Wyse Jackson *et al.* (2016).

[1] The Domin scale is used to estimate the abundance of a particular species in a particular area of vegetation. The scale utilised here is from + to 10, each stage representing a range of percentage values from + = cover of <1% and a single individual, to 10 = cover of 91-100%.

Non-native (Invasive) Flora

No plant species listed on the Third Schedule of the *European Communities (Birds and Natural Habitats) Regulations, 2011* were recorded during the field survey in 2023. Furthermore, no (non-listed) non-native/introduced plant species were recorded.

Habitats

The habitat types (and/or mosaics) recorded within the study area according to the Heritage Council classification system (Fossitt, 2000) are described in detail in section 3.1 (and are also mapped in Figure 2). Full plant species lists (with Domin abundance estimates for each species) for each recorded habitat are also presented in Appendix I of this report. Any EU Habitats Directive Annex I habitats recorded on the study area are presented in Figure 3.

The following 12 habitat types (and/or mosaics) were recorded within the study area during the field survey in 2023:

- Other artificial lakes and ponds (FL8)
- Dry calcareous and neutral grassland (GS1)
- Recolonising bare ground (ED3)
- Scrub (WS1)
- Wet grassland (GS4)
- Dense bracken (HD1)
- Oak-ash-hazel woodland (WN2)
- Cutover bog (PB4)
- Immature woodland (WS2)
- Buildings and artificial surfaces (BL3)
- Rich fen and flush (PF1)
- Calcareous springs (FP1)

Figure 1. Derryadd study area (in red) – background mapping is © Google Satellite

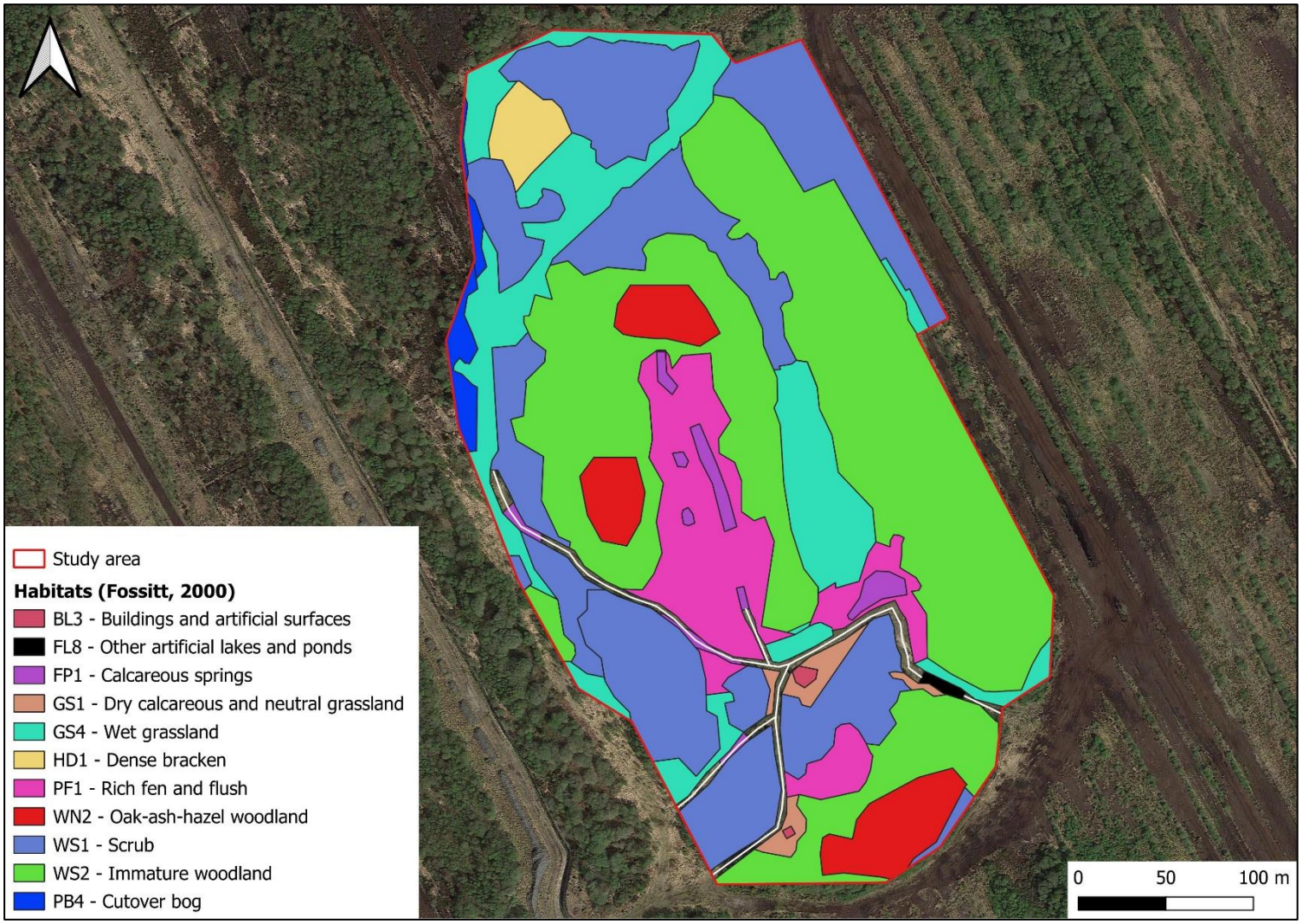

Figure 2. All Fossitt (2000) habitats recorded within the study area during the field survey in 2023 – the dominant habitat in each polygon is displayed here (habitat mosaics do occur but are not displayed for ease of viewing) – background mapping is © Google Satellite

Figure 3. All EU Habitats Directive Annex I habitats recorded within the study area during the field survey in 2023 – background mapping is © Google Satellite

3.1. HABITATS DESCRIPTIONS

Other artificial lakes and ponds (FL8)

Other artificial lakes and ponds (FL8) (see Plate 1) habitat occurs as one narrow ponding of rainwater in low-lying ground in the south-east of the study area. The water was likely calcareous in nature, as indicated by the presence of the charophyte species *Chara vulgaris*. However, no marl was noted here, which would indicate calcareous springs (FP1) habitat. The pond also contains *Juncus articulatus,* with lesser quantities of *Juncus effusus, Glyceria* sp., *Alisma plantago-aquatica, Juncus inflexus, Agrostis stolonifera* and *Typha latifolia*.

This habitat is considered to be of **Local importance (higher value)**, due to the relatively high species diversity present here and its habitat potential (petrifying spring (FP1) habitat may form here over time – see below).

Plate 1. Other artificial lakes and ponds (FL8) habitat in the south-east of the study area

Dry calcareous and neutral grassland (GS1)

Dry calcareous and neutral grassland (GS1) (see Plate 2) habitat is scattered by pathways and beside old buildings in the south of the study area. The substrate here is likely to be neutral to calcareous, given the plant species composition here. This habitat has a relatively high level of plant species diversity, including such grass species as *Festuca rubra* agg. and *Agrostis capillaris,* and herbaceous species such as *Plantago lanceolata*, *Trifolium pratense* and *Succisa pratensis.*

The grassland on the study area does not correspond with the EU Habitats Directive Annex I habitat [6210] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometea). This is because there were no positive indicator species for this habitat recorded within the study area, as shown by the recorded species list for the habitat in Appendix I.

This habitat is considered to be of **Local importance (higher value)**, due to the relatively high species diversity present here.

Plate 2. Dry calcareous and neutral grassland (GS1) habitat in the south of the study area

Recolonising bare ground (ED3)

Recolonising bare ground (ED3) habitat can be found along old trackways throughout the south of the study area. These trackways have been gradually recolonised by vegetation over time. Some of the ED3 habitat here has even become partly re-vegetated (in a mosaic) with wet grassland (GS4), and in one location in the south of the study area, with rich fen and flush (PF1) (see separate habitat accounts below, also see Figure 3). The exposed gravel material has been recolonised by a number of plant species, namely, *Juncus effusus, Taraxacum* agg., *Ranunculus repens, Potentilla anserina, Equisetum arvense, Carex flacca, Juncus articulatus* and *Calliergonella cuspidata*.

This habitat is considered to be of **Local importance (higher value)**, due to the relatively high species diversity present here.

Scrub (WS1)

Scrub (WS1) (see Plate 3) habitat was recorded widely across the study area and constitutes one of the more dominant habitat types by area. This habitat is characterised by the dominance of such shrub species as *Rubus fruticosus* agg.*, Ulex europaeus, Salix cinerea* subsp. *oleifolia* and *Betula pubescens*. In the ground layer of these shrubs, some tall and/or shade-tolerant, perennial grass species occur, including *Arrhenatherum elatius,* as well as creeping herbaceous species like *Galium aparine* and low woody shrubs like *Hedera helix*.

This habitat is considered to be of **Local importance (higher value)**, due to the relatively high species diversity present here and its broad habitat potential.

Plate 3. Scrub (WS1) habitat in the south of the study area

Wet grassland (GS4)

Wet grassland (GS4) habitat was recorded widely across the study area, however, it was often recorded in vegetation mosaics with scrub (WS1) and dense bracken (HD1). Both of these latter habitats are beginning to overcome many areas of wet grassland on the study area over time due to encroachment. This habitat is characterised by having an increased influx of freshwater near the soil surface relative to GS2/GS1 grassland, which allows this grassland type to support some wetland plant species. As a result, the habitat within the study area is dominated by such grass species as *Agrostis stolonifera* and *Molinia caerulea*, alongside such bryophyte species as *Calliergonella cuspidata*. Occasional species in this habitat include *Ranunculus repens* and *Succisa pratensis*.

This habitat is considered to be of **Local importance (higher value)**, due to the relatively high species diversity present here.

Dense bracken (HD1)

Dense bracken (HD1) habitat is present across the study area, however, it is rarely the dominant habitat in the vegetation mosaics here, frequently being recorded in mosaics with larger quantities of scrub (WS1) and wet grassland (GS4). A dominant area of HD1 does occur, however, in the north of the study area (see Figure 2). This habitat is indeed dominated by the characteristic fern *Pteridium aquilinum*, which establishes extensive rooting systems in the deeper soils. However, a few other shrub species are competing with this dominant species here, including *Rubus fruticosus* agg., and

underneath the cover of these species, a few herbaceous species occur, including *Agrostis stolonifera* and *Chamerion angustifolium.*

This habitat is considered to be of **Local importance (lower value),** due to its low species diversity.

Oak-ash-hazel woodland (WN2)

Oak-ash-hazel woodland (WN2) (see Plate 4) habitat occurs in three patches, surrounded by younger immature woodland (WS2), in both the south and north of the study area. These woodlands appear to be substantially older than the surrounding immature woodland, as indicated by the size and girth of trees here. This dry semi-natural woodland habitat is dominated by the tall canopy species *Fraxinus excelsior*. The understorey of the woodland here is very densely vegetated by *Rubus fruticosus* agg. and *Hedera helix,* with lesser quantities of *Polystichum setiferum, Lonicera periclymenum* and *Asplenium scolopendrium.* The bryophyte layer contains *Kindbergia praelonga* and *Eurhynchium striatum*.

Some areas of WN2 habitat correspond with the EU Habitats Directive Annex I habitat [91A0] Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles. However, the area of WN2 habitat within the study area is not classified as such due to the lack of sufficient key indicator species for this habitat type, including *Quercus* species. This habitat is considered to be of **County importance**, due to its relatively well-developed woodland vegetation, which is locally scarce.

Plate 4. Oak-ash-hazel woodland (WN2) vegetation within the south of the study area

Cutover bog (PB4)

Cutover bog (PB4) habitat occurs as two narrow isolated strips of cutover raised bog in the north-west of the study area and grades into scrub (WS1) habitat immediately to the east. This habitat generally occurs on deep peat substrate. *Calluna vulgaris*, *Erica tetralix* and *Molinia caerulea* were all recorded

within the vegetation, the former species being dominant. The herbaceous species *Carex panicea* and the bryophyte species *Pseudoscleropodium purum* and *Hypnum jutlandicum* were also recorded. This vegetation type has close affinities with the '*Calluna vulgaris* cutover bog (LS1)' habitat type of Smith & Crowley (2020).

Some areas of PB4 habitat correspond with the EU Habitats Directive Annex I habitat [7150] Depressions on peat substrates of the Rhynchosporion. However, the areas of PB4 habitat within the study area are not classified as such due to the lack of sufficient key indicator species for this habitat type, including *Rhynchospora alba*. Despite its cutover state, this habitat is considered to be of **County importance**, given the scarcity of the habitat within the county.

Immature woodland (WS2)

Immature woodland (WS2) (see Plate 5) habitat occurs widely across the study area, and is the most dominant habitat on the study area, along with scrub (WS1). This immature woodland appears to have formed by natural means from scrub habitat in this under-managed area and is currently dominated by the canopy species *Betula pubescens* and *Salix cinerea* subsp. *oleifolia*. *Rubus fruticosus* agg., *Hedera helix, Ulex europaeus* and *Arrhenatherum elatius* occur within the undergrowth. This habitat is considered to be of **Local importance (higher value),** due to its broad habitat potential to form mature woodland over time, despite its current immature status.

Plate 5. Immature woodland (WS2) vegetation within the south of the study area

Buildings and artificial surfaces (BL3)

Buildings and artificial surfaces (BL3) habitat within the study area is represented by a few old farm buildings and other built structures located in the south of the study area. This habitat is devoid of plant species and so is considered to be of **Negligible importance**.

Rich fen and flush (PF1)

Rich fen and flush (PF1) (see Plate 6) habitat was recorded in three-four separate extensive patches in the south of the study area. These areas of flush habitat adjoin mostly immature woodland (WS2) and scrub (WS1) on the drier areas adjacent to the wetter fen. This habitat is wet and highly mineral-rich and calcareous in nature, being as it is directly adjacent to a number of calcareous springs (FP1). Grass, rush and sedge species are the dominant vascular plants in this vegetation, with *Juncus inflexus, Carex nigra, Carex flacca* and *Molinia caerulea* all being widespread. The herbaceous and bryophyte species *Succisa pratensis, Ranunculus flammula, Carex panicea, Campylium stellatum, Scorpidium cossonii* and the orchid *Dactylorhiza* species are all occasional, whilst the bryophyte species *Fissidens adianthoides, Didymodon tophaceus* and *Bryum pseudotriquetrum* all occur as rarities in the vegetation. Scattered tufa accumulation was observed around these brown mosses in parts of the vegetation, however, the petrifying spring (FP1) habitat (see below) represents the highest accumulation of this tufa.

Of the species recorded within this vegetation, the following 11 are considered to be positive indicator species for the Annex I habitat [7230] Alkaline fens, according to NPWS (2019): *Succisa pratensis, Campylium stellatum, Scorpidium cossonii, Molinia caerulea, Carex flacca, Carex panicea, Ctenidium molluscum, Ranunculus flammula, Galium palustre, Fissidens adianthoides* and *Carex nigra*. Therefore, given the abundance of positive indicator species for this Annex I habitat within the vegetation on the study area, and the accordance of the vegetation composition with its description in NPWS (2019) and Perrin *et al.* (2014), all of the rich fen and flush habitat within the study area has been classified as [7230] Alkaline fen.

This habitat is considered to be of **National importance**, given the scarcity of such wetland features on a national scale, their decreasing area nationally, and the fact that the examples on the study area occur within the favourable reference range for this EU Annex I habitat in Ireland (NPWS, 2019).

Plate 6. Rich fen and flush (PF1) vegetation within the south of the study area

Calcareous springs (FP1)

Calcareous springs (FP1) (see Plates 7 and 8) habitat was recorded in scattered patches across the south of the study area, adjoining rich fen and flush (PF1) habitat. No spring heads were observed, and the tufa accumulation here appears to be diffuse and widespread across the habitat. The habitat appears to have formed in low-lying former access trackways, hence their apparent linear distribution in most areas (see Figure 3). Brown moss species were recorded widely growing out of the tufa deposits. These include *Bryum pseudotriquetrum* and *Campylium stellatum*. The herbaceous species *Mentha aquatica* was also found to be widespread.

All of the spring habitats within the study area have been classified as the Priority EU Annex I Habitat [*7220] Petrifying springs with tufa formation (Cratoneurion), as per its definition within the *Interpretation Manual of European Union Habitats* (CEC, 2013), and the description of the habitat in the Irish context within Perrin *et al.* (2014) and NPWS (2019). Work on the classification of Irish petrifying spring vegetation communities was undertaken by Lyons & Kelly (2016), however the authors acknowledge that many of the sites described in their report do not conform strictly to the EU Annex I habitat type. NPWS (2019) has adapted a list of positive indicator species for the EU Annex I habitat from Lyons and Kelly (2016), however the definition of the habitat in the Irish context remains poorly defined. Perrin *et al.* (2014) stress the importance of certain brown moss and tufa presence, in conjunction with low quantities of sedges.

Indeed, all of the petrifying spring habitat recorded on the study area contained abundant tufa, as well as brown moss representation and low sedge cover. Furthermore, seven positive indicator species of this EU Annex I habitat (as outlined within NPWS (2019)) were recorded at calcareous

springs within the study area, namely *Aneura pinguis, Campylium stellatum, Bryum pseudotriquetrum, Carex panicea, Mentha aquatica, Juncus articulatus* and *Anagallis tenella*.

This habitat is considered to be of **National importance**, given the scarcity of such wetland features on a national scale and their current "*inadequate*" conservation status in Ireland (NPWS, 2019).

Plate 7. Calcareous springs (FP1) habitat within the south of the study area

Plate 8. Calcareous springs (FP1) habitat within the south of the study area, showing the abundant deposited tufa and some inundated bryophytes, including scattered plants of *Bryum pseudotriquetrum*

4. SUMMARY

This report presents a summary of findings from a habitat field survey in the spring of 2023 at Derryadd, near Lanesborough, Co. Longford. A total of twelve separate habitat types were recorded across the study area, including two EU Habitats Directive Annex I habitats, namely, [7230] Alkaline fen, and the Priority habitat [*7220] Petrifying springs with tufa formation (Cratoneurion). Protecting the quality and integrity of the Annex I habitats and their associated plant species on site will be an important focus going forward. These issues will be assessed in detail in ecological impact and appropriate assessments to be completed for the proposed development.

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Appendix I: Species Lists

Plant Species Lists per Habitat:

Scrub (WS1)		Dense bracken (HD1)		Rich fen and flush (PF1)	
Scientific Name	**Domin**	**Scientific Name**	**Domin**	**Scientific Name**	**Domin**
Rubus fruticosus agg.	8	*Pteridium aquilinum*	10	*Juncus inflexus*	7
Arrhenatherum elatius	5	*Rubus fruticosus* agg.	4	*Calliergonella cuspidata*	6
Ulex europaeus	8	*Agrostis stolonifera*	3	*Succisa pratensis*	4
Crataegus monogyna	3	*Chamerion angustifolium*	2	*Dactylorhiza* species	2
Galium aparine	6	*Pteridium aquilinum*	10	*Campylium stellatum*	4
Salix cinerea subsp. *oleifolia*	6			*Scorpidium cossonii*	4
Betula pubescens	6			*Molinia caerulea*	6
Hedera helix	4			*Carex flacca*	4
				Carex panicea	5
				Ctenidium molluscum	3
				Thuidium species	2
				Epilobium palustre	1
				Ranunculus flammula	2
				Galium palustre	1
				Cirsium arvense	2
				Fissidens adianthoides	2
				Didymodon tophaceus	1
				Bryum pseudotriquetrum	1
				Carex nigra	6

Dry calcareous and neutral grassland (GS1)		Immature woodland (WS2)		Other artificial lakes and ponds (FL8)	
Scientific Name	**Domin**	**Scientific Name**	**Domin**	**Scientific Name**	**Domin**
Succisa pratensis	5	*Rubus fruticosus agg.*	7	*Juncus effusus*	3
Dactylis glomerata	3	*Arrhenatherum elatius*	5	*Glyceria* sp.	3
Agrostis capillaris	7	*Ulex europaeus*	7	*Chara vulgaris*	3
Festuca rubra agg.	6	*Galium aparine*	6	*Alisma plantago-aquatica*	3
Plantago lanceolata	3	*Salix cinerea* subsp. *oleifolia*	7	*Juncus articulatus*	6
Trifolium pratense	3	*Betula pubescens*	7	*Juncus inflexus*	3
Cirsium arvense	3	*Hedera helix*	4	*Agrostis stolonifera*	3
Galium saxatile	3	*Molinia caerulea*	4	*Typha latifolia*	2
Taraxacum agg.	3				
Calliergonella cuspidata	5				
Filipendula ulmaria	3				

Cutover bog (PB4)		Wet grassland (GS4)		Oak-ash-hazel woodland (WN2)	
Scientific Name	**Domin**	**Scientific Name**	**Domin**	**Scientific Name**	**Domin**
Calluna vulgaris	9	*Ranunculus repens*	4	*Fraxinus excelsior*	9
Erica tetralix	3	*Anthoxanthum odoratum*	4	*Rubus fruticosus* agg.	7
Molinia caerulea	6	*Succisa pratensis*	5	*Kindbergia praelonga*	4
Ulex europaeus	2	*Molinia caerulea*	5	*Eurhynchium striatum*	3
Hypnum jutlandicum	4	*Angelica sylvestris*	2	*Lonicera periclymenum*	3
Pseudoscleropodium purum	3	*Agrostis stolonifera*	8	*Pteridium aquilinum*	3
Carex panicea	3	*Pseudoscleropodium purum*	5	*Asplenium scolopendrium*	3
Rubus fruticosus agg.	2	*Calliergonella cuspidata*	6	*Hedera helix*	6

Cutover bog (PB4)		Wet grassland (GS4)		Oak-ash-hazel woodland (WN2)	
Calluna vulgaris	9			*Polystichum setiferum*	4
Erica tetralix	3				
Molinia caerulea	6				
Ulex europaeus	2				
Hypnum jutlandicum	4				
Pseudoscleropodium purum	3				
Carex panicea	3				
Rubus fruticosus agg.	2				

Recolonising bare ground (ED3)		Calcareous springs (FP1)	
Scientific Name	**Domin**	**Scientific Name**	**Domin**
Juncus effusus	6	*Bryum pseudotriquetrum*	2
Taraxacum agg.	4	*Aneura pinguis*	1
Ranunculus repens	5	*Carex panicea*	3
Potentilla anserina	3	*Mentha aquatica*	5
Equisetum arvense	4	*Juncus articulatus*	3
Carex flacca	5	*Anagallis tenella*	2
Juncus articulatus	5	*Campylium stellatum*	2
Calliergonella cuspidata	5		

Appendix II: Criteria for Ecological Evaluations[2]

International Importance:

- 'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation.
- Proposed Special Protection Area (pSPA).
- Site that fulfils the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended).
- Features essential to maintaining the coherence of the Natura 2000 Network.
- Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive.
- Resident or regularly occurring populations (assessed to be important at the national level) of the following:
    - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or
    - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive.
- Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971).
- World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972).
- Biosphere Reserve (UNESCO Man & The Biosphere Programme).
- Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979).
- Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979).
- Biogenetic Reserve under the Council of Europe.
- European Diploma Site under the Council of Europe.
- Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).

National Importance:

- Site designated or proposed as a Natural Heritage Area (NHA).
- Statutory Nature Reserve.
- Refuge for Fauna and Flora protected under the Wildlife Acts.
- National Park.
- Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park.
- Resident or regularly occurring populations (assessed to be important at the national level) of the following:
    - Species protected under the Wildlife Acts; and/or
    - Species listed on the relevant Red Data list.
- Site containing 'viable areas' of the habitat types listed in Annex I of the Habitats Directive.

County Importance:

- Area of Special Amenity.
- Area subject to a Tree Preservation Order.
- Area of High Amenity, or equivalent, designated under the County Development Plan.
- Resident or regularly occurring populations (assessed to be important at the County level) of the following:
    - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
    - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
    - Species protected under the Wildlife Acts; and/or
    - Species listed on the relevant Red Data list.
- Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance.
- County important populations of species, or viable areas of semi-natural habitats or natural heritage features identified in the National or Local BAP, if this has been prepared.
- Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county.
- Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.

[2] Framework and table is taken and adapted from: National Roads Authority (2009). *Guidelines for Assessment of Ecological Impacts of National Roads Schemes*. Report for National Roads Authority.

Local Importance (higher value): • Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared; • Resident or regularly occurring populations (assessed to be important at the Local level) of the following: - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; - Species protected under the Wildlife Acts; and/or - Species listed on the relevant Red Data list. • Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality; • Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.
Local Importance (lower value): • Sites containing small areas of semi-natural habitat that are of some local importance for wildlife; • Sites or features containing non-native species that are of some importance in maintaining habitat links.

Appendix 3 STILLWATERS CONSULTANCY

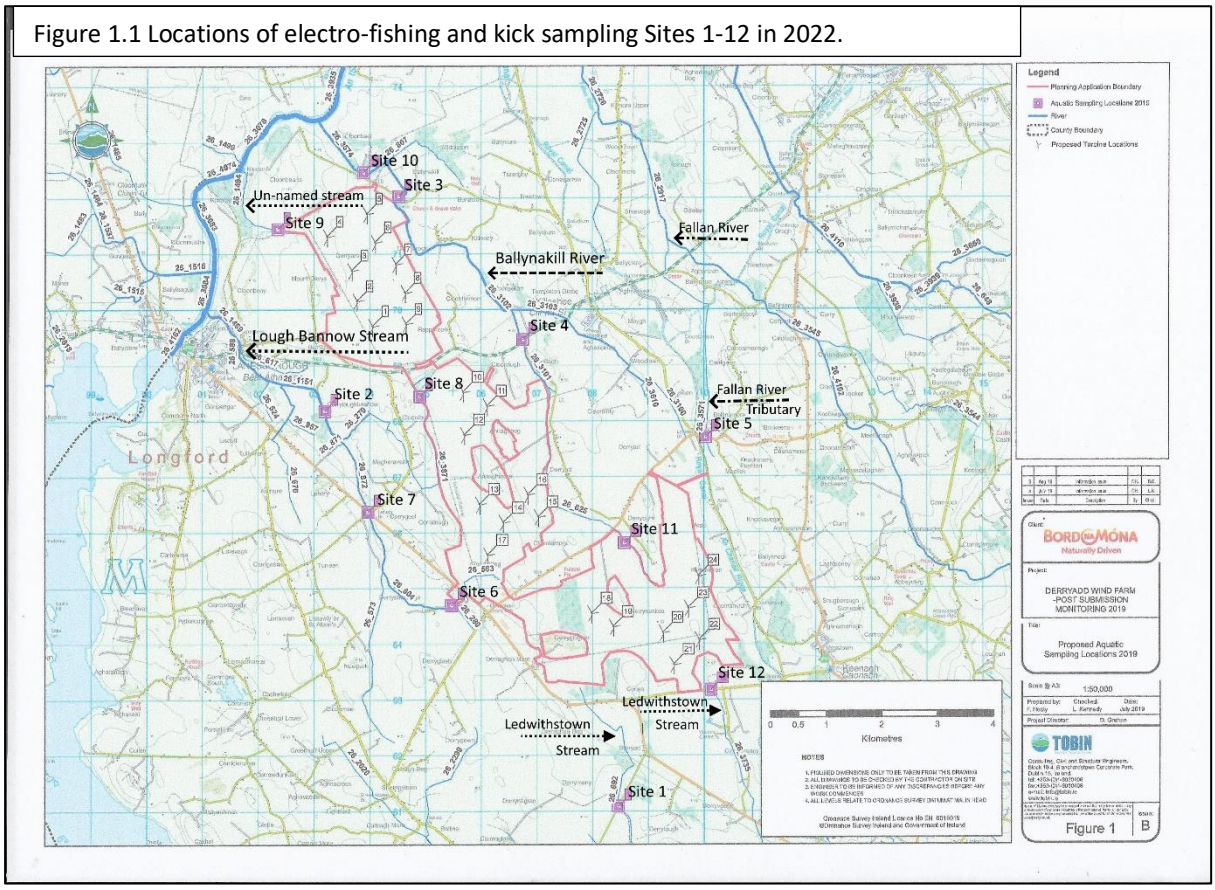
ELECTRO-FISHING AND MACROINVERTEBRATE SURVEYS ON RIVER SITES IN THE DERRYADD AREA CO.LONGFORD

1.0 Introduction

Stillwaters Consultancy was commissioned by Tobin Engineering Consultants to carry out:

1) An electro-fishing survey on 12 sites previously chosen by Tobin for a macroinvertebrate survey.
2) Observations on the Fishery Value of these streams at the chosen sites.
3) Macroinvertebrate samples from these sites.
4) The status of Otters from observations at the sites.

Figure 1.1 Locations of electro-fishing and kick sampling Sites 1-12 in 2022.



The sites covered 5 rivers or streams, Fig 1.1. The Lough Bannow Stream and the Ballynakill River are not marked on the Ordanance Survey (OSI), Discovery Series, No. 40 but are designated on the EPA database. The Ballynakill, (sites 10,3,4, and 11) runs North entering the River Shannon above Lanesborough, The Loughbannow Stream, (sites 2,7,6 and 8) is a similar sized stream flowing North and enters the River Shannon just above Lough Ree. Two sites 12 and 1 are near the source of the Ledwithstown River to the South. Downstream the river is designated as the Bilberry River on the (OSI)map, No.40. Site 5, is a tributary of the Fallan river which flows North to join the Camlin River. Site 9 is on an unnamed stream draining the bog north of Lanesborough and enters the Shannon through Kilnacarrow wood.

2.0 Materials and Methods

Where possible the sites were electro-fished and assessments of the fishery value of the sites were made. A macroinvertebrate sample taken, and the area around each site was examined for signs of otter activity.

2.1 Electro-fishing

A timed (10 minute) electro-fishing method (Matson et al., 2017) was used. Timed surveys were carried out at sites 2, 3, 4, 5 and 10. It did not prove possible to provide timed surveys at other sites because of their physical nature. Sites 1, 6, 7, 8 and 12 were unsuitable because there was no open water and/or little flow due to excessive instream vegetation, but spot fishing was carried out in isolated pockets. There was excessive depth over a soft substrate at site 11, so wading was not possible. Site 9 had no areas suitable for electro-fishing.

The electro-fishing equipment used was a Smith-root LR-24 portable electro-fisher backpack. The settings used were 40 Hertz @250volts with a 18% duty cycle. Fishing was carried out moving upstream.

2.2 Fishery value

The fishery value of the sites was assessed based on results from electro-fishing, the substrate, depths, flows and bank configuration. The sequences of riffle and deep flow and the presence of instream vegetation was a major consideration.

2.3 The macroinvertebrate fauna.

Aquatic invertebrates provide information on the quality of the river water. Aquatic invertebrates are divided into 5 'Indicator Groups' based on their sensitivity to pollution:

Group A- Very Sensitive
Group B -Sensitive
Group C- Tolerant
Group D -Very Tolerant
Group E -Most Tolerant

Macro-invertebrate samples were converted to Q-ratings as per Toner et al. (2005). All riverine samples were taken with a standard kick sampling hand net (250mm width, 500µm mesh size) from areas of riffle/glide utilising a three-minute sampling effort. This included the washing of large cobble and or small boulder at each survey site.

Kick samples were taken at the 12 sites and Q values determined. The samples were live sorted and identified to family level, Appendix 1.

2.4 Otters

Otters*[3] maintain territories and will defend their stretches of riverbank or lake shore from other otters. In lowland rivers otters only need to maintain small territories (1- 2km), but on smaller or less productive rivers where food tends to be less abundant, otter territories need to be larger.

An otter usually maintains numerous couches and holts within its territory. Couches hidden in extensive reed beds, or in dense scrub. Holts can be found underground among rocks or caves but can be excavated in peat banks. In general, otters exploit a narrow strip of habitat along a river or stream.

The otter is an opportunistic feeder with a varied diet. Fish are the most important food, but crayfish can be important locally.

Signs of otter activity including spraints and bank slides were searched for at the sites surveyed. Areas where couches or holts were likely were examined.

*[3] Otter are listed in Appendix II of the Bern Convention (1982)
And protected under the EU Habitats Directive

3.0 The Survey

The sites 1-12, surveyed over three days, 16-18 September 2022, are shown in Figure 1.

The species recorded were:
3-spined stickleback (Gasterosteus aculeatus)
Trout (Salmo trutta)
Pike (Esox Lucius)
Stone loach (Barbatula barbatula)
Roach (Rutilus rutilus)
Tench (Tinca tinca)
Gudgeon (Gobio gobio)
Brook/River Lamprey amnocoete (Lampetra sp.)*2
White clawed crayfish (Austropotamobius pallipes)*1

Lengths are given in centimetres (cm). Fork lengths are recorded for trout and full lengths for other species. The carapace length is given for crayfish.

The survey complied with the Certificate of Authorisation provide by the Department of Communications, Climate Action & Environment, see Appendix 3. The Department of Housing, Local Government and Heritage was informed of the survey.

*1 protected under both Irish law (Wildlife Act 1976) and the EU Habitats Directive Annexes II and V. It is classified as endangered in the (IUCN) Red List. It is listed in Appendix III of the Bern Convention
*2 Brook and river Lamprey are listed in Annex II of the Habitats Directive and in Appendix III of the Bern Convention.

3.1 Site 1, Ledwithstown Stream

Photo 3.1.1 showing overgrown nature of Site 1

Photo 3.1.2 Downstream view of Site 1

Site Description: This Site is in the upper reaches of the Ledwithstown. It is a deep canalised (trapezoidal shaped) lowland depositing stream, 1.5m wide with 4-5m high banks. Photo 3.1.1. The stream had 0.2-0.3m deep peat-stained water. The flow profile was dominated by slow moving glide with very localised riffle, Photo 3.1.2. The bed comprised of gravels with heavy peat sedimentation. The channel was heavily overgrown with macrophytes including branched bur reed (Sparganium erectum), reedmace (Typha latifolia) and water mint (Mentha aquatica). The riparian areas were comprised of dense gorse, hedge bindweed, great willowherb and grey willow bordering cutover lowland blanket bog.

Fisheries Value: It was only possible to carryout spot electro-fishing at this site and no fish were recorded. The channel was not of value to fish or crayfish due to heavy sedimentation, limited flows, and dense vegetation growth.

Macroinvertebrates: Kick sampling analysis assessed this site as having a Q rating of 3, Appendix 1. The absence of clean water along with EPA indicator groups A and B and the dominance of Group C and D pollution indicators resulted in the **Q3** poor status biological water quality rating recorded.

Otter: No evidence of otters was recorded.

3.2 Site 2, Lough Bannow Stream

Photo 3.2.1 Showing U shaped banks.

Photo 3.2.2 Showing instream vegetation.

Site Description: This was a trapezoidal heavily modified lowland river channel that was artificially deepened and straightened as part of historical drainage, Photo 3.2.1. The channel was 2.5-3m wide with bank heights of 2.5-3m and 0.5-1m deep with a bed of gravel and soft silt. The steep banks supported bramble, great willowherb, wild angelica, rank grasses and willow scrub. The channel was bordered by mature sitka spruce plantation and dry grassy meadows. The channel had heavy cover of fool's watercress, water plantain with (Potamogeton lucens) and (Callitriche stagnalis) locally.The duckweed species (Lemna trisulca) and (Lemna minor) were abundant in the channel indicating enrichment, Photo 3.2.2.

Fisheries Value: A timed electro-fishing was undertaken but only a single pike 29.5cm was detected. There was no fisheries value for salmonids but was considered of value for coarse fish, as it was deep and slow flowing. Given the time of year, autumn these species are likely localised in the channel.

Macroinvertebrates. The absence of clear water, and the dominance of group C and D pollution indicators resulted in the Q3 poor status biological water quality rating recorded at Site 2, Appendix 1.

Otter: Poor bank and river quality for otter and no visable signs found.

3.3 Site 3, Ballynakill River

Photo 3.3.1 The overgrown nature of site

Photo 3.3.2 Canal like aspect of Site 3

Site Description: This was a highly modified lowland depositing watercourse that has been deepened and straightened historically (evident dredge berms and elevated banks). The site was dominated by glide habitat with very localised riffle upstream of the culvert at the road crossing, Photo 3.3.1. Bank height was 2-4m and river width of 3-4m with depth of between 0.2m to 0.5m. The channel had very localised branched bur-reed, yellow water lily and common duckweed species, often found in channelised peatland rivers. The riparian zone comprised of hawthorn, blackthorn and grey willow with bramble, bracken, bindweed, and bittersweet scrub. Downstream of the culvert reed sweet grass was common in riparian areas.

Fisheries Value: Considered of some value to coarse fish and salmonids given there was areas of glides and gravel substrate with moderate flow. A timed survey was carried out but no fish were recorded. Spawning and nursery value is diminished given historical drainage maintenance and absence of shallower riffle zones. The channel was not considered of value to crayfish given historical drainage and a substrata with heavy siltation. This also diminished the spawning and nursery value for brown trout and none recorded in the current survey. Downstream of the culvert crossing the water was stagnant with very deep peat-stained water and was only of value for coarse fish, Photo 3.3.2

Macroinvertebrates: Site 3 had EPA group A and B clean water indicator taxa present, Appendix 1. However, the sample composition was dominated by group C moderate water quality indicator species with smaller numbers of group D taxa. This accounted for the moderate (Q3-4) biological water quality status recorded at the site.

Otters: There were no signs of otter at this site.

3.4 Site 4, Ballynakill River

Photo 3.4.1 Showing relatively open water.

Photo 3.4.2 Showing the high banks.

Site Description: This is a lowland depositing watercourse exhibiting deepened and straightened with a U-shaped channel profile, Photo 3.4.1. The channel was 2-3m wide with bank height of 4-5m and water depths between 0.2m and 0.4m, Photo 3.4.2. The bed comprised of gravel but was heavily silted. The flow profile was dominated by glide habitat with very localised riffle. The channel supported frequent branched bur-reed, common water starwort and small patches of (Potamogeton berchtoldii). The riparian zone comprised of grey willow, blackthorn, hedge bindweed, great willowherb, and bramble. The bordering land was predominantly grassland. The channel downstream of culvert improves as it changes to a V shape flowing through mixed broadleaved woodland. Here the channel was predominantly glide with cobble and gravel improving the salmonid nursery and spawning value.

Fisheries Value: There was moderate nursery area upstream of the culvert at the road crossing, improving to good nursery and spawning downstream given a better river profile with more riffle with associated cobble and gravels. The site was of no value for lamprey, despite some soft sediment because of the compacted bed, and none were recorded. One crayfish was taken during electro-fishing 2.5cm but small numbers were observed escaping in the sediment. Two three spined sticklebacks, (4.6, 4.1cm) were recorded. Trout were present in low numbers (13) but both 0+ and older were recorded, Table 3.4.1. The channel was considered a moderate quality trout nursery and spawning area, but its potential is reduced due to historical drainage and heavy siltation.

Table 3.4.1

No.	Species	Length
1	Brown Trout	16.2
2	Brown Trout	22.3
3	Brown Trout	14.0
4	Brown Trout	7.5
5	Brown Trout	7.0
6	Brown Trout	6.6
7	Brown Trout	8.4
8	Brown Trout	7.3
9	Brown Trout	7.4
10	Brown Trout	8.7
11	Brown Trout	6.9
12	Brown Trout	4.6
13	Brown Trout	4.1

The site is also moderately suitable for crayfish and sticklebacks.

Macroinvertebrates: Despite the relative open nature of the stream and the presence of fish the Q value was 3 suggesting poor status, Appendix 1. The absence of clean water EPA group A and B indicators and the dominance of Group C and D pollution indicators resulted in the Q3 poor status biological water quality rating recorded.

Otter: Remains of crayfish were evident in regular otter spraints in the culvert. Here both latrine sites in mud and spraint sites on concrete ledges were observed.

3.5 Site 5, Fallan River

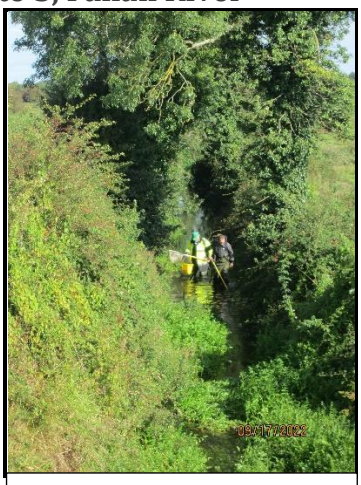


Photo 3.5.1. Showing open channel at Site 5

Photo 3.5.2 Showing the culvert area where there are silt deposits suitable for lamprey

Site Description: The channel was representative of a lowland depositing watercourse that was deepened and straightened historically but retained a semi-natural profile with glide and riffle sequences, Photo 3.5.1. The bank heights were 1.5m and the river width was 2.5m with an average depth of 0.4m. Instream there was abundant fool's watercress, branched bur reed macrophyte beds with frequent common duckweed. The riparian zone comprised of great willowherb, bramble and wild angelica with rank grasses. The bed comprised of mixed coarse gravels with pockets of soft silt in the margins, albeit these were predominantly superficial shallow bands. The channel was bordered by grassland. A kingfisher was observed over the site.

Table 3.5.2 Size Range of trout at Site 5

Size Cm	Trout	No.
4.5-4.9	I	1
5.0-5.4		
5.5-5.9	I	1
6.0-6.4	IIII\II	7
6.5-6.9	IIII\I	6
7.0-7.4	IIII\IIII\IIII	14
7.5-7.9	IIII\I	6
8.0-8.4	IIII\I	6
8.5-8.9	II	2
9.0-9.4		
9.5-9.9		
10.0-10.9	I	1
11.0-11.9	IIII\	5
12.0-12.9	IIII\I	6
13.0-13.9	IIII\	6
14.0-14.9	III	3
15.0-15.9	I	1
16.0-16.9		
17.0-17.9		
18.0-18.9	I	1

Fishery Value. The channel had good spawning and nursery value and good holding habitat for salmonids with glide and riffle sequences but also loose coarse and medium gravels. A timed 10-minute survey yielded the trout numbers (65) in Table 3.5.1, in Appendix 2. From the size range profile shown in Table 3.5.2, this is a natural population structure with likely 3 age groups represented. Size range 4.5-8.9, (0+), 10.0-15.9, (1+) and one trout greater than 1+. A single lamprey was recovered. There was light to moderate siltation with most siltation near the box culvert, Photo 3.5.2. There was moderate value lamprey habitat given the low numbers recorded despite good ammocoete habitat (burial areas in silt and nearby fine gravels for spawning). The channel was suitable for crayfish albeit none were recorded.

Macroinvertebrates. The site had clean water indicator group B species present. However, the sample was dominated by EPA group C taxa, Appendix 1. The absence of group A clean water indicator species and the dominance of group C, moderate water quality indicator species, accounted for the Q3 poor status, biological water quality recorded at the site.

Otter. The channel offered good foraging value for otter given the river was a good salmonid nursery, but no otter signs were recorded.

3.6 Site 6, Lough Bannow Stream

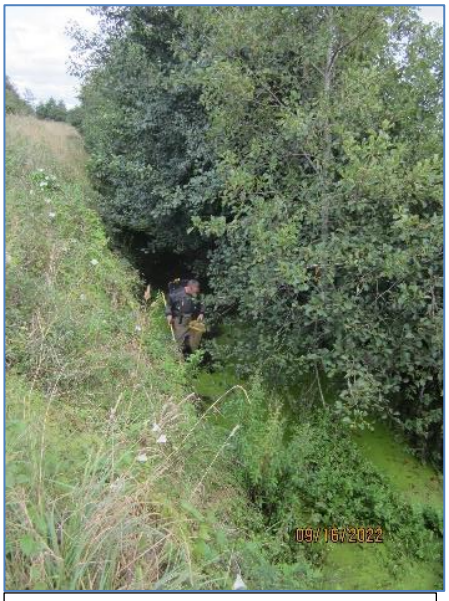


Photo 3.6.1 Showing the overgrown nature of Site 6.

Site Description: This was a deep canalised lowland depositing river channel, that was trapezoidal shaped following deepening and straightening, as shown in Photo 3.6.1. The channel was 3m wide with 0.5-0.8 depth. The flow profile was of deeper very slow-moving glide. The bank heights were 3m and dominated by bramble, bracken, hedge bindweed and willow scrub. The macrophytes included abundant branched bur reed (Sparganium erectum), common water starwort (Callitriche stagnalis), water plantain (Alisma plantago aquatica) and (Potamogeton berchtoldii). The channel had a gravel and peat base. A foraging kingfisher was observed in flight over the channel.

An area some 200m downstream was also surveyed. This was a deep canalised lowland depositing section that was 3-4m wide and deepened and straightened historically. The channel was very deep both upstream and downstream of the culvert at the road crossing with 5-10m on either side being shallower. Approximately 10m upstream of the culvert a steep shelf exists in the peat where the channel dropped off to circa 2m. The channel was 1.5m deep c. 5m downstream of the box culvert. The main fishable area was in the vicinity of the box culvert where 0.1m to 0.4m deep water was present. The bank heights were 3m. The flow profile was of deep glide with a small area of riffle adjoining the culvert. The bed included soft peat with gravels in the footprint of the culvert. Macrophytes were localised near the culvert and included water mint, fool's watercress and watercress. The steep riverbanks have dense bramble, bracken and grey willow scrub. Land use was lowland blanket bog.

Fisheries Value: The site was difficult to electro-fish, given the instream vegetation and the overgrown banks, however spot fishing was possible for small areas, but no fish were recorded. Two three-spined stickleback which were taken with the macroinvertebrate kick sample. The first section fished was of little value to salmonids but may hold coarse fish at times of high water. The area downstream had some clear water and spot electro-fishing was also possible. This section had value as a holding area for coarse fish. A single tench was recorded. No crayfish remains were detected in the single otter spraint recorded at the culvert.

Macroinvertebrates: Macroinvertebrate samples were taken at both parts of this site. The Q value at the upstream section was 2-3, Appendix 1, (Site 6) suggesting a bad status. This is confirmed by the lack of fish despite having relatively good substrate although with heavy peat loads. The site was dominated by EPA group C moderate water quality indicator species but also had significant numbers of pollution indicator group D taxa, that supported the Q2-3 poor status biological water quality recorded at the site.

The downstream section although with slightly clearer water had a Q value of 3 with corresponding poor status, Table 1, (Site 6A). Clean water indicator group B species were present. However, the sample was dominated by group C moderate water quality indicator taxa and also supported group D pollution tolerant species. The absence of group A clean water indicator species and dominance of group C moderate water quality indicator species accounted for the Q3 poor status.

Otter. The channel has some foraging value for otter as a single spraint was observed at the downstream area of the site.

3.7 Site 7, Lough Bannow Stream

Site Description: This was a deep canalised U-shaped lowland depositing river 3-4m wide and was deepened and straightened historically, Photo 3.7.1 The water depth was between 0.5-1.0m but deepening downstream of a culvert at the road crossing to 1.5m. The bank heights were 3-4m and the channel flow profile was dominated by deeper glide. The bed comprised of mixed gravels and soft silt. The riparian areas comprised of dense scrub, bramble, gorse, nettle, hedge bindweed with mature grey willow, osier and ash trees. The land use was agricultural grassland. Macrophyte were abundant in the channel and included water horsetail (Equisetum fluviatilis), water lily (Nuphar lutea), water mint (Mentha aquatica) and common reed (Phragmites australis).

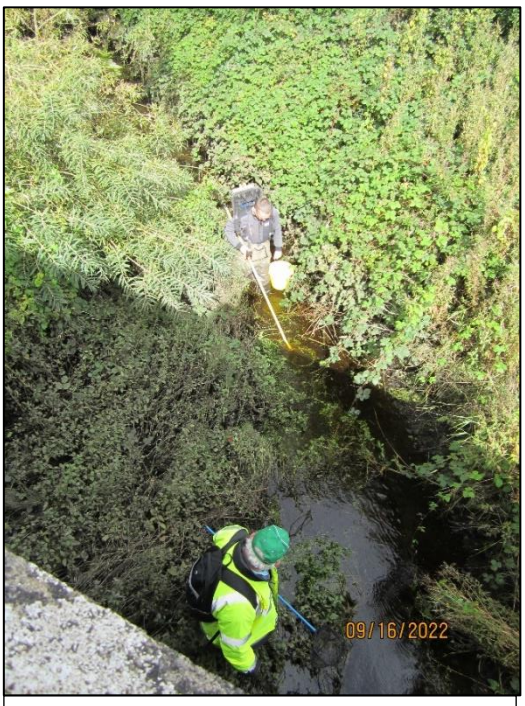


Photo 3.7.1 Enclosed nature of site 7

3.7.2 Fishery Value: The channel was not of value to salmonids given slow flows, extensive instream vegetation and heavy siltation but likely supports coarse fish seasonally. There was some value in the channel as a crayfish nursery given the presence of gravels and sufficient depth, but heavy siltation and enrichment reduced suitability and no fish were recorded during the electro-fishing survey. One stone loach measuring 4cm was recorded while kick-sampling. No crayfish were recorded at the site.

Macroinvertebrates: This site had a Q3 rating poor quality, Appendix 1. The absence of clean water EPA group A and B indicator groups and the dominance of Group C with Group D pollution indicators resulted in the Q3 poor status biological water quality rating recorded at the site.

Otter. The channel had some foraging value and as a commuting route for otter albeit no signs were recorded.

3.8 Site 8, Lough Bannow Stream Tributary

3.8.1 Site Description: This is a small tributary of the Lough Bannow Stream. It is a U-shaped channel 4-5m wide and 0.5-1.3m deep, Photo 3.8.1 and was deepened and straightened historically. It had with abundant macrophytes, broad-leaved pondweed, fool's watercress and occasional water mint in deeper peat-stained water. The substrate is compacted peat. The bank height was 3m with riparian areas supporting mature grey willow, alder, ash, poplar and bramble scrub. Land use was predominantly lowland blanket bog and grassland.

Photo 3.8.1 Totally enclosed nature of Site 8

Fishery Value. The channel was of no fisheries value due to stagnant water and only considered of value perhaps to three-spined stickleback. No fish were recorded either during spot electro-fishing or in subsequent kick sampling. The channel was not suitable for crayfish or lamprey given stagnant water and none were recorded.

Macroinvertebrates. Site 8 was situated in a stagnant peat drain and was not suitable for biological water quality sampling. The sample supported species common in watercourses of this nature, i.e., Gerridae, Asellidae and Corixidae.

Otter. The channel had some foraging value and as a commuting route for otter albeit no signs were recorded.

3.9 Site 9, Un-named Stream

Site Description: The channel was a very heavily modified lowland depositing watercourse. The channel was 1.5m wide, very deep U-shaped in character with vertical 3m high peat banks Photo 3.9.1. The water depth varied between 0.5m and 1.5m with a deep peat base and stagnant water. The channel supported only dense growths of common reed (Phragmites australis). The riparian zone comprised of dense bramble, bracken, nettle, and grey willow scrub. The bordering land was cutover peatland, Photo 3.9.2.

Photo 3.9.1 Overgrown nature of site

Photo 3.9.2 Landscape surrounding site

Fishery Value: The site was unsuitable for electro-fishing as it comprised a series of small pools with minimum flow through the dense reed growth. The channel had low value for fish and crayfish, and none were recorded during kick sampling. Based on the nature of this stream, its substrate and low flows it has low spawning and nursery value for fish, but the habitat may improve downstream as it approaches the River Shannon.

Macroinvertebrates: The site was dominated by group C moderate water quality indicator species, Appendix 1, but also pollution indicator, group D taxa that suggested the Q3 poor status biological water quality recorded.

Otter: There was low foraging value for otter and no signs were recorded during the survey.

3.10 Site 10, Ballynakill River

Photo 3.10.1 In-river open aspect of Site 10

Photo 3.10.2 Showing steep banks at site 10

Site Description: The channel was a heavily modified lowland depositing watercourse in a U-shaped channel. The bank height was 1-2m and the depth was between 0.3m and 0.5m. Despite historical deepening the channel had semi-natural characteristics with glide sequences with some riffle areas. The bed comprised mainly of coarse gravel and fibrous peat material. It had boulder, cobble and gravel bedded with heavy siltation. The channel supported no macrophytes apart from fool's watercress. The riparian zone comprising bramble and dense willow scrub. The bordering land uses were of mixed broadleaved plantation ash woodland.

Fisheries Value: The site had low spawning and nursery value but moderate holding habitat for salmonids and coarse fish given its deep U shape profile (channelised) with moderate flow but no broken flow pattern. The channel was a moderate quality brown trout nursery given the presence of broken glide habitat and a hard bottom. The substrate was of moderate value at best and heavy sedimentation reduced the spawning value as reflected by the absence of 0+ brown trout, Table 3.10.1. The spawning and nursery value was therefore diminished due to the small amount of shallower oxygenated riffle zones. Three fish species were recorded during the timed electro-fishing survey at this site, a total of 11 brown trout, two gudgeon and one roach, Table 3.10.1. The channel had moderately suitable for crayfish, but none were recorded. There were some small pockets of gravel and silt suitable for lamprey, but none were recorded.

Table 3.10.1

No.	Species	Length (cm)
1	Brown Trout	18.0
2	Brown Trout	19.5
3	Brown Trout	14.3
4	Brown Trout	18.4
5	Brown Trout	18.0
6	Brown Trout	15.6
7	Brown Trout	17.7
8	Brown Trout	14.2
9	Brown Trout	15.3
10	Brown Trout	15.0
11	Brown Trout	13.2
12	Gudgeon	11.0
13	Gudgeon	8.0
14	Roach	4.2

Macroinvertebrates: The site had a small number of clean water indicator taxa but was dominated by group C moderate water quality invertebrates, Appendix 1. The community composition supported the Q3 poor status biological water quality assessment.

Otter. There was good foraging value for otter, but no signs were recorded during the survey.

3.11 Site 11, Ballynakill River

Site Description: This is a deep canalised and trapezoidal shaped lowland depositing river. The channel was deep, 1.2-1.5m with a peat base and peat-stained water**.** The channel supported occasional spiked water milfloil, floating sweet grass and water plantain. The very steep 8m high banks were densely vegetated with grey willow, birch, ash, bramble, hogweed and great willow herb. The bordering land was grassland.

Photo 3.11.1 Deep canal like section at Site 11.

Fisheries Value: There was limited, or no salmonid value given the depth, peat-substrate and the lack of flow but the site may have some holding value for coarse fish at times. It was not suitable for crayfish or lamprey.

Macroinvertebrates: Site 11 was dominated by group C moderate water quality indicator species but also had small numbers of pollution indicator group D taxa present, Appendix 1. The community composition recorded supported the Q3 poor status biological water quality recorded.

Otter. The channel may have some value as a foraging and commuting habitat for otter albeit no signs were recorded.

3.12 Site 12, Ledwithstown Stream

Site Description. The survey area was characterised by a historical straightened and deepened, providing a U-shaped stream channel that was 1m wide with 2.5m bank heights. The stream was 0.05m deep with slow flowing water over a bed of gravel, peat and silt. The channel was heavily overgrown with common reed (Phragmites australis), Photo 3.12.1. The channel was heavily shaded with mature birch, grey willow, gorse and bracken, Photo 3.12.2. The bordering land use was of cutover blanket bog.

Photo 3.12.1 Showing overgrown nature of site 12

Photo 3.12.3 Showing overgrown banks at Site 12

Fisheries Value: The stream was not of value to fish or crayfish given the very shallow depth and low flows leading to stagnant water.

Macroinvertebrates: Clean water indicator group B species were present. However, the sample was dominated by EPA group C taxa (i.e., moderate water quality indicators) with smaller numbers of pollution indicator Group D taxa, Appendix 1. The absence of group A clean water indicator species and the dominance of EPA group C moderate water quality indicator species accounted for the Q3 poor status, biological water quality recorded at the site.

Otters. No evidence of otters but activity unlikely due to lack of fish.

4.0 Summary by River

There were 5 streams surveyed all flowing into Lough Ree. The Fallon river joins the Camlin river before entering the Shannon near Clondara. The Ballynakill River enters the Shannon just north of Cloonkeel. The Loughbannow River enter the Shannon just North of Lanesborough before its entry to Lough Ree. The stream marked unnamed drains the bog area north of Lanesborough. The Ledwithstown Stream River flows south before entering Lough Ree near Drumnee.

Weather conditions and water flows were ideal for electro-fishing, and it is expected that the results reflect an accurate picture of the status of these rivers at the time of the survey, where electrofishing was possible. The rivers have all had major drainage works carried out to varying extents. This has reduced the fisheries value of these streams by imposing U or V shaped channels an generally steep high banks. The substrates have been degraded by deposition of peat silt. The natural sinuosity has in general been removed and many stretches are canal like with slow deep flows. The reduction of riffle areas has seriously reduced the habitat for salmonids but the canal like stretches may provide holding areas for coarse fish species at specific times or conditions.

The biological quality of the rivers showed uniform values over all the sites sampled Appendix 1. All had low values at Q3 except for Site 3 on the Ballynakill River which had Q3-4. These values were in keeping with the silt deposits in the substrate and the general condition of the streams.

4.1 Fallan River

Site 5, Table 4.1, below is in the upper reaches of the Fallen River a tributary of the Camlin River. This is a good salmonid stream. It has a mix of riffle and glide areas. It flows through agricultural land and is likely to have salmonids throughout its length. It has a normal brown trout population structure, being composed of 3 age groups, Table Table 5.3.2. One lamprey (ammoecete) was recovered in silt at the road conduit. There are small quantities of suitable lamprey habitat in that area.

The river at this point has poor biological quality. it was assessed as having a Q value of 3. It is expected that this will improve further downstream as silt loads decrease.

Despite suitable habitat particularly at the road conduit and a good population of fish no signs of otter were observed in the area sampled.

Table 4.1 Electro-fishing sites- Physical attributes

Site	River	Longitude	Latitude	Width	Depth	Bank Height	Fishing Method	Observation
1	Ledwithstown	53.59989	-7.87311	1.5m	0.2-0.3m	4-5m	Spot	no fish
2	Lough Bannow	53.64565	-7.93975	2.5-3m	0.05-1m	2.5-3m	Timed	1 pike
3	Ballynakill	53.69795	-7.93235	3-4m	0.2-0.5m	2-4m	Timed	no fish
4	Ballynakill	53.67458	-7.89824	2-3m	.2 -0.4m	4-5m	Timed	13 Trout
5	Fallon_02	53.65891	-7.84905	2.5m	0.4-0.6m	1.5m	Timed	65 trout
6	Lough Bannow	53.63212	-7.91662	3m	0.5m	3m	Spot	1 Stickleback
6Ext	Lough Bannow	53.63419	-7.91393	3-4m	0.4-2M	3m	Spot	1 Tench
7	Lough Bannow	53.64748	-7.94073	3-4m	0.5-1.0	3-4m	Spot	1 Stone loach
8	Lough Bannow	53.66912	-7.92959	4-5m	0.5m	3m	Spot	no Fish
9	Lough Bannow	53.69257	-7.96504	1.5m	0.5-1.5m	3m	-	Macroinvertebrates only
10	Ballynakill 010	53.70195	-7.94199	5m	0.3-0.5	1-2m	Timed	11 Trout, Gudgeon, Roach
11	Ballynakill 011	53.64307	-7.87296	4m	1.2-1.5	8m	-	-
12	Ledwithstown	53.61855	-7.84791	1m	0.05m	2.5m	Spot	no Fish

4.2. Unnamed stream

Site 9, Table 4.1 is a U-shaped stream with high banks, draining extensive previously worked bog. The substrate is peat and flows are restricted due to the dense growth of common reed, so that the water is stagnant. It has little fishery value at this point but may improve further downstream as it approaches the Shannon. The biological river quality was assessed as poor. There were no otter signs around this site.

4.3 Ballynakill River, Sites 3,4,10, 11

The Ballynakill stream Table 4.1, has areas suitable for salmonids throughout its length. The densities are low, but brown trout were observed at Sites 4 and 10. The brown trout population structure at Site 10 is not ideal given there were no 0+ trout present. Site 3 had relatively good salmonid habitat including glide and some riffle areas, but no fish were recovered during electro-fishing. Site 11 was deep and slow flowing and not suitable for salmonids. These deeper more canalised areas are suitable as holding-areas for coarse fish.

The water quality throughout is poor as determined by its Q values. Site 3 was rated as Q3-4

Although otter traces were observed on only one site, many of the other sites had some possibilities as foraging and commuting habitats, and it is possible that otter range throughout this tributary.

4.4 Lough Bannow Stream Sites 2, 6, 7 and 8

The Lough Bannow Stream, Table 4.1, is mainly confined to coarse fish and may be used as holding areas throughout its length at different times of the year, river flows and depths. One pike was recovered at site 2. In the upstream part of site 6 no fish were taken by electro-fishing but two 3 spined stickleback were found in the kick samples. There was extensive in river vegetative growth which made electro-fishing extremely difficult. A single tench was recovered in the more open area downstream. No fish were recovered from spot fishing at sites 7 and 8.

The biological river quality was poor throughout.

Some of the sites were of foraging and commuting value for otter although signs were found only at one site. Otters use at least parts of this stream.

4.5 Ledwithstown Stream, Sites 1, 12

These sites Table 4.1, are at the upper reaches of the Ledwithstown Stream. They have no fishery value at this point. The sites were heavily overgrown and there was substantial peat sedimentation. The streams are shallow with low flows. The water quality is poor. No evidence of otters was found during the survey, but this is very much the upper reaches of the system.

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Appendix 1

Macroinvertebrate samples from Sites 1-12

Site 1

Family	Abundance	EPA Group
Baetidae (Baetis rhodani)	11	C
Polycentropodidae	8	C
Hydrobiidae	6	C
Gammaridae	26	C
Planorbiidae	1	C
Gyrinidae	5	C
Dytiscidae	2	C
Elmidae	5	C
Tipulidae	1	C
Asellidae	7	D
Lymnaeidae	5	D
Site 1		
Q Rating	3	
Water Quality Status	Poor	

Site 2

Family	Abundance	EPA Group
Ephermeridae	3	A
Polycentropodidae	6	C
Hydrobiidae	18	C
Sphaeriidae	21	D
Gammaridae	26	C
Planorbiidae	6	C
Calopterygidae	2	B
Asellidae	13	D
Glossiphoniidae	1	D
Site 2		
Q Rating	3 (Tentative)	
Water Quality Status	Poor	

Site 3

Family	No.	EPA Group
Chloroperlidae	2	A
Sericostomatidae	8	B
Gammaridae	11	C
Elmidae	1	C
Sphaeriidae	11	D
Hydrobiidae	6	C
Simuliidae	5	C
Chironomidae (ex Chironomus sp.)	5	C
Ancylidae	14	C
Asellidae	4	D
Site 3		
Q Rating	Q3-4	
Water Quality Status	Moderate	

Site 4

Family	No.	EPA Group
Baetidae (Baetis rhodani)	9	C
Corixidae	6	C
Gammaridae	11	C
Dytiscidae	8	C
Gyrinidae	2	C
Elmidae	3	C
Sphaeriidae	19	D
Hydrobiidae	21	C
Simuliidae	16	C
Ceratopogonidae	1	C
Chironomidae (excl. Chironomus sp.)	2	C
Asellidae	9	D
Tubificidae	1	E
Site 4		
Q Rating	Q3	
Water Quality Status	Poor	

Site 5

Family	Abundance	EPA Group
Baetidae (other)	2	B
Ephemerellidae	5	C
Limnephilidae	1	B
Lepidostomatidae	3	B
Baetidae (Baetis rhodani)	31	C
Gammaridae	29	C
Hydropsychidae	11	C
Elmidae	6	C
Dytiscidae	4	C
Hydrobiidae	31	C
Chironomidae	6	C
Simuliidae	5	C
Asellidae		D
Site 5		
Q Rating	3	
Water Quality Status	Poor	

Site 6

Family	Abundance	EPA Group
Gammaridae	11	C
Notonectidae	6	C
Asellidae	32	D
Chironomidae (Chironomus sp.)	8	E
Glossiphonidae	6	D
Lymnaeidae	1	D
Site 6		
Q Rating	2-3	
Water Quality Status	Bad	tentative Q

Site 6 (Downstream)

Family	Abundance	EPA Group
Sericostomatidae	1	B
Baetidae (Baetis rhodani)	3	C
Gammarus	28	C
Elmidae	1	C
Asellidae	14	D
Lymnaeidae	2	D
Site 6A		
Q Rating	3	
Water Quality Status	Poor	

Site 7

Family	Abundance	EPA Group
Elmidae	14	C
Hydropsychidae	6	C
Polycentropodidae	5	C
Gammaridae	11	C
Ancylidae	4	C
Hydrobiidae	9	C
Sphaeriidae	12	C
Chironomidae (non-chir)	2	C
Asellidae	21	D
Glossiphonidae	3	D
Site 7		
Q Rating	**3**	
Water Quality Status	Poor	

Site 8. Not suitable for assessment. Families Gerridae, Asellidae and Corixidae present.

Site 9

Family	Abundance	EPA Group
Corixidae	11	C
Notonectidae	4	C
Chironomus sp.	3	E
Asellus aquaticus	19	D
Site 9		
Q Rating	**3**	
Water Quality Status	Poor (Tentative Q)	

Site 10

Family	Abundance	EPA Group
Ephemerellidae	3	C
Baetidae (Baetis rhodani)	16	C
Limnephilidae	2	B
Lepidostomatidae	2	B
Polcentropodidae	6	C
Gammaridae	5	C
Sphaeriidae	3	D
Site 10		
Q Rating	**3**	
Water Quality Status	Poor	

Site 11

Family	Abundance	EPA Group
Coenagrioniidae	1	B
Gammaridae	5	C
Corixidae	16	C
Dytisicidae	2	C
Planorbiidae	3	C
Valvatidae	2	C
Sphaeriidae	8	D
Lymnaeidae	2	D
Site 11		
Q Rating	**Q3 (n/a)**	tentative Q
Water Quality Status	**n/a**	

Site 12

Family	Abundance	EPA Group
Baetidae (Baetis rhiodani)	11	C
Leptoceridae	6	B
Limnephilidae	2	B
Gammaridae	26	C
Hydraenidae	2	C
Elmidae	4	C
Dytiscidae	2	C
Chironomidae (non-chironomus sp.)	2	C
Tipulidae	3	C
Asellidae	14	D
Glossiphonidae	3	D
Site 12		
Q Rating	**Q3**	
Water Quality Status	**Poor**	

Appendix 2

Fish taken by electro-fishing at Site 5

Table 3.5.1 Fish taken by electro-fishing at Site 5

No	Species	Length Cm		No	Species	Length cm		No	Species	Length cm
1	Brown Trout	18.8		23	Brown Trout	12.4		45	Brown Trout	7.5
2	Brown Trout	14.2		24	Brown Trout	7.0		46	Brown Trout	7.7
3	Brown Trout	15.1		25	Brown Trout	7.0		47	Brown Trout	6.7
4	Brown Trout	13.5		26	Brown Trout	8.3		48	Brown Trout	7.0
5	Brown Trout	13.9		27	Brown Trout	11.4		49	Brown Trout	7.3
6	Brown Trout	12.4		28	Brown Trout	7.4		50	Brown Trout	7.4
7	Brown Trout	12.2		29	Brown Trout	6.7		51	Brown Trout	7.1
8	Brown Trout	6.4		30	Brown Trout	6.4		52	Brown Trout	7.0
9	Brown Trout	12.5		31	Brown Trout	6.5		53	Brown Trout	8.1
10	Brown Trout	13.2		32	Brown Trout	7.0		54	Brown Trout	7.8
11	Brown Trout	8.0		33	Brown Trout	7.2		55	Brown Trout	7.7
12	Brown Trout	14.4		34	Brown Trout	10.1		56	Brown Trout	7.1
13	Brown Trout	13.4		35	Brown Trout	8.9		57	Brown Trout	6.9
14	Brown Trout	13.2		36	Brown Trout	8.5		58	Brown Trout	6.1
15	Brown Trout	11.6		37	Brown Trout	6.4		59	Brown Trout	6.2
16	Brown Trout	8.0		38	Brown Trout	7.7		60	Brown Trout	6.9
17	Brown Trout	11.3		39	Brown Trout	7.9		61	Brown Trout	7.1
18	Brown Trout	12.0		40	Brown Trout	6.8		62	Brown Trout	6.2
19	Brown Trout	14.2		41	Brown Trout	7.2		63	Brown Trout	5.6
20	Brown Trout	11.3		42	Brown Trout	8.4		64	Brown Trout	4.9
21	Brown Trout	12.5		43	Brown Trout	7.1		65	Brown Trout	6.2
22	Brown Trout	11.8		44	Brown Trout	8.6		66	Lamprey	10.1

Appendix 3

Certificate of Authorisation

An Roinn Comhshaoil,
Aeráide agus Cumarsáide
Department of the Environment,
Climate and Communications

CERTIFICATE OF AUTHORISATION UNDER SECTION 14 OF THE FISHERIES (CONSOLIDATION) ACT, 1959 AS SUBSTITUTED BY SECTION 4 OF THE FISHERIES (AMENDMENT) ACT, 1962

The Minister for the Environment, Climate and Communications in exercise of the powers conferred on him by Section 14 of the Fisheries (Consolidation) Act, 1959 as substituted by Section 4 of the Fisheries (Amendment) Act, 1962 hereby authorises: John Browne, Stillwaters Consultancy, 24 Thorncliffe Park, Churchtown, Dublin. D14DD80, and or person(s) nominated by him to carry out an electrofishing survey within selected sections of the Shannon catchment. The purpose of the requested licence is to assess fish populations in the vicinity of a proposed Wind Farm site near Lanesborough in Longford.

This authorisation is granted subject to the following conditions:

1. This authorisation shall not confer on the holder thereof, independently of the conditions therein,

   (a) any rights or title which the holder would not have had if this Authorisation had not been given, or

   (b) any authority in any way to interfere with or infringe the lawful rights of any other person.

2. This authorisation is issued to and valid for use by Mr. John Browne and or person(s) nominated by him.

3. This authorisation is valid until 30th September 2022.

4. The Director of the Shannon River Basin District and the appropriate Fisheries Inspector (as indicated by the Director) should be informed at least five days prior to the intended start date of the work providing the exact date(s), location and scope of the planned electro-fishing work. Contact details are as follows:

   IFI Limerick,
   Ashbourne Business Park,
   Dock Road,
   Co. Limerick.
   V94 NPE0

   Email: limerick@fisheriesireland.ie;
   Phone: 061 300238

Teach Leamháin, Bóthar Ghleann an Iarla, An Cabhán, H12 A8H7
Elm House, Earlsvale Road, Cavan, H12 A8H7
T +353 1 678 2000 | 1890 44 99 00
www.gov.ie/decc

5. As Lough Ree is a Special Area of Conservation (SAC), IFI request that National Parks and Wildlife Service (NPWS) are made aware of the proposed operation prior to commencement.

6. Acknowledging the applicant has indicated that there is no intention to kill any fish, the number of inadvertent fish mortalities resulting from the electro-fishing is to be kept to an absolute minimum and IFI inspectors are to be informed of any fish mortalities that occur immediately after the work concludes.

7. IFI request that all lamprey captured in the survey be identified to species level if feasible and measured (total length in mm is standard). This information should also be included on the IFI reporting template.

8. If invasive species are encountered, the field operatives should record their presence, indicate their abundance and extent of occurrence, along with a geo-reference in their report material submitted to IFI.

9. The names of the personnel undertaking the electro-fishing operations are required for the Section 14 authorisation.

10. Electro-fishing should, if possible, be carried out between July 1st and September 30th when juvenile salmon (if present) are of a sufficiently large size to be caught by electro-fishing, to minimize damage and for them to be distinguished from similar species (refer to CEN (2001) and CFB (2008) 'Electric Fishing in Wadeable Reaches' manual).

11. The applicant and agents should desist, to the greatest extent possible, from walking in the general instream area and to avoid walking on instream gravelled areas if present, thereby limiting adverse impact to intra-gravel life stages of salmonids and other species.

12. IFI insists upon strict adherence to the Biosecurity Protocol for Field Survey Work, whereby equipment must be disinfected prior to and after use to prevent the spread of disease, parasites or invasive species (http://www.fisheriesireland.ie/Biosecurity/biosecurity-protocol-for-field-survey-work.html) (and as directed by an officer of IFI). The applicant should be mindful of the potential occurrence of invasive alien species, either in the watercourse being surveyed or in the adjoining riparian zone. Extra care should be taken to ensure that plant fragments and seeds of invasive balsam and knotweed species are not

inadvertently transported on clothing, footwear or equipment. It would be very helpful if the applicant could record presence of such species, along with geo-reference and indication of extent of occurrence, in report material submitted to IFI. If possible, surveying should commence at the uppermost site and proceed sequentially downstream to reduce the risk of carrying invasive species upstream.

13. In the event that the proposed electrofishing operation is cancelled IFI should be notified and an indication of the proposed re-commencement date of the electrofishing operation should also be advised.

14. **No electric fishing should be undertaken at this site when water temperatures exceed 20°C due to the risk to fish. Where water temperatures approach this threshold and fish are obviously stressed electric fishing should cease.**

15. The fishing gear when not in use shall be kept in a secure place known to an officer of the Shannon River Basin District of IFI and the local Garda Siochána. All equipment must be available for inspection by an IFI officer during the survey.

16. IFI recommends that the applicant seeks permission from fishery owners and informs local angling clubs of their plans for the surveys where relevant. The applicant must also seek permission from landowners to cross land, where relevant.

17. No fish of any species should be sacrificed during the surveys. The number of fish killed (if any) is to be kept to an absolute minimum and IFI Ballina and Citywest are to be informed of any fish mortalities immediately after the survey.

18. The surveyor should be mindful of other species, e.g. white-clawed crayfish, which might be encountered during the electro-fishing exercise.

19. IFI request that any larval lamprey captured in the survey (refer to Maitland, P.S. (2003) *Ecology of the river, brook and sea lamprey.* Conserving Natura 2000 Rivers. Ecology Series No. 5, English Nature, Peterborough) be measured (total length in mm is standard). This information should also be included on the IFI reporting template.

20. The operators should be cognisant of the increased risk of mortalities occurring during warmer periods of weather or prolonged containment of fish and such fish should be regularly monitored for signs of stress and released in a timely manner to mitigate for any mortality risk. **Expected species groups, e.g., salmonids, eel and lamprey, should be noted, with references to standard sampling and welfare approaches.**

21. A standard template for reporting survey data to IFI is attached. IFI request that a survey report and qualitative/quantitative data (in the attached standard IFI format) be provided, within 30 days of completion of the survey, in electronic format to Sandra Doyle (Sandra.Doyle@fisheriesireland.ie). The report must include mortality data and a full account of qualitative/quantitative results. This data will not be made publically available, for a period of three years, without the permission of the applicant.

22. Failure to comply with any of the conditions of this Authorisation may result in revocation of this Authorisation.

23. The holder of this Authorisation shall indemnify and keep indemnified the State, the Minister for the Environment, Climate and Communications and the Minister for Finance against any claims, arising in any manner whatsoever in connection with the user of the fishing gear or in the exercise of the permission hereby granted.

24. Notwithstanding the foregoing, this Authorisation may be revoked or amended by the Minister for the Environment, Climate and Communications without the payment of compensation to the holder on giving one week's notice in writing to the holder if he considers it necessary in the public interest to do so.

Dated the 29 August 2022

For the Minister of the Environment, Climate and Communications

Una Ward

An officer authorised on that behalf by the said Minister

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4

Appendix 4 ORNITHOLOGICAL SURVEY

Appendix 4a BREEDING SEASON 2021

FEHILY TIMONEY

CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

DERRYADD, CO. LONGFORD WIND FARM ORNITHOLOGICAL SURVEY

BASELINE ORNITHOLOGICAL SURVEYS – DERRYADD WIND FARM, SUMMER 2021

Prepared for: Bord na Móna

Bord na Móna

Date: February 2022

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BASELINE ORNITHOLOGICAL SURVEYS – DERRYADD WIND FARM, SUMMER 2021

REVISION CONTROL TABLE, CLIENT, KEYWORDS AND ABSTRACT
User is responsible for Checking the Revision Status of This Document

Rev. No.	Description of Changes	Prepared by:	Checked by:	Approved by:	Date:
0	Draft	KM	BOD/JK	JH	02/02/2021

Client: Bord na Móna

Keywords: Baseline, Ornithological Surveys, Wind Farm, Derryadd, Co. Longford

Abstract: This document outlines a baseline ornithological survey during summer 2021 at the potential Derryadd Wind Farm, Co. Longford. This ornithology report is required to assess the impacts of the proposed development on bird species within and surrounding the site.

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EXECUTIVE SUMMARY

Ornithological surveys for the summer 2021 season at Derryadd Wind Farm searched for and recorded all bird species, focusing primarily on the wind farm site but also taking in the surrounding hinterland.

The methodology for the 2021 vantage point surveys at Derryadd adhered to Scottish Natural Heritage guidance (SNH, 2017) for assessing the impact of proposed wind farm developments on target species' breeding and wintering populations. Two timed watches of three hours duration were carried out from each VP every month from April to September 2021 inclusive, totalling 36 hours of observation time at each VP over the survey period. Breeding bird transect surveys, hinterland surveys and wader surveys were also undertaken during this period.

During vantage point surveys a total of 60 bird species were recorded. Of these species, eight are of Red-list status under the Birds of Conservation Concern in Ireland (BoCCI) (Gilbert et al., 2021): black-tailed godwit, curlew, grey wagtail, kestrel, lapwing, meadow pipit, snipe and swift. A total of 18 are Amber-listed and the remaining 34 are Green-listed. Of the species noted, four are protected under Annex I of the EU Birds Directive: common tern, kingfisher, little egret and peregrine.

During hinterland surveys surrounding the proposed site a total of 31 species were noted. Of these species, five are of Red-list status under the BoCCI (Gilbert et al., 2021): grey wagtail, lapwing, oystercatcher, pochard and snipe. A further 16 Amber-listed species were observed: common tern, kingfisher, black-headed gull, common gull, common sandpiper, coot, cormorant, gadwall, great crested grebe, lesser black-backed gull, mallard, mute swan, greylag goose, teal, tufted duck and wigeon. A total of three Annex I species were recorded during hinterland surveys: common tern, kingfisher and little egret.

During breeding wader surveys, four wader species were found to be breeding on site. Of these species, three are Red-listed (lapwing, snipe and woodcock). The fourth species (ringed plover) is Amber-listed.

During general breeding transects a total of 58 species were detected. Of these, four species are Red listed: lapwing, meadow pipit, snipe and swift. A total of 15 amber-listed species were recorded.

1. INTRODUCTION

Fehily Timoney & Company (FT) was appointed by Bord na Móna to undertake summer ornithological surveys at the proposed Derryadd Wind Farm in 2021. This report presents the results of these ornithological surveys and summarises the activity of specific target bird species during summer survey period in 2021. The study area of the proposed Derryadd Wind Farm is near Lanesborough, Co. Longford.

This ornithological assessment for surveys completed during summer 2021 includes the assessment of bird species occurring within the proposed site boundary, and surveys of surrounding habitats of value to birds. Surveys adhered to Scottish Natural Heritage guidance (SNH, 2017). The following surveys were carried out:

- Vantage Point survey
- Hinterland survey
- Breeding wader survey
- Breeding bird transect survey
- Barn Owl Surveys

1.1 Study Area

The proposed Derryadd wind farm is located c. 3 km east of Lanesborough, Co. Longford, 4km west of Killashee, Co. Longford and 8km north of Newtowncashel, Co. Longford. The proposed wind farm is located on the Mountdillon group of peat extraction bogs in Co. Longford (Figure 1.1).

Habitats on the proposed site consist of cutover bog, recolonising cutover bog, remnant raised bog, colonising birch woodland and large ponds/lakes on cutover bog. Surrounding habitats and land uses are described by Corine 2018[1] as: Peat bogs (412), Pastures (code 231), Mixed Forests (313), Coniferous Forests (312), Transitional woodland scrub (324), Broad-leaved forests (311), and Discontinuous urban fabric (112).

Designated Sites within a 15km radius of the proposed wind farm are detailed in Table 1.1.

1 https://gis.epa.ie/EPAMaps/. Accessed 06/12/21

Table 1.1: Designated sites within a 15km radius of the proposed Derryadd Wind Farm.

Site	Site Code	Type
Lough Ree	004064/000440/000440	SPA/SAC/pNHA
Fortwilliam Turlough	000448/000448	SAC/pNHA
Ballykenny-Fisherstown Bog	004101	SPA
Lough Forbes Complex	001818/001818	SAC/pNHA
Brown Bog	002346/000442	SAC/pNHA
Corbo Bog	002349/000602	SAC/pNHA
Annaghmore Lough	001626	SAC
Clooneen Bog	002348/000445	SAC/pNHA
Mount Jessop Bog	001450	SAC/NHA
Forthill Bog	001448	NHA
Derrycanan Bog	000605	NHA
Aghnamona Bog	000422	NHA
Cloonageeher Bog	001423	NHA
Lisnanarriagh Bog	002072	NHA
River Finn	002301	NHA
Lough Bawn	001819	pNHA
Lough Bannow	00449	pNHA
Royal Canal	002103	pNHA
Cordara Turlough	001821	pNHA
Derry Lough	001444	pNHA
Lough Slawn	001443	pNHA
Kilglass and Grange Loughs	000608	pNHA
Carrickglass Demesne	001822	pNHA

Site	Site Code	Type
Lough Boderg and Lough Bofin	001642	pNHA
Annaghmore Lough (Roscommon)	001626	pNHA
Ardnakilla Lough	001617	pNHA

Note: *SPA = Special Protected Area (European site), SAC = Special Area of Conservation (European site), NHA = Natural Heritage Area (Nationally Designated Site), pNHA = proposed Natural Heritage Area

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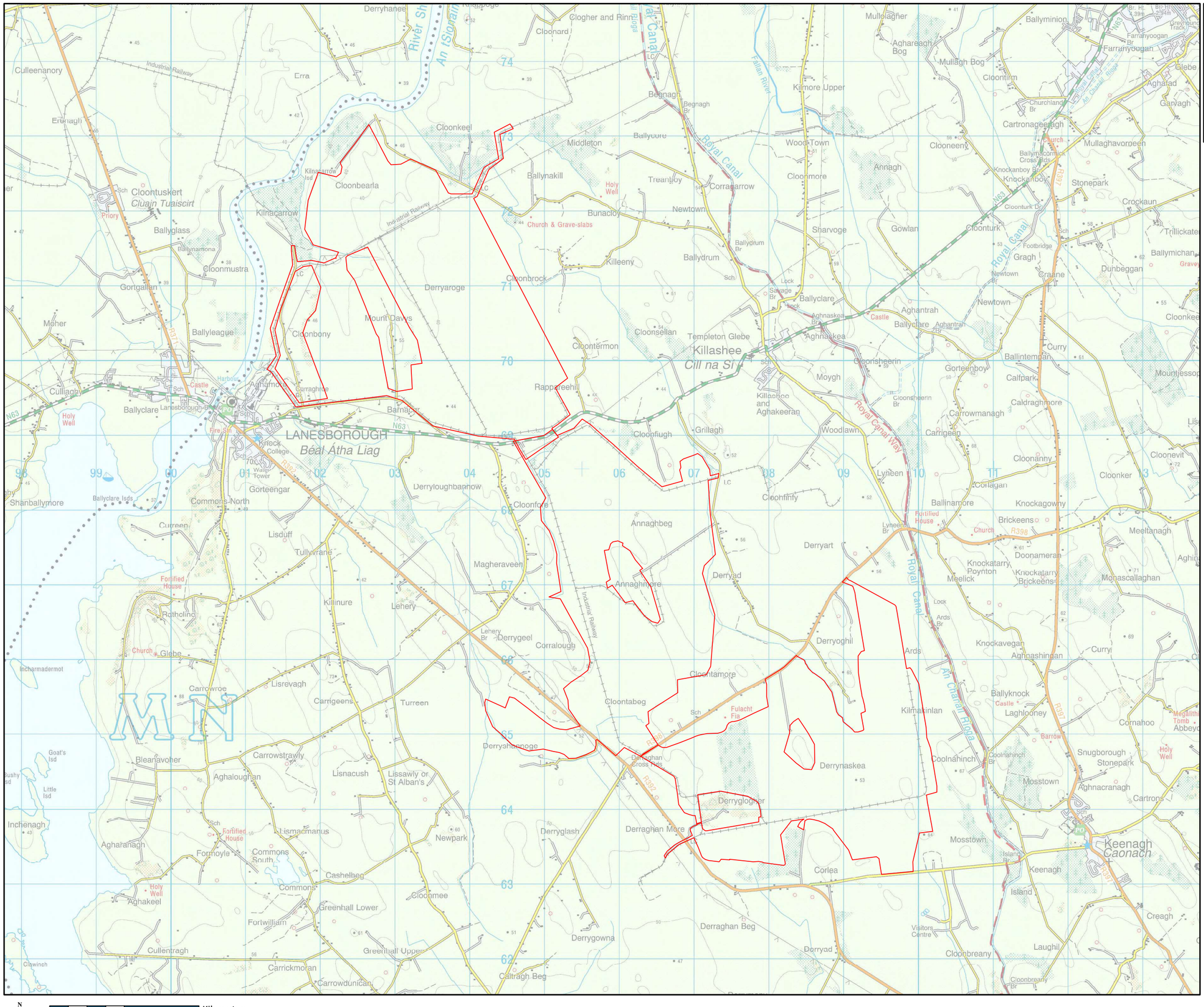

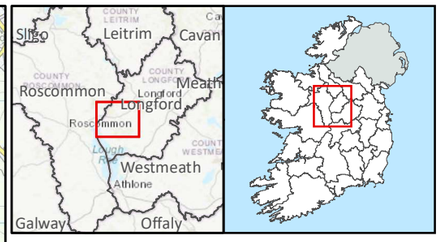

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Proposed Site Boundary

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DATE: 05/01/2022	**PAGE SIZE:** A3

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2. SURVEY METHODOLOGY

The following surveys were carried out:

- Vantage point survey (breeding and non-breeding season)
- Hinterland survey
- Breeding wader survey
- Breeding bird transect survey
- Barn owl Survey

Methodologies for these surveys are detailed under the following headings:

2.1 Vantage Point Surveys

The main purposes of vantage point 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
c. The proportion of flying time spent within the upper and lower height limits as determined by the rotor diameter and rotor hub height

Vantage Point (VP) surveys were carried out at the proposed Derryadd Wind Farm site from April 2021 to September 2021 (covering the breeding season), in accordance with the Scottish Natural Heritage Methodology for assessing onshore wind farms (SNH, 2017). A total of 11 fixed VP locations overlooking the study area were used during the VP surveys (see Figure 2.1 for VP locations), each with specific viewsheds chosen to provide coverage of the proposed Wind Farm in addition to a 500m buffer around the site boundary.

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

In line with recommended best practice (SNH, 2017 and Band *et al*. 2007), viewshed analysis was undertaken using ARCMAP 10.4.1, 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 activity of target species, fulfilling the required effort from SNH. Vantage Point (VP) surveys 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 the breeding period.

Data recorded included flight activity of target species (flight height, duration, directionality) in addition to metrics such as flock size (per recorded transit) and relative time of observation. Detailed notes of each observation of a target bird species were recorded including behaviour, sex (where possible), numbers, flight height, associated habitat and the period 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 and were considered separately in the analysis as additional species. Flight activity was annotated onto field maps. Total numbers of birds present both on arrival at the VP and on departure is noted. Details of each flight-path observation are provided in Section 3. Binoculars were used to scan for target species. Dictaphones were 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 flights 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.

The proportion of survey time that activity was recorded inside and outside the 500m turbine buffer was used as part of the overall analysis and assessment of target species usage of the study area. All surveys were conducted during suitable weather conditions.

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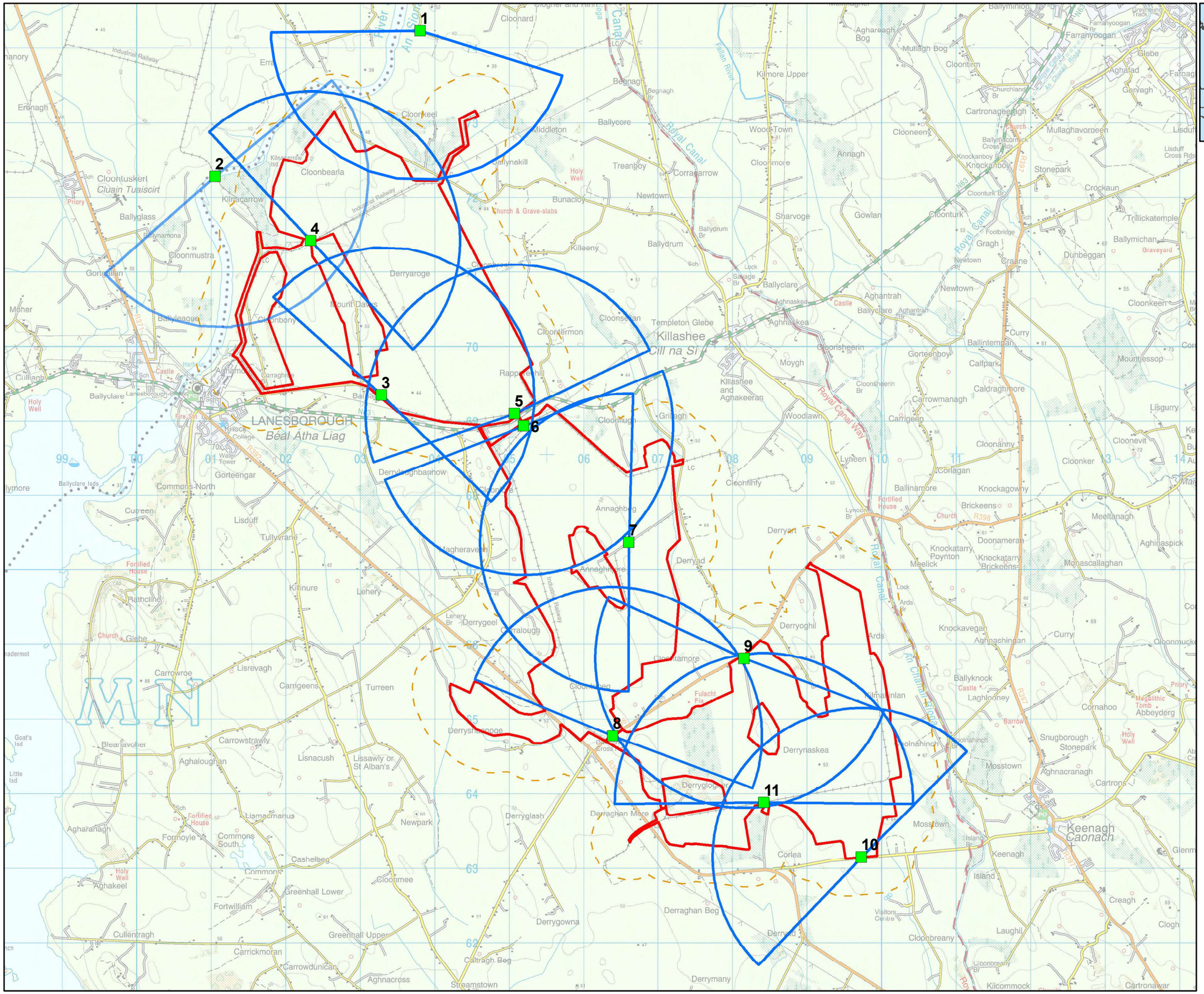

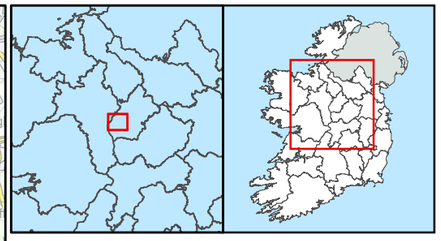

Legend

- Vantage Points
- Viewsheds
- 500m buffer of site boundary
- Site Boundary

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FIGURE NO:	2-1		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	06/05/2021	**PAGE SIZE:**	A3

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2.2 Hinterland Surveys

The methodology used for wetland sites during hinterland surveys followed I-WeBS (Irish Wetland Bird Survey) methodology (Lewis *et al*, 2019), whereby each location was surveyed for the duration necessary to identify and obtain a count for all target species present. The same approach was adapted for non-wetland sites. A hinterland survey for raptors was conducted in accordance with Hardey *et al*. (2013) to assess hen harrier and other raptor activity over the winter and breeding periods in the greater surroundings.

The surveys were carried out in suitable woodland and wetland habitats in the area surrounding the proposed wind farm site. This comprised of 25 sites within 10 km from the proposed wind farm site. These sites were chosen as they had suitable habitat for the following target species: raptors, waders, waterfowl and barn owl. Surveys were carried out between April and September 2021. The sites detailed in Table 2.2 were checked regularly across this period:

Table 2.1: Hinterland survey locations

Code	Location	ITM Coordinates		Dates Visited
		Easting	Northing	
HVP1	*Pake Bridge, Royal Canal*	612898.185	759486.712	12/06/2021, 17/07/2021, 05/08/2021, 14/08/2021, 09/09/2021
HVP2	*Foygh Bridge, Royal Canal*	612023.763	760522.067	12/05/2021, 12/06/2021, 17/07/2021, 05/08/2021, 09/09/2021
HVP3	*Derrymacar Lough*	608506.111	758389.783	12/05/2021, 12/06/2021,
HVP4	*Fortwilliam Turlough*	601465.614	763206.551	12/05/2021, 12/06/2021, 17/07/2021, 05/08/2021, 14/08/2021, 09/09/2021
HVP5	*Incharmadermot Island, Lough Ree*	598015.731	765839.47	12/05/2021, 12/06/2021, 17/07/2021, 05/08/2021, 14/08/2021, 09/09/2021
HVP6	*Cureen, Lough Ree*	599770.446	767832.499	12/05/2021, 12/06/2021, 17/07/2021, 05/08/2021,

Code	Location	ITM Coordinates		Dates Visited
		Easting	Northing	
				14/08/2021, 09/09/2021
HVP7	*Lanesborough Bridge, Lough Ree*	600495.231	769387.084	12/05/2021, 12/06/2021, 17/07/2021, 14/08/2021, 09/09/2021
HVP8	*Cullaghy, Lough Ree*	598739.475	769573.953	14/05/2021, 12/06/2021, 17/07/2021, 5/08/2021, 14/08/2021, 09/09/2021
HVP9	*Gardenstown, Lough Ree*	597396.711	767345.703	14/05/2021, 12/06/2021, 17/07/2021, 5/08/2021, 14/08/2021, 09/09/2021
HVP10	*Cloonmustra, River Shannon*	600807.323	772340.698	12/05/2021, 12/06/2021, 17/07/2021, 5/08/2021, 14/08/2021, 9/09/2021
HVP11	*Erra & Derryhanee, River Shannon*	603635.518	7.944911	13/05/2021, 11/06/2021, 17/07/2021, 5/08/2021, 14/08/2021, 9/09/2021
HVP12	*Derrycashel, River Shannon*	603185.029	776452.94	13/05/2021, 11/06/2021, 17/07/2021, 5/08/2021, 14/08/2021, 9/09/2021
HVP13	*Feorish River*	603428.885	777430.82	13/05/2021, 11/06/2021, 17/07/2021, 9/09/2021
HVP14	*Tarmonbarry Bridge*	605449.722	776948.108	13/05/2021, 11/06/2021, 17/07/2021, 5/08/2021, 14/08/2021, 9/09/2021

Code	Location	ITM Coordinates		Dates Visited
		Easting	Northing	
HVP15	*Tarmonbarry Lock*	605352.886	776538.819	13/05/2021, 11/06/2021, 17/07/2021, 5/08/2021, 14/08/2021, 9/09/2021
HVP16	*Camlin River Complex*	606330.588, -	776126.409	13/05/2021, 11/06/2021, 17/07/2021, 9/09/2021
HVP17	*N5 Bridge over Camlin Park*	611752.094	775901.951	13/05/2021, 11/06/2021, 17/07/2021, 14/08/2021
HVP18	*Fallan Bridge*	608801.086	773065.52	14/05/2021, 11/06/2021, 14/07/2021, 5/08/2021
HVP19	*Richmond Bridge*	613068.179	775627.344	14/05/2021, 11/06/2021, 14/07/2021, 9/09/2021
HVP20	*Cloondara, Royal Canal*	606176.505	775790.583	14/05/2021, 11/06/2021, 14/07/2021, 5/08/2021
HVP21	*Begnagh Bridge, Royal Canal*	606287.094	774216.229	14/05/2021, 11/06/2021, 14/07/2021
HVP22	*Aghnaskea Bridge, Royal Canal*	608672.728	770495.836	14/05/2021, 11/06/2021, 14/07/2021, 14/08/2021, 9/09/2021
HVP23	*Lyneen Bridge, Royal Canal*	609831.385	767761.094	14/05/2021, 11/06/2021, 14/07/2021
HVP24	*Coolnahinch Bridge, Royal Canal*	610855.924	764658.67	14/05/2021, 11/06/2021, 14/07/2021
HVP25	*Island Bridge, Royal Canal*	611337.847	763361.965	14/05/2021, 11/06/2021, 14/07/2021, 05/08/2021

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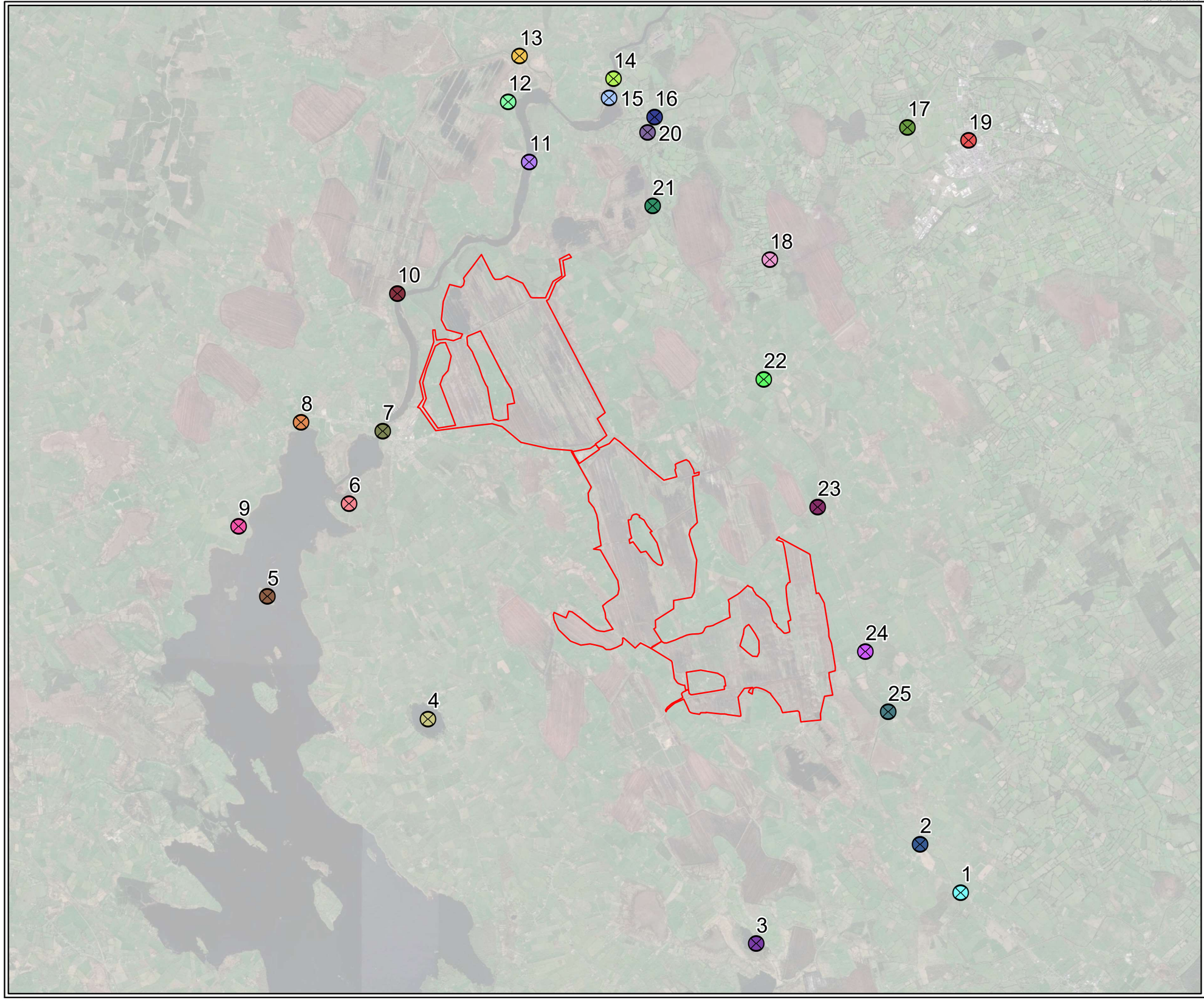

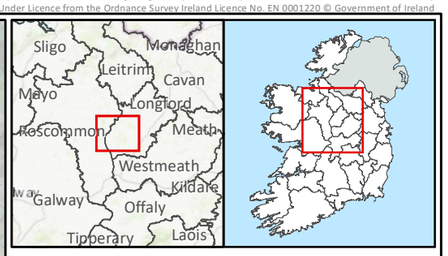

Legend

Site Boundary

ID, Location

1, Park Bridge Royal Canal
2, Foygh Bridge Royal Canal
3, Derrymacar Lough
4, Fortwilliam Turlough
5, Incharmadermot Island Lough Ree
6, Cureen Lough Ree
7, Lanesborough Bridge Lough Ree
8, Cullaghy Lough Ree
9, Gardenstown Lough Ree
10, Cloonmustra River Shannon
11, Erra & Derryhanee River Shannon
12, Derrycashe River Shannon
13, Feorish River
14, Tarmonbarry Bridge
15, Tarmonbarry Lock
16, Camlin River Complex
17, N5 Bridge over Camplin Park
18, Fallan Bridge
19, Richmond Bridge
20, Cloondara Royal Canal
21, Begnagh Bridge Royal Canal
22, Aghnaskea Bridge Royal Canal
23, Lyneen Bridge Royal Canal
24, Coolnahinch Bridge Royal Canal
25, Island Bridge Royal Canal

TITLE:	Hinterland Sites		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	2-2		
CLIENT:	Bord na Móna		
SCALE:	1:80000	**REVISION:**	0
DATE:	05/01/2022	**PAGE SIZE:**	A3

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2.3 Breeding Waders Survey

Survey transects to assess the presence of breeding wader populations were completed during the months of May and June 2021. 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.

Methods utilised were grouped into two categories; those for breeding lapwing *Vanellus vanellus* and those for other species such as curlew *Numenius arquata*, common snipe *Gallinago gallinago*, redshank *Tringa totanus*, woodcock *Scolopax rusticola*, common sandpiper *Actitis hypoleucos* and ringed plover *Charadrius hiaticula*. For each species, a pre-defined matrix of suitable habitats was created and used to select target habitats for survey (Table 2.3).

Table 2.2: Target Species and Associated Suitable Breeding Habitat

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

Survey methods for lapwing followed those in Bibby *et al*. (2000) where the primary count unit for breeding birds is defined as an incubating female. In addition, displaying birds, birds standing guard near nests or distraction displays were also recorded as indications of occupied territories. Extensive areas of open ground were covered from roads, farm tracks or roadsides (where possible); larger areas of open ground not visible from easily accessible vantage points were walked using transects.

Surveys were carried out during the time periods recommended in Bibby *et al*. (2000) although territorial behaviour noted outside these periods was also utilised in the assessment. For all additional species of wader, the employed method was the same and utilised transects walked through suitable habitat within three hours of dawn or dusk. Count units (Table 2.4) were predefined for each target species and included in the method statement provided to surveyors.

Table 2.3: 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 suitable habitats for waders were visited, during the months of May and June 2021. Observations from each visit were annotated onto maps (locations of territories or breeding attempts) and a final, summary map produced at the end of the survey season using ARCMAP 10.4.1. 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.

All species encountered (seen or heard) were recorded and their abundance, behaviour, sex/age and breeding status noted. Any species occurring more than 100 m from the observer, or flying over the site and not using it, were recorded as 'additional' species to further inform the baseline survey. Table 2.5 details the survey dates and weather conditions.

Table 2.4: Breeding waders survey details

Date	Cloud (Okta)	Precipitation	Visibility	Wind
21/05/2021	7/8	Very light showers	Very good	F1
19/05/2021	6/8	Dry	Very good	F1
01/06/2021	7/8	Dry	Very good	F1
03/06/2021	6/8	Dry	Very good	F1
16/06/2021	7/8	Dry	Very good	F1
17/06/2021	8/8	Dry	Very good	F1

2.4 Breeding Bird Surveys

For general breeding birds the method utilised was based on the existing British Trust for Ornithology (BTO) Breeding Bird Survey (BBS or CBS; Bibby *et al*. 2000). The study area for this survey comprised a total of 21 no. c. 1 km transects which were selected and centred on different habitats present within the subject sites (See Table 2-5). Birds were counted over two visits, each timed to coincide with the early part of the breeding season (April to mid-May 2021) and later part of the season (mid-May to late June 2021) with visits at least four weeks apart. 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, 2018).

SNH guidance on recommended bird survey methods to inform impact assessment of onshore wind farms states:

> *"Surveys of farmland passerines especially on more intensive arable habitat are generally not required"* (SNH, 2017).

The summer breeding bird transect schedule is detailed in Table 2.6, with further details including weather and survey times indicated in Appendix 5.

Table 2.5: Breeding bird summer transect survey details

Transect	Month	
	May	June
1	12/05/2021	11/06/2021
2	13/05/2021	13/06/2021
3	12/05/2021	11/06/2021
4	12/05/2021	11/06/2021
5	12/05/2021	11/06/2021
6	12/05/2021	11/06/2021
7	12/05/2021	11/06/2021
8	12/05/2021	11/06/2021
9	12/05/2021	11/06/2021
10	12/05/2021	11/06/2021
11	14/05/2021	12/06/2021
12	14/05/2021	12/06/2021

Transect	Month	
	May	June
13	13/05/2021	12/06/2021
14	13/05/2021	12/06/2021
15	13/05/2021	12/06/2021
16	13/05/2021	12/06/2021
17	13/05/2021	13/06/2021
18	14/05/2021	13/06/2021
19	14/05/2021	13/06/2021
20	14/05/2021	13/06/2021
21	14/05/2021	13/06/2021

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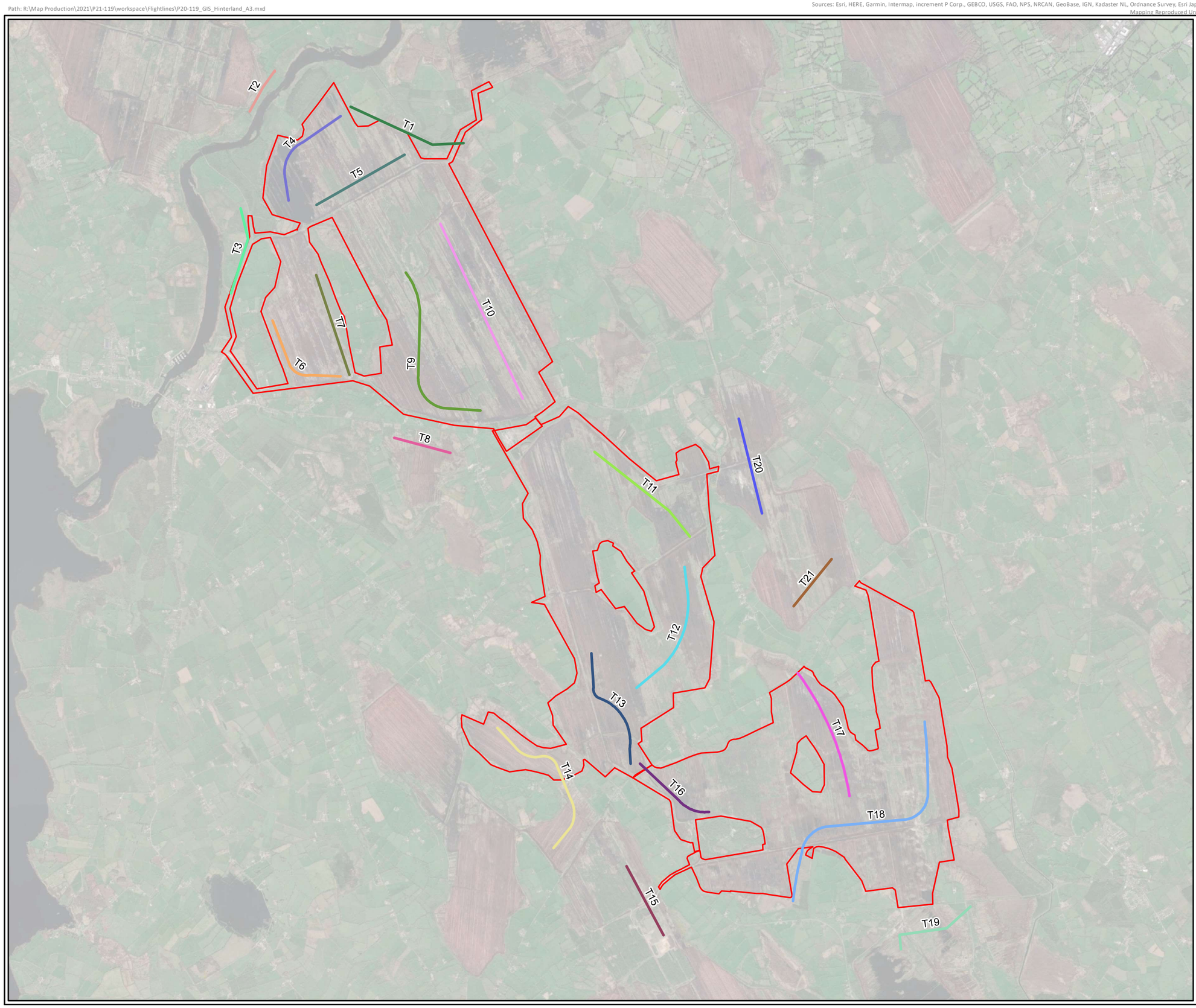

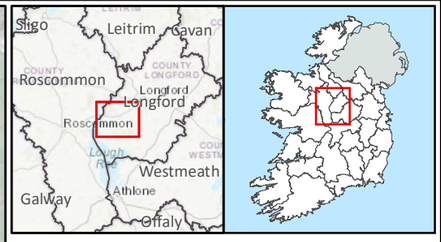

Legend

Site Boundary

Transect

- T1
- T2
- T3
- T4
- T5
- T6
- T7
- T8
- T9
- T10
- T11
- T12
- T13
- T14
- T15
- T16
- T17
- T18
- T19
- T20
- T21

TITLE:	Bird Survey Transects		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	2-3		
CLIENT:	Bord na Móna		
SCALE:	1:45000	**REVISION:**	0
DATE:	05/01/2022	**PAGE SIZE:**	A3

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2.5 Barn Owl Surveys

The barn owl survey focused on visiting all old structures within 2km of the site with potential suitability for barn owls. The surveyor also remained vigilant for barn owl activity when travelling to/from and between the survey sites. Enquiries were also made with local birdwatchers to confirm any nest sites in the area.

The TII guidance document 'Survey and Mitigation Standards for Barn Owls to inform the Planning, Instruction and Operation of National Road Projects' (TII, 2021) was considered in determining Barn Owl survey Methodology; however, the methodology selected aligned with Shawyer (2012) 'Barn Owl *Tyto alba* Survey Methodology and Techniques for use in Ecological Assessment'.

3. RESULTS

3.1 Avian usage of the Study Area – Vantage point

A total of two timed watches of three hours duration each were carried out at each of the 11 vantage points on a monthly basis from April 2021 to September 2021 inclusive. This surveying effort totals 36 hours of observation time at each VP over the survey period (Appendix 2). Bird activity was recorded from the VPs during each survey. Table 3-1 shows all the species recorded during surveys. In total there were 1,187 individual flight lines of 21 target species observed during the survey period.

In total, 60 species of bird were noted. Of these species, eight are of Red-list status under the BoCCI (Gilbert *et al*., 2021): black-tailed godwit, curlew, grey wagtail, kestrel, lapwing, meadow pipit, snipe and swift. A total of 18 are Amber-listed and the remaining 34 are Green-listed. Of the species noted, four are protected under Annex I of the EU Birds Directive: common tern, kingfisher, little egret and peregrine. Table 3.1 details the conservation status of all 60 species.

3.1.1 Summary Results Summer 2021

Target species observed during this survey period at Derryadd were black-headed gull, black-tailed godwit, buzzard, common gull, common tern, cormorant, curlew, grey heron, kestrel, lapwing, lesser black-backed gull, little egret, mallard, moorhen, mute swan, peregrine, snipe, sparrowhawk, teal, whimbrel and wigeon.

Table 3.1 Bird species recorded during VP surveys 2021[2]

Common name (BTO code)	Scientific name	*BoCCI status	**Annex I status
Blackcap	*Sylvia atricapilla*	Green	No
Black-headed Gull	*Chroicocephalus ridibundus*	Amber	No
Black-tailed Godwit	*Limosa limosa*	Red	No
Blue Tit	*Cyanistes caeruleus*	Green	No
Bullfinch	*Pyrrhula pyrrhula*	Green	No
Buzzard	*Buteo buteo*	Green	No
Chaffinch	*Fringilla coelebs*	Green	No
Chiffchaff	*Phylloscopus collybita*	Green	No
Common Gull	*Larus canus*	Amber	No
Common Tern	*Sterna hirundo*	Amber	**Yes**
Cormorant	*Phalacrocorax carbo*	Amber	No
Cuckoo	*Cuculus canorus*	Green	No
Curlew	*Numenius arquata*	Red	No
Dunnock	*Prunella modularis*	Green	No
Goldcrest	*Regulus regulus*	Amber	No
Goldfinch	*Carduelis carduelis*	Green	No
Great Tit	*Parus major*	Green	No
Green Sandpiper	*Tringa ochropus*	Green	No
Grey Heron	*Ardea cinerea*	Green	No
Grey Wagtail	*Motacilla cinerea*	Red	No
Hooded Crow	*Corvus cornix*	Green	No
House Martin	*Delichon urbicum*	Amber	No
Jackdaw	*Corvus monedula*	Green	No
Kestrel	*Falco tinnunculus*	Red	No
Kingfisher	*Alcedo atthis*	Amber	**Yes**
Lapwing	*Vanellus vanellus*	Red	No
Lesser Black-backed Gull	*Larus fuscus*	Amber	No
Lesser Redpoll	*Carduelis cabaret*	Green	No
Linnet	*Carduelis cannabina*	Amber	No
Little Egret	*Egretta garzetta*	Green	**Yes**
Little Grebe	*Tachybaptus ruficollis*	Green	No
Long-tailed Tit	*Aegithalos caudatus*	Green	No
Mallard	*Anas platyrhynchos*	Amber	No
Meadow Pipit	*Anthus pratensis*	Red	No
Mistle Thrush	*Turdus viscivorus*	Green	No
Moorhen	*Gallinula chloropus*	Green	No
Mute Swan	*Cygnus olor*	Amber	No
Peregrine	*Falco peregrinus*	Green	**Yes**

[2] Colours refer to the conservation status of the species according to Birds of Conservation Concern in Ireland.

Common name (BTO code)	Scientific name	*BoCCI status	**Annex I status
Pheasant	*Phasianus colchicus*	Green	No
Raven	*Corvus corax*	Green	No
Reed Bunting	*Emberiza schoeniclus*	Green	No
Robin	*Erithacus rubecula*	Green	No
Sand Martin	*Riparia riparia*	Amber	No
Siskin	*Carduelis spinus*	Green	No
Snipe	*Gallinago gallinago*	Red	No
Sparrowhawk	*Accipiter nisus*	Green	No
Spotted Flycatcher	*Muscicapa striata*	Amber	No
Starling	*Sturnus vulgaris*	Amber	No
Stonechat	*Saxicola torquatus*	Green	No
Swallow	*Hirundo rustica*	Amber	No
Swift	*Apus apus*	Red	No
Teal	*Anas crecca*	Amber	No
Treecreeper	*Certhia familiaris*	Green	No
Water Rail	*Rallus aquaticus*	Green	No
Whimbrel	*Numenius phaeopus*	Green	No
Whitethroat	*Sylvia communis*	Green	No
Wigeon	*Anas penelope*	Amber	No
Willow Warbler	*Phylloscopus trochilus*	Amber	No
Woodpigeon	*Columba palumbus*	Green	No
Wren	*Troglodytes troglodytes*	Green	No

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

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

3.2 Target species observations during VP surveys

3.2.1 Black-Headed Gull

The Amber-listed black-headed gull was recorded 71 times during the summer VP surveys. This species was observed 22 times in May, 28 times in June, 20 times in July and once in September, and was observed at all 11 VP locations. This species was recorded in all height bands, with the exception of >185m. Quantities observed ranged from a minimum of one to a maximum of 51. The average quantity of black-headed gulls observed was five birds.

3.2.2 Black-Tailed Godwit

Black-tailed godwit, a Red listed species was recorded once, at VP2 on the 29th of April 2021. A total of five birds were recorded during this observation. This group flew at a height of 30-50m for 109 seconds.

3.2.3 Buzzard

Green-listed buzzard was observed on 281 occasions. Observations were distributed across all VPs and months. Buzzard was observed flying through all height bands, most frequently at the 30-50m band. Observations were usually of individual birds, but up to five individuals were recorded on occasion.

3.2.4 Common Gull

Common gull, an Amber-listed Species, was observed once from VP2 on the 29th of April 2021. This observation was of a single bird flying in the 50-185m height band.

3.2.5 Common tern

Common tern, an Amber-listed, Annex I species was recorded twice during the summer survey period, on the 7th of July 2021. Both observations were of a single individual, observed flying in the 0-30m height band at VP2. Common tern may breed on inland lakes, and breeding may occur in this area. However, no evidence of breeding onsite was recorded.

3.2.6 Cormorant

The Amber-listed cormorant was observed on 67 occasions. Observations occurred in all months. Cormorant was observed at VPs 1, 2, 3, 4, 5, 6, 8, and 11. This species was observed flying at all height bands, but most frequently at 50-185m. Activity of cormorants was concentrated along the River Shannon and to the northern part of the proposed site.

3.2.7 Curlew

Red-listed Curlew was observed four times, flying in the 50-185m height band on all occasions. At VP1, individual curlews were observed on 18th August and 6th September. A single individual flew through VP4 with four whimbrel on the 13th of August 2021. A single individual was also observed at VP6 on the 19th of August 2021. No evidence was noted of curlew breeding on site.

3.2.8 Grey Heron

The Green-listed Grey Heron was observed 94 times during the summer surveys. Observations of this species were made during all surveyed months. This species generally flew at the 0-30m height band and was observed at higher bands on 18 occasions. This species was observed at all VP locations. Observations were generally of single birds, but two individuals were noted on four occasions and three individuals on another occasion.

3.2.9 Kestrel

Kestrel (Red-listed) was observed 91 times during the summer survey period. This species was observed at all VPs except for VP1. Kestrel was observed in all months except April. Observations were made at all height bands, most frequently between 30-50m, and least frequently above 185m. Generally, only one bird was noted per observation, but two to three birds were occasionally observed.

3.2.10 Lapwing

A total of 28 observations were made of Red-listed lapwing at VP1, VP3, VP4, VP5, VP6 and VP10. Lapwing were recorded in all months except April, and only single observations were made in both August and September. This species most frequently flew at the lower height band (0-30m) and was not observed flying above 185m. An average of five birds were recorded during each observation, ranging from one individual to a flock of 63 birds. The majority of flight activity was concentrated over the bog at the north of the site.

3.2.11 Lesser Black-Backed Gull

Amber-listed lesser black-backed gull was the most frequently recorded species, with 355 flightlines mapped across all VPs. 6 observations across all VPs This species was observed in all months except April. Most observations were in July and August (116 and 111 respectively) with fewer in May, June and September (73, 46 and 8 observations respectively). The number of individuals observed ranged from one to 74, with an average of four birds per observation.

3.2.12 Little Egret

A total of 61 observations of Green-listed/Annex I little egret were recorded. This species was recorded from all VPs except VP11. Observations were made in all months but were most frequent in May (30 observations). This species was most frequently observed flying within the 0-30m height band and was not observed flying above 185m. The numbers of individuals per observation ranged from one to twelve, but most frequently a single bird was observed.

3.2.13 Mallard

Amber-listed mallard was recorded on 51 occasions. It was observed at VP1, VP2, VP3, VP4, VP5, VP9 and VP11 and observations occurred during all months surveyed. Mallard was observed flying most frequently between 0-30m and was not observed above 185m. The numbers of individuals recorded ranged from one to eight, with an average of two per observation.

3.2.14 Moorhen

A single observation of two Green-listed moorhen was made from VP2 on 29th of April 2021. These individuals were observed flying for 11 seconds within the 0-30m height band.

3.2.15 Mute Swan

Mute swan (Amber-listed) was recorded five times. Four of these observations were from VP1 (May, June and August), each of one individual bird within the 0-30m height band. An observation from VP2 (29th of April 2021) recorded two birds flying in the 0-30m and 30-50m height bands. Mute swan activity did not occur on site, with all observed flightlines associated with the River Shannon.

3.2.16 Peregrine

Peregrine (Green-listed, Annex I) was observed three times during the summer VP surveys. On 5th of May a single individual was observed from VP4, flying in height bands 30-50m, 50-185m and >185m. On 1st June, a single individual was observed flying between 0-30m. The final observation was on the 6th of July, with a single individual observed flying in height bands 30-50m, 50-185m and >185m. Each of these observations occurred on the proposed site, with two observations involving birds circling over the site.

3.2.17 Snipe

Red-listed snipe was observed 23 times. This species was observed from VP1, VP3, VP4, VP5, VP6 and VP8. Observations were made in June, July and September. This species was recorded flying at height bands 0-30m, 30-50m and 50-185m. There were 18 observations of single individuals, and five observations of two individuals.

3.2.18 Sparrowhawk

Sparrowhawk (Green-listed) was observed 38 times during the summer survey season. This species was observed from all VPs except VP8. Observations of sparrowhawk were made in all months. Sparrowhawk was observed in all height bands, but most frequently between 0-30m. The number of individuals per observation ranged from one to three, with a one individual per sighting being the most frequent.

3.2.19 Teal

Amber-listed teal was observed twice during VP surveys. The first observation occurred from VP3 on the 4th of May. On this occasion, one female was observed flying for 23 seconds in the 0-30m height band. The second observation occurred from VP1 on the 6th of July. On this occasion, four birds were observed flying for 119s in the 50-185m height band.

3.2.20 Whimbrel

Whimbrel, a Green-listed species was observed four times flying at the 50-185m height band on all occasions. Two observations were made in May, from VP4 and VP8, of 41 and 147 individuals respectively. From VP4, on the 13th of August, 4 individuals were recorded. Finally, on the 6th of September three individuals (one flightline) was made from VP8. Whimbrel is a passage migrant, moving through Ireland to Iceland from the African continent via Europe in spring and back again in autumn.

3.2.21 Wigeon

Two observations were made of wigeon (Amber-listed) from VP1. The first observation occurred on 6th May, with one male observed flying along a drain at a height of 0-30m for seven seconds. The second observation, again of a male, occurred on the 1st of June for 10 seconds at a height of 0-30m. Wigeon are considered to breed in Ireland in small numbers (< 10 pairs).

3.3 Hinterland Survey

Hinterland surveys to establish breeding occupancy within a 10 km radius of the site were carried out over ten dates across summer 2021. The survey schedule and locations of the Hinterland watches are shown in Table 2-1.

For site-specific Hinterland survey results see Appendix 4 of this report.

A total of three Annex I species were recorded during hinterland surveys: common tern, kingfisher, and little egret. A total of five Red-listed species were observed: grey wagtail, lapwing, oystercatcher, pochard and snipe. A further 16 Amber-listed species were observed: common tern, kingfisher, black-headed gull, common gull, common sandpiper, coot, cormorant, gadwall, great crested grebe, lesser black-backed gull, mallard, mute swan, greylag goose, teal, tufted duck and wigeon. All observed species, including green listed species are included in Table 3-2.

For site-specific Hinterland survey results see Appendix 4 of this report.

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

3.3.1 Black-Headed Gull

This Amber-listed species was seen 35 times during hinterland surveys, with observations made during all survey months. Observations were made from the following hinterland vantage points (HVPs): HVP4 (Fortwilliam Turlough, 3.4km west), HVP5 (Incharmadermot Island, Lough Ree, 5.1km west), HVP6 (Cureen, Lough Ree, 2.4km west), HVP7 (Lanesborough Bridge, Lough Ree, 0.9 km west), HVP8 (Cullaghy, Lough Ree, 2.5km west), HVP9 (Gardenstown, Lough Ree, 4.6km west), HVP11 (Erra & Derryhanee, River Shannon, 2.2km north), , HVP10 (Cloonmustra, River Shannon, 1km north-west), HVP 11 (Erra and Derryhanee, River Shannon, 2.2km north), HVP12 (Derrycashel, River Shannon, 3.3km north), HVP15 (Tarmonbarry Lock, 3.5km north), HVP16 (Camlin River Complex, 3.5km north), and HVP20 (Cloondara, Royal Canal, 3.1km north). These HVPs are to the west, north and northeast of the proposed site, in the vicinity of Lough Ree and the River Shannon. The quantity of birds counted in these observations ranged from one to 290, with an average of 22.

3.3.2 Buzzard

Buzzard (Green-listed) was observed on eight occasions during the hinterland surveys. In May 2021, buzzard was observed from HVP21 (Begnagh Bridge, Royal Canal), c. 2.1 km north of the site. Buzzard was observed in June from HVP13 (Feorish River, 3.4km north) and HVP18 (Fallan Bridge, 4.3km north-east), in July from HVP4 (Fortwilliam Turlough, 3.4 km west), in August from HVP18 (Fallan Bridge, 4.3km north-east), HVP6 (Cureen, Lough Ree 2.4 km west) and HVP8 (Cullaghy, Lough Ree, 0.9km west), and again in September from HVP4. All observations were of individuals, except for the sighting at HVP4 on the 17th of July, where six buzzards were seen together.

3.3.3 Common Gull

There were six observations of common gull (Amber-listed) through the hinterland surveys. In May, this species was observed at HVP6 (Incharmadermot Island, Lough Ree, 5.1km W), HVP8 (Cullaghy, Lough Ree, 0.9km west) and HVP12 (Derrycashel, River Shannon, 3.3km north). In July, common gull was observed at HVP9 (Gardenstown, Lough Ree, 4.6km west) and HVP14 (Tarmonbarry Bridge, 3.9km north). Common gull was also observed at HVP9 in August. The quantity of this species observed ranged from one to nine.

3.3.4 Common Sandpiper

One observation was noted of a single common sandpiper (Amber-listed species). This record occurred on 14th August 2021 from HVP8 (Cullagh, Lough Ree, 0.9km north), located 2.5km to the west of the proposed site.

3.3.5 Common Tern

Common tern (Amber-listed, Annex I) was observed on four occasions. In May and June, two individuals were observed on each occasion from HVP5 (Incharmadermot Island, Lough Ree, 5.1km west). In June and July, individuals were observed from HVP8 (Cullaghy, Lough Ree, 2.5km west) and HVP9 (Gardenstown, Lough Ree, 4.6km west) respectively. These HVPs all surround Lough Ree SPA (004064), which is a protected site for common tern.

3.3.6 Curlew

Curlew (Red-listed) was observed on one occasion during the hinterland surveys. On the 9th of September 2021, two curlew were observed from HVP8 (Cullaghy, Lough Ree SPA (004064).

3.3.7 Common Coot

Coot (Amber-listed) was observed 16 times during the hinterland surveys. Quantities ranged from 2 to 20, averaging 16 individuals. Observations of coot occurred from May to September, and were recorded from HVP4 (Fortwilliam Turlough, 3.4km W), HVP5 (Incharmadermot Island, Lough Ree, 5.1km west), HVP8 (Cullaghy, Lough Ree, 2.5km west), and HVP9 (Gardenstown, Lough Ree, 4.6km west). These Hinterland Vantage Points (HVPs) all surround Lough Ree SPA (004064), which is a protected site for coot

3.3.8 Cormorant

Cormorant (Amber-listed) were recorded 22 times during the hinterland surveys, with groups ranging from 24 to 114 individuals, noted especially from HVP5 (Incharmadermot Island, Lough Ree, 5.1 km west). Smaller groups and individual birds were more frequently recorded. This species was observed during all survey months. Sighting occurred at the following hinterland vantage points: HVP5, HVP6 (Cureen, Lough Ree, 2.4km west), HVP7 (Lanesborough Bridge, Lough Ree, 0.9km west), HVP8 (Cullaghy, Lough Ree, 2.5km west), HVP9 (Gardenstown, Lough Ree, 4.6 km west), HVP10 (Cloonmustra, River Shannon, 1km north-west), HVP11 (Erra and Derryhanee, River Shannon, 2.2km north), HVP12(Derrycash, River Shannon 3.3km north) and HVP15 (Tarmonbarry Lock, 3.5km north). These hinterland sites are in the vicinity
of either Lough Ree or the River Shannon

3.3.9 Gadwall

Amber-listed gadwall was observed on five occasions. In May (2 birds), June (1 bird) and July (2 birds) were observed at HVP 5 (Incharmadermot Island, Lough Ree, 5.1 km west). In July, 31 gadwall were observed at HVP8 (Cullaghy, Lough Ree, 2.5km west). Additionally, eight gadwall were observed at HVP9 in July 2021.

3.3.10 Great Black-Backed Gull

One observation of great black-backed gull (Green-listed) was made from HVP8 (Cullaghy, Lough Ree, 2.5km west) on the 9th of September. A single bird was observed.

3.3.11 Great Crested Grebe

Over the survey period, 20 observations were made of great-crested grebe. Sightings of this species occurred in all months and numbers per observation ranged from 1 to 12 (average = 5). These observations were made from HVP5 (Incharmadermot Island, Lough Ree, 5.1km west), HVP8 (Cullaghy, Lough Ree, 2.5km west), HVP9 (Gardenstown, Lough Ree, 4.6km west), HVP11 (Erra & Derryhanee, River Shannon, 2.2km north), and HVP12 (Derrycashel, River Shannon, 3.3km north).

3.3.12 Great White Egret

A single observation of great white egret was made on 13th May 2021. This observation occurred from HVP11 (Erra & Derryhanee, River Shannon, 2.2km north). The observed bird was a non-breeding bird with winter plumage.

3.3.13 Grey Heron

During hinterland surveys, grey heron (Green-listed) was observed 23 times. The observations occurred in all months. Observations of this species were made from HVP1 (Pake Bridge, Royal Canal, 4.8km south-east), HVP2 (Foygh Bridge, Royal Canal, 3.4km south-east), HVP4 (Fortwilliam Turlough, 3.4km west), HVP5 (Incharmadermot Island, Lough Ree, 5.1km west), HVP7 (Lanesborough Bridge, Lough Ree, 0.9 km west), HVP8 (Cullaghy, Lough Ree, 2.5km west), HVP9 (Gardenstown, Lough Ree, 4.6km west), HVP10 (Cloonmustra, River Shannon, 1km north-west), HVP11 (Erra & Derryhanee, River Shannon, 2.2km north), HVP12 (Derrycashel, River Shannon, 3.3km N), HVP15 (Tarmonbarry Lock, 3.5km N), HVP16 (Camlin River Complex, 3.5kmnorth), HVP19 (Richmond Bridge, 8.9km north-east) and HVP21 (Begnagh Bridge, Royal Canal, 2.1km north). The majority of observations (17) were of individuals, but groups of 2-9 were also observed.

3.3.14 Grey Wagtail

Red-listed grey wagtail was observed on 12 occasions during VP surveys. This species was sighted in all months (May to September). Quantities observed ranged from one to 3 (average=1.3). Sightings occurred at HVP1 (Pake Bridge, Royal Canal, 4.8km south-east), HVP7 (Lanesborough Bridge, Lough Ree, 0.9 km west), HVP8 (Cullaghy, Lough Ree, 2.5km west), HVP15 (Tarmonbarry Lock, 3.5km north), HVP16 (Camlin River Complex, 3.5km north), HVP19 (Richmond Bridge, 8.9km north-east), HVP20 (Cloondara, Royal Canal, 3.1km north), HVP23 (Lyneen Bridge, Royal Canal, 1km east) and HVP25 (Island Bridge, Royal Canal, 1.2km east).

3.3.15 Greylag Goose

On the 12th of May2021, two Amber-Listed greylag geese were observed from HVP5 (Incharmadermot Island, Lough Ree, 5.1km west).

3.3.16 Kingfisher

During the hinterland surveys, kingfisher (Amber-listed, Annex I) was observed on three occasions. A single individual was seen on each occasion. Sightings occurred in May, August and September from HVP8 (Cullaghy, Lough Ree, 2.5km west), HVP20 (Cloondara, Royal Canal, 3.1km north) and HVP2 (Foygh Bridge, Royal Canal, 3.4km south-east) respectively.

3.3.17 Lapwing

Overall, six sightings of Red-listed lapwing were made during the hinterland surveys. In May and July, single birds were observed at HVP12 (Derrycashel, River Shannon, 3.3km north) and HVP4 (Fortwilliam Turlough, 3.4km west). Groups ranging from 16 to 38 (mean=22) were observed from HVP8 (Cullaghy, Lough Ree, 2.5km west) during July, August and September. This Hinterland sites is at Lough Ree SPA (004064), which is a protected site for lapwing.

3.3.18 Lesser Black-Backed Gull

During the hinterland surveys, 44 observations were made of lesser black-backed gull (Amber-listed). Counts ranged from one individual to 1400 (mean=145). Sightings occurred during all surveyed months. Observations occurred at all HVP sites with the exception of HVP2 (Foygh Bridge, Royal Canal, 3.4km south-east), HVP3 (Derrymacar Lough, 4.9km south), HVP13 (Feorish River, 4.3km north), HVP16 (Camlin River Complex, 3.5km north), HVP10 (Cloonmustra, River Shannon, 1km north-west), HVP20 (Cloondara, Royal Canal, 3.1km north) and HVP24 (Coolnahinch Bridge, Royal Canal, 0.7km east).

3.3.19 Little Egret

Little egret (Green-listed, Annex I) was recorded 18 times. Observations occurred during all survey months from the following hinterland sites: HVP4 (Fortwilliam Turlough, 3.4km west), HVP5 (Incharmadermot Island, Lough Ree, 5.1km west), HVP6 (Cureen, Lough Ree, 2.4km west), HVP8 (Cullaghy, Lough Ree, 2.5km west), HVP9 (Gardenstown, Lough Ree, 4.6km west), HVP11 (Erra & Derryhanee, River Shannon, 2.2km north), and HVP15 (Tarmonbarry Lock, 3.5km north).

3.3.20 Little Grebe

Little grebe (Green-listed) was observed 8 times, in quantities of 2-12 (mean=5). This species was observed in May, August and September, and observations occurred from HVP4 (Fortwilliam Turlough, 3.4km west), HVP5 (Incharmadermot Island, Lough Ree, 5.1km west), HVP8 (Cullaghy, Lough Ree, 2.5km west), and HVP9 (Gardenstown, Lough Ree, 4.6km west). These hinterland sites are all in the vicinity of Lough Ree SPA, which lists little grebe as a Special Conservation Interest.

3.3.21 Mallard

Mallard (Amber-listed) was observed on 39 occasions. Sightings were made during all surveyed months. Mallard was observed from HVP1 (Pake Bridge, Royal Canal, 4.8km south-east), HVP2 (Foygh Bridge, Royal Canal, 3.4km SE), HVP4 (Fortwilliam Turlough, 3.4km west), HVP5 (Incharmadermot Island, Lough Ree, 5.1km west), HVP6 (Cureen, Lough Ree, 2.4km west), HVP7 (Lanesborough Bridge, Lough Ree, 0.9 km west), HVP8 (Cullaghy, Lough Ree, 2.5km west),HVP9 (Gardenstown, Lough Ree, 4.6km west), HVP10 (Cloonmustra, River Shannon, 1km north-west), HVP11 (Erra & Derryhanee, River Shannon, 2.2km north), HVP12 (Derrycashel, River Shannon, 3.3km north), HVP13 (Feorish River, 4.3km north), HVP15 (Tarmonbarry Lock, 3.5km north), and HVP20 (Cloondara, Royal Canal, 3.1km north). A number of these HVPs are located on the shores of Lough Ree SPA, which is designated for mallard. Counts of this species ranged from 1 to 44, with an average count of 7.5.

3.3.22 Moorhen

Moorhen (Green-listed) was observed 18 times, from June to September. Sightings occurred from HVP1 (Pake Bridge, Royal Canal, 4.8km south-east), HVP4 (Fortwilliam Turlough, 3.4km west), HVP5 (Incharmadermot Island, Lough Ree, 5.1km west), HVP8 (Cullaghy, Lough Ree, 2.5km west), HVP9 (Gardenstown, Lough Ree, 4.6km west), HVP 11 (Erra & Derryhanee, River Shannon, 2.2km north), HVP12 (Derrycashel, River Shannon, 3.3km north), and HVP15 (Tarmonbarry Lock, 3.5km north). Counts ranged from 1 to 10, with an average count of 2 birds per observation.

3.3.23 Mute Swan

Mute swan (Amber-listed) was the most frequently observed species, noted 49 times during the hinterland surveys. Observations occurred in all months and were evenly distributed across those months. Counts ranged from 1 to 66, with an average count of 11 per observation. Sightings occurred at the following HVPs: HVP3 (Derrymacar Lough, 4.9km south), HVP4 (Fortwilliam Turlough, 3.4km W), HVP5 (Incharmadermot Island, Lough Ree, 5.1km west), HVP6 (Cureen, Lough Ree, 2.4km west), HVP7 (Lanesborough Bridge, Lough Ree, 0.9 km west), HVP8 (Cullaghy, Lough Ree, 2.5km west), HVP9 (Gardenstown, Lough Ree, 4.6km west), HVP10 (Cloonmustra, River Shannon, 1km north west), HVP11 (Erra & Derryhanee, River Shannon, 2.2km N), HVP12 (Derrycashel, River Shannon, 3.3km north), HVP13 (Feorish River, 4.3km north), HVP14 (Tarmonbarry Bridge, 3.9km north) and HVP15 (Tarmonbarry Lock, 3.5km north). No sightings were observed from the southeast of the proposed wind farm.

3.3.24 Oystercatcher

A single observation of Red-listed oystercatcher was made from HVP8 (Cullaghy, Lough Ree, 2.5km west) on the 12th of June. This sighting involved a single individual.

3.3.25 Pink-footed Goose

A single observation of the Green-listed pink-footed goose was made from HVP8 (Cullaghy, Lough Ree, 2.5km west) on the 14th of May. This sighting involved a single individual.

3.3.26 Pochard

A single observation of the Red-Listed pochard was made from HVP8 (Cullaghy, Lough Ree, 2.5km west) on the 17th of July. This sighting involved a single individual.

3.3.27 Snipe

Snipe (Red-listed) was recorded on four occasions during the hinterland surveys. Each observation consisted of one individual. Two observations occurred from HVP4 (Fortwilliam Turlough, 3.4km west), on 12th June and 7th July. A sighting occurred from HVP 11 (Erra & Derryhanee, River Shannon, 2.2km north) on 13th May and from HVP 13 (Feorish River, 4.3km north) on the 9th of September.

3.3.28 Teal

Amber-listed teal was observed once from HVP8 (Cullaghy, Lough Ree, 2.5km west) on the 9th of September 2021. This HVP site is within the Lough Ree SPA, which lists teal as a Special Conservation Interest. A single bird was recorded on this occasion.

3.3.29 Tufted Duck

A total of 15 observations were made of the Amber-listed tufted duck. Observations were made at the following HVPs, which are in the vicinity of Lough Ree SPA, which is designated for tufted duck: HVP4 (Fortwilliam Turlough, 3.4km west), HVP5 (Incharmadermot Island, Lough Ree, 5.1km west), HVP8 (Cullaghy, Lough Ree, 2.5km west) and HVP9 (Gardenstown, Lough Ree, 4.6km west). Counts for this species ranged from 2 to 124 individuals, averaging at 21 birds. Observations occurred from May to August.

3.3.30 Water Rail

Green-listed water rail was observed six times. Four times from HVP4 (Fortwilliam Turlough, 3.4km west) and twice from HVP12 (Derrycashel, River Shannon, 3.3km north). Each observation consisted of a single individual, and observations occurred from July to September.

3.3.31 Whimbrel

Whimbrel (Green-listed) was observed twice, with each observation involving a single individual. The first observation was on the 13th of May from HVP12 (Derrycashel, River Shannon, 3.3km N). The second observation occurred the following day (14th of May) from HVP8 (Cullaghy, Lough Ree, 2.5km W). This species occurs as a passage migrant in Ireland.

3.3.32 Wigeon

There were two observations of single wigeon (Red-listed) during the hinterland surveys. The first observation was on the 6th of June from HVP4 (Fortwilliam Turlough, 3.4km west). The second observation occurred on the 14th of August from HVP5 (Incharmadermot Island, Lough Ree, 5.1km west). These hinterland vantage points are near or within Lough Ree SPA, which lists wigeon as a Special Conservation Interest.

Table 3.2: Bird species recorded during hinterland surveys in summer 2021[3]

Common Name	Scientific Name	Conservation Status	
		BoCCI*	Annex I**
Black-headed Gull	*Chroicocephalus ridibundus*	Amber	No
Buzzard	*Buteo buteo*	Green	No
Common Gull	*Larus canus*	Amber	No
Common Sandpiper	*Actitis hypoleucos*	Amber	No
Common Tern	*Sterna hirundo*	Amber	**Yes**
Coot	*Fulica atra*	Amber	No
Cormorant	*Phalacrocorax carbo*	Amber	No
Gadwall	*Anas strepera*	Amber	No
Great Black-backed Gull	*Larus marinus*	Green	No
Great Crested Grebe	*Podiceps cristatus*	Amber	No
Great White Egret	*Ardea alba*	Green	Yes
Grey Heron	*Ardea cinerea*	Green	No
Grey Wagtail	*Motacilla cinerea*	Red	No
Greylag Goose	*Anser anser*	Amber	No
Kingfisher	*Alcedo atthis*	Amber	**Yes**
Lapwing	*Vanellus vanellus*	Red	No
Lesser Black-backed Gull	*Larus fuscus*	Amber	No
Little Egret	*Egretta garzetta*	Green	**Yes**
Little Grebe	*Tachybaptus ruficollis*	Green	No
Mallard	*Anas platyrhynchos*	Amber	No
Moorhen	*Gallinula chloropus*	Green	No
Mute Swan	*Cygnus olor*	Amber	No
Oystercatcher	*Haematopus ostralegus*	Red	No
Pink-footed Goose	*Anser brachyrhynchus*	Green	No
Pochard	*Aythya ferina*	Red	No
Snipe	*Gallinago gallinago*	Red	No
Teal	*Anas crecca*	Amber	No
Tufted Duck	*Aythya fuligula*	Amber	No
Water Rail	*Rallus aquaticus*	Green	No
Whimbrel	*Numenius phaeopus*	Green	No
Wigeon	*Anas penelope*	Amber	No

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

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

[3] Colours refers to the conservation status of the species according to Birds of Conservation Concern in Ireland. Species in bold refers to species listed on Annex I of the EU Birds Directive.

3.4 Breeding Waders Survey

A total of four wader species were observed during the Breeding Waders survey, with all observed waders detailed in Table 3.3. Of the observed wading species, three are Red-listed (lapwing, snipe and woodcock). The remaining species, ringed plover, is Amber-listed. Details of their breeding status are included under the subheadings below.

Other species were also recorded during the breeding wader survey. Amber-listed lesser black-backed gull and mallard were observed. Additionally, the following Green-listed species were noted: long-eared owl, little egret and grey heron. Long eared owl was not observed in the other surveys.

Table 3.3: Bird species recorded during breeding wader surveys in summer 2021 [4]

Common Name	Scientific Name	Conservation Status	
		BoCCI*	Annex I**
Lapwing	*Vanellus vanellus*	Red	No
Ringed Plover	*Charadrius hiaticula*	Amber	No
Snipe	*Gallinago gallinago*	Red	No
Woodcock	*Scolopax rusticola*	Red	No

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

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

3.4.1 Lapwing

Observations of breeding lapwing (occupied territory) occurred on 12 occasions between May and June 2021 (separate observations to the VP surveys) Quantities ranged from two to 14 lapwing. Confirmed breeding was noted twice. On 16th May, an adult was observed with recently fledged young. On the 17th of May, within a group of 14 lapwing, adults were observed with at least two recently fledged young. Lapwing breeding activity was concentrated on peat bog in the north of the site.

3.4.2 Ringed Plover

Occupied territories for breeding ringed plover were noted eight times during May and June 2021. Counts of birds ranged from one to two. Breeding was recorded on peat bog in the north of the site, and the middle section of the site.

3.4.3 Snipe

Snipe was the most frequently observed wader recorded during breeding wader surveys, with 14 observations in total. Breeding records of snipe were distributed across the entire site. Each of these observations were of occupied territories, and snipe were observed drumming on several occasions. Counts of snipe ranged from one to three.

4 Wading species are underlined and species in bold indicate a species is listed on Annex 1 of the EU Birds Directive

3.4.4 Woodcock

Woodcock was observed roding in occupied territory on seven occasions in June 2021. All observations were of individual birds, with the exception of two individuals noted on the 1st of June, in the north-west of the site. The remainder of observations originated from mixed woodland in the south-west of the site. A woodcock was also observed in flight on 1st June but its breeding status was not determined.

3.5 General Breeding Bird Survey

For the summer (breeding) season 2021, a total of 21 transects were chosen (Table 2.6). The results of the summer breeding bird transect survey at Derryadd are shown in Table 3.4 and Table 3.5. A total of 58 species were recorded along the transects over the summer season.

A total of four Red-listed species were recorded: lapwing, meadow pipit, snipe and swift.

Lapwing were recorded in both May (15 records) and June (14 records). In May, it was observed from Transect TR5, TR9, TR10, TR11, and TR20. In June this species was observed from TR3, TR5, TR9, TR10, TR11 and TR20.

In May, 46 meadow pipit records were observed from all transects with the exception of TR1, TR9, TR10 and TR21. In June, 102 meadow pipit records were observed from all transects except TR1, TR6, TR9, TR16 and TR21. Of these observations, 70 originated from the 0-25m distant band, indicating that breeding is occurring onsite. Note, due to the high number of transects, it was not possible to include distance bands in Table 3.4 and Table 3.5.

Snipe were observed twice in May, with a single individual each observed at TR1 and TR14. In June, a total of 12 observations of snipe occurred from TR3, TR5, TR9, TR10. TR16, TR19 AND TR20.

Swift was recorded once in June from TR7. No structures are available within the site boundary that are suitable for swift breeding.

A total of 15 Amber-listed species were recorded: black-headed gull, cormorant, goldcrest, great crested grebe, house martin, lesser black-backed gull, linnet, mallard, ringed plover, sand martin, skylark, starling, swallow, willow warbler and wheatear. Skylark and goldcrest are considered to be breeding onsite.

3.6 Barn Owl Surveys

Searches for barn owl within 2km of the site boundary concluded that there is no evidence of barn owl in the area. No known nest sites were identified in the area.

Table 3.4: Results of breeding bird transects surveys at Derryadd (TR1- TR21) in May 2021[5]

Species	TR1	TR2	TR3	TR4	TR5	TR6	TR7	TR8	TR9	TR10	TR11	TR12	TR13	TR14	TR15	TR16	TR17	TR18	TR19	TR20	TR21
Blackbird	4	3	10	2	3	3	5	2	5	3	1	5	3	4	7	3	3	6	2	5	4
Blackcap	3	5	2	2	2	2	0	2	1	3	0	3	0	3	0	3	1	2	0	0	3
Black-headed Gull	1	3	3	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Blue Tit	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0
Bullfinch	3	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Buzzard	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
Chaffinch	2	1	7	1	1	2	1	4	2	7	1	2	3	2	1	4	4	2	3	1	4
Chiffchaff	4	0	2	0	0	0	3	0	1	1	0	0	0	0	1	1	2	0	1	0	1
Coal Tit	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cormorant	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cuckoo	4	0	2	0	1	1	4	0	2	4	1	0	1	4	1	0	2	4	1	0	0
Dunnock	0	1	1	0	0	0	0	0	0	0	0	1	0	1	1	0	1	1	0	1	1
Goldcrest	2	0	5	0	0	1	0	0	1	0	0	0	0	0	0	1	0	4	1	0	3
Goldfinch	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Grasshopper Warbler	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Great Crested Grebe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Great Tit	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grey Heron	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0
Hooded Crow	2	0	1	4	0	2	1	2	1	5	1	0	0	0	0	2	2	2	0	3	1
Jackdaw	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Lapwing	0	0	0	0	1	0	0	0	1	6	5	0	0	0	0	0	0	0	0	2	0
Lesser Black-backed Gull	0	0	0	1	0	0	1	0	0	1	1	0	0	0	0	1	0	3	1	1	0
Lesser Redpoll	3	4	0	0	1	0	3	5	1	4	2	3	3	4	2	6	2	4	3	1	1
Linnet	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Little Egret	0	0	0	0	0	0	0	0	1	2	3	0	0	0	0	0	0	0	1	0	0
Little Grebe	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0

[5] Colours refers to the conservation status of the species according to Birds of Conservation Concern in Ireland. Species in bold refers to species listed on Annex I of the EU Birds Directive

Species	TR1	TR2	TR3	TR4	TR5	TR6	TR7	TR8	TR9	TR10	TR11	TR12	TR13	TR14	TR15	TR16	TR17	TR18	TR19	TR20	TR21
Magpie	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Mallard	1	1	0	3	1	1	0	0	0	3	2	0	1	0	0	0	0	1	0	0	0
Meadow Pipit	0	2	1	6	1	1	1	3	0	0	2	2	2	8	5	0	2	5	2	2	0
Mistle Thrush	1	3	1	0	1	2	0	2	1	0	0	0	0	2	0	0	0	2	0	1	2
Moorhen	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0
Pheasant	3	1	1	2	2	2	5	0	2	5	3	1	1	0	0	0	3	3	1	0	1
Pied/White Wagtail	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2	0	1
Raven	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Reed Bunting	0	3	0	0	0	3	3	1	2	5	0	0	1	5	0	2	1	2	4	1	2
Ringed Plover	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	0
Robin	5	5	10	4	4	4	0	4	1	1	2	3	1	2	5	4	5	6	3	5	8
Rook	1	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sand Martin	0	6	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	0	0
Sedge Warbler	0	1	0	0	1	0	0	0	3	8	2	0	0	0	0	0	0	0	0	1	0
Siskin	0	0	2	0	2	0	0	0	0	1	0	0	0	0	0	0	0	1	0	2	0
Skylark	0	0	0	0	4	2	3	0	0	1	0	3	2	1	0	1	0	6	0	2	0
Snipe	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Song Thrush	2	5	1	0	1	6	4	2	2	2	2	6	0	5	4	5	7	3	2	3	3
Starling	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Stonechat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0
Swallow	1	0	1	2	1	0	0	3	0	1	0	0	0	1	0	1	1	3	0	2	3
Treecreeper	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Rail	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Wheatear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Whitethroat	2	6	0	1	4	1	7	2	6	5	6	5	3	7	3	7	2	7	5	4	3
Willow Warbler	4	0	1	7	5	6	4	3	9	4	7	4	3	4	5	3	3	6	5	9	6
Woodpigeon	1	0	1	1	0	2	1	1	0	0	1	0	1	0	0	2	1	2	0	3	3
Wren	6	8	5	4	8	5	6	4	4	4	3	4	2	1	2	8	7	6	4	3	6

Table 3.5: Results of breeding bird transects surveys at Derryadd (TR1- TR21) in June 2021[6]

Species	TR1	TR2	TR3	TR4	TR5	TR6	TR7	TR8	TR9	TR10	TR11	TR12	TR13	TR14	TR15	TR16	TR17	TR18	TR19	TR20	TR21
Blackbird	7	3	11	9	11	1	5	5	3	1	3	3	4	2	4	5	5	8	2	4	6
Blackcap	5	7	5	7	5	1	2	0	1	2	0	3	0	1	1	2	1	0	0	3	5
Black-headed Gull	1	2	0	1	0	0	0	0	0	4	0	1	0	0	0	1	0	2	1	0	0
Blue Tit	1	0	1	1	1	2	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
Bullfinch	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
Buzzard	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Chaffinch	3	0	0	5	0	1	0	1	2	1	0	2	1	0	1	1	2	5	0	0	0
Chiffchaff	1	0	0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1
Cormorant	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cuckoo	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Dunnock	1	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
Goldcrest	1	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Great Crested Grebe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Grey Heron	0	0	0	1	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	2	0
Hooded Crow	2	0	1	1	1	0	1	0	0	2	2	0	0	0	0	0	0	3	0	0	1
House Martin	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jackdaw	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Jay	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lapwing	0	0	1	0	1	0	0	0	1	4	5	0	0	0	0	0	0	0	0	2	0
Lesser Black-backed Gull	2	3	7	4	7	0	2	0	0	2	3	1	0	0	2	1	1	5	0	2	1
Lesser Redpoll	1	2	7	1	7	0	4	5	1	5	4	7	7	4	6	6	3	6	7	3	1
Linnet	0	0	1	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0

[6] Colours refers to the conservation status of the species according to Birds of Conservation Concern in Ireland. Species in bold refers to species listed on Annex I of the EU Birds Directive

Species	TR1	TR2	TR3	TR4	TR5	TR6	TR7	TR8	TR9	TR10	TR11	TR12	TR13	TR14	TR15	TR16	TR17	TR18	TR19	TR20	TR21
Little Egret	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
Little Grebe	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Long-tailed Tit	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Magpie	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mallard	1	1	0	1	0	0	0	0	0	5	3	0	1	0	0	0	0	0	0	0	0
Meadow Pipit	0	1	6	2	6	0	4	3	0	2	1	2	3	7	2	0	5	6	5	2	0
Mistle Thrush	1	1	2	1	2	3	0	2	1	0	0	0	0	1	1	0	0	2	0	2	1
Moorhen	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pheasant	3	0	4	2	4	0	1	0	0	0	1	0	1	0	0	0	2	0	1	0	0
Pied/White Wagtail	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Reed Bunting	0	4	1	1	1	2	6	2	3	4	0	0	0	1	0	4	0	3	6	1	2
Ringed Plover	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Robin	2	2	0	3	0	1	1	1	1	1	0	1	1	3	2	3	1	5	2	1	5
Sand Martin	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	5	0	0
Sedge Warbler	0	1	0	2	0	0	0	0	2	2	1	0	0	0	0	0	0	0	0	0	0
Siskin	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	1	0
Skylark	0	0	1	1	1	1	4	0	0	4	0	3	1	1	0	2	0	6	1	2	0
Snipe	0	0	2	0	2	0	0	0	1	4	0	0	0	0	0	1	0	0	1	1	0
Song Thrush	5	3	4	3	4	2	1	1	3	0	1	0	1	5	4	3	4	3	0	3	2
Starling	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stonechat	0	0	0	1	0	2	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0
Swallow	8	2	2	0	2	0	2	2	0	4	0	0	0	0	0	0	0	2	0	2	1
Swift	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Rail	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Whitethroat	3	5	8	1	7	2	5	2	5	4	5	4	2	3	4	4	0	5	3	3	4
Willow Warbler	0	0	7	5	7	5	6	4	8	4	3	5	1	4	5	2	2	6	5	4	6
Woodpigeon	1	0	1	2	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0

Species	TR1	TR2	TR3	TR4	TR5	TR6	TR7	TR8	TR9	TR10	TR11	TR12	TR13	TR14	TR15	TR16	TR17	TR18	TR19	TR20	TR21
Wren	13	6	5	10	5	4	6	5	6	3	2	4	2	4	5	4	4	5	6	2	9

4. DISCUSSION

In conclusion, FT carried out ornithological surveys at the proposed Derryadd Windfarm during summer 2021. Surveys took place between May and September inclusive. The following surveys were undertaken: vantage point surveys, breeding bird transect surveys, hinterland surveys, and breeding wader surveys.

In total 84 species of bird were noted across all surveys. Of these species 11 are of Red-list status under the BoCCI (Gilbert et al., 2021). A further 27 are Amber-listed and the remaining 46 are Green-listed. Of these species, four are protected under Annex I of the EU Birds Directive: little egret, peregrine, common tern and kingfisher.

Of these species, 74 were recorded as part of Vantage Point (VP) and transect surveys and can therefore be presumed as directly using or regularly transiting the site. Of these, four are protected under Annex 1 of the EU Birds directive: little egret, peregrine, common tern and kingfisher. Of the species recorded, nine are Red-listed in Ireland: meadow pipit, swift, grey wagtail, kestrel, lapwing, snipe, black-tailed godwit, curlew and woodcock. A further 22 of the recorded species are Amber-listed with the remaining 43 being Green-listed.

During vantage point surveys, there were 1,187 individual flight lines of 21 target species observed during the survey period.

Breeding was confirmed onsite for lapwing, ringed plover, snipe, woodcock, long-eared owl, mistle thrush, song thrush, robin, dunnock, stonechat, blackbird. A number of species are also suspected to be breeding on site, including, sedge warbler, wren, redpoll, reed bunting, grasshopper warbler, blackcap, blue tit, coal tit, great tit, chaffinch, cuckoo, meadow pipit, hooded crow, goldcrest, goldfinch skylark, woodpigeon and whitethroat. Additionally, the surveyor noted the possibility of reed warbler breeding onsite.

During hinterland surveys, 31 species of bird were noted. Of these, three species are protected under Annex I of the EU Birds directive: common tern, kingfisher and little egret. Five of the hinterland species are Red-listed: grey wagtail, lapwing, oystercatcher, pochard and snipe. Additionally, 16 of the hinterland species are Amber-listed with the remaining species being Green-listed.

The most important sites for wetland bird species of interest were HVP4 (Fortwilliam Turlough, 3.4km west), HVP5 (Incharmadermot Island, Lough Ree, 5.1km west), HVP8 (Cullaghy, Lough Ree, 2.5km west) and HVP9 (Gardenstown, Lough Ree, 4.6km west). These hinterland vantage points are near or within the Lough Ree SPA (004064). This SPA lists several Special Conservation Interests that were observed during on site during VP and transect surveys: little grebe, wigeon, teal, mallard, tufted duck, coot, lapwing and common tern.

Other hinterland sites which support a variety of species of conservation interest are: HVP11 (Erra & Derryhanee, River Shannon, 2.2km north), HVP12 (Derrycashel, River Shannon, 3.3km north), HVP15 (Tarmonbarry Lock, 3.5km north), HVP6 (Cureen, Lough Ree, 2.4km west) and HVP7 (Lanesborough Bridge, Lough Ree, 0.9 km west).

Ornithological surveys are ongoing at the site.

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FEHILY TIMONEY

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APPENDIX 1

VP Survey Details
Summer 2021

VP	Date	Start Time	End Time	Cloud (Oktas)	Visibility	Rain	Survey Details
2	29/04/2021	09:38	12:38	5	Very Good	Dry	F1 E
2	29/04/2021	13:32	16:32	6	Very Good	Dry	F1 E
3	04/05/2021	07:26	10:26	5	Good	Heavy Showers	F2-3 WNW
3	04/05/2021	15:15	18:15	4	Good	Heavy Showers	F2 WNW
4	05/05/2021	08:15	11:15	4	Very Good	Light Showers	F2 SSE
4	05/05/2021	12:47	15:47	4	Very Good	Light Showers	F2 SSE
5	05/05/2021	16:35	19:35	7	Very Good	Dry	F1 NW
1	06/05/2021	12:33	15:33	7	Very Good	Dry	F2 NNW
1	06/05/2021	16:04	19:04	7	Very Good	Dry	F2 NNW
5	06/05/2021	08:25	11:25	7	Very Good	Dry	F2 WNW/NW
6	07/05/2021	09:42	12:42	5	Very Good	Dry	F1 SE
6	07/05/2021	13:16	16:16	6	Very Good	Dry	F1 SE
7	07/05/2021	16:50	19:50	5	Very Good	Dry	F1 SSE
7	11/05/2021	07:09	10:09	5	Very Good	Dry	F2 S
8	11/05/2021	17:02	20:02	7	Very Good	Dry	F1 SSE
8	19/05/2021	10:30	13:30	6	Very Good	Dry	F3 WNW
9	21/05/2021	09:15	12:15	8	Very Good	Dry	F2 NW
9	22/05/2021	10:31	13:31	5	Good	Heavy Showers	F2 NW
10	22/05/2021	14:05	17:05	5	Good	Dry	F2 W
10	27/05/2021	11:03	14:03	8	Good-Poor	Drizzle	F1 SE
11	28/05/2021	12:45	15:45	8	Very Good	Light Showers	F1 SSW
11	28/05/2021	16:22	19:22	8	Good	Light Showers	F1 SSW
2	31/05/2021	08:45	11:45	4	Very Good	Dry	F3 SSE
2	31/05/2021	17:31	20:31	4	Very Good	Dry	F3 SSE
1	01/06/2021	09:16	12:16	7	Very Good	Dry	F2 NNE
1	01/06/2021	12:57	15:57	8	Very Good	Dry	F1 ENE
3	01/06/2021	17:05	20:05	4	Good (Hazy)	Dry	F1 NW
3	02/06/2021	13:07	16:07	6	Very Good	Heavy Showers	F2 NE
4	10/06/2021	13:09	16:09	7	Very Good	Dry	F4 SW
4	10/06/2021	17:02	20:02	7	Very Good	Dry	F4 SW
5	16/06/2021	13:32	16:32	6	Very Good	Dry	F3 SW
5	16/06/2021	17:06	20:06	3	Very Good	Dry	F3 SW

VP	Date	Start Time	End Time	Cloud (Oktas)	Visibility	Rain	Survey Details
6	17/06/2021	10:45	13:45	6	Good (Hazy)	Dry	F3 NW
6	17/06/2021	14:30	17:30	7	Very Good	Light Showers	F3 NW
7	18/06/2021	09:05	12:05	7	Good (Hazy)	Dry	F1-2 N
7	18/06/2021	13:04	16:04	7	Good (Hazy)	Dry	F1-2 N
8	23/06/2021	10:05	13:05	8	Very Good	Dry	F2 WNW
8	23/06/2021	14:10	17:10	8	Very Good	Dry	F2 WNW
9	23/06/2021	18:10	21:10	7	Very Good	Dry	F2 WNW
9	24/06/2021	10:15	13:15	8	Good	Light Showers	F3 SW
10	24/06/2021	14:00	17:00	8	Poor	Heavy Showers	F3 W
10	24/06/2021	17:35	20:35	8	Poor	Constant Light Rain	F3 W
11	25/06/2021	11:00	14:00	7	Very Good	Dry	F4 N
11	25/06/2021	14:40	17:40	8	Very Good	Dry	F4 N
3	05/07/2021	16:05	19:05	8	Very Good	Very Light Showers	F2 W
1	06/07/2021	09:05	12:05	8	Good	Light Showers	F2 W
1	06/07/2021	13:00	16:00	8	Good	Showers	F3 NW
2	06/07/2021	14:45	17:45	8	Very Good	Dry	F3 WNW
3	06/07/2021	08:40	11:40	7	Very Good	Very Light Showers	F2 W
5	06/07/2021	16:55	19:55	8	Good-Poor	Light Showers	F3 WNW
2	07/07/2021	11:02	14:02	8	Very Good	Light Showers	F2-3 WNW
2	07/07/2021	14:45	17:45	8	Very Good	Dry	F3 WNW
4	07/07/2021	18:30	21:30	7	Very Good	Dry	F3 WNW
6	08/07/2021	11:10	14:10	8	Very Good	Dry	F2 WSW
6	08/07/2021	15:05	18:05	8	Very Good	Dry	F2 WSW
7	08/07/2021	18:45	21:45	8	Very Good	Dry	F1-2 WSW
4	09/07/2021	14:50	17:50	7	Very Good	Dry	F2 S
5	09/07/2021	18:30	21:30	7	Very Good	Dry	F2 S
7	09/07/2021	11:15	14:15	8	Very Good	Dry	F2 S
8	13/07/2021	07:35	10:35	5	Very Good	Dry	F1 WNW
8	13/07/2021	15:00	18:00	6	Very Good	Dry	F1 WNW
9	14/07/2021	07:50	10:50	4	Very Good	Dry	F1 W
9	15/07/2021	08:10	11:10	2	Very Good	Dry	F1 NW
10	15/07/2021	12:05	15:05	3	Very Good	Dry	F1 WNW

VP	Date	Start Time	End Time	Cloud (Oktas)	Visibility	Rain	Survey Details
10	15/07/2021	16:10	19:10	5	Very Good	Dry	F1 WNW
11	16/07/2021	08:30	11:30	3	Very Good	Dry	F1 W
11	16/07/2021	12:30	15:30	2	Very Good	Dry	F1 W
5	27/07/2021	09:05	12:05	6-8	Good	Light Showers	F1-2 WNW
5	27/07/2021	16:00	19:00	7	Good	Heavy Showers	F1-2 WNW
2	28/07/2021	09:17	12:17	7	Very Good	Dry	F3 W
2	28/07/2021	09:17	12:17	7	Very Good	Dry	F3 W
2	28/07/2021	13:05	16:05	8	Very Good	Light Showers	F3 W
3	28/07/2021	17:00	20:00	8	Good	Light Showers	F3-4 WNW
1	29/07/2021	10:10	13:10	8	Very Good	Dry	F3 W
1	29/07/2021	14:00	17:00	8	Very Good	Dry	F2-3 W
3	29/07/2021	17:40	20:40	8	Very Good	Dry	F1-2 NW
4	30/07/2021	10:45	13:45	8	Good-Poor	Heavy Showers	F2 WNW
4	30/07/2021	14:30	17:30	8	Good	Showers	F2-3 WNW
7	02/08/2021	09:35	12:35	7	Very Good	Showers	F1-2 SSW
7	02/08/2021	15:05	18:05	6	Very Good	Dry	F1-2 SSW
8	03/08/2021	17:30	20:30	5	Very Good	Dry	F1-2 S
9	03/08/2021	09:45	12:45	8	Very Good	Dry	F1 SSW
9	03/08/2021	13:45	16:45	6	Good (Hazy)	Dry	F2 S
6	04/08/2021	10:00	13:00	7-8	Good-Poor	Heavy Showers	F2-3 S
6	04/08/2021	13:50	16:50	8	Good	Showers	F2-3 S
8	04/08/2021	17:30	20:30	8	Good-Poor	Heavy Showers	F1 S/SE
10	05/08/2021	11:06	14:06	8	Poor	Heavy Showers	F2-3 S
10	11/08/2021	09:15	12:15	8	Good-Very Good	Showers	F3 W
11	11/08/2021	12:55	15:55	6	Very Good	Dry	F3-4 WSW
11	11/08/2021	16:40	19:40	2	Very Good	Dry	F3 SW
5	12/08/2021	10:25	13:25	8	Very Good	Showers	F4 S
5	12/08/2021	14:05	17:05	4	Very Good	Light Showers	F4-5 WSW
7	12/08/2021	17:45	20:45	3	Very Good	Dry	F3 SW
4	13/08/2021	10:31	13:01	6	Very Good	Light Showers	F4 SW
4	13/08/2021	14:05	17:05	7	Very Good	Very Light Showers	F4 SW
7	13/08/2021	17:40	20:40	7	Good	Showers	F3 SW

VP	Date	Start Time	End Time	Cloud (Oktas)	Visibility	Rain	Survey Details
8	14/08/2021	10:35	13:35	8	Good	Showers	F1 SSE
3	16/08/2021	08:47	11:47	8	Very Good	Dry	F3W
3	16/08/2021	12:30	15:30	8	Very Good	Very Light Showers	F3W
8	16/08/2021	16:20	19:20	8	Good-Poor	Very Light Showers	F3 W
2	17/08/2021	08:50	11:50	8	Very Good	Dry	F3-4WNW
2	17/08/2021	12:30	15:30	8	Very Good	Dry	F3-4WNW
9	17/08/2021	16:20	19:20	8	Good	Very Light Showers	F3 W
1	18/08/2021	08:56	11:56	8	Very Good	Dry	F3W
1	18/08/2021	12:42	15:42	8	Very Good	Dry	F2W
9	18/08/2021	16:18	19:18	8	Very Good	Dry	F2W
9	18/08/2021	16:18	19:18	8	Very Good	Dry	F2W
6	19/08/2021	09:10	12:10	8	Very Good	Dry	F1 E
6	19/08/2021	12:55	15:55	7	Very Good	Dry	F1 SW
10	19/08/2021	16:40	19:40	7	Very Good	Light Showers	F2 SW
10	20/08/2021	09:17	12:17	8	Very Good	Showers	F3 SE
11	20/08/2021	12:55	15:55	8	Good-Poor	Heavy Showers	F2 SE
11	20/08/2021	16:33	19:33	8	Good-Poor	Heavy Showers	F2 S/SE
3	02/09/2021	08:45	11:45	8	Very Good	Dry	F3 ENE
3	02/09/2021	12:24	15:24	8	Very Good	Dry	F3 ENE
5	02/09/2021	16:00	19:00	8	Good	Dry	F1-2 ENE
5	03/09/2021	08:53	11:53	8	Good	Dry	F2 E
7	03/09/2021	12:30	15:30	8	Good	Dry	F2 E
7	03/09/2021	16:05	19:05	8	Good	Dry	F2 E
1	06/09/2021	08:25	11:25	2	Very Good	Dry	F1 S
1	06/09/2021	12:00	15:00	3	Very Good	Dry	F1 S
8	06/09/2021	16:00	19:00	3	Very Good	Dry	F1SSW
4	07/09/2021	12:15	15:15	3	Very Good	Dry	F1 ESE/E
4	07/09/2021	15:55	18:55	3	Very Good	Dry	F1 E/ENE
8	07/09/2021	08:30	11:30	3	Very Good	Dry	F1 ESE
6	09/09/2021	08:35	11:35	6	Good	Showers	F2 SSE
2	12/09/2021	11:55	14:55	7	Very Good	Dry	F1 NNE
2	12/09/2021	15:30	18:30	7	Very Good	Dry	F1 NNE

VP	Date	Start Time	End Time	Cloud (Oktas)	Visibility	Rain	Survey Details
6	12/09/2021	08:20	11:20	6	Very Good	Dry	F1 N
9	13/09/2021	08:30	11:30	8	Very Good	Dry	F1 NE
9	13/09/2021	12:15	15:15	8	Very Good	Dry	F1 N
10	13/09/2021	16:00	19:00	8	Very Good	Light Showers	F1 SSE
10	14/09/2021	08:35	11:35	5	Very Good	Very Light Showers	F1 SE
11	14/09/2021	12:15	15:15	4	Very Good	Very Light Showers	F1 SE
11	14/09/2021	15:55	18:55	5	Very Good	Dry	F1 SE

FEHILY TIMONEY

CONSULTANTS IN ENGINEERING,
ENVIRONMENTAL SCIENCE
& PLANNING

APPENDIX 2

Vantage Point Observations
Summer 2021

VP No.	Date	Time	Species	Duration (s)	Flightline No	Flightline Map Title
2	29/04/2021	09:40	Cormorant	44	1	Cormorant 1
2	29/04/2021	09:53	Mute Swan	28	1	Mute Swan
2	29/04/2021	10:02	Mallard	12	1	Mallard 1
2	29/04/2021	10:11	Grey Heron	30	1	Grey Heron 1
2	29/04/2021	10:17	Buzzard	22	1	Buzzard 1
2	29/04/2021	10:24	Cormorant	45	2	Cormorant 1
2	29/04/2021	10:33	Grey Heron	9	2	Grey Heron 1
2	29/04/2021	10:46	Moorhen	11	1	Moorhen
2	29/04/2021	11:00	Mallard	17	2	Mallard 1
2	29/04/2021	11:14	Cormorant	47	3	Cormorant 1
2	29/04/2021	11:20	Little Egret	32	1	Little Egret 1
2	29/04/2021	11:34	Buzzard	139	2	Buzzard 1
2	29/04/2021	11:45	Little Egret	38	2	Little Egret 1
2	29/04/2021	11:56	Buzzard	189	3	Buzzard 1
2	29/04/2021	12:11	Black-tailed Godwit	76	72	Black-Tailed Godwit
2	29/04/2021	12:32	Buzzard	59	4	Buzzard 1
2	29/04/2021	13:39	Cormorant	45	4	Cormorant 1
2	29/04/2021	14:00	Cormorant	45	5	Cormorant 1
2	29/04/2021	14:26	Buzzard	229	5	Buzzard 1
2	29/04/2021	14:41	Mallard	18	3	Mallard 1
2	29/04/2021	14:49	Cormorant	27	6	Cormorant 1
2	29/04/2021	15:09	Buzzard	248	6	Buzzard 1
2	29/04/2021	15:13	Cormorant	23	7	Cormorant 1
2	29/04/2021	15:24	Buzzard	96	7	Buzzard 1
2	29/04/2021	15:45	Grey Heron	17	3	Grey Heron 1
2	29/04/2021	15:58	Little Egret	33	3	Little Egret 1
2	29/04/2021	16:14	Sparrowhawk	317	1	Sparrowhawk 1
2	29/04/2021	16:26	Common Gull	20	1	Common Gull
3	04/05/2021	07:31	Little Egret	190	4	Little Egret 1
3	04/05/2021	07:53	Black-headed Gull	114	1	Black Headed Gull 1
3	04/05/2021	08:07	Sparrowhawk	28	2	Sparrowhawk 1
3	04/05/2021	08:08	Little Egret	7	5	Little Egret 1
3	04/05/2021	08:20	Kestrel	78	1	Kestrel 1
3	04/05/2021	08:27	Mallard	210	4	Mallard 1
3	04/05/2021	08:36	Grey Heron	53	4	Grey Heron 1
3	04/05/2021	08:54	Lesser Black-backed Gull	183	1	Lesser Black-Backed Gull 1
3	04/05/2021	09:18	Sparrowhawk	16	3	Sparrowhawk 1
3	04/05/2021	09:40	Mallard	65	5	Mallard 1
3	04/05/2021	09:48	Kestrel	294	2	Kestrel 1
3	04/05/2021	10:15	Grey Heron	12	5	Grey Heron 1
3	04/05/2021	15:20	Grey Heron	32	6	Grey Heron 1
3	04/05/2021	15:22	Lapwing	95	1	Lapwing
3	04/05/2021	15:49	Little Egret	3	6	Little Egret 1

VP No.	Date	Time	Species	Duration (s)	Flightline No	Flightline Map Title
3	04/05/2021	16:07	Little Egret	24	7	Little Egret 1
3	04/05/2021	16:09	Mallard	187	6	Mallard 1
3	04/05/2021	16:23	Teal	23	1	Teal
3	04/05/2021	16:39	Mallard	133	7	Mallard 1
3	04/05/2021	16:49	Buzzard	34	8	Buzzard 1
3	04/05/2021	17:01	Black-headed Gull	54	2	Black Headed Gull 1
3	04/05/2021	17:15	Lesser Black-backed Gull	172	2	Lesser Black-Backed Gull 1
3	04/05/2021	17:23	Little Egret	2	8	Little Egret 1
3	04/05/2021	17:45	Lapwing	27	2	Lapwing
3	04/05/2021	17:59	Little Egret	223	9	Little Egret 1
3	04/05/2021	18:10	Buzzard	76	9	Buzzard 1
4	05/05/2021	08:21	Peregrine	427	1	Peregrine
4	05/05/2021	08:34	Little Egret	12	10	Little Egret 1
4	05/05/2021	08:44	Lesser Black-backed Gull	163	3	Lesser Black-Backed Gull 1
4	05/05/2021	08:50	Buzzard	319	10	Buzzard 1
4	05/05/2021	08:55	Little Egret	40	11	Little Egret 1
4	05/05/2021	09:03	Buzzard	410	11	Buzzard 1
4	05/05/2021	09:11	Black-headed Gull	43	3	Black Headed Gull 1
4	05/05/2021	09:22	Little Egret	28	12	Little Egret 1
4	05/05/2021	09:37	Grey Heron	124	7	Grey Heron 1
4	05/05/2021	09:46	Buzzard	414	12	Buzzard 1
4	05/05/2021	09:59	Little Egret	70	13	Little Egret 1
4	05/05/2021	10:10	Sparrowhawk	156	4	Sparrowhawk 1
4	05/05/2021	10:23	Lesser Black-backed Gull	15	4	Lesser Black-Backed Gull 1
4	05/05/2021	10:44	Buzzard	306	13	Buzzard 1
4	05/05/2021	10:52	Buzzard	96	14	Buzzard 1
4	05/05/2021	11:00	Buzzard	404	15	Buzzard 1
4	05/05/2021	11:11	Lapwing	14	3	Lapwing
4	05/05/2021	12:59	Little Egret	33	14	Little Egret 1
4	05/05/2021	13:06	Lesser Black-backed Gull	45	5	Lesser Black-Backed Gull 1
4	05/05/2021	13:19	Lesser Black-backed Gull	61	6	Lesser Black-Backed Gull 1
4	05/05/2021	13:34	Buzzard	642	16	Buzzard 1
4	05/05/2021	13:55	Grey Heron	2	8	Grey Heron 1
4	05/05/2021	14:01	Little Egret	34	15	Little Egret 1
4	05/05/2021	14:10	Buzzard	56	17	Buzzard 1
4	05/05/2021	14:22	Cormorant	136	8	Cormorant 1
4	05/05/2021	14:36	Mallard	16	8	Mallard 1
4	05/05/2021	14:44	Lesser Black-backed Gull	124	7	Lesser Black-Backed Gull 1
4	05/05/2021	14:53	Whimbrel	175	1	Whimbrel
4	05/05/2021	15:17	Little Egret	128	16	Little Egret 1
4	05/05/2021	15:20	Buzzard	271	18	Buzzard 1
4	05/05/2021	15:30	Kestrel	880	3	Kestrel 1
4	05/05/2021	15:45	Buzzard	45	19	Buzzard 1

VP No.	Date	Time	Species	Duration (s)	Flightline No	Flightline Map Title
5	05/05/2021	16:43	Buzzard	24	20	Buzzard 1
5	05/05/2021	16:49	Little Egret	17	17	Little Egret 1
5	05/05/2021	17:06	Cormorant	55	9	Cormorant 1
5	05/05/2021	17:17	Lapwing	3	4	Lapwing
5	05/05/2021	17:23	Black-headed Gull	65	4	Black Headed Gull 1
5	05/05/2021	17:30	Grey Heron	12	9	Grey Heron 1
5	05/05/2021	17:46	Little Egret	88	18	Little Egret 1
5	05/05/2021	17:55	Cormorant	81	10	Cormorant 1
5	05/05/2021	18:02	Buzzard	105	21	Buzzard 1
5	05/05/2021	18:06	Kestrel	421	4	Kestrel 1
5	05/05/2021	18:18	Lapwing	17	5	Lapwing
5	05/05/2021	18:25	Little Egret	125	19	Little Egret 1
5	05/05/2021	18:34	Mallard	10	9	Mallard 1
5	05/05/2021	18:54	Cormorant	86	11	Cormorant 1
5	05/05/2021	19:13	Lapwing	13	6	Lapwing
5	05/05/2021	19:27	Mallard	72	10	Mallard 1
5	06/05/2021	08:36	Lapwing	4	7	Lapwing
5	06/05/2021	08:51	Grey Heron	3	10	Grey Heron 1
5	06/05/2021	08:57	Cormorant	88	12	Cormorant 1
5	06/05/2021	09:05	Little Egret	24	20	Little Egret 1
5	06/05/2021	09:16	Lesser Black-backed Gull	125	8	Lesser Black-Backed Gull 1
5	06/05/2021	09:24	Black-headed Gull	42	5	Black Headed Gull 1
5	06/05/2021	09:30	Buzzard	427	22	Buzzard 1
5	06/05/2021	09:42	Sparrowhawk	272	5	Sparrowhawk 1
5	06/05/2021	09:51	Mallard	15	11	Mallard 1
5	06/05/2021	10:06	Buzzard	65	23	Buzzard 1
5	06/05/2021	10:38	Little Egret	23	21	Little Egret 1
5	06/05/2021	10:57	Buzzard	227	24	Buzzard 1
5	06/05/2021	11:15	Buzzard	22	25	Buzzard 1
1	06/05/2021	12:55	Wigeon	7	1	Wigeon
1	06/05/2021	13:10	Cormorant	96	13	Cormorant 1
1	06/05/2021	13:20	Buzzard	114	26	Buzzard 1
1	06/05/2021	13:42	Grey Heron	15	11	Grey Heron 1
1	06/05/2021	14:03	Cormorant	57	14	Cormorant 1
1	06/05/2021	14:18	Grey Heron	12	12	Grey Heron 1
1	06/05/2021	14:29	Buzzard	345	27	Buzzard 1
1	06/05/2021	14:40	Sparrowhawk	42	6	Sparrowhawk 1
1	06/05/2021	14:57	Mute Swan	8	2	Mute Swan
1	06/05/2021	15:21	Buzzard	134	28	Buzzard 1
1	06/05/2021	16:05	Cormorant	49	15	Cormorant 1
1	06/05/2021	16:17	Lesser Black-backed Gull	107	9	Lesser Black-Backed Gull 1
1	06/05/2021	16:33	Mallard	39	12	Mallard 1
1	06/05/2021	16:45	Buzzard	375	29	Buzzard 1

VP No.	Date	Time	Species	Duration (s)	Flightline No	Flightline Map Title
1	06/05/2021	17:18	Grey Heron	355	13	Grey Heron 1
1	06/05/2021	17:30	Mallard	24	13	Mallard 1
1	06/05/2021	17:42	Buzzard	36	30	Buzzard 1
1	06/05/2021	17:44	Sparrowhawk	44	7	Sparrowhawk 1
1	06/05/2021	17:49	Mallard	10	14	Mallard 1
1	06/05/2021	18:10	Buzzard	247	31	Buzzard 2
1	06/05/2021	18:32	Black-headed Gull	103	6	Black Headed Gull 1
6	07/05/2021	10:12	Black-headed Gull	22	7	Black Headed Gull 1
6	07/05/2021	10:30	Buzzard	26	32	Buzzard 2
6	07/05/2021	10:34	Little Egret	81	22	Little Egret 1
6	07/05/2021	10:43	Grey Heron	52	14	Grey Heron 1
6	07/05/2021	10:56	Little Egret	225	23	Little Egret 1
6	07/05/2021	11:02	Sparrowhawk	4	8	Sparrowhawk 1
6	07/05/2021	11:08	Kestrel	1076	5	Kestrel 1
6	07/05/2021	11:30	Buzzard	184	33	Buzzard 2
6	07/05/2021	11:35	Lesser Black-backed Gull	345	10	Lesser Black-Backed Gull 1
6	07/05/2021	11:45	Sparrowhawk	3	9	Sparrowhawk 1
6	07/05/2021	12:13	Buzzard	545	34	Buzzard 2
6	07/05/2021	13:20	Buzzard	123	35	Buzzard 2
6	07/05/2021	13:27	Lapwing	45	8	Lapwing
6	07/05/2021	13:30	Grey Heron	19	15	Grey Heron 1
6	07/05/2021	13:48	Buzzard	437	36	Buzzard 2
6	07/05/2021	14:13	Lesser Black-backed Gull	67	11	Lesser Black-Backed Gull 1
6	07/05/2021	14:22	Little Egret	17	24	Little Egret 1
6	07/05/2021	14:35	Kestrel	45	6	Kestrel 1
6	07/05/2021	14:50	Lesser Black-backed Gull	124	12	Lesser Black-Backed Gull 1
6	07/05/2021	14:59	Black-headed Gull	143	8	Black Headed Gull 1
6	07/05/2021	15:28	Little Egret	73	25	Little Egret 1
6	07/05/2021	15:42	Sparrowhawk	24	10	Sparrowhawk 1
7	07/05/2021	17:00	Black-headed Gull	42	9	Black Headed Gull 1
7	07/05/2021	17:23	Black-headed Gull	14	10	Black Headed Gull 1
7	07/05/2021	17:45	Buzzard	50	37	Buzzard 2
7	07/05/2021	17:49	Lesser Black-backed Gull	63	13	Lesser Black-Backed Gull 1
7	07/05/2021	18:10	Buzzard	245	38	Buzzard 2
7	07/05/2021	18:19	Grey Heron	128	16	Grey Heron 1
7	07/05/2021	18:31	Buzzard	33	39	Buzzard 2
7	07/05/2021	18:43	Kestrel	72	7	Kestrel 1
7	07/05/2021	19:01	Kestrel	628	8	Kestrel 1
7	07/05/2021	19:25	Black-headed Gull	74	11	Black Headed Gull 1
7	07/05/2021	19:44	Lesser Black-backed Gull	37	14	Lesser Black-Backed Gull 1
7	11/05/2021	13:09	Buzzard	895	40	Buzzard 2
7	11/05/2021	13:21	Grey Heron	122	17	Grey Heron 1
7	11/05/2021	13:28	Buzzard	127	41	Buzzard 2

VP No.	Date	Time	Species	Duration (s)	Flightline No	Flightline Map Title
7	11/05/2021	13:52	Sparrowhawk	138	11	Sparrowhawk 1
7	11/05/2021	14:12	Lesser Black-backed Gull	45	15	Lesser Black-Backed Gull 1
7	11/05/2021	14:30	Lesser Black-backed Gull	33	16	Lesser Black-Backed Gull 1
7	11/05/2021	14:44	Black-headed Gull	28	12	Black Headed Gull 1
7	11/05/2021	14:58	Lesser Black-backed Gull	103	17	Lesser Black-Backed Gull 1
7	11/05/2021	15:11	Lesser Black-backed Gull	141	18	Lesser Black-Backed Gull 1
7	11/05/2021	15:15	Buzzard	32	42	Buzzard 2
7	11/05/2021	15:23	Lesser Black-backed Gull	73	19	Lesser Black-Backed Gull 1
7	11/05/2021	15:44	Lesser Black-backed Gull	44	20	Lesser Black-Backed Gull 1
7	11/05/2021	16:03	Buzzard	55	43	Buzzard 2
7	11/05/2021	16:08	Little Egret	6	26	Little Egret 1
8	11/05/2021	17:13	Lesser Black-backed Gull	187	21	Lesser Black-Backed Gull 1
8	11/05/2021	17:32	Buzzard	360	44	Buzzard 2
8	11/05/2021	17:55	Whimbrel	543	2	Whimbrel
8	11/05/2021	18:08	Lesser Black-backed Gull	610	22	Lesser Black-Backed Gull 1
8	11/05/2021	18:20	Lesser Black-backed Gull	184	23	Lesser Black-Backed Gull 1
8	11/05/2021	18:39	Cormorant	284	16	Cormorant 1
8	11/05/2021	18:51	Buzzard	33	45	Buzzard 2
8	11/05/2021	19:06	Grey Heron	102	18	Grey Heron 1
8	11/05/2021	19:15	Grey Heron	30	19	Grey Heron 1
8	11/05/2021	19:22	Lesser Black-backed Gull	24	24	Lesser Black-Backed Gull 1
8	11/05/2021	19:25	Black-headed Gull	128	13	Black Headed Gull 1
8	11/05/2021	19:41	Little Egret	122	27	Little Egret 1
8	11/05/2021	19:53	Lesser Black-backed Gull	106	25	Lesser Black-Backed Gull 1
8	19/05/2021	10:43	Grey Heron	53	20	Grey Heron 1
8	19/05/2021	10:54	Lesser Black-backed Gull	124	26	Lesser Black-Backed Gull 1
8	19/05/2021	11:02	Black-headed Gull	40	14	Black Headed Gull 1
8	19/05/2021	11:21	Buzzard	144	46	Buzzard 2
8	19/05/2021	11:33	Black-headed Gull	182	15	Black Headed Gull 1
8	19/05/2021	11:45	Lesser Black-backed Gull	23	27	Lesser Black-Backed Gull 1
8	19/05/2021	12:00	Cormorant	295	17	Cormorant 1
8	19/05/2021	12:06	Buzzard	149	47	Buzzard 2
8	19/05/2021	12:29	Buzzard	240	48	Buzzard 2
8	19/05/2021	12:47	Little Egret	189	28	Little Egret 1
8	19/05/2021	13:02	Lesser Black-backed Gull	84	28	Lesser Black-Backed Gull 1
8	19/05/2021	13:09	Little Egret	44	29	Little Egret 1
8	19/05/2021	13:16	Lesser Black-backed Gull	62	29	Lesser Black-Backed Gull 1
9	21/05/2021	09:23	Lesser Black-backed Gull	48	30	Lesser Black-Backed Gull 1
9	21/05/2021	09:35	Lesser Black-backed Gull	72	31	Lesser Black-Backed Gull 2
9	21/05/2021	09:44	Lesser Black-backed Gull	24	32	Lesser Black-Backed Gull 2
9	21/05/2021	09:57	Buzzard	28	49	Buzzard 2
9	21/05/2021	10:16	Buzzard	107	50	Buzzard 2
9	21/05/2021	10:30	Lesser Black-backed Gull	189	33	Lesser Black-Backed Gull 2

VP No.	Date	Time	Species	Duration (s)	Flightline No	Flightline Map Title
9	21/05/2021	10:38	Sparrowhawk	3	12	Sparrowhawk 1
9	21/05/2021	10:44	Little Egret	136	30	Little Egret 1
9	21/05/2021	10:59	Buzzard	245	51	Buzzard 2
9	21/05/2021	11:01	Sparrowhawk	180	13	Sparrowhawk 1
9	21/05/2021	11:12	Lesser Black-backed Gull	74	34	Lesser Black-Backed Gull 2
9	21/05/2021	11:22	Buzzard	435	52	Buzzard 2
9	21/05/2021	11:28	Mallard	15	15	Mallard 1
9	21/05/2021	11:43	Black-headed Gull	62	16	Black Headed Gull 1
9	21/05/2021	12:06	Lesser Black-backed Gull	53	35	Lesser Black-Backed Gull 2
9	21/05/2021	12:10	Lesser Black-backed Gull	40	36	Lesser Black-Backed Gull 2
9	22/05/2021	10:53	Buzzard	424	53	Buzzard 2
9	22/05/2021	11:15	Lesser Black-backed Gull	83	37	Lesser Black-Backed Gull 2
9	22/05/2021	11:29	Kestrel	105	9	Kestrel 1
9	22/05/2021	11:42	Lesser Black-backed Gull	187	38	Lesser Black-Backed Gull 2
9	22/05/2021	12:00	Buzzard	15	54	Buzzard 2
9	22/05/2021	12:07	Lesser Black-backed Gull	44	39	Lesser Black-Backed Gull 2
9	22/05/2021	12:21	Lesser Black-backed Gull	60	40	Lesser Black-Backed Gull 2
9	22/05/2021	13:02	Buzzard	242	55	Buzzard 2
9	22/05/2021	13:23	Buzzard	186	56	Buzzard 2
10	22/05/2021	14:23	Lesser Black-backed Gull	87	41	Lesser Black-Backed Gull 2
10	22/05/2021	14:48	Lesser Black-backed Gull	72	42	Lesser Black-Backed Gull 2
10	22/05/2021	15:01	Buzzard	370	57	Buzzard 2
10	22/05/2021	15:09	Buzzard	18	58	Buzzard 2
10	22/05/2021	15:17	Lesser Black-backed Gull	64	43	Lesser Black-Backed Gull 2
10	22/05/2021	15:24	Lesser Black-backed Gull	103	44	Lesser Black-Backed Gull 2
10	22/05/2021	15:41	Buzzard	249	59	Buzzard 2
10	22/05/2021	15:50	Sparrowhawk	184	14	Sparrowhawk 1
10	22/05/2021	15:59	Lesser Black-backed Gull	173	45	Lesser Black-Backed Gull 2
10	22/05/2021	16:10	Little Egret	12	31	Little Egret 2
10	22/05/2021	16:22	Buzzard	543	60	Buzzard 2
10	22/05/2021	16:32	Lesser Black-backed Gull	21	46	Lesser Black-Backed Gull 2
10	22/05/2021	16:51	Buzzard	242	61	Buzzard 3
10	27/05/2021	11:20	Kestrel	122	10	Kestrel 1
10	27/05/2021	11:29	Lesser Black-backed Gull	108	47	Lesser Black-Backed Gull 2
10	27/05/2021	11:41	Black-headed Gull	41	17	Black Headed Gull 1
10	27/05/2021	12:05	Kestrel	256	11	Kestrel 1
10	27/05/2021	12:49	Lesser Black-backed Gull	77	48	Lesser Black-Backed Gull 2
10	27/05/2021	13:16	Lesser Black-backed Gull	110	49	Lesser Black-Backed Gull 2
10	27/05/2021	13:52	Grey Heron	18	21	Grey Heron 1
11	28/05/2021	13:02	Buzzard	289	62	Buzzard 3
11	28/05/2021	13:10	Lesser Black-backed Gull	45	50	Lesser Black-Backed Gull 2
11	28/05/2021	13:23	Cormorant	184	18	Cormorant 1
11	28/05/2021	13:32	Buzzard	120	63	Buzzard 3

VP No.	Date	Time	Species	Duration (s)	Flightline No	Flightline Map Title
11	28/05/2021	13:41	Lesser Black-backed Gull	74	51	Lesser Black-Backed Gull 2
11	28/05/2021	13:55	Lesser Black-backed Gull	192	52	Lesser Black-Backed Gull 2
11	28/05/2021	14:09	Lesser Black-backed Gull	33	53	Lesser Black-Backed Gull 2
11	28/05/2021	14:16	Buzzard	48	64	Buzzard 3
11	28/05/2021	14:40	Lesser Black-backed Gull	87	54	Lesser Black-Backed Gull 2
11	28/05/2021	14:56	Buzzard	63	65	Buzzard 3
11	28/05/2021	15:03	Lesser Black-backed Gull	101	55	Lesser Black-Backed Gull 2
11	28/05/2021	15:29	Lesser Black-backed Gull	44	56	Lesser Black-Backed Gull 2
11	28/05/2021	16:40	Lesser Black-backed Gull	82	57	Lesser Black-Backed Gull 2
11	28/05/2021	16:51	Lesser Black-backed Gull	96	58	Lesser Black-Backed Gull 2
11	28/05/2021	17:08	Lesser Black-backed Gull	109	59	Lesser Black-Backed Gull 2
11	28/05/2021	17:16	Lesser Black-backed Gull	77	60	Lesser Black-Backed Gull 2
11	28/05/2021	17:29	Lesser Black-backed Gull	122	61	Lesser Black-Backed Gull 2
11	28/05/2021	17:45	Mallard	48	16	Mallard 1
11	28/05/2021	18:07	Kestrel	129	12	Kestrel 1
11	28/05/2021	18:23	Lesser Black-backed Gull	87	62	Lesser Black-Backed Gull 2
11	28/05/2021	18:44	Lesser Black-backed Gull	138	63	Lesser Black-Backed Gull 2
11	28/05/2021	19:00	Mallard	7	17	Mallard 1
11	28/05/2021	19:08	Lesser Black-backed Gull	46	64	Lesser Black-Backed Gull 2
11	28/05/2021	19:10	Lesser Black-backed Gull	84	65	Lesser Black-Backed Gull 2
11	28/05/2021	19:19	Black-headed Gull	15	18	Black Headed Gull 1
2	31/05/2021	09:00	Mallard	31	18	Mallard 1
2	31/05/2021	09:03	Lesser Black-backed Gull	59	66	Lesser Black-Backed Gull 2
2	31/05/2021	09:16	Little Egret	45	32	Little Egret 2
2	31/05/2021	09:28	Buzzard	15	66	Buzzard 3
2	31/05/2021	09:39	Buzzard	103	67	Buzzard 3
2	31/05/2021	09:52	Lesser Black-backed Gull	37	67	Lesser Black-Backed Gull 2
2	31/05/2021	09:56	Buzzard	62	68	Buzzard 3
2	31/05/2021	10:04	Sparrowhawk	102	15	Sparrowhawk 1
2	31/05/2021	10:27	Buzzard	36	69	Buzzard 3
2	31/05/2021	10:43	Cormorant	98	19	Cormorant 1
2	31/05/2021	10:59	Cormorant	26	20	Cormorant 1
2	31/05/2021	11:11	Buzzard	131	70	Buzzard 3
2	31/05/2021	11:18	Little Egret	42	33	Little Egret 2
2	31/05/2021	11:30	Lesser Black-backed Gull	46	68	Lesser Black-Backed Gull 2
2	31/05/2021	11:35	Mallard	7	19	Mallard 1
2	31/05/2021	11:43	Lesser Black-backed Gull	29	69	Lesser Black-Backed Gull 2
2	31/05/2021	17:38	Cormorant	23	21	Cormorant 1
2	31/05/2021	17:55	Buzzard	189	71	Buzzard 3
2	31/05/2021	18:06	Black-headed Gull	127	19	Black Headed Gull 1
2	31/05/2021	18:17	Lesser Black-backed Gull	42	70	Lesser Black-Backed Gull 2
2	31/05/2021	18:22	Lesser Black-backed Gull	29	71	Lesser Black-Backed Gull 2
2	31/05/2021	18:40	Black-headed Gull	22	20	Black Headed Gull 1

VP No.	Date	Time	Species	Duration (s)	Flightline No	Flightline Map Title
2	31/05/2021	19:00	Lesser Black-backed Gull	100	72	Lesser Black-Backed Gull 2
2	31/05/2021	19:12	Buzzard	45	72	Buzzard 3
2	31/05/2021	19:21	Black-headed Gull	154	21	Black Headed Gull 1
2	31/05/2021	19:35	Buzzard	6	73	Buzzard 3
2	31/05/2021	19:52	Lesser Black-backed Gull	102	73	Lesser Black-Backed Gull 2
2	31/05/2021	20:02	Buzzard	73	74	Buzzard 3
2	31/05/2021	20:15	Mallard	27	20	Mallard 1
2	31/05/2021	20:27	Black-headed Gull	63	22	Black Headed Gull 1
1	01/06/2021	09:27	Cormorant	39	22	Cormorant 1
1	01/06/2021	09:43	Wigeon	10	2	Wigeon
1	01/06/2021	09:52	Lesser Black-backed Gull	124	74	Lesser Black-Backed Gull 2
1	01/06/2021	10:07	Buzzard	141	75	Buzzard 3
1	01/06/2021	10:14	Black-headed Gull	63	23	Black Headed Gull 1
1	01/06/2021	10:32	Mallard	35	21	Mallard 1
1	01/06/2021	10:53	Buzzard	413	76	Buzzard 3
1	01/06/2021	11:06	Lesser Black-backed Gull	96	75	Lesser Black-Backed Gull 2
1	01/06/2021	11:15	Lesser Black-backed Gull	48	76	Lesser Black-Backed Gull 2
1	01/06/2021	11:38	Cormorant	33	23	Cormorant 1
1	01/06/2021	11:39	Cormorant	97	24	Cormorant 1
1	01/06/2021	12:10	Little Egret	64	34	Little Egret 2
1	01/06/2021	13:11	Buzzard	189	77	Buzzard 3
1	01/06/2021	13:23	Cormorant	62	25	Cormorant 1
1	01/06/2021	13:30	Lesser Black-backed Gull	110	77	Lesser Black-Backed Gull 2
1	01/06/2021	13:48	Black-headed Gull	72	24	Black Headed Gull 1
1	01/06/2021	14:06	Mallard	51	22	Mallard 1
1	01/06/2021	14:22	Mute Swan	16	3	Mute Swan
1	01/06/2021	14:31	Cormorant	102	26	Cormorant 1
1	01/06/2021	14:44	Lesser Black-backed Gull	111	78	Lesser Black-Backed Gull 2
1	01/06/2021	15:00	Mallard	45	23	Mallard 1
1	01/06/2021	15:13	Grey Heron	33	22	Grey Heron 1
1	01/06/2021	15:20	Lesser Black-backed Gull	122	79	Lesser Black-Backed Gull 2
1	01/06/2021	15:33	Lesser Black-backed Gull	67	80	Lesser Black-Backed Gull 2
1	01/06/2021	15:51	Buzzard	106	78	Buzzard 3
3	01/06/2021	17:22	Buzzard	342	79	Buzzard 3
3	01/06/2021	17:31	Sparrowhawk	257	16	Sparrowhawk 1
3	01/06/2021	17:39	Buzzard	58	80	Buzzard 3
3	01/06/2021	17:55	Buzzard	62	81	Buzzard 3
3	01/06/2021	18:06	Grey Heron	154	23	Grey Heron 1
3	01/06/2021	18:23	Lesser Black-backed Gull	212	81	Lesser Black-Backed Gull 2
3	01/06/2021	18:35	Lesser Black-backed Gull	65	82	Lesser Black-Backed Gull 2
3	01/06/2021	18:42	Black-headed Gull	203	25	Black Headed Gull 1
3	01/06/2021	18:50	Black-headed Gull	127	26	Black Headed Gull 1
3	01/06/2021	19:07	Peregrine	6	2	Peregrine

VP No.	Date	Time	Species	Duration (s)	Flightline No	Flightline Map Title
3	01/06/2021	19:25	Little Egret	24	35	Little Egret 2
3	01/06/2021	19:41	Buzzard	60	82	Buzzard 3
3	02/06/2021	13:20	Kestrel	64	13	Kestrel 1
3	02/06/2021	13:32	Lapwing	135	9	Lapwing
3	02/06/2021	13:39	Buzzard	112	83	Buzzard 3
3	02/06/2021	13:55	Cormorant	191	27	Cormorant 1
3	02/06/2021	14:00	Lesser Black-backed Gull	245	83	Lesser Black-Backed Gull 2
3	02/06/2021	14:09	Black-headed Gull	107	27	Black Headed Gull 1
3	02/06/2021	14:21	Lesser Black-backed Gull	34	84	Lesser Black-Backed Gull 2
3	02/06/2021	14:42	Cormorant	208	28	Cormorant 1
3	02/06/2021	15:10	Black-headed Gull	50	28	Black Headed Gull 1
3	02/06/2021	15:23	Lesser Black-backed Gull	44	85	Lesser Black-Backed Gull 2
3	02/06/2021	15:35	Little Egret	94	36	Little Egret 2
3	02/06/2021	15:55	Snipe	155	1	Snipe
4	10/06/2021	13:21	Buzzard	63	84	Buzzard 3
4	10/06/2021	13:30	Lesser Black-backed Gull	257	86	Lesser Black-Backed Gull 2
4	10/06/2021	13:46	Buzzard	134	85	Buzzard 3
4	10/06/2021	13:52	Black-headed Gull	55	29	Black Headed Gull 1
4	10/06/2021	14:07	Lapwing	27	10	Lapwing
4	10/06/2021	14:15	Lesser Black-backed Gull	35	87	Lesser Black-Backed Gull 2
4	10/06/2021	14:23	Black-headed Gull	44	30	Black Headed Gull 1
4	10/06/2021	14:39	Cormorant	26	29	Cormorant 1
4	10/06/2021	15:00	Buzzard	189	86	Buzzard 3
4	10/06/2021	15:11	Buzzard	69	87	Buzzard 3
4	10/06/2021	15:25	Lapwing	45	11	Lapwing
4	10/06/2021	15:48	Lesser Black-backed Gull	82	88	Lesser Black-Backed Gull 2
4	10/06/2021	16:02	Black-headed Gull	20	31	Black Headed Gull 2
4	10/06/2021	17:21	Lapwing	34	12	Lapwing
4	10/06/2021	17:34	Buzzard	163	88	Buzzard 3
4	10/06/2021	17:49	Lesser Black-backed Gull	129	89	Lesser Black-Backed Gull 2
4	10/06/2021	17:55	Lapwing	12	13	Lapwing
4	10/06/2021	18:10	Lesser Black-backed Gull	144	90	Lesser Black-Backed Gull 2
4	10/06/2021	18:22	Black-headed Gull	56	32	Black Headed Gull 2
4	10/06/2021	18:33	Black-headed Gull	99	33	Black Headed Gull 2
4	10/06/2021	18:53	Buzzard	106	89	Buzzard 3
4	10/06/2021	19:06	Lapwing	25	14	Lapwing
4	10/06/2021	19:15	Buzzard	68	90	Buzzard 3
4	10/06/2021	19:34	Grey Heron	29	24	Grey Heron 1
4	10/06/2021	19:51	Little Egret	133	37	Little Egret 2
5	16/06/2021	13:48	Kestrel	114	14	Kestrel 1
5	16/06/2021	14:06	Buzzard	248	91	Buzzard 4
5	16/06/2021	14:15	Little Egret	4	38	Little Egret 2
5	16/06/2021	14:29	Buzzard	54	92	Buzzard 4

VP No.	Date	Time	Species	Duration (s)	Flightline No	Flightline Map Title
5	16/06/2021	14:52	Kestrel	44	15	Kestrel 1
5	16/06/2021	15:14	Little Egret	110	39	Little Egret 2
5	16/06/2021	15:22	Buzzard	128	93	Buzzard 4
5	16/06/2021	15:38	Lesser Black-backed Gull	67	91	Lesser Black-Backed Gull 3
5	16/06/2021	15:57	Buzzard	29	94	Buzzard 4
5	16/06/2021	16:12	Black-headed Gull	77	34	Black Headed Gull 2
5	16/06/2021	16:24	Cormorant	104	30	Cormorant 1
5	16/06/2021	16:30	Grey Heron	40	25	Grey Heron 1
5	16/06/2021	17:22	Cormorant	122	31	Cormorant 2
5	16/06/2021	17:31	Lapwing	16	15	Lapwing
5	16/06/2021	17:44	Buzzard	109	95	Buzzard 4
5	16/06/2021	17:58	Lesser Black-backed Gull	47	92	Lesser Black-Backed Gull 3
5	16/06/2021	18:10	Buzzard	54	96	Buzzard 4
5	16/06/2021	18:17	Black-headed Gull	113	35	Black Headed Gull 2
5	16/06/2021	18:34	Snipe	66	2	Snipe
5	16/06/2021	18:43	Kestrel	224	16	Kestrel 1
5	16/06/2021	18:50	Buzzard	22	97	Buzzard 4
5	16/06/2021	19:09	Kestrel	97	17	Kestrel 1
5	16/06/2021	19:24	Buzzard	49	98	Buzzard 4
5	16/06/2021	19:45	Grey Heron	15	26	Grey Heron 1
5	16/06/2021	20:00	Little Egret	10	40	Little Egret 2
6	17/06/2021	10:53	Buzzard	22	99	Buzzard 4
6	17/06/2021	11:22	Buzzard	210	100	Buzzard 4
6	17/06/2021	11:30	Lesser Black-backed Gull	79	93	Lesser Black-Backed Gull 3
6	17/06/2021	11:49	Buzzard	65	101	Buzzard 4
6	17/06/2021	12:02	Snipe	72	3	Snipe
6	17/06/2021	12:09	Black-headed Gull	109	36	Black Headed Gull 2
6	17/06/2021	12:24	Snipe	227	4	Snipe
6	17/06/2021	12:48	Buzzard	42	102	Buzzard 4
6	17/06/2021	13:10	Lapwing	86	16	Lapwing
6	17/06/2021	13:27	Kestrel	177	18	Kestrel 1
6	17/06/2021	13:40	Cormorant	94	32	Cormorant 2
6	17/06/2021	14:55	Snipe	83	5	Snipe
6	17/06/2021	15:06	Buzzard	40	103	Buzzard 4
6	17/06/2021	15:19	Buzzard	104	104	Buzzard 4
6	17/06/2021	15:38	Lesser Black-backed Gull	85	94	Lesser Black-Backed Gull 3
6	17/06/2021	15:44	Black-headed Gull	99	37	Black Headed Gull 2
6	17/06/2021	16:03	Grey Heron	34	27	Grey Heron 1
6	17/06/2021	16:27	Buzzard	133	105	Buzzard 4
6	17/06/2021	16:49	Lesser Black-backed Gull	166	95	Lesser Black-Backed Gull 3
6	17/06/2021	17:23	Kestrel	222	19	Kestrel 1
6	17/06/2021	17:28	Cormorant	66	33	Cormorant 2
7	18/06/2021	09:29	Lesser Black-backed Gull	86	96	Lesser Black-Backed Gull 3

VP No.	Date	Time	Species	Duration (s)	Flightline No	Flightline Map Title
7	18/06/2021	09:54	Buzzard	124	106	Buzzard 4
7	18/06/2021	10:15	Black-headed Gull	60	38	Black Headed Gull 2
7	18/06/2021	10:48	Kestrel	178	20	Kestrel 1
7	18/06/2021	11:07	Buzzard	192	107	Buzzard 4
7	18/06/2021	11:36	Kestrel	56	21	Kestrel 1
7	18/06/2021	11:53	Black-headed Gull	201	39	Black Headed Gull 2
7	18/06/2021	12:01	Grey Heron	15	28	Grey Heron 1
7	18/06/2021	13:42	Lesser Black-backed Gull	77	97	Lesser Black-Backed Gull 3
7	18/06/2021	13:56	Buzzard	89	108	Buzzard 4
7	18/06/2021	14:20	Kestrel	122	22	Kestrel 1
7	18/06/2021	14:37	Buzzard	145	109	Buzzard 4
7	18/06/2021	15:15	Buzzard	209	110	Buzzard 4
7	18/06/2021	15:54	Black-headed Gull	80	40	Black Headed Gull 2
8	23/06/2021	10:37	Buzzard	193	111	Buzzard 4
8	23/06/2021	10:57	Lesser Black-backed Gull	88	98	Lesser Black-Backed Gull 3
8	23/06/2021	11:22	Black-headed Gull	124	41	Black Headed Gull 2
8	23/06/2021	11:45	Little Egret	73	41	Little Egret 2
8	23/06/2021	12:03	Black-headed Gull	204	42	Black Headed Gull 2
8	23/06/2021	12:14	Lesser Black-backed Gull	157	99	Lesser Black-Backed Gull 3
8	23/06/2021	12:29	Lesser Black-backed Gull	58	100	Lesser Black-Backed Gull 3
8	23/06/2021	12:48	Black-headed Gull	83	43	Black Headed Gull 2
8	23/06/2021	14:32	Buzzard	213	112	Buzzard 4
8	23/06/2021	14:44	Buzzard	149	113	Buzzard 4
8	23/06/2021	15:02	Lesser Black-backed Gull	94	101	Lesser Black-Backed Gull 3
8	23/06/2021	15:27	Kestrel	168	23	Kestrel 1
8	23/06/2021	15:38	Lesser Black-backed Gull	100	102	Lesser Black-Backed Gull 3
8	23/06/2021	15:55	Black-headed Gull	66	44	Black Headed Gull 2
8	23/06/2021	16:31	Buzzard	82	114	Buzzard 4
8	23/06/2021	16:52	Grey Heron	78	29	Grey Heron 1
9	23/06/2021	18:34	Lesser Black-backed Gull	122	103	Lesser Black-Backed Gull 3
9	23/06/2021	18:57	Lesser Black-backed Gull	39	104	Lesser Black-Backed Gull 3
9	23/06/2021	19:11	Buzzard	200	115	Buzzard 4
9	23/06/2021	19:26	Black-headed Gull	111	45	Black Headed Gull 2
9	23/06/2021	19:39	Kestrel	309	24	Kestrel 1
9	23/06/2021	20:14	Buzzard	45	116	Buzzard 4
9	23/06/2021	20:48	Lesser Black-backed Gull	66	105	Lesser Black-Backed Gull 3
9	24/06/2021	10:33	Lesser Black-backed Gull	102	106	Lesser Black-Backed Gull 3
9	24/06/2021	10:49	Buzzard	327	117	Buzzard 4
9	24/06/2021	11:10	Lesser Black-backed Gull	91	107	Lesser Black-Backed Gull 3
9	24/06/2021	11:22	Black-headed Gull	55	46	Black Headed Gull 2
9	24/06/2021	11:37	Kestrel	310	25	Kestrel 1
9	24/06/2021	12:04	Buzzard	228	118	Buzzard 4
9	24/06/2021	12:12	Buzzard	73	119	Buzzard 4

VP No.	Date	Time	Species	Duration (s)	Flightline No	Flightline Map Title
9	24/06/2021	12:41	Grey Heron	22	30	Grey Heron 1
9	24/06/2021	13:00	Mallard	12	24	Mallard 1
10	24/06/2021	14:36	Lesser Black-backed Gull	47	108	Lesser Black-Backed Gull 3
10	24/06/2021	14:45	Black-headed Gull	69	47	Black Headed Gull 2
10	24/06/2021	15:06	Lesser Black-backed Gull	125	109	Lesser Black-Backed Gull 3
10	24/06/2021	15:33	Buzzard	34	120	Buzzard 4
10	24/06/2021	15:50	Lapwing	63	17	Lapwing
10	24/06/2021	16:09	Lapwing	36	18	Lapwing
10	24/06/2021	16:44	Lesser Black-backed Gull	110	110	Lesser Black-Backed Gull 3
10	24/06/2021	16:57	Grey Heron	10	31	Gery Heron 2
10	24/06/2021	18:06	Lesser Black-backed Gull	50	111	Lesser Black-Backed Gull 3
10	24/06/2021	18:15	Black-headed Gull	66	48	Black Headed Gull 2
10	24/06/2021	18:43	Lapwing	25	19	Lapwing
10	24/06/2021	18:59	Lesser Black-backed Gull	102	112	Lesser Black-Backed Gull 3
10	24/06/2021	19:37	Lesser Black-backed Gull	33	113	Lesser Black-Backed Gull 3
10	24/06/2021	20:03	Lesser Black-backed Gull	37	114	Lesser Black-Backed Gull 3
10	24/06/2021	20:20	Kestrel	184	26	Kestrel 1
11	25/06/2021	11:09	Lesser Black-backed Gull	77	115	Lesser Black-Backed Gull 3
11	25/06/2021	11:21	Black-headed Gull	55	49	Black Headed Gull 2
11	25/06/2021	11:33	Buzzard	128	121	Buzzard 5
11	25/06/2021	11:47	Lesser Black-backed Gull	22	116	Lesser Black-Backed Gull 3
11	25/06/2021	12:14	Buzzard	229	122	Buzzard 5
11	25/06/2021	12:30	Lesser Black-backed Gull	90	117	Lesser Black-Backed Gull 3
11	25/06/2021	12:52	Mallard	5	25	Mallard 1
11	25/06/2021	13:06	Buzzard	57	123	Buzzard 5
11	25/06/2021	13:23	Kestrel	155	27	Kestrel 1
11	25/06/2021	13:40	Lesser Black-backed Gull	66	118	Lesser Black-Backed Gull 3
11	25/06/2021	13:56	Lesser Black-backed Gull	100	119	Lesser Black-Backed Gull 3
11	25/06/2021	15:02	Kestrel	105	28	Kestrel 1
11	25/06/2021	15:20	Buzzard	225	124	Buzzard 5
11	25/06/2021	15:35	Buzzard	50	125	Buzzard 5
11	25/06/2021	15:43	Lesser Black-backed Gull	111	120	Lesser Black-Backed Gull 3
11	25/06/2021	16:27	Black-headed Gull	63	50	Black Headed Gull 2
11	25/06/2021	16:48	Lesser Black-backed Gull	28	121	Lesser Black-Backed Gull 4
11	25/06/2021	17:09	Kestrel	77	29	Kestrel 1
11	25/06/2021	17:32	Buzzard	10	126	Buzzard 5
3	05/07/2021	09:44	Snipe	197	6	Snipe
3	05/07/2021	10:00	Snipe	99	7	Snipe
3	05/07/2021	10:03	Lesser Black-backed Gull	66	122	Lesser Black-Backed Gull 4
3	05/07/2021	10:17	Black-headed Gull	40	51	Black Headed Gull 2
3	05/07/2021	11:20	Black-headed Gull	110	52	Black Headed Gull 2
3	05/07/2021	11:33	Lesser Black-backed Gull	130	123	Lesser Black-Backed Gull 4
3	05/07/2021	11:37	Buzzard	36	127	Buzzard 5

VP No.	Date	Time	Species	Duration (s)	Flightline No	Flightline Map Title
3	05/07/2021	16:20	Lesser Black-backed Gull	73	124	Lesser Black-Backed Gull 4
3	05/07/2021	16:34	Buzzard	108	128	Buzzard 5
3	05/07/2021	16:45	Kestrel	47	30	Kestrel 1
3	05/07/2021	16:53	Lapwing	13	20	Lapwing
3	05/07/2021	17:07	Lesser Black-backed Gull	94	125	Lesser Black-Backed Gull 4
3	05/07/2021	17:31	Black-headed Gull	112	53	Black Headed Gull 2
3	05/07/2021	17:52	Buzzard	37	129	Buzzard 5
3	05/07/2021	18:06	Grey Heron	30	32	Grey Heron 2
3	05/07/2021	18:27	Cormorant	182	34	Cormorant 2
3	05/07/2021	18:52	Kestrel	50	31	Kestrel 2
3	06/07/2021	08:52	Kestrel	44	32	Kestrel 2
3	06/07/2021	09:12	Snipe	222	8	Snipe
1	06/07/2021	09:19	Snipe	111	9	Snipe
3	06/07/2021	09:19	Buzzard	148	130	Buzzard 5
1	06/07/2021	09:30	Lapwing	208	21	Lapwing
1	06/07/2021	09:44	Lesser Black-backed Gull	75	126	Lesser Black-Backed Gull 4
1	06/07/2021	09:49	Snipe	97	10	Snipe
1	06/07/2021	10:11	Cormorant	195	35	Cormorant 2
1	06/07/2021	10:23	Mallard	60	26	Mallard 1
3	06/07/2021	10:38	Lesser Black-backed Gull	179	127	Lesser Black-Backed Gull 4
1	06/07/2021	10:49	Sparrowhawk	11	17	Sparrowhawk 1
3	06/07/2021	10:55	Peregrine	576	3	Peregrine
1	06/07/2021	11:03	Lapwing	36	22	Lapwing
3	06/07/2021	11:15	Snipe	73	11	Snipe
1	06/07/2021	11:20	Black-headed Gull	62	54	Black Headed Gull 2
1	06/07/2021	11:30	Buzzard	144	131	Buzzard 5
1	06/07/2021	11:47	Snipe	68	12	Snipe
1	06/07/2021	12:01	Lesser Black-backed Gull	15	128	Lesser Black-Backed Gull 4
1	06/07/2021	13:11	Lesser Black-backed Gull	92	129	Lesser Black-Backed Gull 4
1	06/07/2021	13:30	Buzzard	75	132	Buzzard 5
1	06/07/2021	13:46	Snipe	86	13	Snipe
1	06/07/2021	13:58	Lesser Black-backed Gull	50	130	Lesser Black-Backed Gull 4
1	06/07/2021	14:07	Mallard	42	27	Mallard 1
1	06/07/2021	14:29	Black-headed Gull	67	55	Black Headed Gull 2
1	06/07/2021	14:55	Cormorant	45	36	Cormorant 2
1	06/07/2021	15:06	Teal	119	2	Teal
1	06/07/2021	15:34	Lapwing	79	23	Lapwing
1	06/07/2021	15:50	Buzzard	128	133	Buzzard 5
2	06/07/2021	16:00	Common Tern	93	2	Common Tern
5	06/07/2021	17:06	Lesser Black-backed Gull	247	131	Lesser Black-Backed Gull 4
5	06/07/2021	17:15	Kestrel	116	33	Kestrel 2
5	06/07/2021	17:23	Snipe	322	14	Snipe
5	06/07/2021	17:39	Buzzard	145	134	Buzzard 5

VP No.	Date	Time	Species	Duration (s)	Flightline No	Flightline Map Title
5	06/07/2021	17:58	Cormorant	21	37	Cormorant 2
5	06/07/2021	18:24	Grey Heron	84	33	Grey Heron 2
5	06/07/2021	18:44	Kestrel	109	34	Kestrel 2
5	06/07/2021	18:55	Kestrel	144	35	Kestrel 2
5	06/07/2021	18:58	Kestrel	32	36	Kestrel 2
5	06/07/2021	19:43	Black-headed Gull	117	56	Black Headed Gull 2
5	06/07/2021	19:50	Lesser Black-backed Gull	74	132	Lesser Black-Backed Gull 4
5	06/07/2021	20:03	Lesser Black-backed Gull	94	133	Lesser Black-Backed Gull 4
2	07/07/2021	11:21	Lesser Black-backed Gull	38	134	Lesser Black-Backed Gull 4
2	07/07/2021	11:40	Cormorant	108	38	Cormorant 2
2	07/07/2021	12:19	Black-headed Gull	124	57	Black Headed Gull 2
2	07/07/2021	12:36	Lesser Black-backed Gull	229	135	Lesser Black-Backed Gull 4
2	07/07/2021	12:55	Buzzard	43	135	Buzzard 5
2	07/07/2021	13:02	Cormorant	111	39	Cormorant 2
2	07/07/2021	13:16	Cormorant	11	40	Cormorant 2
2	07/07/2021	13:20	Grey Heron	201	34	Grey Heron 2
2	07/07/2021	13:31	Lesser Black-backed Gull	57	136	Lesser Black-Backed Gull 4
2	07/07/2021	13:45	Black-headed Gull	55	58	Black Headed Gull 2
2	07/07/2021	13:59	Cormorant	124	41	Cormorant 2
2	07/07/2021	15:01	Buzzard	45	136	Buzzard 5
2	07/07/2021	15:15	Lesser Black-backed Gull	70	137	Lesser Black-Backed Gull 4
2	07/07/2021	15:28	Cormorant	33	42	Cormorant 2
2	07/07/2021	15:50	Mallard	51	28	Mallard 1
2	07/07/2021	16:22	Cormorant	20	43	Cormorant 2
2	07/07/2021	16:38	Buzzard	115	137	Buzzard 5
2	07/07/2021	16:47	Buzzard	96	138	Buzzard 5
2	07/07/2021	16:57	Lesser Black-backed Gull	88	138	Lesser Black-Backed Gull 4
2	07/07/2021	17:23	Grey Heron	27	35	Grey Heron 2
2	07/07/2021	17:38	Black-headed Gull	185	59	Black Headed Gull 2
2	07/07/2021	17:43	Common Tern	25	3	Common Tern
4	07/07/2021	18:50	Buzzard	90	139	Buzzard 5
4	07/07/2021	19:02	Lesser Black-backed Gull	87	139	Lesser Black-Backed Gull 4
4	07/07/2021	19:11	Black-headed Gull	78	60	Black Headed Gull 2
4	07/07/2021	19:28	Lesser Black-backed Gull	255	140	Lesser Black-Backed Gull 4
4	07/07/2021	19:53	Buzzard	313	140	Buzzard 5
4	07/07/2021	20:15	Grey Heron	17	36	Grey Heron 2
4	07/07/2021	20:26	Mallard	33	29	Mallard 1
4	07/07/2021	20:49	Buzzard	162	141	Buzzard 5
4	07/07/2021	20:58	Lesser Black-backed Gull	70	141	Lesser Black-Backed Gull 4
4	07/07/2021	21:08	Cormorant	69	44	Cormorant 2
4	07/07/2021	21:25	Lesser Black-backed Gull	88	142	Lesser Black-Backed Gull 4
6	08/07/2021	11:33	Lesser Black-backed Gull	83	143	Lesser Black-Backed Gull 4
6	08/07/2021	11:50	Buzzard	165	142	Buzzard 5

VP No.	Date	Time	Species	Duration (s)	Flightline No	Flightline Map Title
6	08/07/2021	12:07	Black-headed Gull	70	61	Black Headed Gull 3
6	08/07/2021	12:29	Sparrowhawk	224	18	Sparrowhawk 1
6	08/07/2021	12:45	Buzzard	49	143	Buzzard 5
6	08/07/2021	13:11	Lesser Black-backed Gull	111	144	Lesser Black-Backed Gull 4
6	08/07/2021	13:42	Lesser Black-backed Gull	84	145	Lesser Black-Backed Gull 4
6	08/07/2021	13:50	Kestrel	37	37	Kestrel 2
6	08/07/2021	14:03	Black-headed Gull	92	62	Black Headed Gull 3
6	08/07/2021	15:09	Lesser Black-backed Gull	80	146	Lesser Black-Backed Gull 4
6	08/07/2021	15:20	Kestrel	1763	38	Kestrel 2
6	08/07/2021	16:05	Buzzard	107	144	Buzzard 5
6	08/07/2021	16:12	Black-headed Gull	74	63	Black Headed Gull 3
6	08/07/2021	16:28	Lesser Black-backed Gull	110	147	Lesser Black-Backed Gull 4
6	08/07/2021	16:51	Buzzard	15	145	Buzzard 5
6	08/07/2021	16:59	Grey Heron	22	37	Grey Heron 2
6	08/07/2021	17:10	Lesser Black-backed Gull	99	148	Lesser Black-Backed Gull 4
6	08/07/2021	17:33	Grey Heron	55	38	Grey Heron 2
6	08/07/2021	17:46	Lesser Black-backed Gull	106	149	Lesser Black-Backed Gull 4
6	08/07/2021	18:00	Lesser Black-backed Gull	23	150	Lesser Black-Backed Gull 4
7	08/07/2021	19:03	Lesser Black-backed Gull	94	151	Lesser Black-Backed Gull 5
7	08/07/2021	19:23	Buzzard	147	146	Buzzard 5
7	08/07/2021	19:47	Lesser Black-backed Gull	42	152	Lesser Black-Backed Gull 5
7	08/07/2021	20:30	Kestrel	90	39	Kestrel 2
7	08/07/2021	20:55	Lesser Black-backed Gull	75	153	Lesser Black-Backed Gull 5
7	08/07/2021	21:09	Buzzard	63	147	Buzzard 5
7	08/07/2021	21:22	Grey Heron	18	39	Grey Heron 2
7	08/07/2021	21:40	Black-headed Gull	100	64	Black Headed Gull 3
7	09/07/2021	11:20	Black-headed Gull	96	65	Black Headed Gull 3
7	09/07/2021	11:37	Buzzard	174	148	Buzzard 5
7	09/07/2021	11:52	Lesser Black-backed Gull	73	154	Lesser Black-Backed Gull 5
7	09/07/2021	12:23	Grey Heron	25	40	Grey Heron 2
7	09/07/2021	12:46	Lesser Black-backed Gull	183	155	Lesser Black-Backed Gull 5
7	09/07/2021	13:00	Lesser Black-backed Gull	55	156	Lesser Black-Backed Gull 5
7	09/07/2021	13:17	Lesser Black-backed Gull	33	157	Lesser Black-Backed Gull 5
7	09/07/2021	13:44	Lesser Black-backed Gull	70	158	Lesser Black-Backed Gull 5
7	09/07/2021	14:06	Lesser Black-backed Gull	66	159	Lesser Black-Backed Gull 5
4	09/07/2021	15:00	Buzzard	124	149	Buzzard 5
4	09/07/2021	15:17	Cormorant	95	45	Cormorant 2
4	09/07/2021	15:36	Lesser Black-backed Gull	147	160	Lesser Black-Backed Gull 5
4	09/07/2021	15:43	Lesser Black-backed Gull	67	161	Lesser Black-Backed Gull 5
4	09/07/2021	16:08	Buzzard	34	150	Buzzard 5
4	09/07/2021	16:30	Mallard	20	30	Mallard 1
4	09/07/2021	16:49	Black-headed Gull	73	66	Black Headed Gull 3
4	09/07/2021	17:02	Buzzard	100	151	Buzzard 6

VP No.	Date	Time	Species	Duration (s)	Flightline No	Flightline Map Title
4	09/07/2021	17:15	Grey Heron	29	41	Grey Heron 2
4	09/07/2021	17:35	Lesser Black-backed Gull	92	162	Lesser Black-Backed Gull 5
4	09/07/2021	17:48	Lesser Black-backed Gull	36	163	Lesser Black-Backed Gull 5
5	09/07/2021	18:47	Buzzard	110	152	Buzzard 6
5	09/07/2021	19:20	Lesser Black-backed Gull	93	164	Lesser Black-Backed Gull 5
5	09/07/2021	19:36	Snipe	50	15	Snipe
5	09/07/2021	20:19	Grey Heron	15	42	Grey Heron 2
5	09/07/2021	20:45	Lesser Black-backed Gull	66	165	Lesser Black-Backed Gull 5
5	09/07/2021	20:55	Lesser Black-backed Gull	118	166	Lesser Black-Backed Gull 5
5	09/07/2021	21:14	Buzzard	97	153	Buzzard 6
5	09/07/2021	21:23	Cormorant	106	46	Cormorant 2
8	13/07/2021	08:03	Buzzard	135	154	Buzzard 6
8	13/07/2021	08:27	Lesser Black-backed Gull	120	167	Lesser Black-Backed Gull 5
8	13/07/2021	08:35	Buzzard	73	155	Buzzard 6
8	13/07/2021	09:02	Buzzard	66	156	Buzzard 6
8	13/07/2021	09:18	Black-headed Gull	96	67	Black Headed Gull 3
8	13/07/2021	09:46	Lesser Black-backed Gull	102	168	Lesser Black-Backed Gull 5
8	13/07/2021	10:10	Cormorant	103	47	Cormorant 2
8	13/07/2021	10:22	Lesser Black-backed Gull	29	169	Lesser Black-Backed Gull 5
8	13/07/2021	15:05	Lesser Black-backed Gull	100	170	Lesser Black-Backed Gull 5
8	13/07/2021	15:31	Buzzard	73	157	Buzzard 6
8	13/07/2021	15:40	Buzzard	62	158	Buzzard 6
8	13/07/2021	15:58	Black-headed Gull	112	68	Black Headed Gull 3
8	13/07/2021	16:27	Lesser Black-backed Gull	53	171	Lesser Black-Backed Gull 5
8	13/07/2021	16:43	Buzzard	97	159	Buzzard 6
8	13/07/2021	17:02	Lesser Black-backed Gull	112	172	Lesser Black-Backed Gull 5
8	13/07/2021	17:18	Lesser Black-backed Gull	68	173	Lesser Black-Backed Gull 5
8	13/07/2021	17:39	Lesser Black-backed Gull	70	174	Lesser Black-Backed Gull 5
9	14/07/2021	08:12	Buzzard	79	160	Buzzard 6
9	14/07/2021	08:27	Lesser Black-backed Gull	103	175	Lesser Black-Backed Gull 5
9	14/07/2021	09:00	Grey Heron	26	43	Grey Heron 2
9	14/07/2021	09:53	Kestrel	206	40	Kestrel 2
9	14/07/2021	10:15	Buzzard	110	161	Buzzard 6
9	14/07/2021	10:27	Lesser Black-backed Gull	48	176	Lesser Black-Backed Gull 5
9	14/07/2021	10:44	Kestrel	72	41	Kestrel 2
9	15/07/2021	08:27	Buzzard	79	162	Buzzard 6
9	15/07/2021	08:46	Lesser Black-backed Gull	113	177	Lesser Black-Backed Gull 5
9	15/07/2021	08:55	Buzzard	100	163	Buzzard 6
9	15/07/2021	09:23	Buzzard	93	164	Buzzard 6
9	15/07/2021	09:40	Black-headed Gull	36	69	Black Headed Gull 3
9	15/07/2021	10:17	Lesser Black-backed Gull	69	178	Lesser Black-Backed Gull 5
9	15/07/2021	10:48	Lesser Black-backed Gull	124	179	Lesser Black-Backed Gull 5
9	15/07/2021	11:00	Lesser Black-backed Gull	148	180	Lesser Black-Backed Gull 5

VP No.	Date	Time	Species	Duration (s)	Flightline No	Flightline Map Title
10	15/07/2021	12:47	Buzzard	147	165	Buzzard 6
10	15/07/2021	13:06	Lesser Black-backed Gull	65	181	Lesser Black-Backed Gull 6
10	15/07/2021	13:33	Sparrowhawk	32	19	Sparrowhawk 1
10	15/07/2021	13:59	Kestrel	323	42	Kestrel 2
10	15/07/2021	14:40	Lesser Black-backed Gull	104	182	Lesser Black-Backed Gull 6
10	15/07/2021	14:52	Buzzard	91	166	Buzzard 6
10	15/07/2021	16:30	Lesser Black-backed Gull	98	183	Lesser Black-Backed Gull 6
10	15/07/2021	16:47	Buzzard	77	167	Buzzard 6
10	15/07/2021	17:15	Kestrel	202	43	Kestrel 2
10	15/07/2021	17:52	Buzzard	60	168	Buzzard 6
10	15/07/2021	18:13	Lesser Black-backed Gull	91	184	Lesser Black-Backed Gull 6
10	15/07/2021	18:43	Sparrowhawk	43	20	Sparrowhawk 1
10	15/07/2021	19:00	Lesser Black-backed Gull	144	185	Lesser Black-Backed Gull 6
10	15/07/2021	19:08	Grey Heron	27	44	Grey Heron 2
11	16/07/2021	09:06	Buzzard	37	169	Buzzard 6
11	16/07/2021	09:43	Lesser Black-backed Gull	64	186	Lesser Black-Backed Gull 6
11	16/07/2021	10:09	Kestrel	304	44	Kestrel 2
11	16/07/2021	10:54	Buzzard	105	170	Buzzard 6
11	16/07/2021	11:11	Lesser Black-backed Gull	90	187	Lesser Black-Backed Gull 6
11	16/07/2021	11:26	Lesser Black-backed Gull	177	188	Lesser Black-Backed Gull 6
11	16/07/2021	13:02	Kestrel	207	45	Kestrel 2
11	16/07/2021	13:28	Buzzard	120	171	Buzzard 6
11	16/07/2021	13:46	Buzzard	73	172	Buzzard 6
11	16/07/2021	14:24	Lesser Black-backed Gull	113	189	Lesser Black-Backed Gull 6
11	16/07/2021	15:00	Lesser Black-backed Gull	84	190	Lesser Black-Backed Gull 6
11	16/07/2021	15:07	Black-headed Gull	39	70	Black Headed Gull 3
11	16/07/2021	15:23	Lesser Black-backed Gull	209	191	Lesser Black-Backed Gull 6
5	27/07/2021	09:22	Lesser Black-backed Gull	109	192	Lesser Black-Backed Gull 6
5	27/07/2021	09:45	Buzzard	208	173	Buzzard 6
5	27/07/2021	09:57	Lesser Black-backed Gull	54	193	Lesser Black-Backed Gull 6
5	27/07/2021	10:10	Lesser Black-backed Gull	91	194	Lesser Black-Backed Gull 6
5	27/07/2021	10:33	Buzzard	34	174	Buzzard 6
5	27/07/2021	10:49	Lesser Black-backed Gull	119	195	Lesser Black-Backed Gull 6
5	27/07/2021	11:00	Lapwing	263	24	Lapwing
5	27/07/2021	11:12	Little Egret	78	42	Little Egret 2
5	27/07/2021	11:48	Lesser Black-backed Gull	24	196	Lesser Black-Backed Gull 6
5	27/07/2021	11:59	Buzzard	205	175	Buzzard 6
5	27/07/2021	16:06	Buzzard	205	176	Buzzard 6
5	27/07/2021	16:30	Lesser Black-backed Gull	108	197	Lesser Black-Backed Gull 6
5	27/07/2021	16:49	Lesser Black-backed Gull	93	198	Lesser Black-Backed Gull 6
5	27/07/2021	17:11	Little Egret	44	43	Little Egret 2
5	27/07/2021	17:42	Buzzard	129	177	Buzzard 6
5	27/07/2021	18:02	Lesser Black-backed Gull	50	199	Lesser Black-Backed Gull 6

VP No.	Date	Time	Species	Duration (s)	Flightline No	Flightline Map Title
5	27/07/2021	18:14	Lapwing	72	25	Lapwing
5	27/07/2021	18:33	Buzzard	87	178	Buzzard 6
5	27/07/2021	18:55	Lesser Black-backed Gull	26	200	Lesser Black-Backed Gull 6
2	28/07/2021	09:33	Lesser Black-backed Gull	58	201	Lesser Black-Backed Gull 6
2	28/07/2021	09:43	Cormorant	67	48	Cormorant 2
2	28/07/2021	10:06	Lesser Black-backed Gull	42	202	Lesser Black-Backed Gull 6
2	28/07/2021	10:47	Grey Heron	14	45	Grey Heron 2
2	28/07/2021	10:58	Lesser Black-backed Gull	196	203	Lesser Black-Backed Gull 6
2	28/07/2021	11:09	Little Egret	53	44	Little Egret 2
2	28/07/2021	11:26	Kestrel	75	46	Kestrel 2
2	28/07/2021	11:55	Buzzard	49	179	Buzzard 6
2	28/07/2021	11:59	Lesser Black-backed Gull	77	204	Lesser Black-Backed Gull 6
2	28/07/2021	12:10	Buzzard	48	180	Buzzard 6
2	28/07/2021	12:14	Lesser Black-backed Gull	19	205	Lesser Black-Backed Gull 6
2	28/07/2021	13:30	Cormorant	97	49	Cormorant 2
2	28/07/2021	13:44	Lesser Black-backed Gull	66	206	Lesser Black-Backed Gull 6
2	28/07/2021	14:02	Lesser Black-backed Gull	88	207	Lesser Black-Backed Gull 6
2	28/07/2021	14:16	Kestrel	248	47	Kestrel 2
2	28/07/2021	14:57	Lesser Black-backed Gull	111	208	Lesser Black-Backed Gull 6
2	28/07/2021	15:19	Little Egret	21	45	Little Egret 2
2	28/07/2021	15:42	Lesser Black-backed Gull	163	209	Lesser Black-Backed Gull 6
2	28/07/2021	16:03	Lesser Black-backed Gull	36	210	Lesser Black-Backed Gull 6
3	28/07/2021	17:07	Sparrowhawk	12	21	Sparrowhawk 1
3	28/07/2021	17:32	Lesser Black-backed Gull	63	211	Lesser Black-Backed Gull 7
3	28/07/2021	17:38	Buzzard	28	181	Buzzard 7
3	28/07/2021	17:51	Sparrowhawk	546	22	Sparrowhawk 1
3	28/07/2021	18:20	Lesser Black-backed Gull	72	212	Lesser Black-Backed Gull 7
3	28/07/2021	18:40	Buzzard	200	182	Buzzard 7
3	28/07/2021	18:58	Lesser Black-backed Gull	27	213	Lesser Black-Backed Gull 7
3	28/07/2021	19:03	Grey Heron	14	46	Grey Heron 2
3	28/07/2021	19:15	Lesser Black-backed Gull	111	214	Lesser Black-Backed Gull 7
3	28/07/2021	19:29	Buzzard	50	183	Buzzard 7
3	28/07/2021	19:50	Lesser Black-backed Gull	25	215	Lesser Black-Backed Gull 7
1	29/07/2021	10:15	Cormorant	48	50	Cormorant 2
1	29/07/2021	10:29	Cormorant	107	51	Cormorant 2
1	29/07/2021	10:47	Mallard	50	31	Mallard 2
1	29/07/2021	11:04	Buzzard	208	184	Buzzard 7
1	29/07/2021	11:32	Lesser Black-backed Gull	143	216	Lesser Black-Backed Gull 7
1	29/07/2021	11:50	Lesser Black-backed Gull	40	217	Lesser Black-Backed Gull 7
1	29/07/2021	12:03	Mallard	33	32	Mallard 2
1	29/07/2021	12:22	Lapwing	37	26	Lapwing
1	29/07/2021	12:42	Lesser Black-backed Gull	41	218	Lesser Black-Backed Gull 7
1	29/07/2021	13:01	Buzzard	97	185	Buzzard 7

VP No.	Date	Time	Species	Duration (s)	Flightline No	Flightline Map Title
1	29/07/2021	14:05	Lesser Black-backed Gull	83	219	Lesser Black-Backed Gull 7
1	29/07/2021	14:11	Cormorant	44	52	Cormorant 2
1	29/07/2021	14:28	Buzzard	122	186	Buzzard 7
1	29/07/2021	15:02	Lesser Black-backed Gull	93	220	Lesser Black-Backed Gull 7
1	29/07/2021	15:41	Sparrowhawk	37	23	Sparrowhawk 1
1	29/07/2021	15:51	Lesser Black-backed Gull	78	221	Lesser Black-Backed Gull 7
1	29/07/2021	16:00	Mallard	55	33	Mallard 2
1	29/07/2021	16:14	Cormorant	33	53	Cormorant 2
1	29/07/2021	16:43	Buzzard	117	187	Buzzard 7
3	29/07/2021	17:52	Lesser Black-backed Gull	164	222	Lesser Black-Backed Gull 7
3	29/07/2021	17:59	Snipe	180	16	Snipe
3	29/07/2021	18:27	Grey Heron	93	47	Grey Heron 2
3	29/07/2021	18:45	Lesser Black-backed Gull	205	223	Lesser Black-Backed Gull 7
3	29/07/2021	19:03	Lesser Black-backed Gull	47	224	Lesser Black-Backed Gull 7
3	29/07/2021	19:14	Buzzard	88	188	Buzzard 7
3	29/07/2021	19:29	Lesser Black-backed Gull	55	225	Lesser Black-Backed Gull 7
3	29/07/2021	19:50	Buzzard	33	189	Buzzard 7
3	29/07/2021	20:00	Sparrowhawk	242	24	Sparrowhawk 1
3	29/07/2021	20:11	Lesser Black-backed Gull	28	226	Lesser Black-Backed Gull 7
3	29/07/2021	20:32	Cormorant	100	54	Cormorant 2
3	29/07/2021	20:37	Lesser Black-backed Gull	202	227	Lesser Black-Backed Gull 7
4	30/07/2021	11:00	Grey Heron	23	48	Grey Heron 2
4	30/07/2021	11:17	Lesser Black-backed Gull	142	228	Lesser Black-Backed Gull 7
4	30/07/2021	11:22	Lesser Black-backed Gull	33	229	Lesser Black-Backed Gull 7
4	30/07/2021	11:48	Lesser Black-backed Gull	79	230	Lesser Black-Backed Gull 7
4	30/07/2021	12:12	Mallard	48	34	Mallard 2
4	30/07/2021	12:30	Lesser Black-backed Gull	262	231	Lesser Black-Backed Gull 7
4	30/07/2021	12:52	Buzzard	113	190	Buzzard 7
4	30/07/2021	12:59	Snipe	3	17	Snipe
4	30/07/2021	13:08	Cormorant	109	55	Cormorant 2
4	30/07/2021	13:13	Cormorant	83	56	Cormorant 2
4	30/07/2021	13:30	Grey Heron	15	49	Grey Heron 2
4	30/07/2021	13:41	Buzzard	12	191	Buzzard 7
4	30/07/2021	14:52	Lesser Black-backed Gull	133	232	Lesser Black-Backed Gull 7
4	30/07/2021	15:07	Mallard	155	35	Mallard 2
4	30/07/2021	15:23	Grey Heron	34	50	Grey Heron 2
4	30/07/2021	15:40	Lesser Black-backed Gull	21	233	Lesser Black-Backed Gull 7
4	30/07/2021	15:58	Buzzard	77	192	Buzzard 7
4	30/07/2021	16:10	Lesser Black-backed Gull	96	234	Lesser Black-Backed Gull 7
4	30/07/2021	16:24	Lesser Black-backed Gull	47	235	Lesser Black-Backed Gull 7
4	30/07/2021	16:53	Grey Heron	143	51	Grey Heron 2
4	30/07/2021	17:01	Mallard	7	36	Mallard 2
4	30/07/2021	17:15	Lesser Black-backed Gull	11	236	Lesser Black-Backed Gull 7

VP No.	Date	Time	Species	Duration (s)	Flightline No	Flightline Map Title
4	30/07/2021	17:23	Lesser Black-backed Gull	123	237	Lesser Black-Backed Gull 7
7	02/08/2021	10:02	Lesser Black-backed Gull	15	238	Lesser Black-Backed Gull 7
7	02/08/2021	10:15	Lesser Black-backed Gull	177	239	Lesser Black-Backed Gull 7
7	02/08/2021	10:41	Kestrel	190	48	Kestrel 2
7	02/08/2021	10:58	Lesser Black-backed Gull	28	240	Lesser Black-Backed Gull 7
7	02/08/2021	11:22	Lesser Black-backed Gull	149	241	Lesser Black-Backed Gull 8
7	02/08/2021	11:50	Sparrowhawk	72	25	Sparrowhawk 1
7	02/08/2021	12:05	Lesser Black-backed Gull	22	242	Lesser Black-Backed Gull 8
7	02/08/2021	12:28	Buzzard	212	193	Buzzard 7
7	02/08/2021	15:20	Lesser Black-backed Gull	50	243	Lesser Black-Backed Gull 8
7	02/08/2021	15:43	Lesser Black-backed Gull	180	244	Lesser Black-Backed Gull 8
7	02/08/2021	15:56	Lesser Black-backed Gull	48	245	Lesser Black-Backed Gull 8
7	02/08/2021	16:45	Sparrowhawk	57	26	Sparrowhawk 1
7	02/08/2021	17:19	Lesser Black-backed Gull	10	246	Lesser Black-Backed Gull 8
7	02/08/2021	17:34	Grey Heron	97	52	Grey Heron 2
7	02/08/2021	17:58	Lesser Black-backed Gull	15	247	Lesser Black-Backed Gull 8
9	03/08/2021	09:55	Kestrel	155	49	Kestrel 2
9	03/08/2021	10:05	Grey Heron	27	53	Grey Heron 2
9	03/08/2021	10:19	Grey Heron	39	54	Grey Heron 2
9	03/08/2021	10:42	Lesser Black-backed Gull	96	248	Lesser Black-Backed Gull 8
9	03/08/2021	10:59	Buzzard	405	194	Buzzard 7
9	03/08/2021	11:14	Kestrel	14	50	Kestrel 2
9	03/08/2021	11:27	Little Egret	59	46	Little Egret 2
9	03/08/2021	11:38	Sparrowhawk	78	27	Sparrowhawk 1
9	03/08/2021	11:54	Kestrel	110	51	Kestrel 2
9	03/08/2021	12:09	Kestrel	297	52	Kestrel 2
9	03/08/2021	12:30	Buzzard	480	195	Buzzard 7
9	03/08/2021	14:02	Kestrel	122	53	Kestrel 2
9	03/08/2021	14:35	Kestrel	103	54	Kestrel 2
9	03/08/2021	14:56	Grey Heron	245	55	Grey Heron 2
9	03/08/2021	15:19	Lesser Black-backed Gull	274	249	Lesser Black-Backed Gull 8
9	03/08/2021	15:35	Little Egret	212	47	Little Egret 2
9	03/08/2021	15:47	Buzzard	177	196	Buzzard 7
9	03/08/2021	16:03	Sparrowhawk	133	28	Sparrowhawk 1
9	03/08/2021	16:23	Buzzard	99	197	Buzzard 7
9	03/08/2021	16:37	Lesser Black-backed Gull	27	250	Lesser Black-Backed Gull 8
8	03/08/2021	17:54	Buzzard	209	198	Buzzard 7
8	03/08/2021	18:09	Lesser Black-backed Gull	79	251	Lesser Black-Backed Gull 8
8	03/08/2021	18:27	Lesser Black-backed Gull	179	252	Lesser Black-Backed Gull 8
8	03/08/2021	18:50	Lesser Black-backed Gull	249	253	Lesser Black-Backed Gull 8
8	03/08/2021	19:16	Buzzard	88	199	Buzzard 7
8	03/08/2021	19:25	Lesser Black-backed Gull	134	254	Lesser Black-Backed Gull 8
8	03/08/2021	19:49	Grey Heron	105	56	Grey Heron 2

VP No.	Date	Time	Species	Duration (s)	Flightline No	Flightline Map Title
8	03/08/2021	20:14	Lesser Black-backed Gull	112	255	Lesser Black-Backed Gull 8
6	04/08/2021	10:22	Lesser Black-backed Gull	15	256	Lesser Black-Backed Gull 8
6	04/08/2021	10:50	Lesser Black-backed Gull	101	257	Lesser Black-Backed Gull 8
6	04/08/2021	11:15	Buzzard	128	200	Buzzard 7
6	04/08/2021	11:46	Lesser Black-backed Gull	93	258	Lesser Black-Backed Gull 8
6	04/08/2021	12:03	Grey Heron	55	57	Grey Heron 2
6	04/08/2021	12:30	Buzzard	120	201	Buzzard 7
6	04/08/2021	12:42	Lesser Black-backed Gull	31	259	Lesser Black-Backed Gull 8
6	04/08/2021	12:50	Lesser Black-backed Gull	77	260	Lesser Black-Backed Gull 8
6	04/08/2021	14:02	Lesser Black-backed Gull	109	261	Lesser Black-Backed Gull 8
6	04/08/2021	14:19	Lesser Black-backed Gull	133	262	Lesser Black-Backed Gull 8
6	04/08/2021	14:37	Buzzard	311	202	Buzzard 7
6	04/08/2021	15:00	Lesser Black-backed Gull	204	263	Lesser Black-Backed Gull 8
6	04/08/2021	15:34	Lesser Black-backed Gull	63	264	Lesser Black-Backed Gull 8
6	04/08/2021	15:58	Lesser Black-backed Gull	34	265	Lesser Black-Backed Gull 8
6	04/08/2021	16:22	Lesser Black-backed Gull	164	266	Lesser Black-Backed Gull 8
6	04/08/2021	16:41	Grey Heron	20	58	Grey Heron 2
8	04/08/2021	17:50	Lesser Black-backed Gull	127	267	Lesser Black-Backed Gull 8
8	04/08/2021	18:13	Lesser Black-backed Gull	44	268	Lesser Black-Backed Gull 8
8	04/08/2021	18:42	Buzzard	208	203	Buzzard 7
8	04/08/2021	19:19	Lesser Black-backed Gull	112	269	Lesser Black-Backed Gull 8
8	04/08/2021	19:39	Buzzard	68	204	Buzzard 7
8	04/08/2021	20:00	Lesser Black-backed Gull	74	270	Lesser Black-Backed Gull 8
8	04/08/2021	20:22	Lesser Black-backed Gull	52	271	Lesser Black-Backed Gull 9
10	05/08/2021	11:52	Lesser Black-backed Gull	99	272	Lesser Black-Backed Gull 9
10	05/08/2021	12:34	Lesser Black-backed Gull	354	273	Lesser Black-Backed Gull 9
10	05/08/2021	13:05	Grey Heron	173	59	Grey Heron 2
10	05/08/2021	13:40	Lesser Black-backed Gull	97	274	Lesser Black-Backed Gull 9
10	11/08/2021	09:45	Lesser Black-backed Gull	31	275	Lesser Black-Backed Gull 9
10	11/08/2021	09:59	Grey Heron	200	60	Grey Heron 2
10	11/08/2021	10:06	Kestrel	310	55	Kestrel 2
10	11/08/2021	10:38	Buzzard	10	205	Buzzard 7
10	11/08/2021	11:00	Lesser Black-backed Gull	429	276	Lesser Black-Backed Gull 9
10	11/08/2021	11:22	Buzzard	122	206	Buzzard 7
10	11/08/2021	11:37	Lapwing	143	27	Lapwing
10	11/08/2021	11:44	Buzzard	117	207	Buzzard 7
10	11/08/2021	11:59	Kestrel	98	56	Kestrel 2
10	11/08/2021	12:08	Kestrel	105	57	Kestrel 2
11	11/08/2021	13:09	Sparrowhawk	12	29	Sparrowhawk 1
11	11/08/2021	13:23	Kestrel	217	58	Kestrel 2
11	11/08/2021	13:37	Lesser Black-backed Gull	156	277	Lesser Black-Backed Gull 9
11	11/08/2021	13:56	Buzzard	67	208	Buzzard 7
11	11/08/2021	14:45	Buzzard	333	209	Buzzard 7

VP No.	Date	Time	Species	Duration (s)	Flightline No	Flightline Map Title
11	11/08/2021	15:08	Lesser Black-backed Gull	15	278	Lesser Black-Backed Gull 9
11	11/08/2021	17:24	Lesser Black-backed Gull	75	279	Lesser Black-Backed Gull 9
11	11/08/2021	17:51	Buzzard	204	210	Buzzard 7
11	11/08/2021	18:09	Kestrel	27	59	Kestrel 2
11	11/08/2021	18:43	Buzzard	210	211	Buzzard 8
11	11/08/2021	19:06	Lesser Black-backed Gull	72	280	Lesser Black-Backed Gull 9
11	11/08/2021	19:30	Lesser Black-backed Gull	106	281	Lesser Black-Backed Gull 9
5	12/08/2021	10:40	Buzzard	94	212	Buzzard 8
5	12/08/2021	11:04	Lesser Black-backed Gull	24	282	Lesser Black-Backed Gull 9
5	12/08/2021	11:33	Lesser Black-backed Gull	244	283	Lesser Black-Backed Gull 9
5	12/08/2021	11:56	Buzzard	132	213	Buzzard 8
5	12/08/2021	12:42	Lesser Black-backed Gull	15	284	Lesser Black-Backed Gull 9
5	12/08/2021	13:00	Mallard	197	37	Mallard 2
5	12/08/2021	14:30	Buzzard	53	214	Buzzard 8
5	12/08/2021	14:56	Lesser Black-backed Gull	62	285	Lesser Black-Backed Gull 9
5	12/08/2021	15:27	Lesser Black-backed Gull	16	286	Lesser Black-Backed Gull 9
5	12/08/2021	15:59	Buzzard	203	215	Buzzard 8
5	12/08/2021	16:31	Grey Heron	29	61	Grey Heron 3
5	12/08/2021	16:47	Lesser Black-backed Gull	166	287	Lesser Black-Backed Gull 9
7	12/08/2021	18:40	Lesser Black-backed Gull	77	288	Lesser Black-Backed Gull 9
7	12/08/2021	19:11	Lesser Black-backed Gull	195	289	Lesser Black-Backed Gull 9
7	12/08/2021	19:23	Lesser Black-backed Gull	15	290	Lesser Black-Backed Gull 9
7	12/08/2021	20:02	Kestrel	184	60	Kestrel 2
7	12/08/2021	20:29	Lesser Black-backed Gull	90	291	Lesser Black-Backed Gull 9
4	13/08/2021	10:53	Buzzard	55	216	Buzzard 8
4	13/08/2021	11:09	Lesser Black-backed Gull	184	292	Lesser Black-Backed Gull 9
4	13/08/2021	11:40	Lesser Black-backed Gull	253	293	Lesser Black-Backed Gull 9
4	13/08/2021	11:58	Little Egret	201	48	Little Egret 2
4	13/08/2021	12:22	Mallard	94	38	Mallard 2
4	13/08/2021	12:45	Little Egret	15	49	Little Egret 2
4	13/08/2021	12:50	Cormorant	198	57	Cormorant 2
4	13/08/2021	12:58	Lesser Black-backed Gull	107	294	Lesser Black-Backed Gull 9
4	13/08/2021	14:10	Lesser Black-backed Gull	46	295	Lesser Black-Backed Gull 9
4	13/08/2021	14:42	Curlew	19	1	Curlew
4	13/08/2021	14:42	Whimbrel	49	3	Whimbrel
4	13/08/2021	15:05	Buzzard	183	217	Buzzard 8
4	13/08/2021	15:33	Mallard	177	39	Mallard 2
4	13/08/2021	15:57	Grey Heron	105	62	Grey Heron 3
4	13/08/2021	16:10	Lesser Black-backed Gull	105	296	Lesser Black-Backed Gull 9
4	13/08/2021	16:50	Lesser Black-backed Gull	76	297	Lesser Black-Backed Gull 9
4	13/08/2021	16:54	Little Egret	54	50	Little Egret 2
4	13/08/2021	17:03	Grey Heron	11	63	Grey Heron 3
7	13/08/2021	18:15	Lesser Black-backed Gull	109	298	Lesser Black-Backed Gull 9

VP No.	Date	Time	Species	Duration (s)	Flightline No	Flightline Map Title
7	13/08/2021	18:40	Lesser Black-backed Gull	150	299	Lesser Black-Backed Gull 9
7	13/08/2021	19:12	Lesser Black-backed Gull	10	300	Lesser Black-Backed Gull 9
7	13/08/2021	19:55	Buzzard	5	218	Buzzard 8
7	13/08/2021	20:24	Lesser Black-backed Gull	195	301	Lesser Black-Backed Gull 10
8	14/08/2021	11:17	Lesser Black-backed Gull	62	302	Lesser Black-Backed Gull 10
8	14/08/2021	11:51	Lesser Black-backed Gull	94	303	Lesser Black-Backed Gull 10
8	14/08/2021	12:22	Buzzard	52	219	Buzzard 8
8	14/08/2021	12:46	Lesser Black-backed Gull	210	304	Lesser Black-Backed Gull 10
8	14/08/2021	13:15	Lesser Black-backed Gull	224	305	Lesser Black-Backed Gull 10
3	16/08/2021	09:09	Buzzard	67	220	Buzzard 8
3	16/08/2021	09:29	Lesser Black-backed Gull	15	306	Lesser Black-Backed Gull 10
3	16/08/2021	09:47	Kestrel	193	61	Kestrel 3
3	16/08/2021	10:11	Lesser Black-backed Gull	100	307	Lesser Black-Backed Gull 10
3	16/08/2021	10:34	Buzzard	97	221	Buzzard 8
3	16/08/2021	10:55	Kestrel	222	62	Kestrel 3
3	16/08/2021	11:17	Kestrel	294	63	Kestrel 3
3	16/08/2021	11:39	Buzzard	180	222	Buzzard 8
3	16/08/2021	13:02	Buzzard	110	223	Buzzard 8
3	16/08/2021	13:27	Lesser Black-backed Gull	15	308	Lesser Black-Backed Gull 10
3	16/08/2021	13:48	Lesser Black-backed Gull	93	309	Lesser Black-Backed Gull 10
3	16/08/2021	14:21	Buzzard	47	224	Buzzard 8
3	16/08/2021	14:50	Kestrel	172	64	Kestrel 3
3	16/08/2021	15:00	Grey Heron	160	64	Grey Heron 3
3	16/08/2021	15:16	Lesser Black-backed Gull	256	310	Lesser Black-Backed Gull 10
8	16/08/2021	17:04	Lesser Black-backed Gull	62	311	Lesser Black-Backed Gull 10
8	16/08/2021	17:39	Lesser Black-backed Gull	99	312	Lesser Black-Backed Gull 10
8	16/08/2021	18:14	Lesser Black-backed Gull	10	313	Lesser Black-Backed Gull 10
8	16/08/2021	18:40	Lesser Black-backed Gull	53	314	Lesser Black-Backed Gull 10
8	16/08/2021	19:00	Buzzard	209	225	Buzzard 8
2	17/08/2021	09:14	Lesser Black-backed Gull	187	315	Lesser Black-Backed Gull 10
2	17/08/2021	09:42	Grey Heron	94	65	Grey Heron 3
2	17/08/2021	09:57	Buzzard	226	226	Buzzard 8
2	17/08/2021	10:08	Kestrel	45	65	Kestrel 3
2	17/08/2021	10:20	Grey Heron	110	66	Grey Heron 3
2	17/08/2021	10:34	Buzzard	18	227	Buzzard 8
2	17/08/2021	10:49	Lesser Black-backed Gull	198	316	Lesser Black-Backed Gull 10
2	17/08/2021	11:05	Kestrel	47	66	Kestrel 3
2	17/08/2021	11:26	Mallard	53	40	Mallard 2
2	17/08/2021	11:46	Grey Heron	81	67	Grey Heron 3
2	17/08/2021	12:32	Buzzard	33	228	Buzzard 8
2	17/08/2021	12:45	Lesser Black-backed Gull	122	317	Lesser Black-Backed Gull 10
2	17/08/2021	13:03	Kestrel	8	67	Kestrel 3
2	17/08/2021	13:24	Grey Heron	15	68	Grey Heron 3

VP No.	Date	Time	Species	Duration (s)	Flightline No	Flightline Map Title
2	17/08/2021	13:38	Buzzard	27	229	Buzzard 8
2	17/08/2021	14:09	Mallard	105	41	Mallard 2
2	17/08/2021	14:21	Lesser Black-backed Gull	110	318	Lesser Black-Backed Gull 10
2	17/08/2021	14:50	Grey Heron	11	69	Grey Heron 3
2	17/08/2021	15:00	Cormorant	17	58	Cormorant 2
2	17/08/2021	15:23	Lesser Black-backed Gull	23	319	Lesser Black-Backed Gull 10
9	17/08/2021	16:53	Lesser Black-backed Gull	207	320	Lesser Black-Backed Gull 10
9	17/08/2021	17:25	Lesser Black-backed Gull	193	321	Lesser Black-Backed Gull 10
9	17/08/2021	17:47	Buzzard	44	230	Buzzard 8
9	17/08/2021	18:34	Lesser Black-backed Gull	29	322	Lesser Black-Backed Gull 10
9	17/08/2021	19:01	Lesser Black-backed Gull	87	323	Lesser Black-Backed Gull 10
1	18/08/2021	09:09	Mallard	22	42	Mallard 2
1	18/08/2021	09:33	Curlew	47	2	Curlew
1	18/08/2021	09:48	Lesser Black-backed Gull	75	324	Lesser Black-Backed Gull 10
1	18/08/2021	10:07	Lesser Black-backed Gull	38	325	Lesser Black-Backed Gull 10
1	18/08/2021	10:17	Cormorant	167	59	Cormorant 2
1	18/08/2021	10:33	Lesser Black-backed Gull	194	326	Lesser Black-Backed Gull 10
1	18/08/2021	10:54	Grey Heron	24	70	Grey Heron 3
1	18/08/2021	11:12	Mute Swan	96	4	Mute Swan
1	18/08/2021	11:21	Buzzard	26	231	Buzzard 8
1	18/08/2021	11:40	Lesser Black-backed Gull	200	327	Lesser Black-Backed Gull 10
1	18/08/2021	11:52	Lesser Black-backed Gull	66	328	Lesser Black-Backed Gull 10
1	18/08/2021	13:00	Lesser Black-backed Gull	112	329	Lesser Black-Backed Gull 10
1	18/08/2021	13:14	Grey Heron	18	71	Grey Heron 3
1	18/08/2021	13:38	Lesser Black-backed Gull	35	330	Lesser Black-Backed Gull 10
1	18/08/2021	14:02	Mallard	21	43	Mallard 2
1	18/08/2021	14:22	Cormorant	162	60	Cormorant 2
1	18/08/2021	14:45	Buzzard	64	232	Buzzard 8
1	18/08/2021	14:57	Grey Heron	5	72	Grey Heron 3
1	18/08/2021	15:09	Lesser Black-backed Gull	94	331	Lesser Black-Backed Gull 11
1	18/08/2021	15:20	Cormorant	37	61	Cormorant 3
1	18/08/2021	15:34	Mallard	39	44	Mallard 2
9	18/08/2021	16:35	Buzzard	36	233	Buzzard 8
9	18/08/2021	16:56	Kestrel	17	68	Kestrel 3
9	18/08/2021	17:08	Lesser Black-backed Gull	195	332	Lesser Black-Backed Gull 11
9	18/08/2021	17:17	Lesser Black-backed Gull	143	333	Lesser Black-Backed Gull 11
9	18/08/2021	17:42	Sparrowhawk	384	30	Sparrowhawk 1
9	18/08/2021	18:10	Lesser Black-backed Gull	47	334	Lesser Black-Backed Gull 11
9	18/08/2021	18:39	Buzzard	55	234	Buzzard 8
9	18/08/2021	19:02	Grey Heron	24	73	Grey Heron 3
6	19/08/2021	09:34	Buzzard	15	235	Buzzard 8
6	19/08/2021	09:47	Lesser Black-backed Gull	100	335	Lesser Black-Backed Gull 11
6	19/08/2021	10:15	Lesser Black-backed Gull	186	336	Lesser Black-Backed Gull 11

VP No.	Date	Time	Species	Duration (s)	Flightline No	Flightline Map Title
6	19/08/2021	10:40	Kestrel	49	69	Kestrel 3
6	19/08/2021	11:06	Buzzard	55	236	Buzzard 8
6	19/08/2021	11:22	Curlew	163	3	Curlew
6	19/08/2021	11:35	Buzzard	300	237	Buzzard 8
6	19/08/2021	12:01	Lesser Black-backed Gull	44	337	Lesser Black-Backed Gull 11
6	19/08/2021	13:12	Buzzard	212	238	Buzzard 8
6	19/08/2021	13:27	Sparrowhawk	20	31	Sparrowhawk 2
6	19/08/2021	13:56	Lesser Black-backed Gull	134	338	Lesser Black-Backed Gull 11
6	19/08/2021	14:19	Buzzard	29	239	Buzzard 8
6	19/08/2021	14:45	Sparrowhawk	440	32	Sparrowhawk 2
6	19/08/2021	15:07	Kestrel	34	70	Kestrel 3
6	19/08/2021	15:38	Buzzard	153	240	Buzzard 8
10	19/08/2021	17:04	Buzzard	310	241	Buzzard 9
10	19/08/2021	17:24	Sparrowhawk	193	33	Sparrowhawk 2
10	19/08/2021	17:46	Buzzard	100	242	Buzzard 9
10	19/08/2021	18:15	Lesser Black-backed Gull	86	339	Lesser Black-Backed Gull 11
10	19/08/2021	18:52	Little Egret	77	51	Little Egret 2
10	19/08/2021	19:10	Lesser Black-backed Gull	165	340	Lesser Black-Backed Gull 11
10	19/08/2021	19:31	Buzzard	42	243	Buzzard 9
10	20/08/2021	09:44	Little Egret	15	52	Little Egret 2
10	20/08/2021	09:51	Buzzard	50	244	Buzzard 9
10	20/08/2021	10:30	Lesser Black-backed Gull	118	341	Lesser Black-Backed Gull 11
10	20/08/2021	10:49	Little Egret	43	53	Little Egret 2
10	20/08/2021	11:15	Lesser Black-backed Gull	227	342	Lesser Black-Backed Gull 11
10	20/08/2021	12:02	Grey Heron	25	74	Grey Heron 3
11	20/08/2021	13:40	Grey Heron	26	75	Grey Heron 3
11	20/08/2021	14:00	Lesser Black-backed Gull	211	343	Lesser Black-Backed Gull 11
11	20/08/2021	14:52	Kestrel	49	71	Kestrel 3
11	20/08/2021	15:33	Lesser Black-backed Gull	68	344	Lesser Black-Backed Gull 11
11	20/08/2021	17:16	Lesser Black-backed Gull	165	345	Lesser Black-Backed Gull 11
11	20/08/2021	18:05	Lesser Black-backed Gull	222	346	Lesser Black-Backed Gull 11
11	20/08/2021	18:49	Lesser Black-backed Gull	40	347	Lesser Black-Backed Gull 11
3	02/09/2021	09:12	Buzzard	19	245	Buzzard 9
3	02/09/2021	09:27	Kestrel	208	72	Kestrel 3
3	02/09/2021	09:50	Grey Heron	102	76	Grey Heron 3
3	02/09/2021	10:10	Buzzard	54	246	Buzzard 9
3	02/09/2021	10:22	Snipe	190	18	Snipe
3	02/09/2021	11:03	Kestrel	41	73	Kestrel 3
3	02/09/2021	11:19	Grey Heron	15	77	Grey Heron 3
3	02/09/2021	11:34	Kestrel	83	74	Kestrel 3
3	02/09/2021	12:59	Kestrel	122	75	Kestrel 3
3	02/09/2021	13:26	Buzzard	93	247	Buzzard 9
3	02/09/2021	13:45	Grey Heron	14	78	Grey Heron 3

VP No.	Date	Time	Species	Duration (s)	Flightline No	Flightline Map Title
3	02/09/2021	14:14	Kestrel	41	76	Kestrel 3
3	02/09/2021	15:05	Buzzard	152	248	Buzzard 9
3	02/09/2021	15:17	Lesser Black-backed Gull	74	348	Lesser Black-Backed Gull 11
5	02/09/2021	16:43	Buzzard	87	249	Buzzard 9
5	02/09/2021	16:57	Grey Heron	23	79	Grey Heron 3
5	02/09/2021	17:30	Little Egret	15	54	Little Egret 2
5	02/09/2021	18:05	Buzzard	108	250	Buzzard 9
5	02/09/2021	18:38	Kestrel	234	77	Kestrel 3
5	03/09/2021	09:46	Little Egret	27	55	Little Egret 2
5	03/09/2021	10:17	Buzzard	63	251	Buzzard 9
5	03/09/2021	10:47	Buzzard	15	252	Buzzard 9
5	03/09/2021	11:00	Kestrel	145	78	Kestrel 3
5	03/09/2021	11:22	Buzzard	108	253	Buzzard 9
5	03/09/2021	11:35	Kestrel	20	79	Kestrel 3
7	03/09/2021	13:22	Buzzard	163	254	Buzzard 9
7	03/09/2021	14:02	Grey Heron	17	80	Grey Heron 3
7	03/09/2021	14:47	Buzzard	22	255	Buzzard 9
7	03/09/2021	15:09	Kestrel	218	80	Kestrel 3
7	03/09/2021	17:14	Buzzard	124	256	Buzzard 9
7	03/09/2021	17:53	Kestrel	15	81	Kestrel 3
7	03/09/2021	18:22	Buzzard	166	257	Buzzard 9
1	06/09/2021	08:53	Mallard	15	45	Mallard 2
1	06/09/2021	09:11	Lesser Black-backed Gull	133	349	Lesser Black-Backed Gull 11
1	06/09/2021	09:28	Lapwing	27	28	Lapwing
1	06/09/2021	09:45	Cormorant	61	62	Cormorant 3
1	06/09/2021	10:10	Buzzard	64	258	Buzzard 9
1	06/09/2021	10:19	Lesser Black-backed Gull	107	350	Lesser Black-Backed Gull 11
1	06/09/2021	10:52	Sparrowhawk	10	34	Sparrowhawk 2
1	06/09/2021	11:03	Mute Swan	30	5	Mute Swan
1	06/09/2021	11:23	Grey Heron	12	81	Grey Heron 3
1	06/09/2021	12:15	Buzzard	60	259	Buzzard 9
1	06/09/2021	12:37	Black-headed Gull	22	71	Black Headed Gull 3
1	06/09/2021	13:06	Cormorant	105	63	Cormorant 3
1	06/09/2021	13:22	Mallard	47	46	Mallard 2
1	06/09/2021	13:30	Curlew	33	4	Curlew
1	06/09/2021	14:00	Sparrowhawk	28	35	Sparrowhawk 2
1	06/09/2021	14:19	Mallard	19	47	Mallard 2
1	06/09/2021	14:43	Lesser Black-backed Gull	201	351	Lesser Black-Backed Gull 11
8	06/09/2021	17:10	Lesser Black-backed Gull	166	352	Lesser Black-Backed Gull 11
8	06/09/2021	18:03	Whimbrel	109	4	Whimbrel
8	07/09/2021	09:35	Snipe	15	19	Snipe
8	07/09/2021	11:03	Buzzard	179	260	Buzzard 9
4	07/09/2021	12:40	Snipe	19	20	Snipe

VP No.	Date	Time	Species	Duration (s)	Flightline No	Flightline Map Title
4	07/09/2021	12:53	Grey Heron	12	82	Grey Heron 3
4	07/09/2021	13:06	Little Egret	52	56	Little Egret 2
4	07/09/2021	13:36	Snipe	61	21	Snipe
4	07/09/2021	14:05	Buzzard	102	261	Buzzard 9
4	07/09/2021	14:11	Mallard	32	48	Mallard 2
4	07/09/2021	14:52	Grey Heron	27	83	Grey Heron 3
4	07/09/2021	15:00	Cormorant	111	64	Cormorant 3
4	07/09/2021	16:12	Buzzard	65	262	Buzzard 9
4	07/09/2021	16:31	Snipe	30	22	Snipe
4	07/09/2021	16:47	Snipe	5	23	Snipe
4	07/09/2021	17:23	Grey Heron	17	84	Grey Heron 3
4	07/09/2021	17:55	Mallard	71	49	Mallard 2
4	07/09/2021	18:09	Cormorant	105	65	Cormorant 3
4	07/09/2021	18:41	Little Egret	23	57	Little Egret 2
6	09/09/2021	09:03	Buzzard	97	263	Buzzard 9
6	09/09/2021	09:22	Kestrel	209	82	Kestrel 3
6	09/09/2021	10:10	Lesser Black-backed Gull	173	353	Lesser Black-Backed Gull 11
6	09/09/2021	10:51	Buzzard	258	264	Buzzard 9
6	09/09/2021	11:15	Sparrowhawk	111	36	Sparrowhawk 2
6	12/09/2021	09:08	Buzzard	207	265	Buzzard 9
6	12/09/2021	09:48	Kestrel	310	83	Kestrel 3
6	12/09/2021	10:33	Buzzard	125	266	Buzzard 9
6	12/09/2021	10:59	Kestrel	96	84	Kestrel 3
6	12/09/2021	11:15	Grey Heron	27	85	Grey Heron 3
2	12/09/2021	12:11	Mallard	53	50	Mallard 2
2	12/09/2021	12:27	Cormorant	37	66	Cormorant 3
2	12/09/2021	12:46	Kestrel	207	85	Kestrel 3
2	12/09/2021	13:30	Grey Heron	15	86	Grey Heron 3
2	12/09/2021	13:52	Kestrel	69	86	Kestrel 3
2	12/09/2021	14:12	Buzzard	103	267	Buzzard 9
2	12/09/2021	14:41	Grey Heron	22	87	Grey Heron 3
2	12/09/2021	15:43	Cormorant	65	67	Cormorant 3
2	12/09/2021	16:02	Kestrel	126	87	Kestrel 3
2	12/09/2021	16:30	Buzzard	77	268	Buzzard 9
2	12/09/2021	16:45	Grey Heron	26	88	Grey Heron 3
2	12/09/2021	17:10	Cormorant	104	68	Cormorant 3
2	12/09/2021	17:32	Grey Heron	44	89	Grey Heron 3
2	12/09/2021	18:00	Mallard	32	51	Mallard 2
2	12/09/2021	18:21	Grey Heron	17	90	Grey Heron 3
9	13/09/2021	09:11	Buzzard	112	269	Buzzard 9
9	13/09/2021	09:19	Kestrel	225	88	Kestrel 3
9	13/09/2021	09:55	Buzzard	50	270	Buzzard 9
9	13/09/2021	10:33	Grey Heron	43	91	Grey Heron 4

VP No.	Date	Time	Species	Duration (s)	Flightline No	Flightline Map Title
9	13/09/2021	11:00	Lesser Black-backed Gull	97	354	Lesser Black-Backed Gull 11
9	13/09/2021	13:05	Buzzard	69	271	Buzzard 10
9	13/09/2021	13:44	Kestrel	117	89	Kestrel 3
9	13/09/2021	14:07	Buzzard	44	272	Buzzard 10
9	13/09/2021	14:58	Sparrowhawk	15	37	Sparrowhawk 2
10	13/09/2021	16:40	Little Egret	44	58	Little Egret 2
10	13/09/2021	17:21	Buzzard	219	273	Buzzard 10
10	13/09/2021	17:38	Grey Heron	18	92	Grey Heron 4
10	13/09/2021	18:03	Buzzard	55	274	Buzzard 10
10	13/09/2021	18:44	Little Egret	23	59	Little Egret 2
10	14/09/2021	09:20	Little Egret	24	60	Little Egret 2
10	14/09/2021	09:48	Buzzard	73	275	Buzzard 10
10	14/09/2021	10:22	Kestrel	153	90	Kestrel 3
10	14/09/2021	10:59	Buzzard	122	276	Buzzard 10
11	14/09/2021	13:11	Grey Heron	33	93	Grey Heron 4
11	14/09/2021	13:59	Lesser Black-backed Gull	187	355	Lesser Black-Backed Gull 11
11	14/09/2021	14:22	Buzzard	84	277	Buzzard 10
11	14/09/2021	16:10	Grey Heron	14	94	Grey Heron 4
11	14/09/2021	17:25	Buzzard	102	278	Buzzard 10
11	14/09/2021	18:14	Kestrel	80	91	Kestrel 4

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APPENDIX 3

Target Species Flight Line Maps

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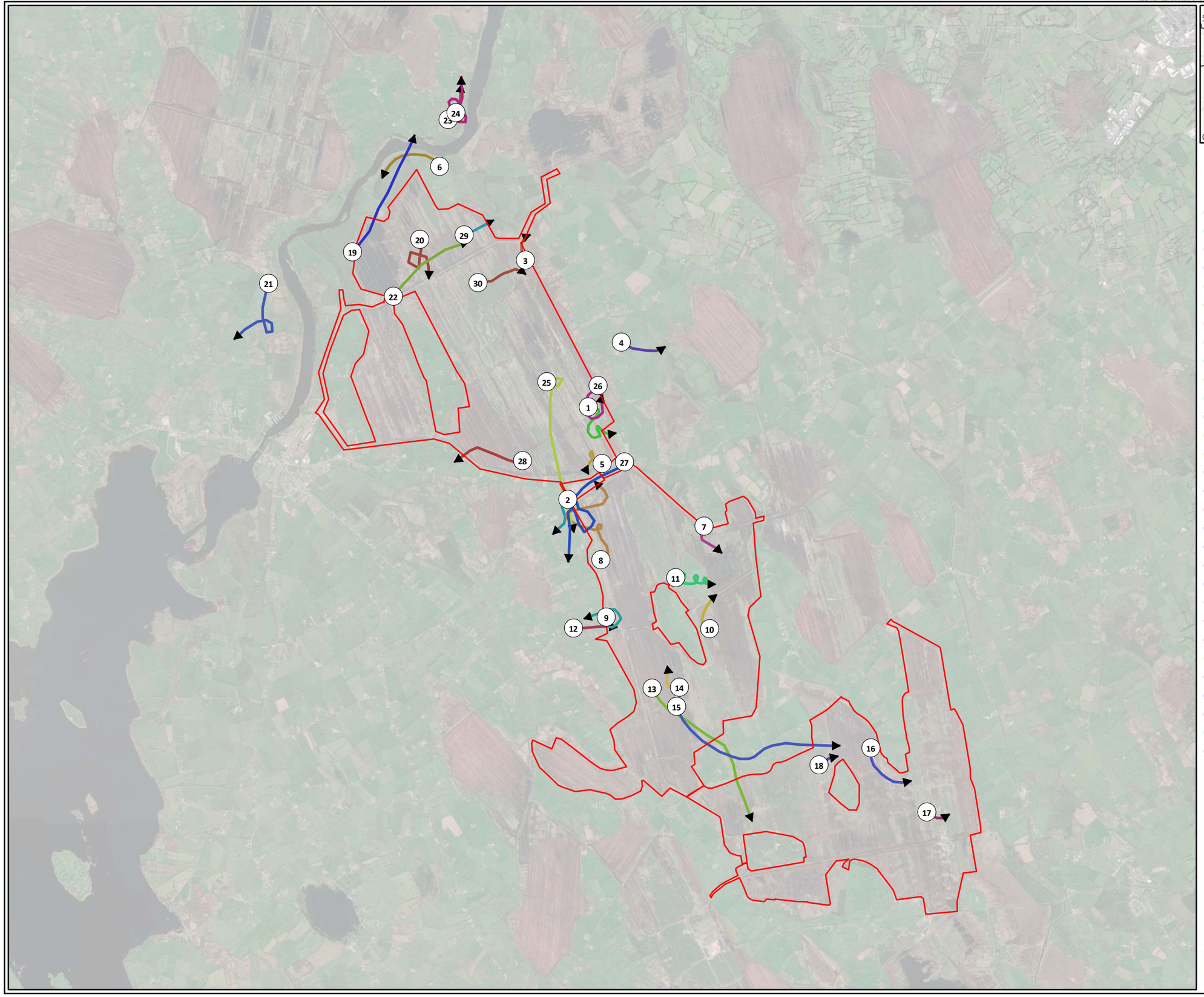

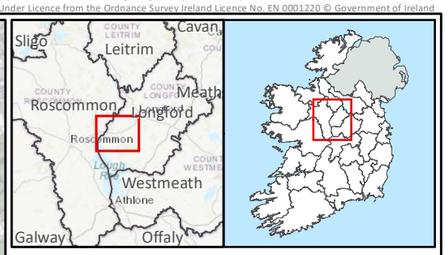

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- 3, 05/05/2021, 09:11
- 4, 05/05/2021, 17:23
- 5, 06/05/2021, 09:24
- 6, 06/05/2021, 18:32
- 7, 07/05/2021, 10:12
- 8, 07/05/2021, 14:59
- 9, 07/05/2021, 17:00
- 10, 07/05/2021, 17:23
- 11, 07/05/2021, 19:25
- 12, 11/05/2021, 14:44
- 13, 11/05/2021, 19:25
- 14, 19/05/2021, 11:02
- 15, 19/05/2021, 11:33
- 16, 21/05/2021, 11:43
- 17, 27/05/2021, 11:41
- 18, 28/05/2021, 19:19
- 19, 31/05/2021, 18:06
- 20, 31/05/2021, 18:40
- 21, 31/05/2021, 19:21
- 22, 31/05/2021, 20:27
- 23, 01/06/2021, 10:14
- 24, 01/06/2021, 13:48
- 25, 01/06/2021, 18:42
- 26, 01/06/2021, 18:50
- 27, 02/06/2021, 14:09
- 28, 02/06/2021, 15:10
- 29, 10/06/2021, 13:52
- 30, 10/06/2021, 14:23

TITLE:	Summer Flightlines 2021 Black-Headed Gull 1		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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0 0.5 1 2

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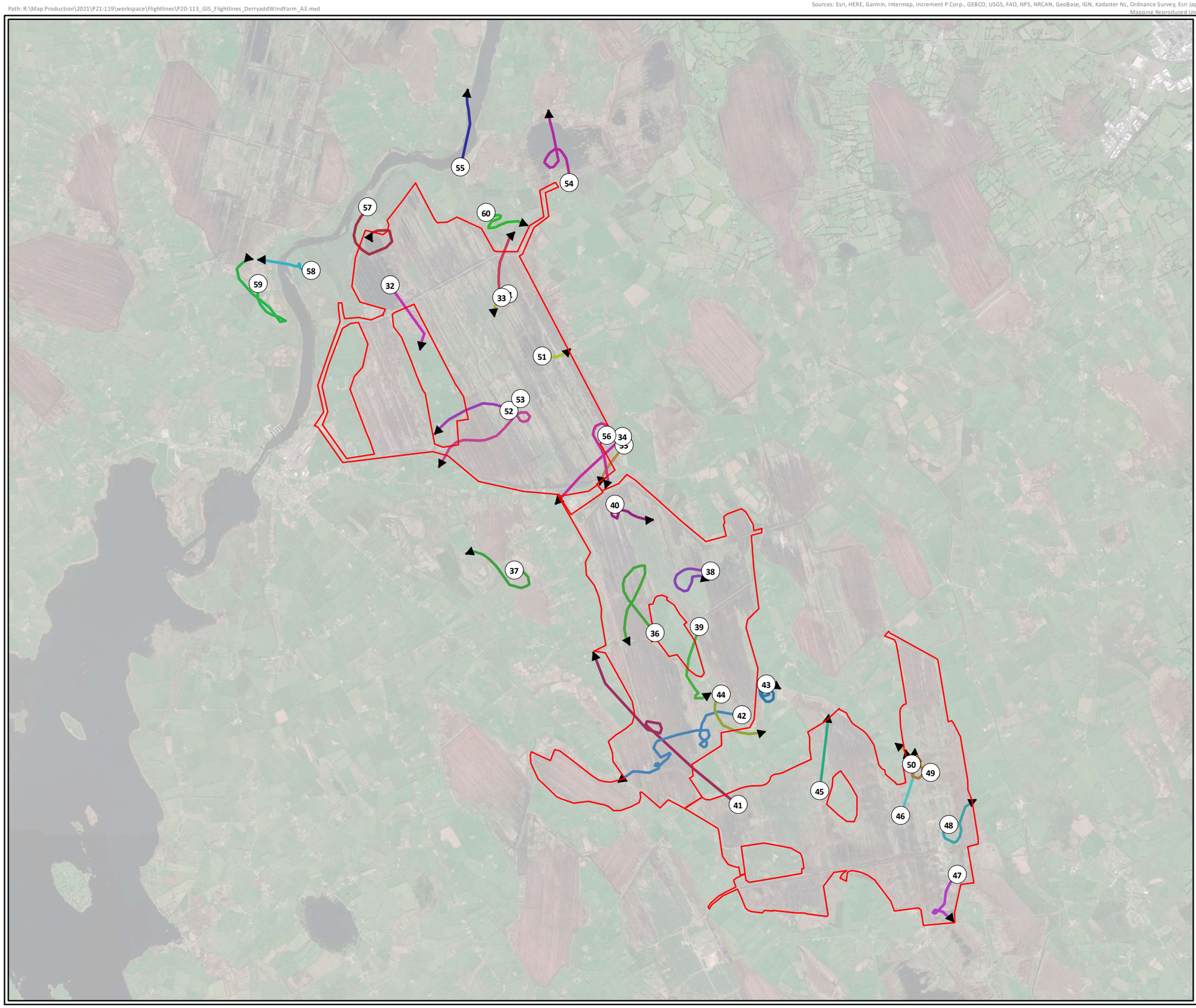

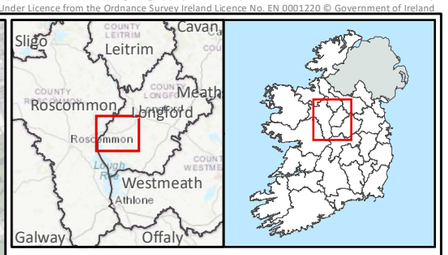

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- 33, 10/06/2021, 18:33
- 34, 16/06/2021, 16:12
- 35, 16/06/2021, 18:17
- 36, 17/06/2021, 12:09
- 37, 17/06/2021, 15:44
- 38, 18/06/2021, 10:15
- 39, 18/06/2021, 11:53
- 40, 18/06/2021, 15:54
- 41, 23/06/2021, 11:22
- 42, 23/06/2021, 12:03
- 43, 23/06/2021, 12:48
- 44, 23/06/2021, 15:55
- 45, 23/06/2021, 19:26
- 46, 24/06/2021, 11:22
- 47, 24/06/2021, 14:45
- 48, 24/06/2021, 18:15
- 49, 25/06/2021, 11:21
- 50, 25/06/2021, 16:27
- 51, 05/07/2021, 10:17
- 52, 05/07/2021, 11:20
- 53, 05/07/2021, 17:31
- 54, 06/07/2021, 11:20
- 55, 06/07/2021, 14:29
- 56, 06/07/2021, 19:43
- 57, 07/07/2021, 12:19
- 58, 07/07/2021, 13:45
- 59, 07/07/2021, 17:38
- 60, 07/07/2021, 19:11

TITLE:	Summer Flightlines 2021 Black-Headed Gull 2		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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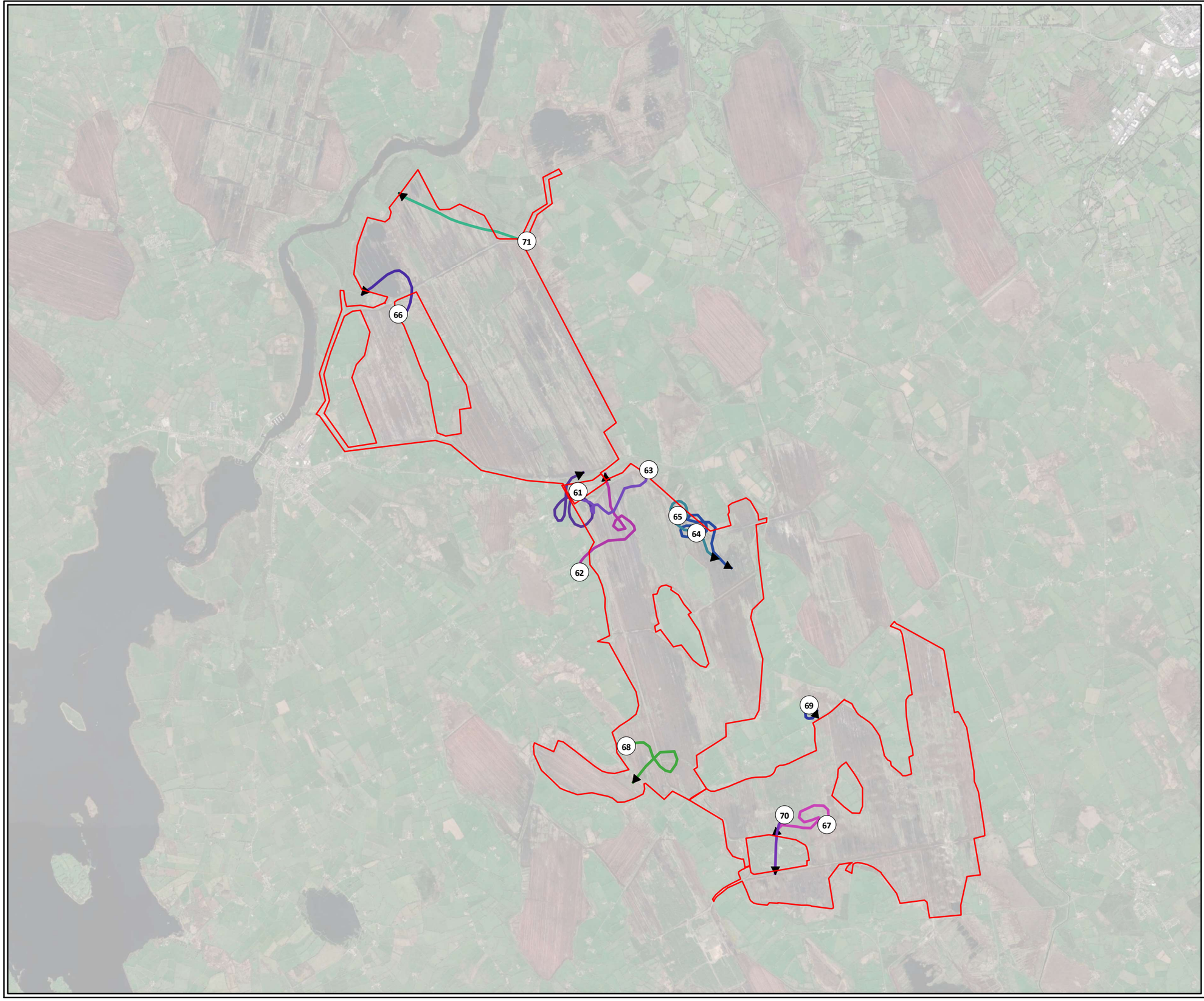
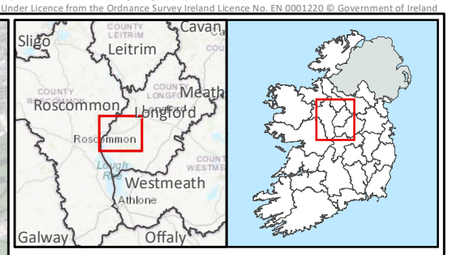
N W E S

0 0.5 1 2 Kilometers

Path: R:\Map Production\2021\P21-119\workspace\Flightlines\P20-113_GIS_Flightlines_DerryaddWindFarm_A3.mxd





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Site Boundary

Individual, Date, Time

- 61, 08/07/2021, 12:07
- 62, 08/07/2021, 14:03
- 63, 08/07/2021, 16:12
- 64, 08/07/2021, 21:40
- 65, 09/07/2021, 11:20
- 66, 09/07/2021, 16:49
- 67, 13/07/2021, 09:18
- 68, 13/07/2021, 15:58
- 69, 15/07/2021, 09:40
- 70, 16/07/2021, 15:07
- 71, 06/09/2021, 12:37

N W E S

0 0.5 1 2 Kilometers

TITLE:	Summer Flightlines 2021 Black-Headed Gull 3		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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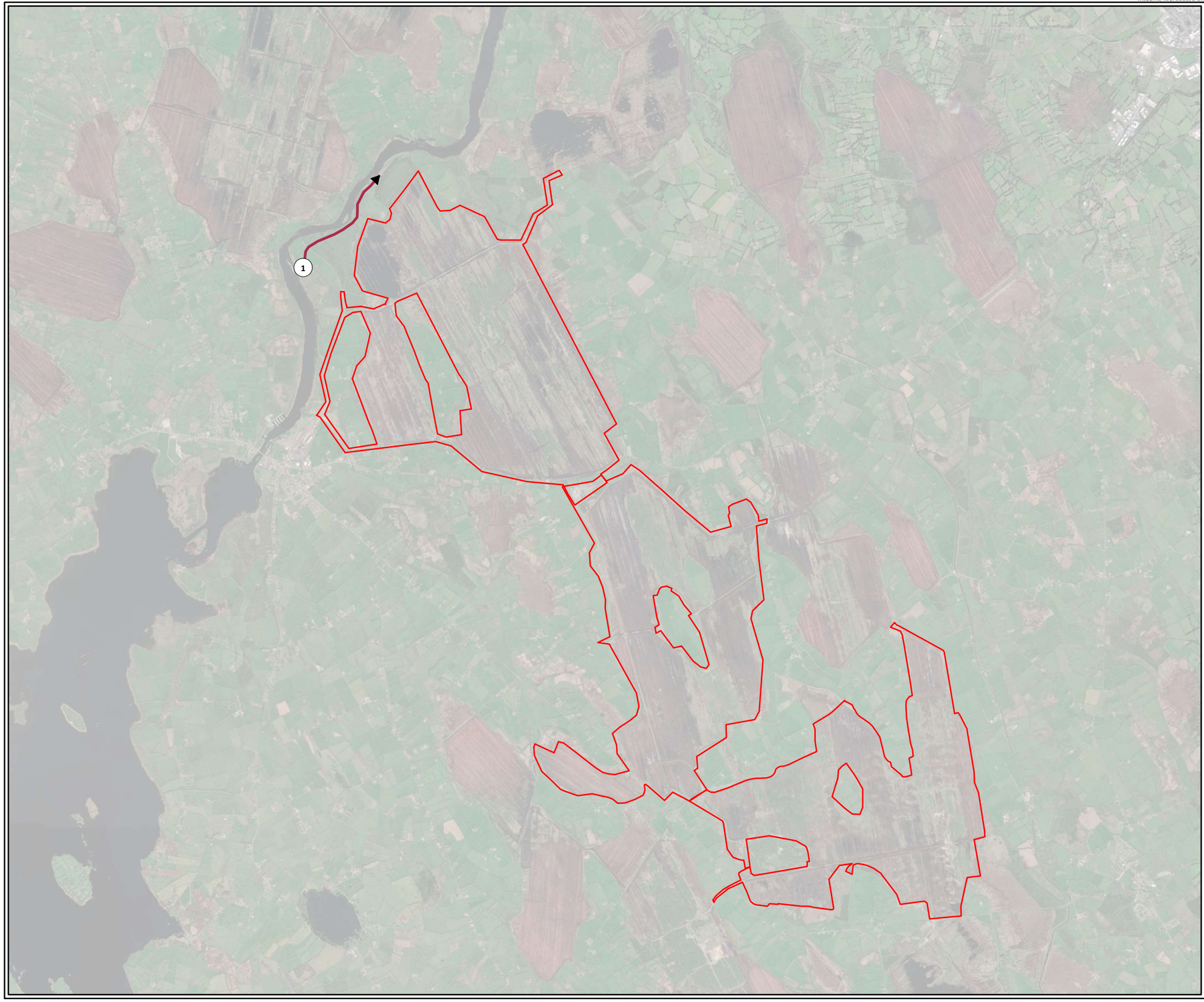

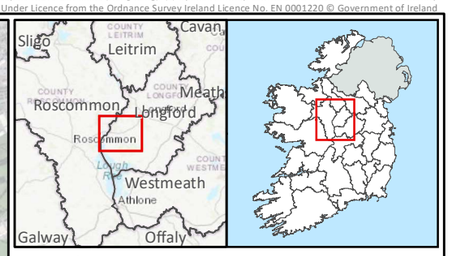

Legend

Site Boundary

Individual, Date, Time

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TITLE:	Summer Flightlines 2021 Black-tailed Godwit		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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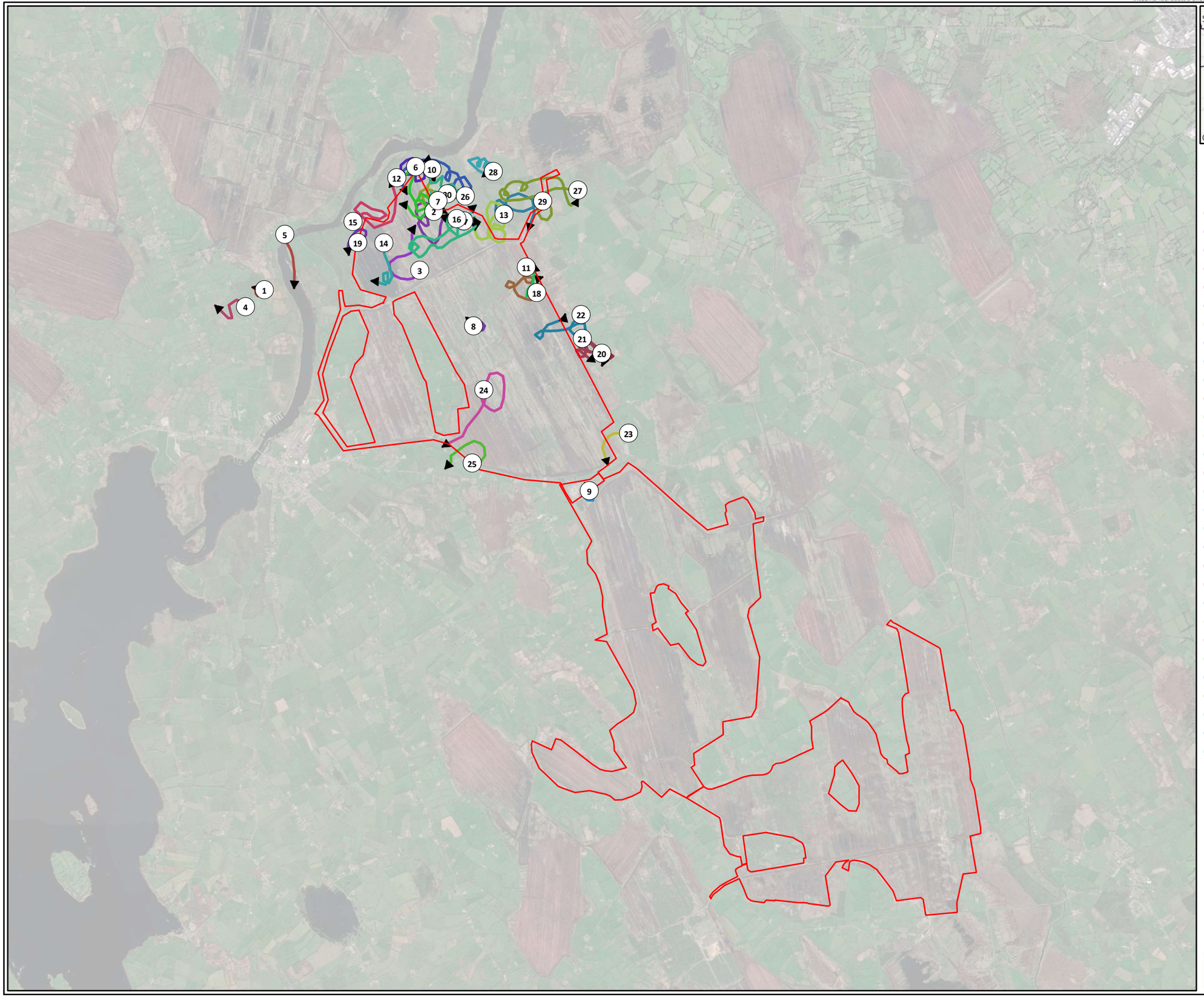

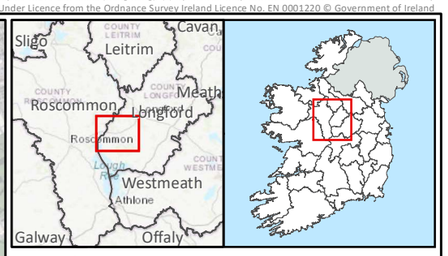

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Site Boundary

Individual, Date, Time

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3, 29/04/2021, 11:56
4, 29/04/2021, 12:32
5, 29/04/2021, 14:26
6, 29/04/2021, 15:09
7, 29/04/2021, 15:24
8, 04/05/2021, 16:49
9, 04/05/2021, 18:10
10, 05/05/2021, 08:50
11, 05/05/2021, 09:03
12, 05/05/2021, 09:46
13, 05/05/2021, 10:44
14, 05/05/2021, 10:52
15, 05/05/2021, 11:00
16, 05/05/2021, 13:34
17, 05/05/2021, 14:10
18, 05/05/2021, 15:20
19, 05/05/2021, 15:45
20, 05/05/2021, 16:43
21, 05/05/2021, 18:02
22, 06/05/2021, 09:30
23, 06/05/2021, 10:06
24, 06/05/2021, 10:57
25, 06/05/2021, 11:15
26, 06/05/2021, 13:20
27, 06/05/2021, 14:29
28, 06/05/2021, 15:21
29, 06/05/2021, 16:45
30, 06/05/2021, 17:42

TITLE:	Summer Flightlines 2021 Buzzard 1		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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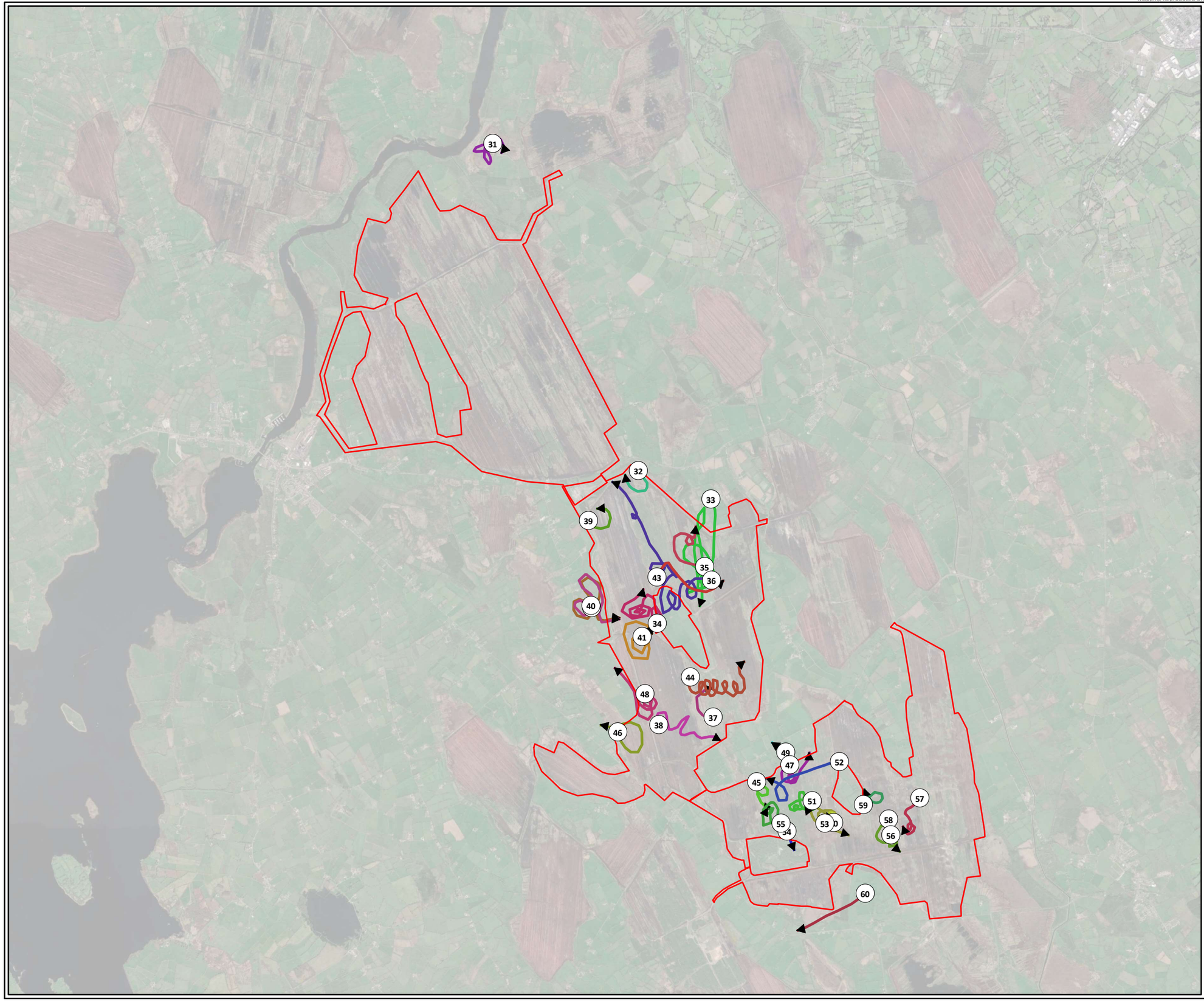

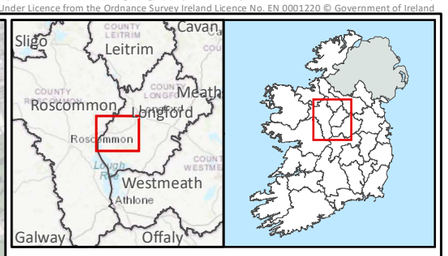

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Site Boundary

Individual, Date, Time

- 31, 06/05/2021, 18:10
- 32, 07/05/2021, 10:30
- 33, 07/05/2021, 11:30
- 34, 07/05/2021, 12:13
- 35, 07/05/2021, 13:20
- 36, 07/05/2021, 13:48
- 37, 07/05/2021, 17:45
- 38, 07/05/2021, 18:10
- 39, 07/05/2021, 18:31
- 40, 11/05/2021, 13:09
- 41, 11/05/2021, 13:28
- 42, 11/05/2021, 15:15
- 43, 11/05/2021, 16:03
- 44, 11/05/2021, 17:32
- 45, 11/05/2021, 18:51
- 46, 19/05/2021, 11:21
- 47, 19/05/2021, 12:06
- 48, 19/05/2021, 12:29
- 49, 21/05/2021, 09:57
- 50, 21/05/2021, 10:16
- 51, 21/05/2021, 10:59
- 52, 21/05/2021, 11:22
- 53, 22/05/2021, 10:53
- 54, 22/05/2021, 12:00
- 55, 22/05/2021, 13:02
- 56, 22/05/2021, 13:23
- 57, 22/05/2021, 15:01
- 58, 22/05/2021, 15:09
- 59, 22/05/2021, 15:41
- 60, 22/05/2021, 16:22

TITLE:	Summer Flightlines 2021 Buzzard 2		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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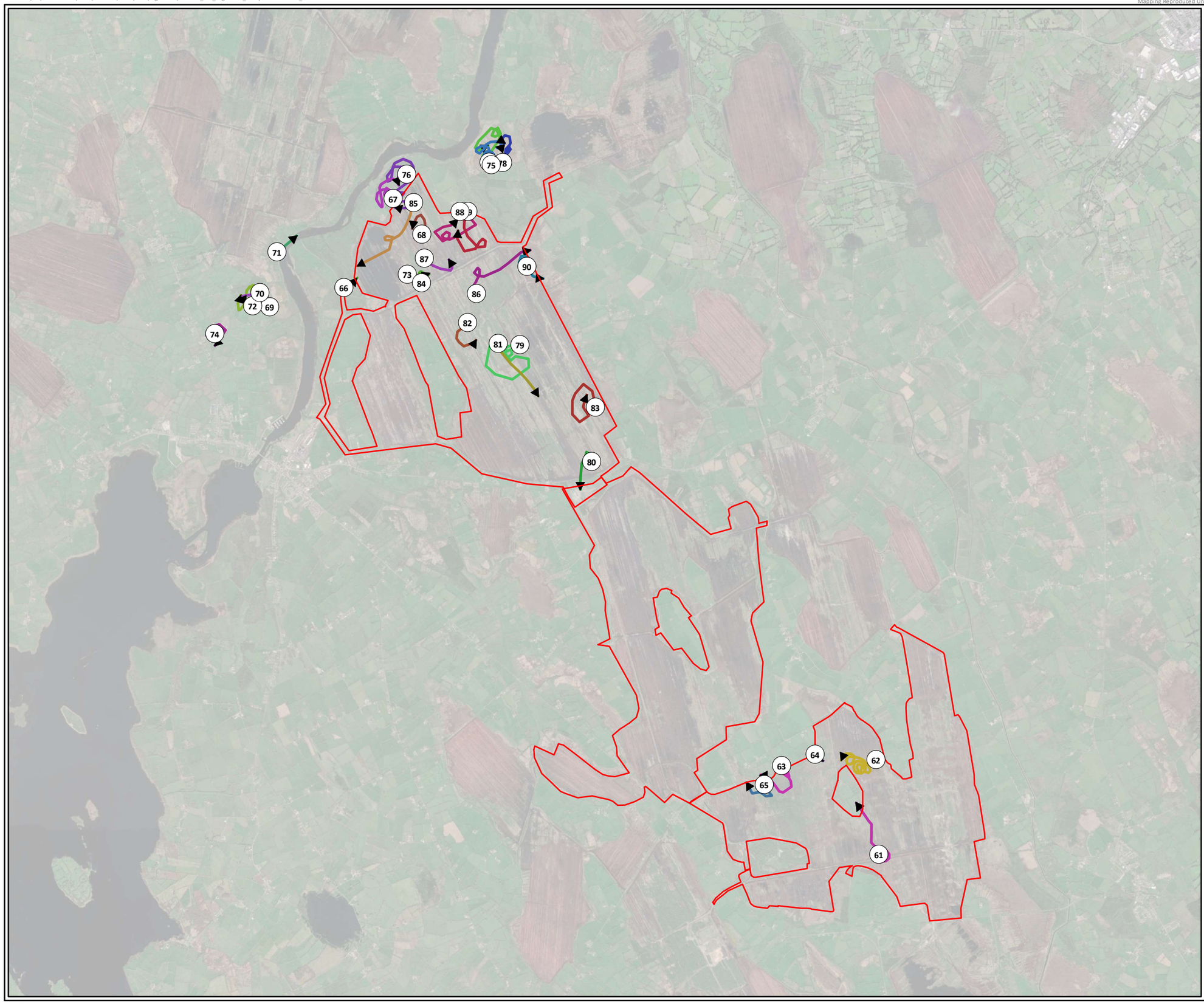

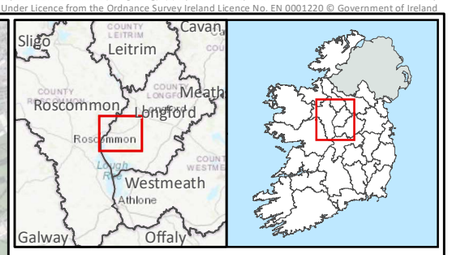

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Site Boundary

Individual, Date, Time

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- 62, 28/05/2021, 13:02
- 63, 28/05/2021, 13:32
- 64, 28/05/2021, 14:16
- 65, 28/05/2021, 14:56
- 66, 31/05/2021, 09:28
- 67, 31/05/2021, 09:39
- 68, 31/05/2021, 09:56
- 69, 31/05/2021, 10:27
- 70, 31/05/2021, 11:11
- 71, 31/05/2021, 17:55
- 72, 31/05/2021, 19:12
- 73, 31/05/2021, 19:35
- 74, 31/05/2021, 20:02
- 75, 01/06/2021, 10:07
- 76, 01/06/2021, 10:53
- 77, 01/06/2021, 13:11
- 78, 01/06/2021, 15:51
- 79, 01/06/2021, 17:22
- 80, 01/06/2021, 17:39
- 81, 01/06/2021, 17:55
- 82, 01/06/2021, 19:41
- 83, 02/06/2021, 13:39
- 84, 10/06/2021, 13:21
- 85, 10/06/2021, 13:46
- 86, 10/06/2021, 15:00
- 87, 10/06/2021, 15:11
- 88, 10/06/2021, 17:34
- 89, 10/06/2021, 18:53
- 90, 10/06/2021, 19:15

TITLE:	Summer Flightlines 2021 Buzzard 3		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
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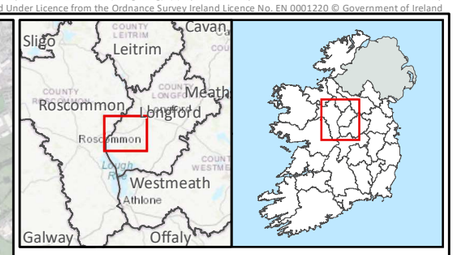

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Site Boundary

Individual, Date, Time

- 91, 16/06/2021, 14:06
- 92, 16/06/2021, 14:29
- 93, 16/06/2021, 15:22
- 94, 16/06/2021, 15:57
- 95, 16/06/2021, 17:44
- 96, 16/06/2021, 18:10
- 97, 16/06/2021, 18:50
- 98, 16/06/2021, 19:24
- 99, 17/06/2021, 10:53
- 100, 17/06/2021, 11:22
- 101, 17/06/2021, 11:49
- 102, 17/06/2021, 12:48
- 103, 17/06/2021, 15:06
- 104, 17/06/2021, 15:19
- 105, 17/06/2021, 16:27
- 106, 18/06/2021, 09:54
- 107, 18/06/2021, 11:07
- 108, 18/06/2021, 13:56
- 109, 18/06/2021, 14:37
- 110, 18/06/2021, 15:15
- 111, 23/06/2021, 10:37
- 112, 23/06/2021, 14:32
- 113, 23/06/2021, 14:44
- 114, 23/06/2021, 16:31
- 115, 23/06/2021, 19:11
- 116, 23/06/2021, 20:14
- 117, 24/06/2021, 10:49
- 118, 24/06/2021, 12:04
- 119, 24/06/2021, 12:12
- 120, 24/06/2021, 15:33

TITLE:	Summer Flightlines 2021 Buzzard 4		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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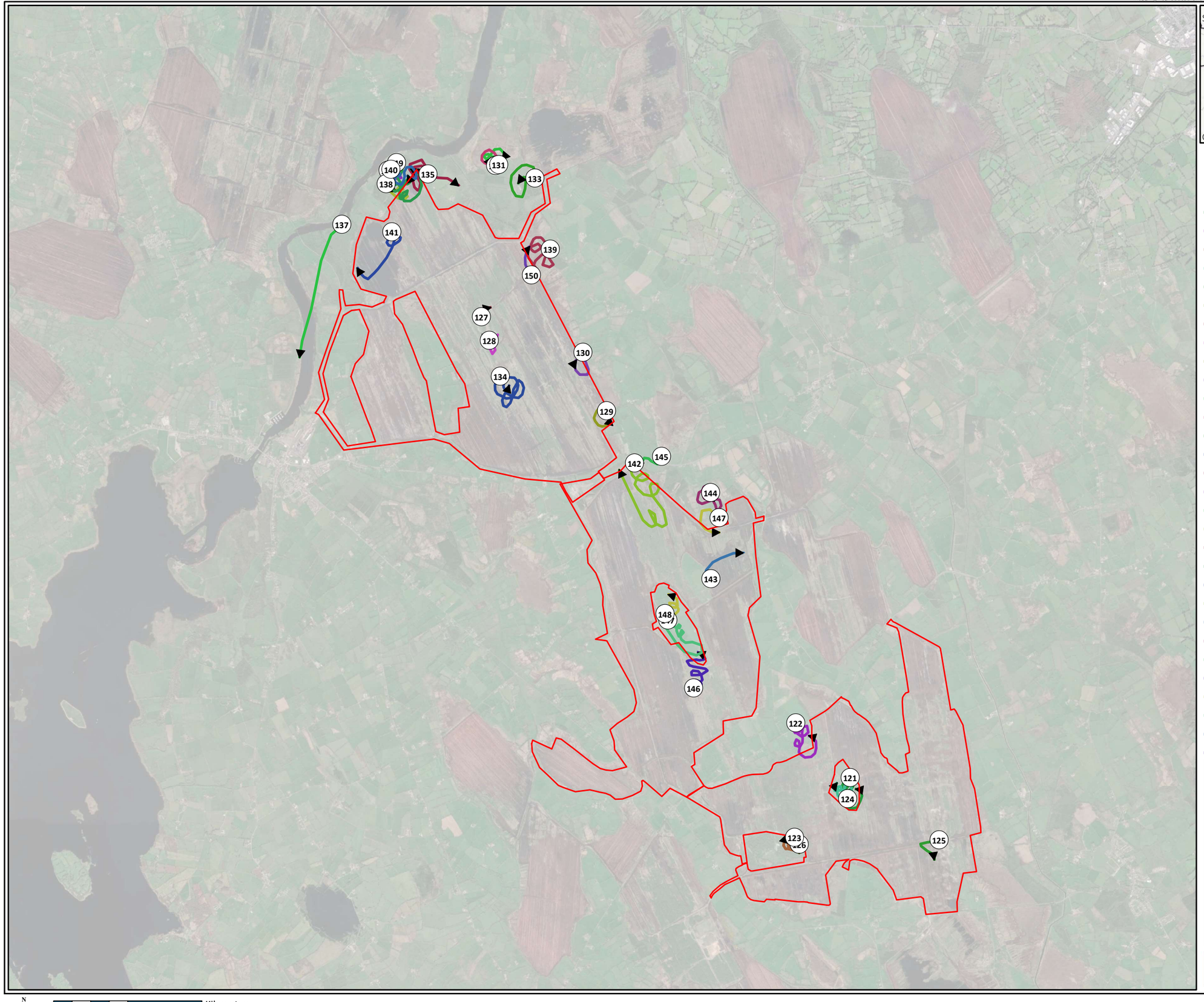
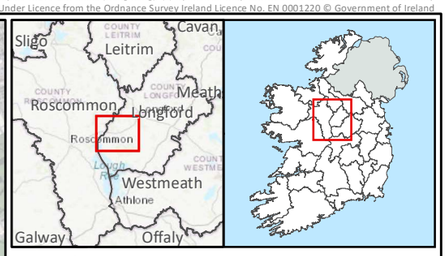
Path: R:\Map Production\2021\P21-119\workspace\Flightlines\P20-113_GIS_Flightlines_DerryaddWindFarm_A3.mxd





Legend

Site Boundary

Individual, Date, Time

- 121, 25/06/2021, 11:33
- 122, 25/06/2021, 12:14
- 123, 25/06/2021, 13:06
- 124, 25/06/2021, 15:20
- 125, 25/06/2021, 15:35
- 126, 25/06/2021, 17:32
- 127, 05/07/2021, 11:37
- 128, 05/07/2021, 16:34
- 129, 05/07/2021, 17:52
- 130, 06/07/2021, 09:19
- 131, 06/07/2021, 11:30
- 132, 06/07/2021, 13:30
- 133, 06/07/2021, 15:50
- 134, 06/07/2021, 17:39
- 135, 07/07/2021, 12:55
- 136, 07/07/2021, 15:01
- 137, 07/07/2021, 16:38
- 138, 07/07/2021, 16:47
- 139, 07/07/2021, 18:50
- 140, 07/07/2021, 19:53
- 141, 07/07/2021, 20:49
- 142, 08/07/2021, 11:50
- 143, 08/07/2021, 12:45
- 144, 08/07/2021, 16:05
- 145, 08/07/2021, 16:51
- 146, 08/07/2021, 19:23
- 147, 08/07/2021, 21:09
- 148, 09/07/2021, 11:37
- 149, 09/07/2021, 15:00
- 150, 09/07/2021, 16:08

TITLE:	Summer Flightlines 2021 Buzzard 5		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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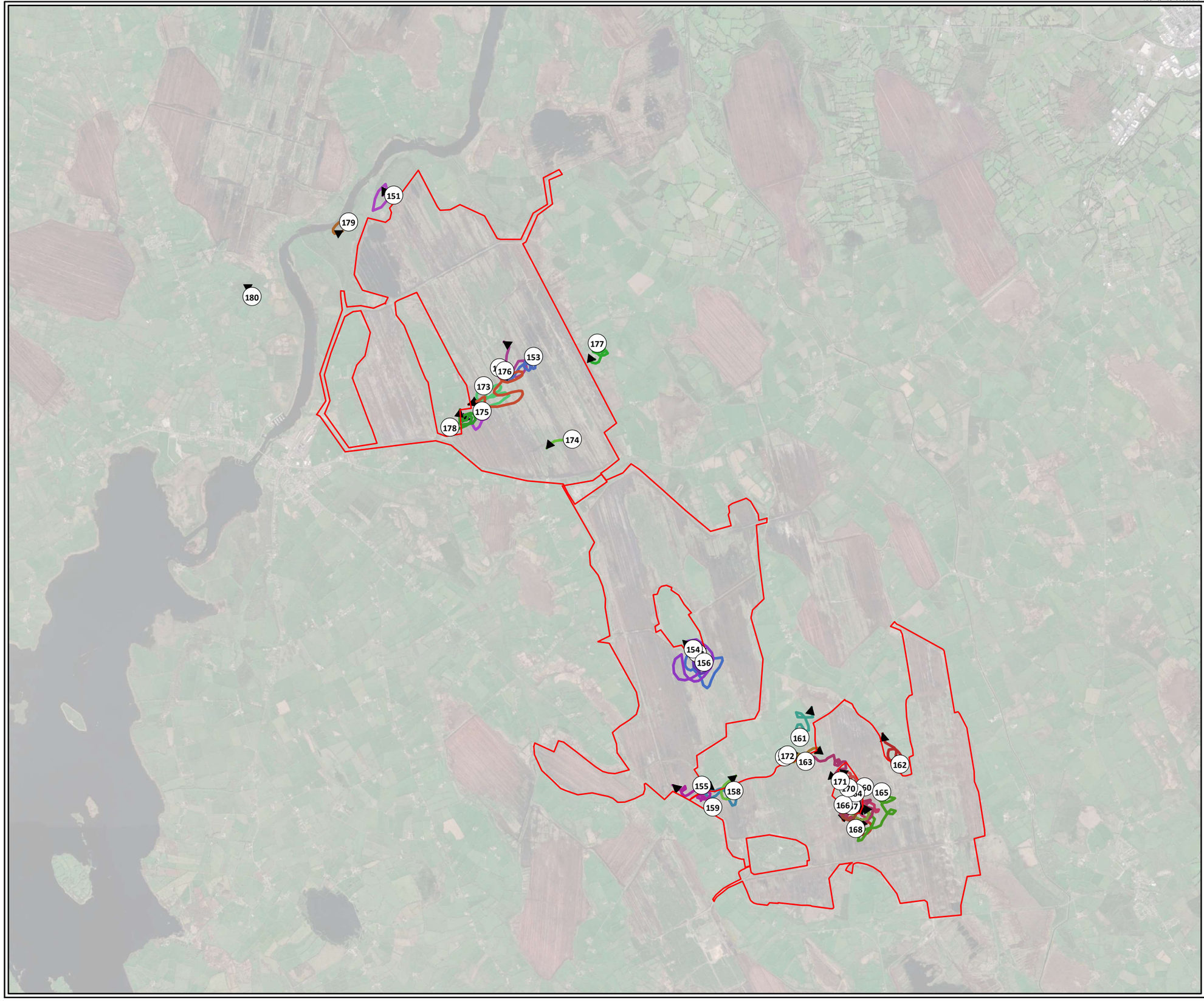

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Site Boundary

Individual, Date, Time

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- 152, 09/07/2021, 18:47
- 153, 09/07/2021, 21:14
- 154, 13/07/2021, 08:03
- 155, 13/07/2021, 08:35
- 156, 13/07/2021, 09:02
- 157, 13/07/2021, 15:31
- 158, 13/07/2021, 15:40
- 159, 13/07/2021, 16:43
- 160, 14/07/2021, 08:12
- 161, 14/07/2021, 10:15
- 162, 15/07/2021, 08:27
- 163, 15/07/2021, 08:55
- 164, 15/07/2021, 09:23
- 165, 15/07/2021, 12:47
- 166, 15/07/2021, 14:52
- 167, 15/07/2021, 16:47
- 168, 15/07/2021, 17:52
- 169, 16/07/2021, 09:06
- 170, 16/07/2021, 10:54
- 171, 16/07/2021, 13:28
- 172, 16/07/2021, 13:46
- 173, 27/07/2021, 09:45
- 174, 27/07/2021, 10:33
- 175, 27/07/2021, 11:59
- 176, 27/07/2021, 16:06
- 177, 27/07/2021, 17:42
- 178, 27/07/2021, 18:33
- 179, 28/07/2021, 11:55
- 180, 28/07/2021, 12:10

TITLE:	Summer Flightlines 2021 Buzzard 6		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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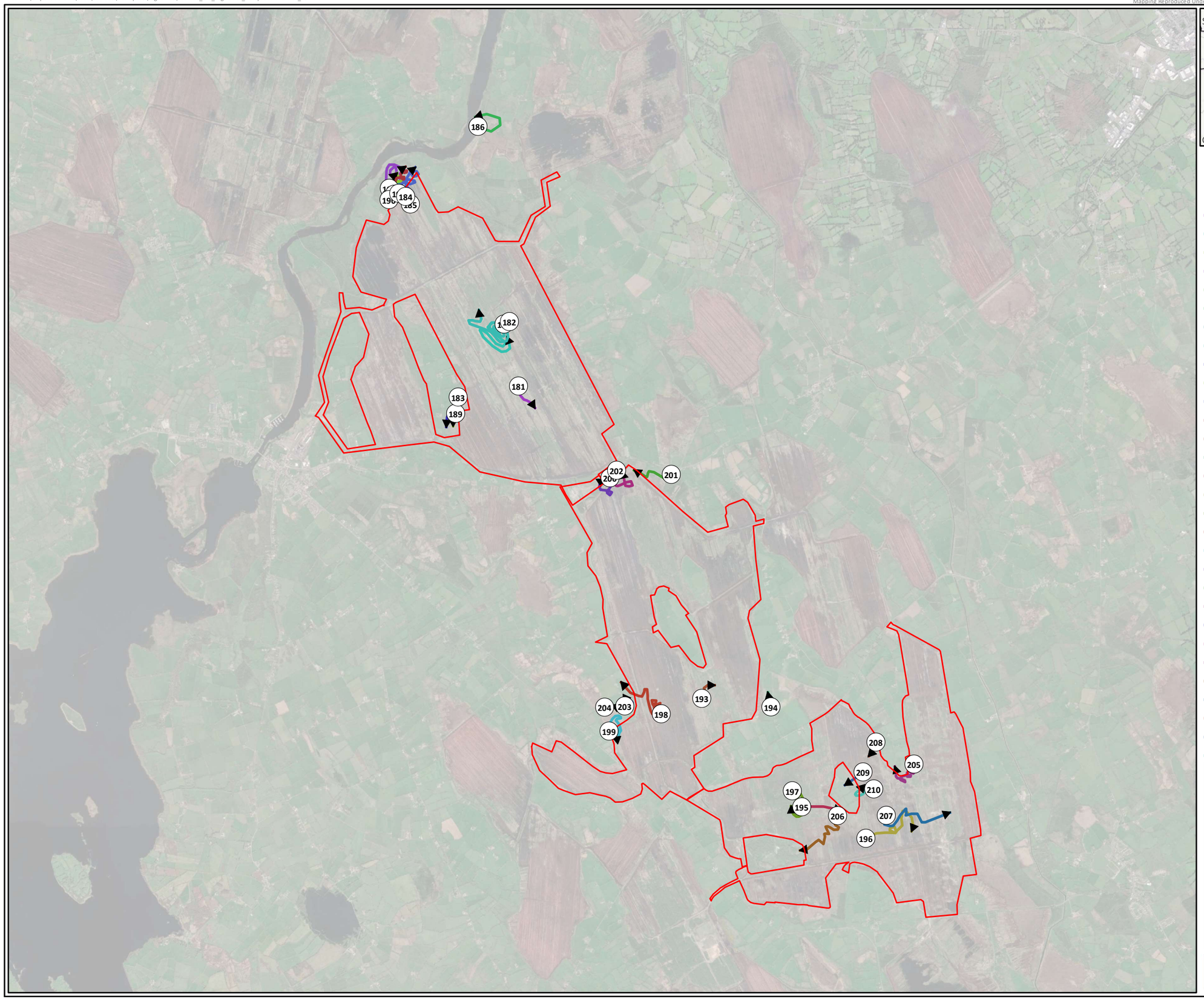

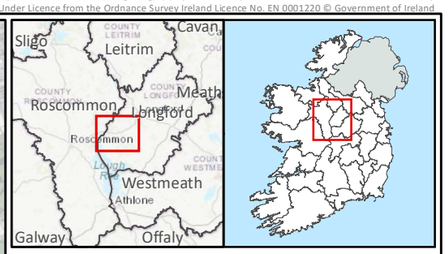

Legend

Site Boundary

Individual, Date, Time

- 181, 28/07/2021, 17:38
- 182, 28/07/2021, 18:40
- 183, 28/07/2021, 19:29
- 184, 29/07/2021, 11:04
- 185, 29/07/2021, 13:01
- 186, 29/07/2021, 14:28
- 187, 29/07/2021, 16:43
- 188, 29/07/2021, 19:14
- 189, 29/07/2021, 19:50
- 190, 30/07/2021, 12:52
- 191, 30/07/2021, 13:41
- 192, 30/07/2021, 15:58
- 193, 02/08/2021, 12:28
- 194, 03/08/2021, 10:59
- 195, 03/08/2021, 12:30
- 196, 03/08/2021, 15:47
- 197, 03/08/2021, 16:23
- 198, 03/08/2021, 17:54
- 199, 03/08/2021, 19:16
- 200, 04/08/2021, 11:15
- 201, 04/08/2021, 12:30
- 202, 04/08/2021, 14:37
- 203, 04/08/2021, 18:42
- 204, 04/08/2021, 19:39
- 205, 11/08/2021, 10:38
- 206, 11/08/2021, 11:22
- 207, 11/08/2021, 11:44
- 208, 11/08/2021, 13:56
- 209, 11/08/2021, 14:45
- 210, 11/08/2021, 17:51

TITLE:	Summer Flightlines 2021 Buzzard 7		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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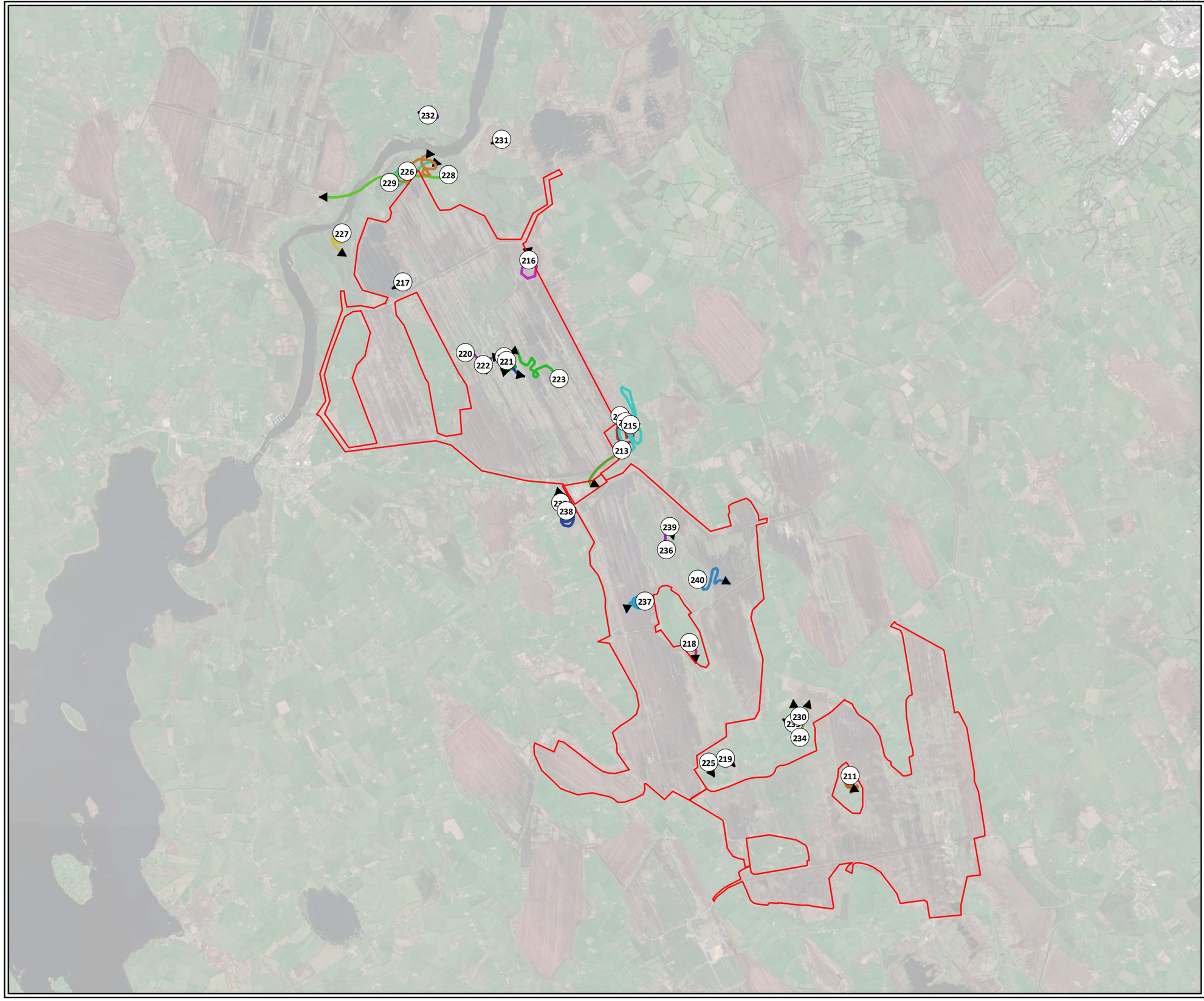

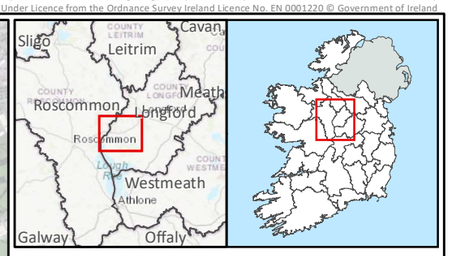

Legend

Site Boundary

Individual, Date, Time

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- 212, 12/08/2021, 10:40
- 213, 12/08/2021, 11:56
- 214, 12/08/2021, 14:30
- 215, 12/08/2021, 15:59
- 216, 13/08/2021, 10:53
- 217, 13/08/2021, 15:05
- 218, 13/08/2021, 19:55
- 219, 14/08/2021, 12:22
- 220, 16/08/2021, 09:09
- 221, 16/08/2021, 10:34
- 222, 16/08/2021, 11:39
- 223, 16/08/2021, 13:02
- 224, 16/08/2021, 14:21
- 225, 16/08/2021, 19:00
- 226, 17/08/2021, 09:57
- 227, 17/08/2021, 10:34
- 228, 17/08/2021, 12:32
- 229, 17/08/2021, 13:38
- 230, 17/08/2021, 17:47
- 231, 18/08/2021, 11:21
- 232, 18/08/2021, 14:45
- 233, 18/08/2021, 16:35
- 234, 18/08/2021, 18:39
- 235, 19/08/2021, 09:34
- 236, 19/08/2021, 11:06
- 237, 19/08/2021, 11:35
- 238, 19/08/2021, 13:12
- 239, 19/08/2021, 14:19
- 240, 19/08/2021, 15:38

TITLE:	Summer Flightlines 2021 Buzzard 8		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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N W E S

Kilometers
0 0.5 1 2

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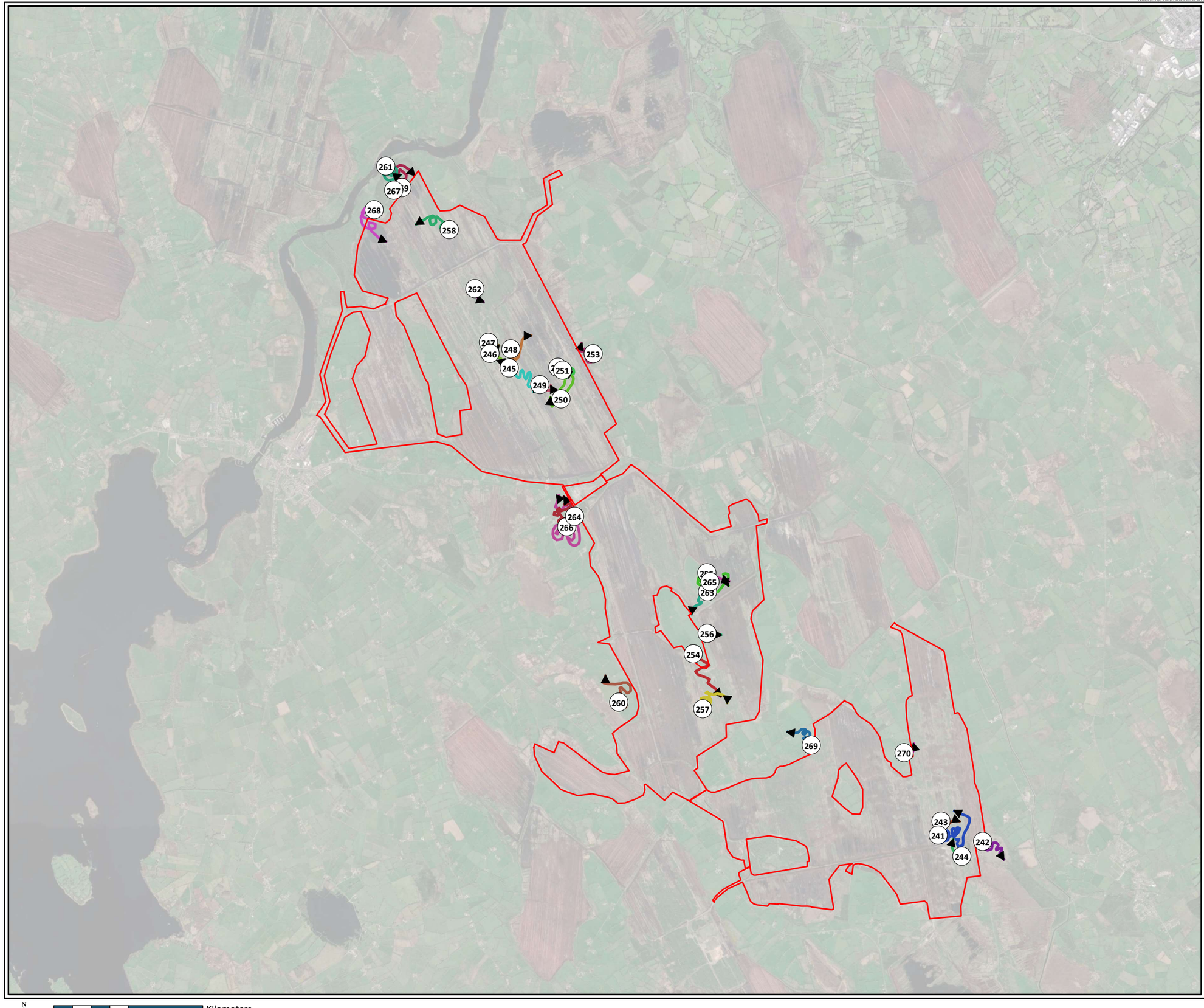

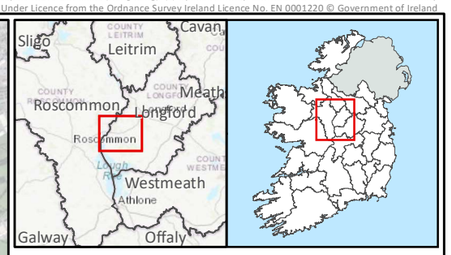

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Site Boundary

Individual, Date, Time

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- 242, 19/08/2021, 17:46
- 243, 19/08/2021, 19:31
- 244, 20/08/2021, 09:51
- 245, 02/09/2021, 09:12
- 246, 02/09/2021, 10:10
- 247, 02/09/2021, 13:26
- 248, 02/09/2021, 15:05
- 249, 02/09/2021, 16:43
- 250, 02/09/2021, 18:05
- 251, 03/09/2021, 10:17
- 252, 03/09/2021, 10:47
- 253, 03/09/2021, 11:22
- 254, 03/09/2021, 13:22
- 255, 03/09/2021, 14:47
- 256, 03/09/2021, 17:14
- 257, 03/09/2021, 18:22
- 258, 06/09/2021, 10:10
- 259, 06/09/2021, 12:15
- 260, 07/09/2021, 11:03
- 261, 07/09/2021, 14:05
- 262, 07/09/2021, 16:12
- 263, 09/09/2021, 09:03
- 264, 09/09/2021, 10:51
- 265, 12/09/2021, 09:08
- 266, 12/09/2021, 10:33
- 267, 12/09/2021, 14:12
- 268, 12/09/2021, 16:30
- 269, 13/09/2021, 09:11
- 270, 13/09/2021, 09:55

TITLE:	Summer Flightlines 2021 Buzzard 9		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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N W E S

0 0.5 1 2 Kilometers

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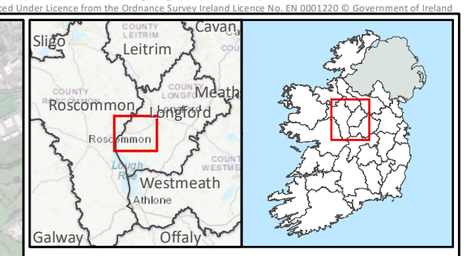

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Site Boundary

Individual, Date, Time

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- 272, 13/09/2021, 14:07
- 273, 13/09/2021, 17:21
- 274, 13/09/2021, 18:03
- 275, 14/09/2021, 09:48
- 276, 14/09/2021, 10:59
- 277, 14/09/2021, 14:22
- 278, 14/09/2021, 17:25

N W E S

0 0.5 1 2 Kilometers

TITLE:	Summer Flightlines 2021 Buzzard 10		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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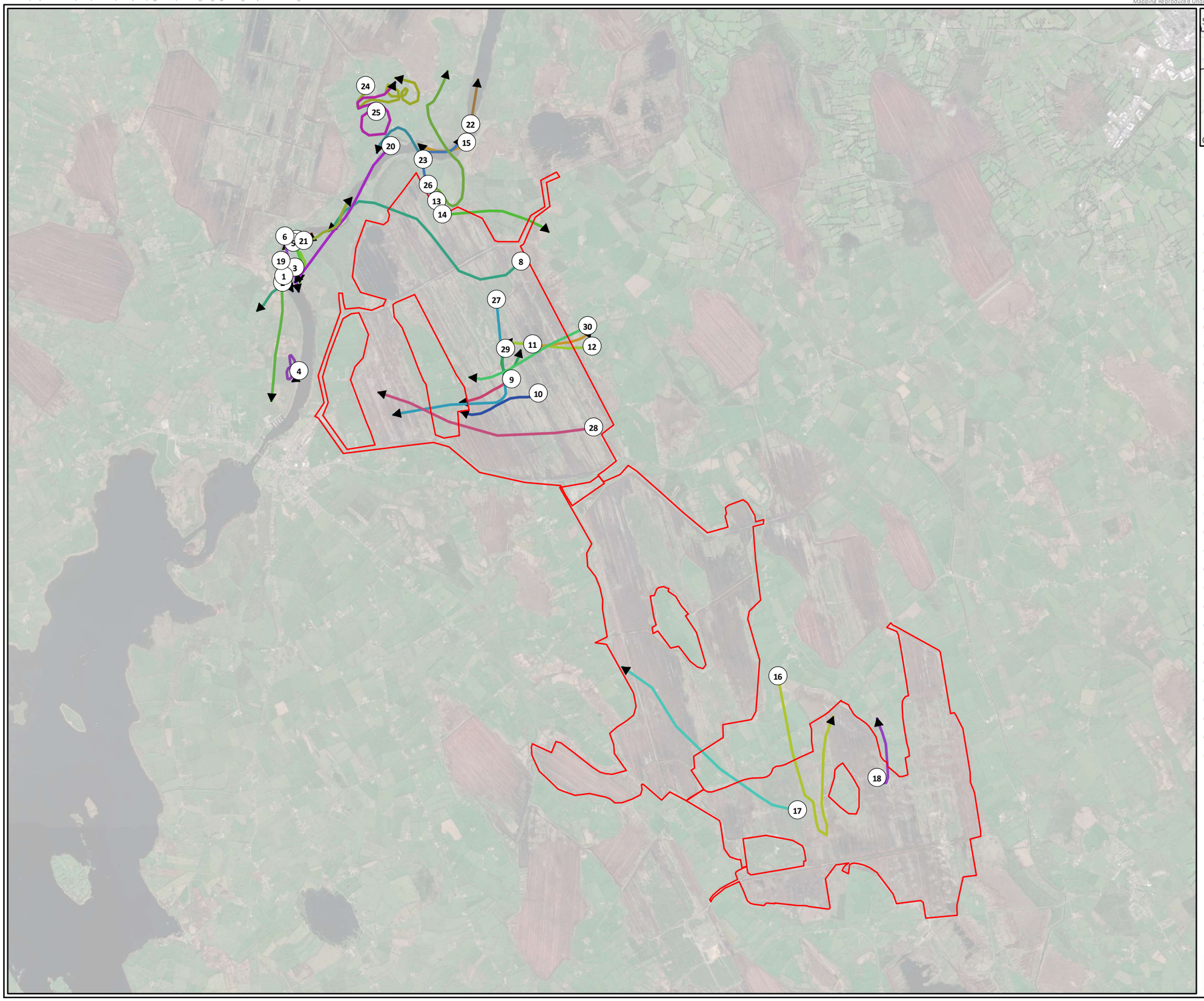

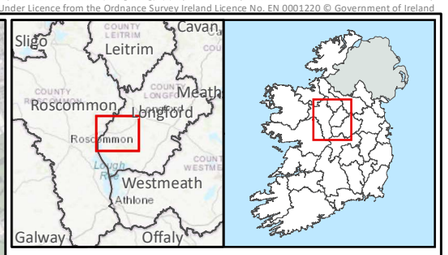

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Site Boundary

Individual, Date, Time

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3, 29/04/2021, 11:14
4, 29/04/2021, 13:39
5, 29/04/2021, 14:00
6, 29/04/2021, 14:49
7, 29/04/2021, 15:13
8, 05/05/2021, 14:22
9, 05/05/2021, 17:06
10, 05/05/2021, 17:55
11, 05/05/2021, 18:54
12, 06/05/2021, 08:57
13, 06/05/2021, 13:10
14, 06/05/2021, 14:03
15, 06/05/2021, 16:05
16, 11/05/2021, 18:39
17, 19/05/2021, 12:00
18, 28/05/2021, 13:23
19, 31/05/2021, 10:43
20, 31/05/2021, 10:59
21, 31/05/2021, 17:38
22, 01/06/2021, 09:27
23, 01/06/2021, 11:38
24, 01/06/2021, 11:39
25, 01/06/2021, 13:23
26, 01/06/2021, 14:31
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28, 02/06/2021, 14:42
29, 10/06/2021, 14:39
30, 16/06/2021, 16:24

TITLE:	Summer Flightlines 2021 Cormorant 1		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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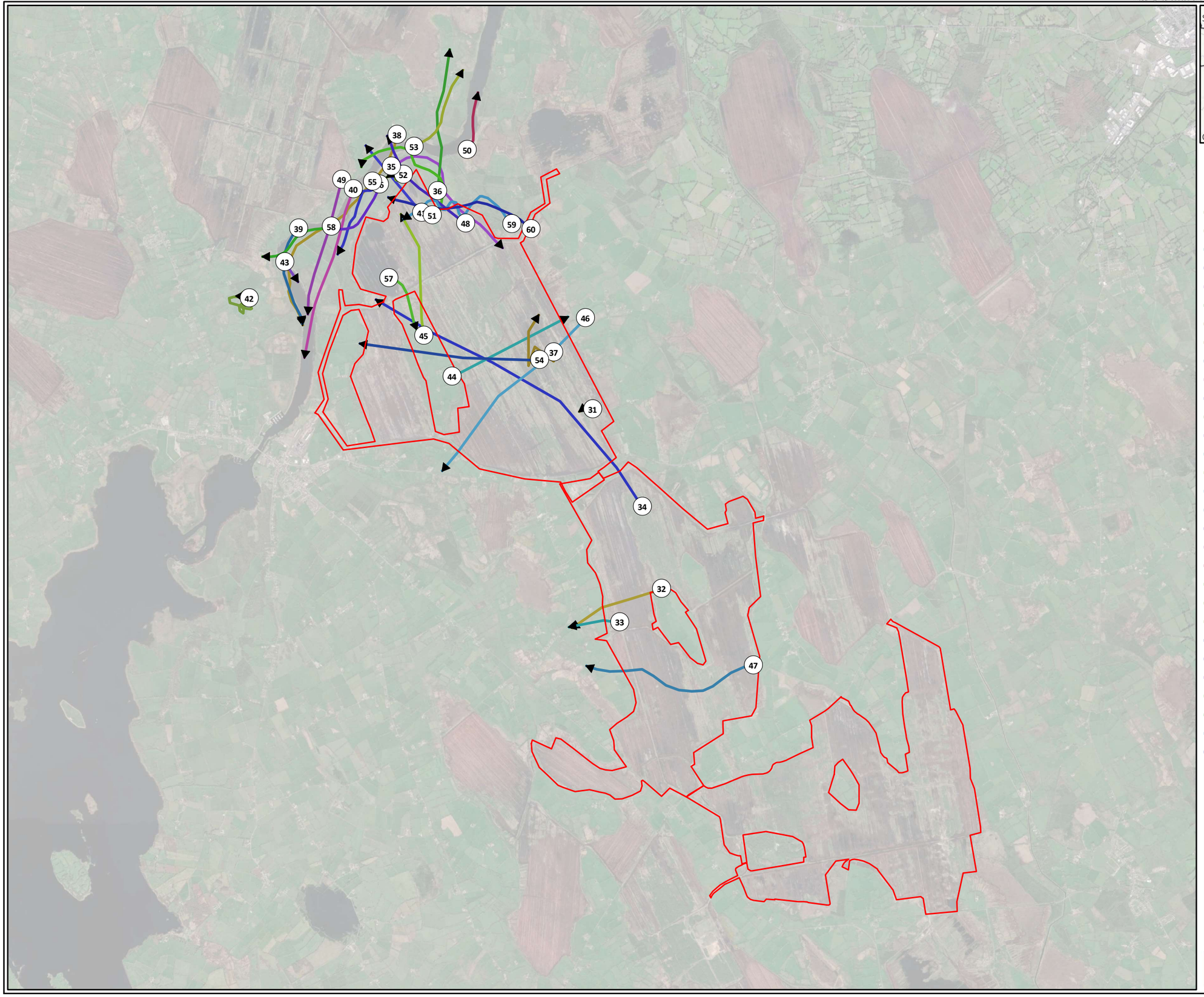

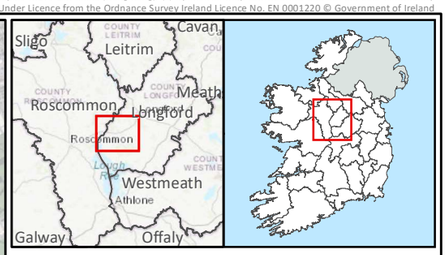

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Site Boundary

Individual, Date, Time

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- 32, 17/06/2021, 13:40
- 33, 17/06/2021, 17:28
- 34, 05/07/2021, 18:27
- 35, 06/07/2021, 10:11
- 36, 06/07/2021, 14:55
- 37, 06/07/2021, 17:58
- 38, 07/07/2021, 11:40
- 39, 07/07/2021, 13:02
- 40, 07/07/2021, 13:16
- 41, 07/07/2021, 13:59
- 42, 07/07/2021, 15:28
- 43, 07/07/2021, 16:22
- 44, 07/07/2021, 21:08
- 45, 09/07/2021, 15:17
- 46, 09/07/2021, 21:23
- 47, 13/07/2021, 10:10
- 48, 28/07/2021, 09:43
- 49, 28/07/2021, 13:30
- 50, 29/07/2021, 10:15
- 51, 29/07/2021, 10:29
- 52, 29/07/2021, 14:11
- 53, 29/07/2021, 16:14
- 54, 29/07/2021, 20:32
- 55, 30/07/2021, 13:08
- 56, 30/07/2021, 13:13
- 57, 13/08/2021, 12:50
- 58, 17/08/2021, 15:00
- 59, 18/08/2021, 10:17
- 60, 18/08/2021, 14:22

TITLE:	Summer Flightlines 2021 Cormorant 2		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
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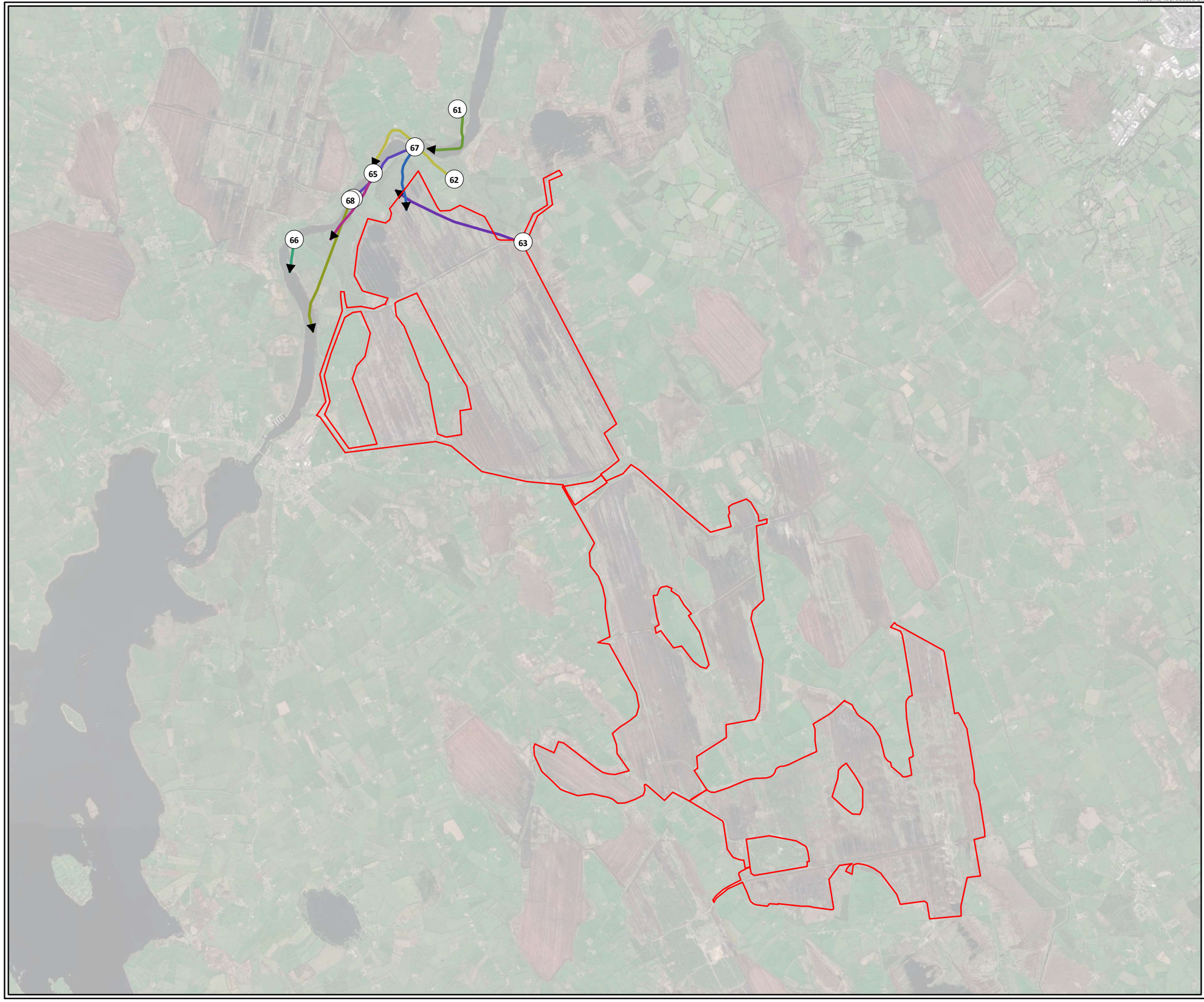

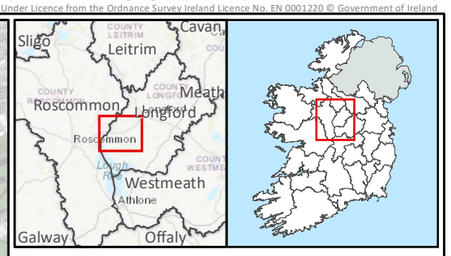

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Site Boundary

Individual, Date, Time

- 61, 18/08/2021, 15:20
- 62, 06/09/2021, 09:45
- 63, 06/09/2021, 13:06
- 64, 07/09/2021, 15:00
- 65, 07/09/2021, 18:09
- 66, 12/09/2021, 12:27
- 67, 12/09/2021, 15:43
- 68, 12/09/2021, 17:10

N W E S

0 0.5 1 2 Kilometers

TITLE:	Summer Flightlines 2021 Cormorant 3		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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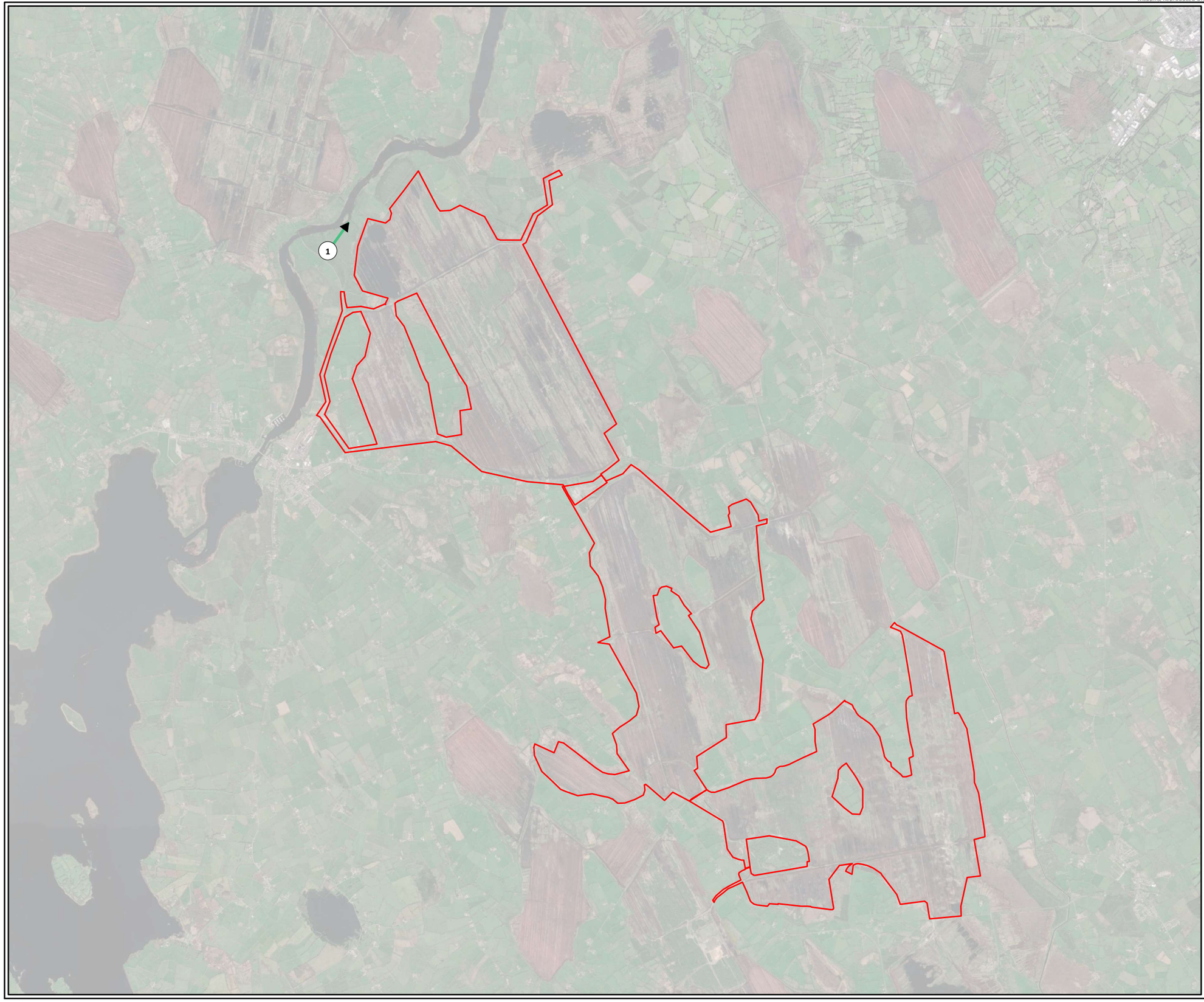

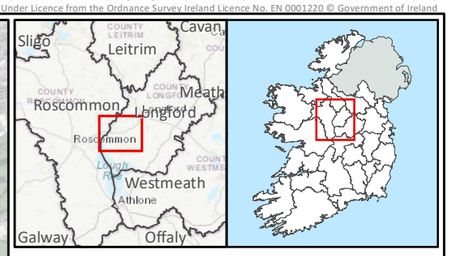

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Site Boundary

Individual, Date, Time

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TITLE:	Summer Flightlines 2021 Common Guill		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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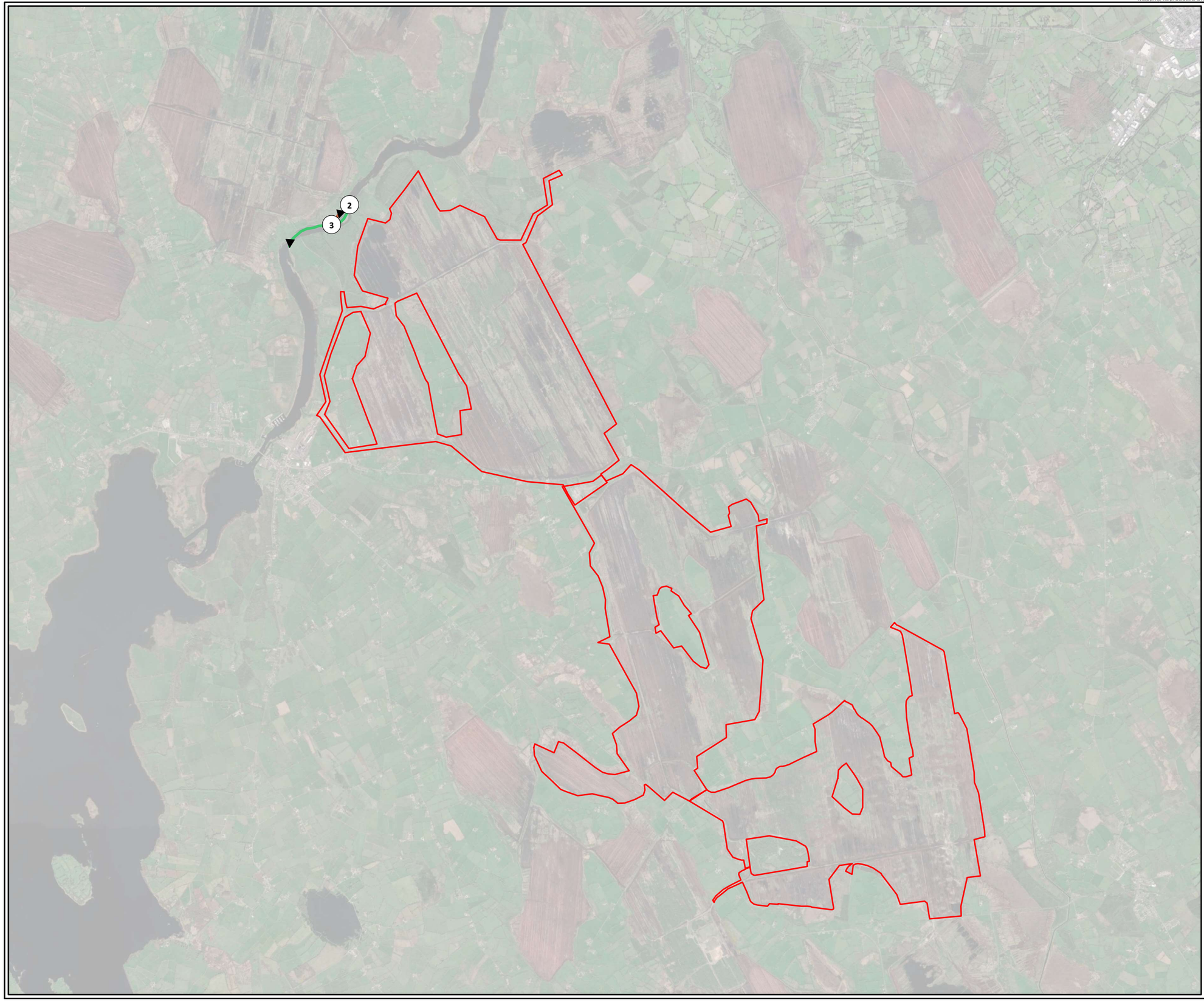

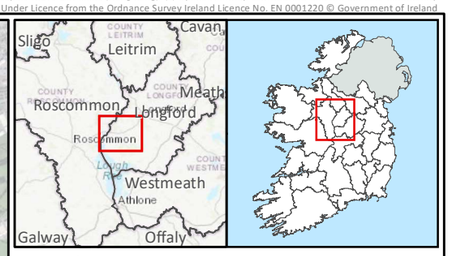

Legend

Site Boundary

Individual, Date, Time

2, 06/07/2021, 16:00

3, 07/07/2021, 17:43

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0 0.5 1 2 Kilometers

TITLE:	Summer Flightlines 2021 Common Tern		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
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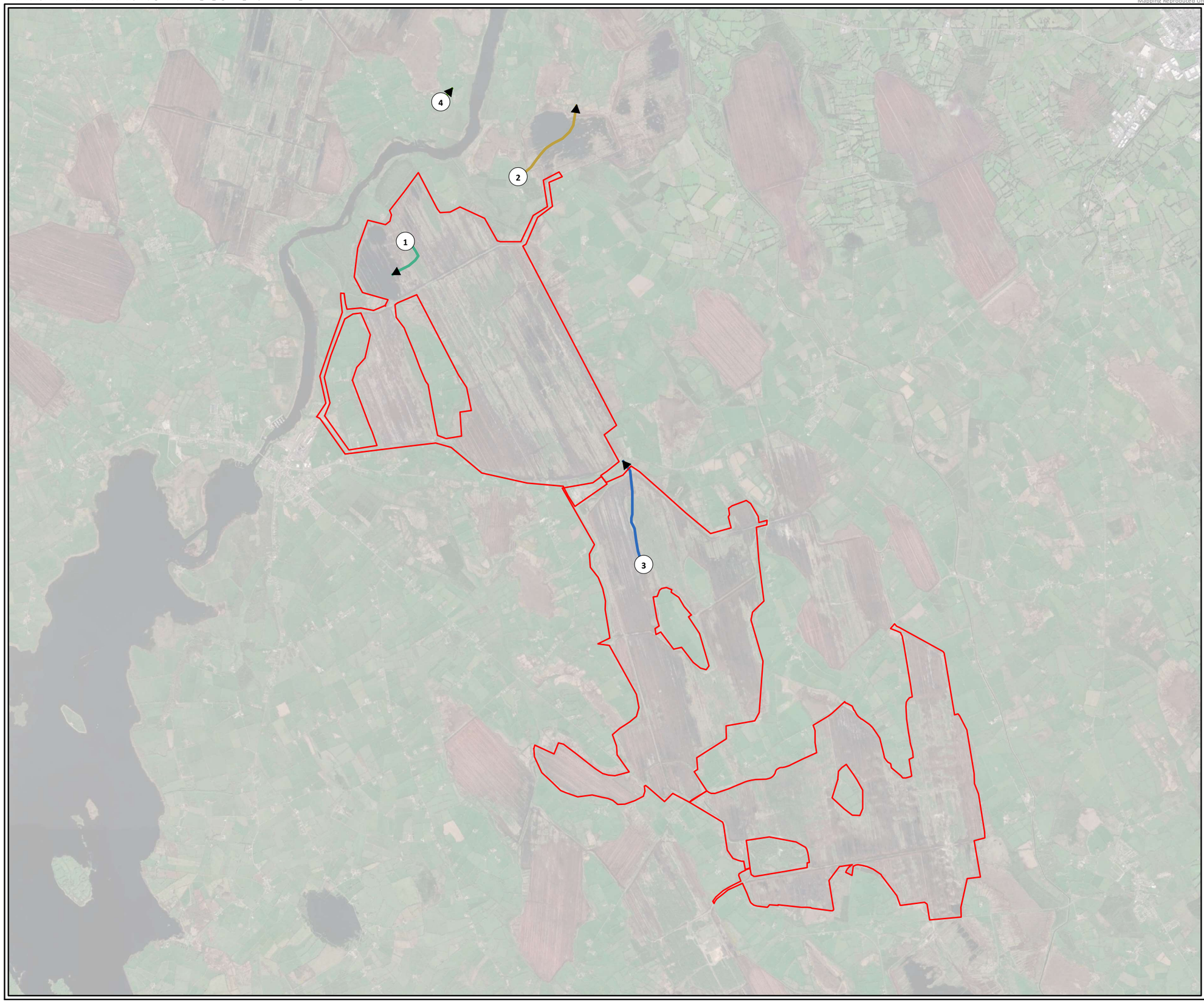

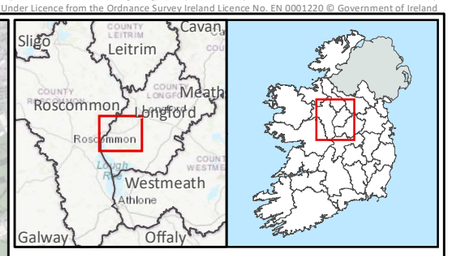

Legend

Site Boundary

Individual, Date, Time

- 1, 13/08/2021, 14:42
- 2, 18/08/2021, 09:33
- 3, 19/08/2021, 11:22
- 4, 06/09/2021, 13:30

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W E
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0 0.5 1 2 Kilometers

TITLE:	Summer Flightlines 2021 Curlew		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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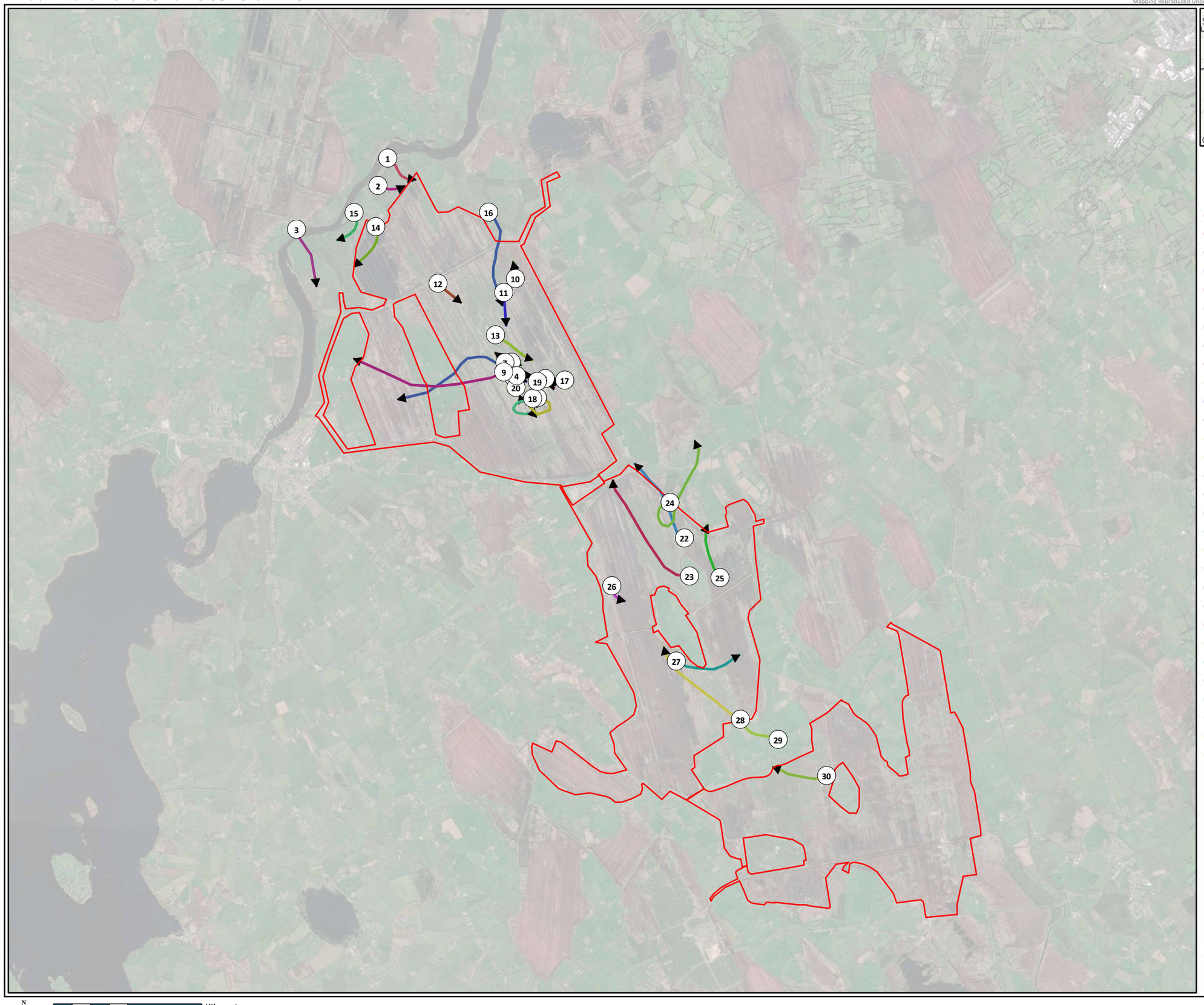

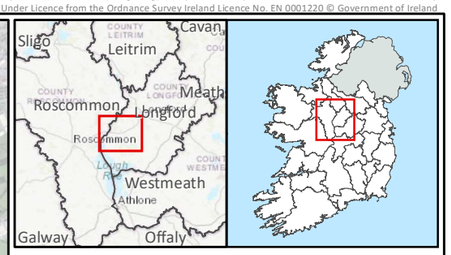

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Site Boundary

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- 2, 29/04/2021, 11:45
- 3, 29/04/2021, 15:58
- 4, 04/05/2021, 07:31
- 5, 04/05/2021, 08:08
- 6, 04/05/2021, 15:49
- 7, 04/05/2021, 16:07
- 8, 04/05/2021, 17:23
- 9, 04/05/2021, 17:59
- 10, 05/05/2021, 08:34
- 11, 05/05/2021, 08:55
- 12, 05/05/2021, 09:22
- 13, 05/05/2021, 09:59
- 14, 05/05/2021, 12:59
- 15, 05/05/2021, 14:01
- 16, 05/05/2021, 15:17
- 17, 05/05/2021, 16:49
- 18, 05/05/2021, 17:46
- 19, 05/05/2021, 18:25
- 20, 06/05/2021, 09:05
- 21, 06/05/2021, 10:38
- 22, 07/05/2021, 10:34
- 23, 07/05/2021, 10:56
- 24, 07/05/2021, 14:22
- 25, 07/05/2021, 15:28
- 26, 11/05/2021, 16:08
- 27, 11/05/2021, 19:41
- 28, 19/05/2021, 12:47
- 29, 19/05/2021, 13:09
- 30, 21/05/2021, 10:44

TITLE:	Summer Flightlines 2021 Little Egret 1		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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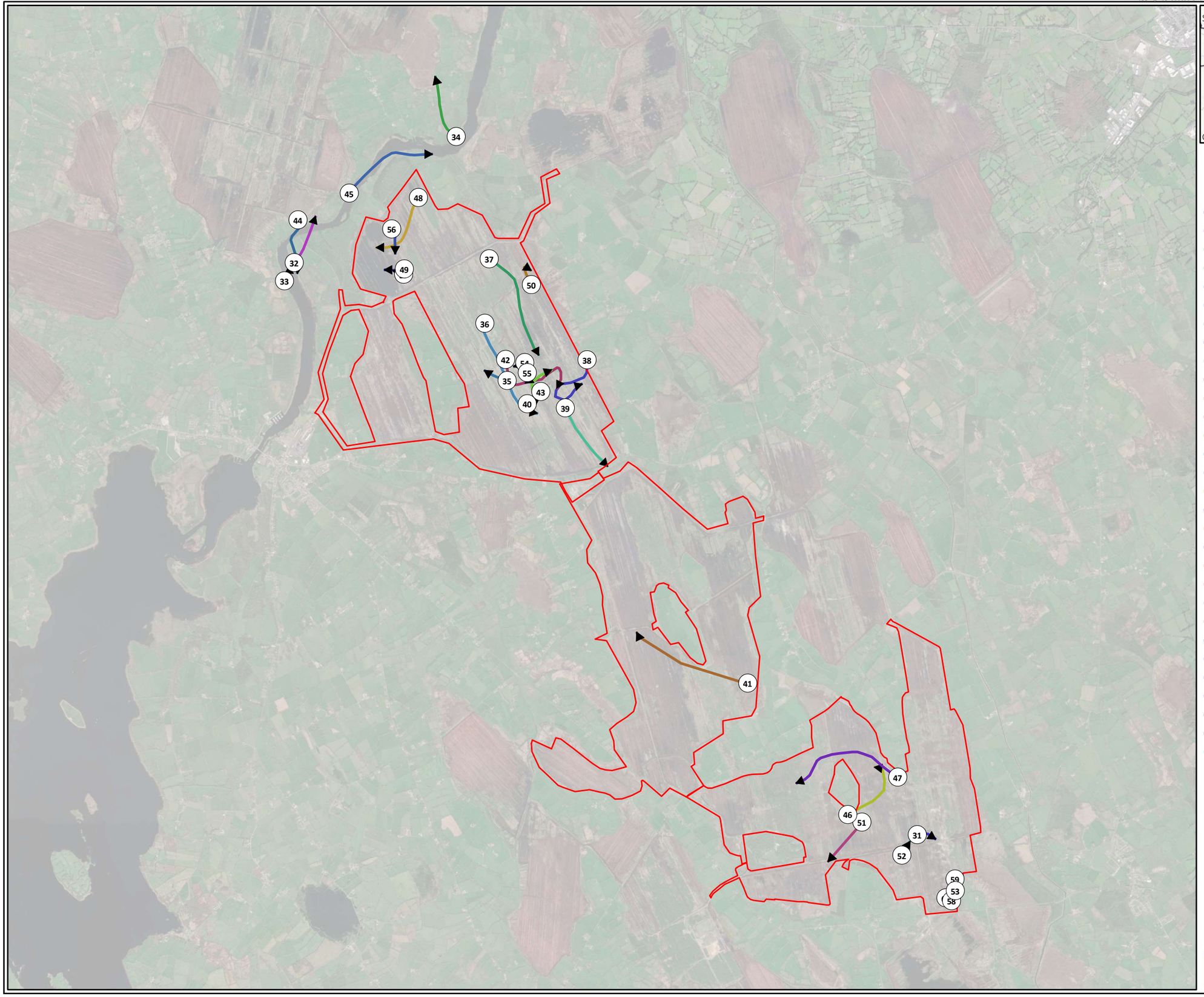

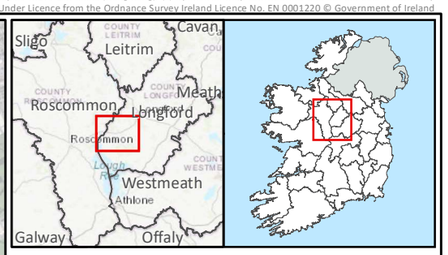

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Site Boundary

Individual, Date, Time

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- 32, 31/05/2021, 09:16
- 33, 31/05/2021, 11:18
- 34, 01/06/2021, 12:10
- 35, 01/06/2021, 19:25
- 36, 02/06/2021, 15:35
- 37, 10/06/2021, 19:51
- 38, 16/06/2021, 14:15
- 39, 16/06/2021, 15:14
- 40, 16/06/2021, 20:00
- 41, 23/06/2021, 11:45
- 42, 27/07/2021, 11:12
- 43, 27/07/2021, 17:11
- 44, 28/07/2021, 11:09
- 45, 28/07/2021, 15:19
- 46, 03/08/2021, 11:27
- 47, 03/08/2021, 15:35
- 48, 13/08/2021, 11:58
- 49, 13/08/2021, 12:45
- 50, 13/08/2021, 16:54
- 51, 19/08/2021, 18:52
- 52, 20/08/2021, 09:44
- 53, 20/08/2021, 10:49
- 54, 02/09/2021, 17:30
- 55, 03/09/2021, 09:46
- 56, 07/09/2021, 13:06
- 57, 07/09/2021, 18:41
- 58, 13/09/2021, 16:40
- 59, 13/09/2021, 18:44
- 60, 14/09/2021, 09:20

TITLE:	Summer Flightlines 2021 Little Egret 2		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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N W E S

Kilometers
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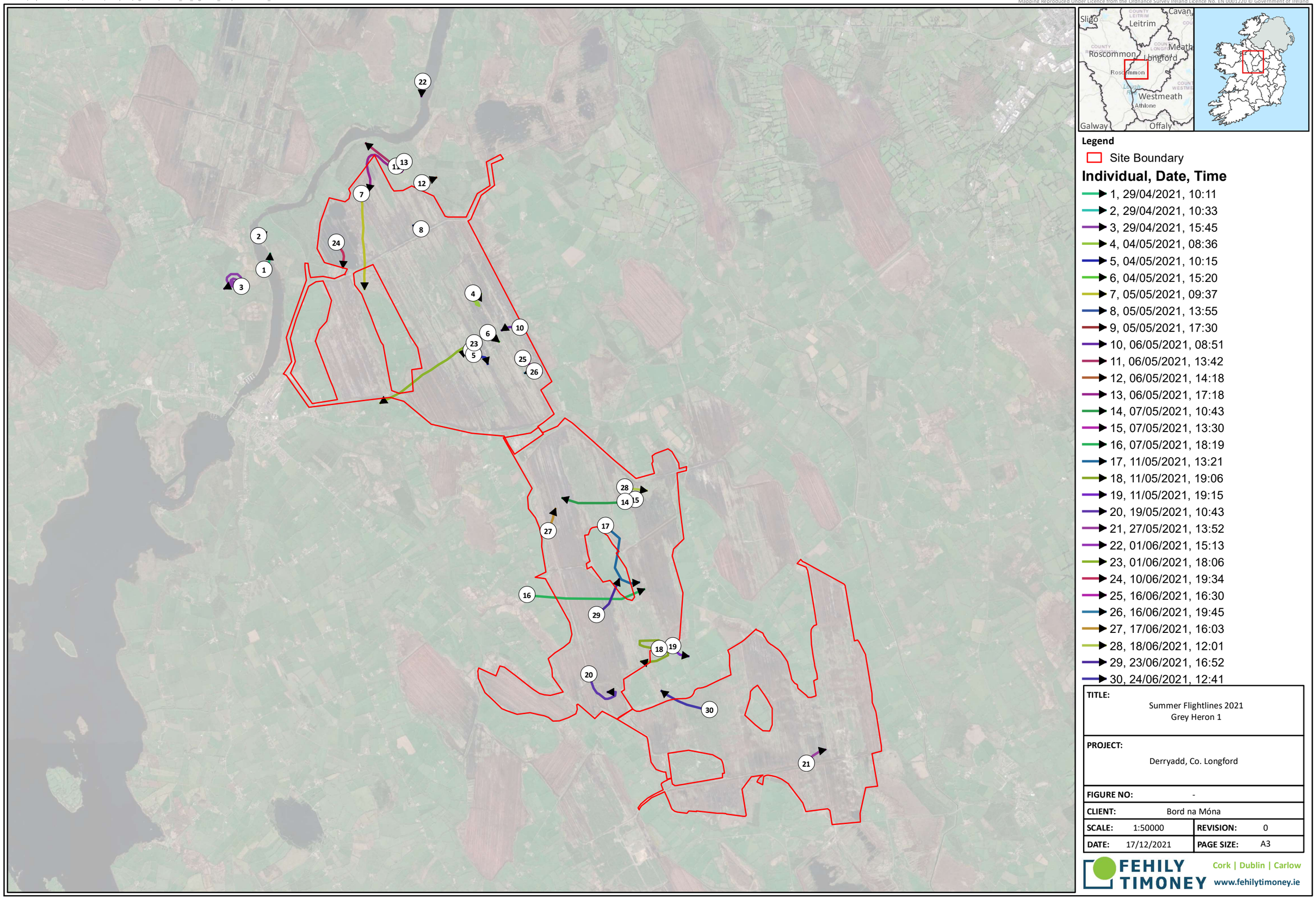
Path: R:\Map Production\2021\P21-119\workspace\Flightlines\P20-113_GIS_Flightlines_DerryaddWindFarm_A3.mxd



Legend

Site Boundary

Individual, Date, Time

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- 2, 29/04/2021, 10:33
- 3, 29/04/2021, 15:45
- 4, 04/05/2021, 08:36
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- 6, 04/05/2021, 15:20
- 7, 05/05/2021, 09:37
- 8, 05/05/2021, 13:55
- 9, 05/05/2021, 17:30
- 10, 06/05/2021, 08:51
- 11, 06/05/2021, 13:42
- 12, 06/05/2021, 14:18
- 13, 06/05/2021, 17:18
- 14, 07/05/2021, 10:43
- 15, 07/05/2021, 13:30
- 16, 07/05/2021, 18:19
- 17, 11/05/2021, 13:21
- 18, 11/05/2021, 19:06
- 19, 11/05/2021, 19:15
- 20, 19/05/2021, 10:43
- 21, 27/05/2021, 13:52
- 22, 01/06/2021, 15:13
- 23, 01/06/2021, 18:06
- 24, 10/06/2021, 19:34
- 25, 16/06/2021, 16:30
- 26, 16/06/2021, 19:45
- 27, 17/06/2021, 16:03
- 28, 18/06/2021, 12:01
- 29, 23/06/2021, 16:52
- 30, 24/06/2021, 12:41

TITLE:	Summer Flightlines 2021 Grey Heron 1		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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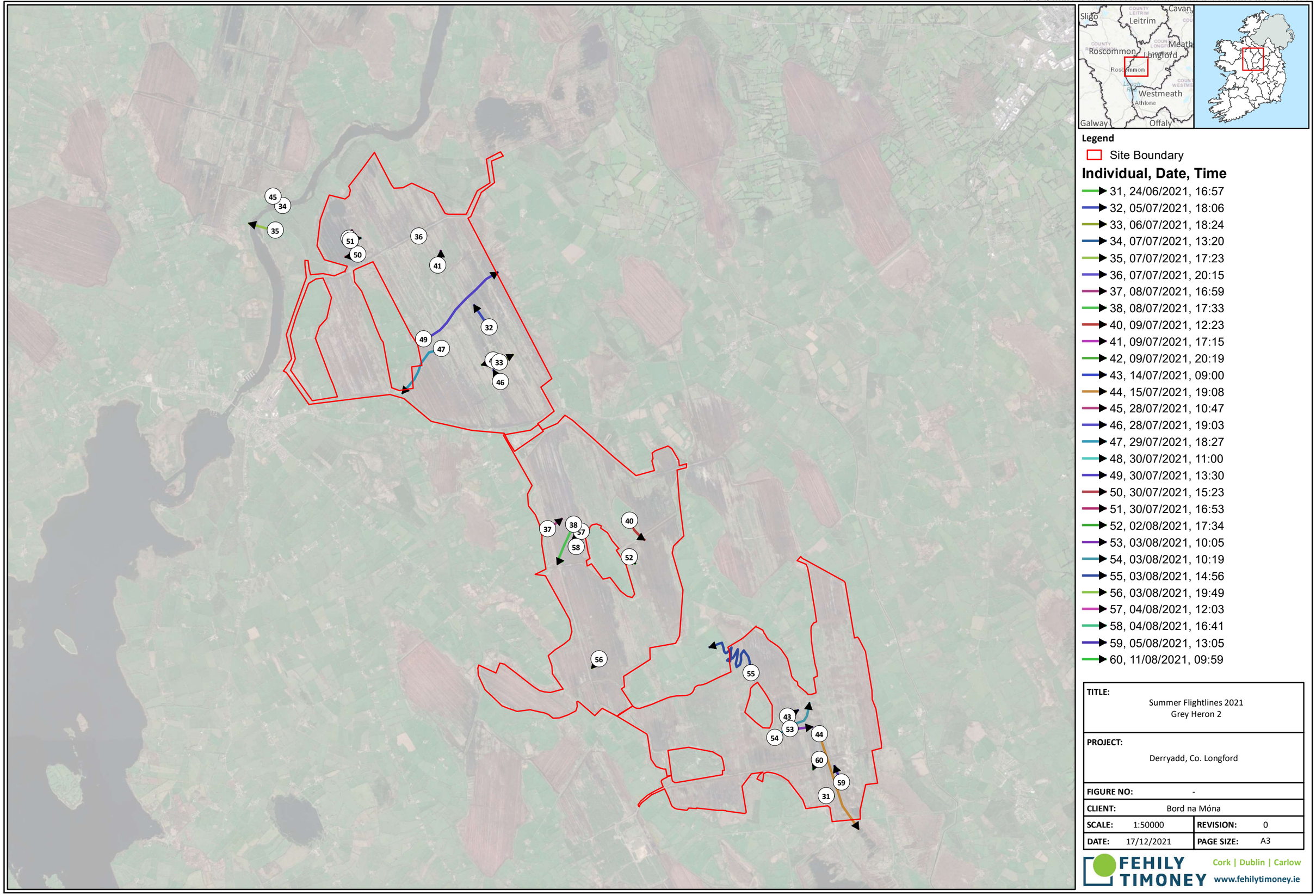

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- 34, 07/07/2021, 13:20
- 35, 07/07/2021, 17:23
- 36, 07/07/2021, 20:15
- 37, 08/07/2021, 16:59
- 38, 08/07/2021, 17:33
- 40, 09/07/2021, 12:23
- 41, 09/07/2021, 17:15
- 42, 09/07/2021, 20:19
- 43, 14/07/2021, 09:00
- 44, 15/07/2021, 19:08
- 45, 28/07/2021, 10:47
- 46, 28/07/2021, 19:03
- 47, 29/07/2021, 18:27
- 48, 30/07/2021, 11:00
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- 53, 03/08/2021, 10:05
- 54, 03/08/2021, 10:19
- 55, 03/08/2021, 14:56
- 56, 03/08/2021, 19:49
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- 59, 05/08/2021, 13:05
- 60, 11/08/2021, 09:59

TITLE:	Summer Flightlines 2021 Grey Heron 2		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
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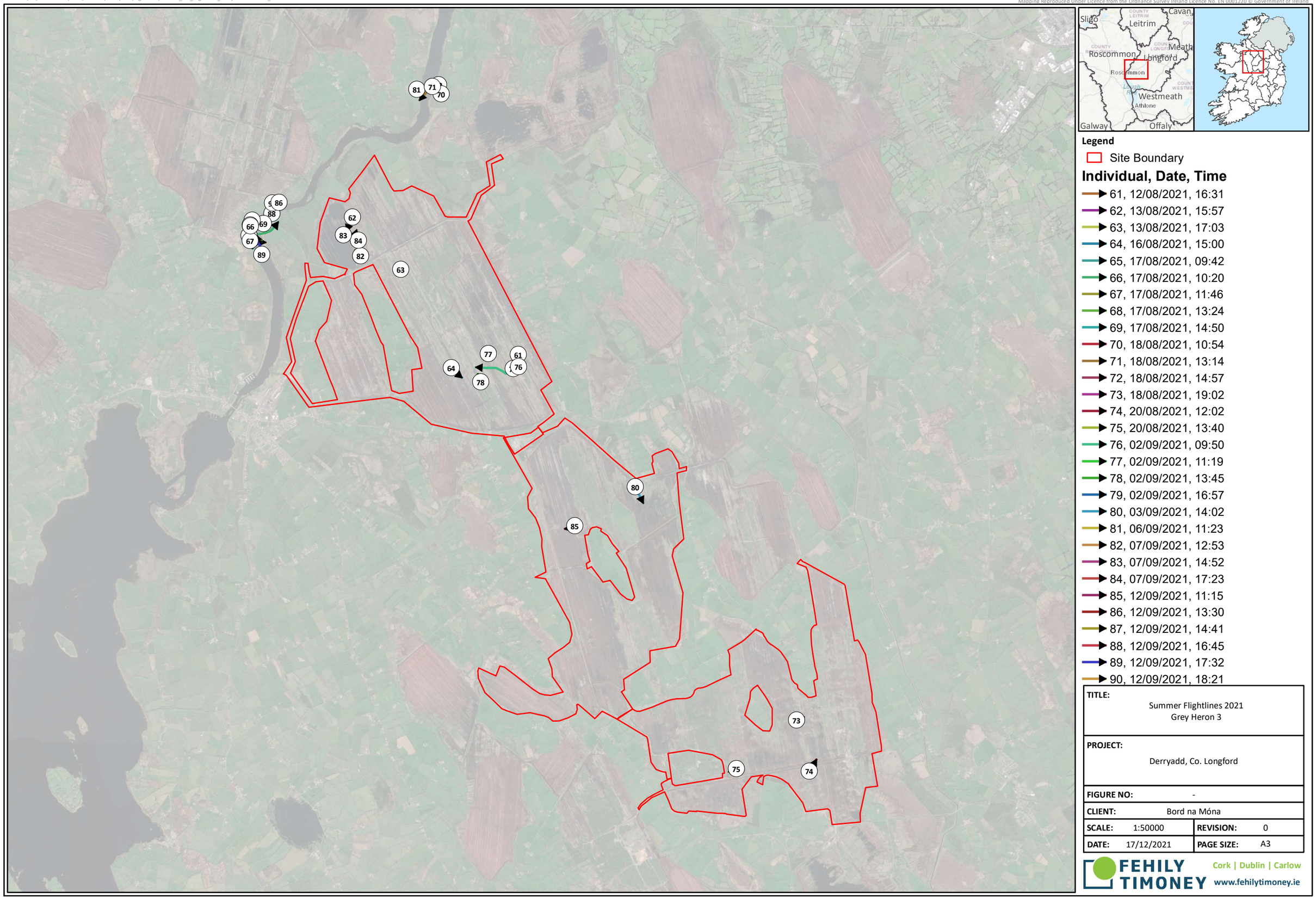

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- 65, 17/08/2021, 09:42
- 66, 17/08/2021, 10:20
- 67, 17/08/2021, 11:46
- 68, 17/08/2021, 13:24
- 69, 17/08/2021, 14:50
- 70, 18/08/2021, 10:54
- 71, 18/08/2021, 13:14
- 72, 18/08/2021, 14:57
- 73, 18/08/2021, 19:02
- 74, 20/08/2021, 12:02
- 75, 20/08/2021, 13:40
- 76, 02/09/2021, 09:50
- 77, 02/09/2021, 11:19
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- 80, 03/09/2021, 14:02
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- 88, 12/09/2021, 16:45
- 89, 12/09/2021, 17:32
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TITLE:	Summer Flightlines 2021 Grey Heron 3		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
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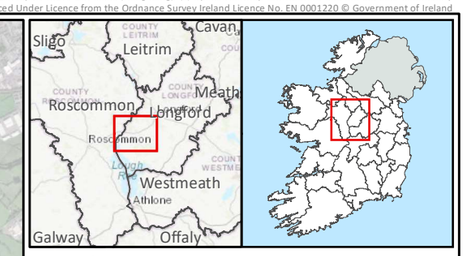

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Site Boundary

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- 92, 13/09/2021, 17:38
- 93, 14/09/2021, 13:11
- 94, 14/09/2021, 16:10

91
93
94
92

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TITLE:	Summer Flightlines 2021 Grey Heron 4		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
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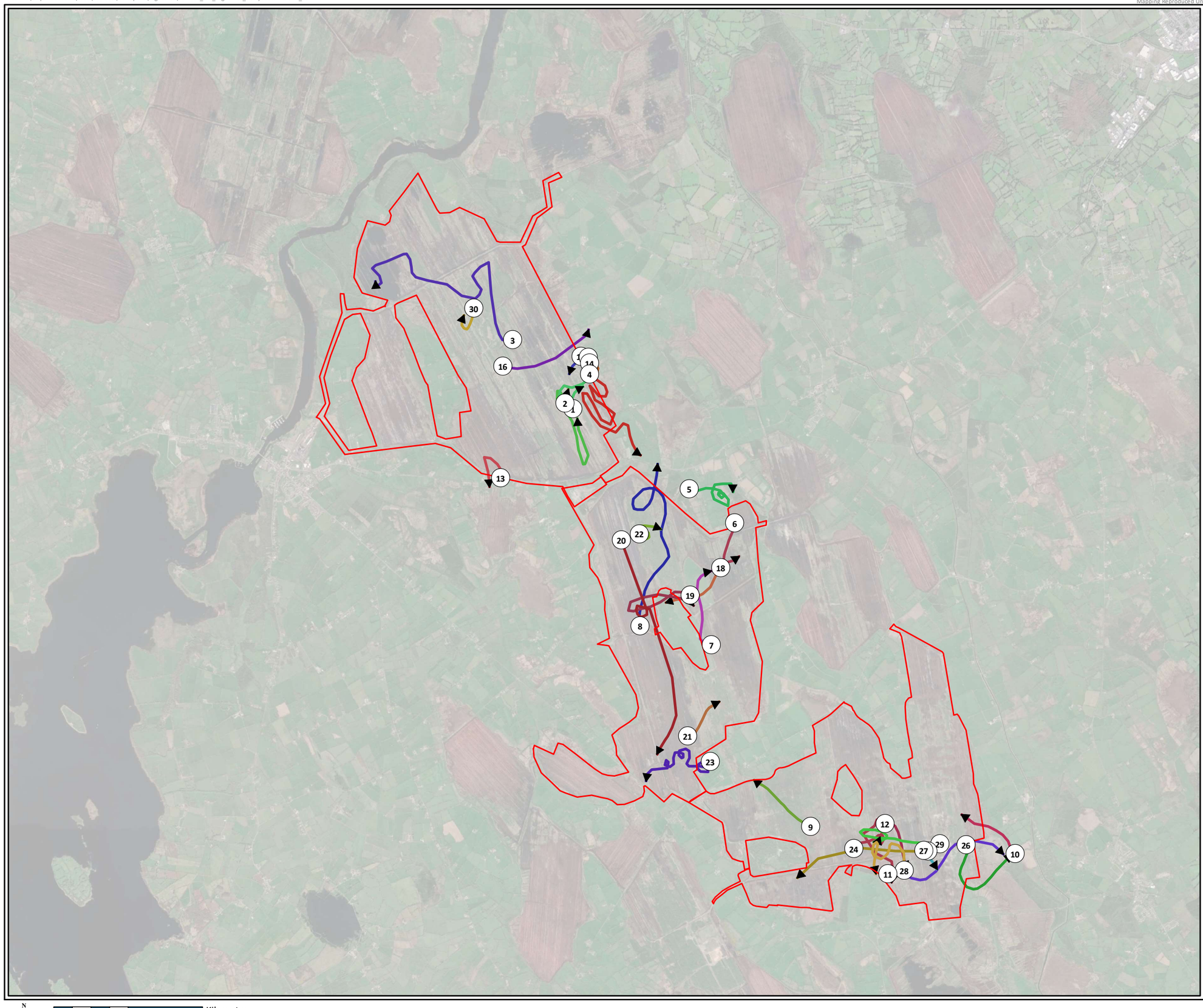

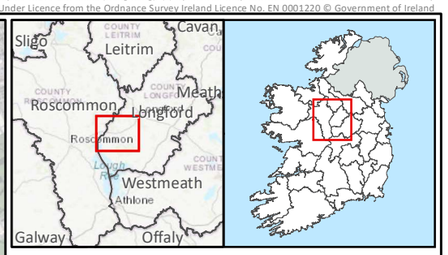

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- 6, 07/05/2021, 14:35
- 7, 07/05/2021, 18:43
- 8, 07/05/2021, 19:01
- 9, 22/05/2021, 11:29
- 10, 27/05/2021, 11:20
- 11, 27/05/2021, 12:05
- 12, 28/05/2021, 18:07
- 13, 02/06/2021, 13:20
- 14, 16/06/2021, 13:48
- 15, 16/06/2021, 14:52
- 16, 16/06/2021, 18:43
- 17, 16/06/2021, 19:09
- 18, 17/06/2021, 13:27
- 19, 17/06/2021, 17:23
- 20, 18/06/2021, 10:48
- 21, 18/06/2021, 11:36
- 22, 18/06/2021, 14:20
- 23, 23/06/2021, 15:27
- 24, 23/06/2021, 19:39
- 25, 24/06/2021, 11:37
- 26, 24/06/2021, 20:20
- 27, 25/06/2021, 13:23
- 28, 25/06/2021, 15:02
- 29, 25/06/2021, 17:09
- 30, 05/07/2021, 16:45

TITLE:	Summer Flightlines 2021 Kestrel 1		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
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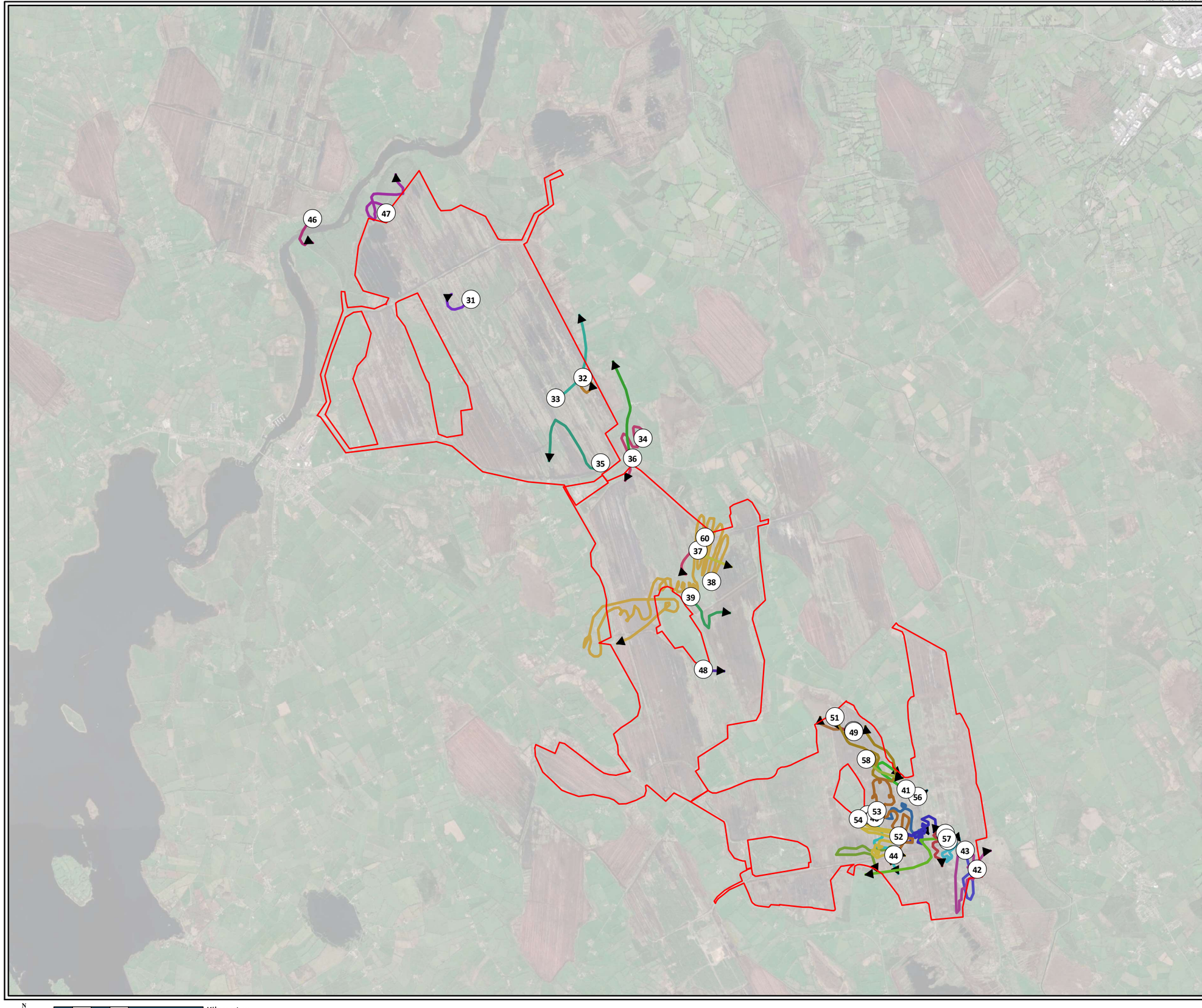

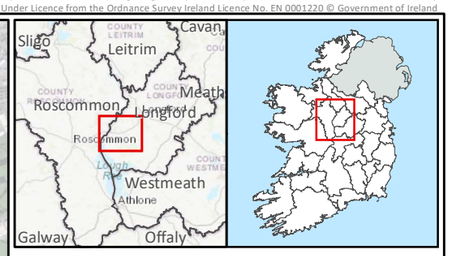

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Site Boundary

Individual, Date, Time

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- 33, 06/07/2021, 17:15
- 34, 06/07/2021, 18:44
- 35, 06/07/2021, 18:55
- 36, 06/07/2021, 18:58
- 37, 08/07/2021, 13:50
- 38, 08/07/2021, 15:20
- 39, 08/07/2021, 20:30
- 40, 14/07/2021, 09:53
- 41, 14/07/2021, 10:44
- 42, 15/07/2021, 13:59
- 43, 15/07/2021, 17:15
- 44, 16/07/2021, 10:09
- 45, 16/07/2021, 13:02
- 46, 28/07/2021, 11:26
- 47, 28/07/2021, 14:16
- 48, 02/08/2021, 10:41
- 49, 03/08/2021, 09:55
- 50, 03/08/2021, 11:14
- 51, 03/08/2021, 11:54
- 52, 03/08/2021, 12:09
- 53, 03/08/2021, 14:02
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- 58, 11/08/2021, 13:23
- 59, 11/08/2021, 18:09
- 60, 12/08/2021, 20:02

TITLE:	Summer Flightlines 2021 Kestrel 2		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
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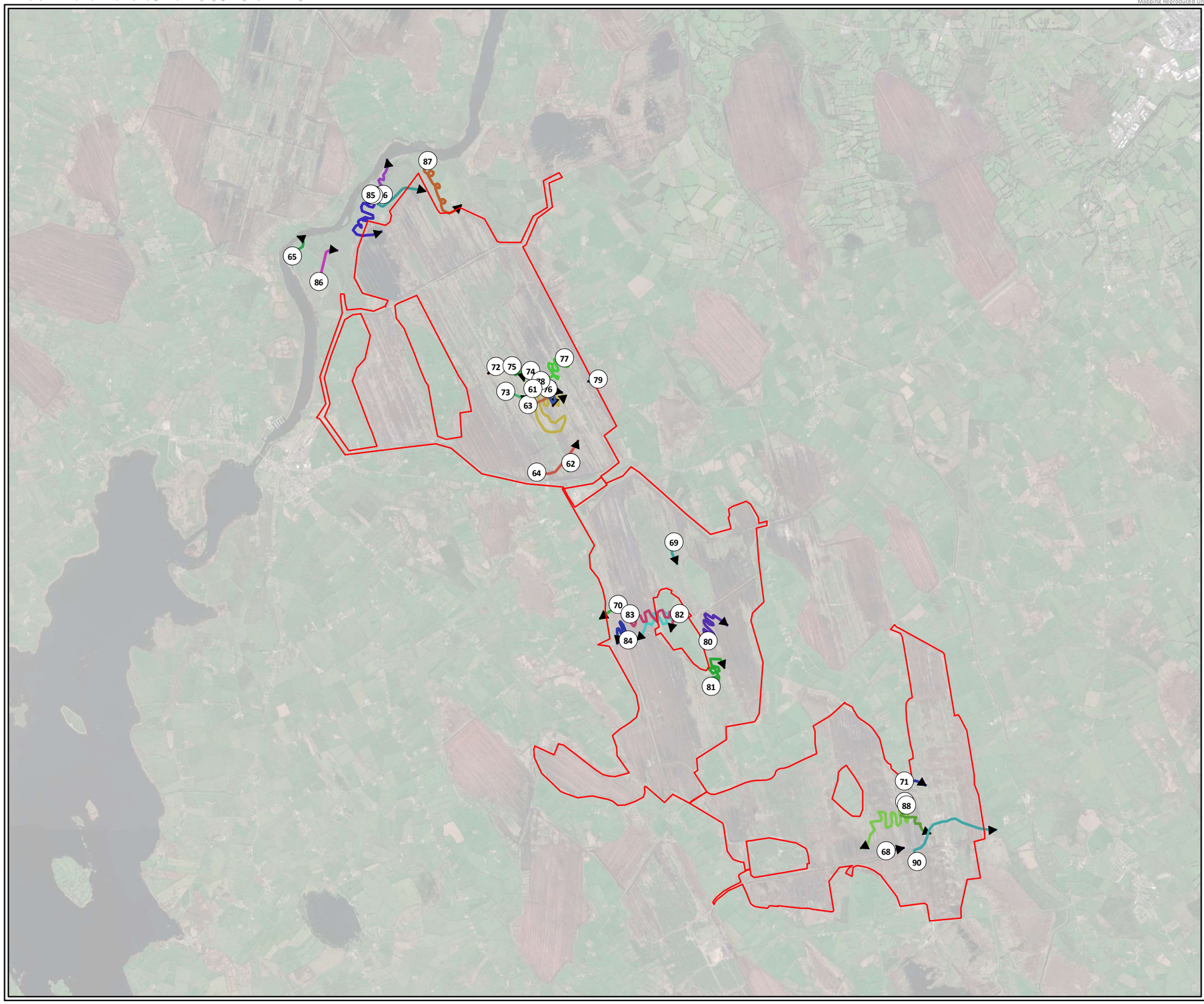

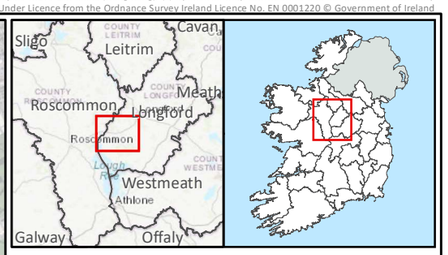

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- 67, 17/08/2021, 13:03
- 68, 18/08/2021, 16:56
- 69, 19/08/2021, 10:40
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- 71, 20/08/2021, 14:52
- 72, 02/09/2021, 09:27
- 73, 02/09/2021, 11:03
- 74, 02/09/2021, 11:34
- 75, 02/09/2021, 12:59
- 76, 02/09/2021, 14:14
- 77, 02/09/2021, 18:38
- 78, 03/09/2021, 11:00
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- 81, 03/09/2021, 17:53
- 82, 09/09/2021, 09:22
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- 84, 12/09/2021, 10:59
- 85, 12/09/2021, 12:46
- 86, 12/09/2021, 13:52
- 87, 12/09/2021, 16:02
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- 89, 13/09/2021, 13:44
- 90, 14/09/2021, 10:22

TITLE:	Summer Flightlines 2021 Kestrel 3		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
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SCALE:	1:50000	**REVISION:**	0
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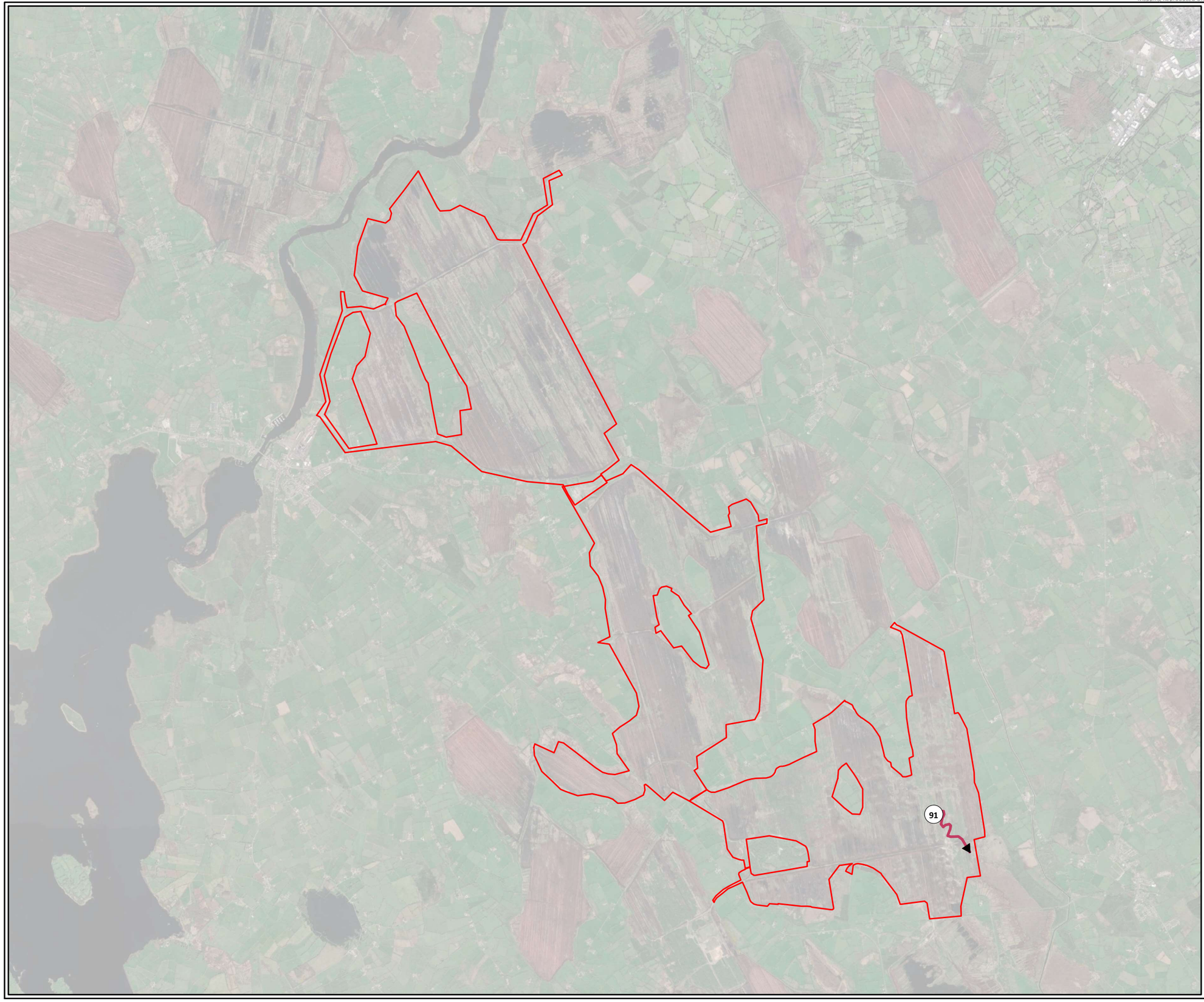

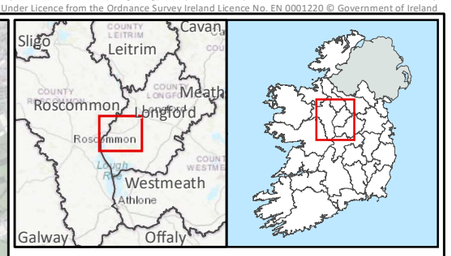

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Site Boundary

Individual, Date, Time

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0 0.5 1 2 Kilometers

TITLE:	Summer Flightlines 2021 Kestrel 4		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
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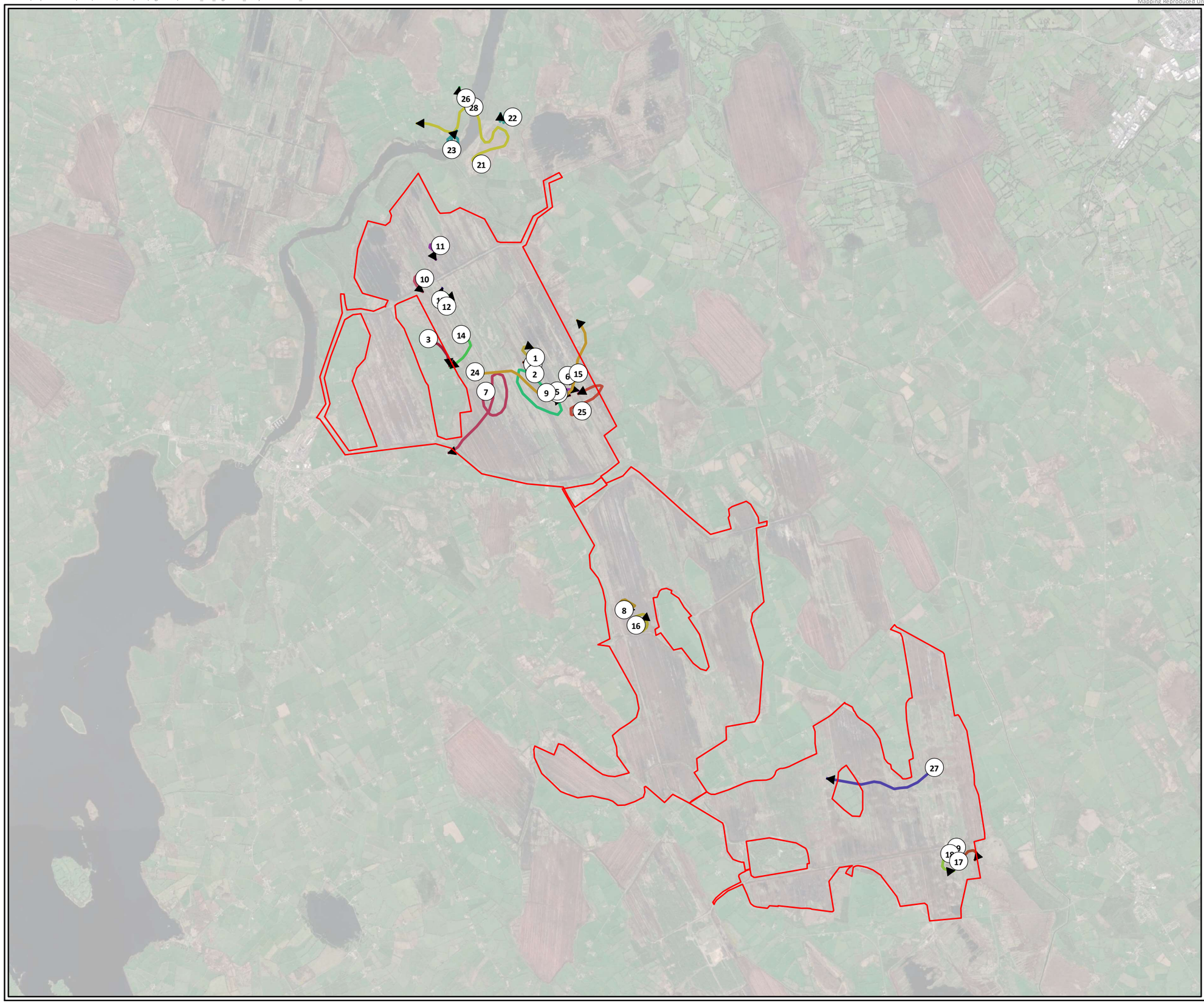

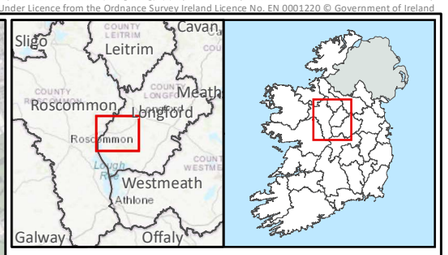

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- 6, 05/05/2021, 19:13
- 7, 06/05/2021, 08:36
- 8, 07/05/2021, 13:27
- 9, 02/06/2021, 13:32
- 10, 10/06/2021, 14:07
- 11, 10/06/2021, 15:25
- 12, 10/06/2021, 17:21
- 13, 10/06/2021, 17:55
- 14, 10/06/2021, 19:06
- 15, 16/06/2021, 17:31
- 16, 17/06/2021, 13:10
- 17, 24/06/2021, 15:50
- 18, 24/06/2021, 16:09
- 19, 24/06/2021, 18:43
- 20, 05/07/2021, 16:53
- 21, 06/07/2021, 09:30
- 22, 06/07/2021, 11:03
- 23, 06/07/2021, 15:34
- 24, 27/07/2021, 11:00
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- 26, 29/07/2021, 12:22
- 27, 11/08/2021, 11:37
- 28, 06/09/2021, 09:28

TITLE:	Summer Flightlines 2021 Lapwing		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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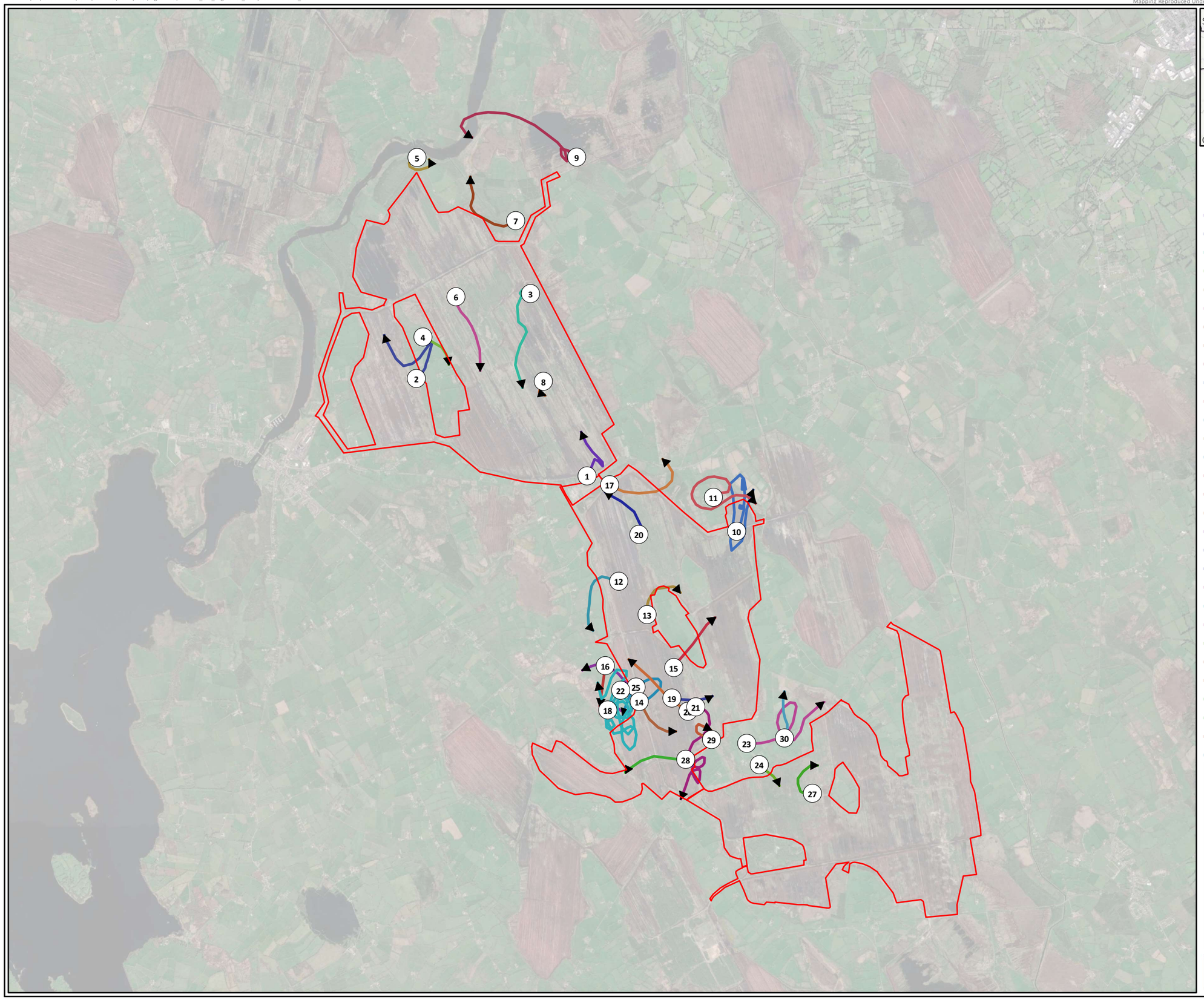

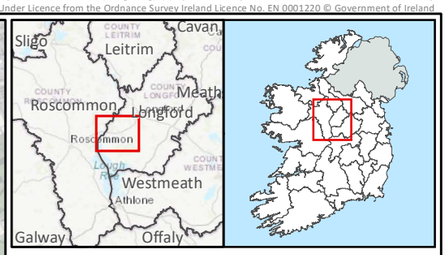

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30, 21/05/2021, 09:23

TITLE:	Summer Flightlines 2021 Lesser Black-Backed Gull 1		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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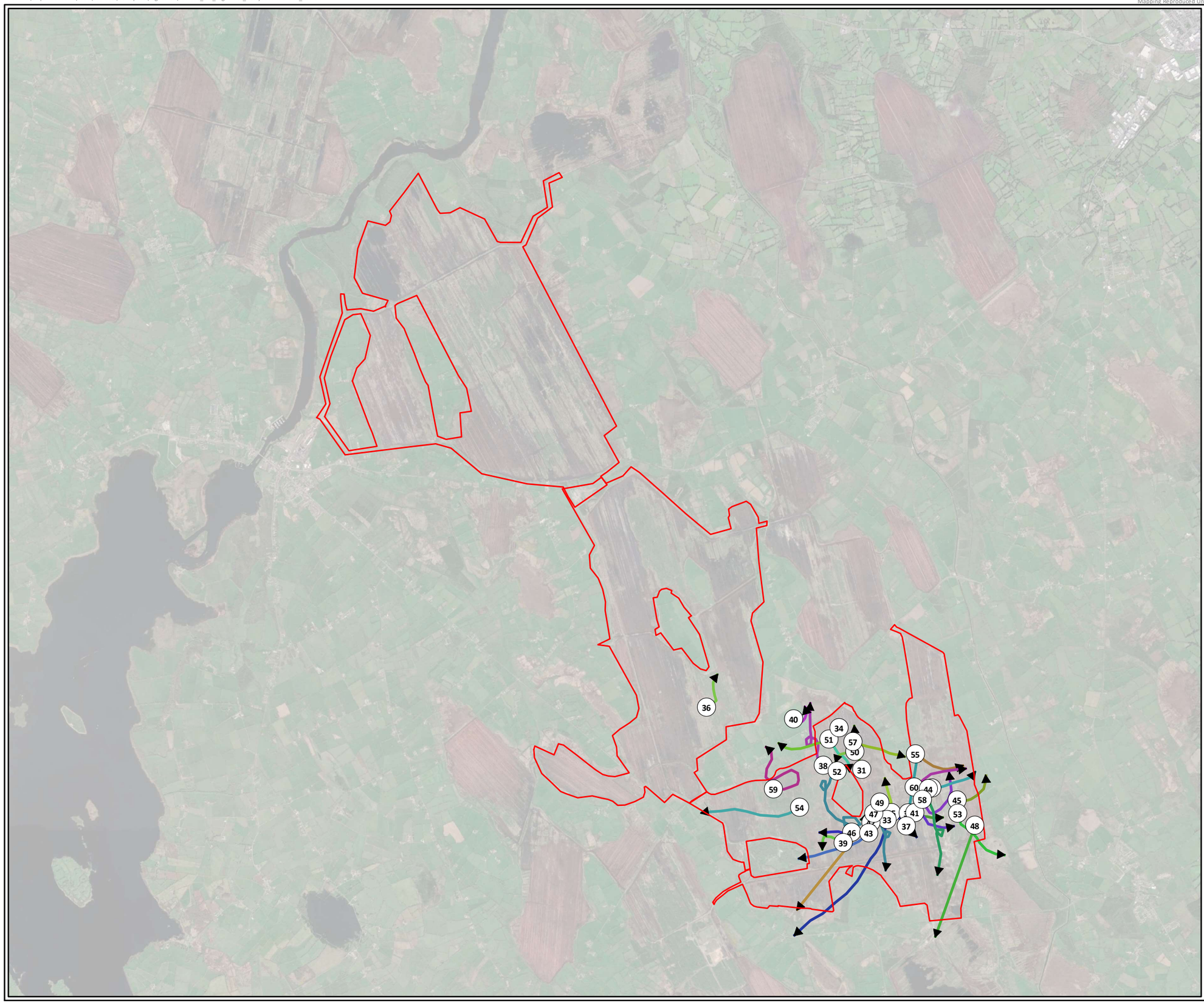

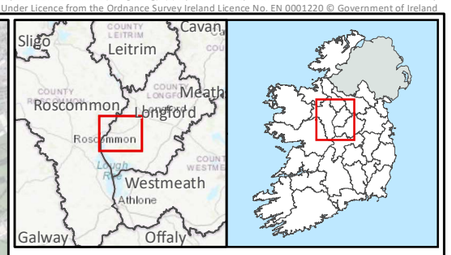

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- 58, 28/05/2021, 16:51
- 59, 28/05/2021, 17:08
- 60, 28/05/2021, 17:16

TITLE:	Summer Flightlines 2021 Lesser Black-Backed Gull 2		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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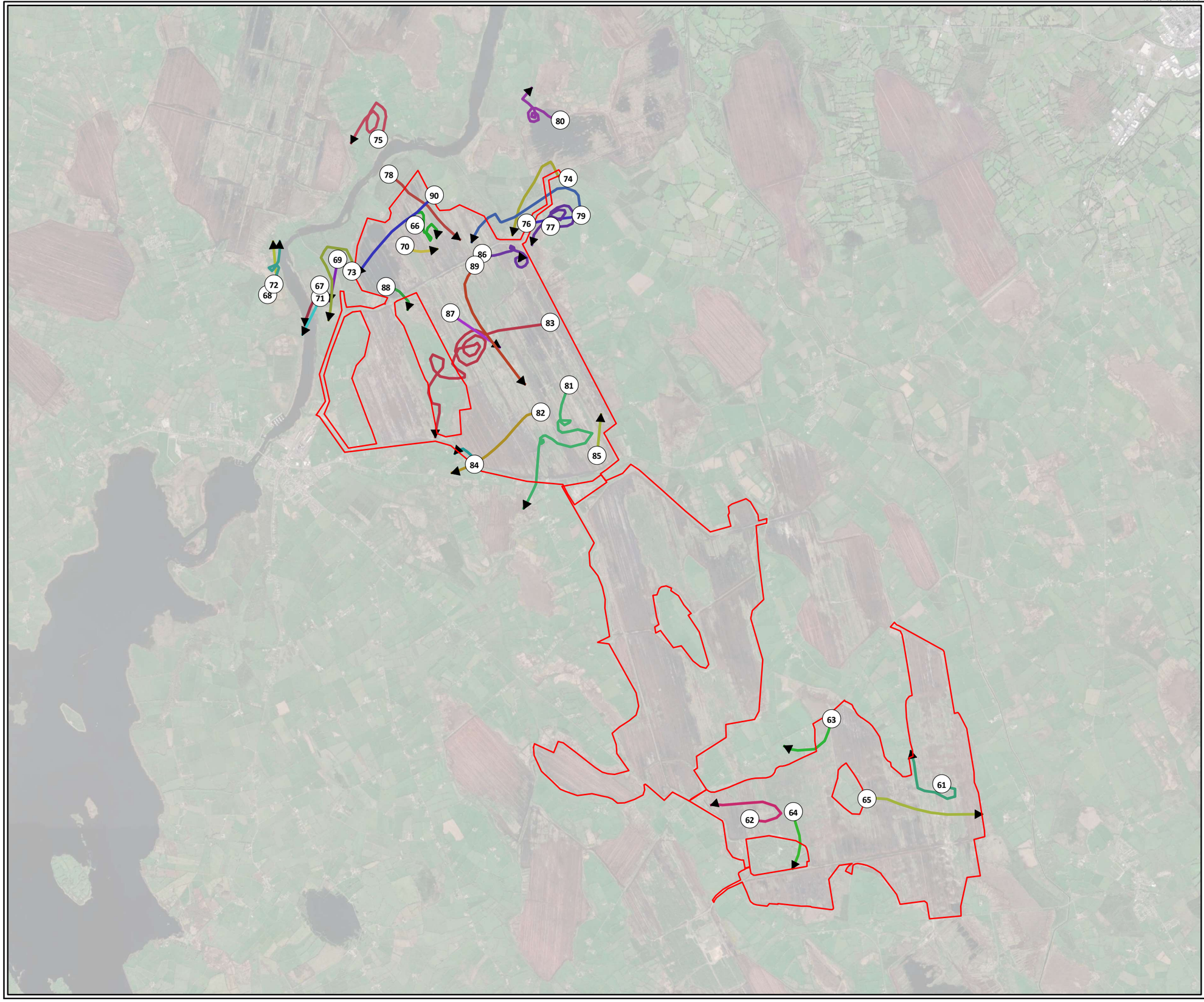
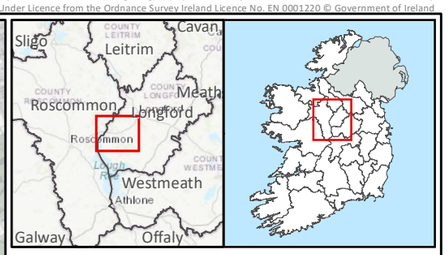
Path: R:\Map Production\2021\P21-119\workspace\Flightlines\P20-113_GIS_Flightlines_DerryaddWindFarm_A3.mxd





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- 82, 01/06/2021, 18:35
- 83, 02/06/2021, 14:00
- 84, 02/06/2021, 14:21
- 85, 02/06/2021, 15:23
- 86, 10/06/2021, 13:30
- 87, 10/06/2021, 14:15
- 88, 10/06/2021, 15:48
- 89, 10/06/2021, 17:49
- 90, 10/06/2021, 18:10

TITLE:	Summer Flightlines 2021 Lesser Black-Backed Gull 3		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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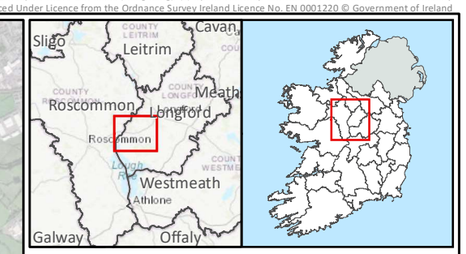

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Site Boundary

Individual, Date, Time

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- 92, 16/06/2021, 17:58
- 93, 17/06/2021, 11:30
- 94, 17/06/2021, 15:38
- 95, 17/06/2021, 16:49
- 96, 18/06/2021, 09:29
- 97, 18/06/2021, 13:42
- 98, 23/06/2021, 10:57
- 99, 23/06/2021, 12:14
- 100, 23/06/2021, 12:29
- 101, 23/06/2021, 15:02
- 102, 23/06/2021, 15:38
- 103, 23/06/2021, 18:34
- 104, 23/06/2021, 18:57
- 105, 23/06/2021, 20:48
- 106, 24/06/2021, 10:33
- 107, 24/06/2021, 11:10
- 108, 24/06/2021, 14:36
- 109, 24/06/2021, 15:06
- 110, 24/06/2021, 16:44
- 111, 24/06/2021, 18:06
- 112, 24/06/2021, 18:59
- 113, 24/06/2021, 19:37
- 114, 24/06/2021, 20:03
- 115, 25/06/2021, 11:09
- 116, 25/06/2021, 11:47
- 117, 25/06/2021, 12:30
- 118, 25/06/2021, 13:40
- 119, 25/06/2021, 13:56
- 120, 25/06/2021, 15:43

TITLE:	Summer Flightlines 2021 Lesser Black-Backed Gull 4		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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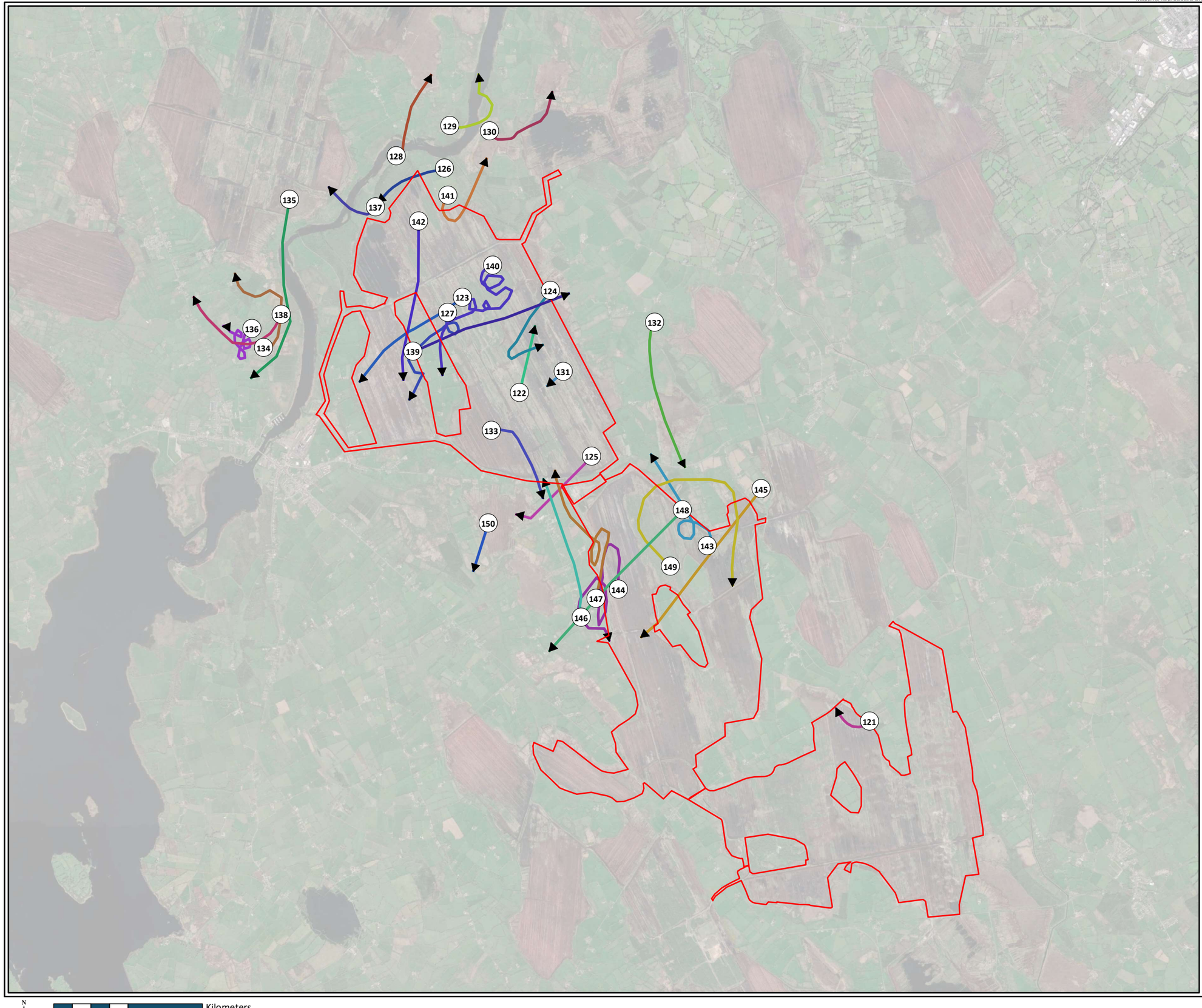

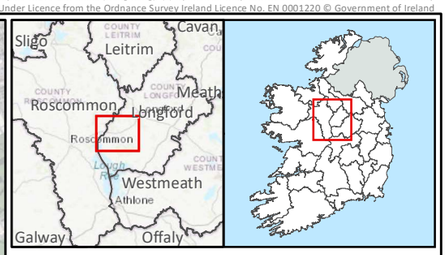

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Site Boundary

Individual, Date, Time

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- 122, 05/07/2021, 10:03
- 123, 05/07/2021, 11:33
- 124, 05/07/2021, 16:20
- 125, 05/07/2021, 17:07
- 126, 06/07/2021, 09:44
- 127, 06/07/2021, 10:38
- 128, 06/07/2021, 12:01
- 129, 06/07/2021, 13:11
- 130, 06/07/2021, 13:58
- 131, 06/07/2021, 17:06
- 132, 06/07/2021, 19:50
- 133, 06/07/2021, 20:03
- 134, 07/07/2021, 11:21
- 135, 07/07/2021, 12:36
- 136, 07/07/2021, 13:31
- 137, 07/07/2021, 15:15
- 138, 07/07/2021, 16:57
- 139, 07/07/2021, 19:02
- 140, 07/07/2021, 19:28
- 141, 07/07/2021, 20:58
- 142, 07/07/2021, 21:25
- 143, 08/07/2021, 11:33
- 144, 08/07/2021, 13:11
- 145, 08/07/2021, 13:42
- 146, 08/07/2021, 15:09
- 147, 08/07/2021, 16:28
- 148, 08/07/2021, 17:10
- 149, 08/07/2021, 17:46
- 150, 08/07/2021, 18:00

TITLE:	Summer Flightlines 2021 Lesser Black-Backed Gull 5		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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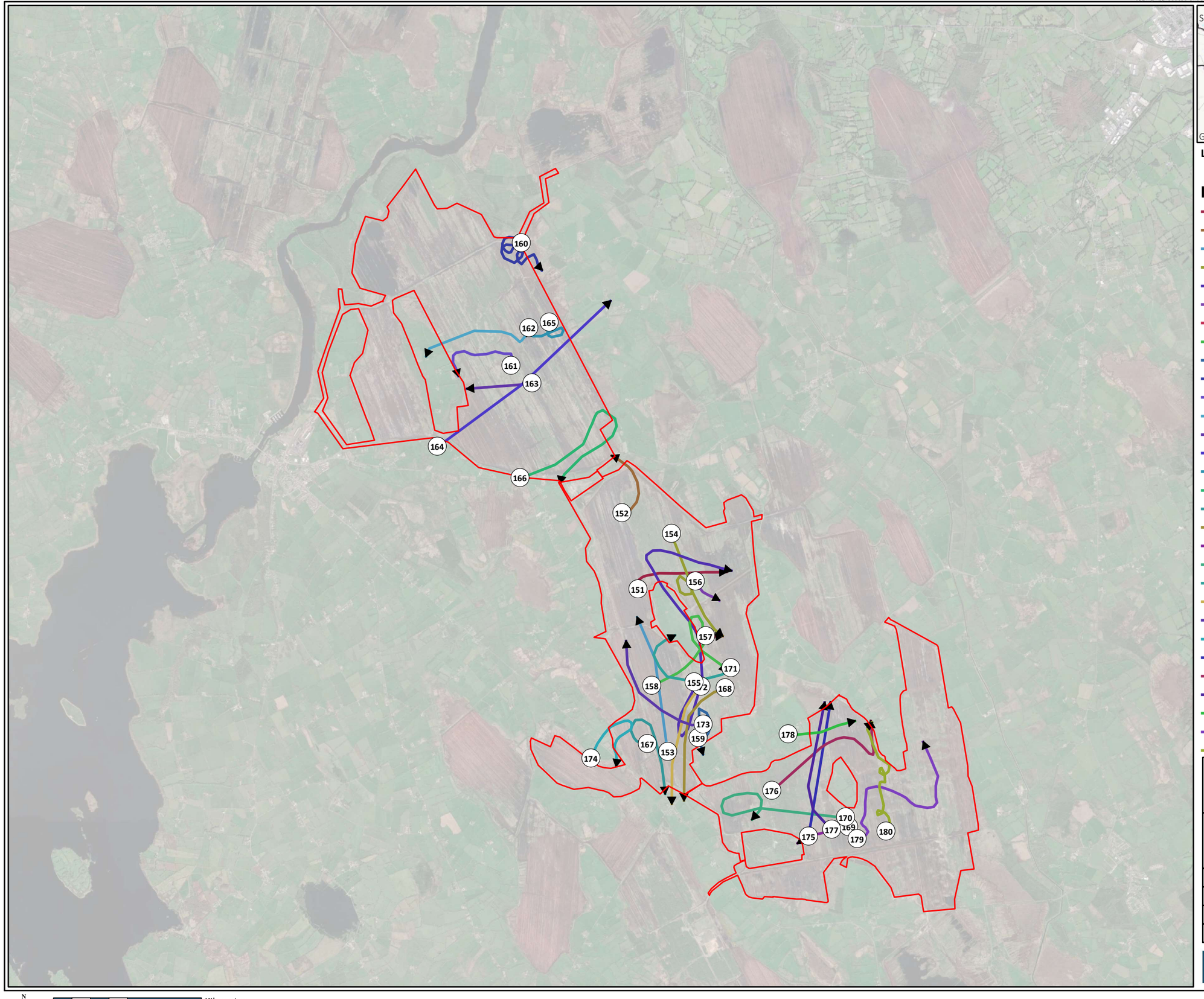

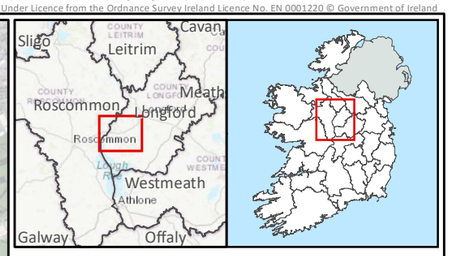

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Site Boundary

Individual, Date, Time

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- 152, 08/07/2021, 19:47
- 153, 08/07/2021, 20:55
- 154, 09/07/2021, 11:52
- 155, 09/07/2021, 12:46
- 156, 09/07/2021, 13:00
- 157, 09/07/2021, 13:17
- 158, 09/07/2021, 13:44
- 159, 09/07/2021, 14:06
- 160, 09/07/2021, 15:36
- 161, 09/07/2021, 15:43
- 162, 09/07/2021, 17:35
- 163, 09/07/2021, 17:48
- 164, 09/07/2021, 19:20
- 165, 09/07/2021, 20:45
- 166, 09/07/2021, 20:55
- 167, 13/07/2021, 08:27
- 168, 13/07/2021, 09:46
- 169, 13/07/2021, 10:22
- 170, 13/07/2021, 15:05
- 171, 13/07/2021, 16:27
- 172, 13/07/2021, 17:02
- 173, 13/07/2021, 17:18
- 174, 13/07/2021, 17:39
- 175, 14/07/2021, 08:27
- 176, 14/07/2021, 10:27
- 177, 15/07/2021, 08:46
- 178, 15/07/2021, 10:17
- 179, 15/07/2021, 10:48
- 180, 15/07/2021, 11:00

TITLE:	Summer Flightlines 2021 Lesser Black-Backed Gull 6		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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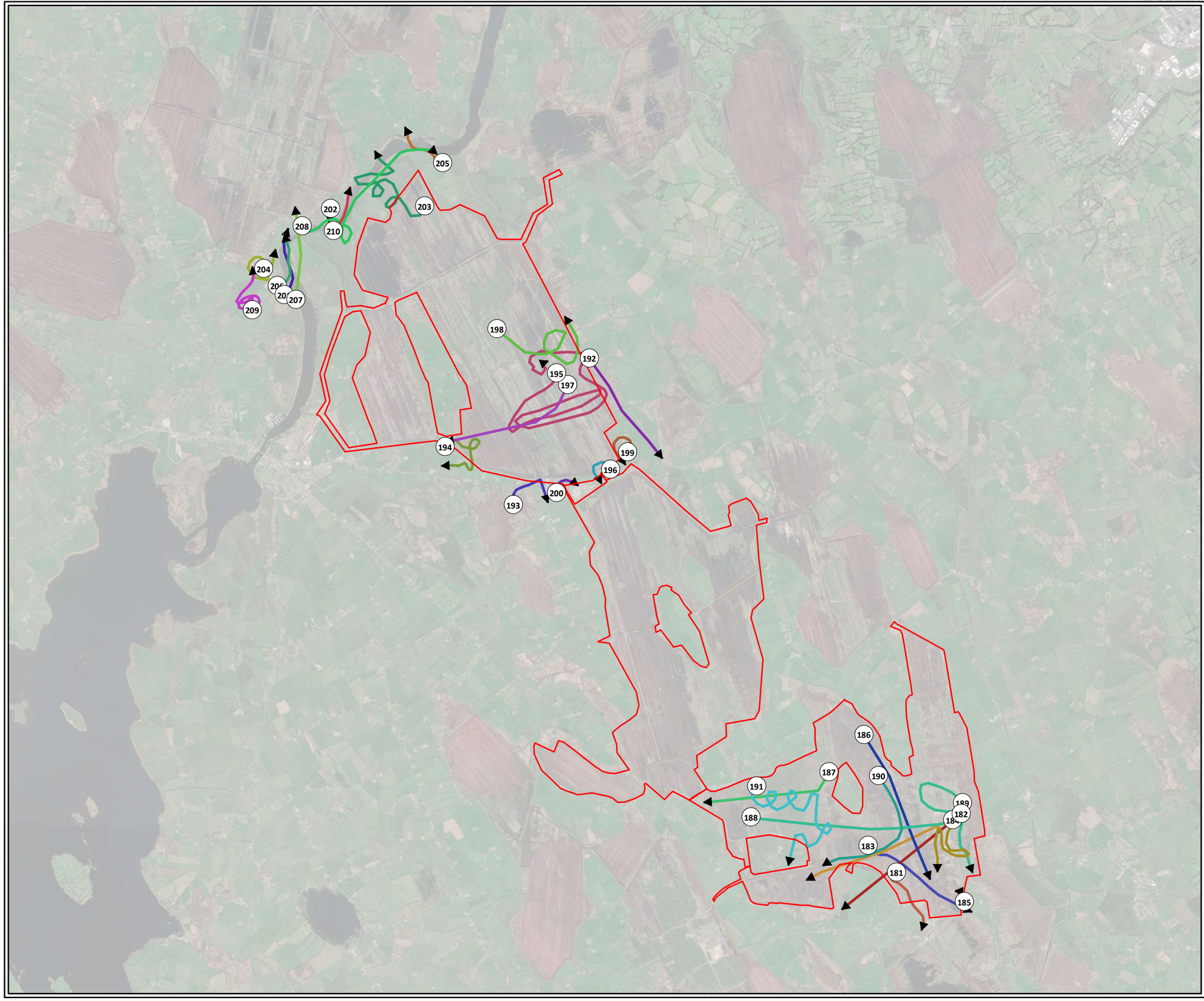

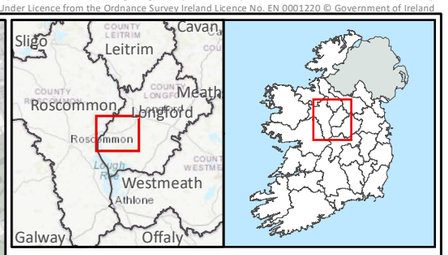

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Site Boundary

Individual, Date, Time

- 181, 15/07/2021, 13:06
- 182, 15/07/2021, 14:40
- 183, 15/07/2021, 16:30
- 184, 15/07/2021, 18:13
- 185, 15/07/2021, 19:00
- 186, 16/07/2021, 09:43
- 187, 16/07/2021, 11:11
- 188, 16/07/2021, 11:26
- 189, 16/07/2021, 14:24
- 190, 16/07/2021, 15:00
- 191, 16/07/2021, 15:23
- 192, 27/07/2021, 09:22
- 193, 27/07/2021, 09:57
- 194, 27/07/2021, 10:10
- 195, 27/07/2021, 10:49
- 196, 27/07/2021, 11:48
- 197, 27/07/2021, 16:30
- 198, 27/07/2021, 16:49
- 199, 27/07/2021, 18:02
- 200, 27/07/2021, 18:55
- 201, 28/07/2021, 09:33
- 202, 28/07/2021, 10:06
- 203, 28/07/2021, 10:58
- 204, 28/07/2021, 11:59
- 205, 28/07/2021, 12:14
- 206, 28/07/2021, 13:44
- 207, 28/07/2021, 14:02
- 208, 28/07/2021, 14:57
- 209, 28/07/2021, 15:42
- 210, 28/07/2021, 16:03

TITLE:	Summer Flightlines 2021 Lesser Black-Backed Gull 7		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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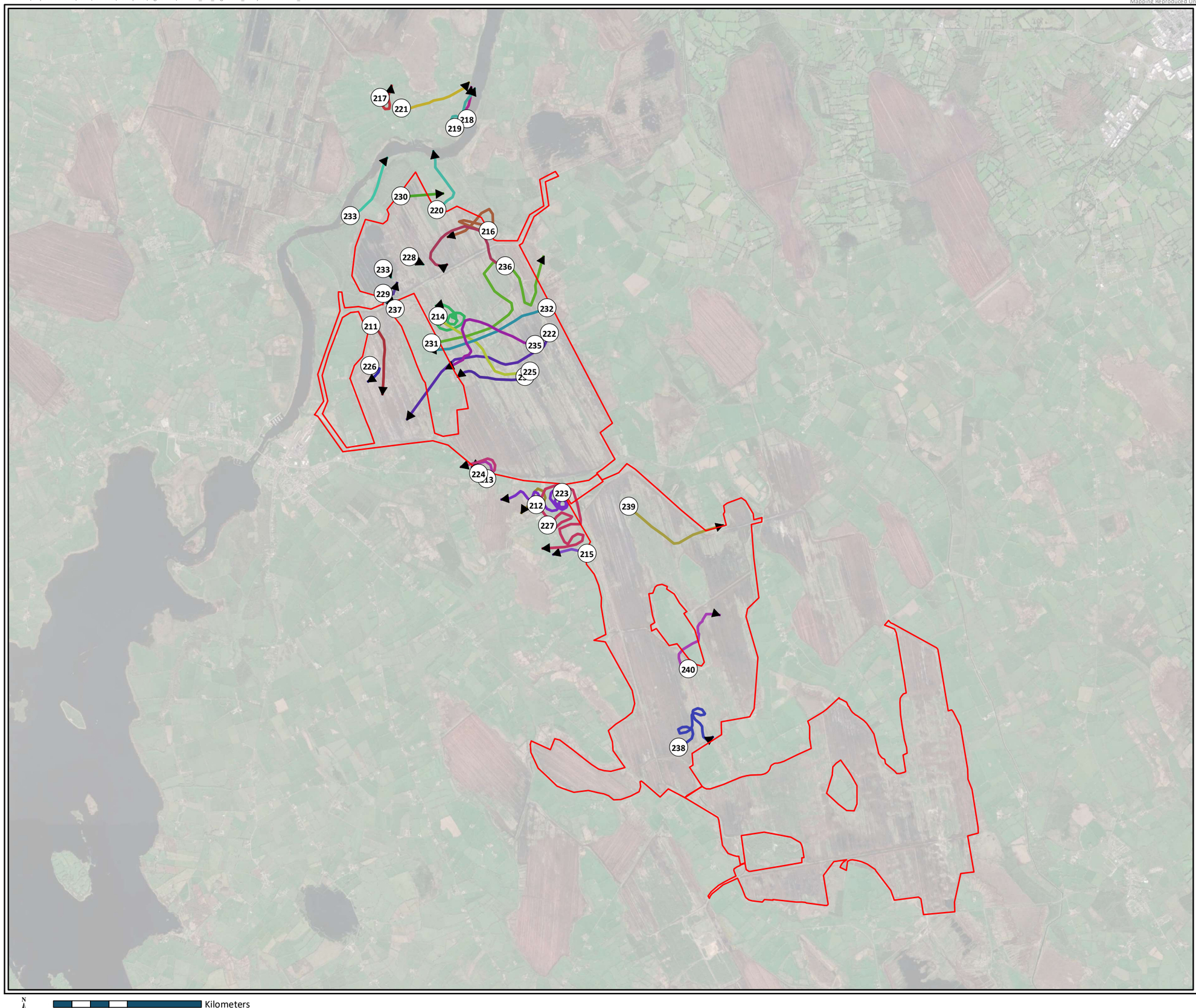

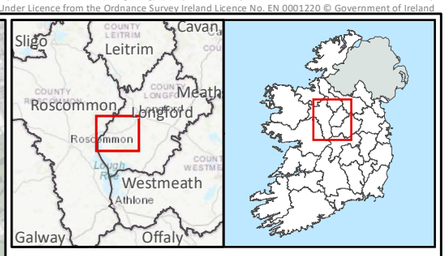

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Site Boundary

Individual, Date, Time

- 211, 28/07/2021, 17:32
- 212, 28/07/2021, 18:20
- 213, 28/07/2021, 18:58
- 214, 28/07/2021, 19:15
- 215, 28/07/2021, 19:50
- 216, 29/07/2021, 11:32
- 217, 29/07/2021, 11:50
- 218, 29/07/2021, 12:42
- 219, 29/07/2021, 14:05
- 220, 29/07/2021, 15:02
- 221, 29/07/2021, 15:51
- 222, 29/07/2021, 17:52
- 223, 29/07/2021, 18:45
- 224, 29/07/2021, 19:03
- 225, 29/07/2021, 19:29
- 226, 29/07/2021, 20:11
- 227, 29/07/2021, 20:37
- 228, 30/07/2021, 11:17
- 229, 30/07/2021, 11:22
- 230, 30/07/2021, 11:48
- 231, 30/07/2021, 12:30
- 232, 30/07/2021, 14:52
- 233, 30/07/2021, 15:40
- 234, 30/07/2021, 16:10
- 235, 30/07/2021, 16:24
- 236, 30/07/2021, 17:15
- 237, 30/07/2021, 17:23
- 238, 02/08/2021, 10:02
- 239, 02/08/2021, 10:15
- 240, 02/08/2021, 10:58

TITLE:	Summer Flightlines 2021 Lesser Black-Backed Gull 8		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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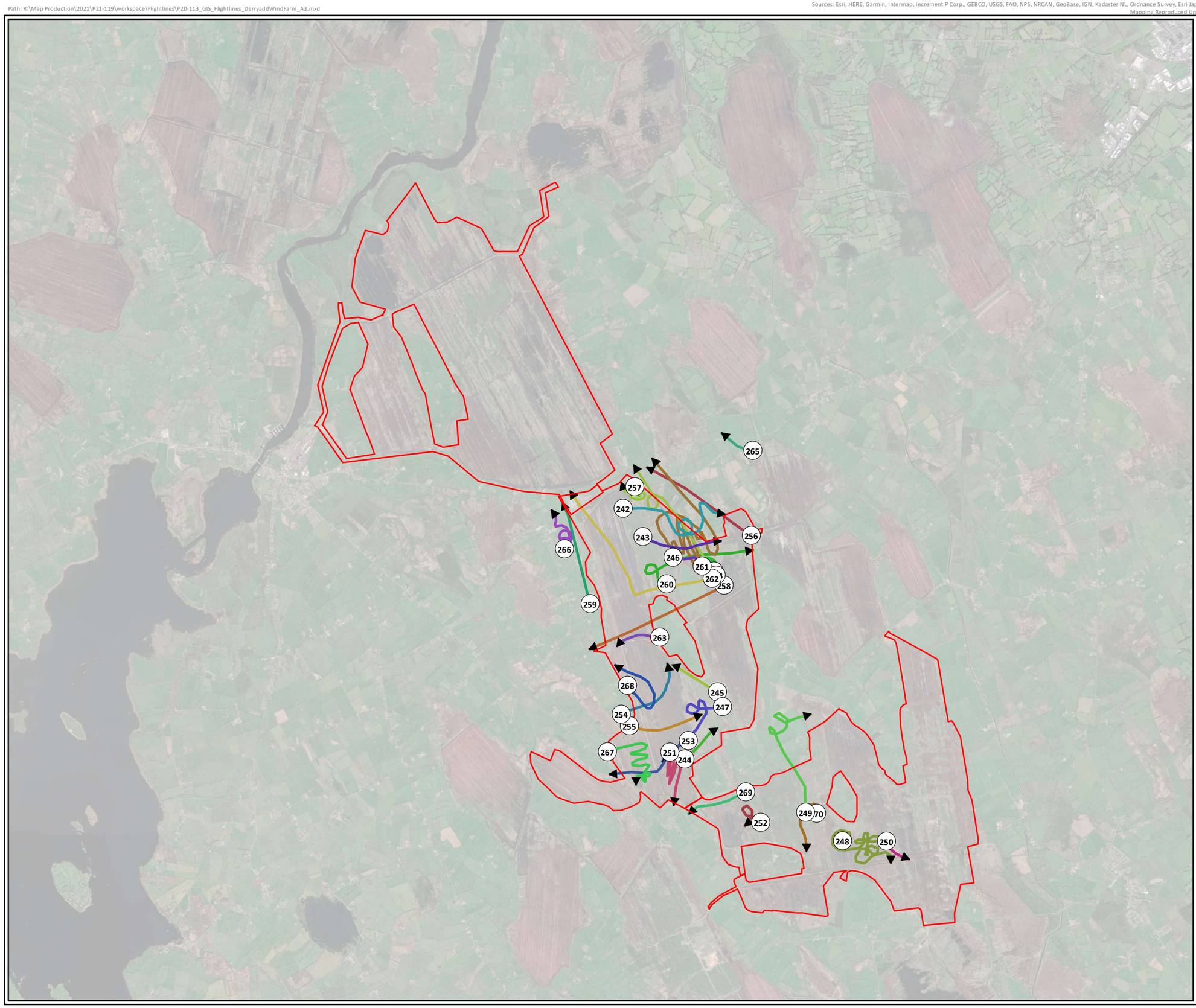

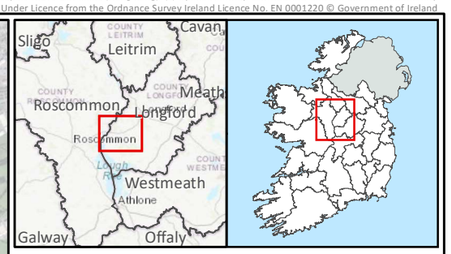

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Site Boundary

Individual, Date, Time

- 241, 02/08/2021, 11:22
- 242, 02/08/2021, 12:05
- 243, 02/08/2021, 15:20
- 244, 02/08/2021, 15:43
- 245, 02/08/2021, 15:56
- 246, 02/08/2021, 17:19
- 247, 02/08/2021, 17:58
- 248, 03/08/2021, 10:42
- 249, 03/08/2021, 15:19
- 250, 03/08/2021, 16:37
- 251, 03/08/2021, 18:09
- 252, 03/08/2021, 18:27
- 253, 03/08/2021, 18:50
- 254, 03/08/2021, 19:25
- 255, 03/08/2021, 20:14
- 256, 04/08/2021, 10:22
- 257, 04/08/2021, 10:50
- 258, 04/08/2021, 11:46
- 259, 04/08/2021, 12:42
- 260, 04/08/2021, 12:50
- 261, 04/08/2021, 14:02
- 262, 04/08/2021, 14:19
- 263, 04/08/2021, 15:00
- 264, 04/08/2021, 15:34
- 265, 04/08/2021, 15:58
- 266, 04/08/2021, 16:22
- 267, 04/08/2021, 17:50
- 268, 04/08/2021, 18:13
- 269, 04/08/2021, 19:19
- 270, 04/08/2021, 20:00

TITLE:	Summer Flightlines 2021 Lesser Black-Backed Gull 9		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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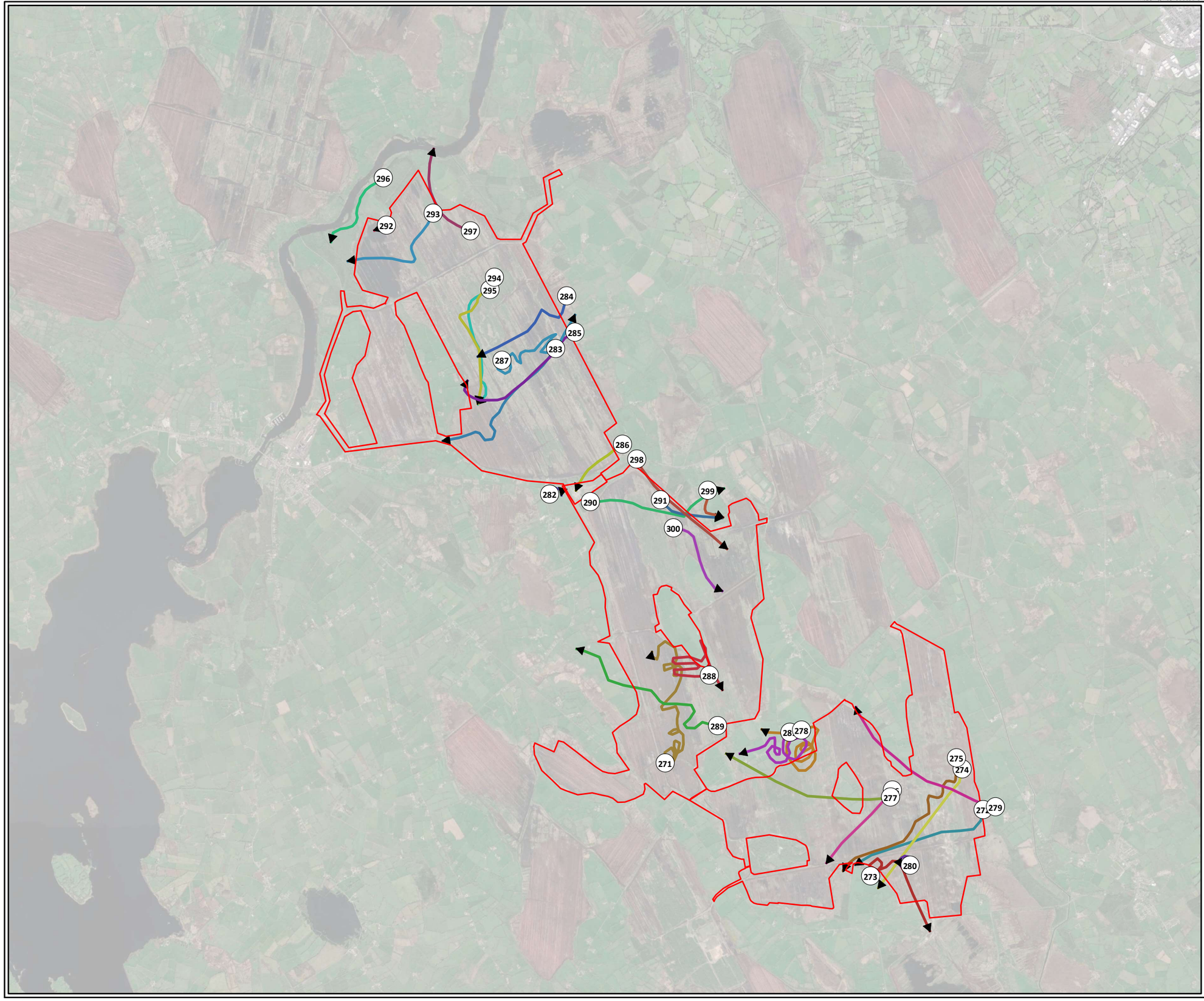

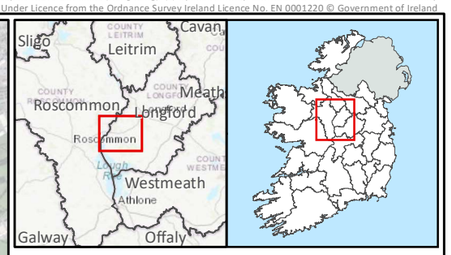

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Site Boundary

Individual, Date, Time

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- 272, 05/08/2021, 11:52
- 273, 05/08/2021, 12:34
- 274, 05/08/2021, 13:40
- 275, 11/08/2021, 09:45
- 276, 11/08/2021, 11:00
- 277, 11/08/2021, 13:37
- 278, 11/08/2021, 15:08
- 279, 11/08/2021, 17:24
- 280, 11/08/2021, 19:06
- 281, 11/08/2021, 19:30
- 282, 12/08/2021, 11:04
- 283, 12/08/2021, 11:33
- 284, 12/08/2021, 12:42
- 285, 12/08/2021, 14:56
- 286, 12/08/2021, 15:27
- 287, 12/08/2021, 16:47
- 288, 12/08/2021, 18:40
- 289, 12/08/2021, 19:11
- 290, 12/08/2021, 19:23
- 291, 12/08/2021, 20:29
- 292, 13/08/2021, 11:09
- 293, 13/08/2021, 11:40
- 294, 13/08/2021, 12:58
- 295, 13/08/2021, 14:10
- 296, 13/08/2021, 16:10
- 297, 13/08/2021, 16:50
- 298, 13/08/2021, 18:15
- 299, 13/08/2021, 18:40
- 300, 13/08/2021, 19:12

TITLE:	Summer Flightlines 2021 Lesser Black-Backed Gull 10		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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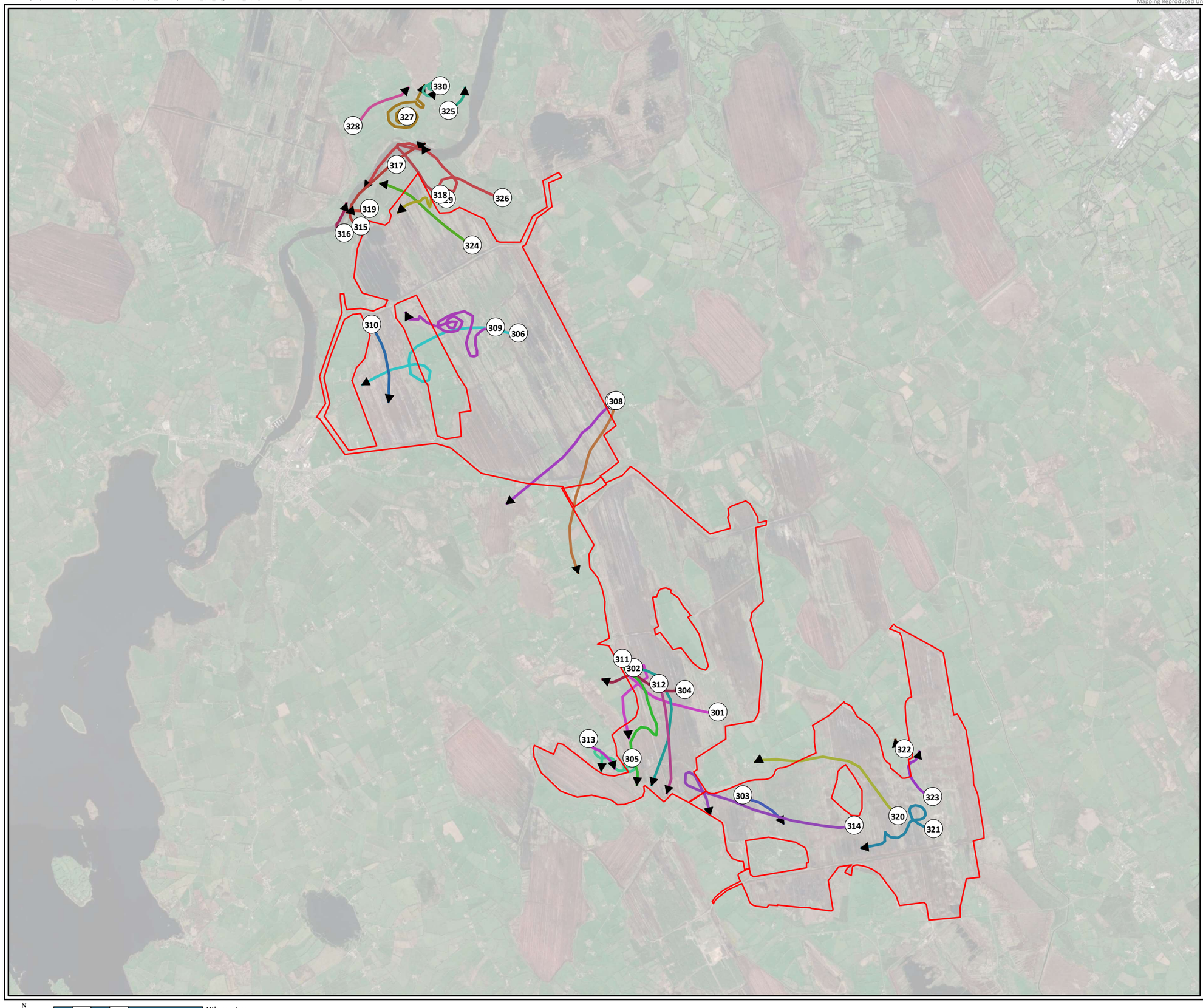

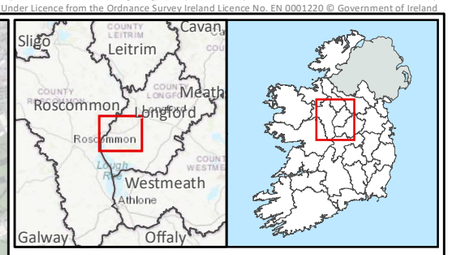

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Site Boundary

Individual, Date, Time

- 301, 13/08/2021, 20:24
- 302, 14/08/2021, 11:17
- 303, 14/08/2021, 11:51
- 304, 14/08/2021, 12:46
- 305, 14/08/2021, 13:15
- 306, 16/08/2021, 09:29
- 307, 16/08/2021, 10:11
- 308, 16/08/2021, 13:27
- 309, 16/08/2021, 13:48
- 310, 16/08/2021, 15:16
- 311, 16/08/2021, 17:04
- 312, 16/08/2021, 17:39
- 313, 16/08/2021, 18:14
- 314, 16/08/2021, 18:40
- 315, 17/08/2021, 09:14
- 316, 17/08/2021, 10:49
- 317, 17/08/2021, 12:45
- 318, 17/08/2021, 14:21
- 319, 17/08/2021, 15:23
- 320, 17/08/2021, 16:53
- 321, 17/08/2021, 17:25
- 322, 17/08/2021, 18:34
- 323, 17/08/2021, 19:01
- 324, 18/08/2021, 09:48
- 325, 18/08/2021, 10:07
- 326, 18/08/2021, 10:33
- 327, 18/08/2021, 11:40
- 328, 18/08/2021, 11:52
- 329, 18/08/2021, 13:00
- 330, 18/08/2021, 13:38

TITLE:	Summer Flightlines 2021 Lesser Black-Backed Gull 11		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	17/12/2021	**PAGE SIZE:**	A3

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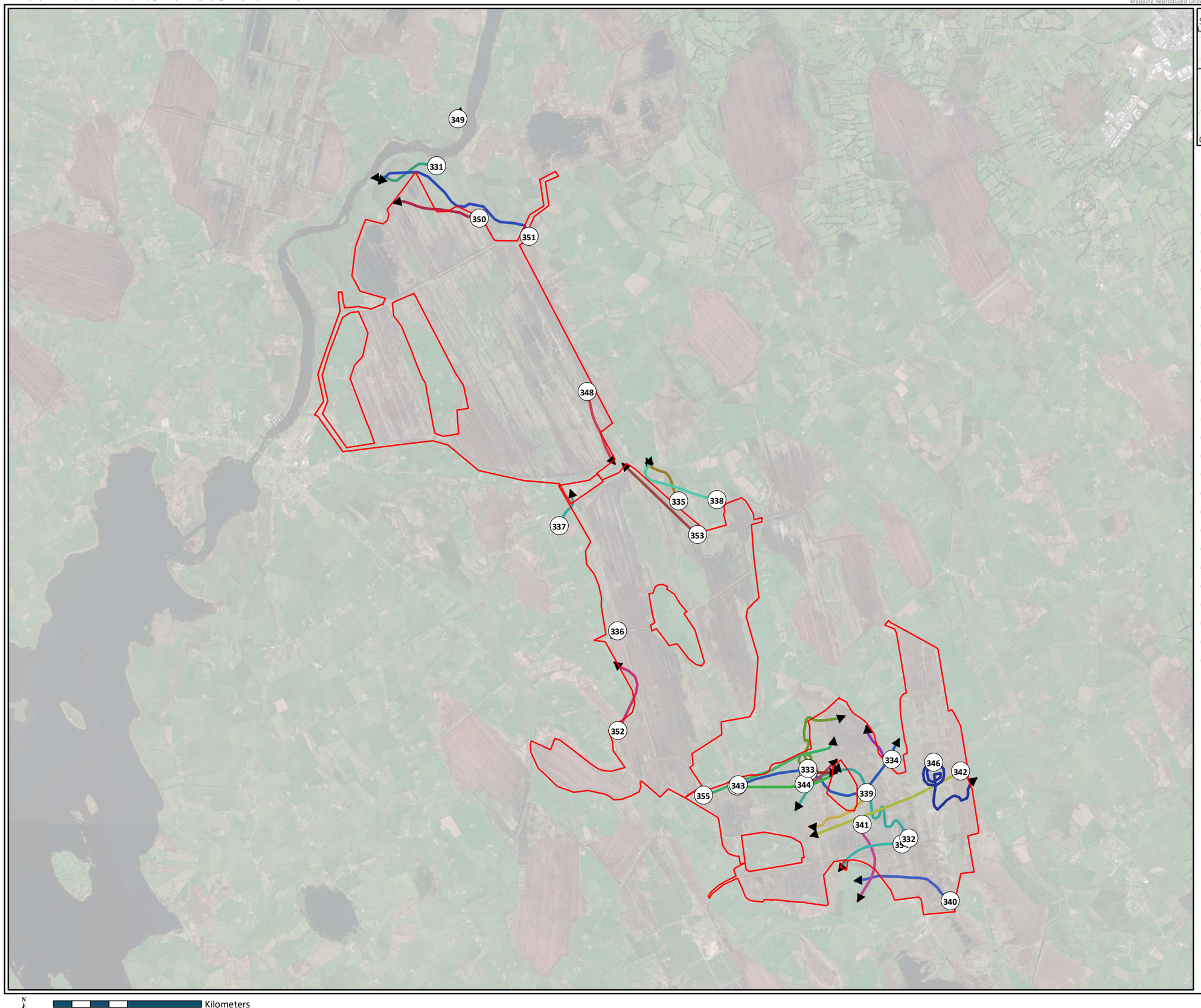

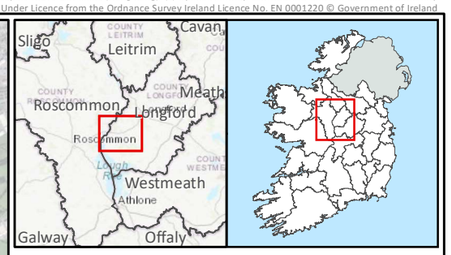

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Site Boundary

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- 333, 18/08/2021, 17:17
- 334, 18/08/2021, 18:10
- 335, 19/08/2021, 09:47
- 336, 19/08/2021, 10:15
- 337, 19/08/2021, 12:01
- 338, 19/08/2021, 13:56
- 339, 19/08/2021, 18:15
- 340, 19/08/2021, 19:10
- 341, 20/08/2021, 10:30
- 342, 20/08/2021, 11:15
- 343, 20/08/2021, 14:00
- 344, 20/08/2021, 15:33
- 345, 20/08/2021, 17:16
- 346, 20/08/2021, 18:05
- 347, 20/08/2021, 18:49
- 348, 02/09/2021, 15:17
- 349, 06/09/2021, 09:11
- 350, 06/09/2021, 10:19
- 351, 06/09/2021, 14:43
- 352, 06/09/2021, 17:10
- 353, 09/09/2021, 10:10
- 354, 13/09/2021, 11:00
- 355, 14/09/2021, 13:59

TITLE:	Summer Flightlines 2021 Lesser Black-Backed Gull 12		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
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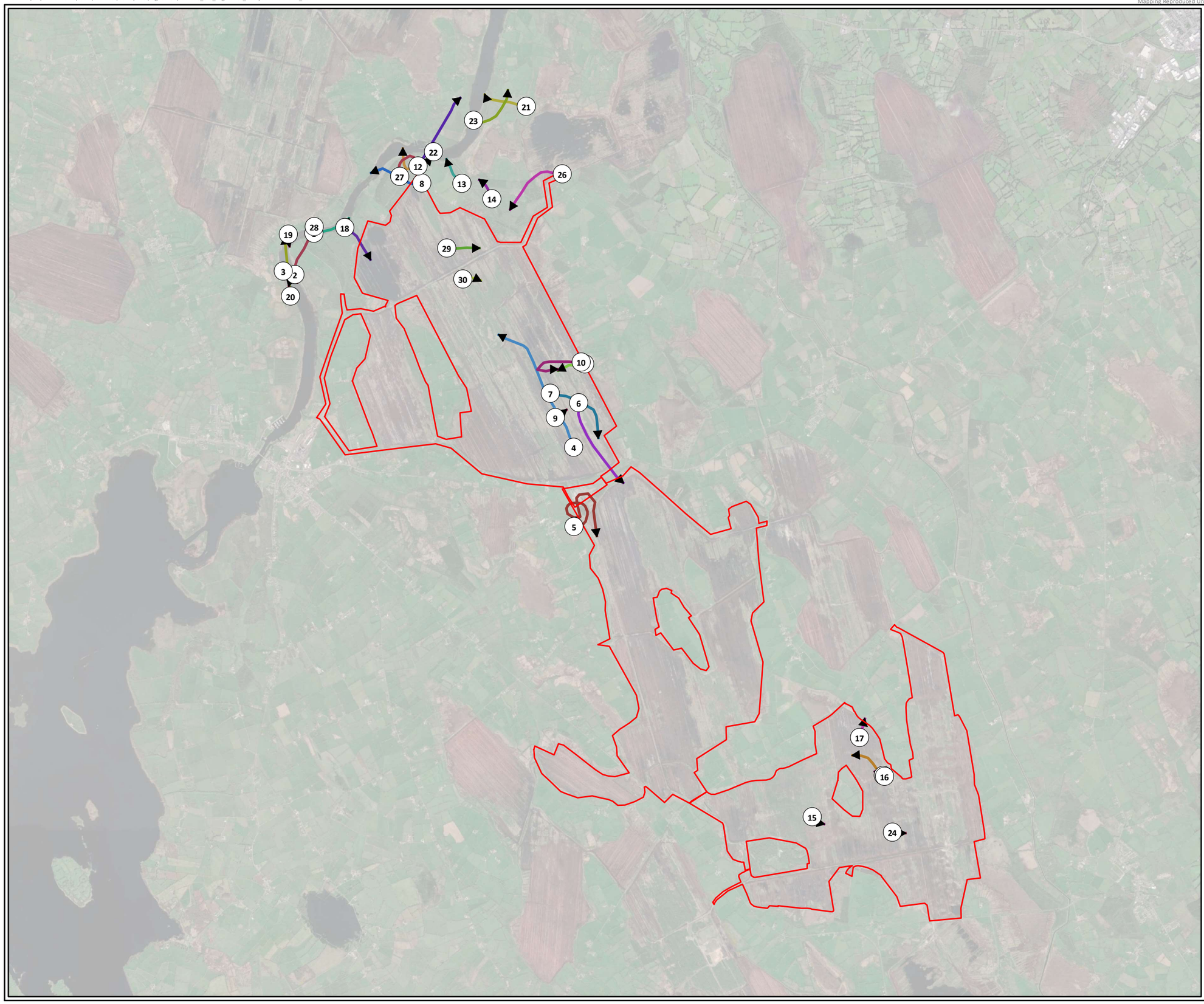

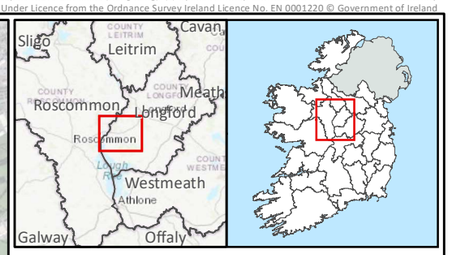

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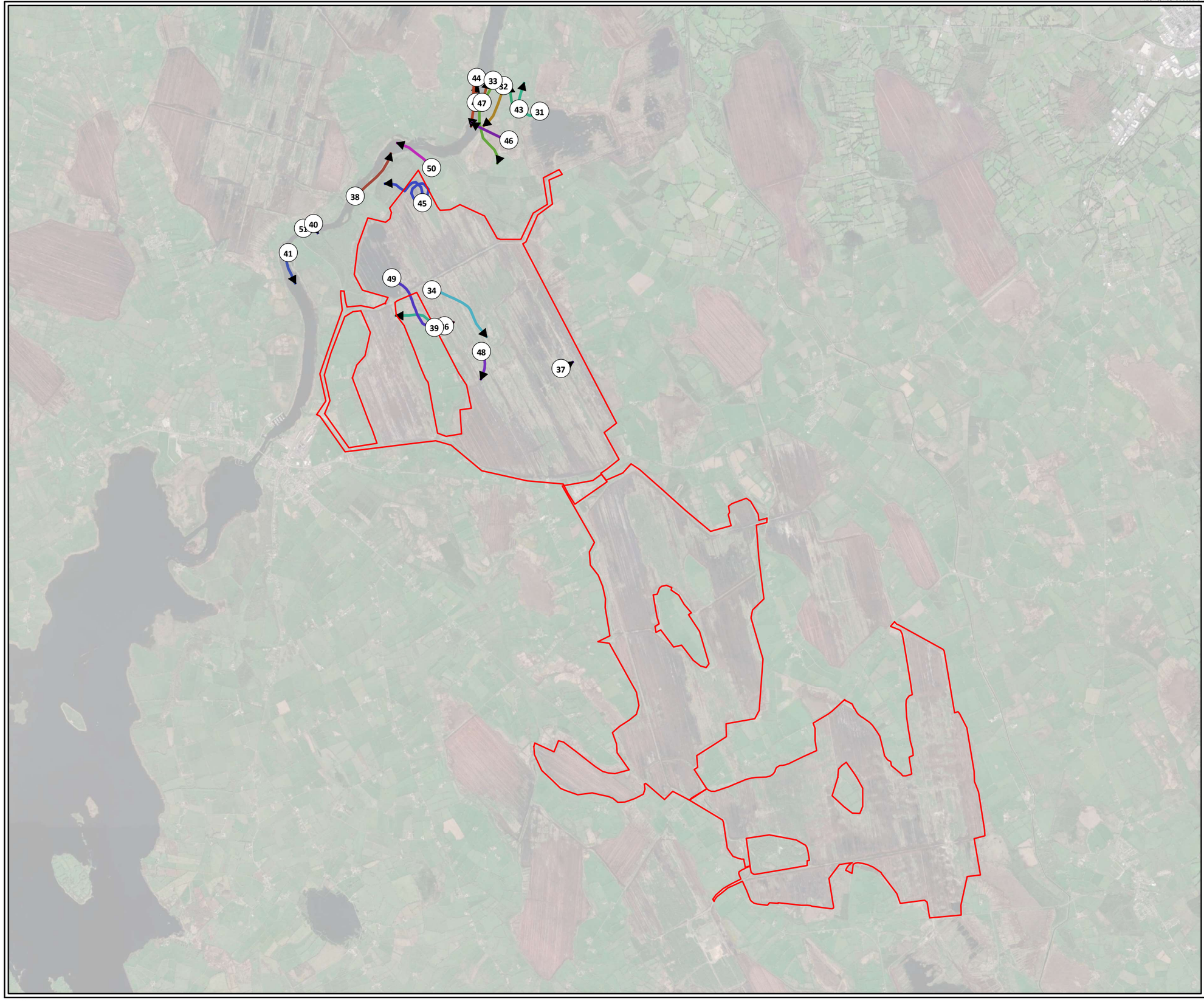

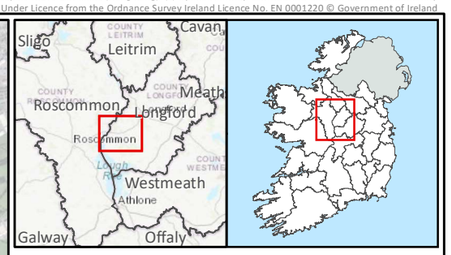

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- 39, 13/08/2021, 15:33
- 40, 17/08/2021, 11:26
- 41, 17/08/2021, 14:09
- 42, 18/08/2021, 09:09
- 43, 18/08/2021, 14:02
- 44, 18/08/2021, 15:34
- 45, 06/09/2021, 08:53
- 46, 06/09/2021, 13:22
- 47, 06/09/2021, 14:19
- 48, 07/09/2021, 14:11
- 49, 07/09/2021, 17:55
- 50, 12/09/2021, 12:11
- 51, 12/09/2021, 18:00

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TITLE:	Summer Flightlines 2021 Mallard 2		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
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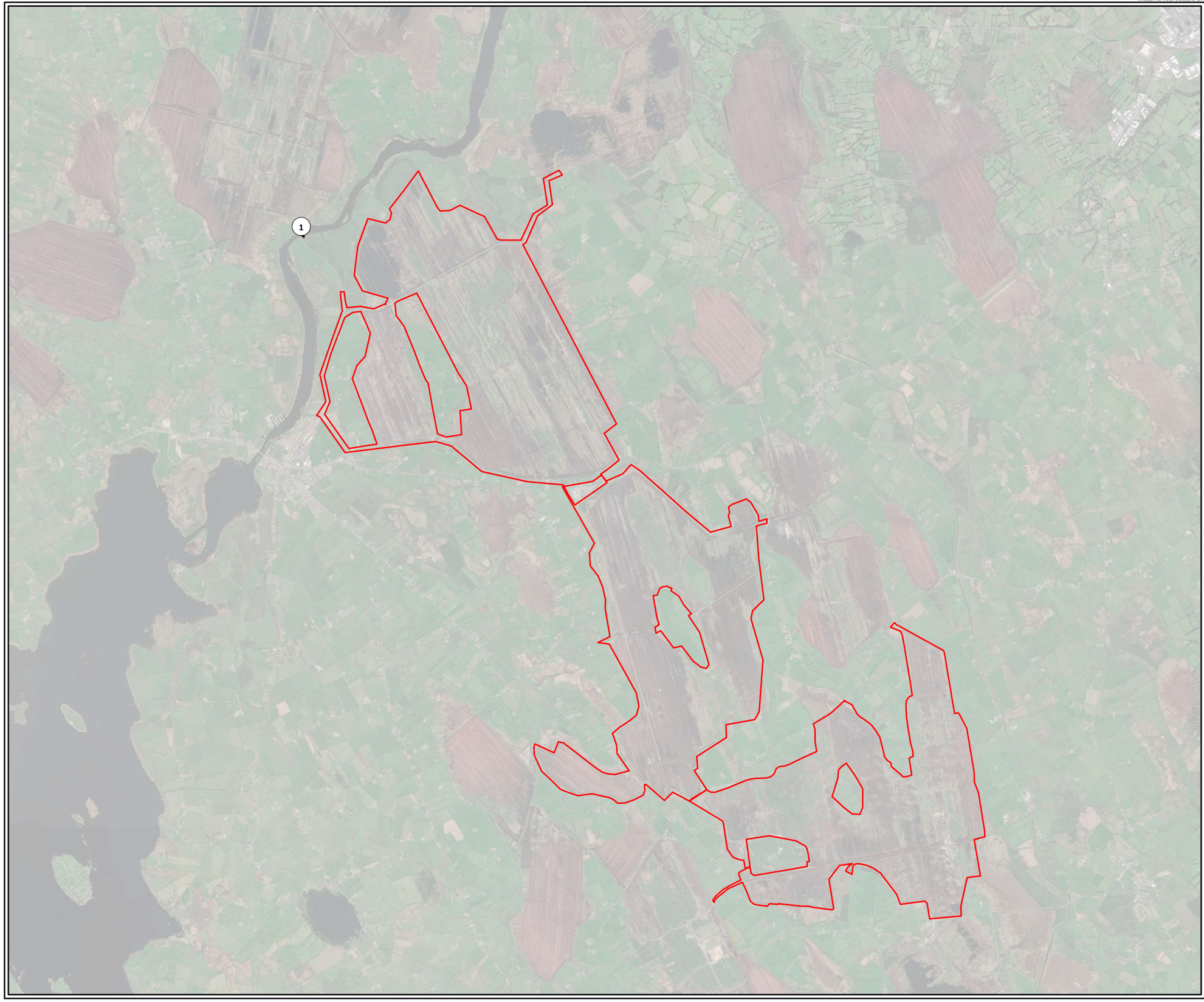

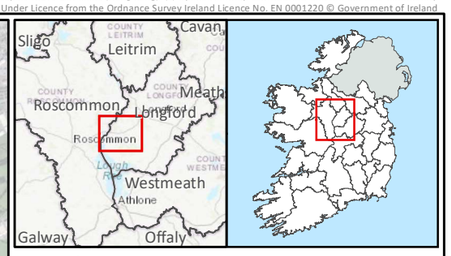

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PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
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DATE:	17/12/2021	**PAGE SIZE:**	A3

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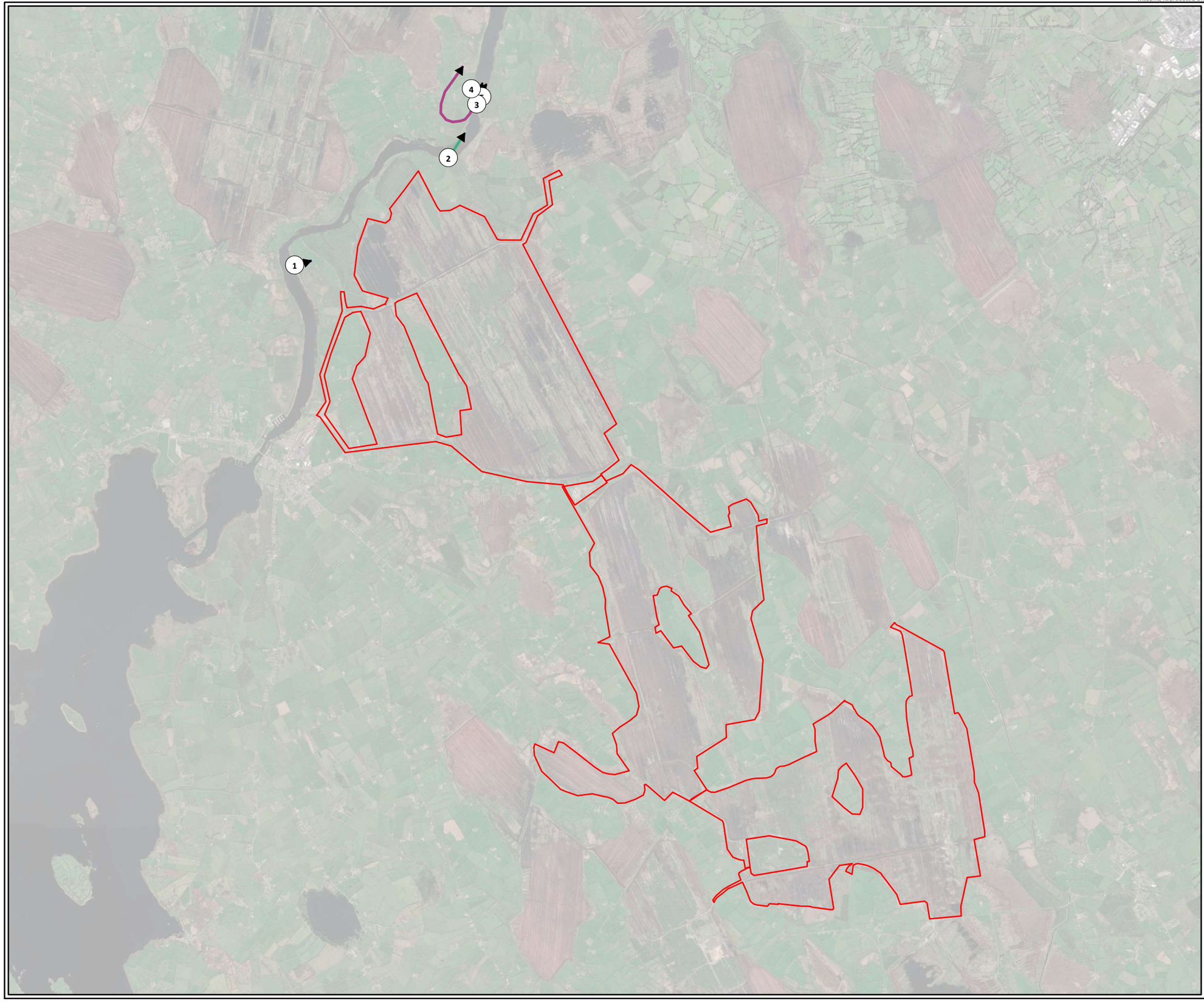

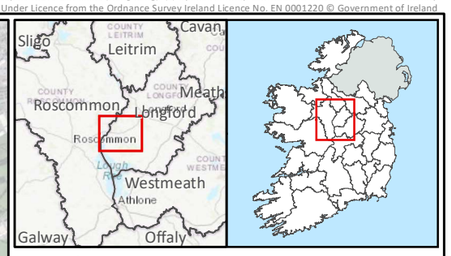

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- 4, 18/08/2021, 11:12
- 5, 06/09/2021, 11:03

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TITLE:	Summer Flightlines 2021 Mute Swan		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
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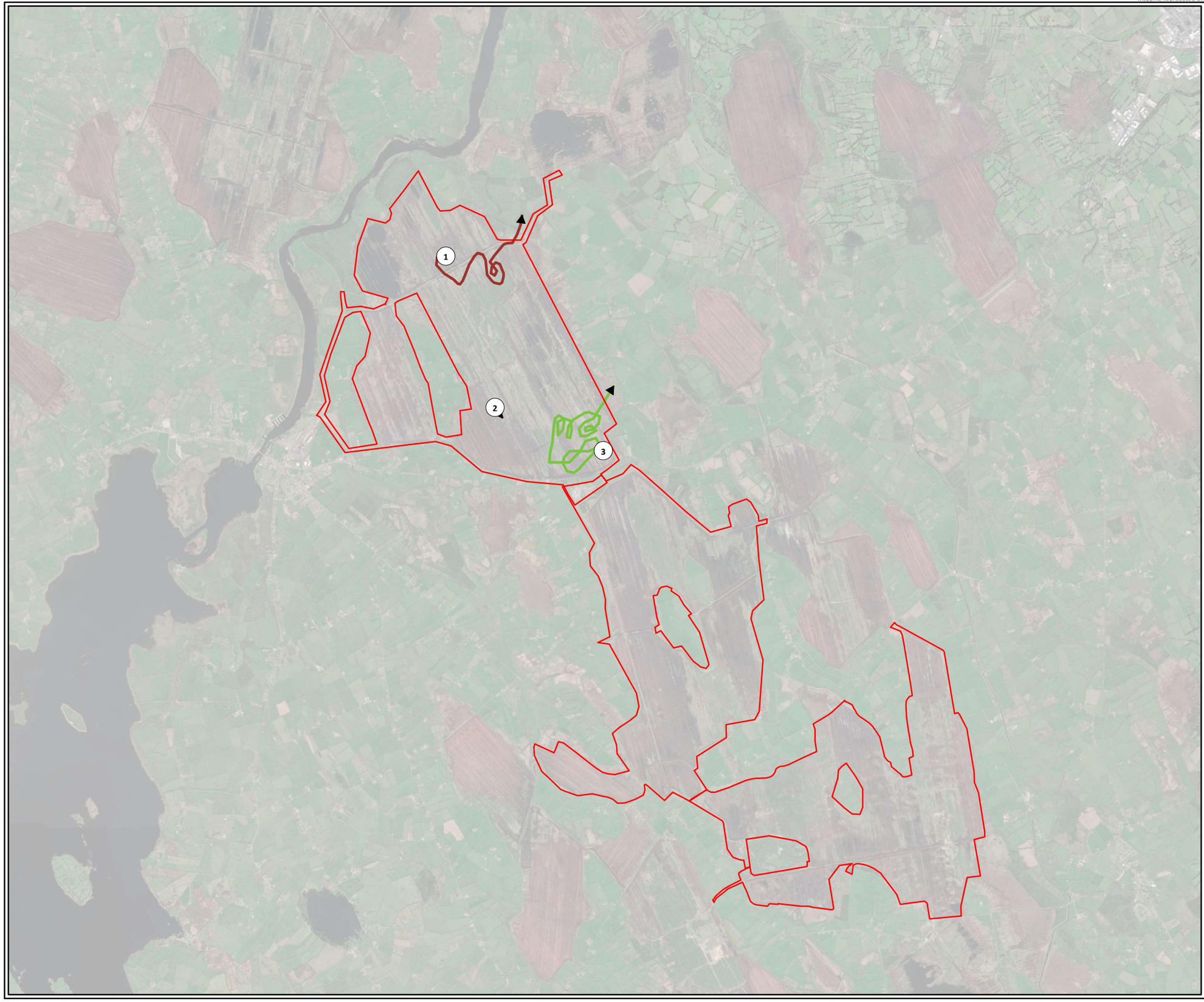

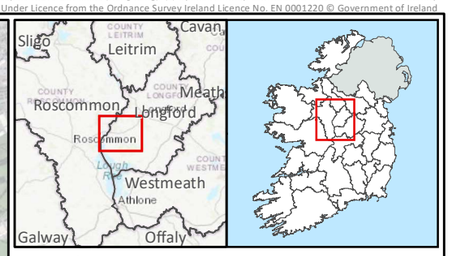

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3, 06/07/2021, 10:55

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TITLE:	Summer Flightlines 2021 Peregrine		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
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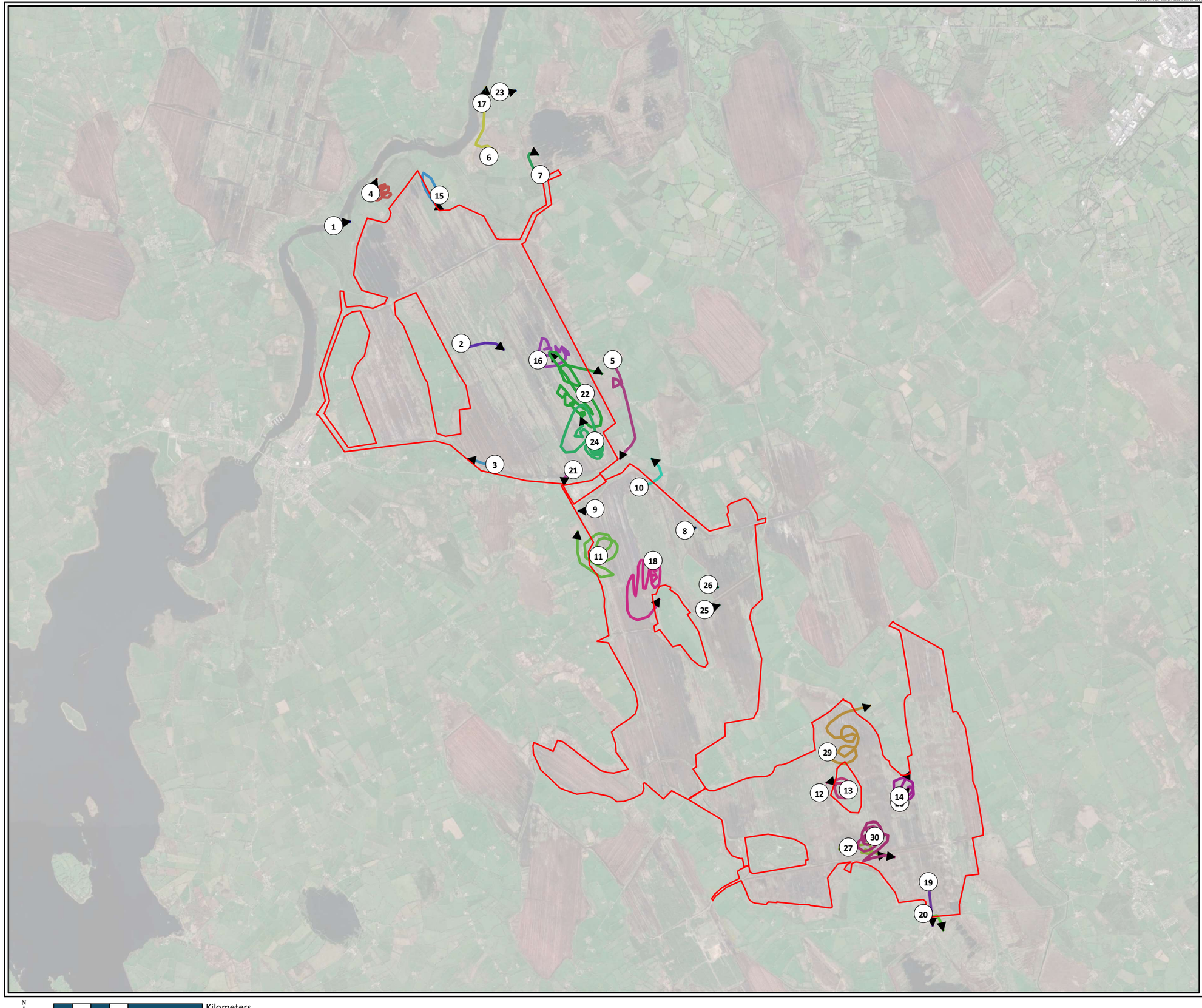

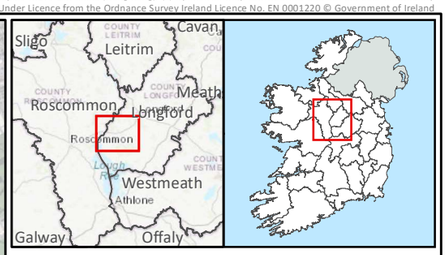

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- 7, 06/05/2021, 17:44
- 8, 07/05/2021, 11:02
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- 10, 07/05/2021, 15:42
- 11, 11/05/2021, 13:52
- 12, 21/05/2021, 10:38
- 13, 21/05/2021, 11:01
- 14, 22/05/2021, 15:50
- 15, 31/05/2021, 10:04
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- 17, 06/07/2021, 10:49
- 18, 08/07/2021, 12:29
- 19, 15/07/2021, 13:33
- 20, 15/07/2021, 18:43
- 21, 28/07/2021, 17:07
- 22, 28/07/2021, 17:51
- 23, 29/07/2021, 15:41
- 24, 29/07/2021, 20:00
- 25, 02/08/2021, 11:50
- 26, 02/08/2021, 16:45
- 27, 03/08/2021, 11:38
- 28, 03/08/2021, 16:03
- 29, 11/08/2021, 13:09
- 30, 18/08/2021, 17:42

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PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
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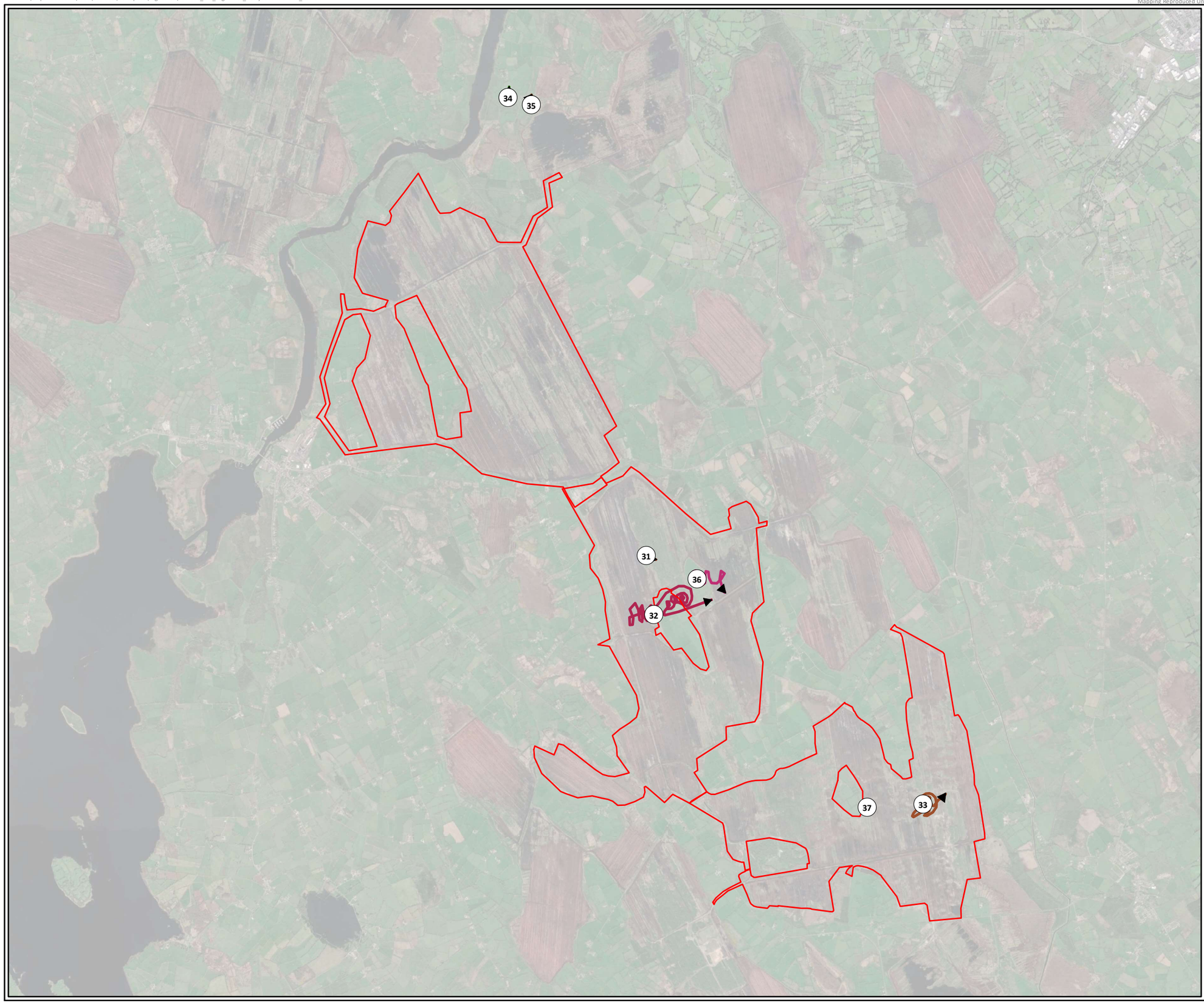

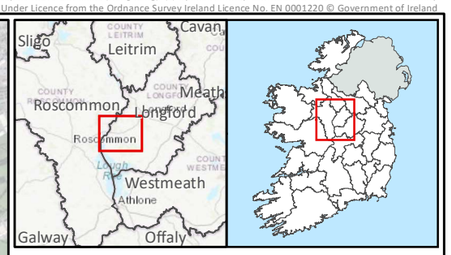

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- 35, 06/09/2021, 14:00
- 36, 09/09/2021, 11:15
- 37, 13/09/2021, 14:58

N W E S

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PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
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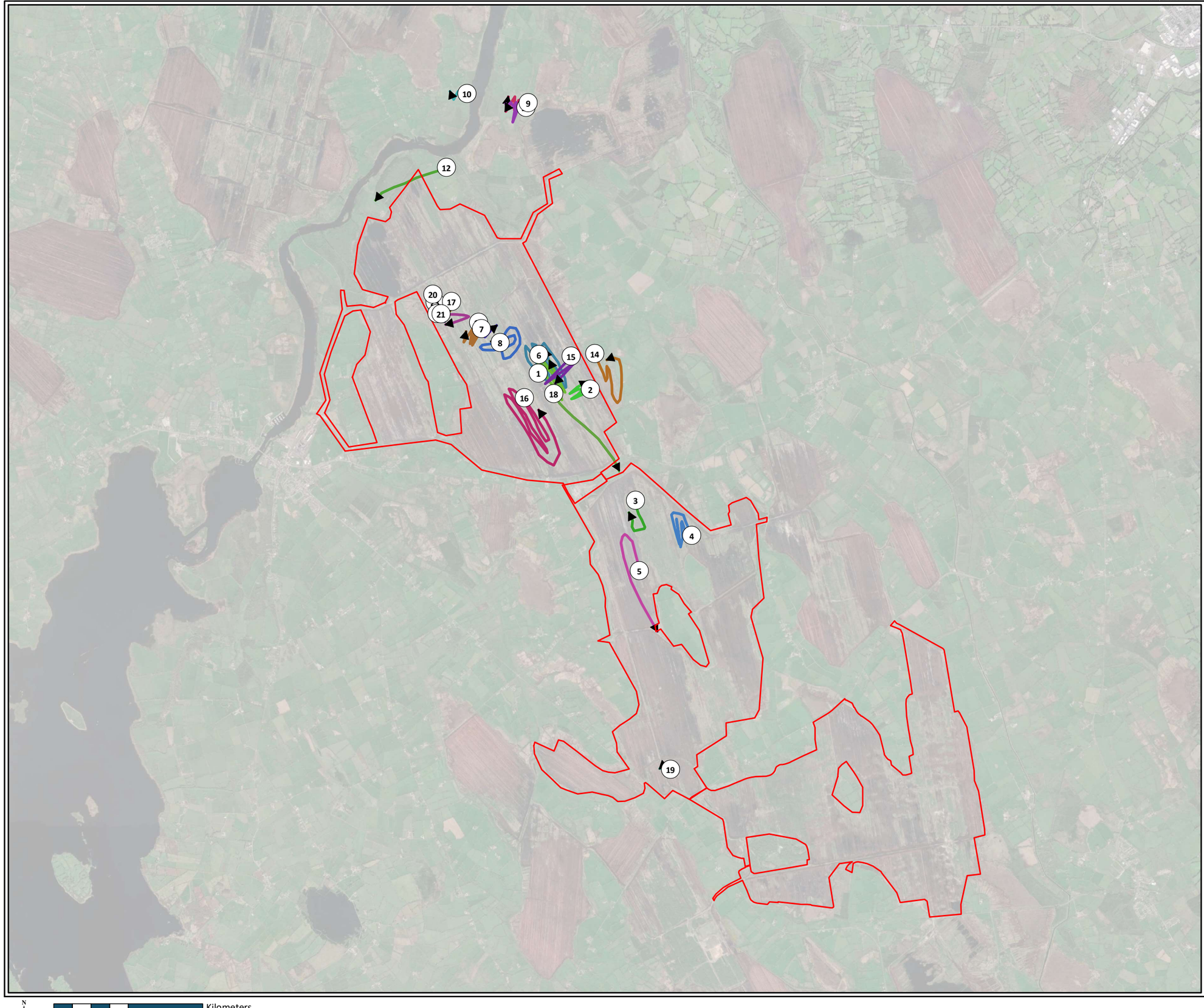

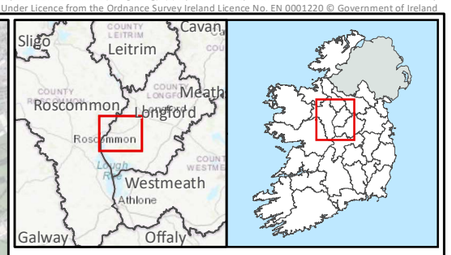

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8, 06/07/2021, 09:12
9, 06/07/2021, 09:19
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TITLE:	Summer Flightlines 2021 Snipe		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	-		
CLIENT:	Bord na Móna		
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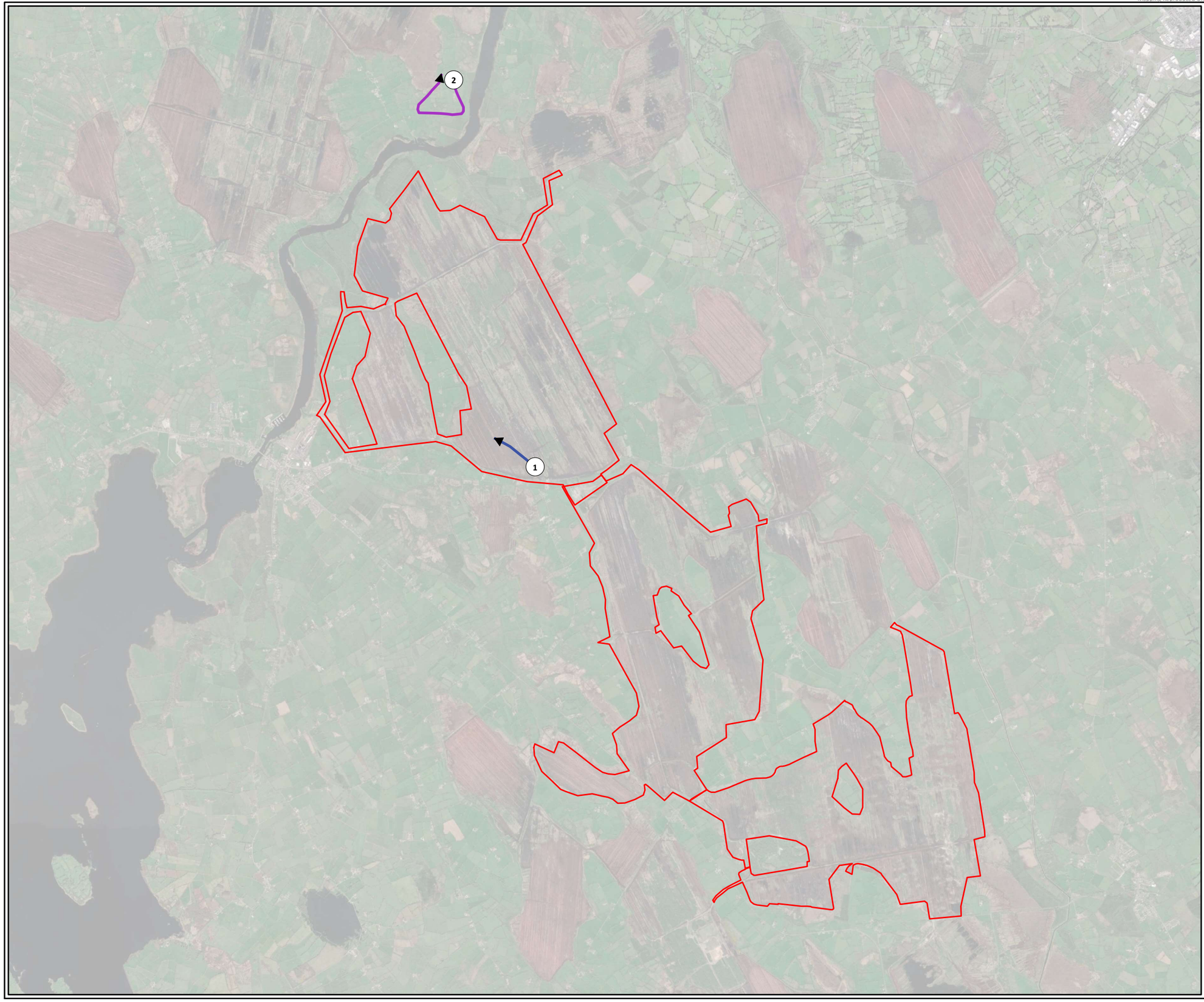

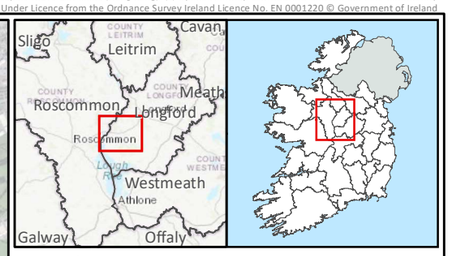

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FIGURE NO:	-		
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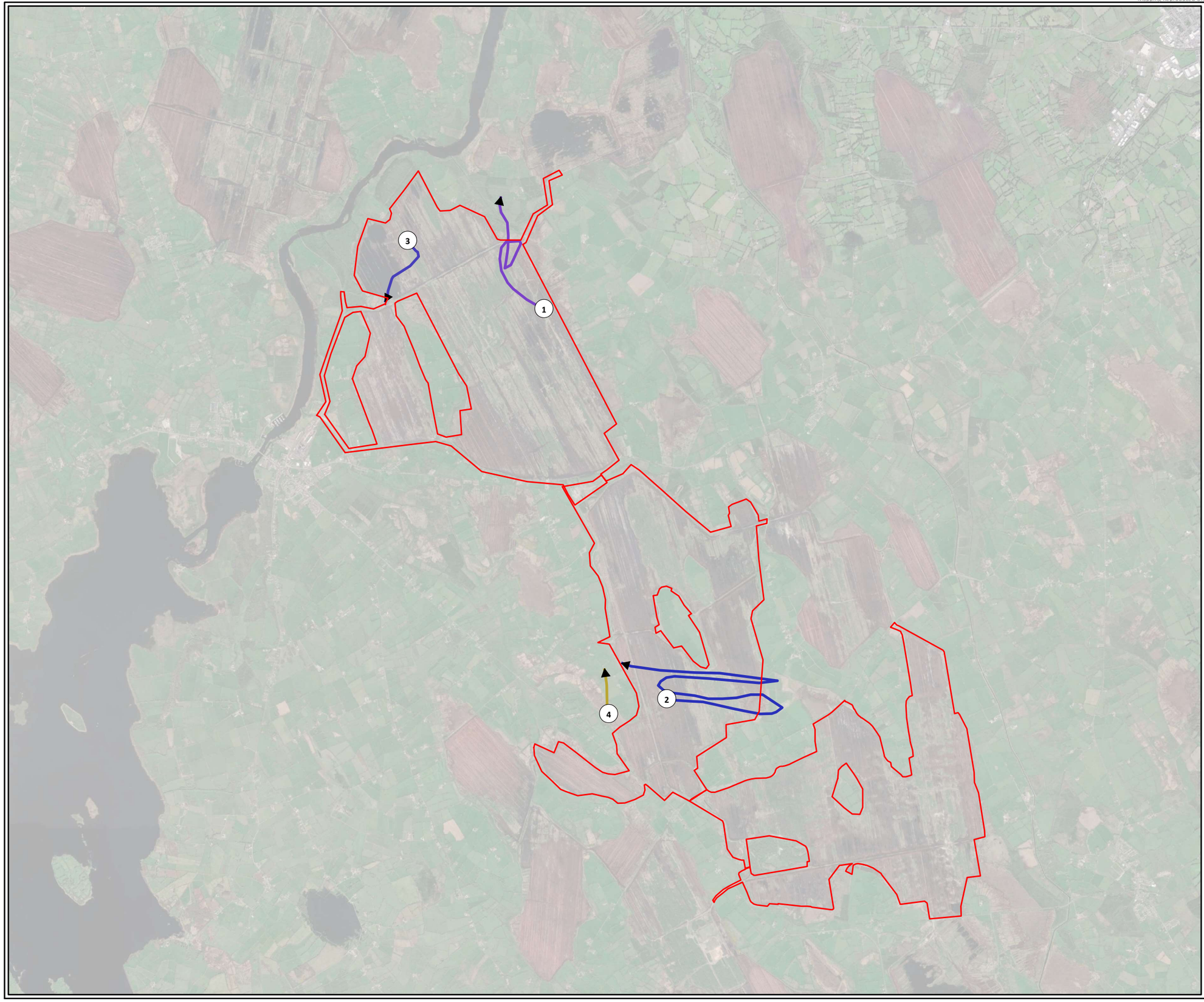

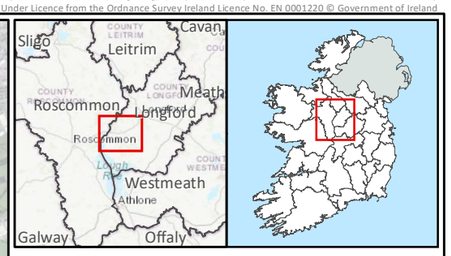

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FIGURE NO:	-		
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SCALE:	1:50000	**REVISION:**	0
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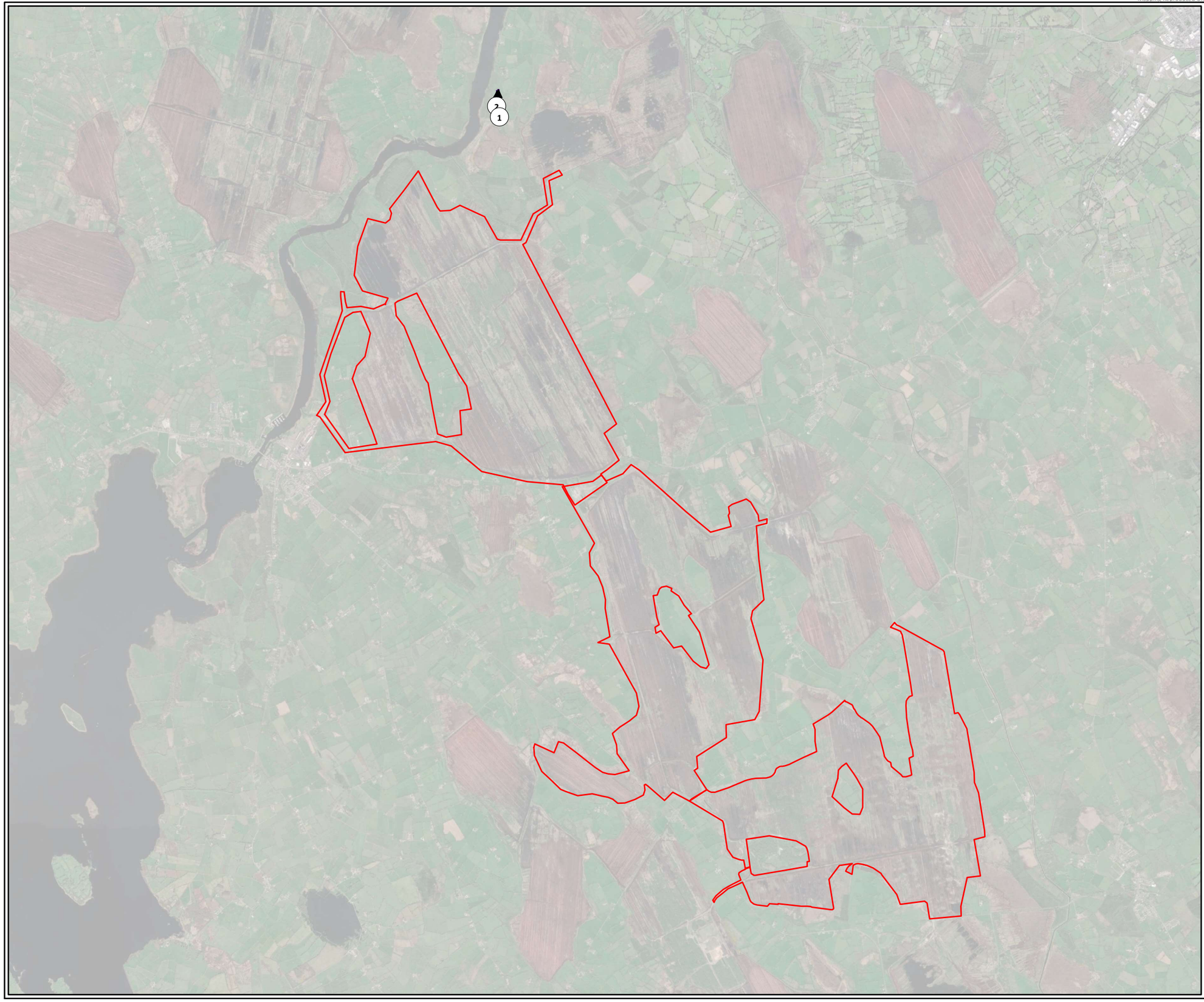

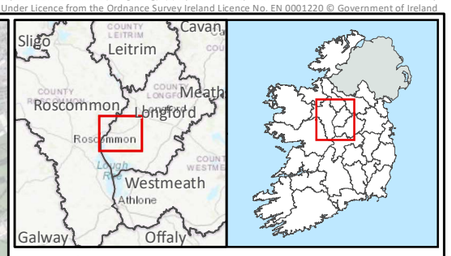

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FIGURE NO:	-		
CLIENT:	Bord na Móna		
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ENVIRONMENTAL SCIENCE
& PLANNING

APPENDIX 4

Hinterland Survey Results

Hinterland Survey Data Summer 2021

HVP	Date	Cloud	Visibility	Rain	Wind	Common Name
3	12/05/2021	6	Very Good	Dry	F1 SSE	Mute Swan
4	12/05/2021	6	Very Good	Dry	F1 SSE	Mute Swan
4	12/05/2021	6	Very Good	Dry	F1 SSE	Tufted Duck
4	12/05/2021	6	Very Good	Dry	F1 SSE	Little Grebe
4	12/05/2021	6	Very Good	Dry	F1 SSE	Moorhen
4	12/05/2021	6	Very Good	Dry	F1 SSE	Coot
4	12/05/2021	6	Very Good	Dry	F1 SSE	Little Egret
4	12/05/2021	6	Very Good	Dry	F1 SSE	Black-headed Gull
5	12/05/2021	6	Very Good	Dry	F1 SSE	Mallard
5	12/05/2021	6	Very Good	Dry	F1 SSE	Lesser Black-backed Gull
5	12/05/2021	6	Very Good	Dry	F1 SSE	Cormorant
5	12/05/2021	6	Very Good	Dry	F1 SSE	Common Tern
5	12/05/2021	6	Very Good	Dry	F1 SSE	Gadwall
5	12/05/2021	6	Very Good	Dry	F1 SSE	Tufted Duck
5	12/05/2021	6	Very Good	Dry	F1 SSE	Black-headed Gull
5	12/05/2021	6	Very Good	Dry	F1 SSE	Greylag Goose
5	12/05/2021	6	Very Good	Dry	F1 SSE	Great Crested Grebe
6	12/05/2021	6	Very Good	Dry	F1 SSE	Mallard
6	12/05/2021	6	Very Good	Dry	F1 SSE	Mute Swan
6	12/05/2021	6	Very Good	Dry	F1 SSE	Common Gull
6	12/05/2021	6	Very Good	Dry	F1 SSE	Lesser Black-backed Gull
6	12/05/2021	6	Very Good	Dry	F1 SSE	Black-headed Gull
6	12/05/2021	6	Very Good	Dry	F1 SSE	Cormorant
7	12/05/2021	6	Very Good	Dry	F1 SSE	Mute Swan
7	12/05/2021	6	Very Good	Dry	F1 SSE	Mallard
7	12/05/2021	6	Very Good	Dry	F1 SSE	Cormorant
7	12/05/2021	6	Very Good	Dry	F1 SSE	Lesser Black-backed Gull
7	12/05/2021	6	Very Good	Dry	F1 SSE	Grey Heron
7	12/05/2021	6	Very Good	Dry	F1 SSE	Black-headed Gull
10	12/05/2021	6	Very Good	Dry	F1 SSE	Mute Swan
10	12/05/2021	6	Very Good	Dry	F1 SSE	Mallard
11	13/05/2021	5	Very Good	Dry	F1 WNW	Mute Swan
11	13/05/2021	5	Very Good	Dry	F1 WNW	Great White Egret
11	13/05/2021	5	Very Good	Dry	F1 WNW	Black-headed Gull
11	13/05/2021	5	Very Good	Dry	F1 WNW	Cormorant
11	13/05/2021	5	Very Good	Dry	F1 WNW	Snipe
12	13/05/2021	5	Very Good	Dry	F1 WNW	Mute Swan
12	13/05/2021	5	Very Good	Dry	F1 WNW	Mallard
12	13/05/2021	5	Very Good	Dry	F1 WNW	Black-headed Gull
12	13/05/2021	5	Very Good	Dry	F1 WNW	Lesser Black-backed Gull
12	13/05/2021	5	Very Good	Dry	F1 WNW	Common Gull
12	13/05/2021	5	Very Good	Dry	F1 WNW	Great Crested Grebe
12	13/05/2021	5	Very Good	Dry	F1 WNW	Whimbrel
12	13/05/2021	5	Very Good	Dry	F1 WNW	Lapwing

HVP	Date	Cloud	Visibility	Rain	Wind	Common Name
12	13/05/2021	5	Very Good	Dry	F1 WNW	Cormorant
13	13/05/2021	5	Very Good	Dry	F1 WNW	Mallard
14	13/05/2021	5	Very Good	Dry	F1 WNW	Lesser Black-backed Gull
15	13/05/2021	5	Very Good	Dry	F1 WNW	Mute Swan
15	13/05/2021	5	Very Good	Dry	F1 WNW	Lesser Black-backed Gull
15	13/05/2021	5	Very Good	Dry	F1 WNW	Grey Heron
15	13/05/2021	5	Very Good	Dry	F1 WNW	Black-headed Gull
15	13/05/2021	5	Very Good	Dry	F1 WNW	Grey Wagtail
16	13/05/2021	5	Very Good	Dry	F1 WNW	Grey Wagtail
8	14/05/2021	7	Very Good	Dry	F1 S	Mute Swan
8	14/05/2021	7	Very Good	Dry	F1 S	Mallard
8	14/05/2021	7	Very Good	Dry	F1 S	Pink-footed Goose
8	14/05/2021	7	Very Good	Dry	F1 S	Kingfisher
8	14/05/2021	7	Very Good	Dry	F1 S	Whimbrel
8	14/05/2021	7	Very Good	Dry	F1 S	Tufted Duck
8	14/05/2021	7	Very Good	Dry	F1 S	Black-headed Gull
8	14/05/2021	7	Very Good	Dry	F1 S	Common Gull
9	14/05/2021	7	Very Good	Dry	F1 S	Black-headed Gull
9	14/05/2021	7	Very Good	Dry	F1 S	Cormorant
9	14/05/2021	7	Very Good	Dry	F1 S	Tufted Duck
9	14/05/2021	7	Very Good	Dry	F1 S	Great Crested Grebe
9	14/05/2021	7	Very Good	Dry	F1 S	Lesser Black-backed Gull
20	14/05/2021	6	Very Good	Dry	F1 S	Grey Wagtail
21	14/05/2021	6	Very Good	Dry	F1 S	Buzzard
21	14/05/2021	6	Very Good	Dry	F1 S	Grey Heron
23	14/05/2021	6	Very Good	Dry	F1 S	Grey Wagtail
25	14/05/2021	6	Very Good	Dry	F1 S	Grey Wagtail
11	11/06/2021	4	Very Good	Dry	F1 SSE	Cormorant
11	11/06/2021	4	Very Good	Dry	F1 SSE	Mute Swan
12	11/06/2021	4	Very Good	Dry	F1 SSE	Lesser Black-backed Gull
12	11/06/2021	4	Very Good	Dry	F1 SSE	Great Crested Grebe
12	11/06/2021	4	Very Good	Dry	F1 SSE	Black-headed Gull
12	11/06/2021	4	Very Good	Dry	F1 SSE	Mute Swan
13	11/06/2021	4	Very Good	Dry	F1 SSE	Buzzard
14	11/06/2021	4	Very Good	Dry	F1 SSE	Lesser Black-backed Gull
15	11/06/2021	4	Very Good	Dry	F1 SSE	Cormorant
15	11/06/2021	4	Very Good	Dry	F1 SSE	Lesser Black-backed Gull
15	11/06/2021	4	Very Good	Dry	F1 SSE	Black-headed Gull
15	11/06/2021	4	Very Good	Dry	F1 SSE	Mute Swan
16	11/06/2021	4	Very Good	Dry	F1 SSE	Black-headed Gull
16	11/06/2021	4	Very Good	Dry	F1 SSE	Grey Heron
18	11/06/2021	4	Very Good	Dry	F1 SSE	Buzzard
20	11/06/2021	4	Very Good	Dry	F1 SSE	Black-headed Gull
21	11/06/2021	4	Very Good	Dry	F1 SSE	Lesser Black-backed Gull
23	11/06/2021	4	Very Good	Dry	F1 SSE	Lesser Black-backed Gull

HVP	Date	Cloud	Visibility	Rain	Wind	Common Name
2	12/06/2021	6	Very Good	Dry	F1 SW	Grey Heron
3	12/06/2021	6	Very Good	Dry	F1 SW	Mute Swan
4	12/06/2021	6	Very Good	Dry	F1 SW	Snipe
4	12/06/2021	6	Very Good	Dry	F1 SW	Wigeon
4	12/06/2021	6	Very Good	Dry	F1 SW	Little Egret
4	12/06/2021	6	Very Good	Dry	F1 SW	Grey Heron
4	12/06/2021	6	Very Good	Dry	F1 SW	Moorhen
4	12/06/2021	6	Very Good	Dry	F1 SW	Coot
4	12/06/2021	6	Very Good	Dry	F1 SW	Black-headed Gull
4	12/06/2021	6	Very Good	Dry	F1 SW	Mallard
4	12/06/2021	6	Very Good	Dry	F1 SW	Tufted Duck
5	12/06/2021	6	Very Good	Dry	F1 SW	Gadwall
5	12/06/2021	6	Very Good	Dry	F1 SW	Common Tern
5	12/06/2021	6	Very Good	Dry	F1 SW	Little Egret
5	12/06/2021	6	Very Good	Dry	F1 SW	Tufted Duck
5	12/06/2021	6	Very Good	Dry	F1 SW	Lesser Black-backed Gull
5	12/06/2021	6	Very Good	Dry	F1 SW	Black-headed Gull
5	12/06/2021	6	Very Good	Dry	F1 SW	Cormorant
5	12/06/2021	6	Very Good	Dry	F1 SW	Great Crested Grebe
5	12/06/2021	6	Very Good	Dry	F1 SW	Coot
5	12/06/2021	6	Very Good	Dry	F1 SW	Mute Swan
6	12/06/2021	6	Very Good	Dry	F1 SW	Cormorant
6	12/06/2021	6	Very Good	Dry	F1 SW	Little Egret
6	12/06/2021	6	Very Good	Dry	F1 SW	Black-headed Gull
6	12/06/2021	6	Very Good	Dry	F1 SW	Lesser Black-backed Gull
6	12/06/2021	6	Very Good	Dry	F1 SW	Mallard
7	12/06/2021	6	Very Good	Dry	F1 SW	Grey Wagtail
7	12/06/2021	6	Very Good	Dry	F1 SW	Black-headed Gull
8	12/06/2021	6	Very Good	Dry	F1 SW	Oystercatcher
8	12/06/2021	6	Very Good	Dry	F1 SW	Common Tern
8	12/06/2021	6	Very Good	Dry	F1 SW	Little Egret
8	12/06/2021	6	Very Good	Dry	F1 SW	Moorhen
8	12/06/2021	6	Very Good	Dry	F1 SW	Coot
8	12/06/2021	6	Very Good	Dry	F1 SW	Black-headed Gull
8	12/06/2021	6	Very Good	Dry	F1 SW	Lesser Black-backed Gull
8	12/06/2021	6	Very Good	Dry	F1 SW	Mute Swan
8	12/06/2021	6	Very Good	Dry	F1 SW	Mallard
9	12/06/2021	6	Very Good	Dry	F1 SW	Black-headed Gull
9	12/06/2021	6	Very Good	Dry	F1 SW	Coot
9	12/06/2021	6	Very Good	Dry	F1 SW	Lesser Black-backed Gull
9	12/06/2021	4	Very Good	Dry	F1 SW	Cormorant
9	12/06/2021	6	Very Good	Dry	F1 SW	Mute Swan
10	12/06/2021	4	Very Good	Dry	F1 SW	Cormorant
10	12/06/2021	4	Very Good	Dry	F1 SW	Mute Swan
10	12/06/2021	4	Very Good	Dry	F1 SW	Black-headed Gull

HVP	Date	Cloud	Visibility	Rain	Wind	Common Name
10	12/06/2021	4	Very Good	Dry	F1 SW	Mallard
1	17/07/2021	2	Very Good	Dry	F1 N	Lesser Black-backed Gull
1	17/07/2021	2	Very Good	Dry	F1 N	Grey Wagtail
4	17/07/2021	2	Very Good	Dry	F1 N	Snipe
4	17/07/2021	2	Very Good	Dry	F1 N	Buzzard
4	17/07/2021	2	Very Good	Dry	F1 N	Coot
4	17/07/2021	2	Very Good	Dry	F1 N	Moorhen
4	17/07/2021	2	Very Good	Dry	F1 N	Water Rail
4	17/07/2021	2	Very Good	Dry	F1 N	Little Egret
4	17/07/2021	2	Very Good	Dry	F1 N	Grey Heron
4	17/07/2021	2	Very Good	Dry	F1 N	Lapwing
4	17/07/2021	2	Very Good	Dry	F1 N	Mallard
5	17/07/2021	2	Very Good	Dry	F1 N	Gadwall
5	17/07/2021	2	Very Good	Dry	F1 N	Tufted Duck
5	17/07/2021	2	Very Good	Dry	F1 N	Black-headed Gull
5	17/07/2021	2	Very Good	Dry	F1 N	Great Crested Grebe
5	17/07/2021	2	Very Good	Dry	F1 N	Cormorant
5	17/07/2021	2	Very Good	Dry	F1 N	Mallard
5	17/07/2021	2	Very Good	Dry	F1 N	Mute Swan
5	17/07/2021	2	Very Good	Dry	F1 N	Lesser Black-backed Gull
6	17/07/2021	2	Very Good	Dry	F1 N	Black-headed Gull
6	17/07/2021	2	Very Good	Dry	F1 N	Cormorant
6	17/07/2021	2	Very Good	Dry	F1 N	Mute Swan
6	17/07/2021	2	Very Good	Dry	F1 N	Lesser Black-backed Gull
7	17/07/2021	2	Very Good	Dry	F1 N	Lesser Black-backed Gull
7	17/07/2021	2	Very Good	Dry	F1 N	Black-headed Gull
7	17/07/2021	2	Very Good	Dry	F1 N	Mute Swan
7	17/07/2021	2	Very Good	Dry	F1 N	Mallard
8	17/07/2021	2	Very Good	Dry	F1 N	Lapwing
8	17/07/2021	2	Very Good	Dry	F1 N	Gadwall
8	17/07/2021	2	Very Good	Dry	F1 N	Grey Heron
8	17/07/2021	2	Very Good	Dry	F1 N	Little Egret
8	17/07/2021	2	Very Good	Dry	F1 N	Tufted Duck
8	17/07/2021	2	Very Good	Dry	F1 N	Lesser Black-backed Gull
8	17/07/2021	2	Very Good	Dry	F1 N	Black-headed Gull
8	17/07/2021	2	Very Good	Dry	F1 N	Pochard
8	17/07/2021	2	Very Good	Dry	F1 N	Mute Swan
8	17/07/2021	2	Very Good	Dry	F1 N	Mallard
9	17/07/2021	2	Very Good	Dry	F1 N	Lesser Black-backed Gull
9	17/07/2021	2	Very Good	Dry	F1 N	Tufted Duck
9	17/07/2021	2	Very Good	Dry	F1 N	Black-headed Gull
9	17/07/2021	2	Very Good	Dry	F1 N	Common Gull
9	17/07/2021	2	Very Good	Dry	F1 N	Gadwall
9	17/07/2021	2	Very Good	Dry	F1 N	Cormorant
9	17/07/2021	2	Very Good	Dry	F1 N	Little Egret

HVP	Date	Cloud	Visibility	Rain	Wind	Common Name
9	17/07/2021	2	Very Good	Dry	F1 N	Grey Heron
9	17/07/2021	2	Very Good	Dry	F1 N	Common Tern
9	17/07/2021	2	Very Good	Dry	F1 N	Mute Swan
10	17/07/2021	2	Very Good	Dry	F1 N	Mute Swan
10	17/07/2021	2	Very Good	Dry	F1 N	Grey Heron
11	17/07/2021	2	Very Good	Dry	F1 N	Black-headed Gull
11	17/07/2021	2	Very Good	Dry	F1 N	Lesser Black-backed Gull
11	17/07/2021	2	Very Good	Dry	F1 N	Great Crested Grebe
11	17/07/2021	2	Very Good	Dry	F1 N	Mute Swan
11	17/07/2021	2	Very Good	Dry	F1 N	Mallard
12	17/07/2021	2	Very Good	Dry	F1 N	Great Crested Grebe
12	17/07/2021	2	Very Good	Dry	F1 N	Mute Swan
13	17/07/2021	2	Very Good	Dry	F1 N	Mute Swan
14	17/07/2021	2	Very Good	Dry	F1 N	Common Gull
15	17/07/2021	2	Very Good	Dry	F1 N	Lesser Black-backed Gull
20	17/07/2021	2	Very Good	Dry	F1 N	Grey Wagtail
1	05/08/2021	8	Good	Showers	F2 SSW	Grey Heron
2	05/08/2021	8	Good	Showers	F2 SSW	Mallard
4	05/08/2021	8	Good	Showers	F2 SSW	Lesser Black-backed Gull
4	05/08/2021	8	Good	Showers	F2 SSW	Coot
4	05/08/2021	8	Good	Showers	F2 SSW	Little Egret
4	05/08/2021	8	Good	Showers	F2 SSW	Grey Heron
4	05/08/2021	8	Good	Showers	F2 SSW	Water Rail
4	05/08/2021	8	Good	Showers	F2 SSW	Mallard
5	05/08/2021	8	Good	Showers	F2 SSW	Lesser Black-backed Gull
5	05/08/2021	8	Good	Showers	F2 SSW	Cormorant
5	05/08/2021	8	Good	Showers	F2 SSW	Black-headed Gull
5	05/08/2021	8	Good	Showers	F2 SSW	Coot
5	05/08/2021	8	Good	Showers	F2 SSW	Tufted Duck
5	05/08/2021	8	Good	Showers	F2 SSW	Great Crested Grebe
5	05/08/2021	8	Good	Showers	F2 SSW	Mallard
5	05/08/2021	8	Good	Showers	F2 SSW	Mute Swan
6	05/08/2021	8	Good	Showers	F2 SSW	Black-headed Gull
6	05/08/2021	8	Good	Showers	F2 SSW	Lesser Black-backed Gull
8	05/08/2021	8	Good	Showers	F2 SSW	Lapwing
8	05/08/2021	8	Good	Showers	F2 SSW	Black-headed Gull
8	05/08/2021	8	Good	Showers	F2 SSW	Coot
8	05/08/2021	8	Good	Showers	F2 SSW	Moorhen
8	05/08/2021	8	Good	Showers	F2 SSW	Little Egret
8	05/08/2021	8	Good	Showers	F2 SSW	Little Grebe
8	05/08/2021	8	Good	Showers	F2 SSW	Great Crested Grebe
8	05/08/2021	8	Good	Showers	F2 SSW	Mallard
8	05/08/2021	8	Good	Showers	F2 SSW	Mute Swan
8	05/08/2021	8	Good	Showers	F2 SSW	Tufted Duck
9	05/08/2021	8	Good	Showers	F2 SSW	Cormorant

HVP	Date	Cloud	Visibility	Rain	Wind	Common Name
9	05/08/2021	8	Good	Showers	F2 SSW	Coot
9	05/08/2021	8	Good	Showers	F2 SSW	Great Crested Grebe
9	05/08/2021	8	Good	Showers	F2 SSW	Tufted Duck
9	05/08/2021	8	Good	Showers	F2 SSW	Mallard
9	05/08/2021	8	Good	Showers	F2 SSW	Mute Swan
9	05/08/2021	8	Good	Showers	F2 SSW	Lesser Black-backed Gull
9	05/08/2021	8	Good	Showers	F2 SSW	Black-headed Gull
10	05/08/2021	8	Good	Showers	F2 SSW	Mute Swan
10	05/08/2021	8	Good	Showers	F2 SSW	Mallard
11	05/08/2021	8	Good	Showers	F2 SSW	Great Crested Grebe
11	05/08/2021	8	Good	Showers	F2 SSW	Moorhen
11	05/08/2021	8	Good	Showers	F2 SSW	Mute Swan
12	05/08/2021	8	Good	Showers	F2 SSW	Cormorant
12	05/08/2021	8	Good	Showers	F2 SSW	Great Crested Grebe
12	05/08/2021	8	Good	Showers	F2 SSW	Mute Swan
14	05/08/2021	8	Good	Showers	F2 SSW	Lesser Black-backed Gull
15	05/08/2021	8	Good	Showers	F2 SSW	Grey Wagtail
15	05/08/2021	8	Good	Showers	F2 SSW	Lesser Black-backed Gull
15	05/08/2021	8	Good	Showers	F2 SSW	Mallard
15	05/08/2021	8	Good	Showers	F2 SSW	Mute Swan
18	05/08/2021	8	Good	Showers	F2 SSW	Buzzard
20	05/08/2021	8	Good	Showers	F2 SSW	Kingfisher
20	05/08/2021	8	Good	Showers	F2 SSW	Mallard
20	05/08/2021	8	Good	Showers	F2 SSW	Grey Wagtail
25	05/08/2021	8	Good	Showers	F2 SSW	Lesser Black-backed Gull
1	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Mallard
4	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Moorhen
4	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Coot
4	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Little Egret
4	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Water Rail
4	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Grey Heron
5	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Mallard
5	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Mute Swan
5	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Wigeon
5	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Cormorant
5	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Lesser Black-backed Gull
5	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Tufted Duck
5	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Coot
5	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Moorhen
5	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Little Grebe
5	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Black-headed Gull
5	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Great Crested Grebe
6	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Mallard
6	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Buzzard
6	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Lesser Black-backed Gull

HVP	Date	Cloud	Visibility	Rain	Wind	Common Name
7	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Mute Swan
7	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Lesser Black-backed Gull
8	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Mute Swan
8	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Mallard
8	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Common Sandpiper
8	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Lapwing
8	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Tufted Duck
8	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Little Grebe
8	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Coot
8	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Moorhen
8	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Buzzard
8	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Lesser Black-backed Gull
8	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Moorhen
8	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Great Crested Grebe
8	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Moorhen
9	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Little Egret
9	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Mute Swan
9	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Lesser Black-backed Gull
9	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Common Gull
9	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Black-headed Gull
9	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Cormorant
9	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Mallard
9	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Little Grebe
9	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Great Crested Grebe
9	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Tufted Duck
9	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Coot
9	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Moorhen
10	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Mallard
11	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Mallard
11	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Great Crested Grebe
11	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Grey Heron
11	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Little Egret
12	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Mute Swan
12	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Mallard
12	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Moorhen
12	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Water Rail
14	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Lesser Black-backed Gull
15	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Mute Swan
15	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Lesser Black-backed Gull
15	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Little Egret
17	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Lesser Black-backed Gull
22	14/08/2021	8	Good	Showers-Light Rain	F1 SSE	Lesser Black-backed Gull
1	09/09/2021	3	Very Good	Showers	F2 SSE	Mallard
1	09/09/2021	3	Very Good	Showers	F2 SSE	Moorhen
2	09/09/2021	3	Very Good	Showers	F2 SSE	Kingfisher

HVP	Date	Cloud	Visibility	Rain	Wind	Common Name
2	09/09/2021	3	Very Good	Showers	F2 SSE	Grey Heron
4	09/09/2021	3	Very Good	Showers	F2 SSE	Little Egret
4	09/09/2021	3	Very Good	Showers	F2 SSE	Water Rail
4	09/09/2021	3	Very Good	Showers	F2 SSE	Moorhen
4	09/09/2021	3	Very Good	Showers	F2 SSE	Grey Heron
4	09/09/2021	3	Very Good	Showers	F2 SSE	Buzzard
5	09/09/2021	3	Very Good	Showers	F2 SSE	Mallard
5	09/09/2021	3	Very Good	Showers	F2 SSE	Mute Swan
5	09/09/2021	3	Very Good	Showers	F2 SSE	Lesser Black-backed Gull
5	09/09/2021	3	Very Good	Showers	F2 SSE	Black-headed Gull
5	09/09/2021	3	Very Good	Showers	F2 SSE	Great Crested Grebe
5	09/09/2021	3	Very Good	Showers	F2 SSE	Moorhen
5	09/09/2021	3	Very Good	Showers	F2 SSE	Coot
5	09/09/2021	3	Very Good	Showers	F2 SSE	Grey Heron
5	09/09/2021	3	Very Good	Showers	F2 SSE	Little Grebe
5	09/09/2021	3	Very Good	Showers	F2 SSE	Little Egret
6	09/09/2021	3	Very Good	Showers	F2 SSE	Mute Swan
6	09/09/2021	3	Very Good	Showers	F2 SSE	Black-headed Gull
7	09/09/2021	3	Very Good	Showers	F2 SSE	Mute Swan
7	09/09/2021	3	Very Good	Showers	F2 SSE	Grey Heron
8	09/09/2021	3	Very Good	Showers	F2 SSE	Mute Swan
8	09/09/2021	3	Very Good	Showers	F2 SSE	Mallard
8	09/09/2021	3	Very Good	Showers	F2 SSE	Lapwing
8	09/09/2021	3	Very Good	Showers	F2 SSE	Grey Wagtail
8	09/09/2021	3	Very Good	Showers	F2 SSE	Teal
8	09/09/2021	3	Very Good	Showers	F2 SSE	Great Crested Grebe
8	09/09/2021	3	Very Good	Showers	F2 SSE	Little Grebe
8	09/09/2021	3	Very Good	Showers	F2 SSE	Black-headed Gull
8	09/09/2021	3	Very Good	Showers	F2 SSE	Moorhen
8	09/09/2021	3	Very Good	Showers	F2 SSE	Little Egret
8	09/09/2021	3	Very Good	Showers	F2 SSE	Grey Heron
8	09/09/2021	3	Very Good	Showers	F2 SSE	Cormorant
8	09/09/2021	3	Very Good	Showers	F2 SSE	Curlew
8	09/09/2021	3	Very Good	Showers	F2 SSE	Great Black-backed Gull
9	09/09/2021	3	Very Good	Showers	F2 SSE	Little Egret
9	09/09/2021	3	Very Good	Showers	F2 SSE	Grey Heron
9	09/09/2021	3	Very Good	Showers	F2 SSE	Mallard
9	09/09/2021	3	Very Good	Showers	F2 SSE	Lesser Black-backed Gull
9	09/09/2021	3	Very Good	Showers	F2 SSE	Great Crested Grebe
9	09/09/2021	3	Very Good	Showers	F2 SSE	Little Grebe
9	09/09/2021	3	Very Good	Showers	F2 SSE	Mute Swan
9	09/09/2021	3	Very Good	Showers	F2 SSE	Coot
9	09/09/2021	3	Very Good	Showers	F2 SSE	Cormorant
10	09/09/2021	3	Very Good	Showers	F2 SSE	Mute Swan
10	09/09/2021	3	Very Good	Showers	F2 SSE	Mallard

HVP	Date	Cloud	Visibility	Rain	Wind	Common Name
11	09/09/2021	3	Very Good	Showers	F2 SSE	Mute Swan
11	09/09/2021	3	Very Good	Showers	F2 SSE	Mallard
12	09/09/2021	3	Very Good	Showers	F2 SSE	Mute Swan
12	09/09/2021	3	Very Good	Showers	F2 SSE	Water Rail
12	09/09/2021	3	Very Good	Showers	F2 SSE	Grey Heron
13	09/09/2021	3	Very Good	Showers	F2 SSE	Snipe
14	09/09/2021	3	Very Good	Showers	F2 SSE	Mute Swan
15	09/09/2021	3	Very Good	Showers	F2 SSE	Mallard
15	09/09/2021	3	Very Good	Showers	F2 SSE	Mute Swan
15	09/09/2021	3	Very Good	Showers	F2 SSE	Moorhen
16	09/09/2021	3	Very Good	Showers	F2 SSE	Grey Heron
19	09/09/2021	3	Very Good	Showers	F2 SSE	Grey Wagtail
19	09/09/2021	3	Very Good	Showers	F2 SSE	Lesser Black-backed Gull
19	09/09/2021	3	Very Good	Showers	F2 SSE	Grey Heron
22	09/09/2021	3	Very Good	Showers	F2 SSE	Lesser Black-backed Gull

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APPENDIX 5

Transect Survey Schedule and Conditions

Date	Transect	Time	Cloud (Okta)	Precipitation	Visibility	Wind
May 2021						
12/05/2021	1	05:20-05:53	7/8	Dry	Very good	F1-2
13/05/2021	2	05:20-05:49	7/8	Dry	Very good	F1
12/05/2021	3	10:33-10:59	6/8	Dry	Very good	F1-2
12/05/2021	4	05:55-06:24	6/8	Dry	Very good	F1
12/05/2021	5	06:27-06:53	6/8	Dry	Very good	F1-2
12/05/2021	6	09:40-10:12	7/8	Dry	Very good	F1-2
12/05/2021	7	09:05-09:31	7/8	Dry	Very good	F1-2
12/05/2021	8	08:22-08:50	6/8	Dry	Very good	F1-2
12/05/2021	9	07:38-08:08	7/8	Dry	Very good	F1-2
12/05/2021	10	07:05-07:32	7/8	Dry	Very good	F1
14/05/2021	11	05:22-05:51	8/8	Dry	Very good	F1
14/05/2021	12	06:08-06:39	8/8	Dry	Very good	F1
13/05/2021	13	09:18-09:46	6/8	Dry	Very good	F1
13/05/2021	14	06:25-06:38	8/8	Dry	Very good	F1
13/05/2021	15	07:31-08:00	7/8	Dry	Good	F1
13/05/2021	16	08:34-09:03	6/8	Dry	Very good	F1
13/05/2021	17	10:03-10:32	5/8	Dry	Very good	F1
14/05/2021	18	09:37-10:36	7/8	Dry	Very good	F1
14/05/2021	19	08:45-09:13	7/8	Dry	Very good	F1
14/05/2021	20	08:02-07:30	7/8	Dry	Very good	F1
14/05/2021	21	07:49-08:22	6/8	Dry	Very good	F1
June 2021						
11/06/2021	1	05:18-05:55	8/8	Dry	Very good	F3-4
13/06/2021	2	05:10-05:41	8/8	Dry	Very good	F2
11/06/2021	3	06:32-07:00	8/8	Dry	Very good	F3-4
11/06/2021	4	05:59-06:29	4/8	Dry	Very good	F3-4
11/06/2021	5	10:52-11:22	7/8	Dry	Very good	F3-4
11/06/2021	6	10:02-10:27	8/8	Dry	Very good	F3
11/06/2021	7	09:30-09:54	8/8	Dry	Very good	F3
11/06/2021	8	08:45-09:13	6/8	Dry	Very good	F3
11/06/2021	9	07:54-08:23	5/8	Dry	Very good	F3-4
11/06/2021	10	07:15-07:45	4/8	Dry	Very good	F3-4
12/06/2021	11	05:15-05:46	8/8	Dry	Very good	F2

Date	Transect	Time	Cloud (Okta)	Precipitation	Visibility	Wind
12/06/2021	12	06:05-06:34	8/8	Dry	Very good	F2
12/06/2021	13	09:00-09:32	7/8	Dry	Very good	F2
12/06/2021	14	10:13-10:44	8/8	Dry	Very good	F2
12/06/2021	15	07:11-07:39	7/8	Dry	Very good	F2
12/06/2021	16	08:15-08:47	7/8	Dry	Very good	F2
13/06/2021	17	09:52-10:30	7/8	Dry	Very good	F1
13/06/2021	18	10:42-11:30	6/8	Dry	Very good	F1
13/06/2021	19	08:45-09:21	6/8	Dry	Very good	F1
13/06/2021	20	06:55-07:29	5/8	Dry	Very good	F1
13/06/2021	21	07:55-08:24	6/8	Dry	Very good	F1

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Appendix 4b NON-BREEDING SEASON 2021/ 2022

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DERRYADD, CO. LONGFORD WIND FARM ORNITHOLOGICAL SURVEY

BASELINE ORNITHOLOGICAL SURVEYS – DERRYADD WIND FARM, MIGRATION AND WINTER 2021/2022

Prepared for: Bord na Móna

Bord na Móna

Date: **June 2022**

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BASELINE ORNITHOLOGICAL SURVEYS – DERRYADD WIND FARM, MIGRATION 2021 AND WINTER 2021/2022

REVISION CONTROL TABLE, CLIENT, KEYWORDS AND ABSTRACT
User is responsible for Checking the Revision Status of This Document

Rev. No.	Description of Changes	Prepared by:	Checked by:	Approved by:	Date:
0	Client Issue	KM/MG	JK	JH	01/06/2022

Client: Bord na Móna

Keywords: Baseline, Ornithological Surveys, Wind Farm, Derryadd, Co. Longford

Abstract: This document outlines a baseline ornithological survey during autumn migrations and winter 2021/2022 at the potential Derryadd Wind Farm, Co. Longford. This ornithology report is required to assess the impacts of the proposed development on bird species within and surrounding the site.

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EXECUTIVE SUMMARY

Ornithological surveys for the winter 2021/2022 season at Derryadd Wind Farm recorded all bird species, within the wind farm site and the surrounding hinterland.

The methodology for the 2021/2022 vantage point surveys at Derryadd adhered to Scottish Natural Heritage guidance (SNH, 2017) for assessing the impact of proposed wind farm developments on target species' wintering populations. Two timed watches of three hours duration were carried out from each VP every month from October 2021 to March 2022 inclusive, totalling 36 hours of observation time at each VP over the survey period. Additionally, two timed watches of three hours duration were carried out from each VP in September 2021 to observe the migration period. Winter transect surveys and hinterland surveys were also undertaken during this period.

During vantage point surveys a total of 83 bird species were recorded. Of these species, 14 are of Red-list status under the Birds of Conservation Concern in Ireland (BoCCI) (Gilbert et al., 2021): bar-tailed godwit, black-tailed godwit, curlew, golden plover, grey wagtail, kestrel, lapwing, meadow pipit, redshank, redwing, shoveler, snipe, white-tailed eagle and yellowhammer. A total of 27 are Amber-listed and the remaining 42 are Green-listed. A total of ten Annex I species were recorded during vantage point surveys: bar-tailed godwit, little egret, golden plover, hen harrier, peregrine, merlin, marsh harrier, kingfisher, white-tailed eagle, and whooper swan.

During hinterland surveys surrounding the proposed site a total of 24 species were noted. Of these species, six are of Red-list status under the BoCCI (Gilbert et al., 2021): golden plover, goldeneye, grey wagtail, lapwing, shoveler and snipe. A further 11 Amber-listed species were observed: black-headed gull, coot, cormorant, goldcrest, great crested grebe, mallard, mute swan, teal, tufted duck, whooper swan and wigeon. Of these, three species are protected under Annex I of the EU Birds directive: golden plover, little egret, whooper swan.

During winter bird transects a total of 29 species were detected. Of these, two species are Red listed: redwing and meadow pipit. A total of two amber-listed species were recorded: linnet and starling.

1. INTRODUCTION

Fehily Timoney & Company (FT) was appointed by Bord na Móna to undertake winter ornithological surveys at the proposed Derryadd Wind Farm in 2021 to 2022. This report presents the results of these ornithological surveys and summarises the activity of specific target bird species during the winter survey period in 2021/2022. The study area of the proposed Derryadd Wind Farm is near Lanesborough, Co. Longford.

This ornithological assessment for surveys completed during winter 2021/2022 includes the assessment of bird species occurring within the proposed site boundary, and surveys of surrounding habitats of value to birds. Surveys adhered to Scottish Natural Heritage guidance (SNH, 2017). The following surveys were carried out:

- Vantage Point survey
- Hinterland survey
- Winter transect surveys

1.1 Study Area

The proposed Derryadd wind farm is located c. 3 km east of Lanesborough, Co. Longford, 4km west of Killashee, Co. Longford and 8km north of Newtowncashel, Co. Longford. The proposed wind farm is located on the Mountdillon group of peat extraction bogs in Co. Longford (Figure 1.1).

Habitats on the proposed site consist of cutover bog, recolonising cutover bog, remnant raised bog, colonising birch woodland and large ponds/lakes on cutover bog. Surrounding habitats and land uses are described by Corine 2018[1] as: Peat bogs (412), Pastures (code 231), Mixed Forests (313), Coniferous Forests (312), Transitional woodland scrub (324), Broad-leaved forests (311), and Discontinuous urban fabric (112).

Designated Sites within a 15km radius of the proposed wind farm are detailed in Table 1.1.

1 https://gis.epa.ie/EPAMaps/. Accessed 26/04/22

Table 1-1: Designated sites within a 15km radius of the proposed Derryadd Wind Farm.

Site	Site Code	Type
Lough Ree	004064/000440/000440	SPA/SAC/pNHA
Fortwilliam Turlough	000448/000448	SAC/pNHA
Ballykenny-Fisherstown Bog	004101	SPA
Lough Forbes Complex	001818/001818	SAC/pNHA
Brown Bog	002346/000442	SAC/pNHA
Corbo Bog	002349/000602	SAC/pNHA
Annaghmore Lough	001626	SAC
Clooneen Bog	002348/000445	SAC/pNHA
Mount Jessop Bog	001450	SAC/NHA
Forthill Bog	001448	NHA
Derrycanan Bog	000605	NHA
Aghnamona Bog	000422	NHA
Cloonageeher Bog	001423	NHA
Lisnanarriagh Bog	002072	NHA
River Finn	002301	NHA
Lough Bawn	001819	pNHA
Lough Bannow	00449	pNHA
Royal Canal	002103	pNHA
Cordara Turlough	001821	pNHA
Derry Lough	001444	pNHA
Lough Slawn	001443	pNHA
Kilglass and Grange Loughs	000608	pNHA
Carrickglass Demesne	001822	pNHA
Lough Boderg and Lough Bofin	001642	pNHA
Annaghmore Lough (Roscommon)	001626	pNHA
Ardnakilla Lough	001617	pNHA

Note: *SPA = Special Protected Area (European site), SAC = Special Area of Conservation (European site), NHA = Natural Heritage Area (Nationally Designated Site), pNHA = proposed Natural Heritage Area

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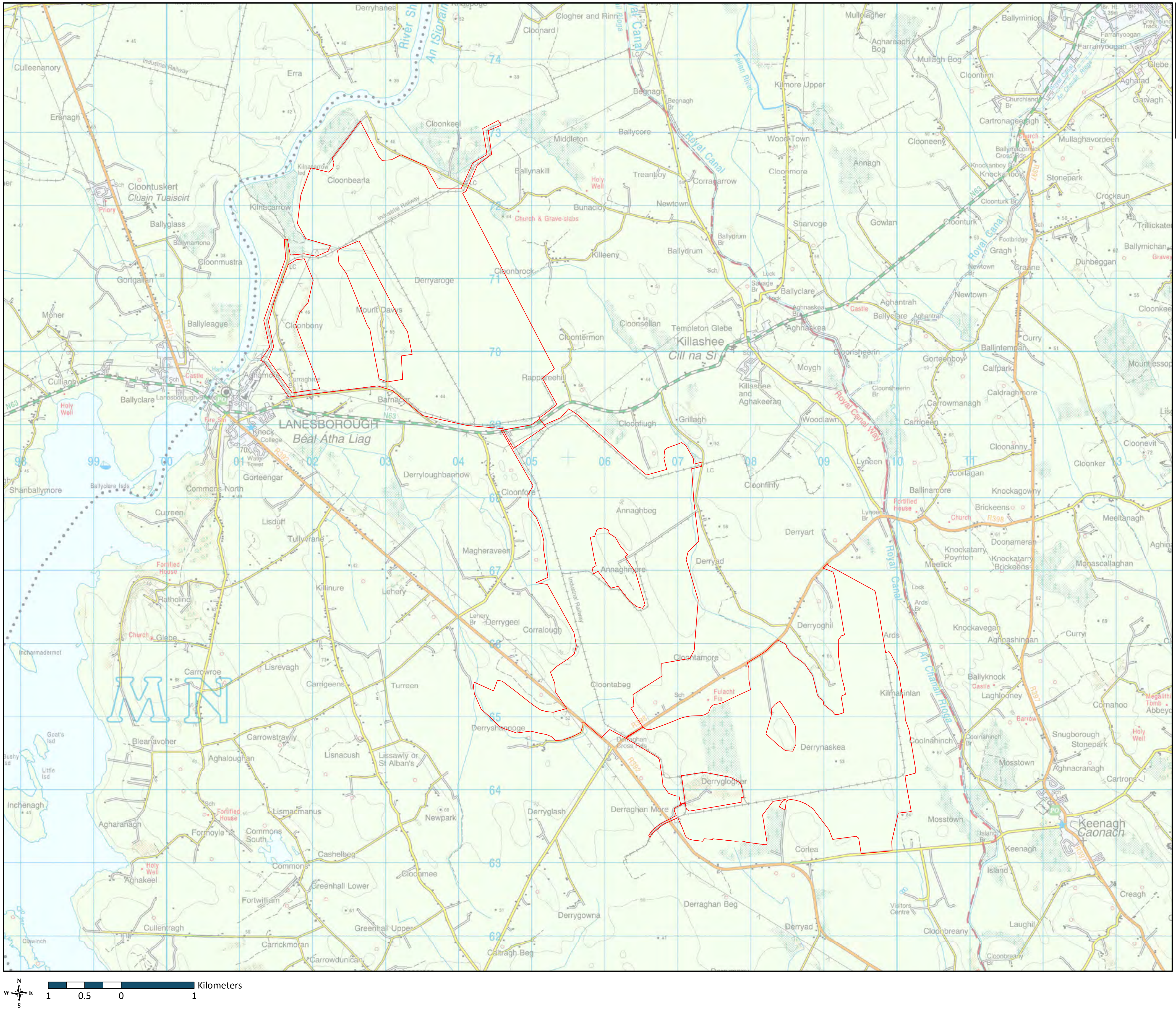

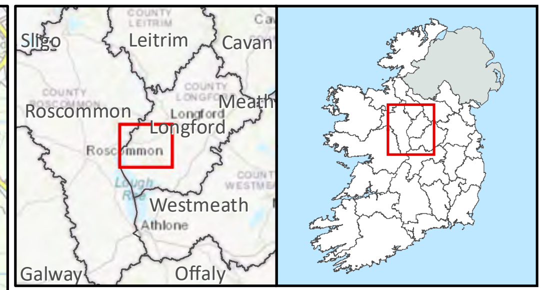

Legend

Proposed Site Boundary

TITLE: Site Location	
PROJECT: Derryadd Wind Farm	
FIGURE NO: 1-1	
CLIENT: Bord na Móna	
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2. SURVEY METHODOLOGY

The following surveys were carried out:

- Vantage point survey
- Hinterland survey
- Winter bird surveys

Methodologies for these surveys are detailed under the following headings:

2.1 Vantage Point Surveys

The main purposes of vantage point 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;

c. The proportion of flying time spent within the upper and lower height limits as determined by the rotor diameter and rotor hub height.

Vantage Point (VP) surveys were carried out at the proposed Derryadd Wind Farm site from October 2021 to March 2022 (covering the winter season), in accordance with the Scottish Natural Heritage Methodology for assessing onshore wind farms (SNH, 2017). Additional surveys were conducted in September 2021 to assess migrating birds. A total of 11 fixed VP locations overlooking the study area were used during the VP surveys (see Figure 2.1 for VP locations), each with specific viewsheds chosen to provide coverage of the proposed Wind Farm in addition to a 500m buffer around the site boundary.

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

In line with recommended best practice (SNH, 2017 and Band *et al*. 2007), viewshed analysis was undertaken using ARCMAP 10.4.1, 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 activity of target species, fulfilling the required effort from SNH. Vantage Point (VP) surveys 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 the winter period.

Data recorded included flight activity of target species (flight height, duration, directionality) in addition to metrics such as flock size (per recorded transit) and relative time of observation. Detailed notes of each observation of a target bird species were recorded including behaviour, sex (where possible), numbers, flight height, associated habitat and the period 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 and were considered separately in the analysis as additional species. Flight activity was annotated onto field maps. Total numbers of birds present both on arrival at the VP and on departure is noted. Details of each flight-path observation are provided in Section 3. Binoculars and telescopes were used to scan for target species. Dictaphones were 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 flights 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.

The proportion of survey time that activity was recorded inside and outside the 500m turbine buffer was used as part of the overall analysis and assessment of target species usage of the study area. All surveys were conducted during suitable weather conditions.

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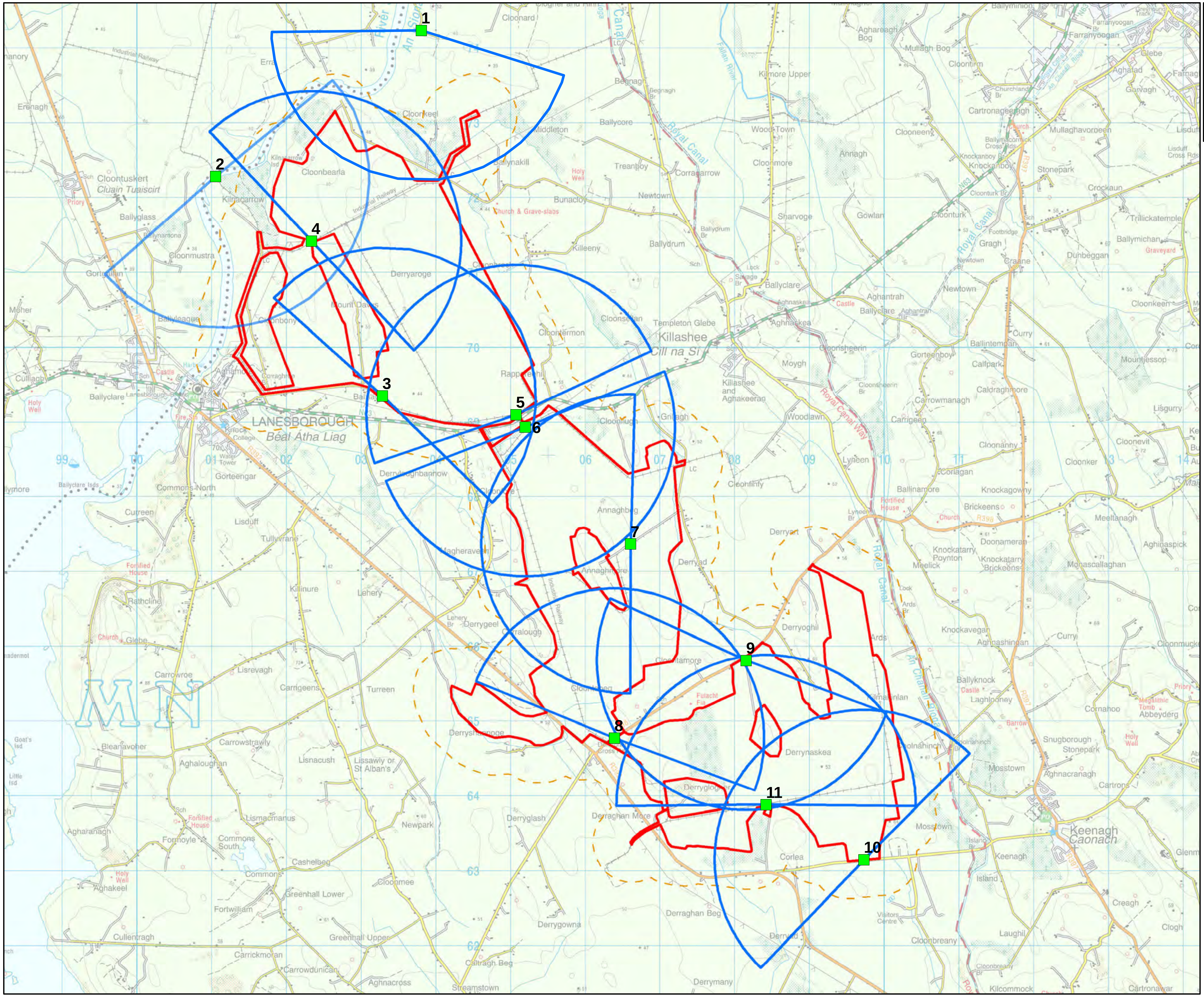

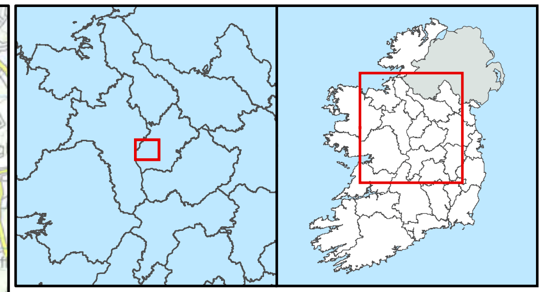

Legend

- Vantage Points
- Viewsheds
- 500m buffer of site boundary
- Site Boundary

TITLE:	Viewshed Analysis
PROJECT:	Derryadd windfarm Farm, Co. Longford
FIGURE NO:	1
CLIENT:	BnM
SCALE: 1:50000	**REVISION:** 0
DATE: 06/05/2021	**PAGE SIZE:** A3

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0 0.5 1 2 3 4 Kilometers

2.2 Hinterland Surveys

The methodology used for wetland sites during hinterland surveys followed I-WeBS (Irish Wetland Bird Survey) methodology (Lewis *et al*, 2019), whereby each location was surveyed for the duration necessary to identify and obtain a count for all target species present. The same approach was adapted for non-wetland sites. A hinterland survey for raptors was conducted in accordance with Hardey *et al*. (2013) to assess hen harrier and other raptor activity over the winter period in the greater surroundings.

The surveys were carried out in suitable woodland, grassland, peatland and wetland habitats in the area surrounding the proposed wind farm site. This comprised of 25 sites within 10 km from the proposed wind farm site. These sites were chosen as they had suitable habitat for the following target species: raptors, waders, waterfowl, geese, swans and barn owl. Surveys were carried out between September 2021 and March 2022, covering the migration period and winter season. The sites detailed in Table 2.2 were checked regularly across this period:

Table 2-1: Hinterland survey locations

Code	Location	ITM Coordinates		Dates Visited
		Easting	Northing	
HVP1	*Pake Bridge, Royal Canal*	612898.185	759486.712	30/09/2021, 26/10/2021, 24/11/2021, 25/01/2022, 28/02/2022, 29/03/2022
HVP2	*Foygh Bridge, Royal Canal*	612023.763	760522.067	
HVP3	*Derrymacar Lough*	608506.111	758389.783	Not surveyed
HVP4	*Fortwilliam Turlough*	601465.614	763206.551	30/09/2021, 26/10/2021, 24/11/2021, 25/01/2022, 28/02/2022, 29/03/2022
HVP5	*Incharmadermot Island, Lough Ree*	598015.731	765839.47	
HVP6	*Cureen, Lough Ree*	599770.446	767832.499	
HVP7	*Lanesborough Bridge, Lough Ree*	600495.231	769387.084	
HVP8	*Cullaghy, Lough Ree*	598739.475	769573.953	
HVP9	*Gardenstown, Lough Ree*	597396.711	767345.703	
HVP10	*Cloonmustra, River Shannon*	600807.323	772340.698	
HVP11	*Erra & Derryhanee, River Shannon*	603635.518	7.944911	
HVP12	*Derrycashel, River Shannon*	603185.029	776452.94	30/09/2021, 28/10/2021, 24/11/2021, 25/01/2022, 28/02/2022, 29/03/2022

Code	Location	ITM Coordinates		Dates Visited
		Easting	Northing	
HVP13	*Feorish River*	603428.885	777430.82	30/09/2021, 28/10/2021, 25/01/2022, 28/02/2022, 29/03/2022
HVP14	*Tarmonbarry Bridge*	605449.722	776948.108	30/09/2021, 28/10/2021, 24/11/2021, 25/01/2022, 28/02/2022, 29/03/2022
HVP15	*Tarmonbarry Lock*	605352.886	776538.819	
HVP16	*Camlin River Complex*	606330.588, -	776126.409	
HVP17	*N5 Bridge over Camlin Park*	611752.094	775901.951	
HVP18	*Fallan Bridge*	608801.086	773065.52	
HVP19	*Richmond Bridge*	613068.179	775627.344	30/09/2021, 29/10/2021, 24/11/2021, 25/01/2022, 28/02/2022, 29/03/2022
HVP20	*Cloondara, Royal Canal*	606176.505	775790.583	
HVP21	*Begnagh Bridge, Royal Canal*	606287.094	774216.229	
HVP22	*Aghnaskea Bridge, Royal Canal*	608672.728	770495.836	
HVP23	*Lyneen Bridge, Royal Canal*	609831.385	767761.094	
HVP24	*Coolnahinch Bridge, Royal Canal*	610855.924	764658.67	
HVP25	*Island Bridge, Royal Canal*	611337.847	763361.965	

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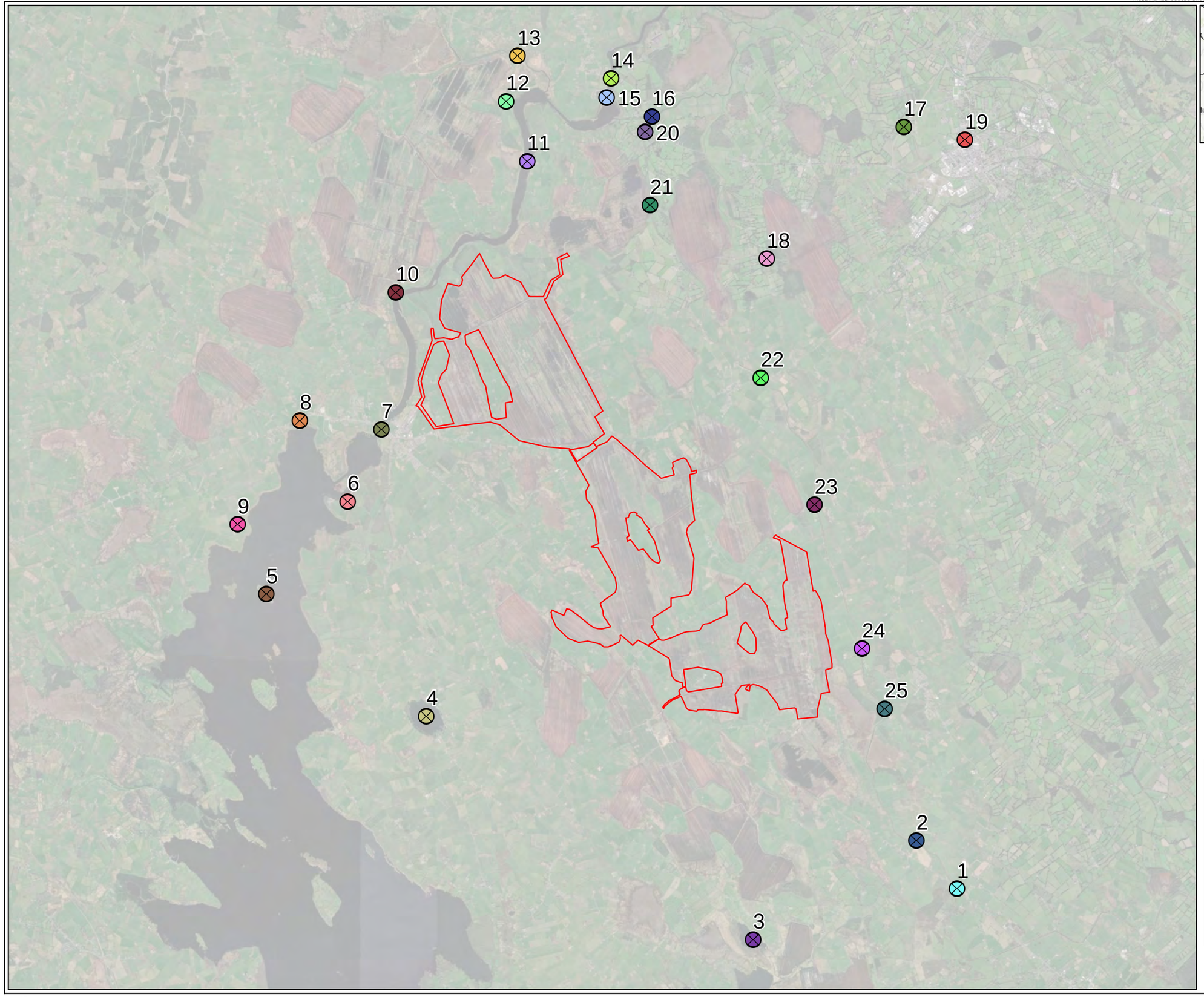

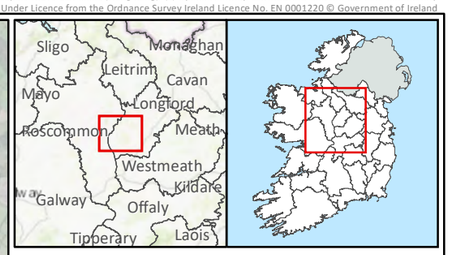

Legend

Site Boundary

ID, Location

1, Park Bridge Royal Canal
2, Foygh Bridge Royal Canal
3, Derrymacar Lough
4, Fortwilliam Turlough
5, Incharmadermot Island Lough Ree
6, Cureen Lough Ree
7, Lanesborough Bridge Lough Ree
8, Cullaghy Lough Ree
9, Gardenstown Lough Ree
10, Cloonmustra River Shannon
11, Erra & Derryhanee River Shannon
12, Derrycashe River Shannon
13, Feorish River
14, Tarmonbarry Bridge
15, Tarmonbarry Lock
16, Camlin River Complex
17, N5 Bridge over Camplin Park
18, Fallan Bridge
19, Richmond Bridge
20, Cloondara Royal Canal
21, Begnagh Bridge Royal Canal
22, Aghnaskea Bridge Royal Canal
23, Lyneen Bridge Royal Canal
24, Coolnahinch Bridge Royal Canal
25, Island Bridge Royal Canal

TITLE:	Hinterland Sites		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	2-2		
CLIENT:	Bord na Móna		
SCALE:	1:80000	**REVISION:**	0
DATE:	05/01/2022	**PAGE SIZE:**	A3

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2.3 Winter Bird Transect Surveys

Over the winter season, general bird transect surveys were carried out at 21 no. c. 1 km transects which were selected and centred on different habitats present within the subject sites (See Table 2-5).

Surveyors recorded all birds seen or heard as they walked methodically along the transect routes. Birds were noted in four distance categories, measured at right angles to the transect line (within 25 m, between 25 m-100 m and over 100 m from the transect line) and those seen in flight only. Recording birds in distance bands gives a measure of bird detectability and allows relative population densities to be estimated if required (BTO, 2018). The winter transect survey details are available in Table 2.6, with further details including weather and survey times indicated in Appendix 5.

Table 2-2: Winter bird transect surveys

Transect	Month	
	February 2022	March 2022
1	03/02/2022	03/03/2022
2	03/02/2022	03/03/2022
3	03/02/2022	03/03/2022
4	03/02/2022	03/03/2022
5	04/02/2022	04/03/2022
6	04/02/2022	04/03/2022
7	04/02/2022	04/03/2022
8	04/02/2022	04/03/2022
9	07/02/2022	09/03/2022
10	07/02/2022	09/03/2022
11	07/02/2022	09/03/2022
12	07/02/2022	09/03/2022
13	11/02/2022	11/03/2022
14	11/02/2022	11/03/2022
15	11/02/2022	11/03/2022
16	11/02/2022	11/03/2022
17	15/02/2022	12/03/2022
18	15/02/2022	12/03/2022
19	15/02/2022	12/03/2022
20	15/02/2022	12/03/2022
21	15/02/2022	12/03/2022

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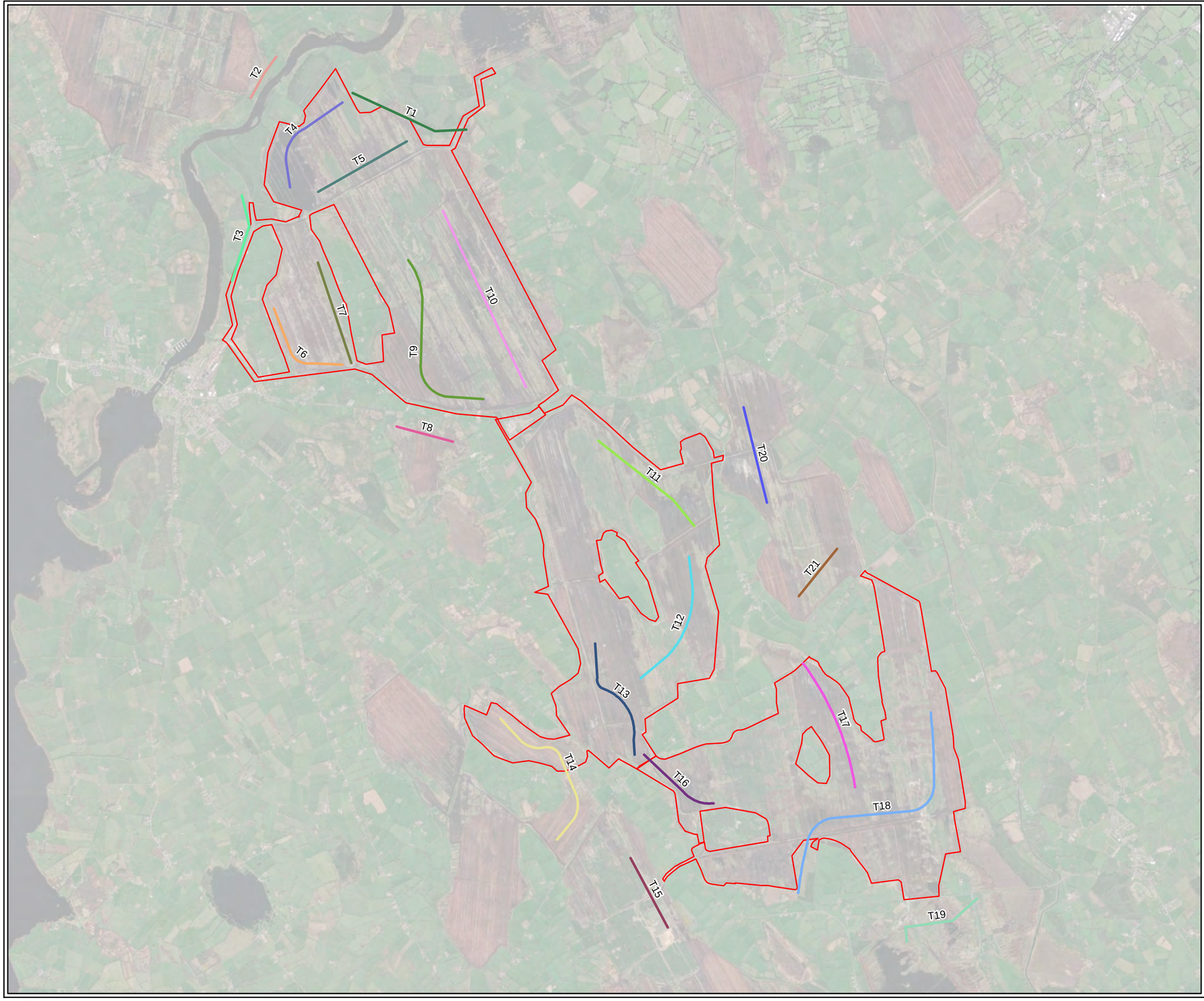

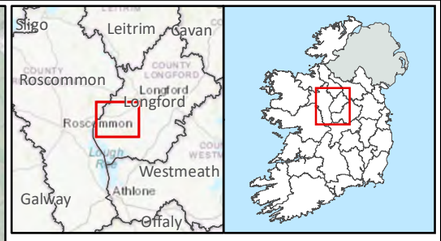

Legend

Site Boundary

Transect

- T1
- T2
- T3
- T4
- T5
- T6
- T7
- T8
- T9
- T10
- T11
- T12
- T13
- T14
- T15
- T16
- T17
- T18
- T19
- T20
- T21

TITLE:	Bird Survey Transects		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	2-3		
CLIENT:	Bord na Móna		
SCALE:	1:45000	**REVISION:**	0
DATE:	05/01/2022	**PAGE SIZE:**	A3

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3. RESULTS

3.1 Avian usage of the Study Area – Vantage point

A total of two timed watches of three hours duration each were carried out at each of the 11 vantage points on a monthly basis from October 2021 to March 2022 inclusive. Additionally, two further timed watches (three hour duration) were conducted at these vantage points in September 2021. This surveying effort totals 36 hours of observation time at each VP over the winter survey period and six hours during the migration period (Appendix 2). Bird activity was recorded from the VPs during each survey. Table 3-1 shows all the species recorded during surveys. In total there were 562 individual flight lines of 27 target species observed during the entire survey period (migration and winter combined).

In total, 83 species of bird were noted. Of these species, 14 are of Red-list status under the BoCCI (Gilbert *et al*., 2021): bar-tailed godwit, black-tailed godwit, curlew, golden plover, grey wagtail, kestrel, lapwing, meadow pipit, redshank, redwing, shoveler, snipe, white-tailed eagle, and yellowhammer. A total of 27 are Amber-listed and the remaining 42 are Green-listed. Of the species noted, seven are listed under Annex I of the EU Birds Directive: bar-tailed godwit, little egret, golden plover, hen harrier, peregrine, merlin, marsh harrier, kingfisher, white-tailed eagle, and whooper swan. It is worth noting that the white-tailed eagle was not observed on site approx. 2km to the northwest. Table 3.1 details the conservation status of all 85 species.

3.1.1 Summary Results Migration Period and Winter 2021/2022

Target species observed, during this survey period at Derryadd were black-headed gull, black-tailed godwit, buzzard, cormorant, curlew, golden plover, great crested grebe, grey heron, greylag goose, hen harrier, kestrel, lapwing, lesser black-backed gull, little egret, mallard, marsh harrier, merlin, moorhen, mute swan, peregrine, pintail, shoveler, snipe, sparrowhawk, teal, whooper swan, and wigeon.

Table 3-1: Bird species recorded during VP surveys winter 2021/2022 and migration surveys[2]

Common name (BTO code)	Scientific name	*BoCCI status	**Annex I status
Bar-tailed Godwit	*Limosa lapponica*	Red	**Yes**
Blackbird	*Turdus merula*	Green	No
Blackcap	*Sylvia atricapilla*	Green	No
Black-headed Gull	*Chroicocephalus ridibundus*	Amber	No
Black-tailed Godwit	*Limosa limosa*	Red	No
Blue Tit	*Cyanistes caeruleus*	Green	No
Brambling	*Fringilla montifringilla*	Amber	No
Bullfinch	*Pyrrhula pyrrhula*	Green	No
Buzzard	*Buteo buteo*	Green	No
Chaffinch	*Fringilla coelebs*	Green	No
Chiffchaff	*Phylloscopus collybita*	Green	No

[2] Colours refer to the conservation status of the species according to Birds of Conservation Concern in Ireland.

Common name (BTO code)	Scientific name	*BoCCI status	**Annex I status
Coal Tit	*Periparus ater*	Green	No
Collared Dove	*Streptopelia decaocto*	Green	No
Common Crossbill	*Loxia curvirostra*	Green	No
Cormorant	*Phalacrocorax carbo*	Amber	No
Curlew	*Numenius arquata*	Red	No
Dunnock	*Prunella modularis*	Green	No
Fieldfare	*Turdus pilaris*	Green	No
Goldcrest	*Regulus regulus*	Amber	No
Golden Plover	*Pluvialis apricaria*	Red	**Yes**
Goldfinch	*Carduelis carduelis*	Green	No
Great Black-backed Gull	*Larus marinus*	Green	No
Great Crested Grebe	*Podiceps cristatus*	Amber	No
Great Spotted Woodpecker	*Dendrocopos major*	Green	No
Great Tit	*Parus major*	Green	No
Greenfinch	*Carduelis chloris*	Amber	No
Grey Heron	*Ardea cinerea*	Green	No
Grey Wagtail	*Motacilla cinerea*	Red	No
Greylag Goose	*Anser anser*	Amber	No
Hen Harrier	*Circus cyaneus*	Amber	**Yes**
Herring Gull	*Larus argentatus*	Amber	No
Hooded Crow	*Corvus cornix*	Green	No
House Sparrow	*Passer domesticus*	Amber	No
Jack Snipe	*Lymnocryptes minimus*	Green	No
Jackdaw	*Corvus monedula*	Green	No
Jay	*Garrulus glandarius*	Green	No
Kestrel	*Falco tinnunculus*	Red	No
Kingfisher	*Alcedo atthis*	Amber	**Yes**
Lapwing	*Vanellus vanellus*	Red	No
Lesser Black-backed Gull	*Larus fuscus*	Amber	No
Lesser Redpoll	*Carduelis cabaret*	Green	No
Linnet	*Carduelis cannabina*	Amber	No
Little Egret	*Egretta garzetta*	Green	**Yes**
Long-tailed Tit	*Aegithalos caudatus*	Green	No
Magpie	*Pica pica*	Green	No
Mallard	*Anas platyrhynchos*	Amber	No
Marsh Harrier	*Circus aeruginosus*	Amber	**Yes**
Meadow Pipit	*Anthus pratensis*	Red	No
Merlin	*Falco columbarius*	Amber	**Yes**
Mistle Thrush	*Turdus viscivorus*	Amber	No
Moorhen	*Gallinula chloropus*	Green	No

Common name (BTO code)	Scientific name	*BoCCI status	**Annex I status
Mute Swan	*Cygnus olor*	Amber	No
Peregrine	*Falco peregrinus*	Green	**Yes**
Pheasant	*Phasianus colchicus*	Green	No
Pied/White Wagtail	*Motacilla alba*	Green	No
Pintail	*Anas acuta*	Amber	No
Raven	*Corvus corax*	Green	No
Redshank	*Tringa totanus*	Red	No
Redwing	*Turdus iliacus*	Red	No
Reed Bunting	*Emberiza schoeniclus*	Green	No
Ringed Plover	*Charadrius hiaticula*	Amber	No
Robin	*Erithacus rubecula*	Green	No
Rook	*Corvus frugilegus*	Green	No
Shoveler	*Anas clypeata*	Red	No
Siskin	*Carduelis spinus*	Green	No
Skylark	*Alauda arvensis*	Amber	No
Snipe	*Gallinago gallinago*	Red	No
Song Thrush	*Turdus philomelos*	Green	No
Sparrowhawk	*Accipiter nisus*	Green	No
Starling	*Sturnus vulgaris*	Amber	No
Stonechat	*Saxicola torquatus*	Green	No
Swallow	*Hirundo rustica*	Amber	No
Teal	*Anas crecca*	Amber	No
Treecreeper	*Certhia familiaris*	Green	No
Water Rail	*Rallus aquaticus*	Green	No
White-tailed Eagle	*Haliaeetus albicilla*	Red	**Yes**
Whitethroat	*Sylvia communis*	Green	No
Whooper Swan	*Cygnus cygnus*	Amber	**Yes**
Wigeon	*Anas penelope*	Amber	No
Willow Warbler	*Phylloscopus trochilus*	Amber	No
Woodpigeon	*Columba palumbus*	Green	No
Wren	*Troglodytes troglodytes*	Green	No
Yellowhammer	*Emberiza citrinella*	Red	No

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

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

3.2 Target species observations during VP surveys

3.2.1 Black-Headed Gull

A single flightline for the Amber-listed black-headed gull was recorded during the VP surveys. This observation occurred in November from VP2 This species was recorded 0-30m height band for 52 seconds, outside the SNH buffer. A single bird was observed in this sighting.

3.2.2 Black-Tailed Godwit

Black-tailed godwit, a Red-listed species was recorded once, at VP1 on the 1st of February 2022. A single bird recorded during this observation. This bird flew at a height of 30-50m for 20 seconds, outside the SNH buffer.

3.2.3 Buzzard

Green-listed buzzard was observed on 71 occasions. Observations were distributed across all VPs and months. Buzzard was observed flying through all height bands, most frequently at the 0-30m band. Observations were usually of individual birds, but up to six individuals were recorded at once, on one occasion in March 2022 from VP3. A total of 55 observations were made inside the SNH buffer, five outside the buffer and 11 both inside and outside the buffer. Activities observed included hunting, calling, circling, hovering and calling.

3.2.4 Cormorant

Cormorant, an Amber-listed Species, was observed on seven occasions, from VP1, 2 and 4. Of these observations, five flightlines were inside the SNH buffer, and two were both inside and outside. Observations were all of individual birds. Fight occurred most frequently in the 50-185m height band (0-30m = 11s, 30-50m = 258s, 50-185m = 561s).

3.2.5 Curlew

Curlew, a Red-listed species was recorded once during the winter survey period, on the 2nd of March 2022. This observation was of seven birds, observed flying in the 30-50m height band at VP1 for 15 seconds.

3.2.6 Golden Plover

The Red-listed/Annex I golden plover was observed on 37 occasions. Observations occurred in all months from October 2021. Golden plover was observed at VPs 1, 3, 4, 5, 9, 10, and 11. This species was observed flying at all height bands, but most frequently at 50-185m (0-30m = 456s, 30-50m = 258s, 50-185m = 1928s, >185m = 7s). Observations included birds being flushed by walkers or other species, as well as groups moving location. Group size ranged from one to approximately 500. Of the flightlines observed, 25 were within the SNH buffer, eight were outside, and four were both inside and outside the buffer.

3.2.7 Great Crested Grebe

Amber-listed great crested grebe was observed once, with a single bird flying in the 0-30m height band for 120s. This observation was from VP2 in November 2021.

3.2.8 Grey Heron

The Green-listed Grey Heron was observed 59 times during the migration/winter surveys. Observations of this species were made during all surveyed months. This species generally flew at the 0-30m height band (0-30m = 11s, 30-50m = 258s, 50-185m = 561s). This species was observed at all VP locations. Observations were generally of single birds, but two individuals were noted on two occasions. Of the flightlines observed, 38 were within the SNH buffer, 16 were outside, and five were both inside and outside the buffer. Behaviours included birds flying to ponds and landing in sections of bog.

3.2.9 Greylag Goose

Greylag goose (Amber-listed) was observed once during the winter survey period, on the 27th December 2021. This species was observed at VP10 flying both inside and outside the SNH buffer. This group of six individuals flew at a height of 50-185m for a period of seven seconds.

3.2.10 Hen Harrier

A total of 11 observations were made of the (Amber-listed) Annex I listed species hen harrier at VPs 2, 3, 5, 7, 8, 10, and 11. Hen harrier was recorded in November, December, January, February and March. This species most frequently flew at the lower height band (0-30m) and was not observed flying above 185m (0-30m = 783s, 30-50m = 126s, 50-185m = 71s). Of the observed flightlines, eight were inside the SNH buffer and three were both inside and outside the buffer. Each observation was of a single individual, and both males and females were observed. Behaviours included flight, hunting and being mobbed by hooded crows.

3.2.11 Kestrel

Red-listed kestrel had 64 flightlines mapped across all VPs, except for VP2. This species was observed in all months. A single individual was noted in all observations. Of the observed flightlines, 63 were inside the SNH buffer and one was both inside and outside the buffer. Behaviours included circling, soaring, hunting, perching and being disturbed by walkers.

3.2.12 Lapwing

A total of 49 observations of Red-listed lapwing were recorded. This species was recorded from all VPs except VP7, VP9 and VP10. Observations were made in all months. This species was most frequently observed flying within the 30-50m height band (0-30m = 576s, 30-50m = 861s, 50-185m = 722s). The numbers of individuals per observation ranged from one to 112, with an average group size of 52. Of the observed flightlines, 22 were inside the SNH buffer, three were both inside and outside the buffer, and 24 were outside the buffer.

3.2.13 Lesser Black-backed Gull

Amber-listed lesser black-backed gull flightlines were recorded five times. Each flightline was of a single individual. Flightlines were all recorded during the migration surveys in September 2021, from VP2, 4 and 8. Flight was mostly observed in the 50-185m height band (0-30m =154s, 30-50m = 690s). Lesser black-backed gull was also recorded during surveys in February and March 2022. These additional records originated from VP1, 2, 4, 5, 8, 10 and 11.

3.2.14 Little Egret

Green-listed/Annex I little egret was recorded 30 times. Observations occurred in all months, from all VPs except 1, 8 and 11. Quantities ranged from one individual up to 11 birds. Of the flightlines, 25 were inside the SNH buffer and five were both inside and outside the buffers. Flight was mostly observed in the 0-30m height band (0-30m =481, 30-50m = 328s, 50-185m = 60s). Behaviours included flight, and landing in a cutover bog.

3.2.15 Mallard

Mallard (Amber-listed) was recorded 55 times. Observations originated from VPs 1, 2, 3, 4, 5, 10 and 11. Observations occurred in all surveyed months. Flight occurred in all height bands, most frequently in the 0-30m band (0-30m = 4448s, 30-50m = 552s, 50-185m = 442s, >185m = 36s). Of the flightlines, 31 were inside the SNH buffer and 12 were both inside and outside the buffers, and 12 were only outside the buffer. Behaviours included feeding in a flooded section of bog to the south of VP4, in the north of the site.

3.2.16 Marsh Harrier

Marsh harrier (Amber-listed, Annex I) was observed once in the winter surveys. On 16th of March a single female was observed from VP3, flying in 0-30 height band for 100 seconds. This individual was observed hunting within the SNH buffer.

3.2.17 Merlin

Amber-listed/Annex I merlin was observed five times. This species was observed from VP6, VP7, VP8, and VP11. Observations were made in December and January. All observations were of one individual and included an immature or female bird. Flight was most frequently in the 0-30m band (108s) but also occurred in the 30-50m band (35s). Behaviours included hunting, and merlin were observed being flushed by a buzzard, and attacked by a hen harrier.

3.2.18 Moorhen

Moorhen (Green-listed) was observed twice during the winter survey season. This species was observed from all VP2 and VP4 in November 2021. Both observations were of one individual. One of these observations was within the SNH buffer, and the other was outside. Flights only occurred in the 0-30m height band (7s).

3.2.19 Mute Swan

Amber-listed mute swan was observed 20 times during VP surveys. Observations occurred from October to March, and mute swan were observed from all VPs except for VP5 and VP8. Quantities observed ranged from one to four birds. Flight occurred in all height bands, most frequently in the 0-30m band (0-30m = 5103s, 30-50m = 403s, 50-185m = 21s, >185m = 30s). Of the flightlines, 11 were inside the SNH buffer and six were both inside and outside the buffers, and three were only outside the buffer. Behaviours included flight over rivers and feeding, as well as moving between foraging areas.

3.2.20 Peregrine

Green-listed/Annex I peregrine was observed nine times. This species was observed from VP1, VP3, VP4, VP6, VP7 and VP9. Observations were made in September, December, January, February and March. Flight occurred in all height bands, most frequently above 185m (0-30m = 88s, 30-50m = 198s, 50-185m =110s, >185m = 200s). Of the flightlines, 6 were inside the SNH buffer and three were only outside the buffer. Behaviours included perching and fly throughs.

3.2.21 Pintail

Pintail (Amber-listed) was observed once during the winter survey season. For this observation, six individuals were observed from VP1, flying both inside and outside the buffer. Flight height was 0-30m for 10s and 30-50m for 20s.

3.2.22 Shoveler

Red-listed shoveler was observed once during VP surveys, on the 2nd of March 2022. A single drake (male) was observed flying at a height of 0-30m for 10 seconds.

3.2.23 Snipe

Red-listed snipe was observed 16 times. This species was observed from VP2, VP4, VP5, VP6, VP7, VP8 and VP9. Observations were made in September (during migration surveys), October, November, December, and February. Quantities ranged from one to 15. Flight was most frequently below 30m (0-30m = 172s, 30-50m = 198s, 50-185m =32s). All observations were inside the SNH buffer, with the exception of one which was outside.

3.2.24 Sparrowhawk

Sparrowhawk (Green-listed) was observed 16 times. This species was observed from VPs 1, 2, 3, 4, 6 and 8. Both males and females were observed, with quantities of between one and two. Observations of sparrowhawk were made in all months except February. Sparrowhawk was observed in all height bands, except for above 185m. It was most frequently observed in the 50-185m band (0-30m = 197s, 30-50m = 148s, 50-185m =209s). Of the flightlines recorded, 11 were inside the SNH buffer, two were outside the buffer, and three were both inside and outside. Birds were observed with prey, landing in trees, displaying and flying through the viewshed.

3.2.25 Teal

Amber-listed teal was observed 15 times during VP surveys. Observations were noted from VP1, 2, 4, 5, and 6 and occurred from November to March inclusive. Quantities ranged from 1 to 32 birds. Teal was most frequently observed flying below 30m (0-30m = 3759s, 30-50m = 163s, 50-185m =13s). Of the observations, 12 were inside the SNH buffer, two were outside, and one was both inside and outside the buffer.

3.2.26 Whooper Swan

Amber-listed/Annex I whooper swan was observed 63 times. This species was observed from all VPs except for VP11. Observations were made from November 2021 to March 2022 inclusive. Quantities ranged from 1 to 16 birds. This species was recorded flying in all height bands, most frequently below 30m (0-30m = 15474s, 30-50m = 808s, 50-185m = 683s, >185m = 235s). Of the observations, 49 were only within the SNH buffer, 6 were outside and eight were both inside and outside the buffer. Many of the observations were of birds flying over, but were sometimes seen landed in areas of flooded bog within the site. Two of these observations were not of flights as the individual remained on the ground, but areas they were occupying are provided in the figures (Appendix 3).

3.2.27 Wigeon

Wigeon (Amber-listed) was observed 15 times during the surveys. Observations occurred from VP1, 2 3 and 4, from November to March inclusive. Quantities observed ranged from 1 to 130 birds. Flight was most frequently in the 0-30m height band (0-30m = 3680s, 30-50m = 115s, 50-185m = 308s). Of the observed flights, nine were inside the SNH buffer, two were outside the buffer and four were both inside and outside the buffer.

3.3 Hinterland Survey

Hinterland surveys to establish occupancy within a 10 km radius of the site were carried out over seven dates during winter 2021/2022, and one date for autumn migration surveys. The survey schedule and locations of the Hinterland watches are shown in Table 2-1.

For site-specific Hinterland survey results see Appendix 4 of this report.

A total of three Annex I species were recorded during hinterland surveys: golden plover, little egret and whooper swan. A total of six Red-listed species were observed: golden plover, goldeneye, grey wagtail, lapwing, shoveler and snipe. A further 11 Amber-listed species were observed: black-headed gull, coot, cormorant, goldcrest, great crested grebe, mallard, mute swan, teal, tufted duck, whooper swan and wigeon. All observed species, including green listed species are included in Table 3-2.

For site-specific Hinterland survey results see Appendix 4 of this report.

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

3.3.1 Black-Headed Gull

This Amber-listed species was seen twice times during hinterland surveys, with observations made during November 2021. Observations were made from the following hinterland vantage points (HVPs): HVP7 (Lanesborough Bridge, Lough Ree, 0.9 km west), and HVP 11 (Erra and Derryhanee, River Shannon, 2.2km north). These HVPs are to the west and north of the proposed site, in the vicinity of Lough Ree and the River Shannon. The quantity of birds counted in these observations ranged from one to four.

3.3.2 Buzzard

Buzzard (Green-listed) was observed on nine occasions during the hinterland surveys. Buzzard was observed from the following hinterland vantage points: from HVP4 (Fortwilliam Turlough, 3.4 km west), HVP8 (Cullaghy, Lough Ree, 0.9km west), HVP12 (Derrycashel, River Shannon, 3.3km north), HVP16 (Camlin River Complex, 3.5km north), HVP17 (N5 Bridge over Camlin Park), HVP19 (Richmond Bridge, 8.9km north-east), HVP20 (Cloondara, Royal Canal, 3.1km north), and HVP21 (Begnagh Bridge, Royal Canal, 2.1km north). All observations were of individuals, except for the sighting at HVP4 on the 30th of September, where two buzzards were seen together.

3.3.3 Common Coot

Coot (Amber-listed) was observed 10 times during the hinterland surveys. Quantities ranged from 1 to 20, and averaging 4 individuals. Observations of coot occurred from late September 2021 to March 2022, and were recorded from HVP4 (Fortwilliam Turlough, 3.4km west), HVP5 (Incharmadermot Island, Lough Ree, 5.1km west), HVP6 (Cureen, Lough Ree, 2.4km west), HVP8 (Cullaghy, Lough Ree, 2.5km west), HVP9 (Gardenstown, Lough Ree, 4.6km west) and HVP10 (Cloonmustra, River Shannon, 1km north-west). These Hinterland Vantage Points (HVPs) all surround Lough Ree SPA (004064), which is a protected site for coot.

3.3.4 Cormorant

Cormorant (Amber-listed) were recorded three times during the hinterland surveys, with quantities ranging from one to three individuals. This species was observed during late September and November 2021. Sightings occurred at the following hinterland vantage points: HVP6 (Cureen, Lough Ree, 2.4km west), HVP9 (Gardenstown, Lough Ree, 4.6 km west), HVP15 (Tarmonbarry Lock, 3.5km north). These hinterland sites are in the vicinity of either Lough Ree or the River Shannon

3.3.5 Goldcrest

Amber-listed goldcrest was observed on three occasions, all in March 2022. Quantities ranged between 1 and 2 birds. These observations occurred at HVP4 (Fortwilliam Turlough, 3.4km west), HVP9 (Gardenstown, Lough Ree, 4.6km west) and HVP12 (Derrycashel, River Shannon, 3.3km north).

3.3.6 Golden Plover

Golden plover (Red-listed/Annex I) was observed once during the hinterland surveys. In November 2021, golden plover was observed from HVP4 (Fortwilliam Turlough, 3.4km west). Two birds were counted during this observation.

3.3.7 Goldeneye

Goldeneye (Red-listed) was observed twice during the hinterland surveys. In September 2021, during migration surveys, two goldeneye were observed from HVP8 (Cullaghy, Lough Ree, 2.5km west). In October 2021, 18 goldeneye were counted from this hinterland vantage point. This hinterland vantage point is at Lough Ree SPA (004064), which is a protected site for goldeneye.

3.3.8 Great Crested Grebe

Over the survey period, eight observations were made of great-crested grebe (Amber-listed). Sightings of this species occurred in September, October, November and February, and numbers per observation ranged from 1 to 7 (average = 3). These observations were made from HVP4 (Fortwilliam Turlough, 3.4km west), HVP5 (Incharmadermot Island, Lough Ree, 5.1km west), HVP6 (Cureen, Lough Ree, 2.4km west), HVP8 (Cullaghy, Lough Ree, 2.5km west), and HVP9 (Gardenstown, Lough Ree, 4.6km west).

3.3.9 Grey Wagtail

Red-listed grey wagtail was observed on once during hinterland surveys. This observation was of a single bird during the migration surveys. This observation was from HVP19 (Richmond Bridge, 8.9km north-east).

3.3.10 Lapwing

Overall, seven sightings of Red-listed lapwing were made during the hinterland surveys. Observations were made in September, October and November 2021 as well as February 2022. Lapwing were observed from HVP4 (Fortwilliam Turlough, 3.4km west), from HVP8 (Cullaghy, Lough Ree, 2.5km west), HVP11 (Erra & Derryhanee, River Shannon, 2.2km north) and HVP12 (Derrycashel, River Shannon, 3.3km north) and. Groups ranging from 1 to 260 (mean = 74) were observed September, October, November 2021 and February 2022. HVP8 is at Lough Ree SPA (004064), which is a protected site for lapwing.

3.3.11 Mallard

Mallard (Amber-listed) was observed on 31 occasions. Sightings were made during all surveyed months. Mallard was observed from HVP1 (Pake Bridge, Royal Canal, 4.8km south-east), HVP2 (Foygh Bridge, Royal Canal, 3.4km SE), HVP4 (Fortwilliam Turlough, 3.4km west), HVP5 (Incharmadermot Island, Lough Ree, 5.1km west), HVP6 (Cureen, Lough Ree, 2.4km west), HVP7 (Lanesborough Bridge, Lough Ree, 0.9 km west), HVP8 (Cullaghy, Lough Ree, 2.5km west),HVP9 (Gardenstown, Lough Ree, 4.6km west), HVP10 (Cloonmustra, River Shannon, 1km north-west), HVP11 (Erra & Derryhanee, River Shannon, 2.2km north), HVP14 (Tarmonbarry Bridge, 3.9km north), and HVP16 (Camlin River Complex, 3.5km north).

A number of these HVPs are located on the shores of Lough Ree SPA, which is designated for mallard. Counts of this species ranged from 1 to 30, with an average count of 7.

3.3.12 Mute Swan

Mute swan (Amber-listed) was observed species 39 times during the hinterland surveys. Observations occurred in all months and were evenly distributed across those months. Counts ranged from 1 to 20, with an average count of 6 per observation. Sightings occurred at the following HVPs: HVP4 (Fortwilliam Turlough, 3.4km W), HVP5 (Incharmadermot Island, Lough Ree, 5.1km west), HVP6 (Cureen, Lough Ree, 2.4km west), HVP7 (Lanesborough Bridge, Lough Ree, 0.9 km west), HVP8 (Cullaghy, Lough Ree, 2.5km west), HVP9 (Gardenstown, Lough Ree, 4.6km west), HVP10 (Cloonmustra, River Shannon, 1km north west), HVP11 (Erra & Derryhanee, River Shannon, 2.2km N), HVP12 (Derrycashel, River Shannon, 3.3km north), HVP15 (Tarmonbarry Lock, 3.5km north), HVP16 (Camlin River Complex, 3.5km north), HVP18 (Fallan Bridge, 2km east), and HVP21 (Begnagh Bridge, Royal Canal, 2.1km north).

3.3.13 Shoveler

Shoveler (Red-listed) was recorded once during the hinterland surveys. During this observation, 18 birds were observed from HVP4 (Fortwilliam Turlough, 3.4km west), on the 12th of November 2021.

3.3.14 Snipe

Snipe (Red-listed) was recorded once during the hinterland surveys. In November 2021, three snipe were observed from HVP4 (Fortwilliam Turlough, 3.4km west).

3.3.15 Teal

Amber-listed teal was observed 12 times during the hinterland surveys. Observations occurred in all surveyed months, with quantities ranging from 5 to 48 birds. Teal was observed at the following hinterland vantage points: HVP4 (Fortwilliam Turlough, 3.4km west), HVP5 (Incharmadermot Island, Lough Ree, 5.1km west), HVP7 (Lanesborough Bridge, Lough Ree, 0.9 km west) from HVP8 (Cullaghy, Lough Ree, 2.5km west) on the 9th of September 2021. Some of these sites are within the Lough Ree SPA, which lists teal as a Special Conservation Interest.

3.3.16 Tufted Duck

A total of 15 observations were made of the Amber-listed tufted duck. Observations were made at the following HVPs, which are in the vicinity of Lough Ree SPA, which is designated for tufted duck: HVP4 (Fortwilliam Turlough, 3.4km west), HVP5 (Incharmadermot Island, Lough Ree, 5.1km west), HVP8 (Cullaghy, Lough Ree, 2.5km west) and HVP9 (Gardenstown, Lough Ree, 4.6km west). Counts for this species ranged from 1 to 55 individuals. Observations occurred during all months. Some of these sites are within or near the Lough Ree SPA, which lists tufted duck as a Special Conservation Interest.

3.3.17 Whooper Swan

Amber-listed/Annex I whooper swan was observed three times from HVP4 (Fortwilliam Turlough, 3.4km west). This species was observed in October, November 2021 and January 2022. Quantities ranged from 2 to 32.

3.3.18 Wigeon

There were 17 observations of wigeon (Red-listed) during the hinterland surveys. Quantities observed ranged from 2 to 210. This species was observed in all survey months. Observations occurred from the following HVPs: HVP4 (Fortwilliam Turlough, 3.4km west), HVP5 (Incharmadermot Island, Lough Ree, 5.1km west), HVP6 (Cureen, Lough Ree, 2.4km west), HVP8 (Cullaghy, Lough Ree, 2.5km west), HVP9 (Gardenstown, Lough Ree, 4.6km west) and HVP11 (Erra & Derryhanee, River Shannon, 2.2km N). Some of these hinterland vantage points are near or within Lough Ree SPA, which lists wigeon as a Special Conservation Interest.

Table 3-2: Bird species recorded during hinterland surveys in winter 2021/2022 and during migration surveys in September 2021[3]

Common Name	Scientific Name	Conservation Status	
		BoCCI*	Annex I**
Black-headed Gull	*Chroicocephalus ridibundus*	Amber	No
Buzzard	*Buteo buteo*	Green	No
Coot	*Fulica atra*	Amber	No
Cormorant	*Phalacrocorax carbo*	Amber	No
Goldcrest	*Regulus regulus*	Amber	No
Golden Plover	*Pluvialis apricaria*	Red	**Yes**
Goldeneye	*Bucephala clangula*	Red	No
Great Black-backed Gull	*Larus marinus*	Green	No
Great Crested Grebe	*Podiceps cristatus*	Amber	No
Grey Heron	*Ardea cinerea*	Green	No
Grey Wagtail	*Motacilla cinerea*	Red	No
Lapwing	*Vanellus vanellus*	Red	No
Little Egret	*Egretta garzetta*	Green	**Yes**
Little Grebe	*Tachybaptus ruficollis*	Green	No
Mallard	*Anas platyrhynchos*	Amber	No
Moorhen	*Gallinula chloropus*	Green	No
Mute Swan	*Cygnus olor*	Amber	No
Shoveler	*Anas clypeata*	Red	No
Snipe	*Gallinago gallinago*	Red	No
Teal	*Anas crecca*	Amber	No

[3] Colours refers to the conservation status of the species according to Birds of Conservation Concern in Ireland. Species in bold refers to species listed on Annex I of the EU Birds Directive.

Common Name	Scientific Name	Conservation Status	
		BoCCI*	Annex I**
Tufted Duck	*Aythya fuligula*	Amber	No
Water Rail	*Rallus aquaticus*	Green	No
Whooper Swan	*Cygnus cygnus*	Amber	**Yes**
Wigeon	*Anas penelope*	Amber	No

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

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

3.4 Winter Bird Transect Surveys

For the winter season 2021, a total of 21 transects were chosen (Table 2.6). The results of the winter bird transect survey at Derryadd are shown in Table 3.4. A total of 29 species were recorded along the transects over the winter season.

A total of two Red-listed species were recorded: redwing and meadow pipit.

Redwing was observed in both February and March 2022. In February, redwing was observed from TR1, TR3, TR8, TR9, TR12, TR14 and TR17, with quantities ranging between 1 and 5. In March, redwing was observed from TR3 and TR11, with quantities of 2 to 4 redwing.

Similarly, meadow pipit was observed in both February and March 2022. In February, meadow pipit was observed from TR3, TR4, TR5, TR9, TR10, TR12, TR17, TR18, TR20. with quantities ranging between 1 and 2. In March, meadow pipit was observed from TR1, TR3, TR5, TR7, TR9, TR14, TR16, TR17, and TR20, with quantities of between 1 and 3.

A total of two Amber-listed species were recorded: linnet and starling.

Table 3-3: Results of winter bird transects surveys at Derryadd (TR1- TR21) in February and March 2022[4]

Species	TR1	TR2	TR3	TR4	TR5	TR6	TR7	TR8	TR9	TR10	TR11	TR12	TR13	TR14	TR15	TR16	TR17	TR18	TR19	TR20	TR21
Blackbird	14	8	9	2	5	2	2	7	6	7	2	9	7	6	7	10	9	8	4	7	1
Blue Tit	1	5	4	2	3	3		2		4		4	2	4	3	5	5	1	3		6
Bullfinch																					2
Chaffinch	6	5	8	2	6	3	3	4			14	7	7	5	4	14	10	7	9	2	10
Coal Tit														1							
Dunnock		4										1	2	2		2	2				1
Fieldfare									1			1									
Goldfinch					1						3		9		2			4	19		
Great Black-backed Gull				1																	
Great Spotted Woodpecker		1																			
Great Tit		2	1	1		4		2		1	3	1	2	1	2	8	4	2	1		3
Hooded Crow	1		3		4			4	4	2	1	1	2	1	4	1	4	3	5	1	2
Jackdaw					2	2						1			1						1
Lesser Redpoll									3		2		4				1		4		
Linnet									6		6	1	12		3		1	3	12		
Magpie	2		3		1	1	1	1	1	1	2		2	1	3	2	1	2			3
Mistle Thrush	1		2	2	2		2		1	1		5	2	1	1	1	2	1		2	1
Meadow Pipit	1		2	1	2		2		4	2		2		3		1	3	1		4	
Pheasant	1																	1			

[4] Colours refers to the conservation status of the species according to Birds of Conservation Concern in Ireland. Species in bold refers to species listed on Annex I of the EU Birds Directive

Species	TR1	TR2	TR3	TR4	TR5	TR6	TR7	TR8	TR9	TR10	TR11	TR12	TR13	TR14	TR15	TR16	TR17	TR18	TR19	TR20	TR21
Pied/White Wagtail				2			2		2	2	2			1						2	
Raven	1				2			1	1	1	1	1	1				1	3		1	
Redwing	1		7					1	1		4	1		1			1				
Reed Bunting	2		1	1	3	1		1		3	1	2	3		4	9	3	6	2	2	3
Robin	6	3	6	1	4	6	4	5	4	5	3	8	8	7	5	6	3	5	4	5	8
Rook	3	3	2			6	1	2		3		1		4	3		1		3		
Song Thrush	1	4	1	1	2	1		1		1	3	1	3	1	2	2	1	1	2		3
Starling		4	4		3						6		7		8		4		4	2	
Woodpigeon	3		1		4	3	2		1	6	2	2	3	3	5		4	2	2	7	3
Wren	11	10	10	8	7	6	5	10	8	9	4	5	12	7	7	12	10	5	7	7	8

4. DISCUSSION

In conclusion, FT carried out ornithological surveys at the proposed Derryadd Wind Farm during winter 2021/2022 and during the autumn migration period (late September 2021). Surveys took place between September 2021 and March 2022 inclusive. The following surveys were undertaken: vantage point surveys, winter bird transect surveys, and hinterland surveys. In total, there were 562 individual flight lines of 27 target species observed during the survey period. In total, 83 bird species were recorded during vantage point surveys. The activity patterns recorded show that the area is used by a wide variety of bird species.

Buzzard, sparrowhawk, kestrel and were noted to hunt within and around the proposed Wind Farm Site. Merlin and hen harrier were also observed hunting occasionally (once and twice respectively). The following species were observed foraging in or near the proposed Wind Farm site: mute swan, whooper swan, lapwing and mallard. This shows that the area is utilised by these species for foraging. Furthermore, buzzard, kestrel, golden plover and lapwing were recorded frequently during the surveys, indicating the presence of roost sites in the area but no roosts were confirmed in the site. Additionally, a variety of other species of conservation concern were heard and seen from the VPs. These included, bar-tailed godwit, golden plover, kingfisher, little egret, marsh harrier, peregrine, black-tailed godwit, curlew, grey wagtail, meadow pipit, redshank, redwing, shoveler, snipe, and yellowhammer.

Hinterland surveys were conducted to show the general wintering occupancy throughout the winter season in a c. 10km radius around the proposed site. During these hinterland surveys, 24 species of bird were noted. Of these, three species are protected under Annex I of the EU Birds directive, six are Red-listed, and 11 are Amber-listed.

The most important sites for wetland bird species of interest were HVP4 (Fortwilliam Turlough, 3.4km west), HVP8 (Cullaghy, Lough Ree, 2.5km west). These hinterland vantage points are near or within the Lough Ree SPA (004064). This SPA lists several Special Conservation Interests that were observed during on site during VP and transect surveys: whooper swan, wigeon, teal, mallard, shoveler, goldeneye, golden plover and lapwing. Other hinterland sites which support a variety of species of conservation interest are: HVP5 (Incharmadermot Island, Lough Ree, 5.1km west), HVP9 (Gardenstown, Lough Ree, 4.6km west), and HVP11 (Erra & Derryhanee, River Shannon, 2.2km north).

The above sites are all less than 5.1km from the proposed development. Many bird species that are vulnerable to wind farm developments are highly mobile and could potentially commute over the Wind Farm site, in the case of wetland birds, or utilise the proposed development site for feeding, in the case of raptors such as buzzard, kestrel and sparrowhawk.

The target bird species seen at both the hinterland surveys and VP surveys were black-headed gull, buzzard, cormorant, golden plover, great black-backed gull, great crested grebe, grey heron, lapwing, little egret, mallard, moorhen, mute swan, shoveler, snipe, teal, whooper swan, and wigeon. This demonstrates that these species are present both onsite and in the surrounding areas during the wintering season and that the local landscape provides suitable habitat for these species.

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FEHILY TIMONEY

CONSULTANTS IN ENGINEERING,
ENVIRONMENTAL SCIENCE
& PLANNING

APPENDIX 1

VP Survey Details

VP	Date	Start Time	End Time	Cloud (Oktas)	Visibility	Rain	Wind
1	24/09/2021	16:05	19:05	7	V.good	Dry	F1 WSW
1	27/09/2021	08:10	11:10	3	V.good	Dry	F1 SSW
2	20/09/2021	08:20	11:20	6	V.good	Dry	F2 W
2	20/09/2021	11:55	14:55	7	V.good	Dry	F2 W
3	28/09/2021	15:37	18:37	2	V.good	Dry	F1 WSW
3	29/09/2021	09:00	12:00	2	V.good	Dry	F1 W
4	23/09/2021	08:50	11:50	6	V.good	Dry	F1 WSW
4	23/09/2021	12:33	15:33	7	V.good	Dry	F1 W
5	20/09/2021	15:35	18:35	7	V.good	Dry	F2 W
5	21/09/2021	16:05	19:05	8	Good	Light showers	F2 SW
6	28/09/2021	08:20	11:20	3	V.good	Dry	F1 SSW
6	28/09/2021	12:00	15:00	3	V.good	Dry	F1 SSW
7	27/09/2021	11:45	14:45	4	V.good	Light showers	F1-2 SW
7	27/09/2021	15:25	18:25	4	V.good	Light showers	F1-2 SW
8	24/09/2021	08:55	11:55	7	V.good	Dry	F1 W
8	24/09/2021	12:30	15:30	7	V.good	Dry	F1 W
9	21/09/2021	08:45	11:45	7	V.good	Dry	F3 SW
9	21/09/2021	12:25	15:25	8	V.good	V. light showers	F3 SW
10	22/09/2021	08:47	11:47	7	V.good	Dry	F3 SW
10	22/09/2021	12:25	15:25	8	V.good	Dry	F4 SW
11	22/09/2021	16:05	19:05	8	V.good	Dry	F3 SW
11	23/09/2021	16:10	19:10	7	V.good	Dry	F1 SW
1	01/10/2021	11:20	14:20	4	V.good	Dry	F2 W
1	01/10/2021	07:45	10:45	2	V.good	Dry	F1-2 SW
2	28/10/2021	08:35	11:35	3	V.good	Dry	F2 S
2	28/10/2021	12:10	15:10	6	V.good	Light showers	F2 S
3	26/10/2021	08:20	11:20	8	V.good	Showers	F2 SSW
3	26/10/2021	12:00	15:00	8	V.good	Showers	F3 SSW
4	02/10/2021	08:00	11:00	4	V.good	Dry	F1 S
4	02/10/2021	11:45	14:45	5	V.good	Dry	F1 W
5	01/10/2021	15:05	18:05	6	V.good	Dry	F2 W
5	02/10/2021	15:20	18:20	5	V.good	Dry	F1 SSW
6	03/10/2021	08:00	11:00	8	V.good	Showers	F2 WSW
6	03/10/2021	11:34	14:34	8	V.good	Showers	F2 WSW
7	03/10/2021	15:05	18:05	8	V.good	Light showers	F1 W
7	27/10/2021	08:30	11:30	8	V.good	Showers	F2 S
8	27/10/2021	12:05	15:05	8	Good	Light rain/showers	F2 S
8	29/10/2021	08:40	11:40	5	V.good	Dry	F1 W

VP	Date	Start Time	End Time	Cloud (Oktas)	Visibility	Rain	Wind
9	25/10/2021	08:18	11:18	5	V.good	Dry	F2 SSW
9	29/10/2021	13:05	16:05	6	V.good	Dry	F1 SSW
10	20/10/2021	08:10	11:10	4	V.good	Dry	F1 WSW
10	25/10/2021	12:30	15:30	5	V.good	Dry	F1 SW
11	20/10/2021	11:45	14:45	5	V.good	Dry	F1 W
11	21/10/2021	15:15	18:15	6	V.good	Dry	F1 W
1	01/12/2021	08:20	11:20	4	Good	Showers	F3 NW
1	01/12/2021	11:20	14:20	4	Good	Showers	F3 NW
2	23/11/2021	08:15	11:15	8	Excellent	Dry	F0
2	23/11/2021	11:45	14:45	8	Excellent	Dry	F0
3	22/11/2021	09:15	12:15	0	Excellent	Dry	F0-1
3	22/11/2021	12:45	15:45	0	Excellent	Dry	F0-1
4	25/11/2021	08:00	11:00	3	Excellent	Dry	F1-2
4	25/11/2021	11:30	14:30	3	Excellent	Dry	F1-2
5	26/11/2021	08:00	11:00	6	Excellent	Occasional light showers	F3-4
5	26/11/2021	11:30	14:30	6	Excellent	Occasional light showers	F3-4
6	02/12/2021	09:10	12:10	4/8-7/8	Moderate	Dry	W F1-2
6	02/12/2021	12:40	15:40	7/8-8/8	Good-Poor	Light rain/showers	W F2
7	29/11/2021	10:45	13:45	8/8	Very good	Dry	W F2
7	29/11/2021	13:45	16:45	8/8	Very good	Dry	W F2
8	24/11/2021	09:00	12:00	7/8-3/8	Excellent	Showers then dry	NW F3
8	24/11/2021	12:30	15:30	3/8	Excellent	Dry/Drizzle	NW F3
9	19/11/2021	07:30	10:30	8/8	Good	Mist/Dry	SW F1
9	02/11/2021	08:20	11:20	5/8	Good	Dry	W F1
10	18/11/2021	11:00	14:00	8/8	Good	Dry	SE F2
10	18/11/2021	14:00	17:00	8/8	Good	Dry	SE F2
11	25/11/2021	08:50	11:50	2/8	Excellent	Dry	NW F3
11	25/11/2021	12:30	15:30	2/8	Good	Shower	NW F3
1	13/12/2021	09:30	12:30	7/8	Good	Light Drizzle	F1
1	13/12/2021	13:00	16:00	7/8	good	Light Drizzle	F1
2	14/12/2021	09:30	12:30	3/8	Good	Dry	F2
2	14/12/2021	13:00	16:00	3/8	Good	Dry	F2
3	13/12/2021	09:30	12:30	7/8	Moderate	Some drizzle	F2
3	13/12/2021	13:00	16:00	7/8	Moderate	Some drizzle	F2
4	15/12/2021	09:30	12:30	8/8	Good	Dry	F3
4	15/12/2021	13:00	16:00	8/8	Very good	Dry	F3
5	14/12/2021	13:00	16:00	7/8	Moderate	Dry	F2
5	14/12/2021	09:30	12:30	7/8	Good	Dry	F1

VP	Date	Start Time	End Time	Cloud (Oktas)	Visibility	Rain	Wind
6	16/12/2021	09:30	12:30	7/8	Moderate	Dry	F2
6	16/12/2021	13:00	16:00	7/8	Moderate	Dry	F2
7	15/12/2021	09:30	12:00	7/8	Moderate	Light Drizzle	F2
7	15/12/2021	13:00	16:00	6/8	Good	Dry	F2
8	27/12/2021	09:00	12:00	8/8	Moderate	Dry	F2
8	27/12/2021	13:00	16:00	4/8	Moderate	Light Drizzle	F2
9	16/12/2021	09:30	12:30	7/8	Good	Dry	F3
9	16/12/2021	13:00	14:00	7/8	Good	Dry	F3
10	27/12/2021	09:30	12:30	8/8	Moderate	Dry	F1
10	27/12/2021	13:00	16:00	8/8	Moderate	Dry	F1
11	28/12/2021	13:00	16:00	3/8	Excellent	Dry	F1
11	28/12/2021	09:30	12:30	3/8	Excellent	Dry	F1
1	07/01/2022	09:30	12:30	6/8	Good	Showers	F3
1	07/01/2022	13:00	16:00	7/8	Good	Showers	F3
2	17/01/2022	09:30	12:30	1/8	Excellent	Dry	F1
2	17/01/2022	13:00	16:00	1/8	Excellent	Dry	F1
3	18/01/2022	09:30	12:30	7/8	Good	Light Drizzle	F1
3	18/01/2022	13:00	16:00	7/8	Good	Light Drizzle	F1
4	24/01/2022	09:30	12:30	7/8	Good	Dry	F1
4	24/01/2022	13:00	16:00	7/8	Good	Dry	F1
5	25/01/2022	09:30	12:30	7/8	Moderate	Dry	F1
5	25/01/2022	13:00	16:00	7/8	Moderate	Dry	F2
6	24/01/2022	09:40	12:40	4/8	Good	Dry	F1
6	24/01/2022	13:10	16:10	4/8	Good	Dry	F1
7	06/01/2022	09:30	12:30	8/8	Moderate	Light Drizzle	F3
7	06/01/2022	13:00	16:00	8/8	Moderate	Light Drizzle	F3
8	11/01/2022	09:30	12:30	3/8	Good	Dry	F1
8	11/01/2022	13:00	16:00	3/8	Good	Dry	F1
9	12/01/2022	09:30	12:30	2/8	Very good	Dry	F1
9	12/01/2022	13:00	16:00	2/8	Very good	Dry	F1
10	17/01/2022	09:40	12:40	2/8	Good	Dry	F1
10	17/01/2022	13:10	16:10	2/8	Good	Dry	F1
11	18/01/2022	09:30	12:30	8/8	Moderate	Dry	F2
11	18/01/2022	13:00	16:00	8/8	Moderate	Light Rain	F2
1	01/02/2022	09:30	12:30	7/8	Good	Light Drizzle	F3
1	02/03/2022	13:00	16:00	7/8	Good	Light Drizzle-Dry	F3
2	03/02/2022	09:30	12:30	6/8	Excellent	Dry	F2
2	03/02/2022	13:00	16:00	6/8	Excellent	Dry	F2
3	02/02/2022	09:30	12:30	6/8	Good	Light Drizzle	F3
3	02/02/2022	13:00	16:00	7/8	Good	Dry	F3

VP	Date	Start Time	End Time	Cloud (Oktas)	Visibility	Rain	Wind
4	28/02/2022	09:30	13:00	2/8	Excellent	Dry	F1
4	28/02/2022	13:00	16:00	2/8	Excellent	Dry/Light Rain	F3
5	25/02/2022	09:30	12:30	6/8	Good	Dry	F1
5	25/02/2022	13:00	16:00	5/8	Good	Dry	F1
6	25/02/2022	09:30	12:30	7/8	Good	Dry	F2
6	25/02/2022	13:00	16:00	7/8	Good	Dry	F3
7	02/02/2022	09:40	12:40	8/8	Good	Dry	F2
7	02/02/2022	13:10	16:10	8/8	Good	Dry	F2
8	14/02/2022	09:15	12:15	6/8	Good	Showers	F4
8	14/02/2022	12:45	15:45	4/8	Good	Showers	F4
9	09/02/2022	09:15	12:15	4/8	Good	Dry	F3
9	09/02/2022	12:45	15:45	5/8	Good	Dry/Occasional Shower	F3
10	01/02/2022	09:40	12:40	8/8	Good	Drizzle	F2
10	01/02/2022	13:10	16:10	8/8	Good	Drizzle	F3
11	08/02/2022	09:30	12:30	8/8	Moderate	Drizzle	F3
11	08/02/2022	13:00	16:00	8/8	Moderate	Drizzle/Light Rain	F3
1	02/03/2022	09:30	12:30	8/8	Moderate	Heavy Drizzle	F2
1	02/03/2022	13:00	16:00	7/8	Good	Light Drizzle-Dry	F3
2	07/03/2022	09:30	12:30	6/8	Good	Dry	F3
2	07/03/2022	13:00	16:00	6/8	Good	Dry	F3
3	16/03/2022	09:30	12:30	1/8	Excellent	Dry	F1
3	16/03/2022	13:00	16:00	1/8	Excellent	Dry	F1
4	08/03/2022	09:30	12:30	7/8	Good	Dry	F4
4	08/03/2022	13:00	16:00	6/8	Good	Dry/Light Drizzle	F3
5	15/03/2022	09:30	12:30	7/8	Good	Dry	F2
5	15/03/2022	13:00	16:00	6/8	Good	Dry	F2
6	16/03/2022	09:30	12:30	3/8	Excellent	Dry	F1
6	16/03/2022	13:00	16:00	4/8	Excellent	Dry	F1
7	07/03/2022	09:35	12:35	8/8	Good	Dry	F3
7	07/03/2022	13:10	16:10	7/8	Good	Dry	F4
8	08/03/2022	09:40	12:40	8/8	Good	Heavy Showers	F3
8	08/03/2022	13:10	16:10	8/8	Good	Showers	F3
9	02/03/2022	09:40	12:40	8/8	Moderate	Drizzle	F3
9	02/03/2022	13:10	16:10	8/8	Moderate	Drizzle	F3
10	15/03/2022	09:45	12:45	8/8	Good	Dry	F1
10	15/03/2022	13:15	16:15	8/8	Good	Dry	F1
11	28/03/2022	09:30	12:30	1/8	Excellent	Dry	F1
11	28/03/2022	13:00	16:00	1/8	Excellent	Dry	F1

FEHILY TIMONEY

CONSULTANTS IN ENGINEERING,
ENVIRONMENTAL SCIENCE
& PLANNING

APPENDIX 2

Vantage Point Observations

VP no.	Flightline Number	Flightline Map	Date	Species	Time of Obs.	Inside/outside Buffer	Total Duration (s)	0-30m (s)	30 - 50m (s)	50-185m (s)	>185m (s)
2	1	8	20/09/2021	Mallard	08:52	in	24	24			
2	1	3	20/09/2021	Grey Heron	09:20	out	15	15			
2	1	1	20/09/2021	Buzzard	09:41	in	64	9	55		
2	1	6	20/09/2021	Lesser Black-backed Gull	10:04	in	143			143	
2	2	8	20/09/2021	Mallard	10:46	out	36	36			
2	2	6	20/09/2021	Lesser Black-backed Gull	11:08	out	48		48		
2	2	6	20/09/2021	Lesser Black-backed Gull	11:08	in	106		106		
2	3	8	20/09/2021	Mallard	12:09	out	37	37			
2	1	11	20/09/2021	Sparrowhawk	12:37	in	24	12	12		
2	2	3	20/09/2021	Grey Heron	13:06	out	16	16			
2	3	3	20/09/2021	Grey Heron	13:33	out	19	19			
2	1	2	20/09/2021	Cormorant	14:00	in	73		73		
2	1	2	20/09/2021	Cormorant	14:00	out	61		61		
2	2	1	20/09/2021	Buzzard	14:28	in	44		44		
5	3	1	20/09/2021	Buzzard	16:04	in	108	9	24	75	
5	1	10	20/09/2021	Snipe	16:47	in	33	17	16		
5	1	4	20/09/2021	Kestrel	17:15	in	205	73	102	30	
5	4	1	20/09/2021	Buzzard	17:57	in	47	6	41		
9	2	4	21/09/2021	Kestrel	09:13	in	363	26	27	310	
9	1	9	21/09/2021	Peregrine	09:46	in	51	8	43		
9	3	4	21/09/2021	Kestrel	10:33	in	144	7	15	122	
9	4	3	21/09/2021	Grey Heron	10:57	in	35	35			
9	5	1	21/09/2021	Buzzard	11:15	in	71		71		
9	4	4	21/09/2021	Kestrel	13:06	in	312		29	283	
9	6	1	21/09/2021	Buzzard	13:52	in	34	23	11		
9	5	4	21/09/2021	Kestrel	14:26	in	111		19	92	
9	6	4	21/09/2021	Kestrel	15:00	in	64		64		
5	7	1	21/09/2021	Buzzard	17:15	in	77		15	62	
5	7	4	21/09/2021	Kestrel	17:49	in	209	8	18	183	

VP no.	Flightline Number	Flightline Map	Date	Species	Time of Obs.	Inside/outside Buffer	Total Duration (s)	0-30m (s)	30 - 50m (s)	50-185m (s)	>185m (s)
5	8	1	21/09/2021	Buzzard	18:43	in	104			104	
10	8	4	22/09/2021	Kestrel	09:32	in	542	57	412	73	
10	9	4	22/09/2021	Kestrel	10:14	in	106	16	90		
10	5	3	22/09/2021	Grey Heron	10:53	in	21	21			
10	10	4	22/09/2021	Kestrel	11:20	in	75	61	14		
10	11	4	22/09/2021	Kestrel	13:09	in	222	26	180	16	
10	9	1	22/09/2021	Buzzard	14:14	in	35	8	27		
10	12	4	22/09/2021	Kestrel	15:00	in	17	17			
11	3	6	22/09/2021	Lesser Black-backed Gull	17:20	in	183			183	
11	13	4	22/09/2021	Kestrel	18:05	in	100	26	74		
11	10	1	22/09/2021	Buzzard	18:27	in	54	13	41		
4	11	1	23/09/2021	Buzzard	09:14	in	93	18	54	21	
4	2	2	23/09/2021	Cormorant	09:24	in	37	11	26		
4	4	6	23/09/2021	Lesser Black-backed Gull	09:38	in	165			165	
4	6	3	23/09/2021	Grey Heron	09:57	in	16	16			
4	1	7	23/09/2021	Little Egret	10:29	in	22	22			
4	2	10	23/09/2021	Snipe	10:50	in	41	21	20		
4	7	3	23/09/2021	Grey Heron	11:03	in	37	37			
4	2	7	23/09/2021	Little Egret	11:26	in	6	6			
4	4	8	23/09/2021	Mallard	11:44	in	69	69			
4	8	3	23/09/2021	Grey Heron	13:00	in	21	21			
4	3	10	23/09/2021	Snipe	13:13	in	15	15			
4	5	8	23/09/2021	Mallard	13:47	in	67	12	55		
4	12	1	23/09/2021	Buzzard	14:06	in	86		86		
4	4	10	23/09/2021	Snipe	14:24	in	29	19	10		
4	9	3	23/09/2021	Grey Heron	14:53	in	10	10			
4	3	7	23/09/2021	Little Egret	15:09	in	35	35			
4	10	3	23/09/2021	Grey Heron	15:21	in	12	12			
11	14	4	23/09/2021	Kestrel	17:11	in	364	111	173	80	

VP no.	Flightline Number	Flightline Map	Date	Species	Time of Obs.	Inside/outside Buffer	Total Duration (s)	0-30m (s)	30 - 50m (s)	50-185m (s)	>185m (s)
11	13	1	23/09/2021	Buzzard	18:00	in	79	10	69		
8	14	1	24/09/2021	Buzzard	09:25	in	83	7	76		
8	5	10	24/09/2021	Snipe	10:14	in	31	21	10		
8	5	6	24/09/2021	Lesser Black-backed Gull	10:29	in	199			199	
8	6	10	24/09/2021	Snipe	14:46	in	49	18	31		
1	11	3	24/09/2021	Grey Heron	16:52	in	162			162	
1	1	5	24/09/2021	Lapwing	17:06	out	36	36			
1	15	1	24/09/2021	Buzzard	17:24	in	52	11		41	
1	12	3	24/09/2021	Grey Heron	17:49	out	11	11			
1	6	8	24/09/2021	Mallard	18:10	out	17	17			
1	3	2	24/09/2021	Cormorant	18:37	in	33		33		
1	3	2	24/09/2021	Cormorant	18:37	out	65		65		
1	2	5	27/09/2021	Lapwing	08:33	out	45	12	33		
1	7	8	27/09/2021	Mallard	09:19	in	15	15			
1	7	8	27/09/2021	Mallard	09:19	out	31	31			
1	2	11	27/09/2021	Sparrowhawk	09:48	out	22	22			
1	13	3	27/09/2021	Grey Heron	10:12	out	19	19			
1	4	2	27/09/2021	Cormorant	10:50	in	152			152	
1	16	1	27/09/2021	Buzzard	10:56	in	63		63		
1	14	3	27/09/2021	Grey Heron	11:05	out	17	17			
7	17	1	27/09/2021	Buzzard	12:39	in	66	14	52		
7	15	4	27/09/2021	Kestrel	13:42	in	307	94	102	111	
7	16	4	27/09/2021	Kestrel	16:14	in	225	89	76	60	
7	17	4	27/09/2021	Kestrel	16:55	in	102	49	53		
6	3	11	28/09/2021	Sparrowhawk	09:02	in	101	12	10	79	
6	15	3	28/09/2021	Grey Heron	09:52	in	31	31			
6	18	4	28/09/2021	Kestrel	10:17	in	222	102	63	57	
6	18	1	28/09/2021	Buzzard	10:55	in	58	8	50		
6	19	4	28/09/2021	Kestrel	11:04	in	177	16	151		

VP no.	Flightline Number	Flightline Map	Date	Species	Time of Obs.	Inside/outside Buffer	Total Duration (s)	0-30m (s)	30 - 50m (s)	50-185m (s)	>185m (s)
6	4	11	28/09/2021	Sparrowhawk	12:21	in	73	60	13		
6	19	1	28/09/2021	Buzzard	12:58	in	103		103		
6	20	4	28/09/2021	Kestrel	13:44	in	66	14	52		
6	21	4	28/09/2021	Kestrel	14:35	in	220	52	168		
3	20	1	28/09/2021	Buzzard	16:04	in	69	15	54		
3	8	8	28/09/2021	Mallard	16:11	in	33	33			
3	22	4	28/09/2021	Kestrel	16:50	in	117	18	99		
3	16	3	28/09/2021	Grey Heron	17:15	in	15	15			
3	23	4	28/09/2021	Kestrel	18:00	in	78	30	48		
3	24	4	29/09/2021	Kestrel	09:37	in	172	55	67	50	
3	21	1	29/09/2021	Buzzard	10:11	in	44	12	32		
3	25	4	29/09/2021	Kestrel	11:06	in	58	20	38		
3	17	3	29/09/2021	Grey Heron	11:30	in	29	29			
1	3	28	01/10/2021	Lapwing	08:12	out	53	12	41		
1	5	16	01/10/2021	Cormorant	08:50	in	109			109	
1	22	14	01/10/2021	Buzzard	09:22	in	70	11	59		
1	18	21	01/10/2021	Grey Heron	09:43	out	15	15			
1	9	31	01/10/2021	Mallard	10:10	out	38	38			
1	19	21	01/10/2021	Grey Heron	11:55	out	17	17			
1	6	16	01/10/2021	Cormorant	12:08	in	202			202	
1	23	14	01/10/2021	Buzzard	12:30	in	89	19	70		
1	4	28	01/10/2021	Lapwing	13:14	out	55	33	22		
1	20	21	01/10/2021	Grey Heron	13:45	out	23	23			
1	10	31	01/10/2021	Mallard	14:02	in	30	30			
1	10	31	01/10/2021	Mallard	14:02	out	47	47			
1	5	41	01/10/2021	Sparrowhawk	14:15	out	10	10			
5	4	30	01/10/2021	Little Egret	16:10	in	36	36			
5	24	14	01/10/2021	Buzzard	16:40	in	79	8	71		
5	26	26	01/10/2021	Kestrel	17:13	in	134	8	20	106	

VP no.	Flightline Number	Flightline Map	Date	Species	Time of Obs.	Inside/outside Buffer	Total Duration (s)	0-30m (s)	30 - 50m (s)	50-185m (s)	>185m (s)
5	21	21	01/10/2021	Grey Heron	17:42	in	22	22			
4	25	14	02/10/2021	Buzzard	08:35	in	53		53		
4	7	16	02/10/2021	Cormorant	08:53	in	98			98	
4	5	30	02/10/2021	Little Egret	09:29	in	34	34			
4	22	21	02/10/2021	Grey Heron	10:10	in	18	18			
4	11	31	02/10/2021	Mallard	10:22	in	77	77			
4	7	40	02/10/2021	Snipe	10:43	in	15	15			
4	6	30	02/10/2021	Little Egret	12:06	in	35	35			
4	23	21	02/10/2021	Grey Heron	12:39	in	29	29			
4	24	21	02/10/2021	Grey Heron	13:04	in	7	7			
4	12	31	02/10/2021	Mallard	13:22	in	25	25			
4	5	28	02/10/2021	Lapwing	14:14	in	63	12	51		
5	26	14	02/10/2021	Buzzard	15:55	in	106	6	12	88	
5	25	21	02/10/2021	Grey Heron	16:26	in	57	57			
5	8	40	02/10/2021	Snipe	17:18	in	29	15	14		
6	27	26	03/10/2021	Kestrel	08:47	in	186	8	26	152	
6	27	14	03/10/2021	Buzzard	09:18	in	54	14	40		
6	6	41	03/10/2021	Sparrowhawk	09:50	in	26	26			
6	28	26	03/10/2021	Kestrel	10:15	in	66	19	47		
6	26	21	03/10/2021	Grey Heron	10:37	in	124	124			
6	29	26	03/10/2021	Kestrel	12:06	in	166	19	54	93	
6	28	14	03/10/2021	Buzzard	12:54	in	77	21	56		
6	30	26	03/10/2021	Kestrel	13:48	in	102			102	
7	27	21	03/10/2021	Grey Heron	16:22	in	31	31			
7	31	26	03/10/2021	Kestrel	16:58	in	79				79
10	32	26	20/10/2021	Kestrel	09:12	in	101	16	33	52	
10	28	21	20/10/2021	Grey Heron	10:00	in	27	27			
11	33	26	20/10/2021	Kestrel	14:01	in	202	58	105	59	
11	34	26	20/10/2021	Kestrel	15:47	in	154	22	34	98	

VP no.	Flightline Number	Flightline Map	Date	Species	Time of Obs.	Inside/outside Buffer	Total Duration (s)	0-30m (s)	30 - 50m (s)	50-185m (s)	>185m (s)
11	35	26	21/10/2021	Kestrel	14:33	in	77			77	
9	36	26	25/10/2021	Kestrel	09:10	in	144		18	126	
9	29	14	25/10/2021	Buzzard	10:17	in	60		60		
10	37	26	25/10/2021	Kestrel	12:35	in	117			117	
10	38	26	25/10/2021	Kestrel	13:30	in	88	9	11	68	
10	29	21	25/10/2021	Grey Heron	15:04	in	24	24			
3	1	18	26/10/2021	Golden Plover	08:33	in	47	37	0		
3	30	21	26/10/2021	Grey Heron	09:03	in	30	30			
3	2	18	26/10/2021	Golden Plover	09:51	in	72	37	35		
3	30	14	26/10/2021	Buzzard	10:15	in	63	14	49		
3	39	26	26/10/2021	Kestrel	10:42	in	118	19	22	77	
3	31	21	26/10/2021	Grey Heron	12:52	in	16	16			
3	3	18	26/10/2021	Golden Plover	13:25	in	80	5	13	62	
3	40	26	26/10/2021	Kestrel	14:14	in	172	12	65	95	
7	32	21	27/10/2021	Grey Heron	09:51	in	44	44			
8	31	14	27/10/2021	Buzzard	14:00	in	72	10	31	31	
2	1	36	28/10/2021	Mute Swan	08:51	in	10				
2	2	36	28/10/2021	Mute Swan	08:51	out	52				
2	32	14	28/10/2021	Buzzard	09:22	in	34	24			
2	33	21	28/10/2021	Grey Heron	09:49	out	22				
2	6	28	28/10/2021	Lapwing	10:24	out	48				
2	6	28	28/10/2021	Lapwing	10:24	in	13				
2	13	31	28/10/2021	Mallard	11:02	out	27				
2	14	31	28/10/2021	Mallard	11:08	out	30				
2	7	28	28/10/2021	Lapwing	12:44	out	62	30	32		
2	15	31	28/10/2021	Mallard	13:30	in	11	11			
2	15	31	28/10/2021	Mallard	13:30	out	22	22			
2	34	21	28/10/2021	Grey Heron	14:10	out	19	19			
2	33	14	28/10/2021	Buzzard	14:22	in	55	5	50		

VP no.	Flightline Number	Flightline Map	Date	Species	Time of Obs.	Inside/outside Buffer	Total Duration (s)	0-30m (s)	30 - 50m (s)	50-185m (s)	>185m (s)
2	35	21	28/10/2021	Grey Heron	14:51	out	17	17			
9	41	26	29/10/2021	Kestrel	14:14	in	153	10	23	120	
9	34	14	29/10/2021	Buzzard	14:38	in	149	18	58	73	
9	36	21	29/10/2021	Grey Heron	15:07	in	167	10	157		
9	4	18	02/11/2021	Golden Plover	08:36	in	64	64			
9	1	43	02/11/2021	Whooper Swan	08:38	in	30		30		
9	9	40	02/11/2021	Snipe	08:40	in	12	12			
9	5	18	02/11/2021	Golden Plover	08:48	in	275	60	5	210	
9	2	43	02/11/2021	Whooper Swan	09:44	in	38	38			
9	7	30	02/11/2021	Little Egret	10:01	in	33	33			
9	3	43	02/11/2021	Whooper Swan	10:12	in	No data				
10	10	40	18/11/2021	Snipe	11:05	in	5	5			
10	8	30	18/11/2021	Little Egret	11:09	in	13	13			
10	42	26	18/11/2021	Kestrel	12:02	in	9	9			
10	35	14	18/11/2021	Buzzard	12:48	in	122		10	112	
10	16	31	18/11/2021	Mallard	13:11	in	51			51	
10	17	31	18/11/2021	Mallard	13:15	in	38			38	
10	4	43	18/11/2021	Whooper Swan	14:18	in/out	55	45	10		
9	5	43	19/11/2021	Whooper Swan	07:52	in	14	14			
9	6	18	19/11/2021	Golden Plover	08:00	in	109	89	20		
9	6	43	19/11/2021	Whooper Swan	08:02	in	31	31			
9	7	18	19/11/2021	Golden Plover	09:01	in	42	37	5		
9	8	18	19/11/2021	Golden Plover	09:26	in	126	66	10	50	
3	43	26	22/11/2021	Kestrel	09:37	in	26	26			
3	36	14	22/11/2021	Buzzard	09:53	in	1320	1320			
2	1	35	23/11/2021	Moorhen	08:15	out	5	5			
2	3	36	23/11/2021	Mute Swan	08:15	out	1200	1200			
2	1	46	23/11/2021	Wigeon	08:28	out	28	28			
2	37	21	23/11/2021	Grey Heron	08:38	out	38	38			

VP no.	Flightline Number	Flightline Map	Date	Species	Time of Obs.	Inside/outside Buffer	Total Duration (s)	0-30m (s)	30 - 50m (s)	50-185m (s)	>185m (s)
2	4	36	23/11/2021	Mute Swan	08:43	out	61	61			
2	18	31	23/11/2021	Mallard	08:44	in	22	22			
2	4	36	23/11/2021	Mute Swan	08:48	in	30	30			
2	1	42	23/11/2021	Teal	08:50	out	16	16			
2	19	31	23/11/2021	Mallard	08:52	in	14	14			
2	19	31	23/11/2021	Mallard	08:52	out	30	30			
2	1	12	23/11/2021	Black-headed Gull	09:01	out	52	52			
2	20	31	23/11/2021	Mallard	09:15	in	36	30			
2	1	20	23/11/2021	Great Crested Grebe	10:51	out	120	120			
2	38	21	23/11/2021	Grey Heron	11:00	out	62	62			
2	8	28	23/11/2021	Lapwing	11:06	out	42	42			
2	7	43	23/11/2021	Whooper Swan	12:35	out	65		65		
2	11	40	23/11/2021	Snipe	12:39	out	52			32	
2	5	36	23/11/2021	Mute Swan	12:51	in	20	20			
2	5	36	23/11/2021	Mute Swan	12:51	out	15	15			
2	5	36	23/11/2021	Mute Swan	12:51	out	10		10		
2	5	36	23/11/2021	Mute Swan	12:51	in	41	5	26		
2	1	46	23/11/2021	Wigeon		in	20	20			
8	44	26	24/11/2021	Kestrel	12:40	in	20			20	
8	9	28	24/11/2021	Lapwing	13:04	in	30		30		
8	45	26	24/11/2021	Kestrel	14:38	in	10	10			
8	8	43	24/11/2021	Whooper Swan	15:15	in	900	900			
4	9	43	25/11/2021	Whooper Swan	08:00	in	10800	10800			
4	10	43	25/11/2021	Whooper Swan	08:00	in	2640	2640			
4	11	43	25/11/2021	Whooper Swan	08:01	in	40	10	30		
4	12	43	25/11/2021	Whooper Swan	08:10	in	69	50	19		
4	2	35	25/11/2021	Moorhen	08:18	in	2	2			
4	2	42	25/11/2021	Teal	08:18	in	20	20			
4	21	31	25/11/2021	Mallard	08:19	in	3600	3600			

VP no.	Flightline Number	Flightline Map	Date	Species	Time of Obs.	Inside/outside Buffer	Total Duration (s)	0-30m (s)	30 - 50m (s)	50-185m (s)	>185m (s)
4	13	43	25/11/2021	Whooper Swan	08:44	in	64	60	14		
11	1	24	25/11/2021	Gull sp.	09:25	in	60		45	10	
11	1	24	25/11/2021	Gull sp.	09:25	out	5			5	
4	14	43	25/11/2021	Whooper Swan	09:29	in	27		27		
4	15	43	25/11/2021	Whooper Swan	09:47	in	72	72			
11	46	26	25/11/2021	Kestrel	09:48	in	15	5			
11	47	26	25/11/2021	Kestrel	10:00	in	45	5	40		
4	41	22	25/11/2021	Grey Heron	10:11	in	51	51			
4	16	43	25/11/2021	Whooper Swan	10:14	in	122	75	36		
11	39	21	25/11/2021	Grey Heron	10:47	in					
4	2	46	25/11/2021	Wigeon	10:50	in	3600	3600			
4	3	42	25/11/2021	Teal	10:50	in	3600	3600			
11	40	22	25/11/2021	Grey Heron	10:52	in	2	2			
4	17	43	25/11/2021	Whooper Swan	11:00	in	61	61			
4	10	28	25/11/2021	Lapwing	11:40	in	146	26	120		
4	6	36	25/11/2021	Mute Swan	12:10	in	3600	3600			
4	37	14	25/11/2021	Buzzard	12:51	in	1500	1500			
5	18	43	26/11/2021	Whooper Swan	09:23	in	15	15			
5	1	25	26/11/2021	Hen Harrier	09:23	in	72	72			
5	2	25	26/11/2021	Hen Harrier	09:34	in	23	23			
5	19	43	26/11/2021	Whooper Swan	10:16	in	5	5			
5	4	42	26/11/2021	Teal	10:44	in	48	8	40		
5	22	31	26/11/2021	Mallard	11:31	in	58	8	10	40	
5	5	42	26/11/2021	Teal	11:37	in	47	15	32		
5	6	42	26/11/2021	Teal	11:42	in	121	50	71		
5	23	31	26/11/2021	Mallard	11:42	in	121	50	71		
5	20	43	26/11/2021	Whooper Swan	11:48	in	29	9	20		
5	24	31	26/11/2021	Mallard	12:22	in	153	50	50	53	
5	21	43	26/11/2021	Whooper Swan	12:32	in	103		103		

VP no.	Flightline Number	Flightline Map	Date	Species	Time of Obs.	Inside/outside Buffer	Total Duration (s)	0-30m (s)	30 - 50m (s)	50-185m (s)	>185m (s)
5	9	30	26/11/2021	Little Egret	12:58	in	30		30		
5	38	14	26/11/2021	Buzzard	13:35	in	37		37		
7	22	43	29/11/2021	Whooper Swan	11:19	in	16	16			
7	42	22	29/11/2021	Grey Heron	12:36	in	32		32		
7	43	22	29/11/2021	Grey Heron	14:28	in	61	61			
7	23	43	29/11/2021	Whooper Swan	15:21	in	108	108			
7	39	14	29/11/2021	Buzzard	15:24	in	59	59			
7	40	14	29/11/2021	Buzzard	16:06	in	72	72			
1	24	43	01/12/2021	Whooper Swan	08:32	out	30	30			
1	11	28	01/12/2021	Lapwing	08:46	out	23	23			
1	12	28	01/12/2021	Lapwing	08:50	out	32	25	7		
1	7	36	01/12/2021	Mute Swan	09:05	out	71	60	11		
1	13	28	01/12/2021	Lapwing	09:18	out	16	16			
1	14	28	01/12/2021	Lapwing	09:20	out	26	19	7		
1	25	31	01/12/2021	Mallard	09:23	out	18		18		
1	25	43	01/12/2021	Whooper Swan	09:27	out	56		56		
1	15	28	01/12/2021	Lapwing	09:28	out	18	18			
1	16	28	01/12/2021	Lapwing	09:31	out	120	110	10		
1	26	43	01/12/2021	Whooper Swan	09:58	out	50		50		
1	26	31	01/12/2021	Mallard	10:01	out	13	13			
1	17	28	01/12/2021	Lapwing	10:17	out	102	5	25	72	
1	18	28	01/12/2021	Lapwing	11:40	out	58			58	
1	8	36	01/12/2021	Mute Swan	11:59	out	64	54	10		
1	41	14	01/12/2021	Buzzard	12:57	out	6	6			
1	19	28	01/12/2021	Lapwing	13:09	out	18	18			
1	20	28	01/12/2021	Lapwing	13:11	out	10	8	2		
1	21	28	01/12/2021	Lapwing	13:30	out	21	21			
1	42	14	01/12/2021	Buzzard	14:06	out	42			42	
6	43	14	02/12/2021	Buzzard	09:40	in	180		180		

VP no.	Flightline Number	Flightline Map	Date	Species	Time of Obs.	Inside/outside Buffer	Total Duration (s)	0-30m (s)	30 - 50m (s)	50-185m (s)	>185m (s)
6	44	14	02/12/2021	Buzzard	10:03	in	50	5	45		
6	45	14	02/12/2021	Buzzard	10:20	in	65	10	55		
6	2	37	02/12/2021	Peregrine	10:30	in	300	50			
6	48	26	02/12/2021	Kestrel	11:44	in	10		10		
6	27	43	02/12/2021	Whooper Swan	12:57	in	50	50			
6	46	14	02/12/2021	Buzzard	14:29	in	16	16			
6	10	30	02/12/2021	Little Egret	14:39	in	65	65			
1	28	43	13/12/2021	Whooper Swan	09:35	out	9		9		
1	28	43	13/12/2021	Whooper Swan	09:35	in	6	6			
1	22	28	13/12/2021	Lapwing	09:42	out	8		8		
1	22	28	13/12/2021	Lapwing	09:42	in	292	5	25	272	
1	9	18	13/12/2021	Golden Plover	09:46	out	18			18	
1	9	18	13/12/2021	Golden Plover	09:46	in	300	5	3	292	
1	29	43	13/12/2021	Whooper Swan	09:55	in	6	3	3		
1	29	43	13/12/2021	Whooper Swan	09:55	out	9		9		
1	3	46	13/12/2021	Wigeon	10:00	in	32	5	15	12	
1	3	46	13/12/2021	Wigeon	10:01	out	9			9	
1	4	46	13/12/2021	Wigeon	10:12	in	14	4	2	8	
1	4	46	13/12/2021	Wigeon	10:12	out	8			8	
1	7	42	13/12/2021	Teal	10:13	in	15	2	5	3	
1	7	42	13/12/2021	Teal	10:13	out	10			10	
1	27	31	13/12/2021	Mallard	10:30	out	3	3			
1	27	31	13/12/2021	Mallard	10:30	in	5	5			
1	5	46	13/12/2021	Wigeon	10:40	in	12	3	3	6	
1	5	46	13/12/2021	Wigeon	10:40	out	15			15	
1	28	31	13/12/2021	Mallard	10:55	out	15		5	10	
1	28	31	13/12/2021	Mallard	10:55	in	10	3	7		
1	9	36	13/12/2021	Mute Swan	11:05	in	12	3	3	6	
1	9	36	13/12/2021	Mute Swan	11:05	out	15			15	

VP no.	Flightline Number	Flightline Map	Date	Species	Time of Obs.	Inside/outside Buffer	Total Duration (s)	0-30m (s)	30 - 50m (s)	50-185m (s)	>185m (s)
3	30	43	13/12/2021	Whooper Swan	11:26	in	100	50	50		
3	31	44	13/12/2021	Whooper Swan	11:34	in	70	30	40		
1	29	32	13/12/2021	Mallard	11:35	out	8			8	
1	29	32	13/12/2021	Mallard	11:35	in	22			22	
3	11	30	13/12/2021	Little Egret	11:56	in	60	60			
3	6	46	13/12/2021	Wigeon	12:09	in	10	10			
3	30	32	13/12/2021	Mallard	12:11	in	50			50	
1	44	22	13/12/2021	Grey Heron	12:15	out	18			18	
1	44	22	13/12/2021	Grey Heron	12:15	in	7			7	
3	31	32	13/12/2021	Mallard	12:19	in	60		60		
3	3	37	13/12/2021	Peregrine	12:20	in	80	30	50		
1	44	22	13/12/2021	Grey Heron	12:21	out	8		7		
1	44	22	13/12/2021	Grey Heron	12:21	in	10	3	3	4	
3	32	32	13/12/2021	Mallard	13:14	out	30		30		
3	7	41	13/12/2021	Sparrowhawk	13:18	in	20	20			
3	7	46	13/12/2021	Wigeon	13:20	out	10			10	
3	12	30	13/12/2021	Little Egret	13:31	in	60	30	30		
3	32	44	13/12/2021	Whooper Swan	13:39	in	180				180
1	45	22	13/12/2021	Grey Heron	13:41	out	7		7		
1	45	22	13/12/2021	Grey Heron	13:41	in	10	3	3	4	
3	8	41	13/12/2021	Sparrowhawk	13:59	in	5	5			
3	47	14	13/12/2021	Buzzard	15:02	out	5			5	
3	33	44	13/12/2021	Whooper Swan	15:06	in	180			180	
2	33	32	14/12/2021	Mallard	09:40	in	15	10	5		
2	10	36	14/12/2021	Mute Swan	09:43	in	20	20			
2	34	44	14/12/2021	Whooper Swan	09:56	in	15		15		
2	34	32	14/12/2021	Mallard	10:10	in	10	10			
2	23	28	14/12/2021	Lapwing	10:25	in	35	35			
5	13	30	14/12/2021	Little Egret	10:27	out	60			60	

VP no.	Flightline Number	Flightline Map	Date	Species	Time of Obs.	Inside/outside Buffer	Total Duration (s)	0-30m (s)	30 - 50m (s)	50-185m (s)	>185m (s)
5	13	30	14/12/2021	Little Egret	10:28	in	15	5	10		
5	35	44	14/12/2021	Whooper Swan	10:30	out	60			60	
5	14	30	14/12/2021	Little Egret	10:40	out	10		10		
5	14	30	14/12/2021	Little Egret	10:40	in	15	5	10		
5	36	44	14/12/2021	Whooper Swan	10:43	out	20			20	
5	36	44	14/12/2021	Whooper Swan	10:43	in	60	5	5	50	
5	37	44	14/12/2021	Whooper Swan	11:04	out	7			7	
5	37	44	14/12/2021	Whooper Swan	11:04	in	89			89	
5	48	14	14/12/2021	Buzzard	11:30	out	7			7	
5	48	14	14/12/2021	Buzzard	11:30	in	83			83	
2	24	28	14/12/2021	Lapwing	13:41	in	20		20		
2	24	28	14/12/2021	Lapwing	13:41	out	40		40		
5	15	30	14/12/2021	Little Egret	13:56	out	10		10		
5	15	30	14/12/2021	Little Egret	13:56	in	16	5	11		
7	49	14	15/12/2021	Buzzard	10:31	out	15		10	5	
7	16	30	15/12/2021	Little Egret	10:39	in	20		20		
7	50	14	15/12/2021	Buzzard	11:15	in	10		10		
7	49	26	15/12/2021	Kestrel	11:27	in	380		20	360	
7	4	37	15/12/2021	Peregrine	11:30	in	100			100	
4	46	22	15/12/2021	Grey Heron	11:40	out	4		4		
4	46	22	15/12/2021	Grey Heron	11:40	in	11	4	7		
4	51	15	15/12/2021	Buzzard	11:41	in	60		60		
4	5	37	15/12/2021	Peregrine	12:25	out	7		7		
4	5	37	15/12/2021	Peregrine	12:25	in	25		25		
7	3	25	15/12/2021	Hen Harrier	13:30	in	600	500	100		
7	1	34	15/12/2021	Merlin	13:31	in	20	20			
7	52	15	15/12/2021	Buzzard	14:01	in	30		30		
7	17	30	15/12/2021	Little Egret	14:07	in	10	10			
7	12	40	15/12/2021	Snipe	14:15	in	5	5			

VP no.	Flightline Number	Flightline Map	Date	Species	Time of Obs.	Inside/outside Buffer	Total Duration (s)	0-30m (s)	30 - 50m (s)	50-185m (s)	>185m (s)
6	18	30	16/12/2021	Little Egret	09:47	in	10	10			
6	38	44	16/12/2021	Whooper Swan	09:58	in	5	5			
6	39	44	16/12/2021	Whooper Swan	10:07	in	30	30			
6	40	44	16/12/2021	Whooper Swan	10:19	in	20	5	15		
9	19	30	16/12/2021	Little Egret	10:28	in	15	3	12		
6	20	30	16/12/2021	Little Egret	10:33	in	10	10			
6	13	40	16/12/2021	Snipe	10:44	in	4	4			
6	4	25	16/12/2021	Hen Harrier	10:47	in	7	7			
6	9	41	16/12/2021	Sparrowhawk	10:53	in	20		20		
6	41	44	16/12/2021	Whooper Swan	11:07	in	15	5	10		
9	10	18	16/12/2021	Golden Plover	11:13	in	45	5	10	30	
9	11	18	16/12/2021	Golden Plover	11:50	out	7				7
9	11	18	16/12/2021	Golden Plover	11:50	in	233			233	
6	53	15	16/12/2021	Buzzard	11:57	in	130	30	100		
6	8	42	16/12/2021	Teal	12:03	in	3	3			
6	42	44	16/12/2021	Whooper Swan	12:20	in	30	15	15		
6	43	44	16/12/2021	Whooper Swan	12:29	in	20	10	10		
6	44	44	16/12/2021	Whooper Swan	12:29	in	60	40	20		
9	12	18	16/12/2021	Golden Plover	14:01	in	5	2	3		
8	10	41	27/12/2021	Sparrowhawk	09:40	in	20	20			
8	11	41	27/12/2021	Sparrowhawk	09:57	in	30			30	
10	21	30	27/12/2021	Little Egret	10:43	out	5	5			
10	21	30	27/12/2021	Little Egret	10:43	in	8	8			
10	13	18	27/12/2021	Golden Plover	10:47	in	15	5	10		
10	1	23	27/12/2021	Greylag Goose	12:25	in	20			20	
10	1	23	27/12/2021	Greylag Goose	12:25	out	7			7	
8	2	34	27/12/2021	Merlin	14:27	in	40	10	30		
11	14	18	28/12/2021	Golden Plover	09:22	in	30	10	20		
11	25	28	28/12/2021	Lapwing	10:57	in	60	10		50	

VP no.	Flightline Number	Flightline Map	Date	Species	Time of Obs.	Inside/outside Buffer	Total Duration (s)	0-30m (s)	30 - 50m (s)	50-185m (s)	>185m (s)
11	15	18	28/12/2021	Golden Plover	11:09	in	20				
11	16	18	28/12/2021	Golden Plover	11:40	in	30			30	
11	5	25	28/12/2021	Hen Harrier	11:47	in	10	10			
11	3	34	28/12/2021	Merlin	11:49	in	15	15			
11	17	18	28/12/2021	Golden Plover	12:09	in	11			11	
7	4	34	06/01/2022	Merlin	10:36	out	10	10			
7	4	34	06/01/2022	Merlin	10:36	in	50	50			
1	26	28	07/01/2022	Lapwing	09:35	in	10		10		
1	45	44	07/01/2022	Whooper Swan	09:37	in	20		20	20	
1	18	18	07/01/2022	Golden Plover	09:44	in	20				
1	8	46	07/01/2022	Wigeon	10:16	in	30		30		
1	35	32	07/01/2022	Mallard	10:40	in	10	10			
1	9	42	07/01/2022	Teal	11:00	in	5	5			
1	27	28	07/01/2022	Lapwing	11:16	in	30			30	
1	6	37	07/01/2022	Peregrine	11:27	in	180				180
1	36	32	07/01/2022	Mallard	11:45	in	5		5		
1	54	15	07/01/2022	Buzzard	14:10	in	20		20		
1	46	45	07/01/2022	Whooper Swan	14:19	in	10		10		
1	10	42	07/01/2022	Teal	15:11	in	10	10			
1	28	28	07/01/2022	Lapwing	15:47	in	20	10	10		
8	47	45	11/01/2022	Whooper Swan	10:15	in	7			7	
8	47	45	11/01/2022	Whooper Swan	10:15	out	10			10	
8	6	25	11/01/2022	Hen Harrier	13:24	in	13			13	
9	48	45	12/01/2022	Whooper Swan	10:35	in	55				55
9	49	45	12/01/2022	Whooper Swan	10:50	in	10	10			
9	50	45	12/01/2022	Whooper Swan	13:13	in	35	5	10	10	
9	50	45	12/01/2022	Whooper Swan	13:13	out	10			10	
9	11	36	12/01/2022	Mute Swan	14:23	in	7	3			
2	30	29	17/01/2022	Lapwing	03:23	in	30		30		

VP no.	Flightline Number	Flightline Map	Date	Species	Time of Obs.	Inside/outside Buffer	Total Duration (s)	0-30m (s)	30 - 50m (s)	50-185m (s)	>185m (s)
10	19	18	17/01/2022	Golden Plover	09:45	in	15	5	5	5	
2	47	22	17/01/2022	Grey Heron	09:46	in	5	5			
2	29	28	17/01/2022	Lapwing	09:55	in	30		30		
10	7	25	17/01/2022	Hen Harrier	11:08	in	72	62	5	5	
10	7	25	17/01/2022	Hen Harrier	11:09	out	6		2	4	
10	20	18	17/01/2022	Golden Plover	11:09	in	13	2	2	4	
10	20	18	17/01/2022	Golden Plover	11:09	out	7	2	2	3	
2	12	36	17/01/2022	Mute Swan	11:13	in	40		40		
10	22	30	17/01/2022	Little Egret	11:24	in	14	6	8		
2	23	30	17/01/2022	Little Egret	11:33	in	30		30		
10	8	25	17/01/2022	Hen Harrier	11:53	in	78	69	5		
10	8	25	17/01/2022	Hen Harrier	11:53	out	4		4		
2	48	22	17/01/2022	Grey Heron	13:10	in	20	20			
10	50	26	17/01/2022	Kestrel	13:36	in	5	5			
2	12	41	17/01/2022	Sparrowhawk	14:13	in	10	10			
3	51	45	18/01/2022	Whooper Swan	09:57	in	30			30	
3	9	46	18/01/2022	Wigeon	11:19	in	15		15		
11	51	27	18/01/2022	Kestrel	11:30	out	5			5	
11	51	27	18/01/2022	Kestrel	11:30	in	25	5	5	15	
3	52	27	18/01/2022	Kestrel	14:44	in	30		30		
4	24	30	24/01/2022	Little Egret	10:03	in	20	20			
4	25	30	24/01/2022	Little Egret	11:33	in	40	20	20		
6	13	41	24/01/2022	Sparrowhawk	11:58	out	4		4		
6	13	41	24/01/2022	Sparrowhawk	11:58	in	28		28		
6	55	15	24/01/2022	Buzzard	11:59	out	6		6		
6	55	15	24/01/2022	Buzzard	11:59	in	26		26		
4	14	41	24/01/2022	Sparrowhawk	12:05	in	80			80	
6	56	15	24/01/2022	Buzzard	13:40	out	4		4		
6	56	15	24/01/2022	Buzzard	13:43	in	180		180		

VP no.	Flightline Number	Flightline Map	Date	Species	Time of Obs.	Inside/outside Buffer	Total Duration (s)	0-30m (s)	30 - 50m (s)	50-185m (s)	>185m (s)
6	5	34	24/01/2022	Merlin	13:43	in	3	3			
6	5	34	24/01/2022	Merlin	13:43	out	5		5		
5	52	45	25/01/2022	Whooper Swan	09:33	in	20	20			
5	11	42	25/01/2022	Teal	09:36	in	10	10			
5	53	27	25/01/2022	Kestrel	10:33	in	20	20			
1	21	19	01/02/2022	Golden Plover	09:35	out	10	10			
1	31	29	01/02/2022	Lapwing	09:35	out	30	10	20		
1	22	19	01/02/2022	Golden Plover	09:45	out	40			40	
1	53	45	01/02/2022	Whooper Swan	09:53	in	60			60	
1	23	19	01/02/2022	Golden Plover	09:57	out	60			60	
1	32	29	01/02/2022	Lapwing	09:57	out	80		40	40	
1	37	32	01/02/2022	Mallard	09:58	out	30		30		
1	12	42	01/02/2022	Teal	09:58	out	10	10			
1	10	46	01/02/2022	Wigeon	09:59	out	30	10	20		
1	54	45	01/02/2022	Whooper Swan	10:17	out	30		30		
1	24	19	01/02/2022	Golden Plover	10:35	out	20			20	
1	25	19	01/02/2022	Golden Plover	10:47	out	10	10			
1	33	29	01/02/2022	Lapwing	10:55	out	30				
1	26	19	01/02/2022	Golden Plover	11:30	out	300			300	
1	1	13	01/02/2022	Black-tailed Godwit	11:34	out	20		20		
10	38	32	01/02/2022	Mallard	11:39	in	32	16	16		
10	38	32	01/02/2022	Mallard	11:39	out	6		6		
1	1	38	01/02/2022	Pintail	12:12	out	20		20		
1	1	38	01/02/2022	Pintail	12:12	in	10	10			
1	39	32	01/02/2022	Mallard	12:24	out	15		15		
10	49	22	01/02/2022	Grey Heron	13:21	in	29		29		
10	49	22	01/02/2022	Grey Heron	13:21	out	11		11		
10	40	32	01/02/2022	Mallard	13:22	in	5	2	3		
10	40	32	01/02/2022	Mallard	13:22	out	9		9		

VP no.	Flightline Number	Flightline Map	Date	Species	Time of Obs.	Inside/outside Buffer	Total Duration (s)	0-30m (s)	30 - 50m (s)	50-185m (s)	>185m (s)
3	54	27	02/02/2022	Kestrel	09:57	in	30		30		
7	55	27	02/02/2022	Kestrel	10:25	in	24	24			
7	13	36	02/02/2022	Mute Swan	10:41	out	11				
7	13	36	02/02/2022	Mute Swan	10:41	in	16	16			
7	7	37	02/02/2022	Peregrine	11:08	in	28		28		
7	7	37	02/02/2022	Peregrine	11:09	out	17		17		
7	56	27	02/02/2022	Kestrel	11:11	in	23	5	18		
3	55	45	02/02/2022	Whooper Swan	11:14	in	20			20	
3	14	36	02/02/2022	Mute Swan	11:19	in	40		40		
7	57	27	02/02/2022	Kestrel	14:27	in	72	8	64		
2	15	36	03/02/2022	Mute Swan	09:57	in	40	10	30		
2	41	32	03/02/2022	Mallard	10:01	in	20		20		
2	41	32	03/02/2022	Mallard	10:01	out	30		30		
2	42	32	03/02/2022	Mallard	10:05	out	20	5	15		
2	34	29	03/02/2022	Lapwing	10:56	in	40			40	
2	50	22	03/02/2022	Grey Heron	10:59	in	10	10			
2	35	29	03/02/2022	Lapwing	11:18	in	60	20	40		
2	14	40	03/02/2022	Snipe	11:24	in	15	5	10		
2	9	25	03/02/2022	Hen Harrier	11:25	in	30	30			
2	57	15	03/02/2022	Buzzard	13:03	in	20		20		
2	15	40	03/02/2022	Snipe	14:24	in	20		20		
2	51	22	03/02/2022	Grey Heron	14:26	in	50		50		
11	43	32	08/02/2022	Mallard	10:39	in	6	6			
11	44	32	08/02/2022	Mallard	11:38	in	73	7	22	13	31
11	44	32	08/02/2022	Mallard	11:39	out	5				5
9	16	36	09/02/2022	Mute Swan	10:57	in	185		185		
9	58	15	09/02/2022	Buzzard	11:48	in	97		97		
9	58	15	09/02/2022	Buzzard	11:49	out	6		6		
8	52	22	14/02/2022	Grey Heron	11:26	in	19	19			

VP no.	Flightline Number	Flightline Map	Date	Species	Time of Obs.	Inside/outside Buffer	Total Duration (s)	0-30m (s)	30 - 50m (s)	50-185m (s)	>185m (s)
6	59	15	25/02/2022	Buzzard	09:35	out	7	7			
6	59	15	25/02/2022	Buzzard	09:35	in	32	26	6		
6	17	36	25/02/2022	Mute Swan	09:41	in	6	6			
6	56	45	25/02/2022	Whooper Swan	09:41	in	8	8			
6	57	45	25/02/2022	Whooper Swan	10:25	in	12	12			
5	60	15	25/02/2022	Buzzard	10:48	in	80		20	60	
6	58	45	25/02/2022	Whooper Swan	11:12	in	60	60			
6	61	15	25/02/2022	Buzzard	11:35	in	28			28	
6	61	15	25/02/2022	Buzzard	11:35	out	12			12	
5	61	15	25/02/2022	Buzzard	11:36	in	300		100	200	
6	59	45	25/02/2022	Whooper Swan	11:54	in	88	88			
5	58	27	25/02/2022	Kestrel	12:06	in	50			50	
5	62	15	25/02/2022	Buzzard	12:53	in	100			100	
5	27	19	25/02/2022	Golden Plover	12:58	in	80			80	
5	36	29	25/02/2022	Lapwing	12:58	in	60		60		
6	37	29	25/02/2022	Lapwing	14:05	in	28	5	23		
6	26	30	25/02/2022	Little Egret	14:14	in	15	5	25		
6	26	30	25/02/2022	Little Egret	14:14	out	12		12		
6	63	15	25/02/2022	Buzzard	15:10	out	22			22	
6	63	15	25/02/2022	Buzzard	15:11	in	73			73	
4	38	29	28/02/2022	Lapwing	09:40	in	30		30		
4	64	15	28/02/2022	Buzzard	09:42	in	60			60	
4	39	29	28/02/2022	Lapwing	11:00	in	100		10	90	
4	28	19	28/02/2022	Golden Plover	12:00	in	60			60	
4	13	42	28/02/2022	Teal	12:04	in	15		15		
4	27	30	28/02/2022	Little Egret	12:05	in	10		10		
4	16	40	28/02/2022	Snipe	12:09	in	30		30		
4	59	27	28/02/2022	Kestrel	14:00	In	100	10	90		
1	1	17	02/03/2022	Curlew	09:33	in	15		15		

VP no.	Flightline Number	Flightline Map	Date	Species	Time of Obs.	Inside/outside Buffer	Total Duration (s)	0-30m (s)	30 - 50m (s)	50-185m (s)	>185m (s)
1	11	46	02/03/2022	Wigeon	09:40	in	30		30		
9	60	45	02/03/2022	Whooper Swan	09:43	in	19	19			
1	45	32	02/03/2022	Mallard	09:46	in	60			60	
1	14	42	02/03/2022	Teal	10:05	in	5	5			
1	40	29	02/03/2022	Lapwing	10:11	in	5	5			
9	61	45	02/03/2022	Whooper Swan	10:31	in	56	9	47		
9	29	19	02/03/2022	Golden Plover	10:48	in	142	5	5	114	
9	29	19	02/03/2022	Golden Plover	10:51	out	18			18	
1	46	32	02/03/2022	Mallard	11:02	in	10		10		
1	30	19	02/03/2022	Golden Plover	11:09	in	100			100	
9	31	19	02/03/2022	Golden Plover	11:09	in	98			98	
9	18	36	02/03/2022	Mute Swan	11:25	in	38		38		
1	60	27	02/03/2022	Kestrel	11:42	in	50	10	10	30	
9	61	27	02/03/2022	Kestrel	11:48	in	64	64			
1	41	29	02/03/2022	Lapwing	13:01	out	20			20	
1	42	29	02/03/2022	Lapwing	13:01	out	20			20	
1	32	19	02/03/2022	Golden Plover	13:03	out	30		30		
1	33	19	02/03/2022	Golden Plover	13:03	out	30		30		
1	12	46	02/03/2022	Wigeon	13:19	in	20			20	
1	13	46	02/03/2022	Wigeon	13:19	in	20			20	
1	14	46	02/03/2022	Wigeon	13:30	in	100			100	
1	15	46	02/03/2022	Wigeon	13:30	in	100			100	
1	43	29	02/03/2022	Lapwing	13:44	out	25		25		
1	44	29	02/03/2022	Lapwing	13:44	out	25		25		
1	1	39	02/03/2022	Shoveler	13:45	in	10	10			
1	53	22	02/03/2022	Grey Heron	13:53	out	40			40	
1	54	22	02/03/2022	Grey Heron	13:53	out	40			40	
2	62	45	07/03/2022	Whooper Swan	10:37	in	60			60	
7	62	27	07/03/2022	Kestrel	10:57	in	337	337			

VP no.	Flightline Number	Flightline Map	Date	Species	Time of Obs.	Inside/outside Buffer	Total Duration (s)	0-30m (s)	30 - 50m (s)	50-185m (s)	>185m (s)
7	55	22	07/03/2022	Grey Heron	13:16	in	12	4	8		
2	45	29	07/03/2022	Lapwing	14:16	in	20			20	
4	47	32	08/03/2022	Mallard	10:21	in	10	10			
4	48	32	08/03/2022	Mallard	10:42	in	30			30	
4	63	45	08/03/2022	Whooper Swan	11:51	in	60	10	30	20	
4	63	45	08/03/2022	Whooper Swan	11:51	out	30			30	
4	15	42	08/03/2022	Teal	11:57	in	5	5			
4	49	32	08/03/2022	Mallard	12:04	in	10	10			
5	34	19	15/03/2022	Golden Plover	09:51	in	30		30		
5	50	32	15/03/2022	Mallard	10:09	in	40			40	
5	65	15	15/03/2022	Buzzard	10:39	in	80		10	70	
5	46	29	15/03/2022	Lapwing	10:39	in	10			10	
5	63	27	15/03/2022	Kestrel	10:40	in	40			40	
5	28	30	15/03/2022	Little Egret	10:56	in	20		20		
5	29	30	15/03/2022	Little Egret	10:57	in	30		30		
10	51	32	15/03/2022	Mallard	11:05	in	12			12	
10	51	32	15/03/2022	Mallard	11:05	out	15			15	
5	52	32	15/03/2022	Mallard	11:42	in	10		10		
5	47	29	15/03/2022	Lapwing	11:42	in	10	10			
10	66	15	15/03/2022	Buzzard	11:57	out	23			23	
10	66	15	15/03/2022	Buzzard	11:57	in	32		32		
10	66	15	15/03/2022	Buzzard	11:59	out	18		18		
5	35	19	15/03/2022	Golden Plover	13:21	in	50			50	
5	48	29	15/03/2022	Lapwing	13:23	in	15		15		
3	1	33	16/03/2022	Marsh Harrier	09:50	in	100	100			
3	49	29	16/03/2022	Lapwing	09:51	in	20		20		
3	30	30	16/03/2022	Little Egret	09:51	in	30		30		
3	53	32	16/03/2022	Mallard	09:51	in	15		15		
3	36	19	16/03/2022	Golden Plover	10:01	in	40			40	

VP no.	Flightline Number	Flightline Map	Date	Species	Time of Obs.	Inside/outside Buffer	Total Duration (s)	0-30m (s)	30 - 50m (s)	50-185m (s)	>185m (s)
3	67	15	16/03/2022	Buzzard	10:03	out	25				25
3	56	22	16/03/2022	Grey Heron	10:16	in	30	5	5	20	
6	68	15	16/03/2022	Buzzard	10:59	in	35			35	
6	68	15	16/03/2022	Buzzard	10:59	out	8			8	
6	69	15	16/03/2022	Buzzard	11:22	out	12				12
6	69	15	16/03/2022	Buzzard	11:22	in	32				32
3	10	25	16/03/2022	Hen Harrier	11:28	in	20	10	10		
3	8	37	16/03/2022	Peregrine	11:28	in	30			10	20
6	11	25	16/03/2022	Hen Harrier	11:35	out	7			7	
6	11	25	16/03/2022	Hen Harrier	11:36	in	42			42	
6	9	37	16/03/2022	Peregrine	12:24	out	5		5		
6	9	37	16/03/2022	Peregrine	12:24	in	23		23		
3	70	15	16/03/2022	Buzzard	13:02	in	30		30		
6	15	41	16/03/2022	Sparrowhawk	13:05	out	3		3		
6	15	41	16/03/2022	Sparrowhawk	13:05	in	28		8	20	
3	16	41	16/03/2022	Sparrowhawk	13:09	in	30		30		
3	16	41	16/03/2022	Sparrowhawk	13:09	out	20		20		
3	19	36	16/03/2022	Mute Swan	13:19	in	10		10		
3	57	22	16/03/2022	Grey Heron	15:14	in	25		25		
3	54	32	16/03/2022	Mallard	15:30	in	35		35		
11	37	19	28/03/2022	Golden Plover	10:10	in	20		20		
11	58	22	28/03/2022	Grey Heron	10:50	in	40	10	30		
11	20	36	28/03/2022	Mute Swan	10:52	in	30				30
11	71	15	28/03/2022	Buzzard	11:16	in	500		200	300	
11	64	27	28/03/2022	Kestrel	13:03	in	70	50	20		
	55	32	28/03/2022	Mallard	13:36	in	10	10			

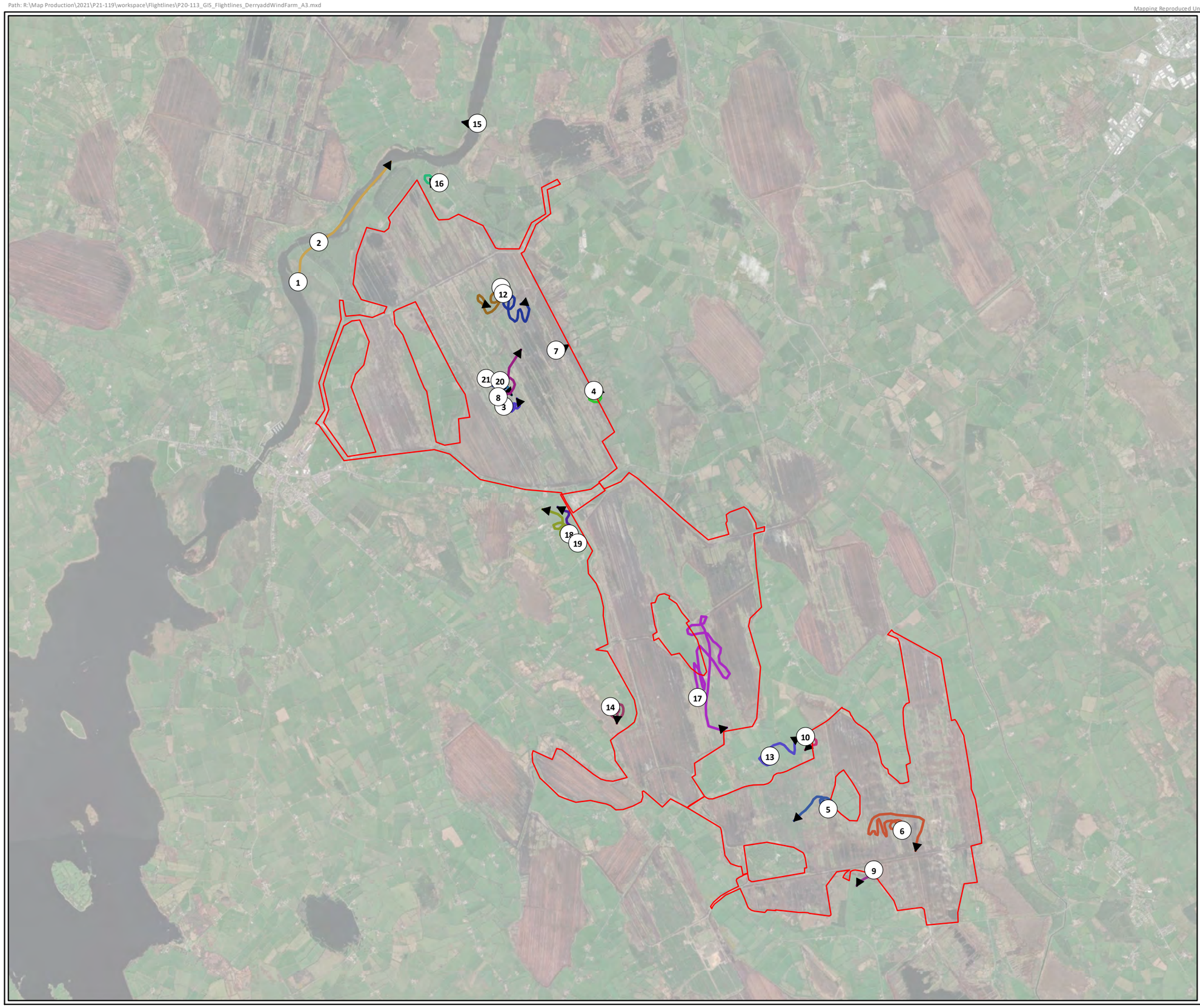
FEHILY TIMONEY

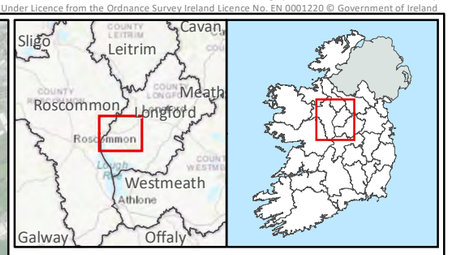
CONSULTANTS IN ENGINEERING,
ENVIRONMENTAL SCIENCE
& PLANNING

APPENDIX 3

Target Species Flight Line Maps

Path: R:\Map Production\2021\P21-119\workspace\Flightlines\P20-113_GIS_Flightlines_DerryaddWindFarm_A3.mxd





Legend

Site Boundary

Individual, Date, Time

- 1, 20/09/2021, 09:41
- 2, 20/09/2021, 14:28
- 3, 20/09/2021, 16:04
- 4, 20/09/2021, 17:57
- 5, 21/09/2021, 11:15
- 6, 21/09/2021, 13:52
- 7, 21/09/2021, 17:15
- 8, 21/09/2021, 18:43
- 9, 22/09/2021, 14:14
- 10, 22/09/2021, 18:27
- 11, 23/09/2021, 09:14
- 12, 23/09/2021, 14:06
- 13, 23/09/2021, 18:00
- 14, 24/09/2021, 09:25
- 15, 24/09/2021, 17:24
- 16, 27/09/2021, 10:56
- 17, 27/09/2021, 12:39
- 18, 28/09/2021, 10:55
- 19, 28/09/2021, 12:58
- 20, 28/09/2021, 16:04
- 21, 29/09/2021, 10:11

N W E S

0 0.5 1 2 Kilometers

TITLE:	Migration Flightlines 2021 Buzzard		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	1		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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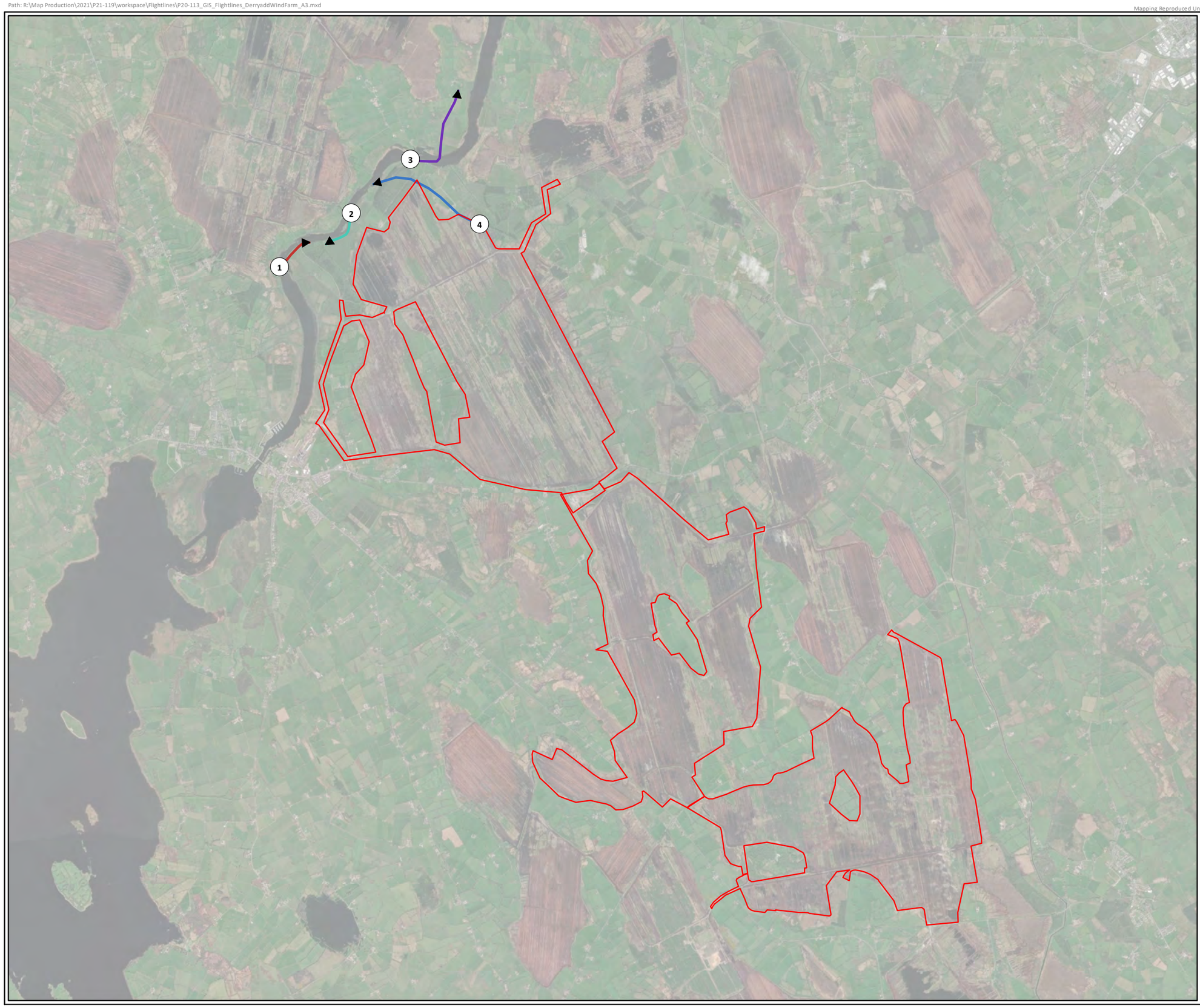

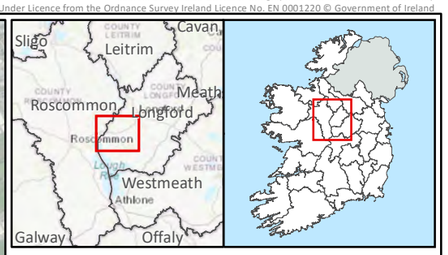

Legend

Site Boundary

Individual, Date, Time

- 1, 20/09/2021, 14:00
- 2, 23/09/2021, 09:24
- 3, 24/09/2021, 18:37
- 4, 27/09/2021, 10:50

N W E S

0 0.5 1 2 Kilometers

TITLE:	Migration Flightlines 2021 Cormorant		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	2		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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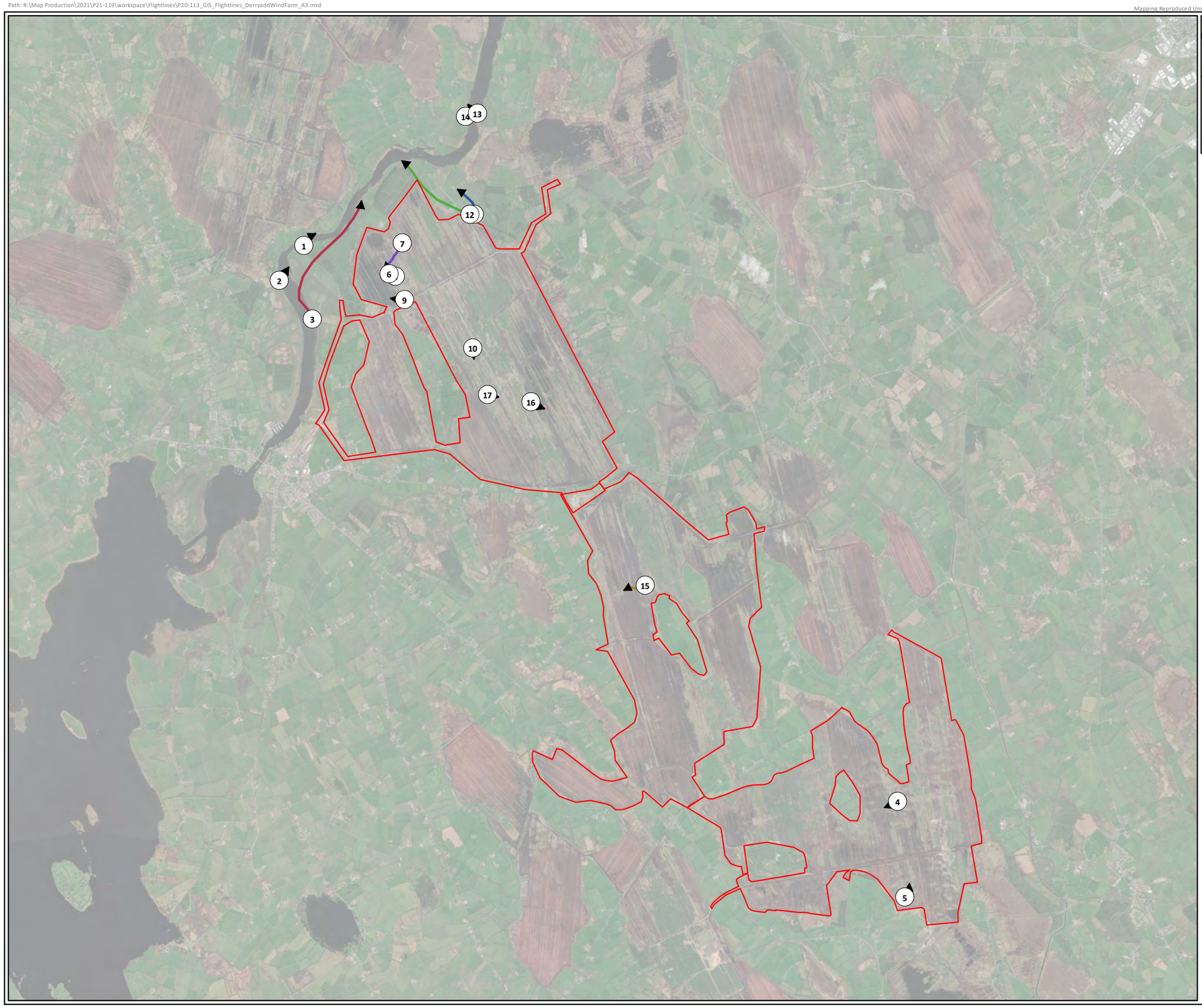

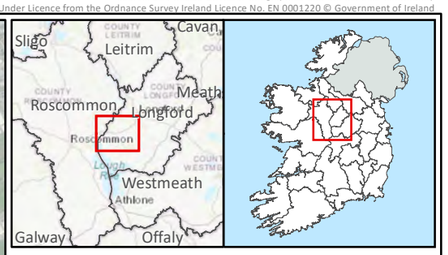

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Individual, Date, Time

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- 3, 20/09/2021, 13:33
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- 5, 22/09/2021, 10:53
- 6, 23/09/2021, 09:57
- 7, 23/09/2021, 11:03
- 8, 23/09/2021, 13:00
- 9, 23/09/2021, 14:53
- 10, 23/09/2021, 15:21
- 11, 24/09/2021, 16:52
- 12, 24/09/2021, 17:49
- 13, 27/09/2021, 10:12
- 14, 27/09/2021, 11:05
- 15, 28/09/2021, 09:52
- 16, 28/09/2021, 17:15
- 17, 29/09/2021, 11:30

TITLE:	Migration Flightlines 2021 Grey Heron		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	3		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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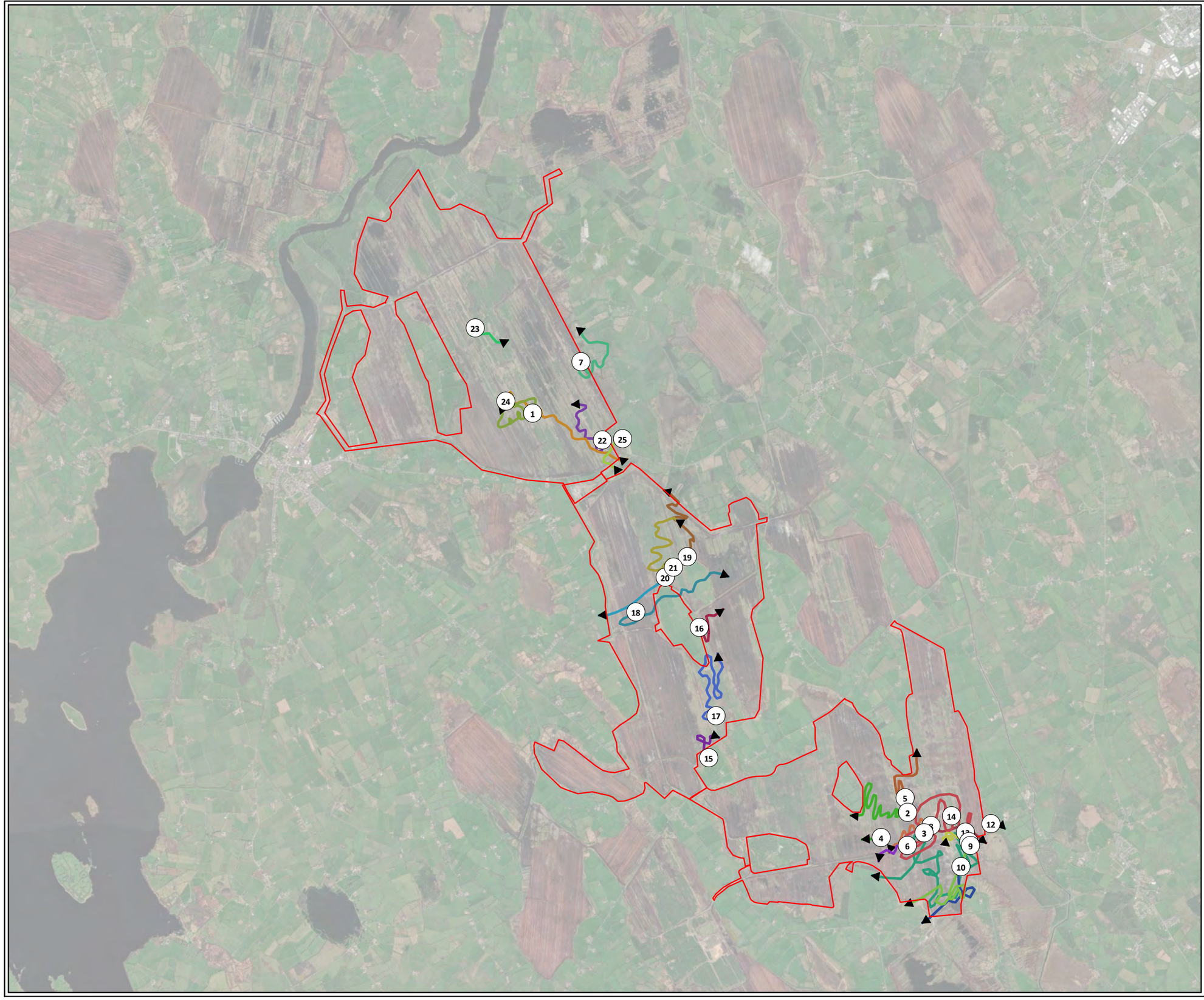

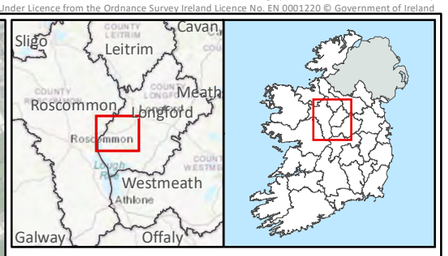

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Site Boundary

Individual, Date, Time

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- 2, 21/09/2021, 09:13
- 3, 21/09/2021, 10:33
- 4, 21/09/2021, 13:06
- 5, 21/09/2021, 14:26
- 6, 21/09/2021, 15:00
- 7, 21/09/2021, 17:49
- 8, 22/09/2021, 11:20
- 9, 22/09/2021, 09:32
- 10, 22/09/2021, 10:14
- 11, 22/09/2021, 13:09
- 12, 22/09/2021, 15:00
- 13, 22/09/2021, 18:05
- 14, 23/09/2021, 17:11
- 15, 27/09/2021, 13:42
- 16, 27/09/2021, 16:14
- 17, 27/09/2021, 16:55
- 18, 28/09/2021, 10:17
- 19, 28/09/2021, 11:04
- 20, 28/09/2021, 13:44
- 21, 28/09/2021, 14:35
- 22, 28/09/2021, 16:50
- 23, 28/09/2021, 18:00
- 24, 29/09/2021, 09:37
- 25, 29/09/2021, 11:06

TITLE:	Migration Flightlines 2021 Kestrel		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	4		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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Kilometers
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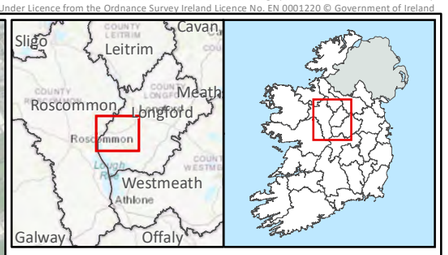

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Site Boundary

Individual, Date, Time

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2, 27/09/2021, 08:33

N W E S

0 0.5 1 2 Kilometers

TITLE:	Migration Flightlines 2021 Lapwing		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	5		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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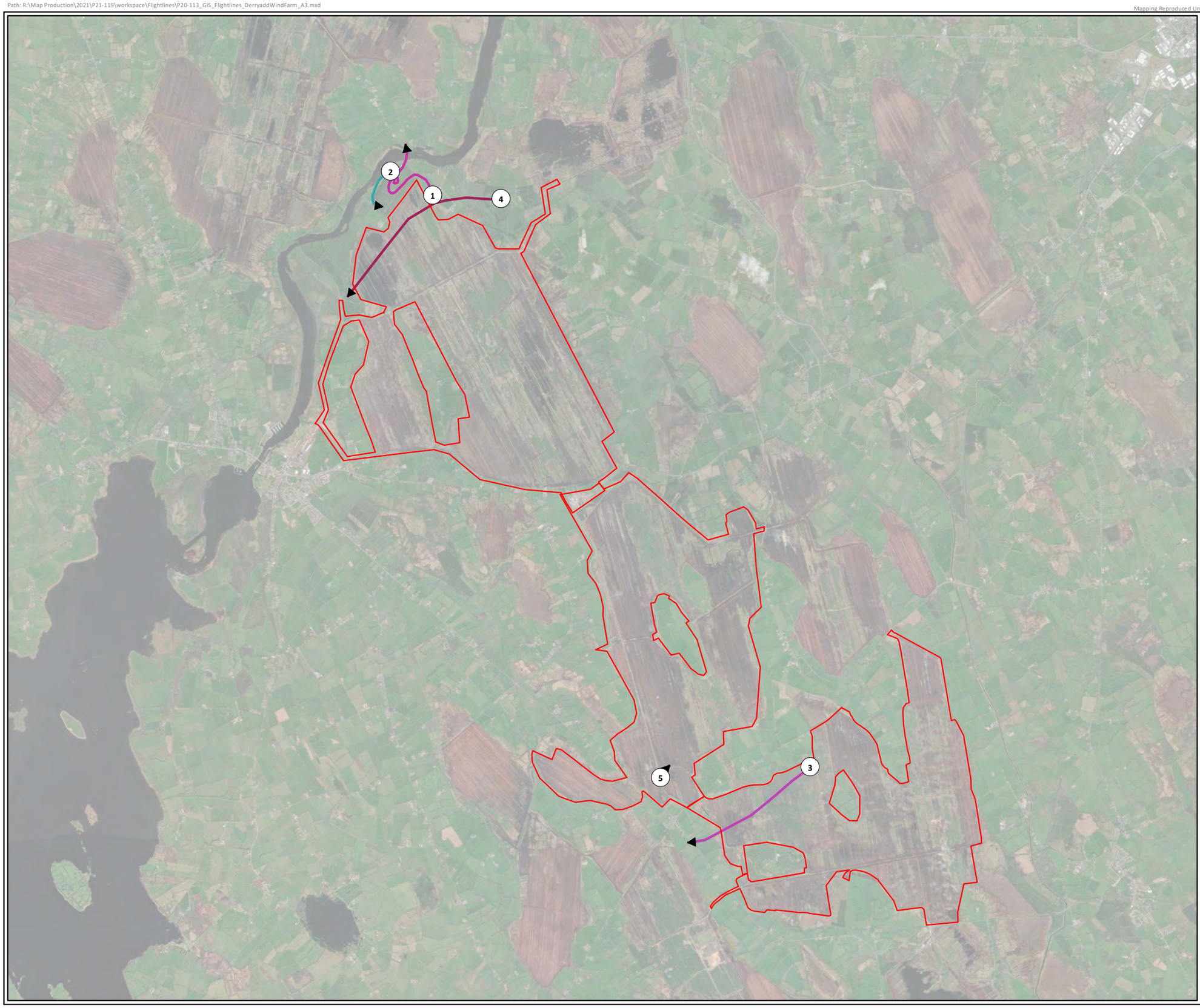

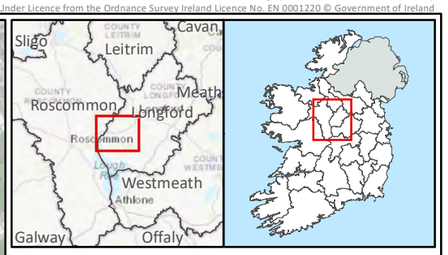

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Site Boundary

Individual, Date, Time

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- 2, 20/09/2021, 11:08
- 3, 22/09/2021, 17:20
- 4, 23/09/2021, 09:38
- 5, 24/09/2021, 10:29

N W E S

0 0.5 1 2 Kilometers

TITLE:	Migration Flightlines 2021 Lesser Black-Backed Gull		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	6		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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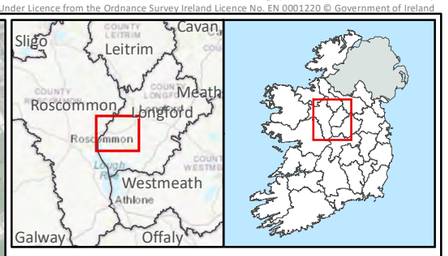

Legend

Site Boundary

Individual, Date, Time

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2, 23/09/2021, 11:26
3, 23/09/2021, 15:09

N
W E
S

0 0.5 1 2 Kilometers

TITLE:	Migration Flightlines 2021 Little Egret		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	7		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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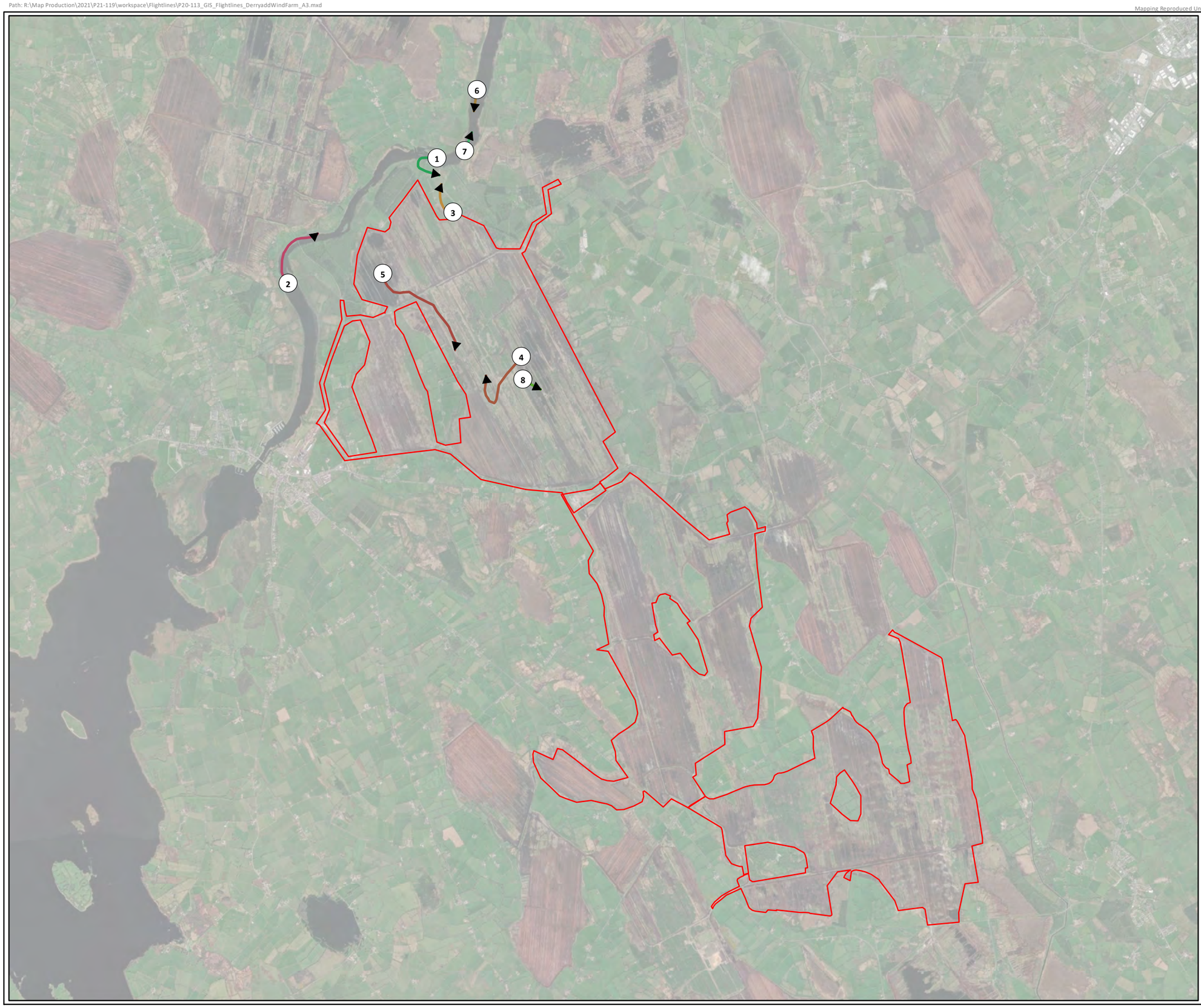

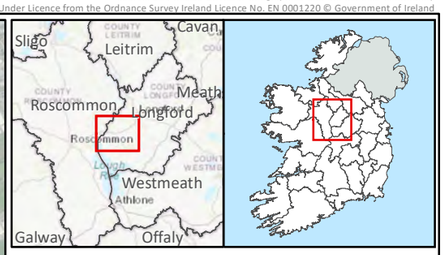

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Site Boundary

Individual, Date, Time

- 1, 20/09/2021, 08:52
- 2, 20/09/2021, 10:46
- 3, 20/09/2021, 12:09
- 4, 23/09/2021, 11:44
- 5, 23/09/2021, 13:47
- 6, 24/09/2021, 18:10
- 7, 27/09/2021, 09:19
- 8, 28/09/2021, 16:11

N W E S

0 0.5 1 2 Kilometers

TITLE:	Migration Flightlines 2021 Mallard		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	8		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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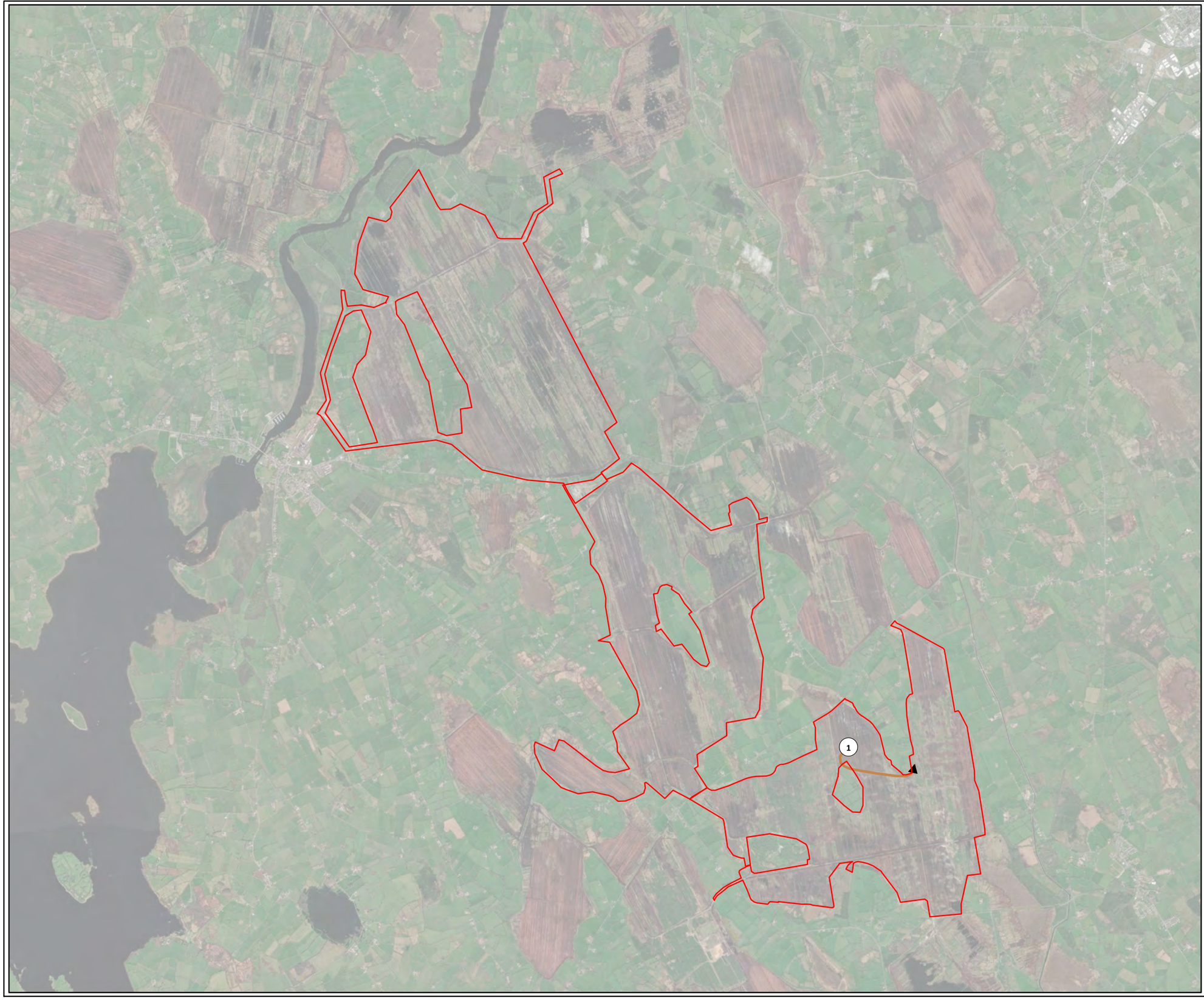

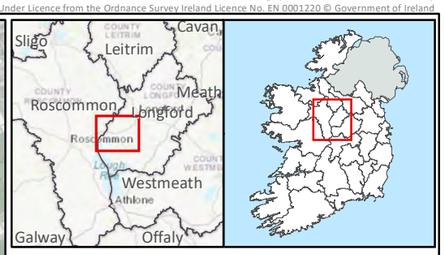

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Site Boundary

Individual, Date, Time

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N
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Kilometers
0 0.5 1 2

TITLE:	Migration Flightlines 2021 Peregrine		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	9		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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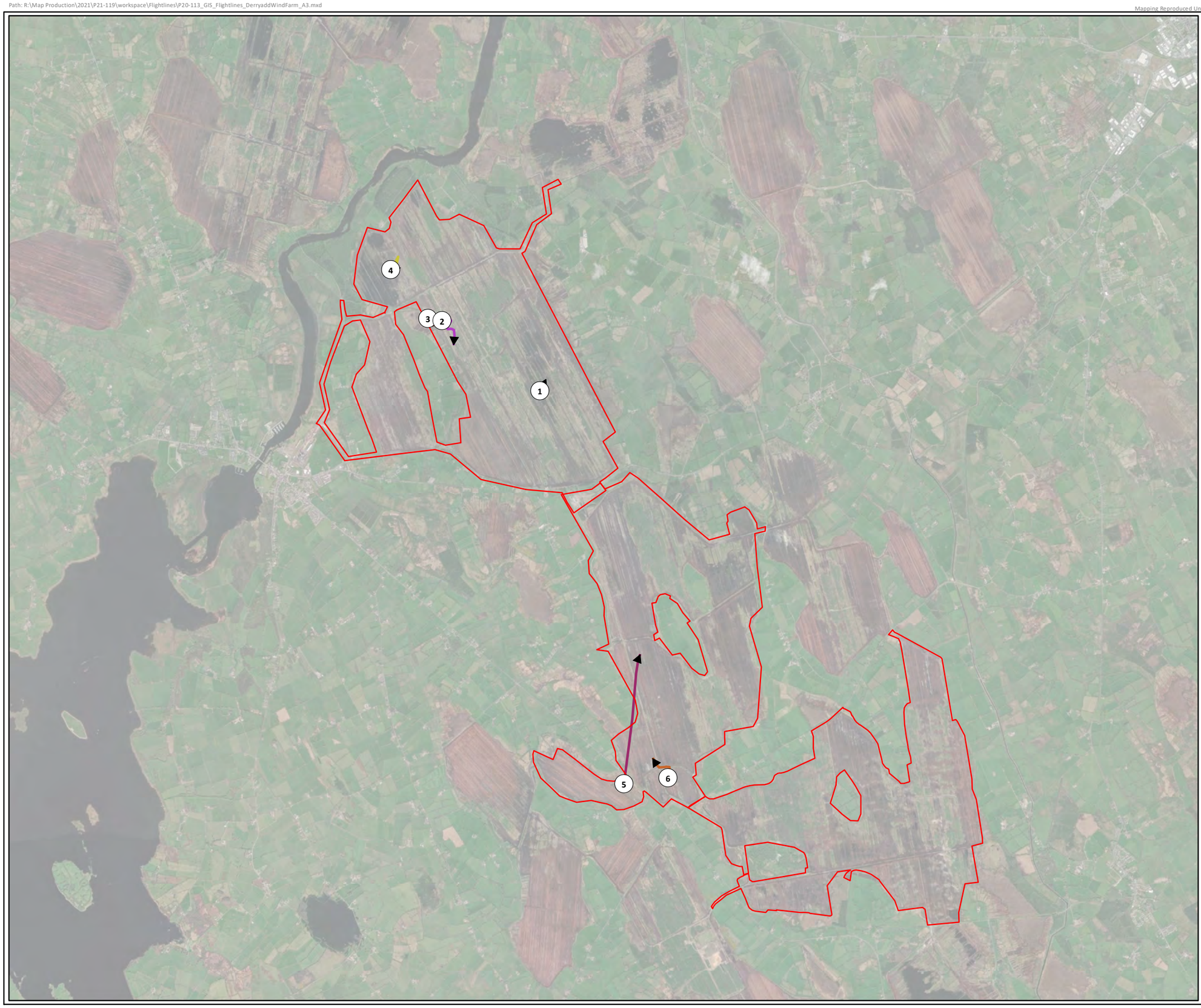

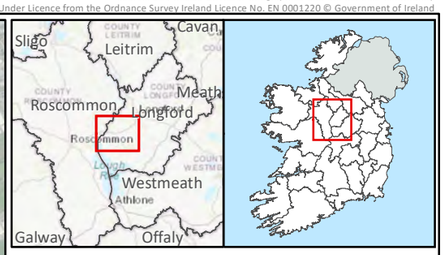

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Site Boundary

Individual, Date, Time

- 1, 20/09/2021, 16:47
- 2, 23/09/2021, 10:50
- 3, 23/09/2021, 13:13
- 4, 23/09/2021, 14:24
- 5, 24/09/2021, 10:14
- 6, 24/09/2021, 14:46

N W E S

0 0.5 1 2 Kilometers

TITLE:	Migration Flightlines 2021 Snipe		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	10		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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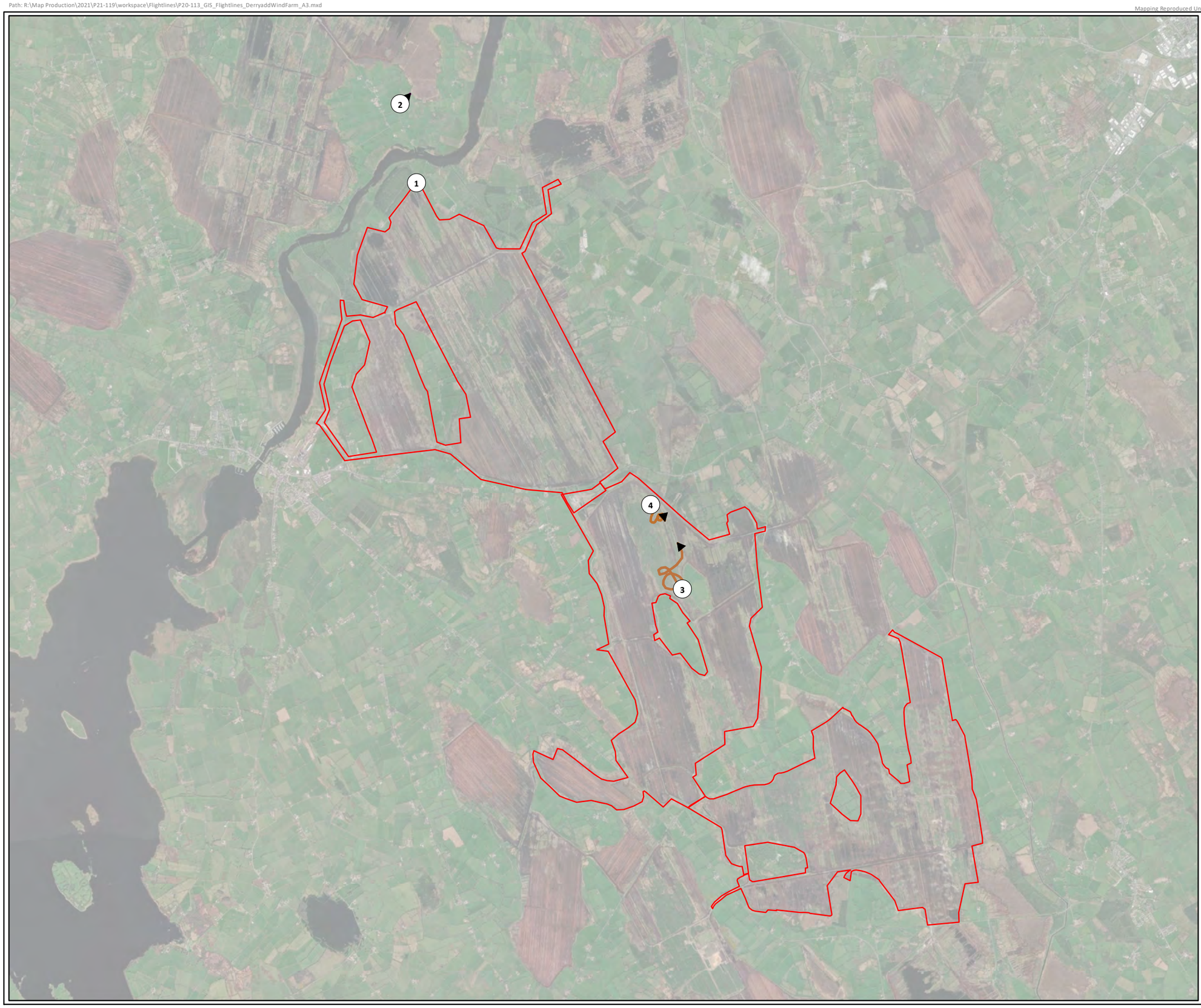

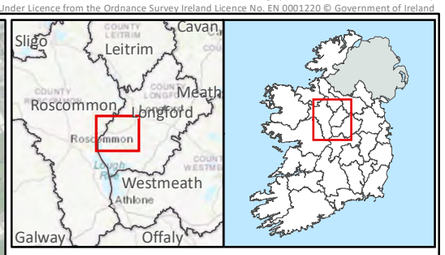

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Site Boundary

Individual, Date, Time

- 1, 20/09/2021, 12:37
- 2, 27/09/2021, 09:48
- 3, 28/09/2021, 09:02
- 4, 28/09/2021, 12:21

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0 0.5 1 2 Kilometers

TITLE:	Migration Flightlines 2021 Sparrowhawlk		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	11		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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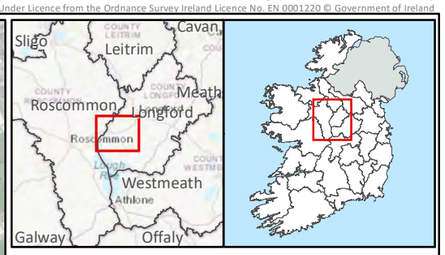

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Site Boundary

Individual, Date, Time

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N
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Kilometers
0 0.5 1 2

TITLE:	Winter 2021/2022 Flightlines Black-Headed Gull		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	12		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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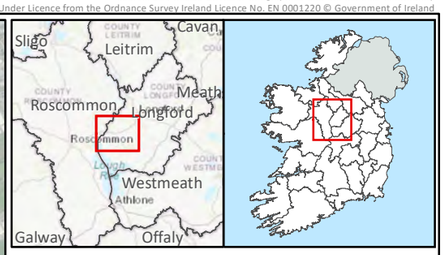

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Site Boundary

Individual, Date, Time

1, 01/02/2022, 11:34

N
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0 0.5 1 2 Kilometers

TITLE:	Winter 2021/2022 Flightlines Black-Tailed Godwit		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	13		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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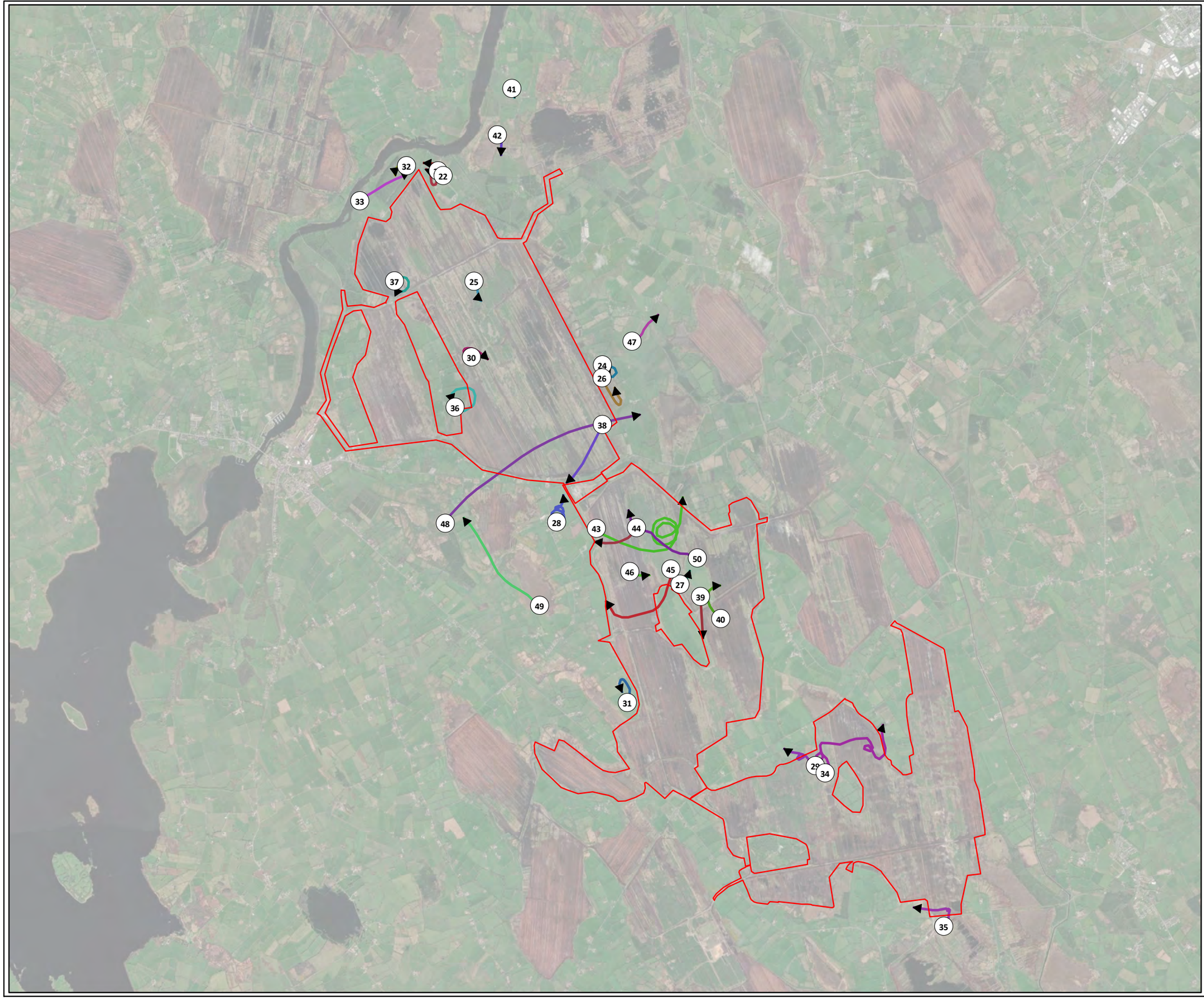

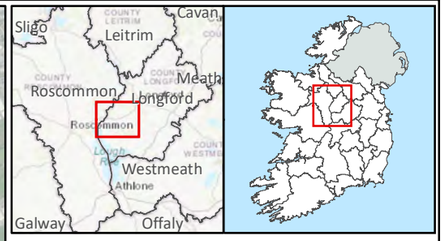

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Individual, Date, Time

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- 24, 01/10/2021, 16:40
- 25, 02/10/2021, 08:35
- 26, 02/10/2021, 15:55
- 27, 03/10/2021, 09:18
- 28, 03/10/2021, 12:54
- 29, 25/10/2021, 10:17
- 30, 26/10/2021, 10:15
- 31, 27/10/2021, 14:00
- 32, 28/10/2021, 09:22
- 33, 28/10/2021, 14:22
- 34, 29/10/2021, 14:38
- 35, 18/11/2021, 12:48
- 36, 22/11/2021, 09:53
- 37, 25/11/2021, 12:51
- 38, 26/11/2021, 13:35
- 39, 29/11/2021, 15:24
- 40, 29/11/2021, 16:06
- 41, 01/12/2021, 12:57
- 42, 01/12/2021, 14:06
- 43, 02/12/2021, 09:40
- 44, 02/12/2021, 10:03
- 45, 02/12/2021, 10:20
- 46, 02/12/2021, 14:29
- 47, 13/12/2021, 15:02
- 48, 14/12/2021, 11:30
- 49, 15/12/2021, 10:31
- 50, 15/12/2021, 11:15

TITLE:	Winter 2021/2022 Flightlines Buzzard		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	14		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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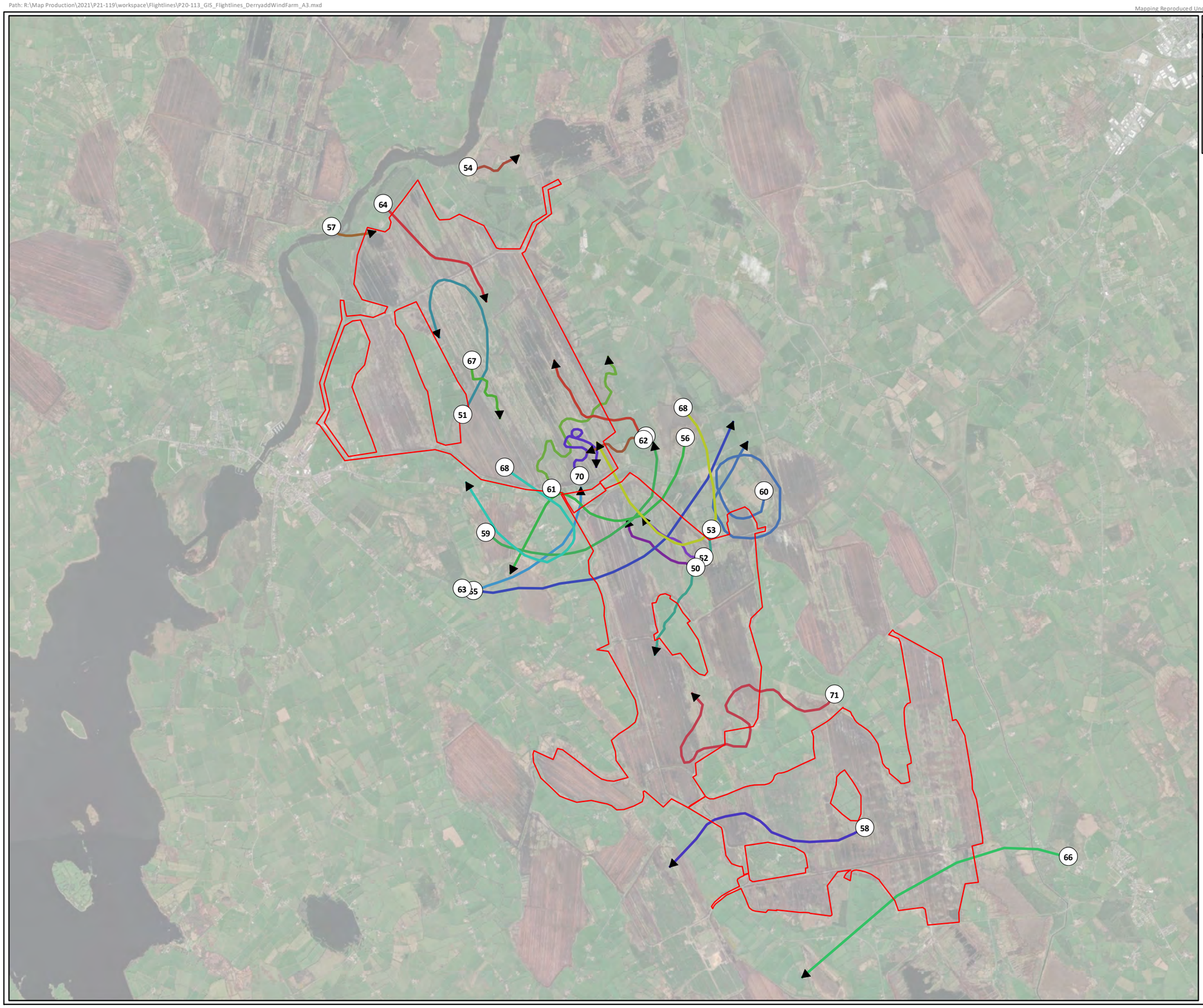
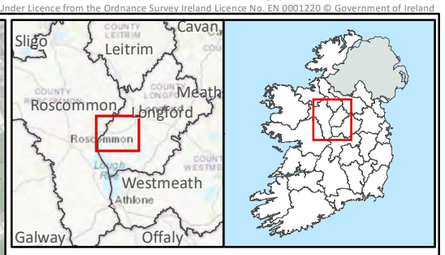
N W E S

0 0.5 1 2 Kilometers

Path: R:\Map Production\2021\P21-119\workspace\Flightlines\P20-113_GIS_Flightlines_DerryaddWindFarm_A3.mxd





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Individual, Date, Time

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- 51, 15/12/2021, 11:41
- 52, 15/12/2021, 14:01
- 53, 16/12/2021, 11:57
- 54, 07/01/2022, 14:10
- 55, 24/01/2022, 11:59
- 56, 24/01/2022, 13:40
- 57, 03/02/2022, 13:03
- 58, 09/02/2022, 11:48
- 59, 25/02/2022, 09:35
- 60, 25/02/2022, 11:35
- 61, 25/02/2022, 11:36
- 62, 25/02/2022, 12:53
- 63, 25/02/2022, 15:11
- 64, 28/02/2022, 09:42
- 65, 15/03/2022, 10:39
- 66, 15/03/2022, 11:57
- 67, 16/03/2022, 10:03
- 68, 16/03/2022, 11:22
- 68, 16/03/2022, 10:59
- 70, 16/03/2022, 13:02
- 71, 28/03/2022, 11:16

TITLE:	Winter 2021/2022 Flightlines Buzzard		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	15		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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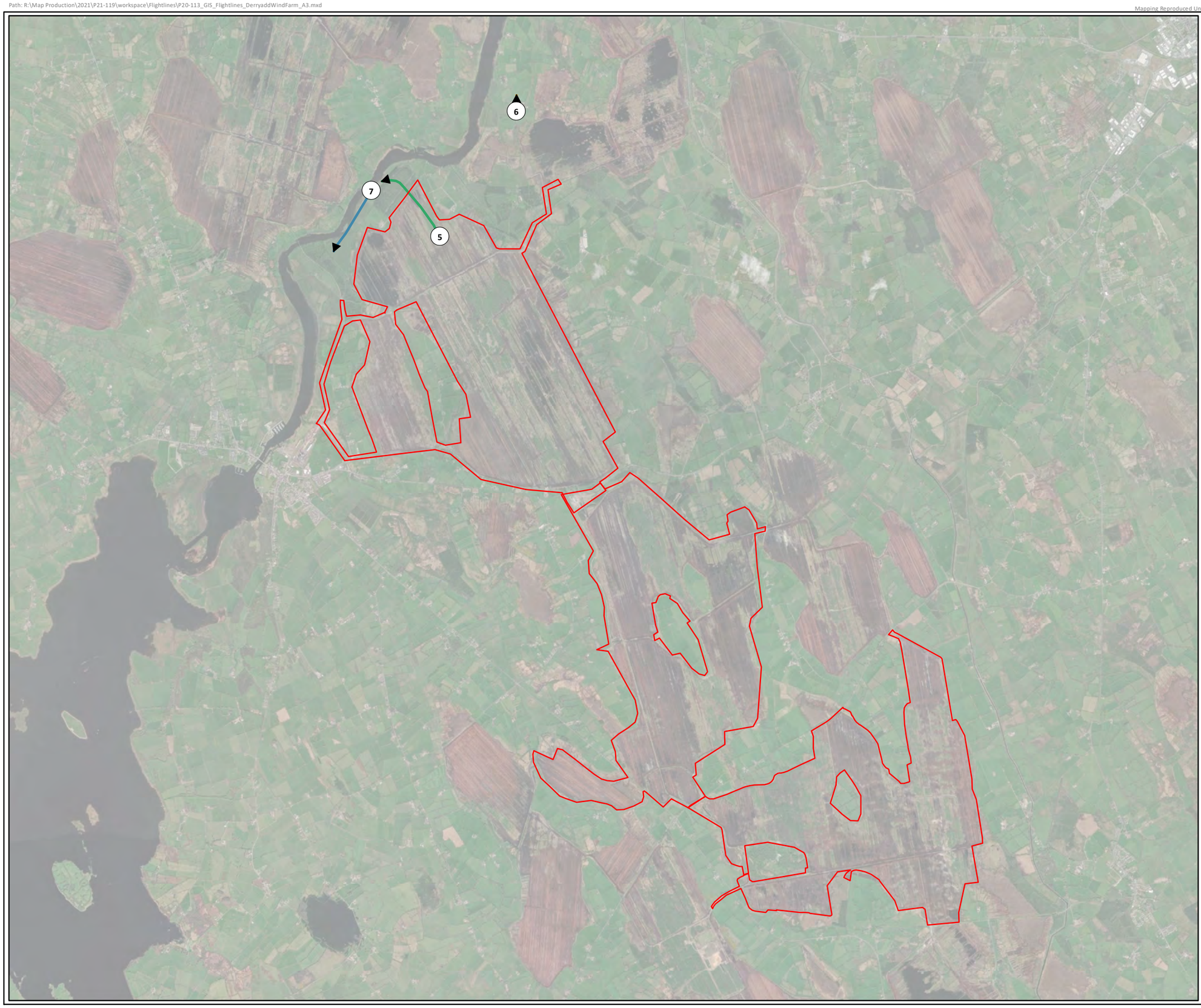

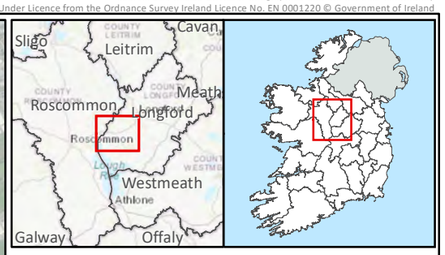

Legend

Site Boundary

Individual, Date, Time

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6, 01/10/2021, 12:08

7, 02/10/2021, 08:53

N
W E
S

0 0.5 1 2 Kilometers

TITLE:	Winter 2021/2022 Flightlines Cormorant		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	16		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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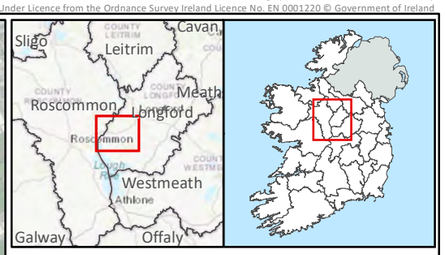

Legend

Site Boundary

Individual, Date, Time

1, 02/03/2022, 09:33

N
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Kilometers
0 0.5 1 2

TITLE:	Winter 2021/2022 Flightlines Curlew		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	17		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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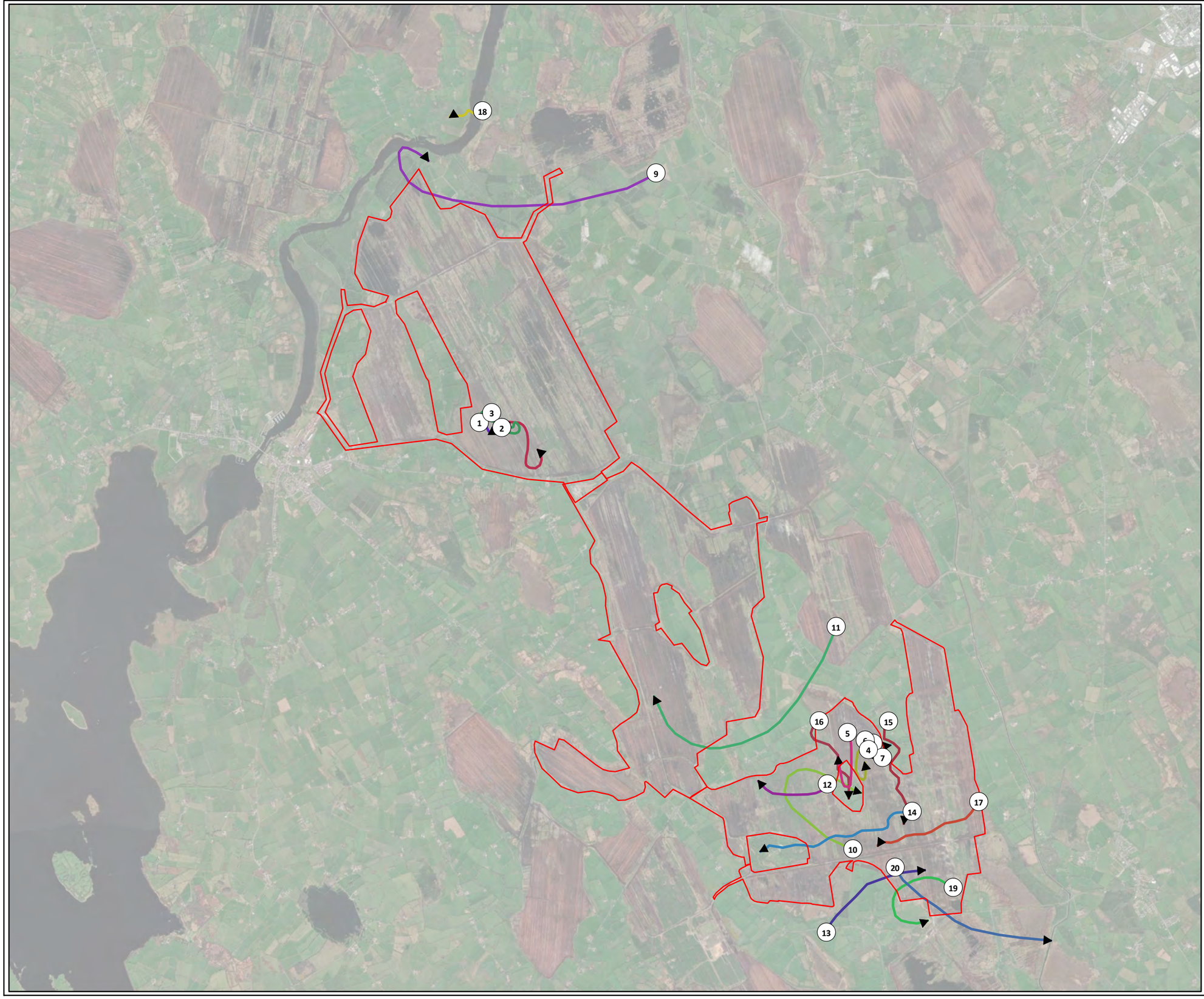

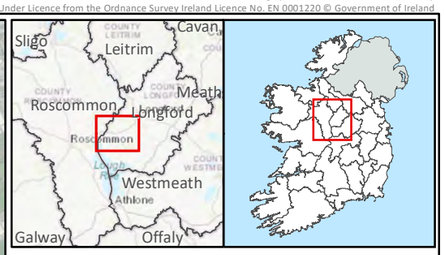

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- 3, 26/10/2021, 13:25
- 4, 02/11/2021, 08:36
- 5, 02/11/2021, 08:48
- 6, 19/11/2021, 08:00
- 7, 19/11/2021, 09:01
- 8, 19/11/2021, 09:26
- 9, 13/12/2021, 09:46
- 10, 16/12/2021, 11:13
- 11, 16/12/2021, 11:50
- 12, 16/12/2021, 14:01
- 13, 27/12/2021, 10:47
- 14, 28/12/2021, 09:22
- 15, 28/12/2021, 11:09
- 16, 28/12/2021, 11:40
- 17, 28/12/2021, 12:09
- 18, 07/01/2022, 09:44
- 19, 17/01/2022, 09:45
- 20, 17/01/2022, 11:09

N W E S

0 0.5 1 2 Kilometers

TITLE:	Winter 2021/2022 Flightlines Buzzard		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	18		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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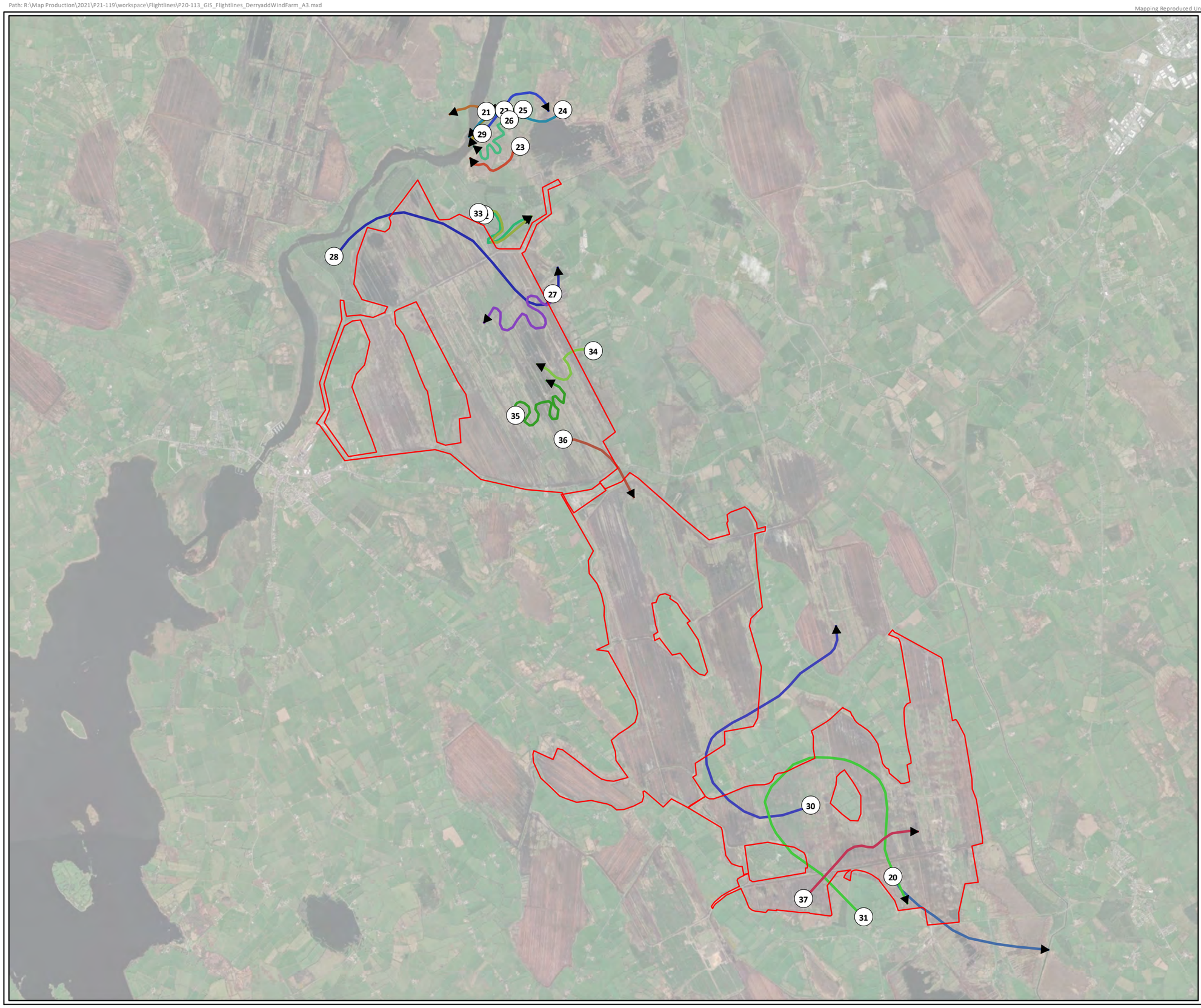

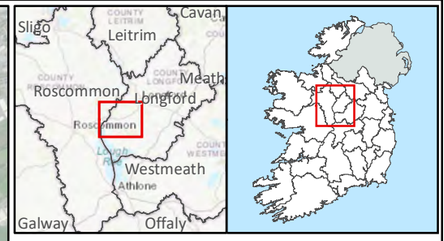

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Site Boundary

Individual, Date, Time

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- 21, 01/02/2022, 09:35
- 22, 01/02/2022, 09:45
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- 25, 01/02/2022, 10:47
- 26, 01/02/2022, 11:30
- 27, 25/02/2022, 12:58
- 28, 28/02/2022, 12:00
- 29, 02/03/2022, 11:09
- 30, 02/03/2022, 10:48
- 31, 02/03/2022, 11:09
- 32, 02/03/2022, 13:03
- 33, 02/03/2022, 13:03
- 34, 15/03/2022, 09:51
- 35, 15/03/2022, 13:21
- 36, 16/03/2022, 10:01
- 37, 28/03/2022, 10:10

TITLE:	Winter 2021/2022 Flightlines Buzzard		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	19		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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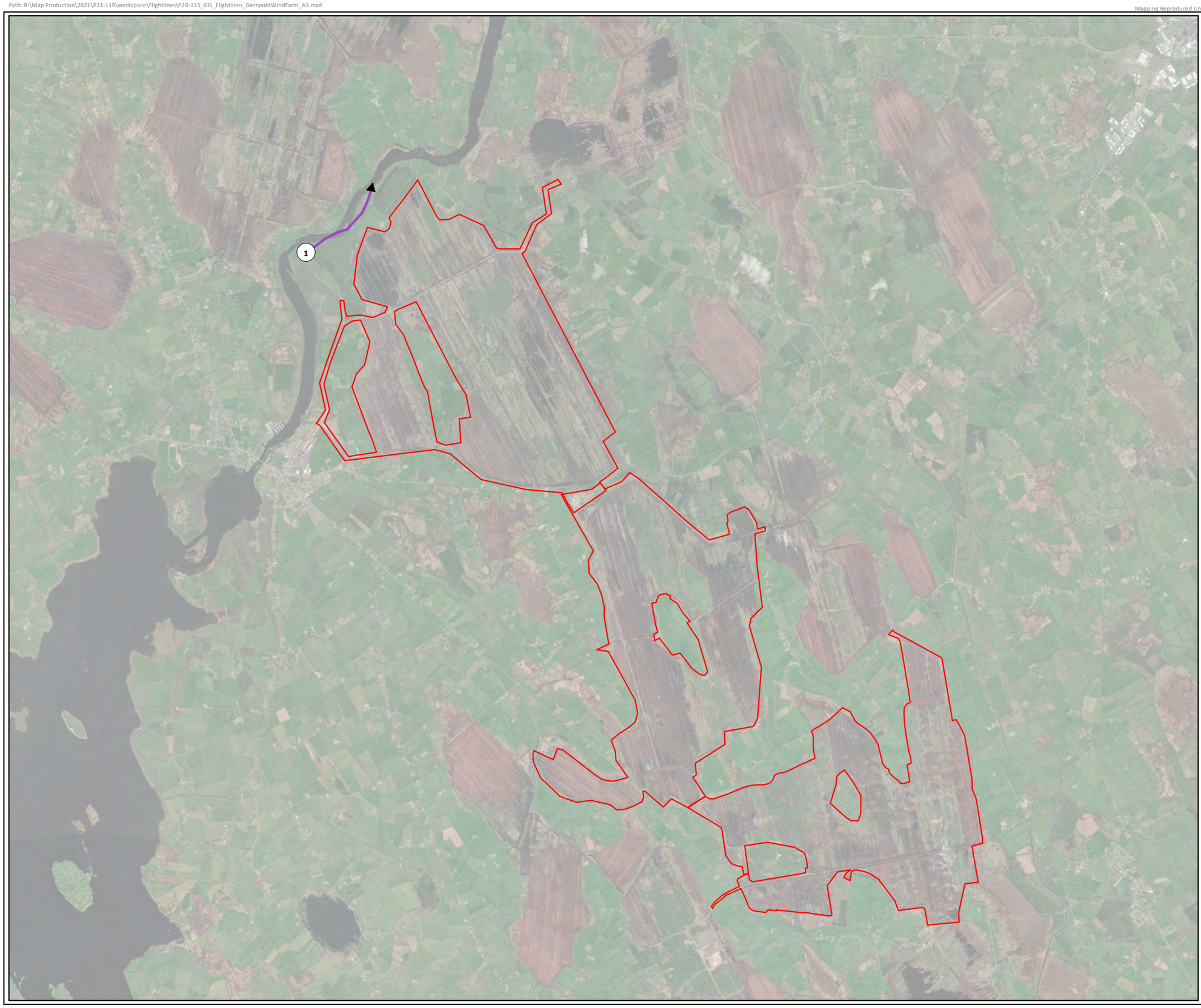

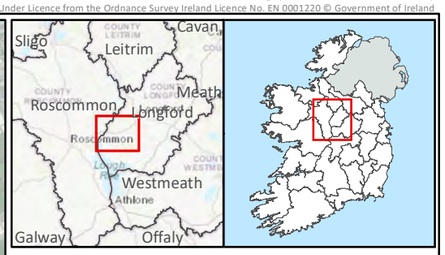

Legend

Site Boundary

Individual, Date, Time

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N
W E
S

0 0.5 1 2 Kilometers

TITLE:	Winter 2021/2022 Flightlines Great Crested Grebe		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	20		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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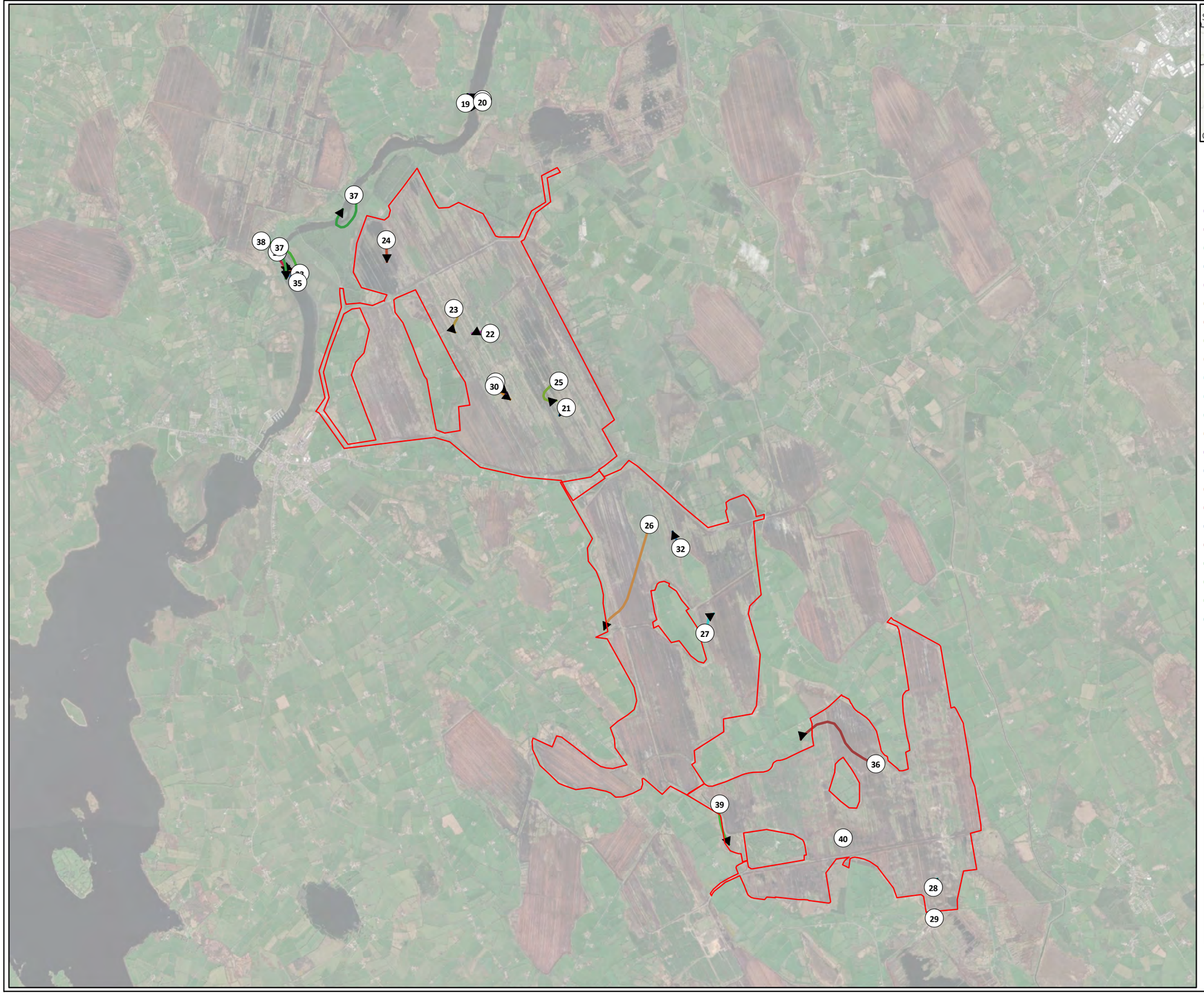

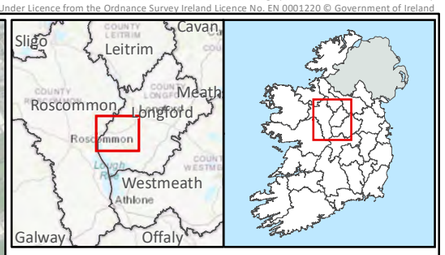

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Site Boundary

Individual, Date, Time

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- 19, 01/10/2021, 11:55
- 20, 01/10/2021, 13:45
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- 22, 02/10/2021, 10:10
- 23, 02/10/2021, 12:39
- 24, 02/10/2021, 13:04
- 25, 02/10/2021, 16:26
- 26, 03/10/2021, 10:37
- 27, 03/10/2021, 16:22
- 28, 20/10/2021, 10:00
- 29, 25/10/2021, 15:04
- 30, 26/10/2021, 09:03
- 31, 26/10/2021, 12:52
- 32, 27/10/2021, 09:51
- 33, 28/10/2021, 09:49
- 34, 28/10/2021, 14:10
- 35, 28/10/2021, 14:51
- 36, 29/10/2021, 15:07
- 37, 23/11/2021, 08:38
- 38, 23/11/2021, 11:00
- 39, 25/11/2021, 10:47
- 40, 25/11/2021, 10:52

TITLE:	Winter 2021/2022 Flightlines Grey Heron		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	21		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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N W E S

0 0.5 1 2 Kilometers

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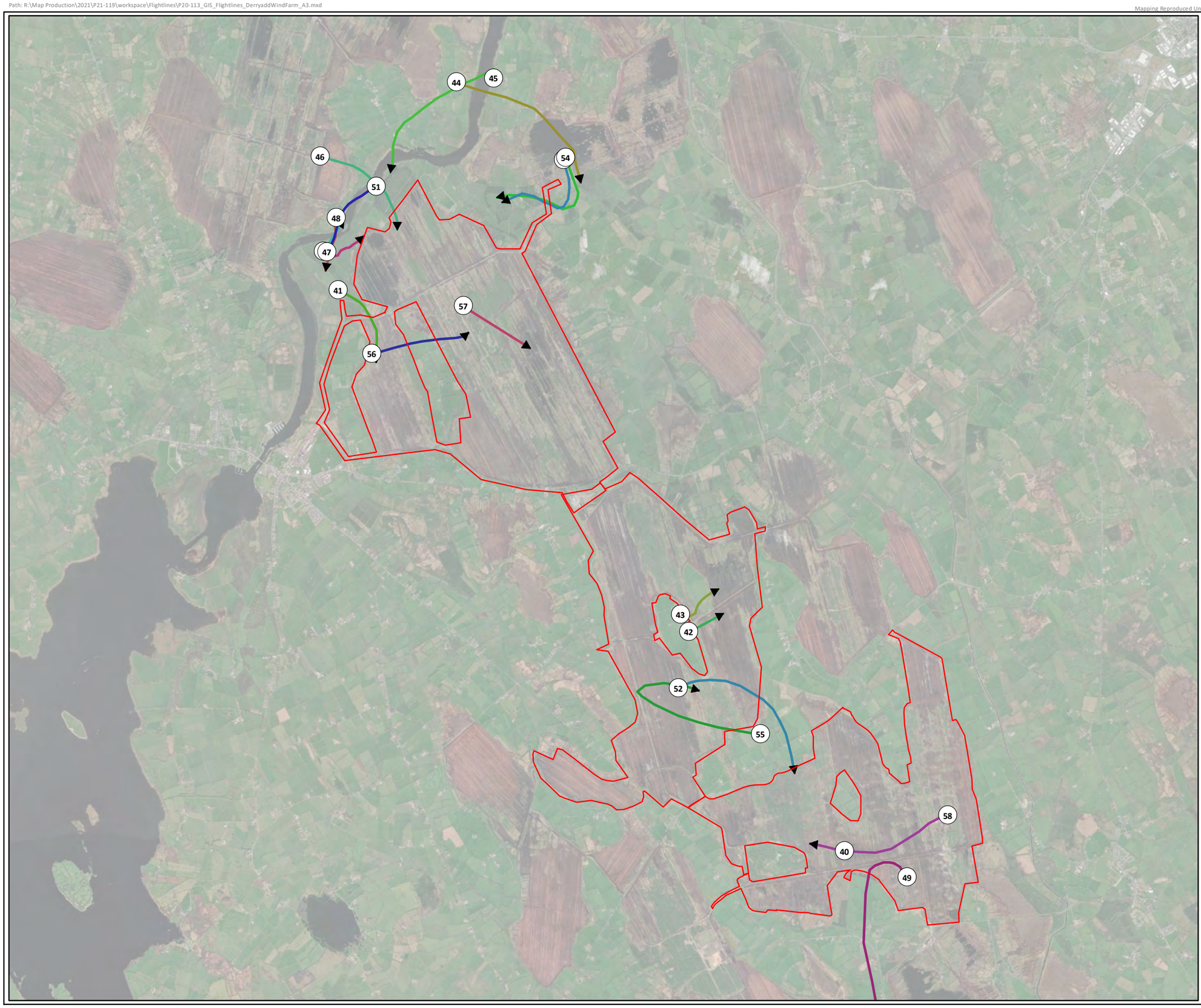

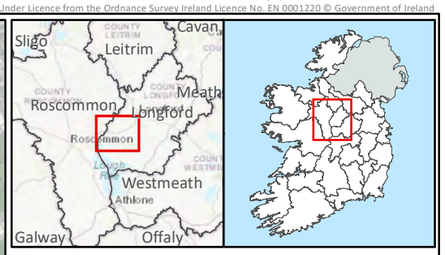

Legend

Site Boundary

Individual, Date, Time

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- 41, 25/11/2021, 10:11
- 42, 29/11/2021, 12:36
- 43, 29/11/2021, 14:28
- 44, 13/12/2021, 12:15
- 45, 13/12/2021, 13:41
- 46, 15/12/2021, 11:40
- 47, 17/01/2022, 09:46
- 48, 17/01/2022, 13:10
- 49, 01/02/2022, 13:21
- 50, 03/02/2022, 10:59
- 51, 03/02/2022, 14:26
- 52, 14/02/2022, 11:26
- 53, 02/03/2022, 13:53
- 54, 02/03/2022, 13:53
- 55, 07/03/2022, 13:16
- 56, 16/03/2022, 10:16
- 57, 16/03/2022, 15:14
- 58, 28/03/2022, 10:50

N W E S

0 0.5 1 2 Kilometers

TITLE:	Winter 2021/2022 Flightlines Grey Heron		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	22		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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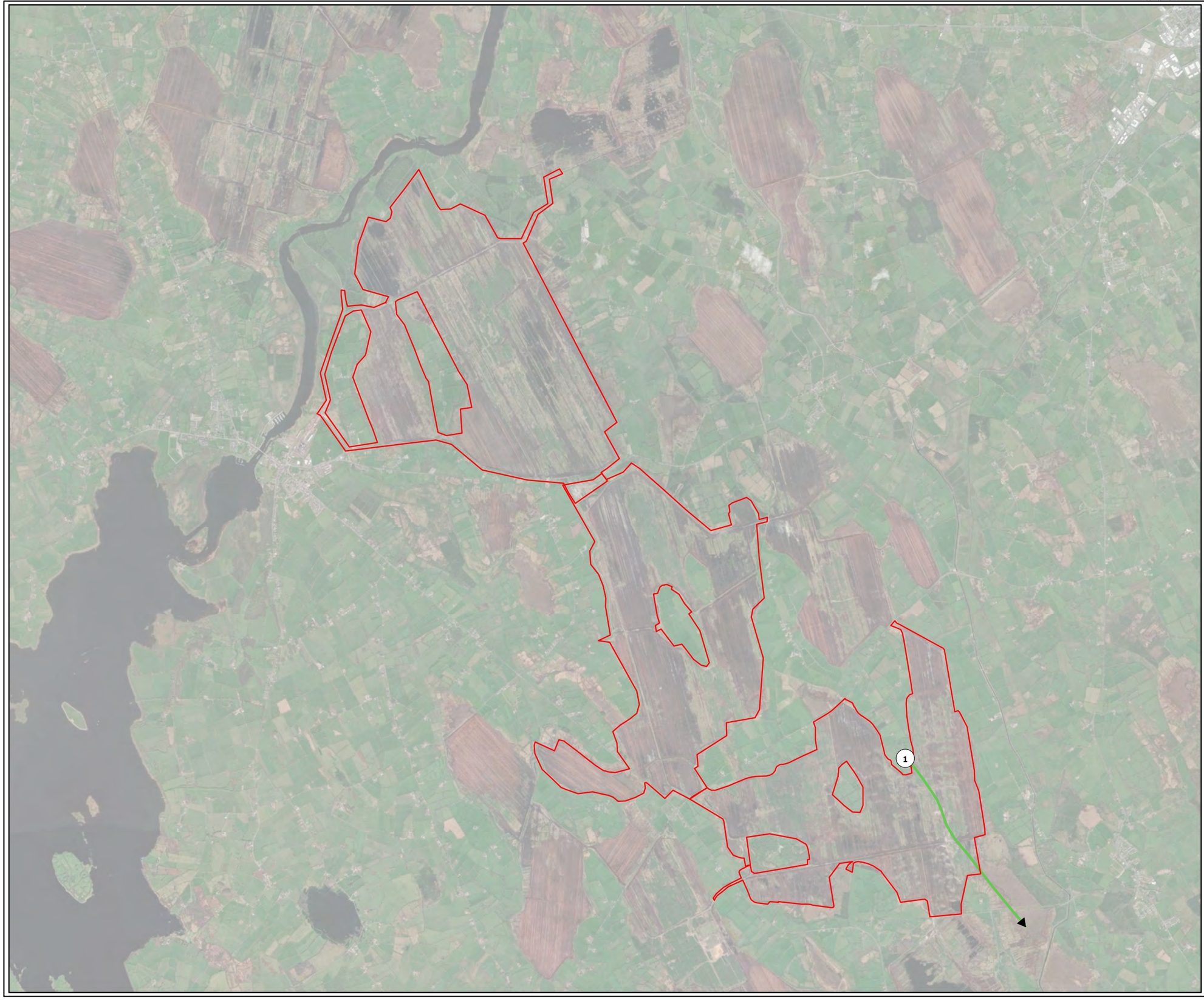

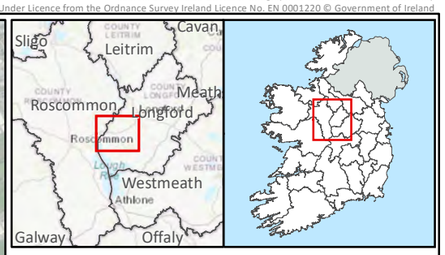

Legend

Site Boundary

Individual, Date, Time

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N
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Kilometers
0 0.5 1 2

TITLE:	Winter 2021/2022 Flightlines Greylag Goose		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	23		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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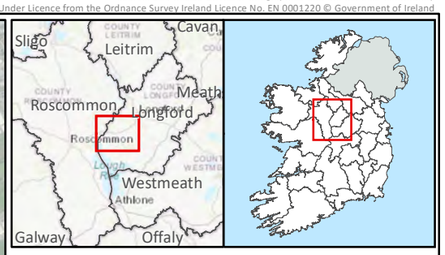

Legend

Site Boundary

Individual, Date, Time

1, 25/11/2021, 09:25

N
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0 0.5 1 2 Kilometers

TITLE:	Winter 2021/2022 Flightlines Gull sp.		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	24		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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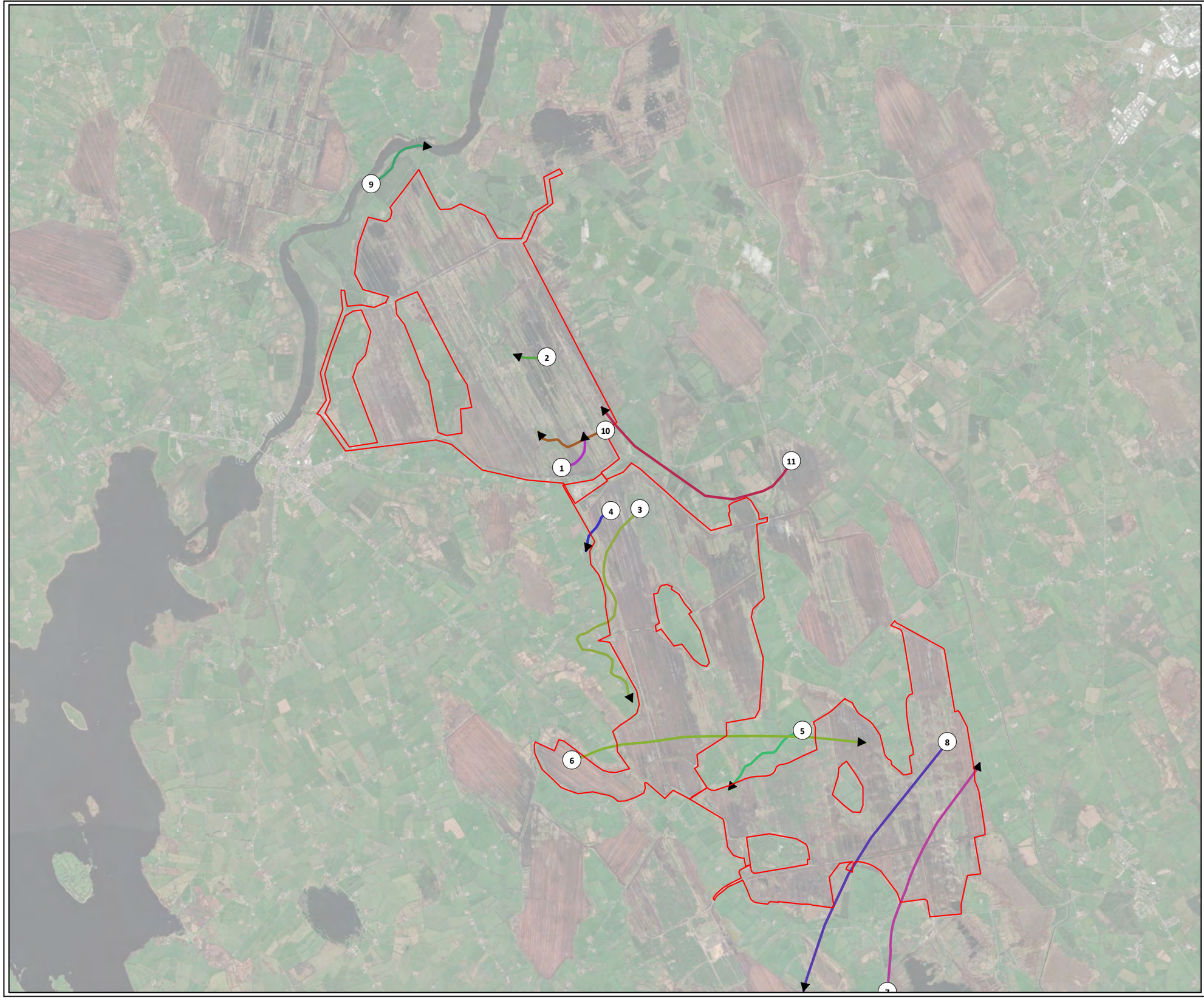

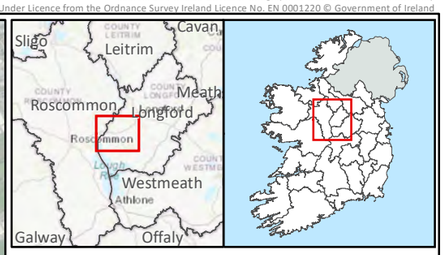

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Site Boundary

Individual, Date, Time

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- 2, 26/11/2021, 09:34
- 3, 15/12/2021, 13:30
- 4, 16/12/2021, 10:47
- 5, 28/12/2021, 11:47
- 6, 11/01/2022, 13:24
- 7, 17/01/2022, 11:09
- 8, 17/01/2022, 11:53
- 9, 03/02/2022, 11:25
- 10, 16/03/2022, 11:28
- 11, 16/03/2022, 11:35

N W E S

0 0.5 1 2 Kilometers

TITLE:	Winter 2021/2022 Flightlines Hen Harrier		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	25		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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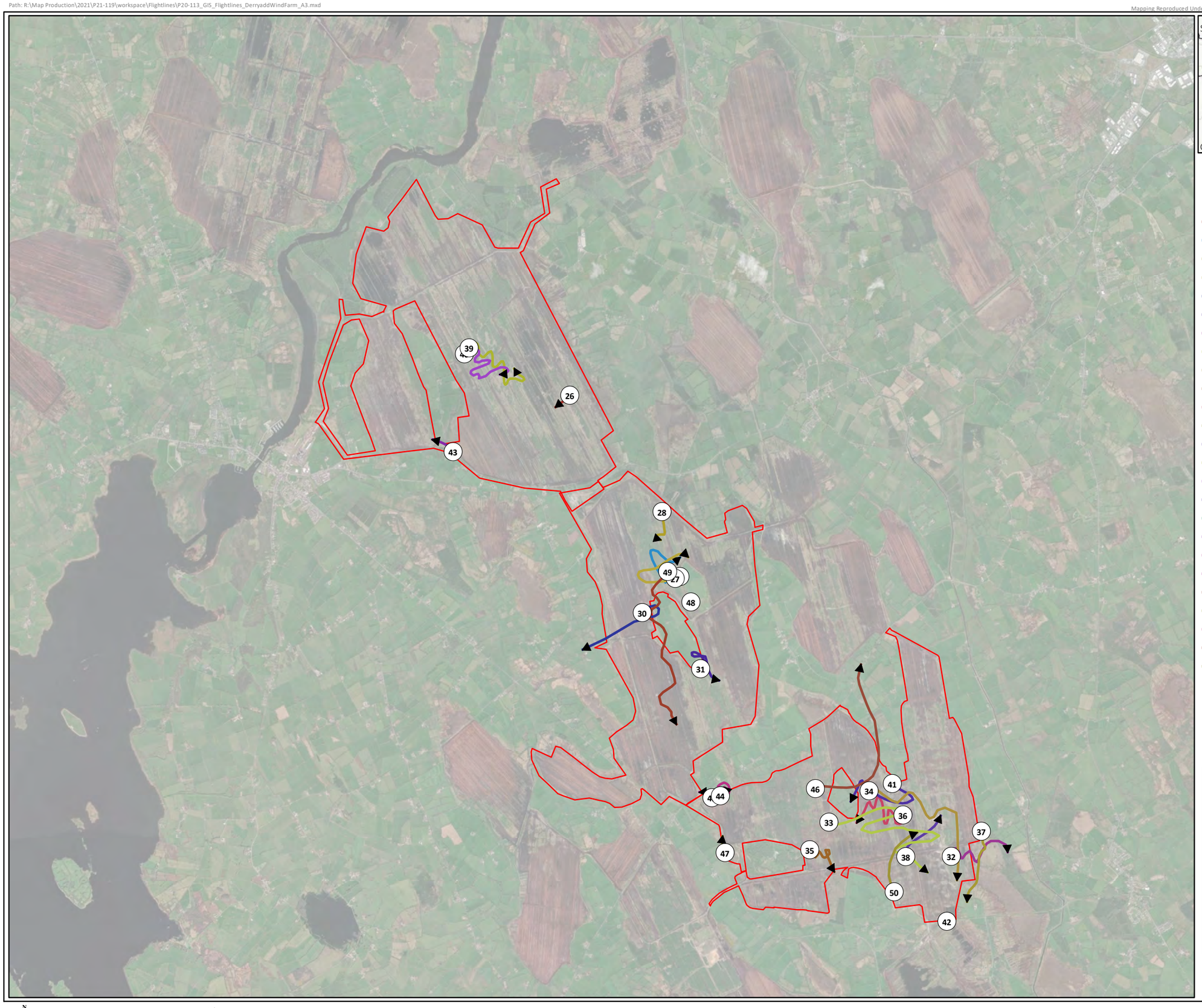

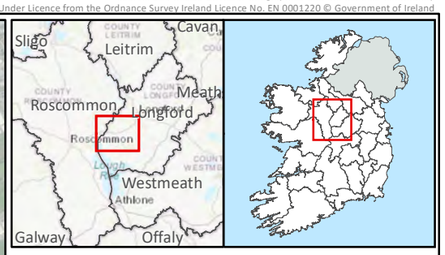

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Site Boundary

Individual, Date, Time

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- 27, 03/10/2021, 08:47
- 28, 03/10/2021, 10:15
- 29, 03/10/2021, 12:06
- 30, 03/10/2021, 13:48
- 31, 03/10/2021, 16:58
- 32, 20/10/2021, 09:12
- 33, 20/10/2021, 14:01
- 34, 20/10/2021, 15:47
- 35, 21/10/2021, 14:33
- 36, 25/10/2021, 09:10
- 37, 25/10/2021, 12:35
- 38, 25/10/2021, 13:30
- 39, 26/10/2021, 10:42
- 40, 26/10/2021, 14:14
- 41, 29/10/2021, 14:14
- 42, 18/11/2021, 12:02
- 43, 22/11/2021, 09:37
- 44, 24/11/2021, 12:40
- 45, 24/11/2021, 14:38
- 46, 25/11/2021, 09:48
- 47, 25/11/2021, 10:00
- 48, 02/12/2021, 11:44
- 49, 15/12/2021, 11:27
- 50, 17/01/2022, 13:36

TITLE:	Winter 2021/2022 Flightlines Kestrel		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	26		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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Kilometers
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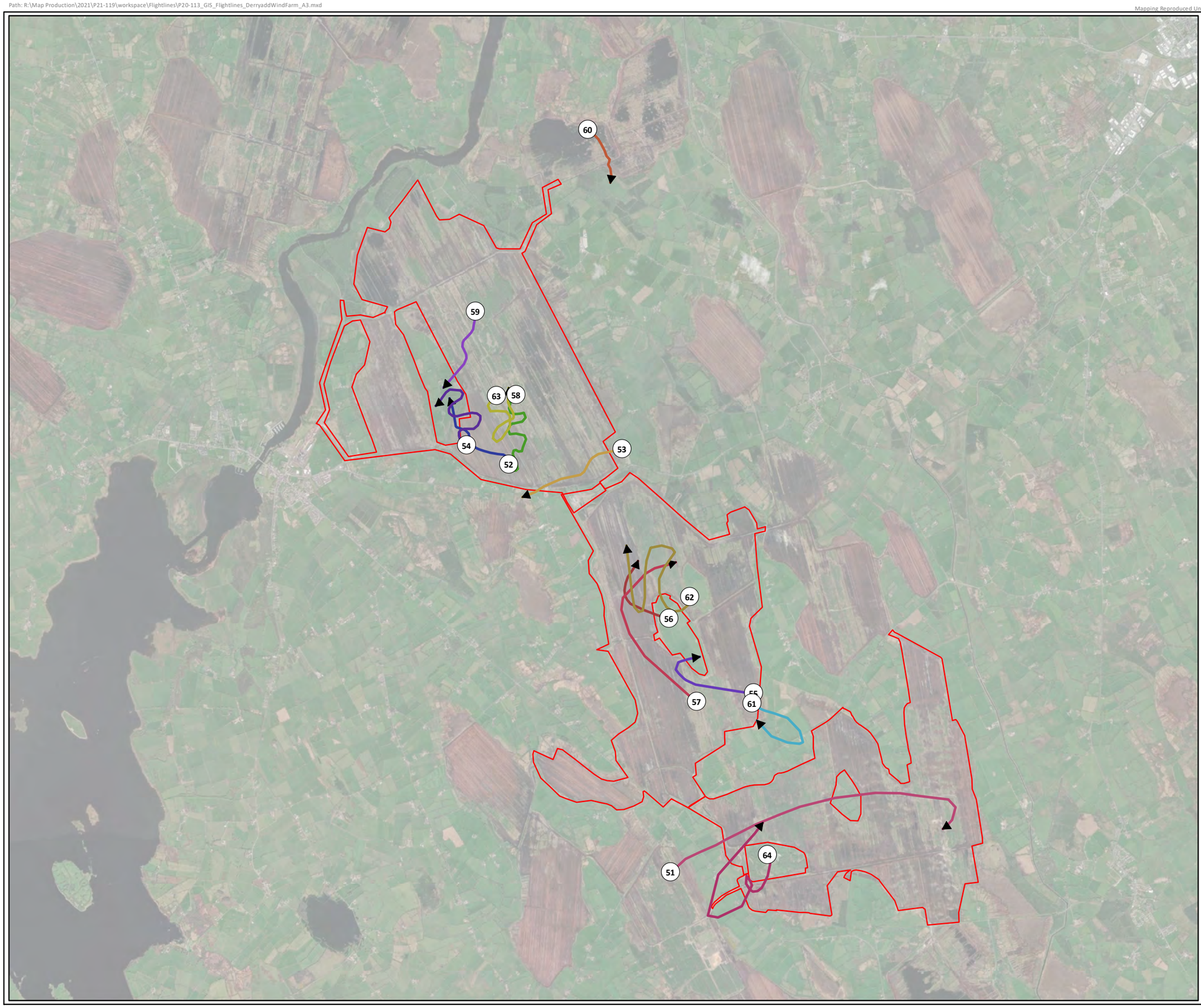

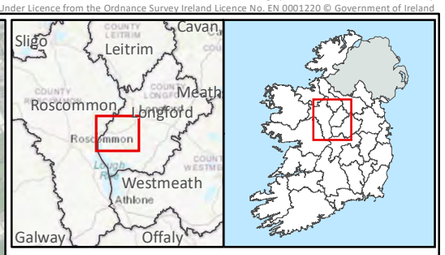

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Site Boundary

Individual, Date, Time

- 51, 18/01/2022, 11:30
- 52, 18/01/2022, 14:44
- 53, 25/01/2022, 10:33
- 54, 02/02/2022, 09:57
- 55, 02/02/2022, 10:25
- 56, 02/02/2022, 11:11
- 57, 02/02/2022, 14:27
- 58, 25/02/2022, 12:06
- 59, 28/02/2022, 14:00
- 60, 02/03/2022, 11:42
- 61, 02/03/2022, 11:48
- 62, 07/03/2022, 10:57
- 63, 15/03/2022, 10:40
- 64, 28/03/2022, 13:03

N W E S

0 0.5 1 2 Kilometers

TITLE:	Winter 2021/2022 Flightlines Kestrel		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	27		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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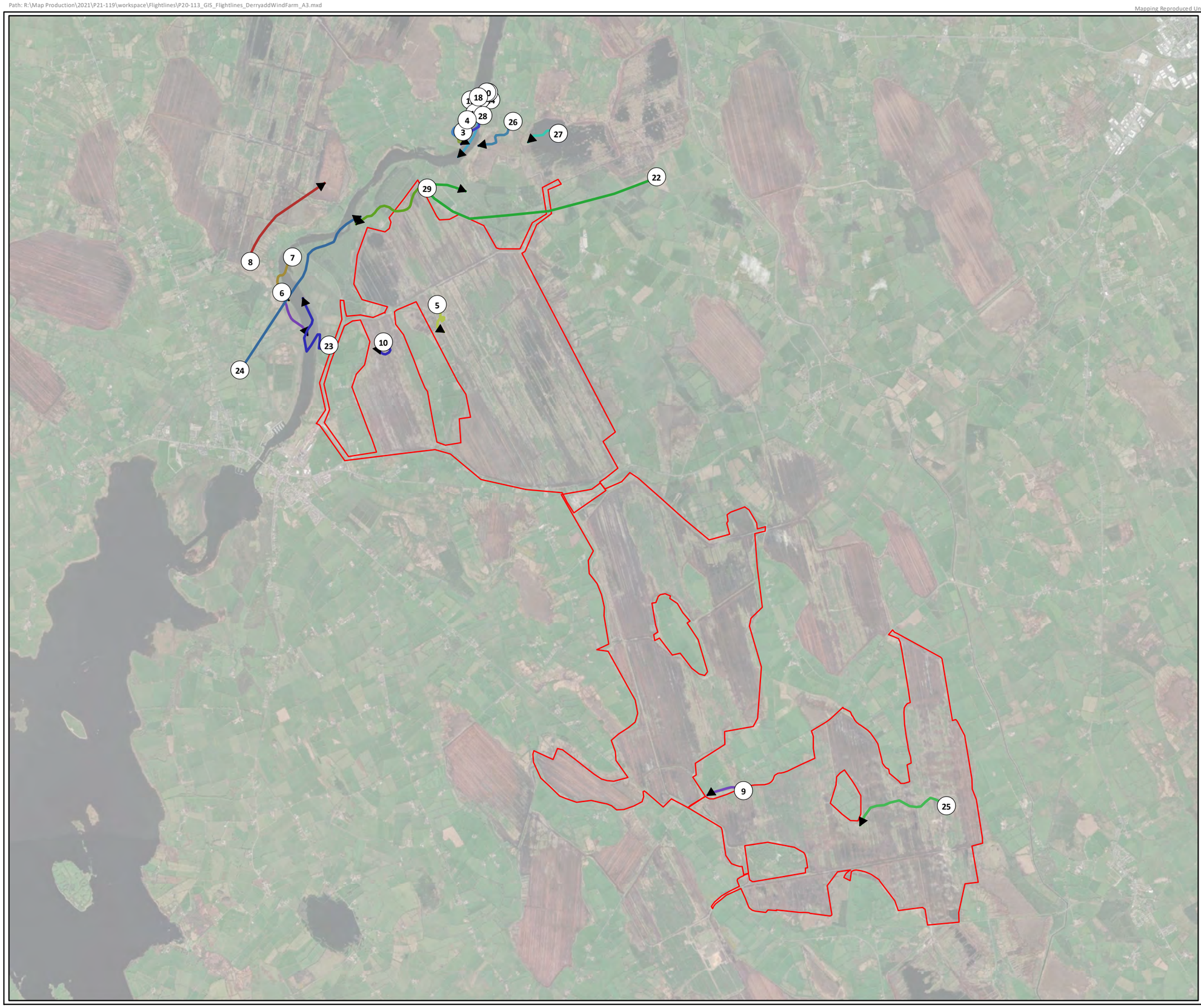

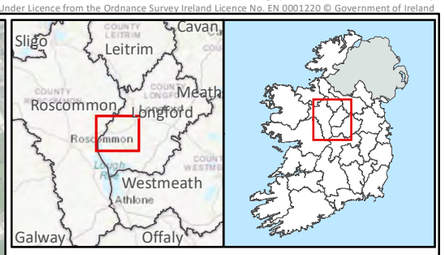

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Site Boundary

Individual, Date, Time

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- 5, 02/10/2021, 14:14
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- 9, 24/11/2021, 13:04
- 10, 25/11/2021, 11:40
- 11, 01/12/2021, 08:46
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- 13, 01/12/2021, 09:18
- 14, 01/12/2021, 09:20
- 15, 01/12/2021, 09:28
- 16, 01/12/2021, 09:31
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- 18, 01/12/2021, 11:40
- 19, 01/12/2021, 13:09
- 20, 01/12/2021, 13:11
- 21, 01/12/2021, 13:30
- 22, 13/12/2021, 09:42
- 23, 14/12/2021, 10:25
- 24, 14/12/2021, 13:41
- 25, 28/12/2021, 10:57
- 26, 07/01/2022, 09:35
- 27, 07/01/2022, 11:16
- 28, 07/01/2022, 15:47
- 29, 17/01/2022, 09:55

TITLE:	Winter 2021/2022 Flightlines Lapwing		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	28		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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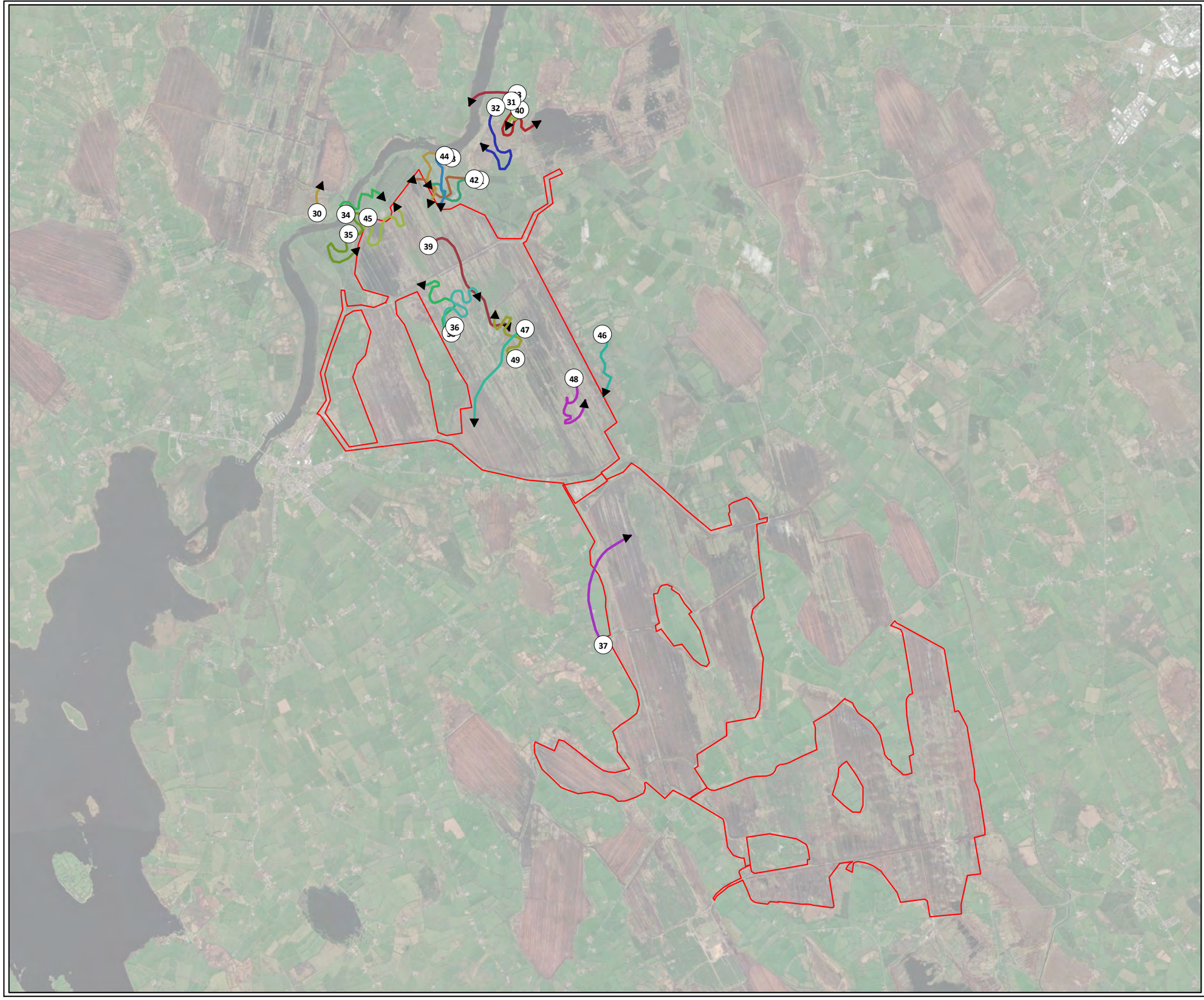

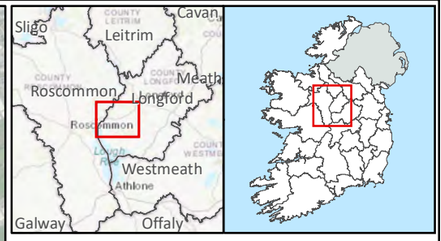

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Individual, Date, Time

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- 32, 01/02/2022, 09:57
- 33, 01/02/2022, 10:55
- 34, 03/02/2022, 10:56
- 35, 03/02/2022, 11:18
- 36, 25/02/2022, 12:58
- 37, 25/02/2022, 14:05
- 38, 28/02/2022, 09:40
- 39, 28/02/2022, 11:00
- 40, 02/03/2022, 10:11
- 41, 02/03/2022, 13:01
- 42, 02/03/2022, 13:01
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- 44, 02/03/2022, 13:44
- 45, 07/03/2022, 14:16
- 46, 15/03/2022, 10:39
- 47, 15/03/2022, 11:42
- 48, 15/03/2022, 13:23
- 49, 16/03/2022, 09:51

N W E S

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TITLE:	Winter 2021/2022 Flightlines Lapwing		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	29		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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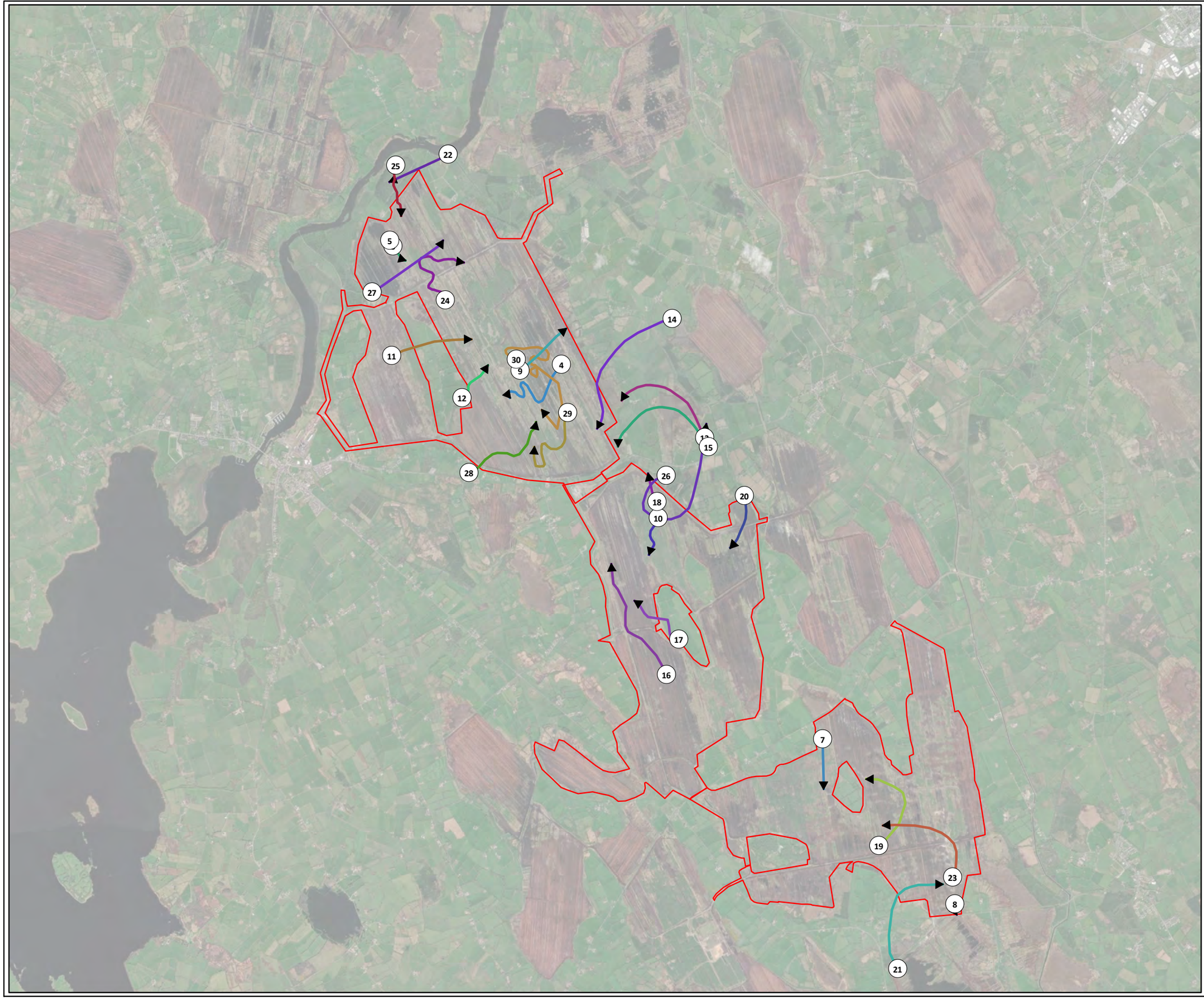

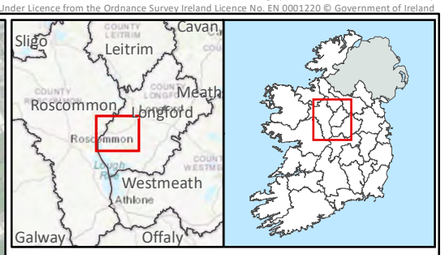

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- 6, 02/10/2021, 12:06
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- 8, 18/11/2021, 11:09
- 9, 26/11/2021, 12:58
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- 12, 13/12/2021, 13:31
- 13, 14/12/2021, 10:27
- 14, 14/12/2021, 10:40
- 15, 14/12/2021, 13:56
- 16, 15/12/2021, 10:39
- 17, 15/12/2021, 14:07
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- 19, 16/12/2021, 10:28
- 20, 16/12/2021, 10:33
- 21, 27/12/2021, 10:43
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- 23, 17/01/2022, 11:24
- 24, 24/01/2022, 10:03
- 25, 24/01/2022, 11:33
- 26, 25/02/2022, 14:14
- 27, 28/02/2022, 12:05
- 28, 15/03/2022, 10:56
- 29, 15/03/2022, 10:57
- 30, 16/03/2022, 09:51

TITLE:	Winter 2021/2022 Flightlines Little Egret		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	30		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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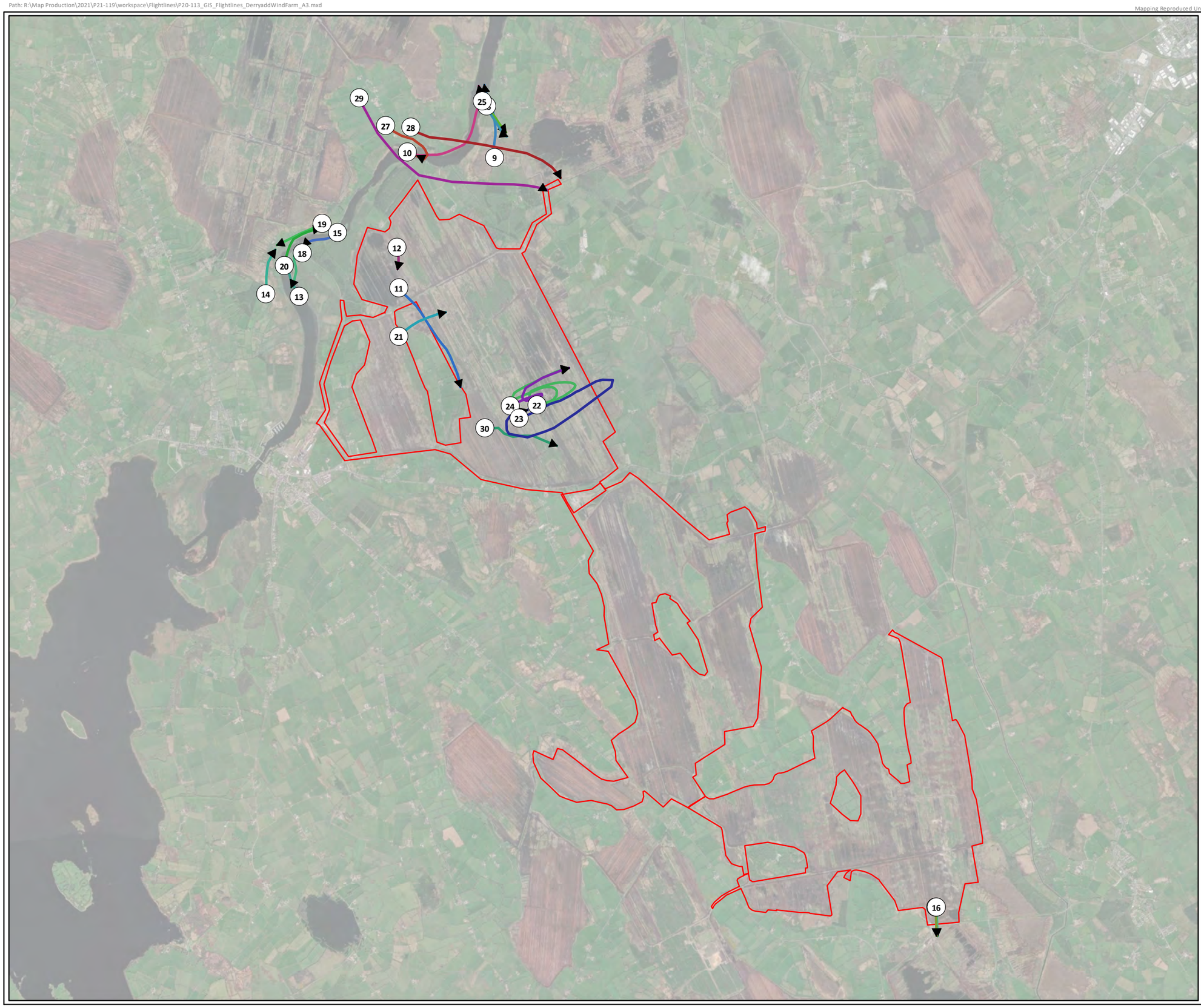

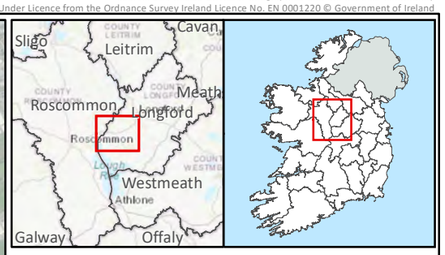

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- 11, 02/10/2021, 10:22
- 12, 02/10/2021, 13:22
- 13, 28/10/2021, 11:02
- 14, 28/10/2021, 11:08
- 15, 28/10/2021, 13:03
- 16, 18/11/2021, 13:11
- 17, 18/11/2021, 13:15
- 18, 23/11/2021, 08:44
- 19, 23/11/2021, 08:52
- 20, 23/11/2021, 09:15
- 21, 25/11/2021, 08:19
- 22, 26/11/2021, 11:31
- 23, 26/11/2021, 11:42
- 24, 26/11/2021, 12:22
- 25, 01/12/2021, 09:23
- 26, 01/12/2021, 10:01
- 27, 13/12/2021, 10:30
- 28, 13/12/2021, 10:55
- 29, 13/12/2021, 11:35
- 30, 13/12/2021, 12:11

TITLE:	Winter 2021/2022 Flightlines Mallard		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	31		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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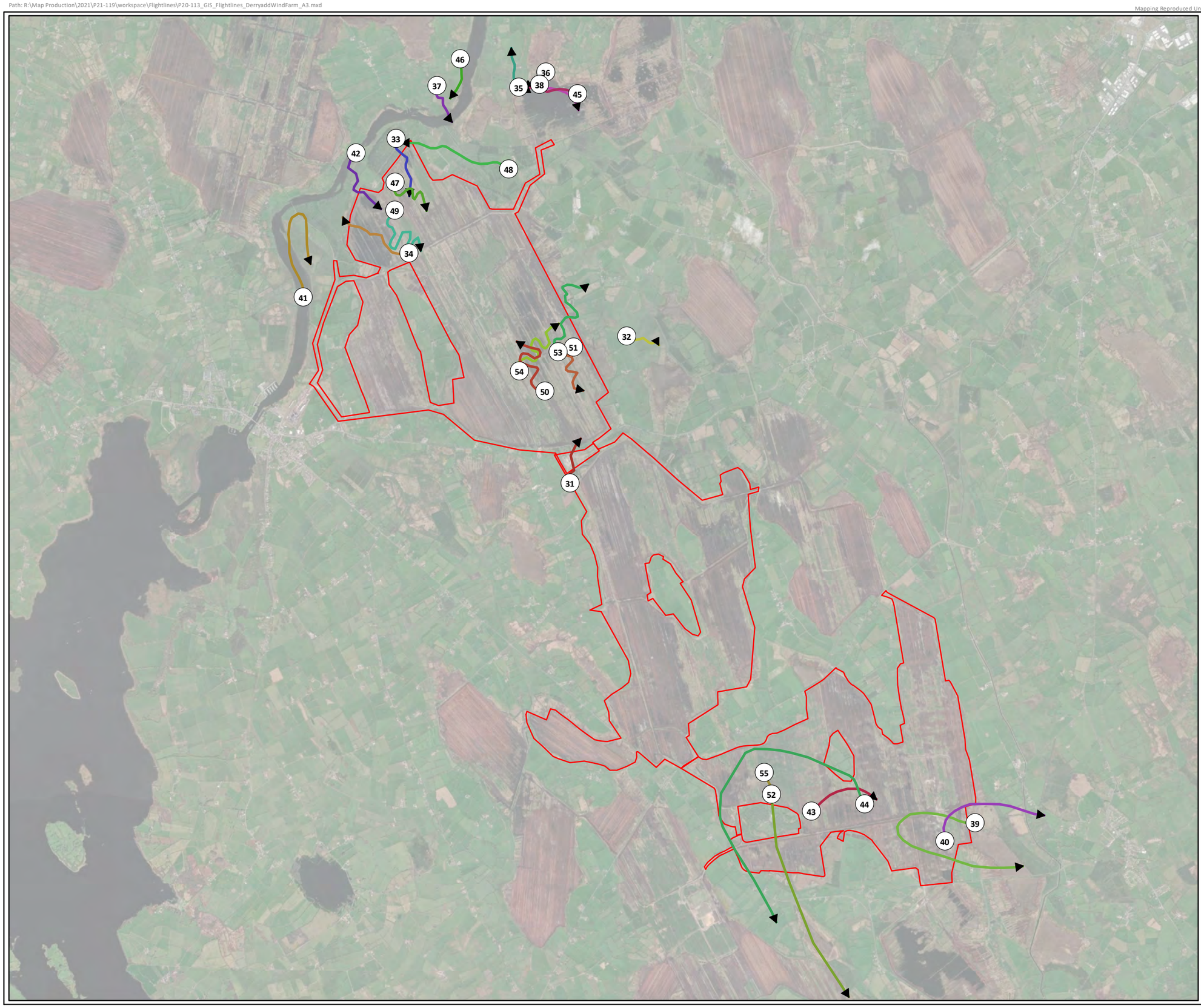

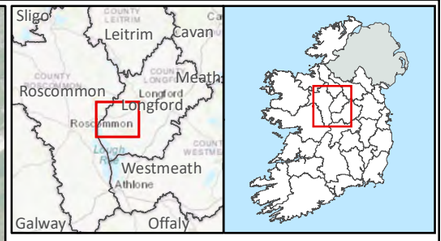

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- 33, 14/12/2021, 09:40
- 34, 14/12/2021, 10:10
- 35, 07/01/2022, 10:40
- 36, 07/01/2022, 11:45
- 37, 01/02/2022, 09:58
- 38, 01/02/2022, 12:24
- 39, 01/02/2022, 11:39
- 40, 01/02/2022, 13:22
- 41, 03/02/2022, 10:01
- 42, 03/02/2022, 10:05
- 43, 08/02/2022, 10:39
- 44, 08/02/2022, 11:38
- 45, 02/03/2022, 09:46
- 46, 02/03/2022, 11:02
- 47, 08/03/2022, 10:21
- 48, 08/03/2022, 10:42
- 49, 08/03/2022, 12:04
- 50, 15/03/2022, 10:09
- 51, 15/03/2022, 11:42
- 52, 15/03/2022, 11:05
- 53, 16/03/2022, 09:51
- 54, 16/03/2022, 15:30
- 55, 28/03/2022, 13:36

TITLE:	Winter 2021/2022 Flightlines Mallard		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	32		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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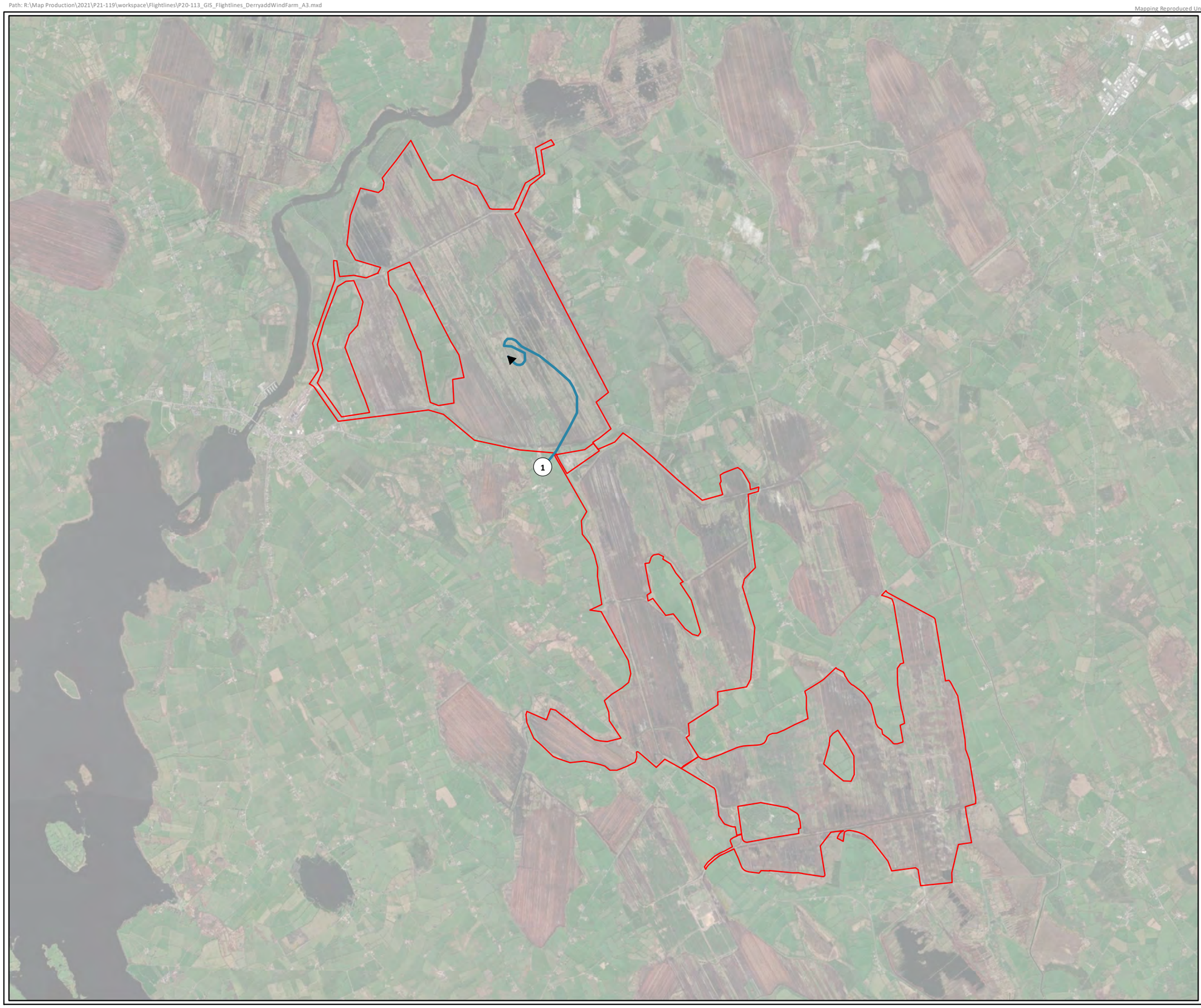

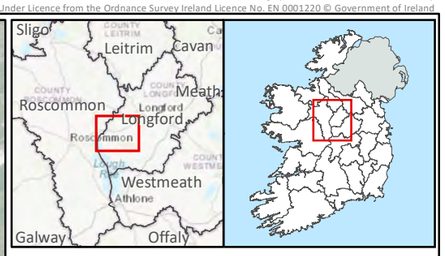

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Site Boundary

Individual, Date, Time

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TITLE:	Winter 2021/2022 Flightlines Marsh Harrier		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	33		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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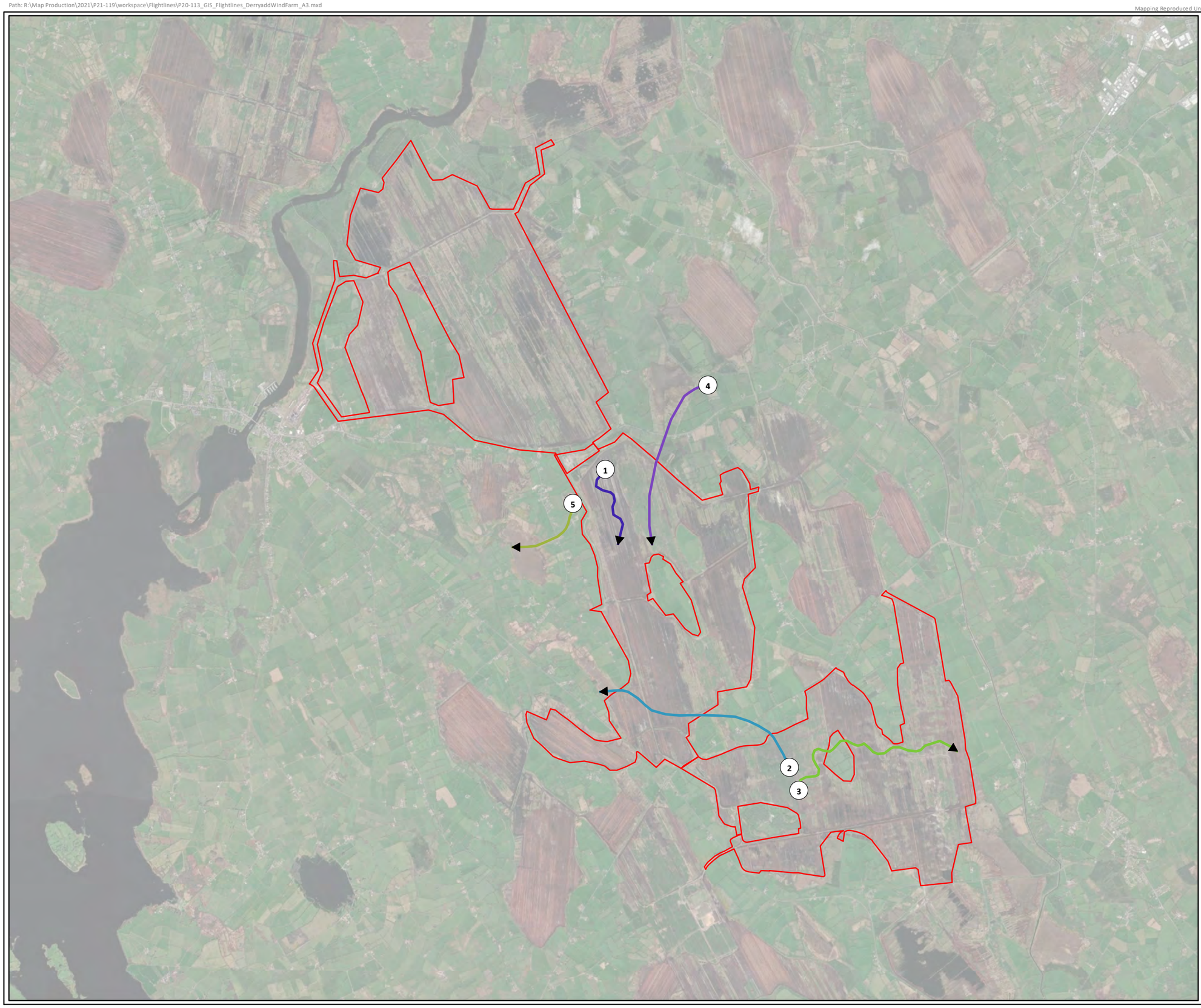

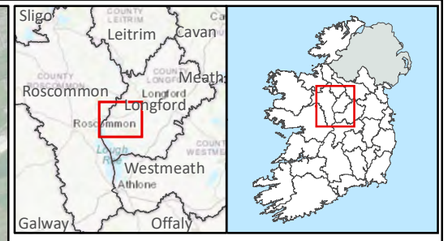

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- 2, 27/12/2021, 14:27
- 3, 28/12/2021, 11:49
- 4, 06/01/2022, 10:36
- 5, 24/01/2022, 13:43

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TITLE:	Winter 2021/2022 Flightlines Merlin		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	34		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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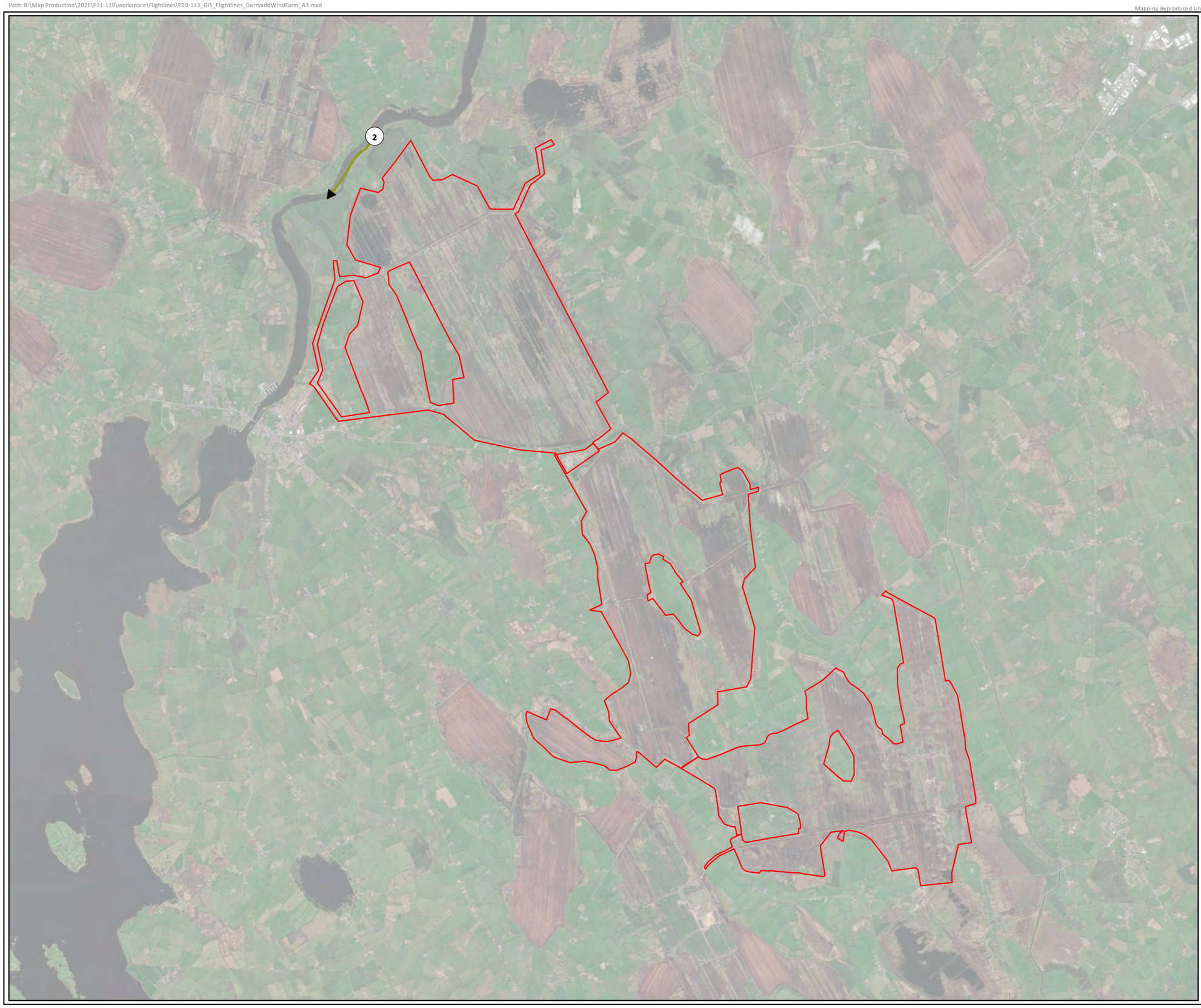

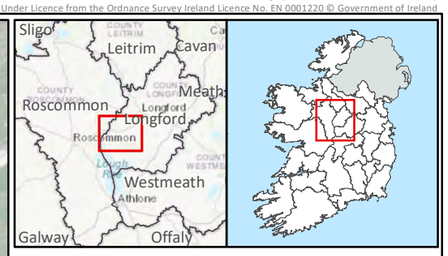

Legend

Site Boundary

Individual, Date, Time

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TITLE:	Winter 2021/2022 Flightlines Moorhen		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	35		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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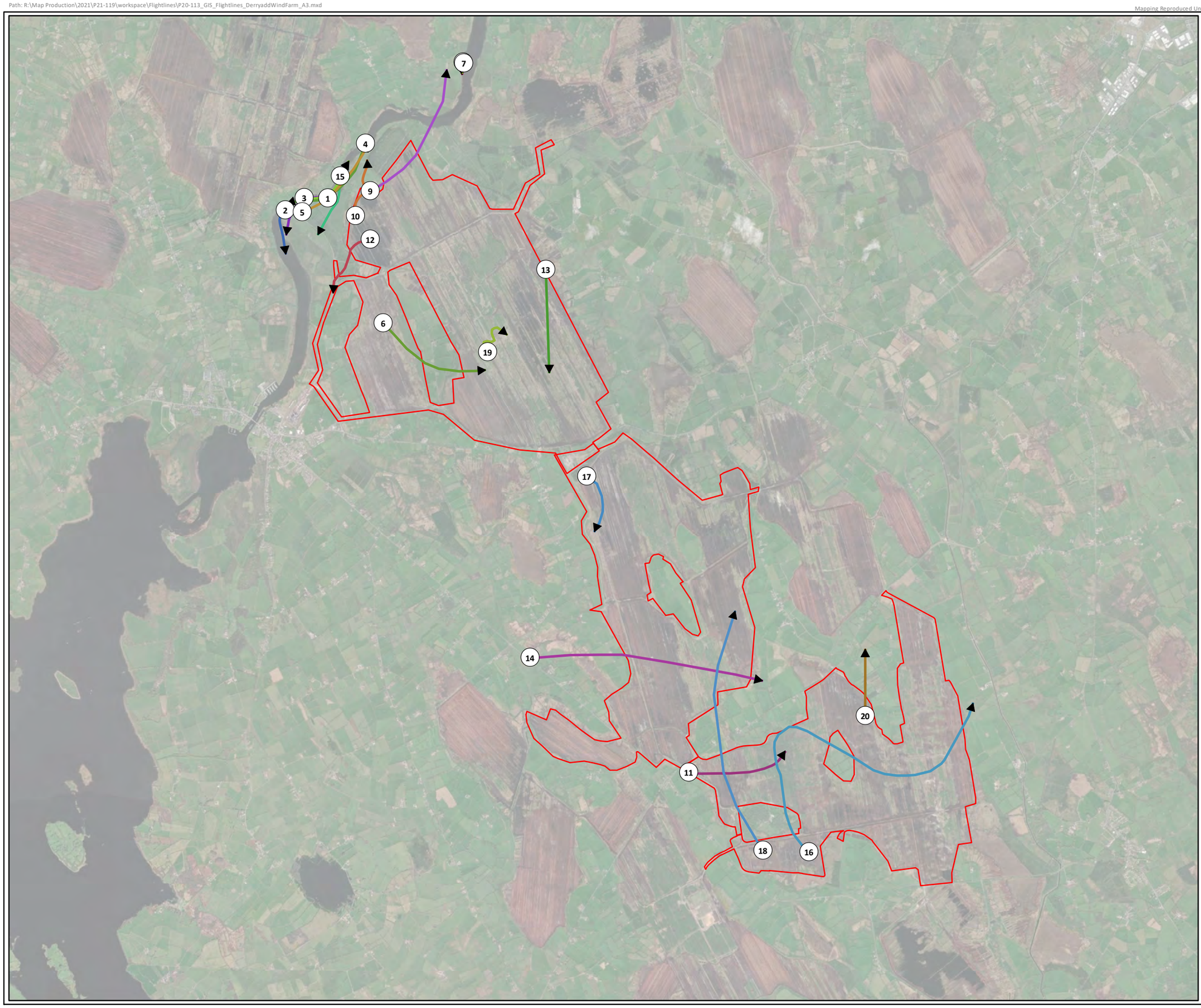

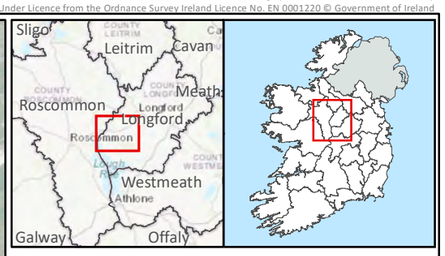

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Site Boundary

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- 2, 23/11/2021, 08:15
- 3, 23/11/2021, 08:43
- 4, 23/11/2021, 08:48
- 5, 23/11/2021, 12:51
- 6, 25/11/2021, 12:10
- 7, 01/12/2021, 09:05
- 8, 01/12/2021, 11:59
- 9, 13/12/2021, 11:05
- 10, 14/12/2021, 09:43
- 11, 12/01/2022, 14:23
- 12, 17/01/2022, 11:13
- 13, 02/02/2022, 11:19
- 14, 02/02/2022, 10:41
- 15, 03/02/2022, 09:57
- 16, 09/02/2022, 10:57
- 17, 25/02/2022, 09:41
- 18, 02/03/2022, 11:25
- 19, 16/03/2022, 13:19
- 20, 28/03/2022, 10:52

TITLE:	Winter 2021/2022 Flightlines Mute Swan		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	36		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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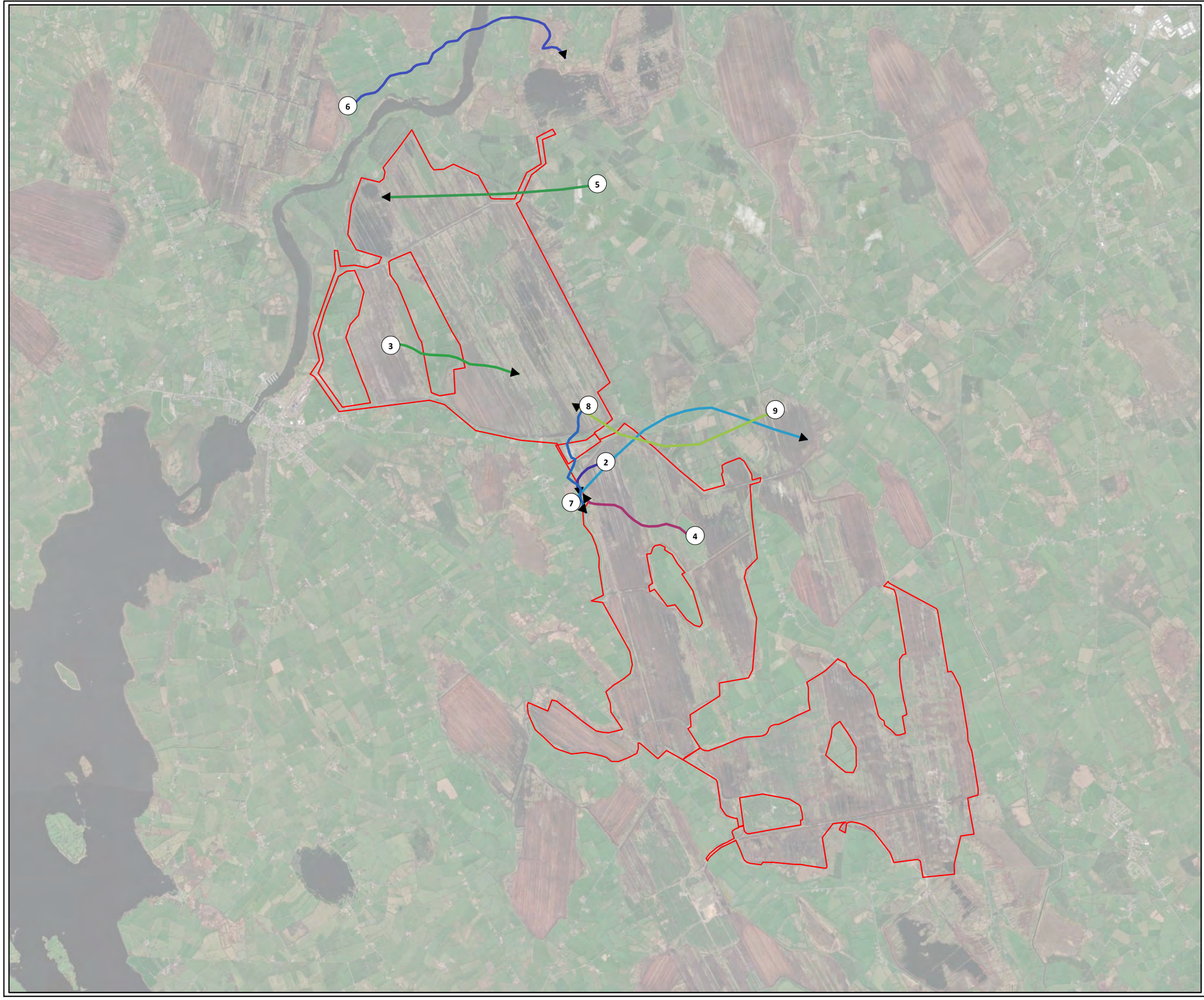

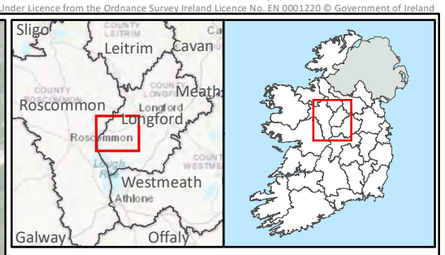

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Site Boundary

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- 4, 15/12/2021, 11:30
- 5, 15/12/2021, 12:25
- 6, 07/01/2022, 11:27
- 7, 02/02/2022, 11:09
- 8, 16/03/2022, 11:28
- 9, 16/03/2022, 12:24

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0 0.5 1 2 Kilometers

TITLE:	Winter 2021/2022 Flightlines Peregrine		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	37		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
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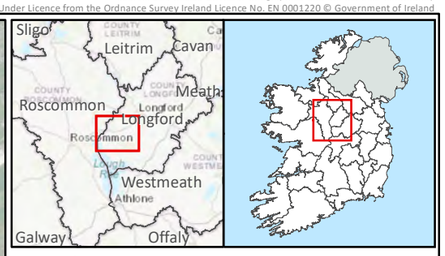

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Site Boundary

Individual, Date, Time

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TITLE:	Winter 2021/2022 Flightlines Pintail		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	38		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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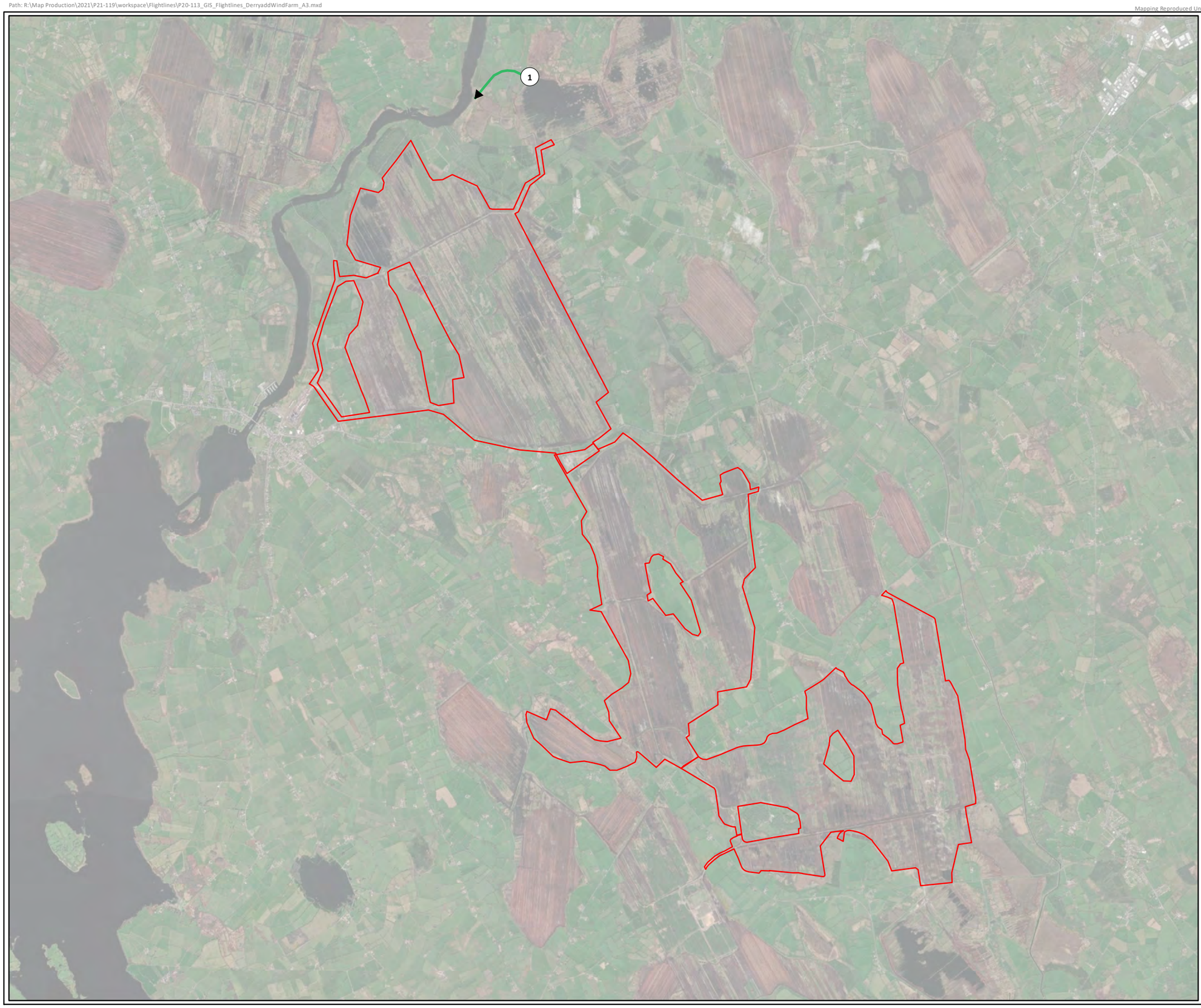

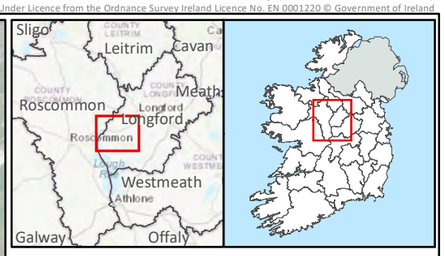

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Site Boundary

Individual, Date, Time

1, 02/03/2022, 13:45

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TITLE:	Winter 2021/2022 Flightlines Shoveler		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	39		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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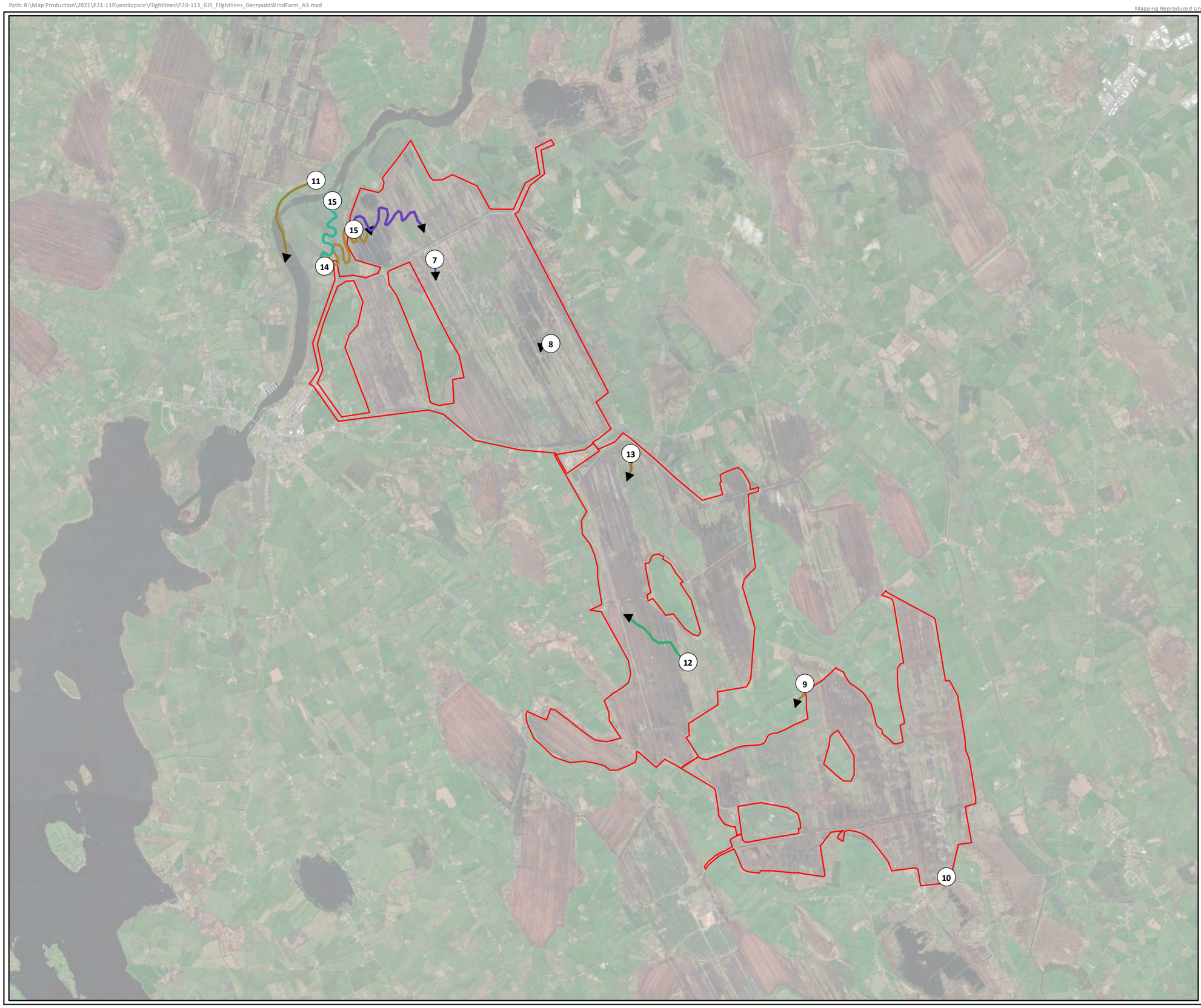

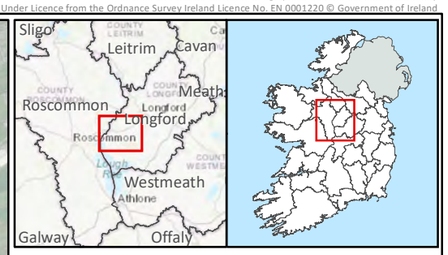

Legend

Site Boundary

Individual, Date, Time

- 7, 02/10/2021, 10:43
- 8, 02/10/2021, 17:18
- 9, 02/11/2021, 08:40
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- 11, 23/11/2021, 12:39
- 12, 15/12/2021, 14:15
- 13, 16/12/2021, 10:44
- 14, 03/02/2022, 11:24
- 15, 28/02/2022, 12:09
- 15, 03/02/2022, 14:24

N W E S

0 0.5 1 2 Kilometers

TITLE:	Winter 2021/2022 Flightlines Snipe		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	40		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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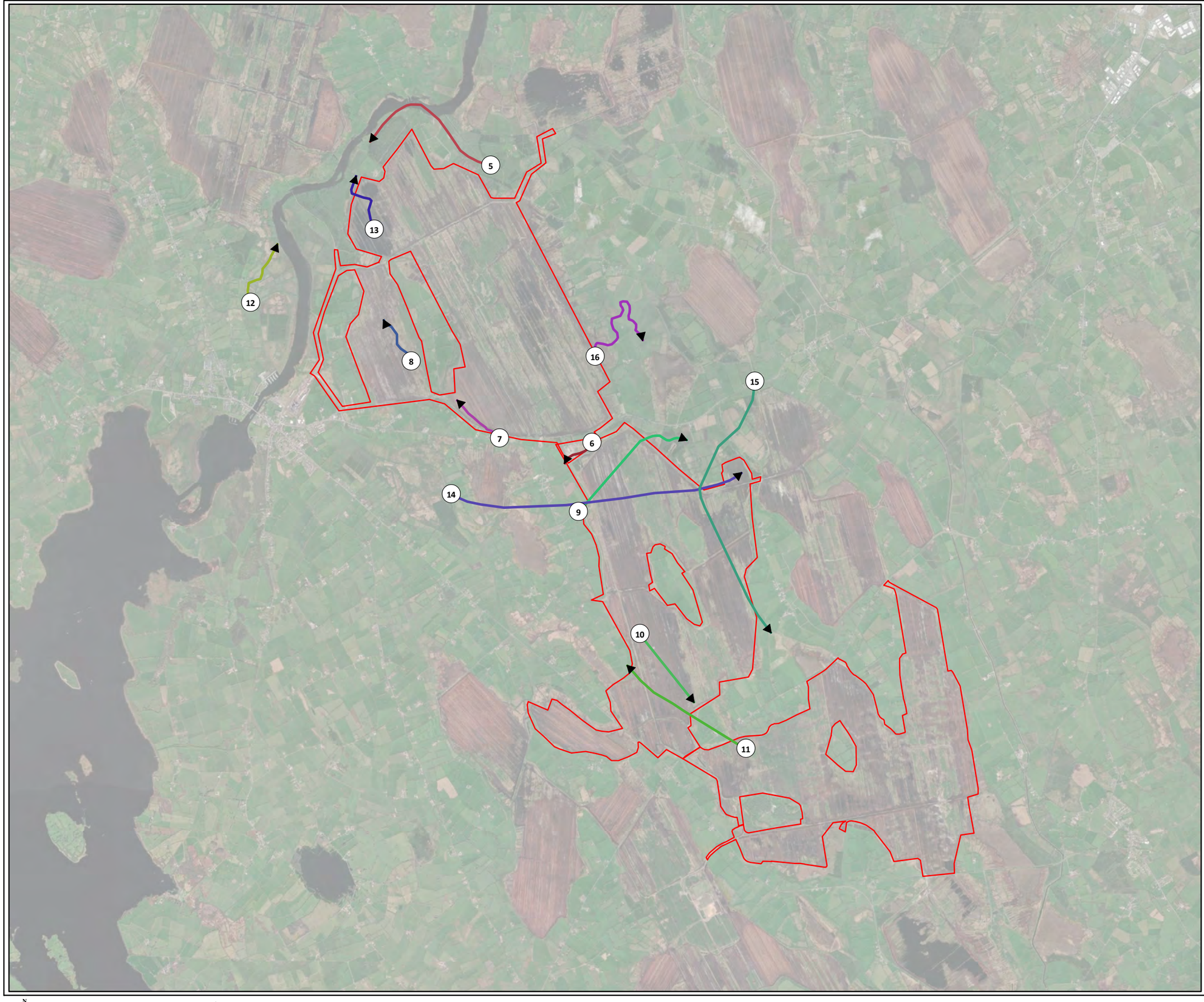

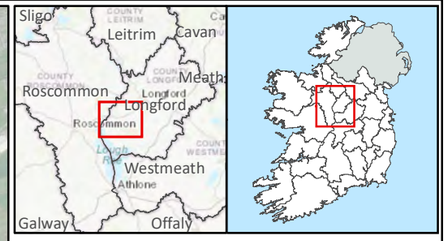

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- 13, 24/01/2022, 12:05
- 14, 24/01/2022, 11:58
- 15, 16/03/2022, 13:05
- 16, 16/03/2022, 13:09

N W E S

0 0.5 1 2 Kilometers

TITLE:	Winter 2021/2022 Flightlines Sparrowhawk		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	41		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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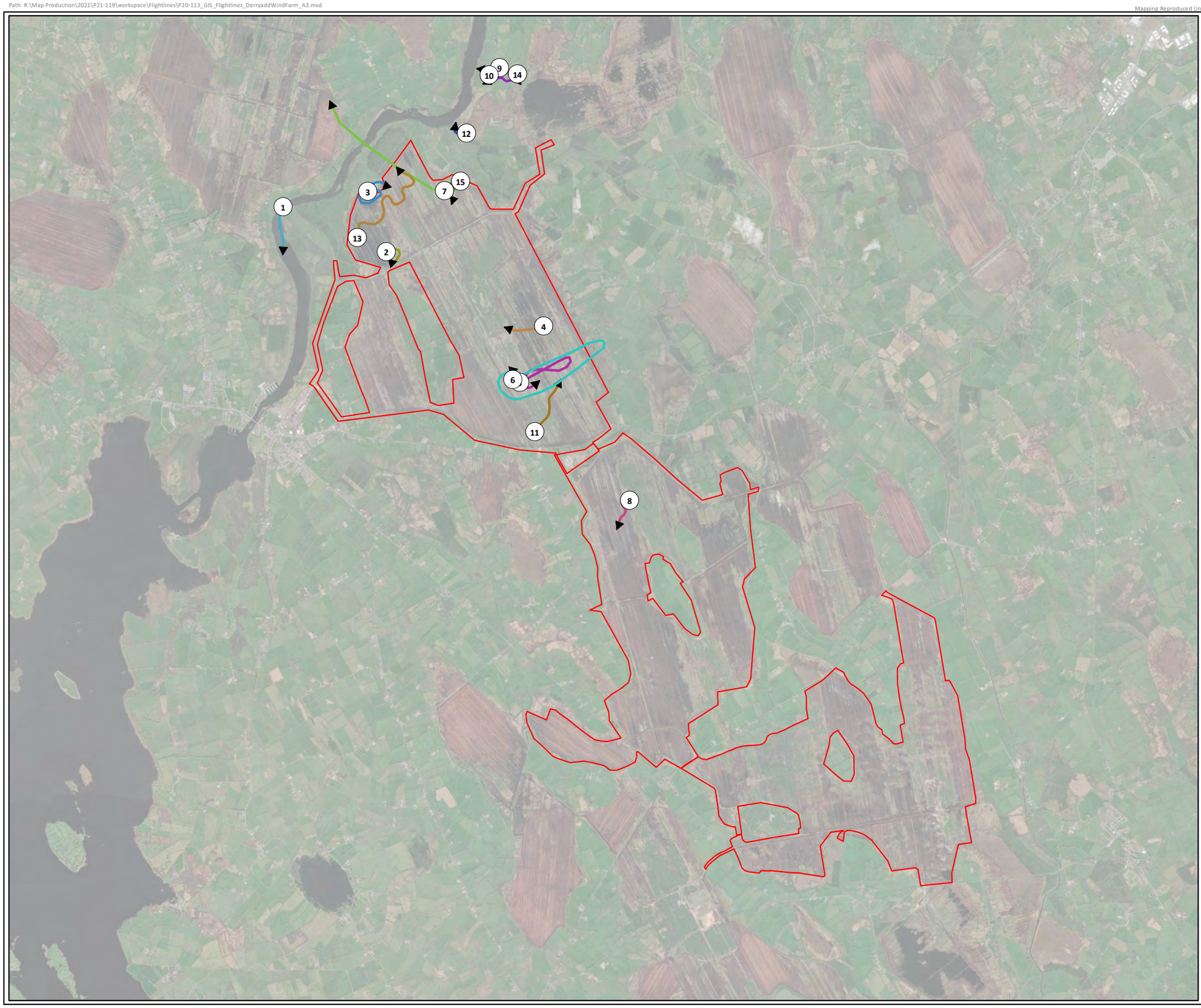

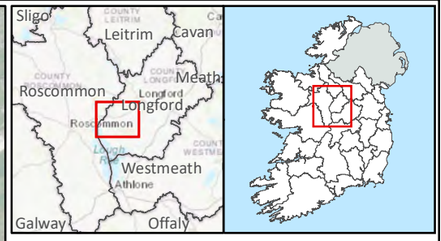

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- 5, 26/11/2021, 11:37
- 6, 26/11/2021, 11:42
- 7, 13/12/2021, 10:13
- 8, 16/12/2021, 12:03
- 9, 07/01/2022, 11:00
- 10, 07/01/2022, 15:11
- 11, 25/01/2022, 09:36
- 12, 01/02/2022, 09:58
- 13, 28/02/2022, 12:04
- 14, 02/03/2022, 10:05
- 15, 08/03/2022, 11:57

TITLE:	Winter 2021/2022 Flightlines Teal		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	42		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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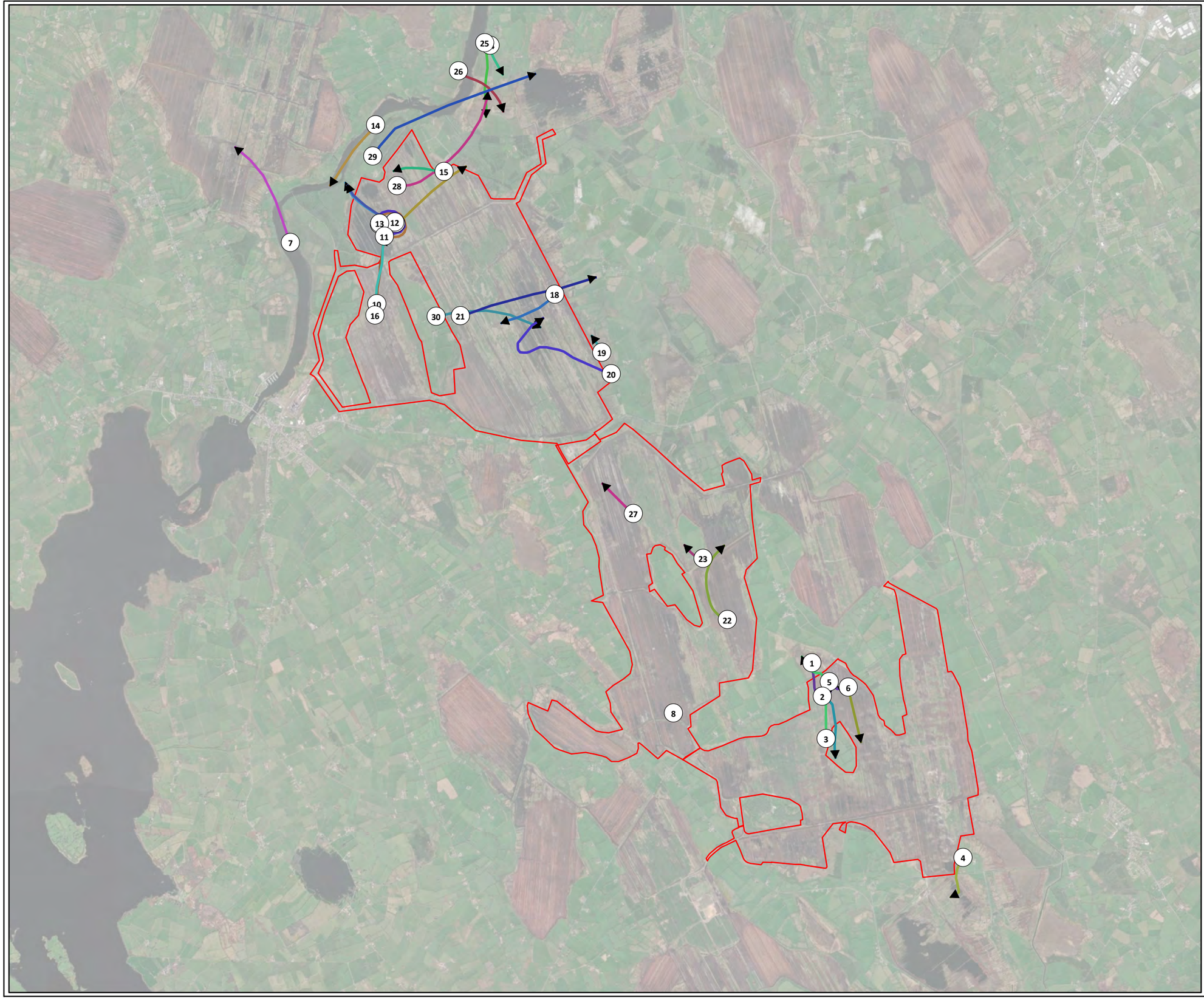

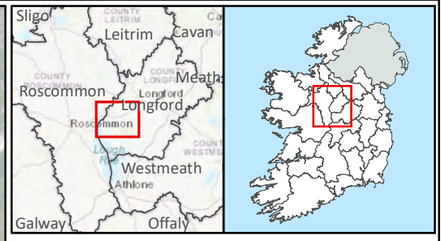

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- 16, 25/11/2021, 10:14
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- 18, 26/11/2021, 09:23
- 19, 26/11/2021, 10:16
- 20, 26/11/2021, 11:48
- 21, 26/11/2021, 12:32
- 22, 29/11/2021, 11:19
- 23, 29/11/2021, 15:21
- 24, 01/12/2021, 08:32
- 25, 01/12/2021, 09:27
- 26, 01/12/2021, 09:58
- 27, 02/12/2021, 12:57
- 28, 13/12/2021, 09:35
- 29, 13/12/2021, 09:55
- 30, 13/12/2021, 11:26

TITLE:	Winter 2021/2022 Flightlines Whooper Swan		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	43		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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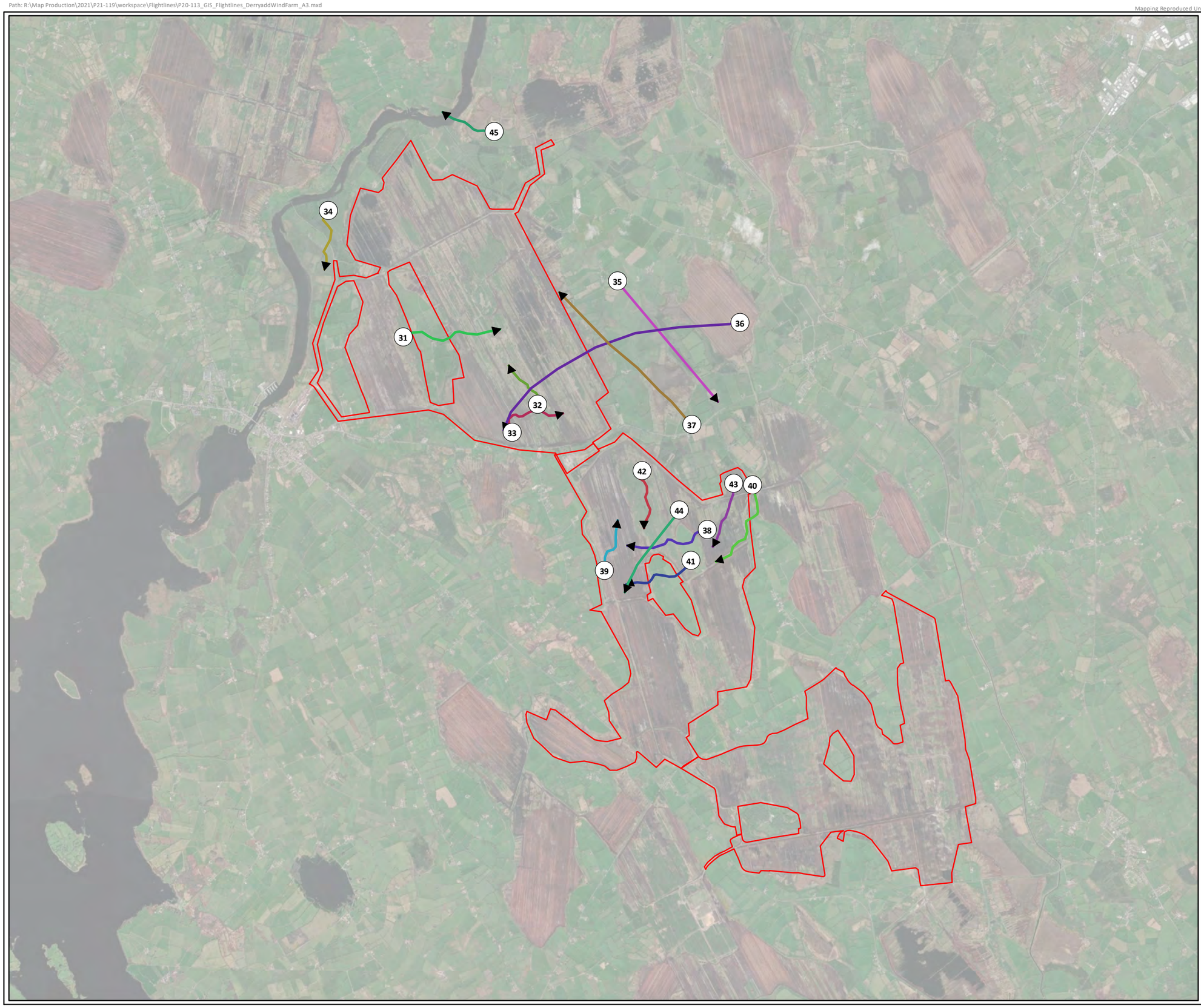

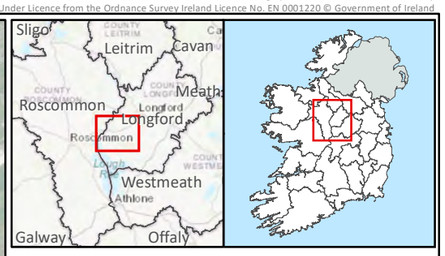

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- 34, 14/12/2021, 09:56
- 35, 14/12/2021, 10:30
- 36, 14/12/2021, 10:43
- 37, 14/12/2021, 11:04
- 38, 16/12/2021, 09:58
- 39, 16/12/2021, 10:07
- 40, 16/12/2021, 10:19
- 41, 16/12/2021, 11:07
- 42, 16/12/2021, 12:20
- 43, 16/12/2021, 12:29
- 44, 16/12/2021, 12:29
- 45, 07/01/2022, 09:37

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TITLE:	Winter 2021/2022 Flightlines Whooper Swan		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	44		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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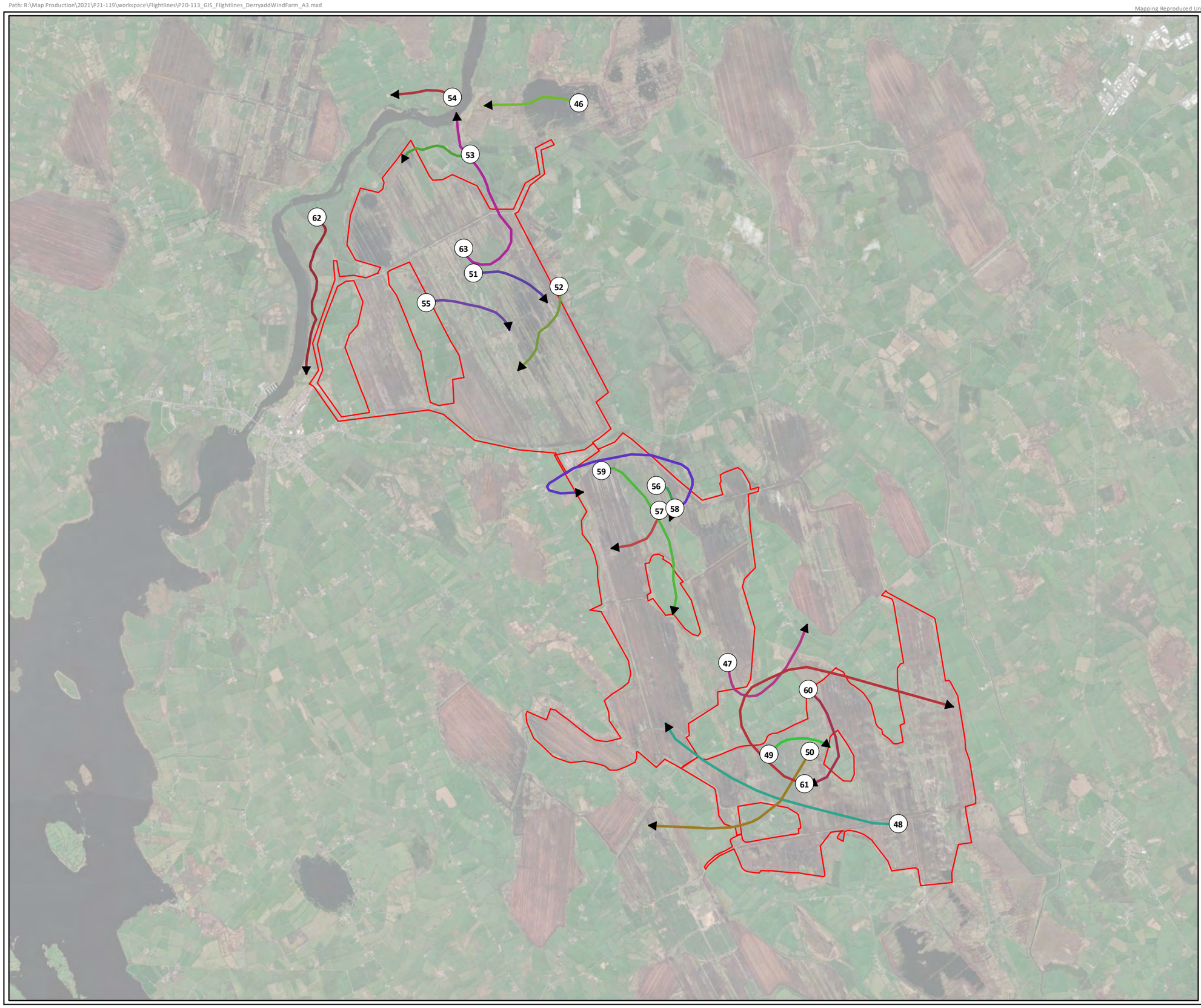

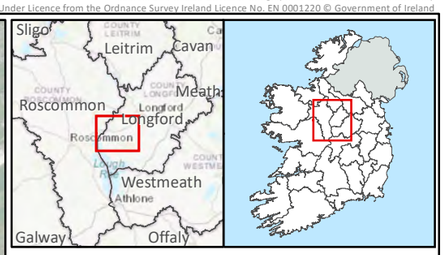

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Site Boundary

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- 48, 12/01/2022, 10:35
- 49, 12/01/2022, 10:50
- 50, 12/01/2022, 13:13
- 51, 18/01/2022, 09:57
- 52, 25/01/2022, 09:33
- 53, 01/02/2022, 09:53
- 54, 01/02/2022, 10:17
- 55, 02/02/2022, 11:14
- 56, 25/02/2022, 09:41
- 57, 25/02/2022, 10:25
- 58, 25/02/2022, 11:12
- 59, 25/02/2022, 11:54
- 60, 02/03/2022, 09:43
- 61, 02/03/2022, 10:31
- 62, 07/03/2022, 10:37
- 63, 08/03/2022, 11:51

TITLE:	Winter 2021/2022 Flightlines Whooper Swan		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	45		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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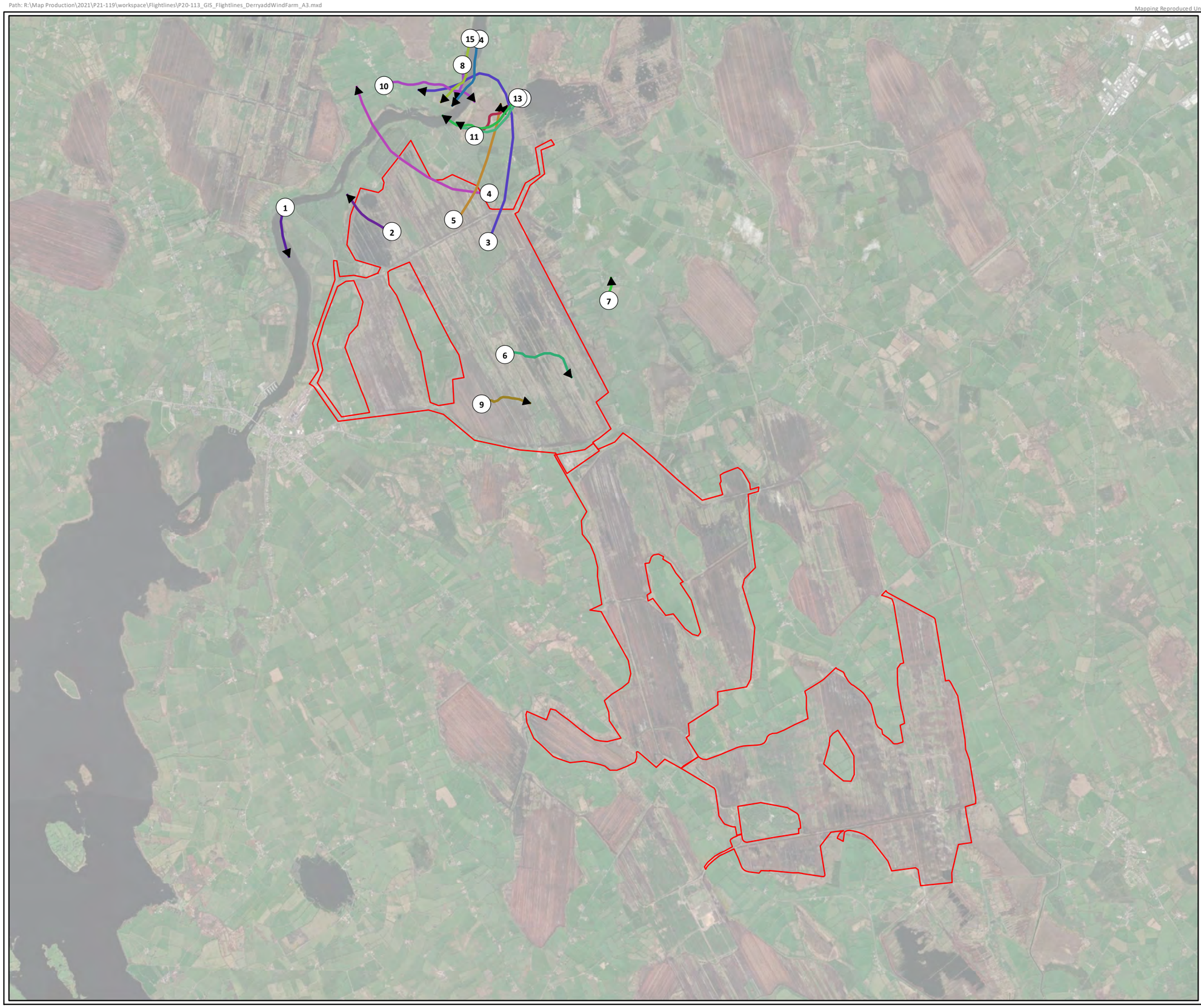

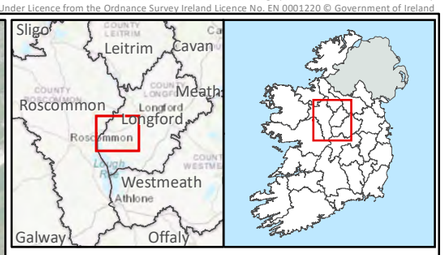

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- 7, 13/12/2021, 13:20
- 8, 07/01/2022, 10:16
- 9, 18/01/2022, 11:19
- 10, 01/02/2022, 09:59
- 11, 02/03/2022, 09:40
- 12, 02/03/2022, 13:19
- 13, 02/03/2022, 13:19
- 14, 02/03/2022, 13:30
- 15, 02/03/2022, 13:30

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TITLE:	Winter 2021/2022 Flightlines Wigeon		
PROJECT:	Derryadd, Co. Longford		
FIGURE NO:	46		
CLIENT:	Bord na Móna		
SCALE:	1:50000	**REVISION:**	0
DATE:	30/05/2022	**PAGE SIZE:**	A3

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APPENDIX 4

Hinterland Survey Results

Hinterland Survey Data Migration 2021 and Winter 2021/2022

HVP	Date	Cloud	Visibility	Rain	Wind	Common Name
Migration 2021						
1	30/09/2021	8	Very Good	Showers	F2 SW	Mallard
1	30/09/2021	8	Very Good	Showers	F2 SW	Moorhen
2	30/09/2021	8	Very Good	Showers	F2 SW	Moorhen
2	30/09/2021	8	Very Good	Showers	F2 SW	Grey Heron
4	30/09/2021	8	Very Good	Showers	F2 SW	Little Egret
4	30/09/2021	8	Very Good	Showers	F2 SW	Mallard
4	30/09/2021	8	Very Good	Showers	F2 SW	Moorhen
4	30/09/2021	8	Very Good	Showers	F2 SW	Water Rail
4	30/09/2021	8	Very Good	Showers	F2 SW	Buzzard
4	30/09/2021	8	Very Good	Showers	F2 SW	Lapwing
5	30/09/2021	8	Very Good	Showers	F2 SW	Great Crested Grebe
5	30/09/2021	8	Very Good	Showers	F2 SW	Mute Swan
5	30/09/2021	8	Very Good	Showers	F2 SW	Mallard
5	30/09/2021	8	Very Good	Showers	F2 SW	Coot
5	30/09/2021	8	Very Good	Showers	F2 SW	Moorhen
5	30/09/2021	8	Very Good	Showers	F2 SW	Grey Heron
5	30/09/2021	8	Very Good	Showers	F2 SW	Little Egret
5	30/09/2021	8	Very Good	Showers	F2 SW	Little Grebe
6	30/09/2021	8	Very Good	Showers	F2 SW	Mute Swan
7	30/09/2021	8	Very Good	Showers	F2 SW	Mute Swan
7	30/09/2021	8	Very Good	Showers	F2 SW	Grey Heron
7	30/09/2021	8	Very Good	Showers	F2 SW	Moorhen
8	30/09/2021	8	Very Good	Showers	F2 SW	Great Black-backed Gull
8	30/09/2021	8	Very Good	Showers	F2 SW	Lapwing
8	30/09/2021	8	Very Good	Showers	F2 SW	Goldeneye
8	30/09/2021	8	Very Good	Showers	F2 SW	Tufted Duck
8	30/09/2021	8	Very Good	Showers	F2 SW	Teal
8	30/09/2021	8	Very Good	Showers	F2 SW	Mallard
8	30/09/2021	8	Very Good	Showers	F2 SW	Great Crested Grebe
8	30/09/2021	8	Very Good	Showers	F2 SW	Little Grebe
8	30/09/2021	8	Very Good	Showers	F2 SW	Mute Swan
8	30/09/2021	8	Very Good	Showers	F2 SW	Little Egret
8	30/09/2021	8	Very Good	Showers	F2 SW	Grey Heron
8	30/09/2021	8	Very Good	Showers	F2 SW	Moorhen
9	30/09/2021	8	Very Good	Showers	F2 SW	Tufted Duck
9	30/09/2021	8	Very Good	Showers	F2 SW	Grey Heron
9	30/09/2021	8	Very Good	Showers	F2 SW	Wigeon
9	30/09/2021	8	Very Good	Showers	F2 SW	Mallard
9	30/09/2021	8	Very Good	Showers	F2 SW	Great Crested Grebe
9	30/09/2021	8	Very Good	Showers	F2 SW	Little Grebe
9	30/09/2021	8	Very Good	Showers	F2 SW	Mallard

HVP	Date	Cloud	Visibility	Rain	Wind	Common Name
9	30/09/2021	8	Very Good	Showers	F2 SW	Coot
9	30/09/2021	8	Very Good	Showers	F2 SW	Cormorant
10	30/09/2021	8	Very Good	Showers	F2 SW	Mute Swan
11	30/09/2021	8	Very Good	Showers	F2 SW	Wigeon
11	30/09/2021	8	Very Good	Showers	F2 SW	Mute Swan
11	30/09/2021	8	Very Good	Showers	F2 SW	Grey Heron
11	30/09/2021	8	Very Good	Showers	F2 SW	Mallard
11	30/09/2021	8	Very Good	Showers	F2 SW	Moorhen
12	30/09/2021	8	Very Good	Showers	F2 SW	Grey Heron
13	30/09/2021	8	Very Good	Showers	F2 SW	No target species
14	30/09/2021	8	Very Good	Showers	F2 SW	Mallard
15	30/09/2021	8	Very Good	Showers	F2 SW	Moorhen
15	30/09/2021	8	Very Good	Showers	F2 SW	Mute Swan
16	30/09/2021	8	Very Good	Showers	F2 SW	No target species
17	30/09/2021	8	Very Good	Showers	F2 SW	No target species
18	30/09/2021	8	Very Good	Showers	F2 SW	No target species
19	30/09/2021	8	Very Good	Showers	F2 SW	Grey Wagtail
20	30/09/2021	8	Very Good	Showers	F2 SW	Buzzard
21	30/09/2021	8	Very Good	Showers	F2 SW	Grey Heron
22	30/09/2021	8	Very Good	Showers	F2 SW	No target species
23	30/09/2021	8	Very Good	Showers	F2 SW	No target species
24	30/09/2021	8	Very Good	Showers	F2 SW	No target species
25	30/09/2021	8	Very Good	Showers	F2 SW	No target species
Winter 2021/2022						
1	26/10/2021	8	Very Good	Showers	F3 SSW	Mallard
2	26/10/2021	8	Very Good	Showers	F3 SSW	Moorhen
2	26/10/2021	8	Very Good	Showers	F3 SSW	Mallard
4	26/10/2021	8	Very Good	Showers	F3 SSW	Moorhen
4	26/10/2021	8	Very Good	Showers	F3 SSW	Water Rail
4	26/10/2021	8	Very Good	Showers	F3 SSW	Grey Heron
4	26/10/2021	8	Very Good	Showers	F3 SSW	Mallard
4	26/10/2021	8	Very Good	Showers	F3 SSW	Whooper Swan
5	26/10/2021	8	Very Good	Showers	F3 SSW	Great Crested Grebe
5	26/10/2021	8	Very Good	Showers	F3 SSW	Mute Swan
5	26/10/2021	8	Very Good	Showers	F3 SSW	Mallard
5	26/10/2021	8	Very Good	Showers	F3 SSW	Coot
5	26/10/2021	8	Very Good	Showers	F3 SSW	Moorhen
5	26/10/2021	8	Very Good	Showers	F3 SSW	Little Grebe
6	26/10/2021	8	Very Good	Showers	F3 SSW	No target species
7	26/10/2021	8	Very Good	Showers	F3 SSW	Moorhen
7	26/10/2021	8	Very Good	Showers	F3 SSW	Mallard
8	26/10/2021	8	Very Good	Showers	F3 SSW	Great Black-backed Gull
8	26/10/2021	8	Very Good	Showers	F3 SSW	Tufted Duck
8	26/10/2021	8	Very Good	Showers	F3 SSW	Lapwing

HVP	Date	Cloud	Visibility	Rain	Wind	Common Name
8	26/10/2021	8	Very Good	Showers	F3 SSW	Goldeneye
8	26/10/2021	8	Very Good	Showers	F3 SSW	Teal
8	26/10/2021	8	Very Good	Showers	F3 SSW	Buzzard
8	26/10/2021	8	Very Good	Showers	F3 SSW	Mute Swan
8	26/10/2021	8	Very Good	Showers	F3 SSW	Little Egret
8	26/10/2021	8	Very Good	Showers	F3 SSW	Grey Heron
8	26/10/2021	8	Very Good	Showers	F3 SSW	Moorhen
8	26/10/2021	8	Very Good	Showers	F3 SSW	Great Crested Grebe
9	26/10/2021	8	Very Good	Showers	F3 SSW	Tufted Duck
9	26/10/2021	8	Very Good	Showers	F3 SSW	Wigeon
9	26/10/2021	8	Very Good	Showers	F3 SSW	Mallard
9	26/10/2021	8	Very Good	Showers	F3 SSW	Mute Swan
9	26/10/2021	8	Very Good	Showers	F3 SSW	Little Grebe
9	26/10/2021	8	Very Good	Showers	F3 SSW	Great Crested Grebe
10	28/10/2021	6	Very Good	Light showers	F2 S	Mallard
11	28/10/2021	6	Very Good	Light showers	F2 S	Wigeon
11	28/10/2021	6	Very Good	Light showers	F2 S	Mute Swan
11	28/10/2021	6	Very Good	Light showers	F2 S	Grey Heron
11	28/10/2021	6	Very Good	Light showers	F2 S	Moorhen
11	28/10/2021	6	Very Good	Light showers	F2 S	Mallard
12	28/10/2021	6	Very Good	Light showers	F2 S	No target species
13	28/10/2021	6	Very Good	Light showers	F2 S	Grey Heron
14	28/10/2021	6	Very Good	Light showers	F2 S	Mallard
15	28/10/2021	6	Very Good	Light showers	F2 S	Mute Swan
16	28/10/2021	6	Very Good	Light showers	F2 S	No target species
17	28/10/2021	6	Very Good	Light showers	F2 S	Buzzard
17	28/10/2021	6	Very Good	Light showers	F2 S	Grey Heron
18	29/10/2021	6	Very Good	Dry	F1 SSW	No target species
19	29/10/2021	6	Very Good	Dry	F1 SSW	Buzzard
20	29/10/2021	6	Very Good	Dry	F1 SSW	Grey Heron
21	29/10/2021	6	Very Good	Dry	F1 SSW	Grey Heron
22	29/10/2021	6	Very Good	Dry	F1 SSW	No target species
23	29/10/2021	6	Very Good	Dry	F1 SSW	No target species
24	29/10/2021	6	Very Good	Dry	F1 SSW	Grey Heron
25	29/10/2021	6	Very Good	Dry	F1 SSW	No target species
1	24/11/2021	8	Excellent	Occasional light rain	F1-F2	No target species
2	24/11/2021	8	Excellent	Occasional light rain	F1-F2	No target species
4	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Lapwing
4	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Wigeon
4	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Mallard
4	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Grey Heron
4	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Mute Swan
4	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Shoveler
4	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Golden Plover

HVP	Date	Cloud	Visibility	Rain	Wind	Common Name
4	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Teal
4	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Whooper Swan
4	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Moorhen
4	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Tufted Duck
4	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Snipe
5	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Mute Swan
6	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Mute Swan
6	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Little Grebe
6	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Great Crested Grebe
6	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Cormorant
6	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Mallard
6	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Wigeon
7	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Black-headed Gull
7	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Mute Swan
7	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Teal
8	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Wigeon
8	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Mallard
8	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Mute Swan
8	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Tufted Duck
9	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Wigeon
10	24/11/2021	8	Excellent	Occasional light rain	F1-F2	No target species
11	24/11/2021	8	Excellent	Occasional light rain	F1-F2	No target species
12	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Grey Heron
12	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Buzzard
12	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Lapwing
12	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Mute Swan
15	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Mute Swan
15	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Cormorant
14	24/11/2021	8	Excellent	Occasional light rain	F1-F2	No target species
16	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Buzzard
16	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Mute Swan
20	24/11/2021	8	Excellent	Occasional light rain	F1-F2	No target species
11	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Moorhen
11	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Grey Heron
11	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Mute Swan
11	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Lapwing
11	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Black-headed Gull
21	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Mute Swan
21	24/11/2021	8	Excellent	Occasional light rain	F1-F2	Buzzard
18	24/11/2021	8	Excellent	Occasional light rain	F1-F2	No target species
17	24/11/2021	8	Excellent	Occasional light rain	F1-F2	No target species
19	24/11/2021	8	Excellent	Occasional light rain	F1-F2	No target species
22	24/11/2021	8	Excellent	Occasional light rain	F1-F2	No target species
23	24/11/2021	8	Excellent	Occasional light rain	F1-F2	No target species

HVP	Date	Cloud	Visibility	Rain	Wind	Common Name
24	24/11/2021	8	Excellent	Occasional light rain	F1-F2	No target species
25	24/11/2021	8	Excellent	Occasional light rain	F1-F2	No target species
1	25/01/2022	8	No Data	Dry	F1	No target species
2	25/01/2022	8	No Data	Dry	F1	No target species
4	25/01/2022	8	No Data	Dry	F1	Whooper Swan
4	25/01/2022	8	No Data	Dry	F1	Wigeon
4	25/01/2022	8	No Data	Dry	F1	Teal
4	25/01/2022	8	No Data	Dry	F1	Tufted Duck
4	25/01/2022	8	No Data	Dry	F1	Mallard
4	25/01/2022	8	No Data	Dry	F1	Coot
5	25/01/2022	8	No Data	Dry	F1	Mallard
5	25/01/2022	8	No Data	Dry	F1	Mute Swan
6	25/01/2022	8	No Data	Dry	F1	Mute Swan
6	25/01/2022	8	No Data	Dry	F1	Mallard
7	25/01/2022	8	No Data	Dry	F1	Moorhen
7	25/01/2022	8	No Data	Dry	F1	Mute Swan
8	25/01/2022	8	No Data	Dry	F1	Teal
8	25/01/2022	8	No Data	Dry	F1	Little Egret
8	25/01/2022	8	No Data	Dry	F1	Wigeon
8	25/01/2022	8	No Data	Dry	F1	Coot
8	25/01/2022	8	No Data	Dry	F1	Tufted Duck
9	25/01/2022	8	No Data	Dry	F1	Tufted Duck
9	25/01/2022	8	No Data	Dry	F1	Mallard
9	25/01/2022	8	No Data	Dry	F1	Little Egret
9	25/01/2022	8	No Data	Dry	F1	Mute Swan
9	25/01/2022	8	No Data	Dry	F1	Wigeon
10	25/01/2022	8	No Data	Dry	F1	No target species
11	25/01/2022	8	No Data	Dry	F1	Grey Heron
12	25/01/2022	8	No Data	Dry	F1	Moorhen
13	25/01/2022	8	No Data	Dry	F1	No target species
14	25/01/2022	8	No Data	Dry	F1	No target species
15	25/01/2022	8	No Data	Dry	F1	No target species
16	25/01/2022	8	No Data	Dry	F1	No target species
17	25/01/2022	8	No Data	Dry	F1	No target species
18	25/01/2022	8	No Data	Dry	F1	Mute Swan
19	25/01/2022	8	No Data	Dry	F1	No target species
20	25/01/2022	8	No Data	Dry	F1	No target species
21	25/01/2022	8	No Data	Dry	F1	No target species
22	25/01/2022	8	No Data	Dry	F1	No target species
23	25/01/2022	8	No Data	Dry	F1	No target species
24	25/01/2022	8	No Data	Dry	F1	No target species
25	25/01/2022	8	No Data	Dry	F1	No target species
1	28/02/2022	2	Good	Dry	F1	No target species
2	28/02/2022	2	Good	Dry	F1	No target species

HVP	Date	Cloud	Visibility	Rain	Wind	Common Name
4	28/02/2022	2	Good	Dry	F1	Coot
4	28/02/2022	2	Good	Dry	F1	Tufted Duck
4	28/02/2022	2	Good	Dry	F1	Teal
4	28/02/2022	2	Good	Dry	F1	Mallard
4	28/02/2022	2	Good	Dry	F1	Lapwing
4	28/02/2022	2	Good	Dry	F1	Great Crested Grebe
4	28/02/2022	2	Good	Dry	F1	Wigeon
4	28/02/2022	2	Good	Dry	F1	Mute Swan
5	28/02/2022	2	Good	Dry	F1	Mute Swan
5	28/02/2022	2	Good	Dry	F1	Mallard
5	28/02/2022	2	Good	Dry	F1	Wigeon
5	28/02/2022	2	Good	Dry	F1	Teal
5	28/02/2022	2	Good	Dry	F1	Grey Heron
6	28/02/2022	2	Good	Dry	F1	Grey Heron
6	28/02/2022	2	Good	Dry	F1	Coot
6	28/02/2022	2	Good	Dry	F1	Moorhen
6	28/02/2022	2	Good	Dry	F1	Mute Swan
6	28/02/2022	2	Good	Dry	F1	Little Grebe
7	28/02/2022	2	Good	Dry	F1	No target species
8	28/02/2022	2	Good	Dry	F1	Mute Swan
8	28/02/2022	2	Good	Dry	F1	Wigeon
8	28/02/2022	2	Good	Dry	F1	Teal
8	28/02/2022	2	Good	Dry	F1	Tufted Duck
8	28/02/2022	2	Good	Dry	F1	Mallard
9	28/02/2022	2	Good	Dry	F1	No target species
10	28/02/2022	2	Good	Dry	F1	Grey Heron
10	28/02/2022	2	Good	Dry	F1	Coot
11	28/02/2022	2	Good	Dry	F1	Moorhen
12	28/02/2022	2	Good	Dry	F1	Mute Swan
12	28/02/2022	2	Good	Dry	F1	Grey Heron
13	28/02/2022	2	Good	Dry	F1	Grey Heron
14	28/02/2022	2	Good	Dry	F1	No target species
15	28/02/2022	2	Good	Dry	F1	No target species
16	28/02/2022	2	Good	Dry	F1	No target species
17	28/02/2022	2	Good	Dry	F1	No target species
18	28/02/2022	2	Good	Dry	F1	No target species
19	28/02/2022	2	Good	Dry	F1	No target species
20	28/02/2022	2	Good	Dry	F1	No target species
21	28/02/2022	2	Good	Dry	F1	No target species
22	28/02/2022	2	Good	Dry	F1	No target species
23	28/02/2022	2	Good	Dry	F1	No target species
24	28/02/2022	2	Good	Dry	F1	No target species
25	28/02/2022	2	Good	Dry	F1	No target species
1	29/03/2022	4	Good	Dry	F1	No target species

HVP	Date	Cloud	Visibility	Rain	Wind	Common Name
2	29/03/2022	4	Good	Dry	F1	No target species
4	29/03/2022	4	Good	Dry	F1	Tufted Duck
4	29/03/2022	4	Good	Dry	F1	Moorhen
4	29/03/2022	4	Good	Dry	F1	Coot
4	29/03/2022	4	Good	Dry	F1	Mallard
4	29/03/2022	4	Good	Dry	F1	Wigeon
4	29/03/2022	4	Good	Dry	F1	Goldcrest
4	29/03/2022	4	Good	Dry	F1	Teal
5	29/03/2022	4	Good	Dry	F1	Tufted Duck
5	29/03/2022	4	Good	Dry	F1	Teal
5	29/03/2022	4	Good	Dry	F1	Mallard
5	29/03/2022	4	Good	Dry	F1	Grey Heron
5	29/03/2022	4	Good	Dry	F1	Wigeon
5	29/03/2022	4	Good	Dry	F1	Mute Swan
6	29/03/2022	4	Good	Dry	F1	No target species
7	29/03/2022	4	Good	Dry	F1	Mute Swan
7	29/03/2022	4	Good	Dry	F1	Little Egret
7	29/03/2022	4	Good	Dry	F1	Moorhen
8	29/03/2022	4	Good	Dry	F1	Mute Swan
8	29/03/2022	4	Good	Dry	F1	Little Egret
8	29/03/2022	4	Good	Dry	F1	Teal
8	29/03/2022	4	Good	Dry	F1	Wigeon
8	29/03/2022	4	Good	Dry	F1	Mallard
8	29/03/2022	4	Good	Dry	F1	Moorhen
8	29/03/2022	4	Good	Dry	F1	Coot
8	29/03/2022	4	Good	Dry	F1	Tufted Duck
9	29/03/2022	4	Good	Dry	F1	Mute Swan
9	29/03/2022	4	Good	Dry	F1	Grey Heron
9	29/03/2022	4	Good	Dry	F1	Tufted Duck
9	29/03/2022	4	Good	Dry	F1	Goldcrest
10	29/03/2022	4	Good	Dry	F1	Mute Swan
10	29/03/2022	4	Good	Dry	F1	Grey Heron
11	29/03/2022	4	Good	Dry	F1	No target species
12	29/03/2022	4	Good	Dry	F1	Mute Swan
12	29/03/2022	4	Good	Dry	F1	Goldcrest
13	29/03/2022	4	Good	Dry	F1	No target species
14	29/03/2022	4	Good	Dry	F1	No target species
15	29/03/2022	4	Good	Dry	F1	Mute Swan
16	29/03/2022	4	Good	Dry	F1	Grey Heron
16	29/03/2022	4	Good	Dry	F1	Mallard
17	29/03/2022	4	Good	Dry	F1	No target species
18	29/03/2022	4	Good	Dry	F1	No target species
19	29/03/2022	4	Good	Dry	F1	No target species
20	29/03/2022	4	Good	Dry	F1	No target species

HVP	Date	Cloud	Visibility	Rain	Wind	Common Name
21	29/03/2022	4	Good	Dry	F1	No target species
22	29/03/2022	4	Good	Dry	F1	No target species
23	29/03/2022	4	Good	Dry	F1	No target species
24	29/03/2022	4	Good	Dry	F1	No target species
25	29/03/2022	4	Good	Dry	F1	No target species

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APPENDIX 5

Transect Survey Schedule and Conditions

Date	Transect	Cloud (Okta)	Precipitation	Visibility	Wind	Start Time	End Time
February 2022							
03/02/2022	1	5/8	Light Rain	Good	F2	09:15	09:47
03/02/2022	2	5/8	Light Rain	Good	F2	08:25	09:00
03/02/2022	3	5/8	Light Rain	Good	F2	10:10	10:41
03/02/2022	4	5/8	Light Rain	Good	F2	10:55	11:27
04/02/2022	5	5/8	Drizzle	Good	F2	08:30	09:05
04/02/2022	6	5/8	Drizzle	Good	F2	09:17	09:50
04/02/2022	7	5/8	Drizzle	Good	F2	09:58	11:00
04/02/2022	8	5/8	Drizzle	Good	F2	11:20	11:56
07/02/2022	9	7/8	Light Rain	Good	F2	08:25	08:57
07/02/2022	10	7/8	Light Rain	Good	F2	09:10	09:40
07/02/2022	11	7/8	Light Rain	Good	F2	09:55	10:30
07/02/2022	12	7/8	Light Rain	Good	F2	11:00	11:39
11/02/2022	13	6/8	Drizzle	Good	F1	09:01	09:35
11/02/2022	14	6/8	Drizzle	Good	F1	09:45	10:18
11/02/2022	15	6/8	Drizzle	Good	F1	10:30	11:02
11/02/2022	16	7/8	Light Rain	Moderat	F1	11:15	11:45
15/02/2022	17	4/8	Dry	Good	F1	10:28	11:00
15/02/2022	18	4/8	Dry	Good	F1	09:00	09:38
15/02/2022	19	4/8	Dry	Good	F1	09:45	10:16
15/02/2022	20	4/8	Dry	Good	F1	11:15	11:45
15/02/2022	21	4/8	Dry	Good	F1	11:55	12:30
March 2022							
03/03/2022	1	8/8	Dry	Moderate	F1	09:00	13:00
03/03/2022	2	8/8	Dry	Moderate	F1	09:00	13:00
03/03/2022	3	8/8	Dry	Moderate	F1	09:00	13:00
03/03/2022	4	8/8	Dry	Moderate	F1	09:00	13:00
04/03/2022	5	8/8	Dry	Moderate	F1	08:30	12:40
04/03/2022	6	8/8	Dry	Moderate	F1	08:30	12:40
04/03/2022	7	8/8	Dry	Moderate	F1	08:30	12:40
04/03/2022	8	8/8	Dry	Moderate	F1	08:30	12:40
09/03/2022	9	7/8	Light Drizzle	Good	F1	08:30	12:45
09/03/2022	10	7/8	Light Drizzle	Good	F1	08:30	12:45
09/03/2022	11	7/8	Light Drizzle	Good	F1	08:30	12:45
09/03/2022	12	7/8	Light Drizzle	Good	F1	08:30	12:45
11/03/2022	13	7/8	Dry	Good	F1	08:40	13:10
11/03/2022	14	7/8	Dry	Good	F1	08:40	13:10
11/03/2022	15	7/8	Dry	Good	F1	08:40	13:10

Date	Transect	Cloud (Okta)	Precipitation	Visibility	Wind	Start Time	End Time
11/03/2022	16	7/8	Dry	Good	F1	08:40	13:10
12/03/2022	17	8/8	Dry	Moderate	F1	09:00	13:00
12/03/2022	18	8/8	Dry	Moderate	F1	09:00	13:00
12/03/2022	19	8/8	Dry	Moderate	F1	09:00	13:00
12/03/2022	20	8/8	Dry	Moderate	F1	09:00	13:00
12/03/2022	21	8/8	Dry	Moderate	F1	09:00	13:00

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Appendix 5 HABITAT SURVEY – PLANT SPECIES LIST

Appendix 7.7 – Habitat Survey – Plant Species List

Representative plant species on each habitat type, identified during the multidisciplinary walkover survey in August 2022; Habitats with no plant species listed were not significantly vegetated at the time of the survey (e.g. BL3) or were not surveyed in August 2022 (PF3)

Code (Fossitt, 2000)	Habitat Name	Common Name	Scientific Name
PB4	Cutover bog	Soft Rush	*Juncus effusus*
		Purple Moor-grass	*Molinia caerulea*
		Ling	*Calluna vulgaris*
		Marsh Arrowgrass	*Triglochin palustris*
		Sharp-flowered Rush	*Juncus acutiflorus*
		Downy Birch	*Betula pubescens*
		Butterbur	*Petasites hybridus*
		Willow	*Salix* spp.
		Horsetail	*Equisetum* spp.
		Silverweed	*Potentilla anserina*
		Rosebay Willowherb	*Chamaenerion angustifolium*
		Timothy-grass	*Phleum pratense*
		Perennial Sowthistle	*Sonchus arvensis*
		Creeping Thistle	*Cirsium arvense*
		Clover	*Trifolium* spp.
		Black Medick	*Medicago lupulina*
		Lesser Hawkbit	*Leontodon saxatilis*
		Marsh Woundwort	*Stachys palustris*
		Wild Carrot	*Daucus carota*
		Slender St. John's-wort	*Hypericum pulchrum*
		Redshank	*Persicaria maculosa*
		Tormentil	*Potentilla erecta*
		Bulbous Rush	*Juncus bulbosus*
		Common Cottongrass	*Eriophorum angustifolium*
		Deergrass	*Trichophorum germanicum*
		Hogweed	*Heracleum sphondylium*
		Marsh Pennywort	*Hydrocotyle vulgaris*
		Common Chickweed	*Stellaria media*
		Devil's-bit Scabious	*Succisa pratensis*

Code (Fossitt, 2000)	Habitat Name	Common Name	Scientific Name
		Yellow-rattle	*Rhinanthus minor*
		Birch	*Betula* spp.
		Common Knapweed	*Centaurea nigra*
		Common Alder	*Alnus glutinosa*
		Common Milkwort	*Polygala vulgaris*
		Gorse	*Ulex europaeus*
		Bramble	*Rubus fruticosus* agg.
		Lodgepole Pine	*Pinus contorta*
		Sitka Spruce	*Picea sitchensis*
		Spear Thistle	*Cirsium vulgare*
		Cross-leaved Heath	*Erica tetralix*
		Bulrush	*Typha latifolia*
		Cocksfoot	*Dactylis glomerata*
		Yorkshire Fog	*Holcus lanatus*
		Ribwort Plantain	*Plantago lanceolata*
		Cat's-ear	*Hypochaeris radicata*
		Bell Heather	*Erica cinerea*
		Dock	*Rumex* spp.
		Noble Fir	*Abies procera*
		Red Fescue	*Festuca rubra* agg.
		Meadowsweet	*Filipendula ulmaria*
		Gypsywort	*Lycopus europaeus*
		Scots Pine	*Pinus sylvestris*
		Sowthistle	*Sochus* spp.
		Self-heal	*Prunella vulgaris*
		Greater Plantain	*Plantago major*
		Sweet Vernal-grass	*Anthoxanthum odoratum*
		Water Mint	*Mentha aquatica*
		Marsh Thistle	*Cirsium palustre*
		Sphagnum	*Sphagnum* spp.
		Common Centaury	*Centaurium erythraea*
		Lesser Centaury	*Centaurium pulchellum*
		Rowan	*Sorbus aucuparia*

Code (Fossitt, 2000)	Habitat Name	Common Name	Scientific Name
WN7	Bog woodland	Downy Birch	*Betula pubescens*
		Willow	*Salix* spp.
		Soft Rush	*Juncus effusus*
		Ling	*Calluna vulgaris*
		Bramble	*Rubus fruticosus* agg.
		Common Cottongrass	*Eriophorum angustifolium*
		Gorse	*Ulex europaeus*
		Purple Moor-grass	*Molinia caerulea*
		Wild Carrot	*Daucus carota*
		Cat's-ear	*Hypochaeris radicata*
		Silverweed	*Potentilla anserina*
		Bulbous Rush	*Juncus bulbosus*
		Butterbur	*Petasites hybridus*
		Marsh Arrowgrass	*Triglochin palustris*
		Ash	*Fraxinus excelsior*
		Goat Willow	*Salix caprea*
		Bracken	*Pteridium aquilinum*
		Dog-rose	*Rosa canina*
		Ivy	*Hedera hibernica*
		Scots Pine	*Pinus sylvestris*
		Sitka Spruce	*Picea sitchensis*
		Rowan	*Sorbus aucuparia*
		Cross-leaved Heath	*Erica tetralix*
		Marsh Thistle	*Cirsium palustre*
		Guelder-rose	*Viburnum opulus*
		Tormentil	*Potentilla erecta*
		Common Centaury	*Centaurium erythraea*
		Devil's-bit Scabious	*Succisa pratensis*
		Self-heal	*Prunella vulgaris*
		Horsetail	*Equisetum* spp.
		Water Mint	*Mentha aquatica*
		Noble Fir	*Abies procera*
		Unspecified Conifer	

Code (Fossitt, 2000)	Habitat Name	Common Name	Scientific Name
		Hawthorn	*Crataegus monogyna*
		Common Reed	*Phragmites australis*
		Meadowsweet	*Filipendula ulmaria*
		Slender Sowthistle	*Sonchus tenerrimus*
		Common Knapweed	*Centaurea nigra*
		Birch	*Betula* spp.
		Rosebay Willowherb	*Chamaenerion angustifolium*
		Thistle	*Cirsium* spp.
		Lodgepole Pine	*Pinus contorta*
		Field Bindweed	*Convolvulus arvensis*
		Perennial Sowthistle	*Sonchus arvensis*
		Creeping Buttercup	*Ranunculus repens*
		Common Milkwort	*Polygala vulgaris*
		Cocksfoot	*Dactylis glomerata*
		Bulrush	*Typha latifolia*
		Yellow-wort	*Blackstonia perfoliata*
		Eyebright	*Euphrasia officinalis*
		Lesser Centaury	*Centaurium pulchellum*
FL8	Other artificial lakes and ponds	Bulrush	*Typha latifolia*
		Horsetail	*Equisetum* spp.
		Marsh Pennywort	*Hydrocotyle vulgaris*
		Redshank	*Persicaria maculosa*
		Water-plantain	*Alisma plantago-aquatica*
		Purple Moor-grass	*Molinia caerulea*
		Sharp-flowered Rush	*Juncus acutiflorus*
		Willow	*Salix* spp.
		Gypsywort	*Lycopus europaeus*
		Water Mint	*Mentha aquatica*
		Nodding Bur-marigold	*Bidens cernua*
		Green Algae	
		Lesser Hawkbit	*Leontodon saxatilis*
		Common Reed	*Phragmites australis*
		Soft Rush	*Juncus effusus*

Code (Fossitt, 2000)	Habitat Name	Common Name	Scientific Name
		Jointed Rush	*Juncus articulates*
		Marsh Arrowgrass	*Triglochin palustris*
		Bog Pondweed	*Potamogeton polygonifolius*
		Spiked Water-milfoil	*Myriophyllum spicatum*
		Mare's-tail	*Hippuris vulgaris*
		Common Alder	*Alnus glutinosa*
		Bracken	*Pteridium aquilinum*
		Ling	*Calluna vulgaris*
		Gorse	*Ulex europaeus*
		Bramble	*Rubus fruticosus* agg.
		Common Cottongrass	*Eriophorum angustifolium*
		Tormentil	*Potentilla erecta*
		Reed Canary-grass	*Phalaris arundinaceae*
		Downy Birch	*Betula pubescens*
		Water-milfoil	*Myriophyllum* spp.
		Common Duckweed	*Lemna minor*
		Meadowsweet	*Filipendula ulmaria*
		Small-fruited Yellow-sedge	*Carex viridula* ssp. *viridula*
		Lesser Bladderwort	*Utricularia minor*
		Bladderwort	*Urticularia* spp.
		Bogbean	*Menyanthes trifoliata*
		Birch	*Betula* spp.
		Yarrow	*Achillea millefolium*
		Cat's-ear	*Hypochaeris radicata*
		Bindweed	*Calystegia* spp.
		Rosebay Willowherb	*Chamaenerion angustifolium*
		Butterbur	*Petasites hybridus*
		Yellow-rattle	*Rhinanthus minor*
		Hogweed	*Heracleum sphondylium*
		Branched Bur-reed	*Sparganium erectum*
PB1	Raised bog	Ling	*Calluna vulgaris*
		Cross-leaved Heath	*Erica tetralix*
		Round-leaved Sundew	*Drosera rotundifolia*

Code (Fossitt, 2000)	Habitat Name	Common Name	Scientific Name
		White Beak-sedge	*Rhynchospora alba*
		Sphagnum	*Sphagnum* spp.
		Bog Asphodel	*Narthecium ossifragum*
		Bog-myrtle	*Myrica gale*
		Reindeer Moss	*Cladonia rangiferina*
		Purple Moor-grass	*Molinia caerulea*
		Common Cottongrass	*Eriophorum angustifolium*
		Gorse	*Ulex europaeus*
		Rowan	*Sorbus aucuparia*
		Downy Birch	*Betula pubescens*
		Willow	*Salix* spp.
		Sundew	*Drosera* spp.
		Devil's-bit Scabious	*Succisa pratensis*
		Bracken	*Pteridium aquilinum*
		Sitka Spruce	*Picea sitchensis*
		Tormentil	*Potentilla erecta*
		Scots Pine	*Pinus sylvestris*
		Slender St. John's-wort	*Hypericum pulchrum*
		Common Spotted-orchid	*Dactylorhiza fuchsii*
		Bell Heather	*Erica cinerea*
		Yarrow	*Achillea millefolium*
		Deergrass	*Trichophorum germanicum*
		Common Alder	*Alnus glutinosa*
		Soft Rush	*Juncus effusus*
		Common Milkwort	*Polygala vulgaris*
		Lodgepole Pine	*Pinus contorta*
		Ribwort Plantain	*Plantago lanceolata*
		Hare's-tail Cottongrass	*Eriophorum vaginatum*
		Holly	*Ilex aquifolium*
		Sphagnum	*Shagnum* spp.
WD4	Conifer plantation	Lodgepole Pine	*Pinus contorta*
		Larch	*Larix* spp.
		Scots Pine	*Pinus sylvestris*

Code (Fossitt, 2000)	Habitat Name	Common Name	Scientific Name
		Downy Birch	*Betula pubescens*
		Ling	*Calluna vulgaris*
		Reindeer Moss	*Cladonia rangiferina*
		Fir Clubmoss	*Huperzia selago*
		Sitka Spruce	*Picea sitchensis*
		Willow	*Salix* spp.
		Common Alder	*Alnus glutinosa*
		Beech	*Fagus sylvatica*
		Elder	*Sambucus nigra*
		Ivy	*Hedera hibernica*
		Holly	*Ilex aquifolium*
		Bramble	*Rubus fruticosus* agg.
FS1	Reed and large sedge swamps	Common Reed	*Phragmites australis*
		Bulrush	*Typha latifolia*
		Nodding Burr-marigold	*Bidens cernua*
		Water Mint	*Mentha aquatica*
		Willow	*Salix* spp.
		Downy Birch	*Betula pubescens*
		Soft Rush	*Juncus effusus*
		Water-plantain	*Alisma plantago-aquatica*
		Gypsywort	*Lycopus europaeus*
		Redshank	*Persicaria maculosa*
		White Beak-sedge	*Rhynchospora alba*
		Horsetail	*Equisetum* spp.
		Marsh Arrowgrass	*Triglochin palustris*
		Butterbur	*Petasites hybridus*
		Common Cottongrass	*Eriophorum angustifolium*
		Cat's-ear	*Hypochaeris radicata*
		Great Willowherb	*Epilobium hirsutum*
		Silverweed	*Potentilla anserina*
WS1	Scrub	Bramble	*Rubus fruticosus* agg.
		Gorse	*Ulex europaeus*
		Willow	*Salix* spp.

Code (Fossitt, 2000)	Habitat Name	Common Name	Scientific Name
		Bracken	*Pteridium aquilinum*
		Hard Rush	*Juncus inflexus*
		Hogweed	*Heracleum sphondylium*
		Meadowsweet	*Filipendula ulmaria*
		Silverweed	*Potentilla anserina*
		Marsh Thistle	*Cirsium palustre*
		Poplar	*Populus* spp.
		Hawthorn	*Crataegus monogyna*
		Tufted Vetch	*Vicia cracca*
		Bush Vetch	*Vicia sepium*
		Bulrush	*Typha latifolia*
		Marsh Woundwort	*Stachys palustris*
		Ling	*Calluna vulgaris*
		Cross-leaved Heath	*Erica tetralix*
		Downy Birch	*Betula pubescens*
		Lodgepole Pine	*Pinus contorta*
		Rowan	*Sorbus aucuparia*
		Purple Moor-grass	*Molinia caerulea*
		Bog-myrtle	*Myrica gale*
		Devil's-bit Scabious	*Succisa pratensis*
		Common Bird's-foot-trefoil	*Lotus corniculatus*
		Blackthorn	*Prunus spinosa*
		Cocksfoot	*Dactylis glomerata*
		Water Mint	*Mentha aquatica*
		Birch	*Betula* spp.
		Rosebay Willowherb	*Chamaenerion angustifolium*
		Bindweed	*Calystegia* spp.
		Yorkshire Fog	*Holcus lanatus*
		Slender Sowthistle	*Sonchus tenerrimus*
		Common Ragwort	*Jacobaea vulgaris*
		Cat's-ear	*Hypochaeris radicata*
		Tormentil	*Potentilla erecta*
		Common Spotted-orchid	*Dactylorhiza fuchsii*

Code (Fossitt, 2000)	Habitat Name	Common Name	Scientific Name
		Spear Thistle	*Cirsium vulgare*
		False Oat-grass	*Arrhenatherum elatius*
		Perennial Rye-grass	*Lolium perenne*
		Soft Rush	*Juncus effusus*
		Self-heal	*Prunella vulgaris*
		Wild Carrot	*Daucus carota*
		Slender St. John's-wort	*Hypericum pulchrum*
		Dock	*Rumex* spp.
		Ribwort Plantain	*Plantago lanceolata*
		Common Alder	*Alnus glutinosa*
		Common Knapweed	*Centaurea nigra*
		Cleavers	*Galium aparine*
		Vetch	*Vicia* spp.
		Ivy	*Hedera hibernica*
		Horsetail	*Equisetum* spp.
		Butterbur	*Petasites hybridus*
		Field Bindweed	*Convolvulus arvensis*
		Red Fescue	*Festuca rubra* agg.
		Leyland Cypress	*Cupressus x leylandii*
		Common Reed	*Phragmites australis*
		Yellow-wort	*Blackstonia perfoliata*
		Noble Fir	*Abies procera*
		Common Cottongrass	*Eriophorum angustifolium*
BL3	Buildings and artificial surfaces	-	-
WS2	Immature woodland	Birch	*Betula* spp.
		Willow	*Salix* spp.
		Scots Pine	*Pinus sylvestris*
		Soft Rush	*Juncus effusus*
		Gorse	*Ulex europaeus*
		Purple Moor-grass	*Molinia caerulea*
		Marsh Arrowgrass	*Triglochin palustris*
		Horsetail	*Equisetum* spp.
		Rosebay Willowherb	*Chamaenerion angustifolium*

Code (Fossitt, 2000)	Habitat Name	Common Name	Scientific Name
		Bramble	*Rubus fruticosus* agg.
		Marsh Helleborine	*Epipactis palustris*
		Deergrass	*Trichophorum germanicum*
		Downy Birch	*Betula pubescens*
		Lodgepole Pine	*Pinus contorta*
		Rowan	*Sorbus aucuparia*
		Bracken	*Pteridium aquilinum*
		Meadowsweet	*Filipendula ulmaria*
		Greater Knapweed	*Centaurea scabiosa*
		Silverweed	*Potentilla anserina*
ED2	Spoil and bare ground	Soft Rush	*Juncus effusus*
		Greater Plantain	*Plantago major*
		Jointed Rush	*Juncus articulates*
		Sharp-flowered Rush	*Juncus acutiflorus*
		Gorse	*Ulex europaeus*
		Bramble	*Rubus fruticosus* agg.
PF3	Transition mire and quaking bog	-	-
GS4	Wet grassland	Purple Moor-grass	*Molinia caerulea*
		Water Mint	*Mentha aquatica*
		Glaucous Sedge	*Carex flacca*
		Silverweed	*Potentilla anserina*
		Yorkshire Fog	*Holcus lanatus*
		Timothy-grass	*Phleum pratense*
		Perennial Sowthistle	*Sonchus arvensis*
		Common Knapweed	*Centaurea nigra*
		Bramble	*Rubus fruticosus* agg.
		Yellow-wort	*Blackstonia perfoliata*
		Lesser Centaury	*Centaurium pulchellum*
		Soft Rush	*Juncus effusus*
		Hard Rush	*Juncus inflexus*
		Common Bent	*Agrostis capillaris*
		Red Fescue	*Festuca rubra* agg.
		Horsetail	*Equisetum* spp.

Code (Fossitt, 2000)	Habitat Name	Common Name	Scientific Name
		Red Clover	*Trifolium pratense*
		White Clover	*Trifolium repens*
		Soft Rush	*Juncus effusus*
		Meadowsweet	*Filipendula ulmaria*
		Common Nettle	*Urtica dioica*
		Field Bindweed	*Convolvulus arvensis*
		False Oat-grass	*Arrhenatherum elatius*
		Thistle	*Cirsium* spp.
		Silverweed	*Potentilla anserina*
		Clover	*Trifolium* spp.
		Common Bird's-foot-trefoil	*Lotus corniculatus*
		Buttercup	*Ranunculus* spp.
		Meadow Vetchling	*Lathyrus pratensis*
		Great Willowherb	*Epilobium hirsutum*
		Sharp-flowered Rush	*Juncus acutiflorus*
		Common Cottongrass	*Eriophorum angustifolium*
		Willow	*Salix* spp.
		Meadowsweet	*Filipendula ulmaria*
		Dock	*Rumex* spp.
		Self-heal	*Prunella vulgaris*
PF2	Poor fen and flush	Common Reed	*Phragmites australis*
		Bulrush	*Typha latifolia*
		Common Cottongrass	*Eriophorum angustifolium*
		Soft Rush	*Juncus effusus*
		Jointed Rush	*Juncus articulatus*
		Rosebay Willowherb	*Chamaenerion angustifolium*
		Downy Birch	*Betula pubescens*
		Marsh Arrowgrass	*Triglochin palustris*
		Sharp-flowered Rush	*Juncus acutiflorus*
		Colt's-foot	*Tussilago farfara*
		Water Mint	*Mentha aquatica*
		Cat's-ear	*Hypochaeris radicata*
		Water Forget-me-not	*Myosotis scorpioides*

Code (Fossitt, 2000)	Habitat Name	Common Name	Scientific Name
		Common Centaury	*Centaurium erythraea*
		Common Spotted-orchid	*Dactylorhiza fuchsii*
		Willow	*Salix* spp.
		Spear Thistle	*Cirsium vulgare*
		Hard Rush	*Juncus inflexus*
		Sundew	*Drosera* spp.
		Hogweed	*Heracleum sphondylium*
		Bracken	*Pteridium aquilinum*
		Butterbur	*Petasites hybridus*
		Yellow-rattle	*Rhinanthus minor*
		Nodding Bur-marigold	*Bidens cernua*
		Horsetail	*Equisetum* spp.
		Gypsywort	*Lycopus europaeus*
		Nodding-moss	*Pohlia* spp.
HH1	Dry siliceous heath	Ling	*Calluna vulgaris*
		Cross-leaved Heath	*Erica tetralix*
		Gorse	*Ulex europaeus*
		Purple Moor-grass	*Molinia caerulea*
		Willow	*Salix* spp.
		Sitka Spruce	*Picea sitchensis*
HD1	Dense bracken	Bracken	*Pteridium aquilinum*
		Bindweed	*Calystegia* spp.
		Rosebay Willowherb	*Chamaenerion angustifolium*
GS3	Dry humid acid grassland	Cocksfoot	*Dactylis glomerata*
		Meadowsweet	*Filipendula ulmaria*
		Horsetail	*Equisetum* spp.
		Yarrow	*Achillea millefolium*
		Lousewort	*Pedicularis sylvatica*
		False Oat-grass	*Arrhenatherum elatius*
		Water Mint	*Mentha aquatica*
		Cleavers	*Galium aparine*
		Ribwort Plantain	*Plantago lanceolata*
		Bramble	*Rubus fruticosus* agg.

Code (Fossitt, 2000)	Habitat Name	Common Name	Scientific Name
		Willow	*Salix* spp.
		Bracken	*Pteridium aquilinum*
		Purple Moor-grass	*Molinia caerulea*
		Marsh Arrowgrass	*Triglochin palustris*
		Butterbur	*Petasites hybridus*
		Red Fescue	*Festuca rubra* agg.
		Common Knapweed	*Centaurea nigra*
		Sheep's Sorrel	*Rumex acetosella*
		Silverweed	*Potentilla anserina*
		Gorse	*Ulex europaeus*
		Mat-grass	*Nardus stricta*
		Bindweed	*Calystegia* spp.
		Sowthistle	*Sochus* spp.
		Marsh Lousewort	*Pedicularis palustris*
		Eyebright	*Euphrasia officinalis*
		Devil's-bit Scabious	*Succisa pratensis*
ED1	Exposed sand, gravel or till	-	-
WD1	(Mixed) broadleaved woodland	Ash	*Fraxinus excelsior*
		Willow	*Salix* spp.
		Birch	*Betula* spp.
		Rowan	*Sorbus aucuparia*
		Pedunculate Oak	*Quercus robur*
		Bramble	*Rubus fruticosus* agg.
		Hazel	*Corylus avellana*
		Bracken	*Pteridium aquilinum*
		Elder	*Sambucus nigra*
		Blackthorn	*Prunus Spinosa*
		Hawthorn	*Crataegus monogyna*
		Gorse	*Ulex europaeus*
		Downy Birch	*Betula pubescens*
		Common Alder	*Alnus glutinosa*
ED3	Recolonising bare ground	Oxeye Daisy	*Leucanthemum vulgare*
		Ribwort Plantain	*Plantago lanceolata*

Code (Fossitt, 2000)	Habitat Name	Common Name	Scientific Name
		Colt's-foot	*Tussilago farfara*
		Rosebay Willowherb	*Chamaenerion angustifolium*
		Silverweed	*Potentilla anserina*
		White Clover	*Trifolium repens*
		Red Clover	*Trifolium pratense*
		Creeping Cinquefoil	*Potentilla reptans*
GS2	Dry meadows and grassy verges	Annual Meadow-grass	*Poa annua*
		Daisy	*Bellis perennis*
		Clover	*Trifolium* spp.
		Dandelion	*Taraxacum vulgaria*
		Perennial Rye-grass	*Lolium perenne*
		Ribwort Plantain	*Plantago lanceolata*
		Common Bird's-foot-trefoil	*Lotus corniculatus*
		Buttercup	*Ranunculus* spp.
		Silver Birch	*Betula pendula*
		Box	*Buxus sempervirens*
		Honeysuckle	*Lonicera periclymenum*
		Meadowsweet	*Filipendula ulmaria*
		Yarrow	*Achillea millefolium*
		Hazel	*Corylus avellana*
		Creeping Buttercup	*Ranunculus repens*
		Bramble	*Rubus fruticosus* agg.
		Field Scabious	*Knautia arvensis*
		Common Ragwort	*Jacobaea vulgaris*
		Marjoram	*Origanum vulgare*
		Gorse	*Ulex europaeus*
		Willow	*Salix* spp.
		Field Bindweed	*Convolvulus arvensis*
		Ivy	*Hedera hibernica*
		Bent grasses	*Agrostis* spp.
		Slender St. John's-wort	*Hypericum pulchrum*
		Yorkshire Fog	*Holcus lanatus*
		Thistle	*Cirsium* spp.

Code (Fossitt, 2000)	Habitat Name	Common Name	Scientific Name
		Sycamore	*Acer pseudoplatanus*
		Ash	*Fraxinus excelsior*
		Hogweed	*Heracleum sphondylium*
		False Oat-grass	*Arrhenatherum elatius*
		Common Knapweed	*Centaurea nigra*
		Common Nettle	*Urtica dioica*
		Plantain	*Plantago* spp.
		Field Forget-me-not	*Myosotis arvensis*
		Lesser Celandine	*Ficaria verna* ssp. *verna*
		Cocksfoot	*Dactylis glomerata*
		Silverweed	*Potentilla anserina*
		Common Nettle	*Urtica dioica*
		Broad-leaved Dock	*Rumex obtusifolius*
		Bracken	*Pteridium aquilinum*
		Tufted Hair-grass	*Deschampsia cespitosa*
		Rosebay Willowherb	*Chamaenerion angustifolium*
		Greater Stitchwort	*Stellaria holostea*
		Bramble	*Rubus fruticosus* agg.
		Marsh Lousewort	*Pedicularis palustris*
WN6	Wet Willow-Alder-Ash woodland	Common Alder	*Alnus glutinosa*
		Horsetail	*Equisetum* spp.
		Willow	*Salix* spp.
		Gorse	*Ulex europaeus*
		Bramble	*Rubus fruticosus* agg.
		Rowan	*Sorbus aucuparia*
		Cat's-ear	*Hypochaeris radicata*
		Broom	*Cytisus scoparius*
		Downy Birch	*Betula pubescens*
		Bracken	*Pteridium aquilinum*
WD3	(Mixed) conifer woodland	Lodgepole Pine	*Pinus contorta*
		Downy Birch	*Betula pubescens*
		Common Alder	*Alnus glutinosa*
		Willow	*Salix* spp.

Code (Fossitt, 2000)	Habitat Name	Common Name	Scientific Name
		Rowan	*Sorbus aucuparia*
		Bramble	*Rubus fruticosus* agg.
		Ivy	*Hedera hibernica*
		Holly	*Ilex aquifolium*
		Hawthorn	*Crataegus monogyna*
BL2	Earth banks	Willow	*Salix* spp.
		Bracken	*Pteridium aquilinum*
		Bindweed	*Calystegia* spp.
		Horsetail	*Equisetum* spp.
		Perennial Rye-grass	*Lolium perenne*
		Colt's-foot	*Tussilago farfara*
		Bramble	*Rubus fruticosus* agg.
		Rosebay Willowherb	*Chamaenerion angustifolium*
		Common Reed	*Phragmites australis*
WD2	Mixed broadleaved/conifer woodland	Lodgepole Pine	*Pinus contorta*
		Larch	*Larix* spp.
		Willow	*Salix* spp.
		Ivy	*Hedera hibernica*
		Bramble	*Rubus fruticosus* agg.
		Hogweed	*Heracleum sphondylium*
		Hawthorn	*Crataegus monogyna*
		Rosebay Willowherb	*Chamaenerion angustifolium*
		Downy Birch	*Betula pubescens*
GA2	Amenity grassland (improved)	Perennial Rye-grass	*Lolium perenne*
		Cocksfoot	*Dactylis glomerata*
		Rosebay Willowherb	*Chamaenerion angustifolium*
		Willow	*Salix* spp.
		Thistle	*Cirsium* spp.
		Common Nettle	*Urtica dioica*
		Horsetail	*Equisetum* spp.
		False Oat-grass	*Arrhenatherum elatius*
FW4	Drainage ditches	Soft Rush	*Juncus effusus*
		Common Alder	*Alnus glutinosa*

Code (Fossitt, 2000)	Habitat Name	Common Name	Scientific Name
		Willow	*Salix* spp.
		Common Duckweed	*Lemna minor*
		Bog Pondweed	*Potamogeton polygonifolius*
		Bracken	*Pteridium aquilinum*
		Rosebay Willowherb	*Chamaenerion angustifolium*
		Sowthistle	*Sochus* spp.
		Field Bindweed	*Convolvulus arvensis*
		Creeping Thistle	*Cirsium arvense*
FW2	Depositing/ lowland rivers	-	-
FW4	Drainage ditches	Ling	*Calluna vulgaris*
		Cross-leaved Heath	*Erica tetralix*
		Purple Moor-grass	*Molinia caerulea*
		Bog Pondweed	*Potamogeton polygonifolius*
		White Beak-sedge	*Rhynchospora alba*
		Nodding Burr-marigold	*Bidens cernua*
		Birch	*Betula* spp.
		Common Cottongrass	*Eriophorum angustifolium*
		Willow	*Salix* spp.
		Soft Rush	*Juncus effusus*
		Gypsywort	*Lycopus europaeus*
		Marsh Pennywort	*Hydrocotyle vulgaris*
		Sharp-flowered Rush	*Juncus acutiflorus*
		Bulrush	*Typha latifolia*
		Water Mint	*Mentha aquatica*
		Silverweed	*Potentilla anserina*
		Lesser Bladderwort	*Utricularia minor*
		Redshank	*Persicaria maculosa*
		Devil's-bit Scabious	*Succisa pratensis*
		Water-plantain	*Alisma plantago-aquatica*
		Common Alder	*Alnus glutinosa*
		Downy Birch	*Betula pubescens*
		Bramble	*Rubus fruticosus* agg.
		Lodgepole Pine	*Pinus contorta*

Code (Fossitt, 2000)	Habitat Name	Common Name	Scientific Name
		Common Ragwort	*Jacobaea vulgaris*
		Lesser Hawkbit	*Leontodon saxatilis*
		Gorse	*Ulex europaeus*
		Rowan	*Sorbus aucuparia*
		Marsh Arrowgrass	*Triglochin palustris*
		Rosebay Willowherb	*Chamaenerion angustifolium*
		Common Reed	*Phragmites australis*
		Common Knapweed	*Centaurea nigra*
		Yellow-rattle	*Rhinanthus minor*
		Great Willowherb	*Epilobium hirsutum*
		Tufted Vetch	*Vicia cracca*
		Butterbur	*Petasites hybridus*
		Yellow Iris	*Iris pseudacorus*
		Bladderwort	*Urticularia* spp.
		Bracken	*Pteridium aquilinum*
		Water-cress	*Nasturtium officinale*
		Fool's-water-cress	*Apium nodiflorum*
		Brooklime	*Veronica beccabunga*
		Hogweed	*Heracleum sphondylium*
		Heath Spotted-orchid	*Dactylorhiza maculata*
		Hawthorn	*Crataegus monogyna*
		Elder	*Sambucus nigra*
		Silver Birch	*Betula pendula*
		Sundew	*Drosera* spp.
		Field Bindweed	*Convolvulus arvensis*
		Yarrow	*Achillea millefolium*
		Red Clover	*Trifolium pratense*
		Common Spotted-Orchid	*Dactylorhiza fuchsii* ssp. *fuchsii*
		Greater Knapweed	*Centaurea scabiosa*
		Slender St. John's-wort	*Hypericum pulchrum*
		Self-heal	*Prunella vulgaris*
		Common Duckweed	*Lemna minor*
		Ling	*Calluna vulgaris*

Code (Fossitt, 2000)	Habitat Name	Common Name	Scientific Name
		Cross-leaved Heath	*Erica tetralix*
		Purple Moor-grass	*Molinia caerulea*
		Bog Pondweed	*Potamogeton polygonifolius*
		White Beak-sedge	*Rhynchospora alba*
		Nodding Burr-marigold	*Bidens cernua*
		Birch	*Betula* spp.
		Common Cottongrass	*Eriophorum angustifolium*
		Willow	*Salix* spp.
		Soft Rush	*Juncus effusus*
		Gypsywort	*Lycopus europaeus*
		Marsh Pennywort	*Hydrocotyle vulgaris*
		Sharp-flowered Rush	*Juncus acutiflorus*
		Bulrush	*Typha latifolia*
		Water Mint	*Mentha aquatica*
		Silverweed	*Potentilla anserina*
		Lesser Bladderwort	*Utricularia minor*
		Redshank	*Persicaria maculosa*
		Devil's-bit Scabious	*Succisa pratensis*
		Water-plantain	*Alisma plantago-aquatica*
		Common Alder	*Alnus glutinosa*
		Downy Birch	*Betula pubescens*
		Bramble	*Rubus fruticosus* agg.
		Lodgepole Pine	*Pinus contorta*
		Common Ragwort	*Jacobaea vulgaris*
		Lesser Hawkbit	*Leontodon saxatilis*
		Gorse	*Ulex europaeus*
		Rowan	*Sorbus aucuparia*
		Marsh Arrowgrass	*Triglochin palustris*
		Rosebay Willowherb	*Chamaenerion angustifolium*
		Common Reed	*Phragmites australis*
		Common Knapweed	*Centaurea nigra*
		Yellow-rattle	*Rhinanthus minor*
		Great Willowherb	*Epilobium hirsutum*

Code (Fossitt, 2000)	Habitat Name	Common Name	Scientific Name
		Tufted Vetch	*Vicia cracca*
		Butterbur	*Petasites hybridus*
		Yellow Iris	*Iris pseudacorus*
		Bladderwort	*Urticularia* spp.
		Bracken	*Pteridium aquilinum*
		Water-cress	*Nasturtium officinale*
		Fool's-water-cress	*Apium nodiflorum*
		Brooklime	*Veronica beccabunga*
		Hogweed	*Heracleum sphondylium*
		Heath Spotted-orchid	*Dactylorhiza maculata*
		Hawthorn	*Crataegus monogyna*
		Elder	*Sambucus nigra*
		Silver Birch	*Betula pendula*
		Sundew	*Drosera* spp.
		Field Bindweed	*Convolvulus arvensis*
		Yarrow	*Achillea millefolium*
		Red Clover	*Trifolium pratense*
		Common Spotted-Orchid	*Dactylorhiza fuchsii* ssp. *fuchsii*
		Greater Knapweed	*Centaurea scabiosa*
		Slender St. John's-wort	*Hypericum pulchrum*
		Self-heal	*Prunella vulgaris*
		Common Duckweed	*Lemna minor*
WL1	Hedgerows	Common Nettle	*Urtica dioica*
		Rhododendron	*Rhododendron ponticum*
		Oxeye Daisy	*Leucanthemum vulgare*
		Bindweed	*Calystegia* spp.
		Blackthorn	*Prunus spinosa*
		Vetch	*Vicia* spp.
		Sycamore	*Acer pseudoplatanus*
		False Oat-grass	*Arrhenatherum elatius*
WL2	Treelines	Leyland Cypress	*Cupressus x leylandii*
		Ash	*Fraxinus excelsior*
		Scots Pine	*Pinus sylvestris*

Code (Fossitt, 2000)	Habitat Name	Common Name	Scientific Name
		Ivy	*Hedera hibernica*
		Grey Alder	*Alnus incana*
		Beech	*Fagus sylvatica*
		Wych Elm	*Ulmus glabra*
		Hornbeam	*Carpinus betulus*

Appendix 6 IPC LICENCE

This licence was amended on 26th September, 2012 under Section 96(1) of the Environmental Protection Agency Acts, as amended. The details of Amendment A must be read in conjunction with this licence. The amendment document is entitled "Technical Amendment A"

Headquarters,
Johnstown Castle Estate,
County Wexford, Ireland

INTEGRATED POLLUTION CONTROL LICENCE

Licence Register Number: 504

Licensee: Bord na Mona Energy Limited,
Mountdillon Group,
Boora, Leabeg, Tullamore,
County Offaly.

Location of Activity: Mountdillon Works,
Lanesboro,
County Longford.

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Glossary of Terms

The Agency	Environmental Protection Agency.
The Licensee	Bord na Mona Energy Limited, Mountdillon Group, Boora, Leabeg, Tullamore, Co. Offaly.
AER	Annual Environmental Report.
Annually	All or part of a period of twelve consecutive months.
BATNEEC	Best Available Technology Not Entailing Excessive Cost.
Bi-annually	All or part of a period of six consecutive months.
COD	Chemical Oxygen Demand.
Daily	During all days of plant operation, and in the case of emissions, when emissions are taking place; with no more than 1 measurement on any one day.
Day	Any 24 hr. period.
Daytime	0800 hrs to 2200 hrs.
dB(A)	Decibels (A weighted).
EMP	Environmental Management Programme.
EWC	European Waste Catalogue (94/3/EEC, see also Agency Guidance Note on the EWC).
Fortnightly	At least 20 measurements in a calendar year with no more than one measurement in any one week.
IPC	Integrated Pollution Control.
Leq	Equivalent continuous sound level.
Lighting-up time	30 minutes after sun set.
Local Authority	Longford County Council and Roscommon County Council.
Location of the Activity	Mountdillon Works, Lanesboro, Co. Longford
Monthly	At least 12 times per year at approximately monthly intervals.
NHA	National Heritage Area.
Night-time	2200 hrs to 0800 hrs.

Noise sensitive location	Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels.
Dust Sensitive location	Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or area of high amenity which for its proper enjoyment requires the absence of dust at nuisance levels.
Quarterly	All or part of a period of three consecutive months beginning on the first day of January, April, July or October.
SAC	Special Area of Conservation.
Screenings	Wood, stone and other debris removed from milled peat (by screening) prior to introduction to processing.
Standard Methods	As detailed in "Standard Methods for the Examination of Water and Wastewater", (prepared and published jointly by A.P.H.A., A.W.W.A & W.E.F) 19th Ed. 1995, American Public Health Association, 1015 Fifteenth Street, N.W., Washington DC 20005, USA.
TA Luft	Technical Instructions on Air Quality Control - TA Luft in accordance with art. 48 of the Federal Immission Control Law (BImSchG) dated 15 March 1974 (BGBI. I p.721). Federal Ministry for Environment, Bonn 1986 and amendments.
Waste disposal operation	Means any of the operations included in the Third Schedule to the Waste Management Act 1996.
Waste recovery operation	Means any of the operations included in the Fourth Schedule to the Waste Management Act 1996.
Weekly	During all weeks of plant operation, and in the case of emissions, when emissions are taking place; with no more than one measurement in any one week.

Reasons for the Decision

The Agency is satisfied, on the basis of the information available that, subject to compliance with the conditions of this licence, any emissions from the activity will comply with and not contravene any of the requirements of Section 83(3) of the Environmental Protection Agency Act, 1992.

In reaching this decision the Agency has considered the application and supporting documentation received from the applicant, all objections received and the report of its inspectors.

Activities Licensed

In pursuance of the powers conferred on it by the Environmental Protection Agency Act, 1992, the Agency hereby grants a licence to:

Bord na Mona Energy Limited, Mountdillon Group, Boora, Leabeg, Tullamore, County Offaly

under Section 83(1) of the said Act to carry on the following activity,

:- the extraction of peat in the course of business which involves an area exceeding 50 hectares

at lands labelled as Mountdillon Group on Location Map Drawings 2.1 and 2.2 (Attachment 2) of the IPC Application subject to the following fourteen Conditions, with the reasons therefor and associated schedules attached thereto.

Conditions

Condition 1 Scope

1.1 The activity shall be controlled, operated, and maintained and emissions shall take place as set out in this Integrated Pollution Control licence. All programmes required to be carried out under the terms of this licence, become part of this licence.

1.2 No alteration to, or reconstruction in respect of, the activity or any part thereof which would, or is likely to, result in a material change or increase in:

1.2.1 The nature or quantity of any emission,

1.2.2 The abatement/treatment or recovery systems,

1.2.3 The range of processes to be carried out,

1.2.4 The fuels, raw materials, intermediates, products or wastes generated,

or any changes in:

1.2.5 The site management and control with adverse environmental significance,

shall be carried out or commenced without prior notice to, and without the prior written agreement of, the Agency.

1.3 This licence is for the purposes of IPC licensing under the EPA Act, 1992 only and nothing in this licence shall be construed as negating the licensee's statutory obligations or requirements under any other enactments or regulations.

1.4 Any reference in this licence to 'site' shall mean the plan area outlined in black and labelled Mountdillon Group on Location Map Drawings 2.1 and 2.2 of Attachment 2 in the IPC licence application.

Reason: To clarify the scope of this licence.

Condition 2 Management of the Activity

2.1 The licensee shall establish and maintain an Environmental Management System (EMS) which shall fulfil the requirements of this licence. The EMS shall assess all operations and review all practicable options for the use of cleaner technology, cleaner production and the reduction and minimisation of waste, and shall include as a minimum those elements specified in the Conditions 2.2 to 2.7 below:

2.2 Environmental Management Programme (EMP)

2.2.1 The licensee shall, not later than six months from the date of grant of this licence, establish and maintain an EMP, including a time schedule, for achieving objectives and targets. The EMP shall thereafter, form part of the AER and shall be agreed with the Agency prior to implementation. It shall include:

(i) designation of responsibility for targets;

(ii) the means by which they may be achieved;

(iii) the time within which they may be achieved.

2.2.2 The EMP shall as a minimum include the following objectives:

(i) Minimisation of suspended solids movement to surface water systems via peatland surface water drainage channels during development and operation of boglands.

(ii) Rationalisation of surface water discharge points.

(iii) Investigation of reed-bed systems for final polish of silt pond discharges.

(iv) Reduction of fugitive dust emissions during loading and transfer operation on the bog and during unloading operations at the tippler and works yard areas.

(v) Provision of measures to protect dust sensitive areas.

(vi) Reuse of silt pond waste.

(vii) Collection, storage and reuse of polythene covering.

(viii) Use of reusable material for stockpile protection.

(ix) Use of wind power technology for pumped drainage.

(x) Separation of storm water runoff from process and non process areas.

(xi) Effective spill/leak management of mobile fuelling units.

(xii) Replacement (and remediation where necessary) of all underground fuel tanks.

2.2.3 A report on the programme, including the success in meeting agreed targets, shall be prepared and submitted to the Agency as part of the AER. Such reports shall be retained on-site for a period of not less than seven years and shall be available for inspection by authorised persons of the Agency.

2.3 Documentation

2.3.1 The licensee shall establish and maintain an environmental management documentation system which shall be to the satisfaction of the Agency.

2.3.2 The licensee shall issue a copy of this licence to all relevant personnel whose duties relate to any condition of this licence.

2.4 Corrective Action

2.4.1 The licensee shall establish procedures to ensure that corrective action is taken should the specified requirements of this licence not be fulfilled. The responsibility and authority for initiating further investigation and corrective action in the event of a reported non-conformity with this licence shall be defined.

2.5 Awareness and Training

2.5.1 The licensee shall establish and maintain procedures for identifying training needs, and for providing appropriate training, for all personnel whose work can have a significant effect upon the environment. Appropriate records of training shall be maintained.

2.5.2 Personnel performing specifically assigned tasks shall be qualified on the basis of appropriate education, training and/or experience, as required.

2.6 Responsibilities

2.6.1 The licensee shall ensure that a person in charge, as defined under the terms of the Environmental Protection Agency Act, 1992 shall be available on-site at all times when the activity is in operation. The person in charge shall also be available to meet with authorised persons of the Agency at all reasonable times.

2.7 Communications

2.7.1 The licensee shall, within six months of date of grant of this licence, put in place a programme to ensure that members of the public can obtain information concerning the environmental performance of the licensee at all reasonable times.

2.7.2 The licensee shall submit to the Agency, by 1 March each year, an AER which shall be to the satisfaction of the Agency. This report shall include as a minimum the information specified in *Schedule 4 Recording and Reporting to the Agency* and shall be prepared in accordance with any relevant guidelines issued by the Agency.

Reason: *To make provision for management of the activity on a planned basis having regard to the desirability of ongoing assessment, recording and reporting of matters affecting the environment.*

Condition 3 Interpretation

3.1 Emission limit values for emissions to atmosphere in this licence shall be interpreted in the following way:-

3.1.1 Dust deposition at Dust Sensitive Location's:

(i) No value shall exceed the emission limit value.

3.2 Emission limit values for emissions to water in this licence shall be interpreted in the following way:-

3.2.1 Non-Continuous Monitoring:

(i) No pH value shall deviate from the specified range.

(ii) For parameters other than pH, 75% of grab samples for each monitored discharge shall not exceed the emission limit value; and no individual grab sample value shall exceed 3 times the emission limit value.

(iii) Eight out of ten consecutive results, on the basis of 24hr flow proportional composite sampling, shall not exceed the emission limit value. No individual daily result similarly calculated shall exceed 1.5 times the emission limit value.

3.3 Noise:

3.3.1 Noise from the activity shall not give rise to sound pressure levels (Leq,T) measured at noise sensitive locations which exceed the limit value(s) by more than 2 dB(A).

Reason: To clarify the interpretation of emission limit values fixed under the licence.

Condition 4 Notification

4.1 The licensee shall notify the Agency by both telephone and facsimile, if available, to the Agency's Headquarters in Wexford, or to such other Agency office as may be specified by the Agency, as soon as practicable after the occurrence of any of the following:

4.1.1 Any release to atmosphere resulting in significant impairment of, or significant interference with amenities or the environment.

4.1.2 Any emission which does not comply with the requirements of this licence.

4.1.3 Any incident with the potential for environmental contamination of surface water or groundwater, or posing an environmental threat to air or land, or requiring an emergency response by a Local Authority.

The licensee shall include as part of the notification, date and time of the incident, details of the occurrence, and the steps taken to minimise the emissions and avoid recurrence.

4.2 The licensee shall make a record of any incident as set out in Condition 4.1 above. The notification given to the Agency shall include details of the circumstances giving rise to the incident and all actions taken to minimise the effect on the environment and minimise wastes generated.

4.3 A summary report of reported incidents shall be submitted to the Agency as part of the AER. The information contained in this report shall be prepared in accordance with any relevant guidelines issued by the Agency.

4.4 In the case of any incident as set out in Condition 4.1.2 above which relates to discharges to water, the licensee shall notify either the Eastern or Shannon Regional Fisheries Board, as appropriate, as soon as practicable after such an incident.

4.5 In the event of any incident, as set out in Condition 4.1.3 having taken place, the licensee shall notify the appropriate Local Authority as soon as practicable, after such an incident.

4.6 The licensee shall as part of their AER, or more frequently as may be necessary, notify the Agency of boglands, and discharges from same, intended to be included in the subsequent years development and operational programmes.

4.7 In the case of any incident, as set out in Condition 4.1.3, which has the potential to impact the conservation objectives of the NHA and SAC areas having taken place, the licensee shall notify Dúchas of the Department of Arts, Heritage, Gaeltacht and the Islands as soon as practicable after such an incident.

Reason: To provide for the notification of incidents and update information on the activity.

Condition 5 Emissions to Atmosphere

5.1 Boiler Combustion Efficiency shall be tested annually and results reported on annually as part of the AER.

5.2 The licensee shall ensure that all operations on-site shall be carried out in a manner such that air emissions and/or dust do not result in significant impairment of, or significant interference with amenities or the environment beyond the site boundary.

5.3 Within three months of the date of grant of the licence, the licensee shall submit to the Agency for agreement, a proposal for the identification and monitoring of Dust Sensitive Locations (DSL's) on and off site for dust deposition. A report on this monitoring shall be submitted annually as part of the AER.

5.4 Activities on-site shall not give rise to dust levels off site at any Dust Sensitive Location which exceed an emission limit of 350 mg/m^2/day. [The sampling method to be in accordance with German TA Luft Immission Standards for Particle Deposition (IW1)].

5.5 In relation to Dust Control the licensee shall, within six months of date of grant of this licence, develop and implement procedures to ensure that:

- shelter belts are planted in sensitive areas,
- harvesting in sensitive areas is avoided during windy weather,
- where possible machinery use grassed pathways,
- headlands are kept clean and free of excessive loose peat,
- stockpiles are sheeted where possible,
- moving machinery maintains slow speeds when travelling along dusty headlands,
- when harvesting, the jib is maintained low to the stockpile,
- shelter belts are planted around outloading facilities,
- road transported peat is adequately covered (sheeted or similar),
- wind breaks are planted where-ever possible.

Reason: To provide for the protection of the environment by way of control, limitation, treatment and monitoring of emissions.

Condition 6 Emissions to Water

6.1 No specified emission to water shall exceed the emission limit values set out in *Schedule 1(i) Emissions to Water* subject to Condition 3 of this licence. There shall be no other emissions to water of environmental significance.

6.2 The licensee shall within three months of date of grant submit to the Agency for approval, a proposal for a surface water discharge monitoring location programme. This programme shall, *inter alia*, have regard to the current status of each bogland (virgin, under development, operational or worked out), sensitivity of the receiving water, status of silt pond upgrade programme. This programme shall be reviewed and revised as necessary each year as part of the AER.

6.3 The licensee shall, within six months of date of grant of licence, present a proposal for the installation (on a long term basis) of a composite sampler to one representative discharge point within the licensed area. The proposal shall set out the rational for selection of the nominated discharge point as well as the sampling programme. The results of this monitoring are to be reported each year as part of the AER. Any proposal to relocate the composite sampler is to be dealt with under Condition 6.2.

6.4 Monitoring and analyses of each agreed emission monitoring location shall be carried out as specified in *Schedule 1(ii) Monitoring of Emissions to Water* of this licence. A report on the results of this monitoring shall be submitted to the Agency quarterly.

6.5 A summary report of emissions to water shall be submitted to the Agency as part of the AER. The information contained in this report shall be prepared in accordance with any relevant guidelines issued by the Agency.

6.6 The licensee shall, within six months of the date of grant of licence, develop and implement a programme to ensure that all drainage water from all boglands in the licensed area is discharged via an appropriately designed silt pond treatment arrangement. The programme, to be implemented within a period to be agreed with the Agency, shall ensure that all discharges associated with operational boglands should be prioritised within this programme.

6.7 Within three months of the date of grant of licence, the licensee shall prepare an operational procedure for de-silting of the silt ponds. The procedure shall as a minimum provide for visual inspection of all ponds on a fortnightly basis. The de-silting roster shall be based on recommendations of such visual inspection. A log of visual inspection and de-silting shall be maintained and a summary report on the de-silting programme shall be included in the AER. The licensee shall within 12 months of the date of grant of licence demonstrate to the satisfaction of the Agency that the programme of inspection is adequate.

6.8 Silt ponds serving operational bogs shall be cleaned as a minimum twice a year, once before ditching and once before harvesting, and more frequently as inspections may dictate (refer Condition 6.7). Septic tanks and interceptors are required to be inspected and cleaned as necessary with a log being maintained.

6.9 Within six months of the date of grant of licence, the licensee shall prepare a programme, for agreement with the Agency, to upgrade all the sedimentation pond treatment system. The programme shall, *inter alia*, address provision of additional ponds, weir or pipe installation (inlet and outlet), pond configuration, use of baffles, performance efficiency and frequency of de-silting. The upgrade shall have regard to the minimum silt pond specifications detailed in Condition 6.10.

6.10 Within three years of date of grant of this licence all existing silt ponds serving operational bogs shall achieve the following minimum performance criteria (flood periods excepted):

- Maximum flow velocity < 10 cms^{-1} ,
- Silt design capacity of lagoons, minimum 50m^3 per nett ha of bog serviced.

All new ponds installed shall be designed to achieve these stated minimum design criteria.

6.11 All silt ponds prone to flooding shall be de-silted by 1st November of each year. Excavated sludge shall be removed for disposal to a location outside the flood plain.

6.12 In respect of silt control the licensee shall, within nine months of date of grant of this licence, prepare and implement procedures to ensure that:

(i) drainage manholes are protected and maintained free of excessive peat,

(ii) headlands are kept clean and free of excessive loose peat,

(iii) all new manholes and outfalls are set well back from turning grounds, drivers of bog plant do not turn short (over drains) at headlands,

(iv) harrows, millers, ridgers do not drag loose peat onto manholes or into drains, outside harrow spoons are directed away from drains,

(v) silt run-off, while piping or ditching, is minimised,

(vi) outfalls are controlled to minimise silt discharge during cleaning operations,

(vii) drains are ditched in dry weather,

(viii) while ditching, outfalls are blocked and ditch towards outfall,

(ix) outlets from stockpile field drains are blocked during stockpile loading,

(x) field drains adjacent to stockpiles are cleaned as soon as practicable after stockpile loading,

(xi) adequate room is allowed for rail bed beside Peco stockpiles,

(xii) all fields that have been milled are ridged at the end of the production season,

(xiii) all fields liable to winter flooding have been cleared of milled peat or re-compacted at the end of the production season.

Reason: To provide for the protection of the environment by way of control, limitation, treatment and monitoring of emissions.

Condition 7 Waste Management

7.1 Disposal or recovery of waste shall take place only as specified in *Schedule 2(i) Hazardous Wastes for Disposal/Recovery* and *Schedule 2(ii) Other Wastes for Disposal/Recovery* of this licence and in accordance with the appropriate National and European legislation and protocols. No other waste shall be disposed of/recovered either on-site or off-site without prior notice to, and prior written agreement of, the Agency.

7.2 Waste sent off-site for recovery or disposal shall only be conveyed to a waste contractor, as agreed by the Agency, and only transported from the site of the activity to the site of recovery/disposal in a manner which will not adversely affect the environment.

7.3 A full record, which shall be open to inspection by authorised persons of the Agency at all times, shall be kept by the licensee on matters relating to the waste management operations and practices at this site. This record shall as a minimum contain details of the following:

7.3.1 The names of the agent and transporter of the waste.

7.3.2 The name of the persons responsible for the ultimate disposal/recovery of the waste.

7.3.3 The ultimate destination of the waste.

7.3.4 Written confirmation of the acceptance and disposal/recovery of any hazardous waste consignments sent off-site.

7.3.5 The tonnages and EWC Code for the waste materials listed in *Schedule 2(i) Hazardous Wastes for Disposal/Recovery* and *Schedule 2(ii) Other Wastes for Disposal/Recovery* sent off-site for disposal/recovery.

7.3.6 Details of any rejected consignments.

A copy of this Waste Management record shall be submitted to the Agency as part of the AER for the site.

7.4 Within nine months of the date of grant of licence, the licensee shall submit to the Agency for agreement, a proposal for identification and management of all ash and screening disposal areas. Once agreed, the proposal shall be implemented within a time-scale stipulated by the Agency.

Reason: To provide for the disposal of waste and the protection of the environment.

Condition 8 Noise

8.1 Activities on-site shall not give rise to noise levels off site at any noise sensitive location which exceed the following sound pressure limits ($Leq_{,30min}$) subject to Condition 3:

Daytime: 55 dB(A)

Night-time: 45 dB(A).

8.2 There shall be no clearly audible tonal component or impulsive component in the noise emission from the activity at any noise sensitive location.

Reason: To provide for the protection of the environment by control of noise.

Condition 9 Water Protection

9.1 Surface & Groundwater Protection - Workshop areas and Depots

9.1.1 No potentially polluting substance or matter shall be permitted to discharge to off-site surface waters, off site storm drains or groundwaters.

9.1.2 Monitoring and analyses of surface water discharges shall be carried out as specified in *Schedule 3 Monitoring of Workshop/Depot Surface Water Run-off* of this licence. A report on the results of this monitoring shall be submitted to the Agency quarterly

9.1.3 In the event that any analyses or observations made on the quality or appearance of surface water runoff should indicate that contamination has taken place, the licensee shall;

(i) carry out an immediate investigation to identify and isolate the source of the contamination,

(ii) put in place measures to prevent further contamination and to minimise the effects of any contamination on the environment,

(iii) and notify the Agency as soon as is practicable.

9.1.4 Within twelve months of the date of grant of licence, all tank and drum storage areas shall be rendered impervious to the materials stored therein. In addition, tank and drum storage areas shall, as a minimum be bunded, either locally or remotely, to a volume not less than the greater of the following;

(i) 110% of the capacity of the largest tank or drum within the bunded area,

(ii) 25% of the total volume of substance which could be stored within the bunded area.

9.1.5 Drainage from bunded areas shall be diverted for collection and safe disposal.

9.1.6 The integrity and water tightness of all the bunding structures and their resistance to penetration by water or other materials stored therein shall be tested and demonstrated by the licensee to the satisfaction of the Agency and shall be reported to the Agency within eighteen months from the date of grant of this licence and every two years thereafter. A report on such tests shall be included in the AER.

9.1.7 Within twelve months of the data of grant of licence, the loading and unloading of fuel oils shall be carried out in designated areas protected against spillage and leachate run-off. While awaiting disposal, all materials shall be collected and stored in designated areas protected against spillage and leachate run-off.

9.1.8 With the exception of roof water, all surface water discharges from workshop areas shall, within twenty-four months of date of grant of this licence, be fitted with oil interceptors.

9.1.9 A maintenance/cleaning log for all oil interceptors and septic tanks shall be maintained. This log shall also record the observations made during weekly inspections of all oil interceptors and bi-annual inspections of septic tanks.

9.1.10 An inspection for leaks on all flanges and valves on over-ground pipes used to transport materials other than water shall be carried out weekly.

9.1.11 The provision of a catchment system to collect any leaks from flanges and valves of all over ground pipes used to transport material other than water shall be examined.

9.1.12 The licensee shall have in storage an adequate supply of containment booms and/or suitable absorbent material to contain and absorb any spillage.

9.1.13 The licensee shall maintain a log of bi-annual inspections of all rail and tractor transported fuelling units. These inspections as a minimum should record any damage or leaks or flaws in rolling stock that could result in accidental spillage.

Reason: To provide for the protection of surface waters and groundwater.

Condition 10 Cutaway Bog Rehabilitation

10.1 Following termination of use or involvement of all or part of the site in the licensed activity, the licensee shall:

10.1.1 Decommission, render safe or remove for disposal/recovery, any soil, subsoils, buildings, plant or equipment, or any waste, materials or substances or other matter contained therein or thereon, that may result in environmental pollution.

10.1.2 Implement the agreed cutaway bog rehabilitation plan (refer Condition 10.2).

10.2 Cutaway Bog Rehabilitation Plan:

10.2.1 The licensee shall prepare, to the satisfaction of the Agency, a fully detailed and costed plan for permanent rehabilitation of the cutaway boglands within the licensed area. This plan shall be submitted to the Agency for agreement within eighteen months of the date of grant of this licence.

10.2.2 The plan shall be reviewed every two years and proposed amendments thereto notified to the Agency for agreement as part of the AER. No amendments may be implemented without the written agreement of the Agency.

10.3 The Rehabilitation Plan shall include as a minimum, the following:

10.3.1 A scope statement for the plan; to include outcome of consultations with relevant Agencies, Authorities and affected parties (to be identified by the licensee).

10.3.2 The criteria which define the successful rehabilitation of the activity or part thereof, which ensures minimum impact to the environment.

10.3.3 A programme to achieve the stated criteria.

10.3.4 Where relevant, a test programme to demonstrate the successful implementation of the rehabilitation plan.

10.3.5 A programme for aftercare and maintenance.

10.4 A final validation report to include a certificate of completion for the Rehabilitation Plan, for all or part of the site as necessary, shall be submitted to the Agency within six months of execution of the plan. The licensee shall carry out such tests, investigations or submit certification, as requested by the Agency, to confirm that there is no continuing risk to the environment.

Reason: To make provision for the proper closure of the activity ensuring protection of the environment.

Condition 11 Monitoring

11.1 The licensee shall carry out such sampling, analyses, measurements, examinations, maintenance and calibrations as set out in Schedules:-

Schedule 1(ii) Monitoring of Emissions to Water

Schedule 3 Monitoring of Workshop/Depot Surface Water Run-off

of this licence.

11.2 Where the ability to measure a parameter is affected by mixing before emission, then, with prior written agreement from the Agency, the parameter may be assessed before mixing takes place.

11.3 All automatic monitors and samplers shall be functioning at all times (except during maintenance and calibration) when the activity is being carried on unless alternative sampling or monitoring has been agreed in writing by the Agency for a limited period. Prior written agreement for the use of alternative equipment, other than in emergency situations, shall be obtained from the Agency.

11.4 Monitoring and analysis equipment shall be operated and maintained as necessary so that monitoring accurately reflects the emission or discharge.

11.5 The frequency, methods and scope of monitoring, sampling and analyses, as set out in this licence, may be amended with the written agreement of the Agency following evaluation of test results.

11.6 The licensee shall provide signage to clearly identify and label all emission points.

11.7 The licensee shall install on all emission points such sampling equipment, including any data-logging or other electronic communication equipment, as may be required by the Agency. All such equipment shall be consistent with the safe operation of all sampling and monitoring systems.

11.8 The licensee shall provide safe and permanent access to the following sampling and monitoring points:

(i) Waste storage areas on-site,

(ii) Surface water discharges,

(iii) Dust sampling locations,

and safe access to any other sampling and monitoring points required by the Agency.

Reason: *To ensure compliance with the requirements of other conditions of this licence by provision of a satisfactory system of measurement and monitoring of emissions.*

Condition 12 Recording and Reporting to Agency

12.1 The licensee shall record all sampling, analyses, measurements, examinations, calibrations and maintenance carried out in accordance with the requirements of this licence.

12.2 The licensee shall record all incidents which affect the normal operation of the activity and which may create an environmental risk.

12.3 The licensee shall record all complaints of an environmental nature related to the operation of the activity. Each such record shall give details of the date and time of the complaint, the name of the complainant and give details of the nature of the complaint. A record shall also be kept of the response made in the case of each complaint. The licensee shall submit a report to the Agency, during the month following such complaints, giving details of any complaints which arise. A summary of the number and nature of complaints received shall be included in the AER.

12.4 The format of all records required by this licence shall be to the satisfaction of the Agency. Records shall be retained on-site for a period of not less than seven years and shall be available for inspection by the Agency at all reasonable times.

12.5 Reports of all recording, sampling, analyses, measurements, examinations, calibrations and maintenance as set out in *Schedule 4 Recording and Reporting to the Agency* of this licence, shall be submitted to the Agency Headquarters as specified in this licence. The format of these reports shall be to the satisfaction of the Agency. One original and three copies shall be submitted as and when specified.

12.6 Provision shall also be made for the transfer of environmental information, in relation to this licence, to the Agency's computer system, as may be requested by the Agency.

12.7 All reports shall be certified accurate and representative by the licensee's Plant Manager or other senior officer designated by the Plant Manager.

12.8 All written procedures controlling operations affecting this licence shall be available on-site for inspection by the Agency at all reasonable times.

12.9 The frequency and scope of reporting, as set out in this licence, may be amended with the written agreement of the Agency following evaluation of test results.

Reason: To provide for the collection and reporting of adequate information on the activity.

Condition 13 Emergency Response

13.1 The licensee shall, within six months of date of grant of this licence, ensure that a documented Emergency Response Procedure is in place which shall address any emergency situation which may originate on-site. This Procedure shall include provision for minimising the effects of any emergency on the environment.

Reason: To provide for the protection of the environment.

Condition 14 Financial Provisions

14.1 Agency Charges

14.1.1 The licensee shall pay to the Agency an annual contribution of £4,080 or such sum as the Agency from time to time determines, towards the cost of monitoring the activity as the Agency considers necessary for the performance of its functions under the Environmental Protection Agency Act, 1992. The licensee shall in 2001 and subsequent years, not later than January 31 of each year, pay to the Agency this amount updated in accordance with changes in the Consumer Price Index from the date of the licence to the renewal date. The updated amount shall be notified to the licensee by the Agency. For 2000, the licensee shall pay a pro rata amount from the date of this licence to December 31 2000. This amount shall be paid to the Agency within one month of the date of grant of this licence.

Reason: To provide for adequate financing for monitoring and financial provisions for measures to protect the environment.

Schedule 1(i) Emissions to Water

Emission Point Reference No.: All surface water outfalls from boglands within the licensed area.

Location: As detailed in Section 11 and Attachment 11 of the IPC licence application form, and any additional locations as may be agreed under Condition 4.6.

Parameter	Emission Limit Value
Suspended Solids	35mg/l

Schedule 1(ii) Monitoring of Emissions to Water

Emission Point Reference No's: As agreed under Condition 6.2.

Parameter	Monitoring Frequency	Analysis Method/Technique
pH	Quarterly	Standard Methods
Flow	Quarterly	Agreed Method
Suspended Solids	Quarterly	Standard Methods
Total Phosphorus	Quarterly	Standard Methods
Ammonia	Quarterly	Standard Methods
Colour	Quarterly	Standard Methods
COD	Quarterly	Standard Methods

Schedule 2(i) Hazardous Wastes for Disposal/Recovery

Waste Materials	Method of disposal/recovery Notes 1, 2, 3
Lubricating Oils	Agreed hazardous waste disposal contractor.
Hydraulic Oils	Agreed hazardous waste disposal contractor.
Oil/Fuel Filters	Agreed hazardous waste disposal contractor.
Lead Acid Batteries	Agreed hazardous waste disposal contractor.
Florescent lights	Agreed hazardous waste disposal contractor.
Degreasing still-bottoms	Agreed hazardous waste disposal contractor.
Anti- freeze liquid	Agreed hazardous waste disposal contractor.
Other Note 4	

Note 1: The licensee may treat, reuse, recycle or recover waste subject to the prior written agreement of the Agency.

Note 2: Any variation from those contractors named in the IPC Licence application, or subsequent agreements, must have the prior written agreement of the Agency. In cases where a previously agreed waste contractor is considered by the Agency not to exercise due care in respect of the transport and disposal of the licensees waste, the Agency may at any time instruct a licensee to stop using this contractor.

Note 3: Other method to be agreed with the Agency

Note 4: No other waste shall be disposed of/recovered off-site without prior notice to, and prior written agreement of the Agency.

Schedule 2(ii) Other Wastes for Disposal/Recovery

Waste Materials	Method of disposal/recovery Notes 1, 2, 3
Scrap Metal/Welding Rods	Agreed waste recovery contractor.
Ash/Cinders/Screenings	Agreed waste disposal contractor/On- site landfill.
Polythene covering	Agreed recycling disposal contractor.
Wooden pallets and timber	Agreed waste disposal/recovery contractor.
Hand cleansing rags	Agreed waste disposal contractor.
Paint waste	Agreed waste disposal contractor.
General Office & Canteen Waste	Agreed waste disposal contractor.
Other Note 4	

Note 1: The licensee may treat, reuse, recycle or recover waste subject to the prior written agreement of the Agency.

Note 2: Any variation from those contractors named in the IPC Licence application, or subsequent agreements, must have the prior written agreement of the Agency. In cases where a previously agreed waste contractor is considered by the Agency not to exercise due care in respect of the transport and disposal of the licensees waste, the Agency may at any time instruct a licensee to stop using this contractor.

Note 3: Other method to be agreed with the Agency

Note 4: No other waste shall be disposed of/recovered off-site without prior notice to, and prior written agreement of the Agency.

Schedule 3 Monitoring of Workshop/Depot Surface Water Run-off

Emission Point Reference No's: All surface water discharges from workshops and depots associated with the licensed activity

Parameter		Analysis Method/Technique
Visual	Weekly	-
COD	Monthly	Standard Methods

Schedule 4 Recording and Reporting to the Agency

Completed reports shall be submitted to: The Environmental Protection Agency
Headquarters
Johnstown Castle Estate
Co Wexford
Ireland,

or Any other address as may be specified by the Agency.

Reports are required to be forwarded as set out below:

Recurring Reports:

Report	Reporting Frequency	Report Submission Date
Surface Water (Schedule 1(ii) and Schedule 3)	Quarterly	Ten days after end of the quarter being reported on.
Complaints (where these arise)	Monthly	Ten days after end of the month being reported on.
Report on monitoring of emissions to water	Quarterly	Ten days after end of the quarter being reported on.
Annual Environment Report(AER)	Annually	1 March of each year

Annual Environmental Report Content	
• Emissions to water summary	• Surface water discharge monitoring location programme
• Waste management report.	• Environmental management programme - proposal
• Resource consumption summary	• Environmental management programme - report
• Complaints summary	• Reported incidents summary
• Air emissions report	• Bog development and operational programme
• Report on de-silting programme	• Bog rehabilitation progress report

Once-off Reports:

Report	Report Submission Date
Bund integrity assessment.	Within eighteen months of the date of grant of licence.
Composite sampling proposal (Condition 6.3).	Within six months of the date of grant of licence.
Environmental management programme proposal.	Within six months of the date of grant of licence.
Proposal for dust monitoring locations (Condition 5.3).	Within three months of the date of grant of licence.
Proposal for surface water monitoring locations (Condition 6.2).	Within three months of the date of grant of licence.
Programme for fitting of silt ponds to all bog discharges (Condition 6.6).	Within six months of the date of grant of licence.
Upgrade of sedimentation pond treatment system (Condition 6.9).	Within six months of the date of grant of licence.
Proposal for screenings disposal (Condition 7.4).	Within nine months of the date of grant of licence.
Bog rehabilitation programme (Condition 10.2).	Within eighteen months of the date of grant of licence.

Signed on behalf of the Agency

Iain MacLean

_____

Director/Authorised person

Dated this 9th day of May, 2000

Environmental Protection Agency
An Ghníomhaireacht um Chaomhnú Comhshaoil

Headquarters
P.O. Box 3000
Johnstown Castle Estate
County Wexford
Ireland

TECHNICAL AMENDMENT A
TO
IPPC LICENCE

Licence Register Number:	P0504-01
Licensee:	Bord na Mona Energy Limited, Mountdillon Group, Boora, Leabeg, Tullamore, County Offaly.
Location of Facility:	Mountdillon Works, Lanesboro, County Longford.

Reasons for the Decision

The Environmental Protection Agency is satisfied, on the basis of the information available, that subject to compliance with the conditions of Integrated Pollution Prevention and Control (IPPC) licence Reg. No. P0504-01 granted on the 9th May 2000, as well as any amendments noted herein, any emissions from the activity will comply with and not contravene any of the requirements of Section 83(5) of the Environmental Protection Agency Acts, 1992 to 2012.

Technical Amendment

In pursuance of the powers conferred on it by Section 96(1)(c) of the Environmental Protection Agency Acts, 1992 to 2012, the Agency amends the licence, granted to Bord na Mona Energy Limited, Mountdillon Group, Boora, Leabeg, Tullamore, County Offaly.

Henceforth, the licence shall be read in conjunction with the amendments set out below.

This technical amendment is limited to the following Glossary of Terms, Condition(s) and Schedule:

Amendments

Amend Glossary of Terms as follows

Extractive waste	As defined in regulation 3(2) of the Waste Management (Management of Waste from the Extractive Industries) Regulations, 2009, SI 566 of 2009.
Sanitary effluent	Wastewater from installation toilet, washroom and canteen facilities.
Trigger level	A parameter value, the achievement or exceedance of which requires certain actions to be taken by the licensee.
Waste facility	As defined in regulation 3(2) of the Waste Management (Management of Waste from the Extractive Industries) Regulations 2009, SI 566 of 2009.

New and Amended Conditions

Amend condition 6.2 of the licence to read as follows.

6.2 The licensee shall, by the 1st February 2013, submit for agreement by the Agency a revised proposal for a surface water discharge monitoring programme. This programme shall have regard to the following:

(i) The current status of each bogland (virgin, under development, operational or worked out);
(ii) The sensitivity of the receiving water;
(iii) The relevant River Basin Management Plan;
(iv) The nature, magnitude and variability of the discharges;
(v) The reliability of the silt ponds control measures; and,
(vi) The status of the silt pond upgrade programme.

The revised surface water discharge monitoring location programme shall ensure that a representative selection of all surface water emission points from boglands within the licensed area is monitored annually and that all emission points are monitored at least once every five years. Surface water emission points shall be monitored as set out in Schedule 1(ii) *Monitoring of Emissions to Water* of this licence.

Add condition 6.13 to include the following after condition 6.12.

6.13 The licensee shall trend the monitoring results for total ammonia and determine any statistically significant relationship that exists between the results and the current status of each bogland (virgin, under development, operational or worked out), rainfall, silt pond control measures or other factors. The licensee shall report annually as part of the AER on the trends and on any statistically significant relationship identified.

Add condition 6.14 to include the following after condition 6.13.

6.14 The licensee shall, by 1st February 2013, establish a suitable trigger level for total ammonia in surface water discharges. The licensee shall have in place a response programme to address the attainment or exceedence of the trigger level value. This response programme shall include the necessary actions to ensure there will be no emissions to surface water of environmental significance.

Add condition 7.5 to include the following after condition 7.4.

7.5 Extractive Waste Management

The licensee shall draw up a Waste Management Plan (to be known as an Extractive Waste Management Plan) for the minimisation, treatment, recovery and disposal of extractive waste. This Plan shall meet the requirements of regulation 5 of the Waste Management (Management of Waste from the Extractive Industries) Regulations, 2009. The Plan shall be submitted for agreement by the Agency by the 31st December 2012. The Plan shall be reviewed at least once every five years thereafter in a manner agreeable to the Agency and amended in the event of substantial changes to the operation of a waste facility or to the waste deposited. Any amendments shall be notified to the Agency.

All extractive waste shall be managed in accordance with the Extractive Waste Management Plan. A report on the implementation of the Extractive Waste Management Plan shall be provided in the AER.

Add condition 7.6 to include the following after condition 7.5.

7.6 Waste Facility

(i) No new waste facility may be developed or an existing waste facility modified unless agreed by the Agency.

(ii) The licensee shall ensure that all existing waste facilities are managed and maintained to ensure their physical stability and to prevent pollution or contamination of soil, air, surface water or groundwater.

(iii) The licensee shall ensure that all new waste facilities are constructed, managed and maintained to ensure their physical stability and to prevent pollution or contamination of soil, air, surface water or groundwater.

(iv) Operational measures shall be continuously employed to prevent damage to waste facilities from personnel, plant or equipment.

(v) The licensee shall establish and maintain a system for regular monitoring and inspection of waste facilities.

(vi) All records of monitoring and inspection of waste facilities, as required under the licence, shall be maintained on-site in order to ensure the appropriate handover of information in the event of a change of operator or relevant personnel.

Add condition 7.7 to include the following after condition 7.6.

7.7 Excavation Voids

7.7.1 Unless otherwise agreed by the Agency, only extractive waste shall be placed in excavation voids.

7.7.2 When placing extractive waste into excavation voids for rehabilitation and construction purposes, the licensee shall, in accordance with regulation 10 of the Waste Management (Management of Waste from the Extractive Industries) Regulations, 2009, and the Extractive Waste Management Plan:

(i) Secure the stability of the waste.
(ii) Put in place measures to prevent pollution of soil, surface water and ground water.
(iii) Carry out monitoring of the extractive waste and excavation void.

Add condition 9.2 to include the following after condition 9.1.

9.2 Sanitary Effluent

The waste water treatment system and any percolation area used for the treatment of sanitary effluent arising on–site, shall, by the 1st August 2013, satisfy the criteria set out in the '*Code of Practice: Waste Water Treatment and Disposal Systems Serving Single Houses*', published by the Environmental Protection Agency.

Amend Schedule 1(ii) Monitoring of Emissions to Water to read as follows:

Schedule 1(ii) Monitoring of Emissions to Water

Emission Point Reference No's.: As agreed under Condition 6.2

Parameter	Monitoring Frequency	Analysis Method/Technique
pH	Quarterly	Standard Methods
Flow	Quarterly	Agreed Method
Suspended Solids	Quarterly	Standard Methods
Total Solids	Quarterly	Standard Methods
Total Phosphorus (as P)	Quarterly	Standard Methods
Total Ammonia (as N)	Monthly Note 1	Standard Methods
Colour	Quarterly	Standard Methods
COD	Quarterly	Standard Methods

Note 1: The frequency of monitoring can be reduced with agreement by the Agency under Condition 11.5 of this licence.

This technical amendment shall be cited as Amendment A (in pursuance of Section 96(1)(c) of the EPA Acts 1992 to 2012) to IPPC Licence Register No. P0504-01.

Sealed by the Seal of the Agency on this the 26th day of September, 2012

PRESENT when the seal of the Agency was affixed hereto

Mary Turner, Authorised Person