

Ørsted

**Greenhills Renewable Energy
Park, Greenhills, Co. Cork**

Ecological Impact Assessment (EclA) Report

December 2025

This report considers the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

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The findings outlined within this report and the data we have provided are to our knowledge true and express our bona fide professional opinions. This report has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) good practice guidelines. Where pertinent CIEEM Guidelines used in the preparation of this report include the *Guidelines for Ecological Report Writing* (CIEEM, 2017a), *Guidelines for Preliminary Ecological Appraisals* (CIEEM, 2017b) and *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* (CIEEM, 2024). CIEEM Guidelines include model formats for Preliminary Ecological Appraisal and Ecological Impact Assessment. Also, where pertinent, evaluations presented herein take cognisance of recommended Guidance from the EPA such as *Guidelines on the information to be contained in Environmental Impact Assessment Reports* (EPA, 2022), and in respect of European sites, *Managing Natura 2000 sites. The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC* (European Commission, 2019).

Due cognisance has been given at all times to the provisions of the *Wildlife Acts 1976-2024*, the *European Union (Natural Habitats) Regulations*, the *European Communities (Birds and Natural Habitats) Regulations 2011-2021*, EU Regulation on Invasive Alien Species under *EU Regulation 1143/2014*, the *EU Birds Directive 2009/147/EC* and *Habitats Directive 92/43/EEC*.

No method of assessment can completely remove the possibility of obtaining partially imprecise or incomplete information. Any limitation to the methods applied or constraints however are clearly identified within the main body of this document.

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Notice

This report was produced by INIS Environmental Consultants Ltd. (INIS) on behalf of Ørsted, the client, for the specific purpose of assessing the proposed development at the Greenhills Renewable Energy Park, Co. Cork for ecological impacts, with all reasonable skill, care and due diligence within the terms of the contract with the client, incorporating our terms and conditions and taking account of the resources devoted to it by agreement with the client.

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1. INTRODUCTION

Inis Environmental Consultants Ltd. (INIS) was commissioned by Ørsted to complete an Ecological Impact Assessment (EclA) report for the Greenhills Renewable Energy Park (hereto referred to as the “Proposed Development”). The proposal is presented in the context of the works required (**Section 2**) and evaluated in the context of baseline ecological survey data collected by INIS ecologists and publicly available desk study information. The potential impacts arising from the Proposed Development are assessed with regard to key biodiversity receptors identified as likely to occur within the immediate vicinity of the proposed development and within the wider study area, i.e. the zone of influence (ZoI). Where required, mitigation measures are proposed to avoid, reduce or remediate potential impacts to avoid significant impacts on sensitive ecological receptors.

1.1. Legislative Context

This EIAR chapter has been prepared in reference to the following legislation:

- The European Communities (Birds and Natural Habitats) Regulations 2011 (as amended) (the “Habitats Regulations”) which transposes Directive 92/43/EC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora (the “Habitats Directive”), and Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the Conservation of Wild Birds (the “Birds Directive”);
- The EU Water Framework Directive 2000/60/EC (the “Water Framework Directive”), which is transposed into Irish Law by the European Communities (Water Policy) Regulations 2003 (the “European Communities (Water Policy) Regulations”);
- Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment as amended by Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 (the “EIA Directive”);
- The Convention on the Conservation of Migratory Species of Wild Animals 1979 (the “Bonn Convention”);
- The Convention on the Conservation of European Wildlife and Natural Habitats 1979 (the “Bern Convention”);
- The Convention on Wetlands of International Importance Especially as Waterfowl Habitat 1971 (the “Ramsar Convention”); and
- Protected Wildlife Acts 1976 to 2023 (as amended) (“Wildlife Acts”).

Further information outlining the relevance of this legislation to this report is provided below.

1.1.1. The Habitats Regulations

These regulations provide for the implementation in Ireland of the Habitats Directive and the Birds Directive. The Habitats Directive requires EU Member States to maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of community interest, which are listed under Annex I, II, IV and/or V. Species listed under Annex IV are known as 'European Protected Species' (EPS). Under the Habitats Directive, EU Member States are required to contribute to the Natura 2000 network through the designation of Special Areas of Conservation (SACs) for natural habitat types listed in Annex I and species listed in Annex II.

1.1.2. The European Communities (Water Policy) Regulations

The Water Framework Directive is transposed into Irish Law by the European Communities (Water Policy) Regulations, which commits European Union Member States to achieve good qualitative and quantitative status of all water bodies. Such water bodies are seen holistically as habitats and their water is not purely seen as a consumer good. The directive standardises the legal framework for the water policy of the EU and aims at shaping water utilisation in a sustainable and environmentally compatible way. The protection of waters plays a crucial role in this respect. The principal objective is for transnational and sustainable management of the water resource and the preservation of the ecological functionality of bodies of water as ecosystems.

1.1.3. The EIA Directive

The EIA Directive aims to ensure that projects that are likely to have significant effects on the environment are identified and assessed within an appraisal process before they are progressed. The directive includes a list of projects that are assessed to have significant effects on the environment and are thus required to undergo an impact assessment. This assessment includes a description of the projects, including an estimate, by type and quantity, of expected effects, residues, and emissions resulting from the operation of the proposed project.

1.1.4. The Bonn Convention

The Bonn Convention was adopted in 1979 and came into force in 1985. Contracting parties work together to conserve migratory species and their habitats by providing strict protection for endangered migratory species (listed in Appendix I of the Convention), by concluding multilateral agreements for the conservation and management of migratory species which require or would benefit from international cooperation (listed in Appendix II), and by undertaking cooperative research activities.

1.1.5. The Bern Convention

The principal aims of the Bern Convention are to ensure the conservation and protection of wild plant and animal species and their natural habitats (listed in Appendices I and II of the Convention), to increase cooperation between contracting parties, and to regulate the exploitation of those species (including migratory species) listed in Appendix III. To this end, the Bern Convention imposes legal obligations on contracting parties, protecting over 500 wild plant species and more than 1,000 wild animal species.

1.1.6. The Ramsar Convention

The Ramsar Convention is an intergovernmental treaty focused on the conservation and sustainable use of wetland, primarily as habitat for waterbirds. Under the convention, each ratified country is required to identify and designate sites (Ramsar sites) that meet the criteria for identifying a wetland of international importance (i.e. containing representative, rare or unique wetland types). The convention also encourages international co-operation to promote appropriate use of wetlands and their resources.

1.1.7. The Wildlife Acts

The Wildlife Acts is the principal national legislation for the protection of wildlife and the control of activities that may adversely affect wildlife. This legislation also seeks to conserve a representative sample of important ecosystems and regulate game resources. It makes licences mandatory for certain activities which may interfere with ecosystems and regulates the possession, trade, and movement of wildlife. Areas of importance for wildlife may be protected under the Act, either as Nature Reserves for Fauna, or by way of management agreements.

1.1.8. Policy Framework

National and local planning policy relevant to this assessment include the following statutory policies:

- Project Ireland 2040: National Planning Framework;
- Climate Action Plan 2021 – Securing our Future (Government of Ireland);
- The Biodiversity Sectoral Climate Change Adaptation Plan;
- National Biodiversity Plan 2023-2030; and
- Cork County Development Plan 2022 – 2028.

Further information outlining the relevance of these policies to this EIAR chapter is provided below.

1.1.9. Project Ireland 2040: National Planning Framework

The National Planning Framework under Project Ireland 2040, produced by the Department of Housing, Planning and Local Government, provides an overarching framework for the social, economic, and cultural development of the country. It is a national document that guides at a high-level strategic planning and development for the country over the next 20 years so that population growth is economically, socially, and environmentally sustainable. This includes the provision of more renewable energy developments such as the Proposed Development. It ensures that any proposed developments consider biodiversity and the future sustainability of the environment.

1.1.10. Climate Action Plan 2025 (Government of Ireland)

The Climate Action Plan follows the Climate Action and Low Carbon Development (Amendment) Act 2021, which commits Ireland to a legally binding target of net-zero greenhouse gas emissions no later than 2050, and a reduction of 51% by 2030. Among the critical measures in the plan is to increase the proportion of renewable electricity to up to 80% by 2030, making solar farm projects imperative to achieving this aim.

1.1.11. The Biodiversity Sectoral Climate Change Adaptation Plan

This plan sets out a long-term goal for adaptation to climate change, including flood risk management, along with a set of objectives and adaptation actions aimed at achieving those objectives. Such objectives include the enhancement of knowledge and understanding of the impacts of climate change, adapting flood risk management practice, and aligning adaptation to the impact of climate change across sectors of Government policy.

1.1.12. National Biodiversity Plan 2023-2030

In 1996 the Irish Government ratified the convention on Biological Diversity and launched a series of National Biodiversity Plans; most recently the 4th National Biodiversity Action Plan 2023-2030. This plan follows from the 2017-2021 Biodiversity Action Plan objectives:

- Mainstream biodiversity into the decision-making process across all sectors;
- Strengthen the knowledge basis for conservation management and sustainable use of biodiversity;
- Increase awareness and appreciation of biodiversity and ecosystem services;
- Conserve and restore biodiversity and ecosystem services in the wider countryside;
- Conserve and restore biodiversity and ecosystem services in the marine environment;
- Expand and improve on the management of protected areas and species; and
- Strengthen international governance for biodiversity and ecosystem services.

Expanding on these goals, the 2023-2030 action plan focuses on five broad goal objectives:

- Adopt a Whole-of-Government, Whole-of-Society Approach to Biodiversity;
- Meet Urgent Conservation and Restoration Needs;
- Secure Nature's Contribution to People;
- Enhance the Evidence Base for Action on Biodiversity; and
- Strengthen Ireland's Contribution to International Biodiversity Initiatives.

This plan operates across statutory and non-statutory policy realms.

1.1.13. Cork County Development Plan 2022-2028

This plan sets out an overall strategy for the proper planning and sustainable development of the functional area of Cork County Council over a six-year period. The Development Plan comprises a written statement indicating the development objectives (including mandatory objectives) for County Cork, supported by maps. Cork County Council is required to prepare and adopt a County Development Plan every six years, with review of the existing Development Plan and commencement of preparation of the new Development Plan required no later than four years after Development Plan adoption.

1.1.14. Waterford County Development Plan 2022-2028

This plan sets out an overall strategy for the proper planning and sustainable development of the functional area of Waterford City & County Council over a six-year period. The Development Plan

comprises a written statement indicating the development objectives (including mandatory objectives) for County Waterford, supported by maps. Waterford City & County Council is required to prepare and adopt a County Development Plan every six years, with review of the existing Development Plan and commencement of preparation of the new Development Plan required no later than four years after Development Plan adoption.

1.1.15. Guidance and Resources

This EIAR chapter has been prepared in reference to current key industry standard guidance including the following:

- Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater Coastal and Marine (CIEEM, 2024);
- Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022);
- Wildlife Acts, 1976-2021 and Wildlife (Amendment) Act (2000) including all amendments. In this document, the legislation is referred to collectively as the Wildlife Acts;
- European Communities (EC) (Birds and Natural Habitats) Regulations 2011-2021 (hereafter referred to as the Birds and Habitats Regulations);
- EC Birds Directive 2009/147/EEC;
- EC Habitats Directive 92/43/EEC;
- Convention on the conservation of European wildlife and natural habitats (Bern Convention);
- European Union EIA Directive 2014/52/EU;
- European Union (Environmental Impact Assessment) (Planning and Development) Regulations 2014 (S.I. No. 543/2014);
- European Union Water Framework directive (WFD) 2000/60/EC;
- Flora (Protection) Order, 2015;
- Planning and Development Act (2000) including all amendments; and
- Planning and Development (Amendment) Act 2010.

The following guidelines were included in the evaluation of biodiversity receptors (flora and fauna) in relation to the Proposed Development:

- EPA (2017). Guidelines on The Information to be Contained in Environmental Impact Assessment Reports (Draft). Environmental Protection Agency, Wexford;
- CIEEM (2017a). Guidelines For Ecological Report Writing. Chartered Institute of Ecology and Environmental Management.
- CIEEM (2017b). Guidelines for Preliminary Ecological Appraisals. Chartered Institute of Ecology and Environmental Management, UK.
- NRA (2009a). Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes. National Roads Authority, Dublin;
- NRA (2009b). Guidelines for Assessment of Ecological Impacts of National Roads Schemes. National Roads Authority, Dublin;

- Environmental Planning and Construction Guidelines Series (National Roads Authority, 2005 – 2011);
- Smith, G.F., O'Donoghue, P., O'Hora, K., Delaney, E. (2011). Best Practice Guidance for Habitat Survey and Mapping. The Heritage Council, Kilkenny;
- Fossitt, J.A. (2000). A Guide to Habitats in Ireland. The Heritage Council, Kilkenny; and
- NPWS (2019). status of EU Protected Habitats and Species in Ireland. Volume 3, Species Assessment. Unpublished Report.

1.1.16. Sources of Information

The following information sources were consulted in undertaking this assessment:

- National Parks & Wildlife Service (NPWS) website www.npws.ie;
- National Biodiversity Data Centre website (NBDC) www.biodiversityireland.ie;
- Cork County Council <https://www.corkcoco.ie/en>;
- Transport Infrastructure Ireland (formerly National Roads Authority (NRA)) www.tii.ie;
- European Union (EU) www.europa.eu;
- Water Framework Directive (WFD) www.wfireland.ie;
- Scottish National Heritage (Nature Scot) www.nature.scot;
- The Heritage Council www.heritagecouncil.ie;
- Construction Industry Research and Information Association (CIRIA) www.ciria.org;
- Irish Wildlife Trust (IWT) www.iwt.ie;
- Environmental Protection Agency website (EPA) www.epa.ie;
- Inland Fisheries Ireland (IFI) www.fisheriesireland.ie;
- Birdwatch Ireland (BWI) www.birdwatchireland.ie;
- Birdlife International <https://datazone.birdlife.org/site/mapsearch>;
- Bat Conservation Ireland (BCI) www.batconservationireland.org; and
- Butterfly Ireland www.butterflyconservation.ie.

Satellite imagery was reviewed to identify areas of potentially suitable breeding habitat.

1.2. Statements of Authority

Cillian Burke BSc ACIEEM (Ecologist, INIS): drafted this EclA. He is an Ecologist with a BSc (Hons) in Environmental Science from the Galway University. Cillian has 5 years' experience in undertaking multi-disciplinary surveys including habitat classification, ornithology vantage point (VP) surveys, breeding wader surveys, Ecological Clerk of Works (ECoW) and bat surveys. He has co-authored ecological reports including Appropriate Assessment (AA) Screenings, Natura Impact Statement (NIS), Environmental Impact Assessment Reports (EIARs), EclAs and Species Habitat Management Plans (SHMP).

Conor Daly MSc BSc (Hons.) ACIEEM (Ecologist, INIS): reviewed this EclA. He is the Report Team Lead with Inis Environmental Consultants Ltd. Conor was awarded a MSc in Biodiversity and Conservation and a BSc (Hons) in Zoology. Conor has conducted bird, mammal, habitat and entomological surveys for renewable energy projects, conservation monitoring projects and private developments since 2021. Over his four years as an ecologist, Conor has written Preliminary Environmental Assessments (PEA), AA Screening, NIS and EIARs.

Chris McKiernan BSc ACIEEM (Ecologist, INIS): Chris carried out waterbird connectivity VP and wintering wetland bird surveys (I-WeBS) for this report. Chris has over 4 years of experience carrying out professional ornithology surveys in Ireland on a variety of projects. They received a BSc in Ecology and Environmental Biology from UCC in 2020 and are an Associate member of CIEEM. They have been heavily involved in carrying out and coordinating hen harrier surveys with INIS, for both breeding and wintering. Chris also carried out many of the other surveys for INIS, including VP surveys, I-WeBS, Woodcock surveys, Red Grouse surveys, Breeding Raptor (Kestrel, Peregrine, Barn Owl, Merlin) surveys, CBS transects, mammal walkover surveys and bat surveys.

Daelyn Purcell BSc (Ecologist, INIS): Daelyn carried out water connectivity VP surveys, bird transect surveys, I-WeBS, a preliminary bat roost (PRA) survey, habitat surveys and an invasive species survey for this report. Daelyn serves as Ecologist within Inis Environmental Consultants Ltd holding a BSc (Hons) in Wildlife Biology from the Institute of Technology Tralee. Daelyn's expertise lies within the area of ornithology with six years' experience conducting various ornithological surveys in line with best practice guidelines through Inis Environmental, other various Ecological Consultancies and has worked on several conservation projects with BirdWatch Ireland in previous years. Daelyn also has experience with terrestrial mammal surveys and habitat classification. Daelyn is also an Associate member of CIEEM.

Emer Hannon BSc (Ecologist, INIS): Emer carried out bat emergence surveys for this report. She is the Team Lead Manager with Inis and has a BSc in Ecology and Environmental Biology. She has bat surveying experience including Preliminary Roost Assessments (PRA), bat activity surveys, and she has also worked with Bat Conservation Ireland as a volunteer for the All-Ireland Daubenton's Bat Waterways Surveys. She is experienced in Ecological Bird Survey techniques, both in the field and with data management. She has extensive training in team management and health and safety practices and processes. She is a Qualifying member of CIEEM.

Calum McSorley BSc MSc (Ecologist, INIS): Calum carried out bat emergence surveys for this report. He was Lead Bat Ecologist at Inis Environmental Consultants and has a BSc in Environmental Science from National University of Ireland Galway and an MSc in Ecological Management and Conservation Biology from Queen's University Belfast. Calum has extensive bat surveying experience including roost

assessments, emergence/re-entry surveys, static detector deployments and various exclusion practices. He also has experience in a range of other ecological surveys including habitat classification, mammal surveys, amphibian surveys and reptile surveys.

Camille Groh BSc MSc (Ecologist, INIS): Camille carried out bat emergence surveys for this report. She is an Ecologist and Project Manager at INIS with a BSc (Hons) in environmental science from Northeastern University and an MSc (Hons) in wildlife conservation and management from University College Dublin. Camille regularly conducts a range of bird, habitat, terrestrial mammal and amphibian surveys in-line with Best Practice standards. Camille has experience writing Ecology Survey Reports and Ecological Impact Assessments. Her work studying Irish and British avifauna communities was published in *Ecology and Evolution*. Camille is a Qualifying member of CIEEM.

Dr Alex Copland BSc PhD MEnvSc MCIEEM (Technical Director, INIS): reviewed this report. Alex has over 25 years of professional experience working in both statutory and private companies, in third-level research institutions and with environmental NGOs. He is a full member of the Institute of Environmental Sciences (IES) and the Chartered Institute of Ecology and Environmental Management (CIEEM). He is proficient in experimental design and data analysis and has managed several large-scale, multi-disciplinary ecological projects. These have included research and targeted management work for species of conservation concern, the design and delivery of practical conservation actions with a range of stakeholders and end-users, education and interpretation on the interface between people and the environment and the development of coordinated, strategic plans for birds and biodiversity. He has written numerous scientific papers, developed and contributed to evidence-based position papers, visions and strategies on birds and habitats in Ireland. He has supervised the successful completion of research theses for several post-graduate students, including doctoral candidates and is a collaborative researcher with both UCD and UCC. He also sits on the Editorial Panel of the scientific journal, *Irish Birds*, which publishes original ornithological research relevant to Ireland's avifauna, and CIEEM'S Irish Policy Group.

1.3. Constraints and Limitations

There are a number of limitations inherent to field-based surveying. These particularly relate to suitable weather conditions for completing surveys, with good visibility and little wind or rain being of paramount importance for recording birds. When undertaking and completing fieldwork, careful consideration and planning is required to ensure optimal weather conditions during survey periods.

A single Vantage Point (VP) location was used for bird activity surveys for the Proposed Development. Initial design phases had the Proposed Development within 1km of this VP location in 2024. Following project design changes in 2025, the Proposed Development fell within 2km of this VP location. Per NatureScot (2017) recommended methods for monitoring birds for renewable energy projects, additional VPs were not required as the whole project fell within the maximum 2km viewshed recommended for VP surveys. Additional surveys related to I-WeBS were also conducted to inform the extent of foraging species utilising the various fields relevant to the Proposed Development. Given these efforts, there is no significant restriction or constraint to apply to the bird data regarding extent of flying individuals utilising the habitat or the extent of foraging species present within the ecological baseline.

The field surveys for the data presented here were all undertaken following Best Practice guidance, including being undertaken during suitable weather conditions. As such, no constraints or limitations associated with the data presented here are considered likely.

2. ENVIRONMENT OF DEVELOPMENT

2.1. Location of Development

The Proposed Development is located 7km northwest of Youghal, and 6.5km northeast of Killeagh, Co. Cork. It is bounded by the R364 to the north, the Park Hill road runs between the east and west sites. The Tourig River (18T03) runs adjacent to the western boundary of the Proposed Development. The Ballyneague River (18B47) and Knocknagappagh River (18K42) run through the Proposed Development site boundary, the Youghal Park (18Y01) and Ballyglavin Rivers (18B67) flow south of the Proposed Development site southern boundary. The Carriganass River (18C30) flows through the Proposed Development from the north. These rivers are within the Tourig_020 sub-basin (IE_SW_18T030700) (**Figure 2.1**). The Proposed Development is located 3.5km upstream of the Blackwater River (Cork/Waterford) Special Area of Conservation (SAC) and the Blackwater Estuary Special Protection Area (SPA) (**Figure 2.2**) and Blackwater River and Estuary proposed Natural Heritage Area (pNHA) (**Figure 2.3**).

2.2. Description of Development

A detailed description is included in the Planning and Environmental Report **Chapter 4 Description of the Proposed Development**. In summary, the Proposed Development area is 328ha and will comprise the following elements:

- Solar array;
- Inverter/transformer stations;
- New site entrances and access tracks;
- All ancillary development such as drainage infrastructure, security fencing, CCTV, weather stations and storage containers for spare parts;
- Temporary construction compound(s);
- Landscaping;
- Biodiversity enhancement;
- Battery energy storage system (BESS); and
- 220kV substation & loop in grid connection.

A 10-year planning permission and 40-year operational life from the date of commissioning of the entire Proposed Development is being sought.

It is envisaged that construction will take approximately 21 months to complete. However, this is subject to various factors including weather conditions. The timeline includes preliminary works such as detailed design and marking out.

Deliveries of project components are scheduled from August 2027 to June 2028 depending on the element of the Proposed Development under construction.

The main construction activities, which includes civil engineering, fencing, tracks, compounds, hardstands, drainage, substation and BESS is scheduled for the period September 2027 to September 2028.

For the solar array element, pile foundation, frame structure assembly and solar PV module installation is scheduled to occur between January 2028 and September 2028.

Trenching for electrical cabling instruction, inverter and transformer installation is scheduled for the period March 2028 to October 2028. Short term local road openings to allow cable ducting will occur during this period.

Construction of the Loop-in grid connection and commissioning of the Proposed Development is scheduled to occur during the period August 2028 to March 2029. During the loop-in construction the existing 220kV Knockraha to Cullenagh Overhead line will be interrupted for a period of circa 17 weeks. The exact timing of this line outage will be agreed in advance with EirGrid and ESB Networks.

This also indicates the overlapping time periods when most delivery and construction activities will occur , mainly between March 2028 and October 2028.

It is anticipated that the Proposed Development will be connected and fully operational by April 2029.

2.2.1. Construction

2.2.1.1. Installation of Solar Panels

Construction of the solar PV panel installation will also entail:

- Installation on ground-mounted frames (driven into the ground attached to driven steel piles), installation of precast concrete ballast foundations where required (expected to be minimal);
- Excavation of trenches for cables connecting solar panels to inverter/transformers, to join the land parcels and to connect the solar farm to the proposed 220kV AIS Substation;
- Erection of the stock proof fencing and gates;
- Laying of stone and concrete beams/plinths for inverter/transformers, crane hardstands and RMU;
- Installation of solar panels;
- Placing of containers and inverter/transformers, and RMU;
- Landscaping;
- Electrical fit out;
- Installation and testing of all below-ground cables, including 33kV interconnector cable;
- Energisation and start up testing;
- Commissioning and compliance testing; and
- Ancillary infrastructure, including internal access tracks, security fencing, CCTV, lighting, and drainage.

Each solar PV panel will be erected on a galvanised steel support structure/ frame. This method of installation causes minimal ground disturbance and occupies less than 1% of the land area.

Battery Energy Storage System (BESS)

The proposed BESS will be constructed just south of the proposed 220kV Loop-in substation on the southern side of the existing 220kV Knockraha – Cullenagh Overhead Line. The key construction element will include:

- Installation of clean water cut-off drains around the BESS construction area and temporary spoil storage;
- Construction of the access track from the trackway accessing the substation site to the BESS site and around the BESS itself. This access track will pass under the existing Knockraha-Cullenagh 220KV line and will be constructed around the BESS;
- Topsoil clearance and storage for landscaping purposes;
- Excavation and levelling of the BESS footprint through cut and fill operations;
- Construction of the concrete **plinths** on which the containers housing the battery units will be placed;
- Construction of the communications building housing electrical components, and banded diesel tank, and a generator;
- Construction of underground ducting for the BESS electrical cabling to the proposed substation
- Construction of the drainage network around the BESS and trackway;
- Delivery and installation of the inverters, transformers and containers with battery units using a lift crane from the constructed access trackway;
- Electrical connection to the substation via 3 x 33kV underground cables of circa 350m in length, which will be pulled through the installed cable ducts; and
- Commissioning of the BESS.

2.2.1.2. Substation

The proposed 220kV AIS Substation will be constructed just north of the existing 220kV Knockraha – Cullenagh Overhead Line. The key construction element will include:

- Construction of the access track to the substation site;
- Establishment of the temporary construction compound (this will also serve the construction of the BESS loop-in tower construction);
- Installation of clean water cut off drains around the proposed substation construction area, temporary spoil storage and temporary construction compound area;
- Topsoil clearance and storage for landscaping purposes;
- Excavation and levelling of the Substation footprint through cut and fill operations;
- Associated ground works for the substation platform, Transformers and transformer bays and storage facilities;
- Construction of the EirGrid control building and Greenhills control building housing electrical control and switchgear equipment, banded diesel tank and generator, welfare facilities and storage;
- Construction of underground ducting for the Substation electrical cabling;
- Construction of the drainage network around the and Substation and construction of the percolation area; and
- Delivery and installation of the transformers, electric switchgear and containers with battery units using a lift crane from temporary crane hardstands.

2.2.1.3. Loop-in Grid Connection to Knockraha-Cullenagh 220kV Overhead Line

The proposed Loop-in grid connection will involve the following construction elements:

- Liaison with EirGrid/ESBN to initiate the existing line outage;
- Temporary disconnection of conductors from the tower to be removed;
- Dismantling of the existing intermediary steel tower and removal of materials off-site including excavation of foundations and backfilling or removal of concrete foundation to a depth of 300mm below ground level and backfilling with suitable subsoil and topsoil;
- Topsoil clearance and storage for landscaping and reinstatement purposes at the new tower locations;
- Excavation of the tower foundations and temporary storage of topsoil and subsoil separately;
- Formwork for concrete foundations and concrete pouring, and curing;
- Erection of the loop-in steel towers using cranes on a temporary hardstand;
- Connection of the steel towers to the Traffos in the proposed new substation;
- Connection of the Loop-in towers to the existing 220kV overhead line; and
- Commissioning of the substation and Loop-in connection.

2.2.2. Operation

A 10-year planning permission and 40-year operational life from the date of commissioning of the entire Proposed Development is sought. During this phase, operational activities will involve general maintenance of elements of the Proposed Development such as the control building which will involve human presence and possible light machinery.

2.2.3. Decommissioning

At the end of its operational life, the Proposed Development will be decommissioned as assessed in the Planning and Environmental Report. Prior to decommissioning, Orsted Onshore Ireland Midco Limited (The Applicant) may make an application to extend the life of the Proposed Development, however this would be subject to an entirely new planning application. Decommissioning the solar farm elements will involve the complete removal of above ground components. Cranes will be used to disassemble each Inverter/Transformer, and they will be removed from the site. The foundations of the Inverter plinths will be removed, and the ground will be covered by soils typical of the surrounding environment and then reseeded or left to re-vegetate according to ecological requirements. Underground cables will be cut back and will be recycled. It is proposed that site access tracks will remain to allow access through the site for farm access, as considered appropriate at the time. Decommissioning the proposed development will take approximately two months to complete.

Details of decommissioning will be agreed with the local authority prior to any decommissioning taking place. A site-specific Decommissioning Management Plan will be prepared by the Developer for the approval of the Planning Authority before Decommissioning work can commence.

Site materials will be recycled where practicable or disposed of in accordance with waste legislation and best practice guidelines at the time of decommissioning.

As with construction, decommissioning works could result in potential significant effects on identified sensitive receptors. Details of decommissioning will be agreed with the local authority prior to any

decommissioning taking place. The potential for effects during the decommissioning phase of the Proposed Development has been fully assessed in the Planning and Environmental Report.

It is envisaged that the Proposed 220kV AIS Substation will be handed over to the Network Operator (EirGrid/ESB Networks), forming part of the national grid and will not be decommissioned.

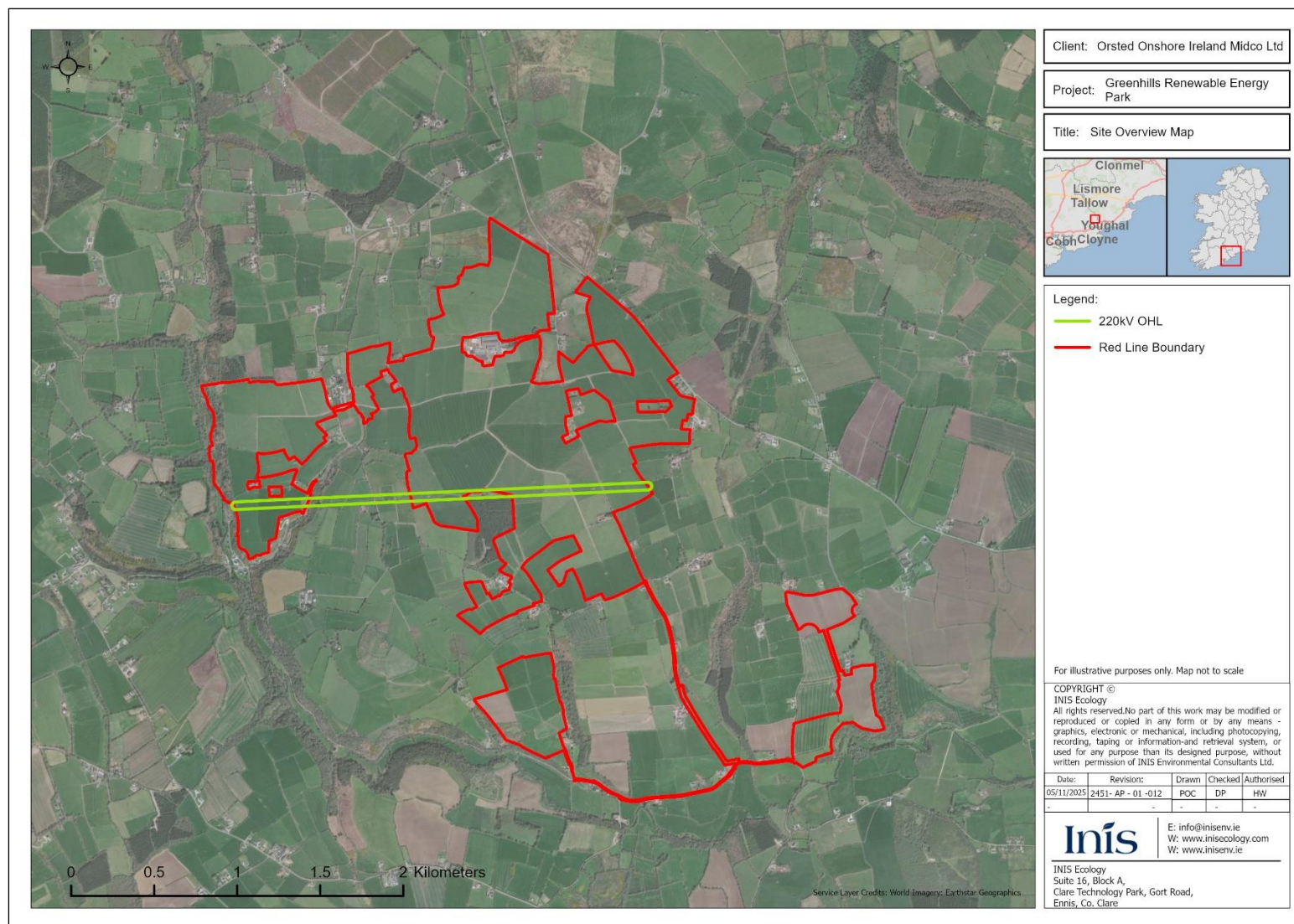


Figure 2.1: Overview Map of Proposed Development, 2025.

3. METHODOLOGY

This section describes the methods employed for determining the ‘ecological baseline’ of the site (i.e. the habitats and species present within and in close proximity to the site absent the Proposed Development), informed by relevant best practice guidance.

3.1. Desk Study

A desktop review was completed to identify relevant features of ecological importance within the receiving environment prior to the commencement of survey work. This involved an online assessment of relevant bird, mammal and other species data from published or open-access data and information. During the course of the survey efforts, this was updated with relevant literature, including reports from previous bird surveys and studies within the area.

Historical records of species recorded within the 10km² OS grid squares that overlap with Proposed Development were acquired from the resources listed in **Section 1.1** (X08). Species of conservation concern or listed under wildlife legislation were provided for each target group.

International, National and Locally designated sites were identified via the NPWS website and county council development plans are provided in a list showing proximity to the nearest element of the Proposed Development.

An indicative list of sources of information included within this review include:

- Bird Atlas 2007–11 (Balmer *et al.*, 2013);
- Birds in Ireland (Hutchinson, 1989);
- BirdWatch Ireland. Countryside Bird Survey Square Histories; Available at <https://c0cre470.caspio.com/dp.asp?AppKey=4bae30003837d13624fb4a4087d1> [accessed November 2025];
- Birdwatch Ireland (2019) I-WeBS Counter Manual: Guidelines for Irish Wetland Bird Survey counters. Available at: <https://birdwatchireland.ie/app/uploads/2019/03/CBS.pdf> [accessed November 2025];
- Birds of Conservation Concern in Ireland (Gilbert *et al.*, 2021). Note that this was published in spring 2021, updating the previous list (Colhoun & Cummins, 2013);
- Irish Birding. Sightings of birds in Ireland; available at <http://www.irishbirding.com/birds/web> [accessed November 2025];
- King *et al.* (2011) Ireland Red List No. 5: Amphibians, Reptiles & Freshwater Fish. National Parks and Wildlife Service;
- Lawton *et al.* (2020) ‘All-Ireland Squirrel and Pine Marten Survey 2019’. Irish Wildlife Manuals;
- Lysaght and Marnell (2016) ‘Atlas of Mammals in Ireland 2010-2015’, National Biodiversity Data Centre, Waterford;
- Marnell *et al.* (2019) ‘Ireland Red List No. 12: Terrestrial Mammals’. National Parks and Wildlife Service;
- National Biodiversity Data Centre. Biodiversity Maps; Available at <https://maps.biodiversityireland.ie/> [accessed November 2025];

- National Parks and Wildlife Service. NPWS Map Viewer; Available at <http://webgis.npws.ie/npwsviewer/> [accessed November 2025];
- 'National Otter Survey of Ireland 2010/12'. *Irish Wildlife Manuals No. 76*. National Parks and Wildlife Service Reid *et al.* (2013); and
- 'How many Eurasian badgers *Meles meles* L. are there in the Republic of Ireland?'. *European Journal of Wildlife Research* Sleeman *et al.* (2009).

The NBDC have introduced a bat landscape suitability index tool¹ to inform areas of high value for bats. The value ratings are based on records of species and general habitat suitability to these species (**Table 3.1**). The results of the bat landscape suitability are in **Section 5.1.2** below.

Table 3.1: NBDC bat landscape suitability.

Bat Landscape Suitability Values Table	
Suitability value range	Suitability rating
0.000000 - 13.000000	Very low/negligible
13.000001 - 21.333300	Low
21.333301 - 28.111099	Moderate
28.111100 - 36.444401	High
36.444402 - 58.555599	Very high

3.2. Field Study

Below is a brief summary list of the surveys conducted for each target group, the relevant guidance followed, and the survey timings (e.g. month and year) (**Table 3.2**).

Table 3.2: Survey Methodology Summary List.

Surveys	Target Species	Methodology Guidance	Date
Terrestrial Habitat			
Walkover	General Plants, Habitat Features, Invasive plant species	Fossitt (2000); Smith <i>et al.</i> (2011)	27 th January; 28 th February; 20 th March; 2 nd May; 19 th August 2025
Birds			
Water connectivity surveys	General waterbirds	SNH (2017)	27 th January; 4 th and 11 th February; 11 th March; 15 th May; 6 th June 2025
Countryside bird transects (CBS) surveys	Passerines	CBS (2012)	22 nd May and 6 th June 2025
I-WeBS	Wintering Waterbirds	SNH 2017; Goodship & Furness, 2022; BirdWatch Ireland (2008)	27 th January, 4 th and 11 th February, 11 th March, 15 th May and 6 th June 2025

¹ <https://maps.biodiversityireland.ie/Map>

Surveys	Target Species	Methodology Guidance	Date
Field Assessment surveys	All birds	N/A	27 th January, 4 th , 11 th and 28 th February, and 12 th , 27 th and 28 th March
Mammals			
Mammal Walkover surveys	General Mammals	NRA (2005, 2006, 2008)	Field Assessments: 27 th January; 4 th , 11 th and 28 th February; 12 th , 27 th and 28 th March. Mammal Walkovers: 19 th and 21 st August 2025
Otter <i>Lutra lutra</i> Watercourse Crossing surveys	Otter	NRA (2006, 2008); Reid <i>et al.</i> (2013); Highways Agency (1999)	19 th and 21 st August 2025
Amphibians			
Field Assessment surveys	Common Frog, Smooth Newt	Amphibian and Reptile Conservation Trust (ARC) (2021); NRA (2008)	27 th January, 4 th , 11 th and 28 th February; 12 th , 27 th and 28 th March
Bats			
PRA	Bats	Collins (2023)	15 th May 2025
Bat Roost Emergence Surveys	Bats	Collins (2023)	15 th , 16 th , 22 nd July; 5 th , 7 th , 28 th August; 2 nd and 9 th September 2025

3.2.1. Field Assessment

3.2.1.1. Habitats

All habitats within this field study area were surveyed and mapped according to best practice methods (Fossitt, 2000; Smith *et al.*, 2011). All habitats within a 50m buffer of work locations of the solar farm were surveyed, where access allowed and classified using Fossitt (2000) (**Figure 3.1**). Aerial photography assisted habitat delineation and interpretation, and plant identification and nomenclature followed Parnell & Curtis (2012) and Stace (2010). The predominant plant species for each habitat type were recorded to accurately determine habitats present within the study area. The surveys were carried out in good weather with no constraints.

During habitat surveys, particular attention was paid to searching suitable habitat for rare or protected flora species, to determine whether they were present within, or close to, the Proposed Development site boundary. Habitat survey efforts are detailed in **Table 3.3** below.

Table 3.3: Habitat Walkover Survey Efforts.

Survey	Observer	Date	Start Time	End Time
Habitat Walkover	DP	27/01/2025	11:45	15:15
Habitat Walkover	DP	28/02/2025	09:15	14:15
Habitat Walkover/Invasive species Walkover	DP	20/03/2025	11:15	17:15
Habitat Walkover	DP	02/05/2025	09:00	14:00
Habitat/Invasive species Walkover	DP	19/08/2025	11:15	14:45

3.2.1.2. Invasive Species

Invasive species surveys were also undertaken during habitat surveys; target species included any Invasive Alien Plant Species (IAPS) listed under the Third Schedule of the EU Birds and Habitat Regulation 2011 (S.I. 477) and First Schedule of the EU (Invasive Alien Species) Regulations 2024 (S.I. 347 of 2024). All invasive species within this field study area were surveyed and mapped according to best practice methods (Smith *et al.*, 2011). Invasive species surveys were undertaken on 20th March and the 19th of August 2025 (**Table 3.3**).

3.2.1.3. Bats

3.2.1.3.1. Preliminary Roost Assessment

A dedicated Preliminary Roost Assessment (PRA) was undertaken on 15th May 2025 to identify suitable bat roost features. General walkover surveys were conducted during field assessments throughout the field study area, to include any forestry and suitable structure to identify any candidate roost features with low suitability or higher. PRA survey efforts are provided in **Table 3.4**.

Table 3.4: PRA Survey Efforts.

Date	Survey Type	Observer	Start Time	End Time	Duration of survey (s)
15/05/2025	PRA	DP	N/A	N/A	N/A

Ground-level roost assessments were carried out for all trees and other structures within the Proposed Development, using binoculars (model: Steiner SkyHawk 3.0 10x42) to determine their suitability for bats. The aim of the ground-level inspections was to identify any Potential Roost Features (PRFs) (i.e. cavities or crevices on trunks or limbs) and evidence of bats (e.g. droppings, fur-oil stains at access points). Coniferous trees within plantations were not inspected in detail, based on them rarely supporting features large enough to be of potential suitability to bats, and because it is standard forestry practice to remove any trees that have obvious signs of damage and disease; as a result, trees within conifer plantations typically have negligible suitability for bats.

More specifically, the aims of undertaking PRAs of structures within the Proposed Development were to:

- Determine the potential roost entry and exit points within the structure;
- Determine the commuting corridors used by bats leading to and from their existing or potential roost(s), and to record associated vegetation, including linear habitat features, likely to be of importance to bats; and
- Assess the potential suitability of structures on site and up to 500m from the Proposed site boundary to roosting bats.

The structures identified within the Proposed Development site boundary area were searched externally for bats or signs of their presence (**Figure 3.1**). Ground-level areas of potential roost entrances were examined for the presence of droppings and feeding remains (e.g. moth wings, etc.). Structures were also examined for access/egress points, polishing or scratching, urine and oily residue stains, and for cavities suitable for roosting bats. Cavities and open areas were searched where safe and possible, and accessible internal areas were checked without disturbance with a high-powered torch. As bats sometimes do not leave visible signs of their presence, absence of evidence was not

enough to reduce the suitability of a structure and was used only to inform a higher likelihood of any roost feature being an active roost.

Buildings, trees and other potential structures were subsequently categorised according to their potential to support roosting bats. Roosting potential for buildings is categorised as: negligible, low, moderate or high (Collins, 2023).

These categorisations informed the number of emergence and re-entry surveys required to confidently determine the presence or likely absence of roosting bats within structures subject to survey (Collins, 2023; see **Table 3.5**).

With adherence to Collins 2023, roosting potential for trees are categorised based on Ground-Level Tree Assessments (GLTAs): negligible, PRF-I or PRF-M and were considered during site visits. As stated in Collins 2023, PRF-I is defined as the PRF being only suitable for individual bats or very small numbers of bats, either due to size or lack of suitable surrounding habitats. PRF-M is defined as a PRF that is suitable for multiple bats, and therefore may be suitable for a maternity colony, see **Table 3.6**.

Table 3.5: Surveys for buildings recommended as a result of PRA (Collins, 2023).

Suitability (structures)	No. of surveys	Timing
Negligible	-	-
Low	1 Dusk Emergence Survey	May-August
Moderate	2 Dusk Emergence Survey and 1 Re-entry Survey	May-September (at least 1 between May-August)
High	3 Dusk Emergence Surveys and 1 Re-entry Survey	May-September (at least 2 between May-August)

Table 3.6: Surveys for trees recommended as a result of PRA (Collins, 2023).

Suitability (structures)	Description	No. of surveys & timing	Timing
Negligible	-	-	-
Low Roost Suitability/PRF-I	PRF is only suitable for individual bats or very small numbers of bats either due to size or lack of suitable surrounding habitats	No further surveys required for trees	-
High Roost Suitability/PRF-M	PRF is suitable for multiple bats and may therefore be used by a maternity colony	At least 2 Dusk Emergence Surveys	May-September

3.2.1.3.2. Roost Emergence/Re-entry Surveys

Dusk emergence surveys initially consisted of presence/absence surveys involving dusk and visits to trees, buildings or other structures to complete emergence. Surveyors used acoustic bat detectors (Anabat Walkabout and Batbox Duets) to listen for bats exiting or re-entering roosts. If the presence of a bat roost was confirmed at any single feature, then this triggered further emergence/re-entry surveys to characterise the roost and determine the species and numbers of individuals occupying it (See **Table 3.5** and **Table 3.6** above).

In line with best practice guidance (Collins, 2023), bat roost presence/absence surveys are needed if:

- The PRAs of structure have not ruled out the reasonable likelihood of a roost being present (because there are locations with potential for bats to roost undetected in concealed cracks, crevices or voids), but no definitive evidence of the presence of bat roosts has been recorded;
- or, the PRA inspections of trees identified them as having low, moderate or high potential roost features for, bats but no definitive evidence of the presence of bat roosts has been recorded;
- A comprehensive inspection survey is not possible because of restricted access, but there are features with a reasonable likelihood of supporting bats; and/or
- There is a risk that evidence of bat use may have been removed by weather or human activities; and
- The aim of this survey is to determine the presence or absence of bats at the time of the survey and the need for further surveys, licensing and mitigation.

Dusk emergence surveys were carried out in suitable weather conditions (**Table 3.7, Table 3.8**). Surveys were carried out with an appropriate number of surveyors to visually cover all the potential roosting features of the structure or tree being surveyed.

Surveys were carried out 15 minutes before sunset and completed 1.5 – 2 hours after sunset, as per Best Practice Guidance (Collins, 2023). If a bat was observed emerging from a structure, its emergence location, time of emergence, and species (if possible) were also recorded. General bat activity directly around the buildings, such as feeding and commuting, was also recorded. Survey efforts of emergence surveys conducted in July and August 2025 for three structures of moderate to high roosting potential, BL1, BL3 and BL6, are provided in **Table 3.9** below.

Bat activity surveys were conducted with handheld bat detectors. The Elekon Batlogger was used by experienced surveyors to identify bat species, based on their call frequencies. SD card recordings from duets and Anabat devices were stored for all surveys to allow for quality control checks on species identification and for species that could not be determined during the survey efforts (e.g. *Myotis* spp.).

Table 3.7: Survey timings and weather condition requirements (Collins, 2023).

Survey Type	Start Time	End Time
Dusk Emergence	15 minutes before sunset	1.5-2hrs after sunset
Area	Temperature minimum	Wind speed maximum
Lowland	10 degrees Celsius	18km/hr
Upland	8 degrees Celsius	27km/hr

Table 3.8: The Beaufort Wind Scale (REF).

Wind Speed (km/hr)	Beaufort Value	Description
0	0	Calm
1-5	1	Light Air
6-11	2	Light Breeze

Wind Speed (km/hr)	Beaufort Value	Description
12-19	3	Gentle Breeze
20-28	4	Moderate Breeze
29-38	5	Fresh Breeze
39-49	6	Strong Breeze
50-61	7	Near Gale
62-74	8	Gale
75-88	9	Strong Gale
89-102	10	Storm
103-117	11	Violent Storm
>118	12	Hurricane

Table 3.9: Roost Emergence survey efforts and weather data.

Site	Date	Surveyor	Detector Model	Thermal Camera	Survey	Rain	Cloud	Wind Speed	Wind Direction	Start Temp	End Temp	Sunset	Start Time	End Time	Duration of survey (s)
BL1	15/07/2025	EH	Elekon Batlogger	Yes	Emergence	None	7/8	F2	WSW	14	12	21:44	21:29	23:14	6300
BL1	15/07/2025	CMS	Elekon Batlogger	Yes	Emergence	None	8/8	F2	SW	14	12	21:44	21:29	23:14	6300
BL1	05/08/2025	KP	Elekon Batlogger	Yes	Emergence	None	6/8	F1	NW	14	12	21:14	20:59	22:44	6800
BL1	02/09/2025	DP	Elekon Batlogger	Yes	Emergence	None	8/8	F1	SSW	14	13	20:18	20:03	21:48	6300
BL3	16/07/2025	EH	Elekon Batlogger	Yes	Emergence	None	8/8	F1	SE	16	16	21:43	21:27	23:13	6300
BL3	16/07/2025	CMS	Elekon Batlogger	Yes	Emergence	None	8/8	F1	SE	16	16	21:43	21:27	23:13	6300
BL3	07/08/2025	EH	Elekon Batlogger	Yes	Emergence	None	3/8	F1	W	16	15	21:14	20:59	22:44	6300
BL3	07/08/2025	CMS	Elekon Batlogger	Yes	Emergence	None	3/8	F1	W	16	15	21:14	20:59	22:44	6300
BL3	28/08/2025	CF	Anabat Walkabout	Yes	Emergence	None	7/8	F2	WSW	15	13	20:27	20:12	21:57	6300
BL3	28/08/2025	KP	Anabat Walkabout	Yes	Emergence	None	7/8	F2	WSW	15	13	20:27	20:12	21:57	6300
BL6	22/07/2025	CG	Elekon Batlogger	Yes	Emergence	None	6/8	F2	NW	14	14	21:38	21:23	23:08	6300
BL6	22/07/2025	CMS	Elekon Batlogger	Yes	Emergence	None	6/8	F2	NW	14	14	21:38	21:23	23:08	6300
BL6	09/09/2025	EH	Elekon Batlogger	Yes	Emergence	None	3/8	F2	S	14	13	20:02	19:47	21:32	6300
BL6	09/09/2025	CMS	Elekon Batlogger	Yes	Emergence	None	3/8	F2	S	14	13	20:02	19:47	21:32	6300

3.2.1.4. Non-Volant Mammals

3.2.1.4.1. General Mammals

Mammal walkovers were conducted within the Proposed Development as part of the field assessment surveys on 27th January; 4th, 11th, 28th February; 12th, 27th and 28th March 2025. Dedicated mammal walkover surveys were also undertaken on 19th and 21st of August 2025. These surveys were undertaken in line with the NRA guidelines for the '*Treatment of Eurasian Badgers Prior to Construction of National Road Schemes*' (NRA, 2005). A general walkover of the Development site was conducted within the Proposed Development where access was possible (**Figure 3.1**). Details recorded included evidence type, species, location, and supporting descriptions. This information was suitable to inform the current mammal baseline data, and the extent of risk posed to the mammal ecological baseline by the Proposed Development. Mammal walkover survey efforts are provided in **Table 3.10**.

Evidence of Otter (spraint, slides, holts, feeding evidence (including cracked shells, fish bones, etc.)) were searched along waterbodies within the Proposed Development as part of these surveys following NRA guidelines for '*Treatment of Otters Prior to the Construction of National Road Schemes*' (NRA, 2006) and '*Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes*' (NRA, 2008).

Other mammal species were surveyed for and included, recording the following field signs of all mammals during terrestrial mammal surveys undertaken within the study area:

- Well-used pathways;
- Prints/tracks;
- Scats/spraints/droppings;
- Signs of feeding (foraged pinecones, Badger *Meles meles* snuffle holes, etc); and
- Places of shelter and features or areas likely to be of particular value as foraging resources (NRA, 2005).

Photographs and detailed notes were also recorded of features of potential value to relevant mammal species and subsequently mapped using QGIS (See **Section 5.2.4; Appendix C for photographs**).

Records of incidental sightings of individuals or other evidence observed during other surveys (incidental records) were also considered to inform the baseline data.

Table 3.10: Mammals Field Assessment Survey Efforts.

Survey Type	Date	Observer	Start Time	End Time	Duration of survey (s)
Field Assessment	27/01/2025	DP	11:45	15:15	12600
Field Assessment	04/02/2025	DP	11:45	15:45	14400
Field Assessment	11/02/2025	DP	11:00	15:30	16200
Field Assessment	28/02/2025	DP	09:15	14:15	18000
Field Assessment	12/03/2025	DP	10:20	13:20	10800
Field Assessment	27/03/2025	DP	09:15	14:15	18000
Field Assessment	28/03/2025	DP	09:15	14:15	18000

Survey Type	Date	Observer	Start Time	End Time	Duration of survey (s)
Mammal Walkover	19/08/2025	DP	11:15	14:45	12600
Mammal Walkover	21/08/2025	DP	11:15	14:45	12600

3.2.1.5. Amphibians

Amphibian field assessment surveys overlapped with mammal field assessment surveys and were conducted simultaneously. Surveys followed the ‘*Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes*’ (NRA, 2008) with regard to the field study area, 50m and along watercourses. Watercourse edges were observed for signs of amphibians during mammal and habitat surveys.

Targeted surveys following ARC (ARC, 2021) protocol were conducted on 27th January 2025, 4th and 28th February 2025 and 28th March 2025. Amphibian surveys commenced with the undertaking of a preliminary habitat suitability survey (**Figure 3.3**). This was carried out during daylight hours, where the surveyor located suitable waterbodies for amphibians to breed in.

A list of survey efforts is provided in **Table 3.11**.

Table 3.11: Amphibian Field Assessment Survey Efforts.

Survey Type	Date	Observer	Start Time	End Time	Duration of survey (s)
Field Assessment	27/01/2025	DP	11:45	15:15	12600
Field Assessment	04/02/2025	DP	11:45	15:45	14400
Field Assessment	11/02/2025	DP	11:00	15:30	16200
Field Assessment	28/02/2025	DP	09:15	14:15	18000
Field Assessment	28/03/2025	DP	09:15	14:15	18000

3.2.1.6. Invertebrates

Invertebrate field assessment surveys overlapped with mammal field assessment surveys and were conducted simultaneously (27th January 2025, 4th & 28th February 2025, 12th and 27th & 28th March 2025 and 19th & 21st of August). Surveys followed the standard advice from the All-Ireland Pollinator Plan in assessing areas suitable to support all life stages of important pollinators (i.e. Hoverflies, Solitary bees, Butterflies and Bumblebees)

Marsh Fritillary *Euphydryas aurinia* is an Annex II species under the EU Habitats Directive. It is found in metapopulations within calcareous grasslands containing its food plant (Devil’s-bit Scabious *Succisa pratensis*). As such, potential supporting habitat exists within the Zol of the Proposed Development where suitable grassland habitat mosaics are present. This species is monitored by both Butterfly Conservation Ireland (BC) and National Parks and Wildlife Services (NPWS). Suitability surveys were conducted within 50m of the proposed site boundary where;

- Any potential supporting habitat within the immediate surrounding area of the Proposed Development where the associated food plant species are present;
- 50m from all road works; and
- 50m from the proposed site boundary.

Marsh Fritillary undergoes local extinctions and refounding events infrequently due to its niche food plant requirements (Harding, 2022). The maximum distance females will travel for ovipositing has been theorized to be several kilometres. Therefore, Qualifying Interest (QI) Marsh Fritillary populations listed under any designated site within 15km of the proposed site boundary were considered for potential interaction with any suitable habitat present with the smaller 50m ZoI.

Any other remaining receptor (e.g. red-list invertebrate species) was assigned a general ZoI of 50m from Proposed Developments elements.

Upon the identification of field sign, photographs and detailed notes were taken, and the feature was mapped using QGIS. Records of incidental sightings of individuals or other evidence from other surveys were also considered to inform the baseline data.

3.2.1.7. Birds

Field assessment surveys were undertaken to identify suitable habitat and evidence of sensitive bird species within the Proposed Development (**Table 3.12**). These surveys overlapped with field assessments for mammal, bat and amphibians' surveys and were conducted simultaneously.

Table 3.12: Bird Field Assessment Survey Efforts.

Survey Type	Date	Observer	Start Time	End Time	Duration of survey (s)
Field Assessment	27/01/2025	DP	11:45	15:15	12600
Field Assessment	04/02/2025	DP	11:45	15:45	14400
Field Assessment	28/02/2025	DP	09:15	14:15	18000
Field Assessment	12/03/2025	DP	10:20	13:20	10800
Field Assessment	28/03/2025	DP	09:15	14:15	18000

3.2.2. Countryside Bird Surveys

Three Transects were surveyed in 2025. Two visits for each transect were undertaken for the breeding season (22nd May 2025 and 6th June 2025). One Transect was located adjacent to the proposed substation loop and BESS area, to identify the extent of bird nesting territories present in proximity to these elements of the Proposed Development. The other two transects were located within the two Southern sections of the Proposed Development (**Figure 3.2**).

The methodology followed the standardised line transect methodology for surveying birds, CBS Manual: Guidelines for Countryside Bird Survey Participants (CBS, 2012). Two transects, 1km in length, which covered hedgerow, treeline and grassland habitats, were walked, and all birds encountered (visually and aurally) were identified and their abundance recorded (**Figure 3.4**). The surveys were carried out in acceptable weather conditions as per best practice (dry weather, calm winds, high visibility) (CBS, 2012).

Survey efforts were undertaken during the optimal surveying period (before 11:00am).

The primary target of these surveys was passerine species. Any other species were also recorded for activity, including waders, gulls, raptors and waterfowl.

All birds were recorded on standardised recording sheets using QField in four distance categories from the transect route (0-25 m; 25-100 m; 100+ m and in flight).

The conservation status of each species recorded during the field surveys was assessed using the EU Birds Directive and Birds of Conservation Concern in Ireland-listed (Gilbert *et al.*, 2021).

Survey efforts for each transect survey undertaken during the breeding season 2025 are provided in **Table 3.13**.

Table 3.13: *Breeding Season 2025 CBS Survey Efforts.*

Transect No.	Date	Observer	Rain	Cloud	Visibility	Wind Speed	Wind Direction	Temp	Start Time	End Time	Duration of Survey (s)
1	22/05/2025	DP	None	3/8	20	F3	SE	16	07:50	08:15	1500
2	22/05/2025	DP	None	3/8	20	F3	SE	13	06:45	07:20	2100
3	22/05/2025	DP	None	3/8	5	F3	SE	12	05:55	06:30	2100
1	06/06/2025	DP	None	3/8	20	F2	SW	10	07:05	07:35	1800
2	06/06/2025	DP	None	3/8	20	F2	SW	9	06:10	06:40	1800
3	06/06/2025	DP	None	2/8	10	F2	SW	8	05:25	06:00	2100

3.2.3. I-WeBS

Wintering wetland birds include wildfowl (ducks, geese, and swans), waders and other species typically associated with wetland habitats, such as herons, grebes, crakes, rails, and gulls. Wetland birds were surveyed in winter following the standardised approach used for the Irish Wetland Birds Survey (I-WeBS). The I-WeBS methodology is detailed in the I-WeBS Counters Manual (BirdWatch Ireland, 2008) and these methods represent the recommended approach in the Nature Scot guidance documents (SNH, 2017).

Monthly I-WeBS took place in winter season 2024/2025 and the breeding migratory period. Surveys included observing from a vantage point over all lakes and suitable waterbodies (i.e. turloughs, flooded fields). Surveyors used binoculars and telescopes to record the count number, locations and time of sightings of species. A precautionary 5km buffer of the Proposed Development was used for the field study area and survey locations are provided in **Figure 3.3**. All wildfowl were recorded (if present) as target species during I-WeBS surveys. Details of survey efforts and dates are provided in **Table 3.14**. Results are provided in **Section 5.2.8**

A total of six site visits were undertaken (27th January 2025, 4th and 11th February 2025, 11th March 2025, 15th May 2025 and 6th June 2025).

3.2.4. Water Connectivity Surveys

Water connectivity surveys were undertaken using the SNH VP methodology (SNH, 2017). One VP was selected following viewshed analysis and available guidance (SNH, 2017) to provide ground level coverage of all lands under consideration at the time (**Figure 3.4**). The availability of suitable weather conditions for completing surveys (i.e., with good visibility and little wind or rain) was considered within survey scheduling to ensure the avian flight data presented herein were all collected in optimal weather conditions (as required by best practice guidance).

Waterbirds were the primary target species for this survey to determine usage of the site by species associated with the Blackwater Estuary SPA and SPAs within the wider coastal and surrounding counties with SCIs with large foraging distances i.e. Lesser Black-backed Gull *Larus fuscus* and Herring Gull *Larus argentatus*, these included gulls, wader species and any species of conservation concern.

Total counts of each species recorded in each season were tallied to inform the key receptors present within the study area. Details recorded included flightlines, which were digitised using QGIS software (QField), flight durations, flight direction, and flight heights.

A combined total of 12 hours of VP surveys were completed during the survey period (**Table 3.15**).

A total of six site visits were conducted for water connectivity surveys (27th January 2025, 4th and 11th February 2025, 11th March 2025, 15th May 2025 and 6th June 2025).

Table 3.16 provides the dates, surveyors and weather during survey efforts over the monitoring period presented in this report. Surveys were distributed evenly across daylight hours and conditions, in line with SNH (2017) guidance.

Table 3.14: I-WeBS Survey Efforts.

Date	Observer	Rain	Cloud	Visibility (km)	Wind Speed	Wind Direction	Temp	Start Time	End Time	Duration of Survey (s)
27/01/2025	DP	Moderate rain	8/8	3	F4	SE	7	10:30	11:30	3600
04/02/2025	DP	None	6/8	20	F4	SW	8	10:15	11:15	3600
11/02/2025	DP	None	7/8	20	F3	E	4	09:10	10:40	5400
11/03/2025	CMCK	None	7/8	5	F3	NE	9	13:20	15:20	7200
15/05/2025	DP	None	3/8	20	F3	SE	16	08:00	09:30	5400
06/06/2025	DP	None	8/8	20	F2	SW	10	07:40	08:40	3600

Table 3.15: Winter VP hours surveyed at the Proposed Development.

VP	Jan	Feb	Mar	May	Jun	Total
1	2	4	2	2	2	12

Table 3.16: Winter Season 2024/2025 Survey Efforts.

VP Name	Date	Observer	Rain	Cloud	Visibility (km)	Wind Speed	Wind Direction	Temp.	Start Time	End Time	Duration of survey (s)
VP1	27/01/2025	DP	None	8/8	5	F4	SE	8	15:25	17:25	7200
VP1	04/02/2025	DP	None	6/8	20	F2	S	7	07:55	09:55	7200
VP1	11/02/2025	DP	None	8/8	10	F3	E	4	16:00	18:00	7200
VP1	11/03/2025	CMCK	None	6/8	10	F1	NE	10	16:28	18:28	7200
VP1	15/05/2025	DP	None	4/8	20	F2	SE	14	17:35	19:35	7200
VP1	06/06/2025	DP	None	6/8	20	F3	SW	14	13:25	15:25	7200

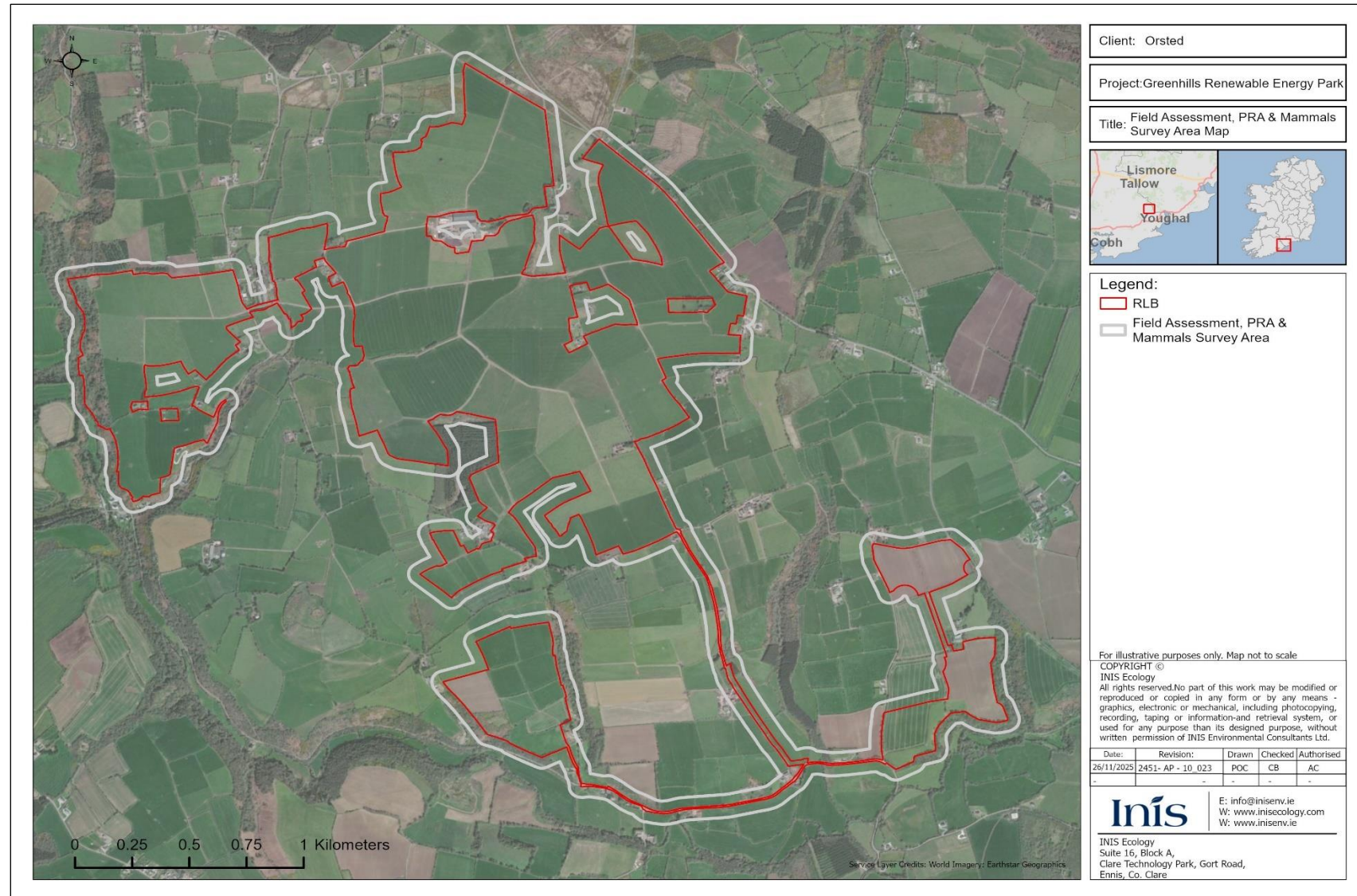


Figure 3.1: Field Assessment, PRA and Mammals Survey Area.

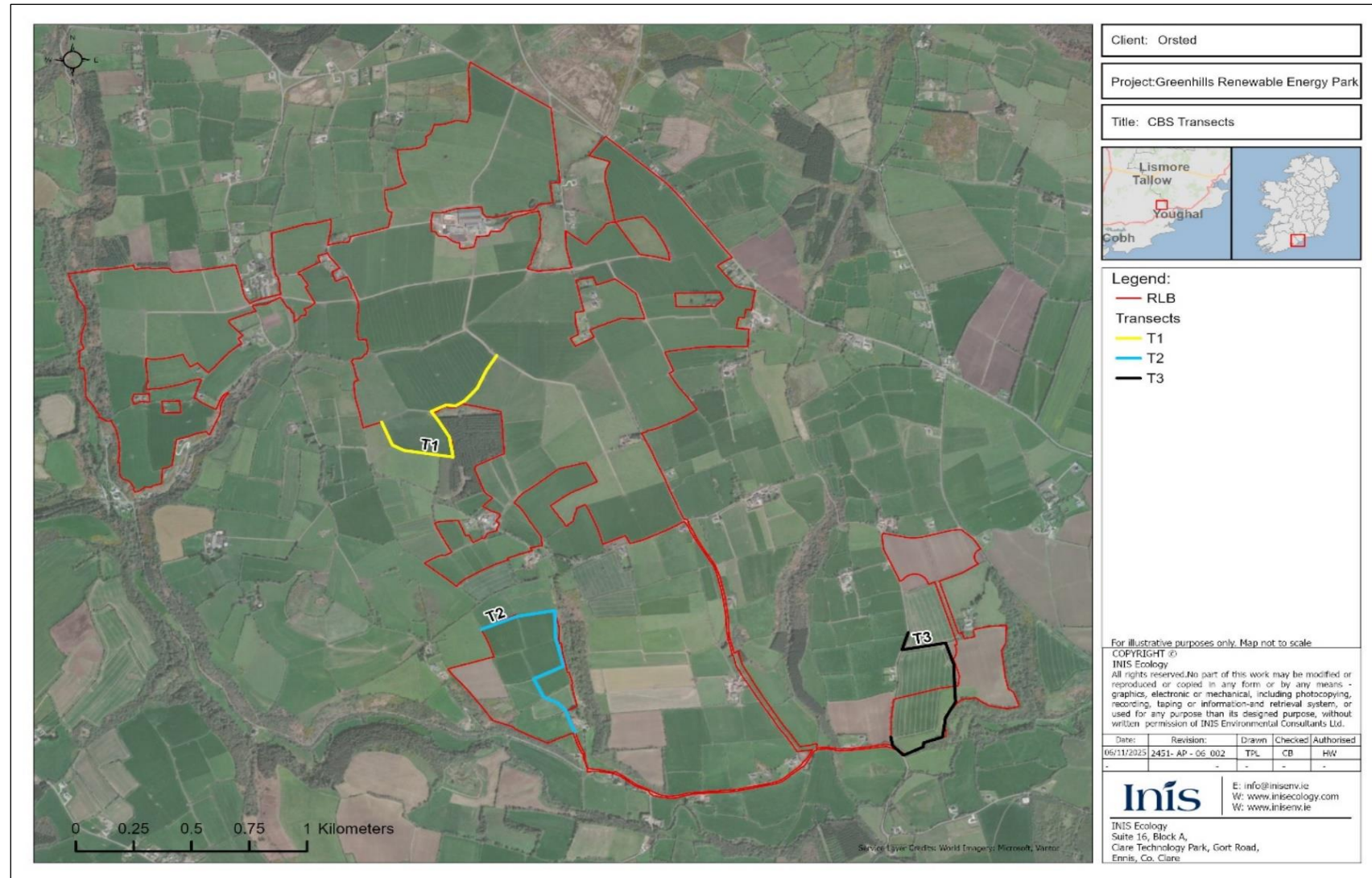


Figure 3.2: CBS Transect Survey Locations.

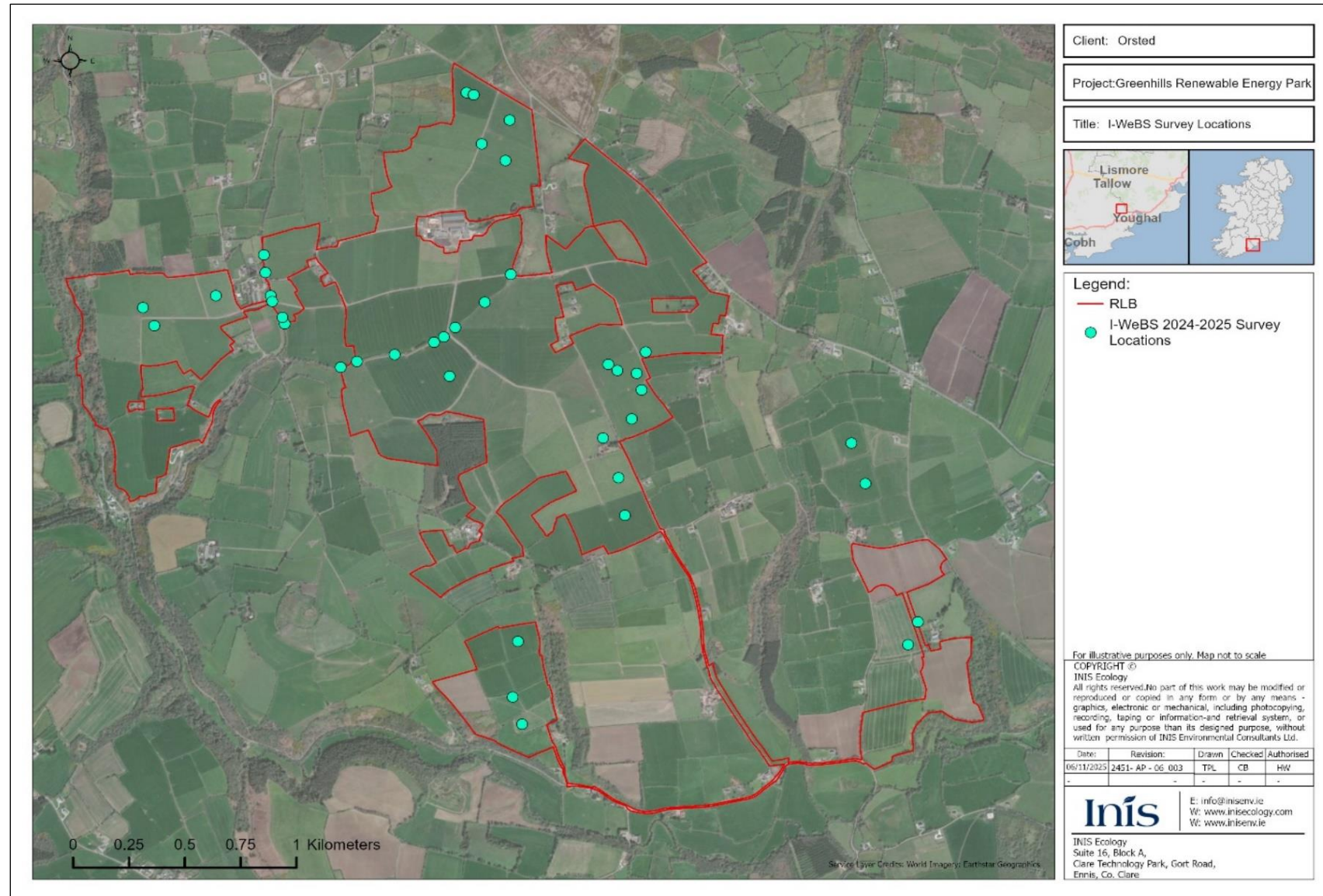


Figure 3.3: I-WeBS Survey Locations.

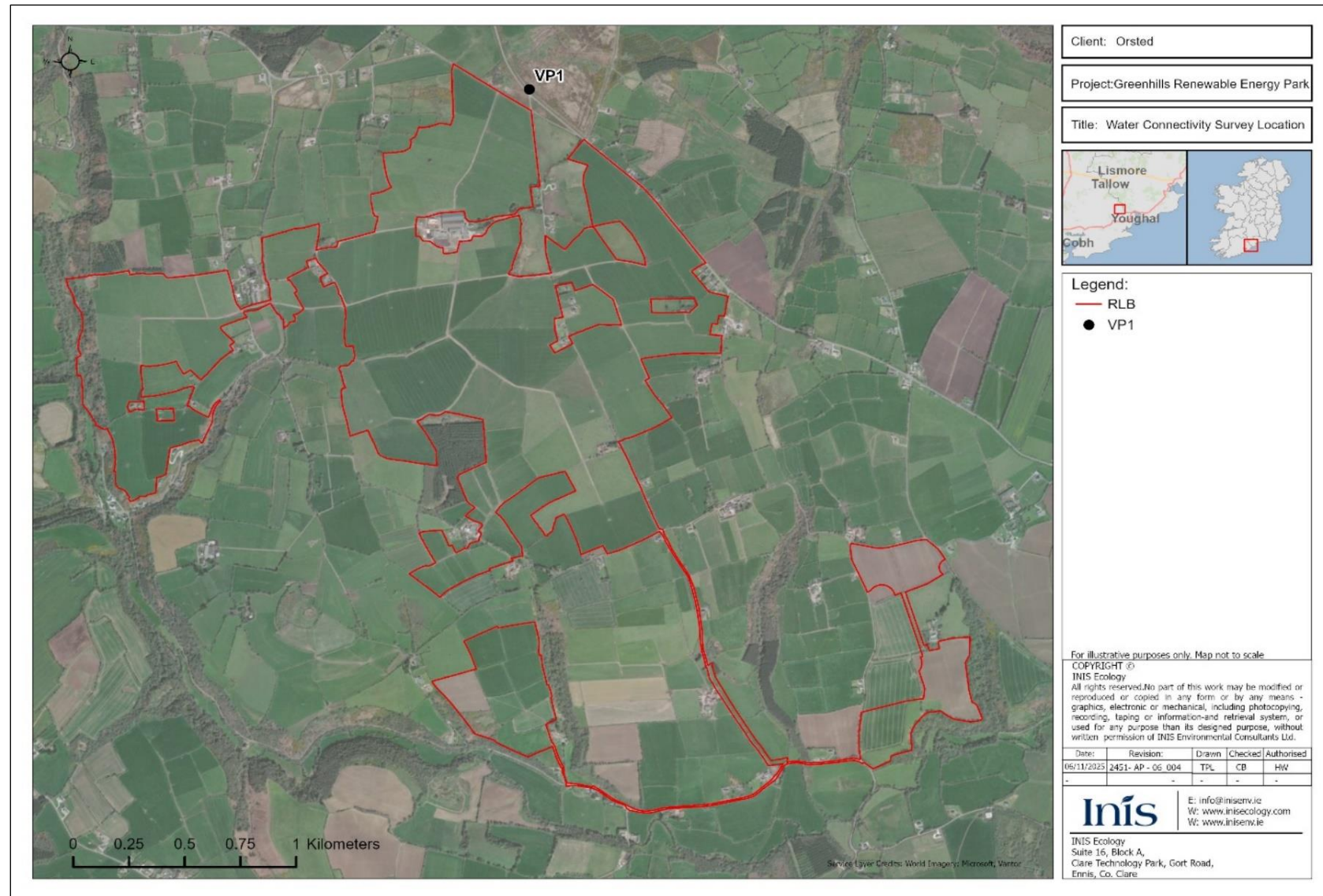


Figure 3.4: Water Connectivity VP location.

4. ASSESSMENT METHODOLOGY

4.1. Potential Impacts Associated with Solar Photovoltaic Farm Developments

Solar farm developments may result in the following impacts on ecological features:

Direct habitat loss and fragmentation: the construction and (typically to a lesser extent) operational maintenance and decommissioning of solar farm infrastructure have the potential to result in both permanent and temporary loss and alteration of habitats, potentially resulting in reduced habitat extent, quality and connectivity;

Disturbance and displacement: the construction, operation and decommissioning stages of a solar farm may result in disturbance of ecological features within and near to the solar farm. This may lead to certain species avoiding the solar farm and its surrounding habitats (i.e., displacement). Displacement may also include barrier effects, resulting in species being deterred from using normal dispersal routes and corridors both to and from feeding, breeding and roosting grounds;

Pollution of habitats: the construction, operation and decommissioning stages of a solar farm may result in the pollution of habitats within and adjacent to the site. In particular, aquatic ecological features can be subject to the following impacts;

Input of silt: as well as directly affecting fish and their ability to use their gills for respiration, the input of silt into waterbodies and watercourses has the potential for medium to long-term impacts as it settles on the riverbed, smothering coarse patches of sediment with fine particles. This can deplete oxygen levels within the sediment by reducing the flow of water through the sediment, causing direct mortality of eggs and early life stages of fish and other aquatic species;

Input of cement: the introduction of cement into an aquatic environment can change the water chemistry (particularly pH and dissolved oxygen) and add suspended solids, both of which can negatively impact aquatic species, resulting in significant adverse effects;

Input of hydrocarbons and chemicals: spillage of hydrocarbons and their chemicals into aquatic environments has the potential to cause increased mortality of plants and animals through physiochemical reactions and direct toxicity;

Input of nutrients: significant increases in nutrient levels in aquatic environments can result in elevated biological productivity and excessive plant and algal growth (e.g., from increased nitrogen and phosphorus). This causes ambient dissolved oxygen levels to fall and leads to eutrophication, which is known to result in adverse effects on a range of aquatic species; and

Hydro-morphological changes: these can result from direct mechanical disturbance to watercourses and/or significant changes within the catchment, potentially affecting the abundances and distributions of aquatic species.

For each of these potential impacts, detailed knowledge of the characteristics and distributions of ecological features within and adjacent to the site has been used to predict the impacts of the

Proposed Development on biodiversity. Impacts are assessed during the construction, operation and decommissioning stages, and cumulatively in consideration of other plans and developments.

4.2. Assessment of the Importance of Key Ecological Receptors

The importance of the ecological features relevant to this assessment has been evaluated based on the methodology set out in Chapter 3 of the 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' (EPA, 2022) and 'Guidelines for Assessment of Ecological Impacts of National Roads Schemes' (NRA, 2009; **Appendix A**). These guidelines and the CIEEM Guidelines for Ecological Impact Assessment (CIEEM, 2024) provide a basis for determination of whether any particular feature is of importance at the following geographic scales:

- International importance (i.e., important in a European context);
- National importance (i.e., important in an Irish context);
- County/district importance (i.e., important in the context of County Cork); and
- Local importance (Higher or Lower) (i.e., locally important populations/assemblages of species and/or protected and/or priority species/habitats).

The evaluation criteria for these scales of importance are provided in **Table 4.1** below.

Table 4.1: Evaluation Criteria for Assessing the Importance of Ecological Receptors.

Level of Importance	Evaluation Criteria
International importance	<i>An internationally designated site or candidate/proposed site; i.e., an SAC or candidate SAC (cSAC), Special Protection Area (SPA) or proposed Special Protection Area (pSPA), and/or Ramsar site.</i> <i>A sustainable area of a habitat listed in Annex I of the Habitats Directive or smaller areas of such habitat which are essential to maintain the viability of the larger whole.</i> <i>Land that is functionally linked to an internationally designated site to the extent that it is essential to maintaining the coherence of the Natura 2000 Network.</i> <i>Sustainable population of an internationally important species or site supporting such a species (or supplying a critical element of their habitat requirement) i.e.: IUCN Red List species that is listed as critically endangered, endangered, or vulnerable; or</i> <i>Species listed in Annex IV of the Habitats Directive; or</i> <i>Sites that support 1% or more of a biogeographic population of a species.</i>
National importance	Nationally designated sites (National Heritage Area (NHA) or potential NHA (pNHA), Statutory Nature Reserve or National Park). Sustainable population of a nationally important species or site supporting such a species (or supplying a critical element of their habitat requirement), i.e.: Refuge for fauna and flora protected under the Wildlife Acts. Resident or regularly occurring populations (assessed to be important in an Irish context) of the following: Species protected under the Wildlife Acts; and/or Species listed on the relevant Red Data list. Sites supporting 1% or more of a national population.

Level of Importance	Evaluation Criteria
County/ district importance	Area of Special Amenity/ area subject to a Tree Preservation Order. Population of a species listed in a Regional BAP or relevant Natural Area on account of its regional rarity or localisation; or Resident or regularly occurring populations (assessed to be important at the regional context) of the following: Species protected under the Wildlife Acts; and/or Species listed on the relevant Red Data list. Sites supporting 1% or more of a regional population. Bird species included on the BoCCI Red or Amber Lists.
Local importance (Higher value)	Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP. Resident or regularly occurring populations (assessed to be important at the Local level) of the following: 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.
Local importance (Lower value)	Sites containing small areas of semi-natural habitat that are of some local importance for wildlife; and/or Sites or features containing non-native species that are of some importance in maintaining habitat links. Populations of species that are common in the local area including those included on the BoCCI Green List.

Features assessed as being of less than Local Importance are considered to be of 'Negligible' importance and have been scoped out of the detailed assessment of effects, since these would not be a material consideration for planning and any effects on these features would not be significant in the context of the local (or higher level) population statuses of these species or species assemblages.

4.3. Identification of Key Ecological Receptors

The assessment methodology follows a precautionary screening approach regarding the identification of ecological features that will be carried forward for impact assessment (i.e. Key Ecological Receptors (KERs)). Therefore, any feature assessed as being of Local importance (Higher value) has been brought forward for assessment of effects, unless it can be proven without any reasonable scientific doubt that effects would be negligible. Other features of lower importance (Local importance (Lower value), and Negligible importance) may also be carried forward; particularly where there may be legislative requirements pertaining to these features that are not necessarily associated with their ecological importance or a feature having a high sensitivity to solar farm projects.

4.4. Methodology for Assessing Effects

The assessment of potential effects from the project on ecological features has taken consideration of the following factors:

- The quality of the effect: assessing the effect as either positive (a change which improves the quality of the environment), neutral (no effects, or effects that are imperceptible), or negative (a change which reduces the quality of the environment);
- The duration of the effect: assessed as either 'short-term' (up to one year), 'medium-term' (one to ten years) or 'long-term' (more than ten years);
- The sensitivity of the receptor/feature: the likelihood of an effect on the ecological feature resulting from an impact, considered on a scale of negligible, low, medium or high;
- The magnitude of change: the extent of change in the baseline conditions of the ecological feature as a result of the Proposed Development, in terms of size, amount, intensity and volume. Expressed in absolute terms where possible and considered on a scale of negligible, low, medium or large;
- Frequency and timing: the number of times an activity or impact may occur and result in the consequential effect;
- Extent: the spatial or geographical area over which the impact and resulting effect may occur under a suitably representative range of conditions; and
- Reversibility: an irreversible effect is one from which recovery within a reasonable timescale is not possible or where there is no reasonable expectation of action being taken to reverse it. A reversible effect is one from which spontaneous recovery is possible, or which may be counteracted through mitigation.

Following the classification of an effect based on the factors described above, a clear statement is made as to whether the effect is "significant" or "not significant". In accordance with CIEEM (2024) guidelines, the significance of an effect on an ecological feature has been determined based on analysis of the factors that characterise the effect.

A significant effect is defined as "an effect that either supports or undermines biodiversity conservation objectives for the ecological feature or for biodiversity in general". The assessment considers whether an effect has potential to alter the conservation status of a species or species assemblage.

The conservation status of a species or species assemblage is defined as "the sum of the influences acting on it which may affect its long-term distribution and abundance, within the geographical area of interest". Conservation status is considered to be favourable under the following circumstances:

- Population dynamics indicate that the species is maintaining itself on a long-term basis as a viable component of its habitats;
- The natural range of the species is not being reduced, nor is it likely to be reduced for the foreseeable future; and

- There is (and probably will continue to be) a sufficiently large area of habitat to maintain its population on a long-term basis.

4.4.1. Methodology of Assessing Effects on Ornithological Features

Guidance from Percival (2007) and NRA (2009) has been used to evaluate the sensitivity of bird species to the Proposed Development (**Table 4.2:**).

Table 4.2: Bird sensitivity rating equivalency (Percival (2007) and NRA (2009) combined).

Sensitivity of bird feature	Percival (2007) Criteria	NRA resource evaluation	NRA Criteria	Combined criteria
Very high	Species is cited interest of SPA. Species present in Internationally important numbers.	International Importance	Resident or regularly occurring populations (assessed to be important at the national level) of the following: Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive.	Species is cited interest of SPA. Species present in Internationally important numbers. Resident or regularly occurring populations (assessed to be important at the national level) of the following: Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive.
High	Other non-cited species which contribute to integrity of SPA. Ecologically sensitive species (<300 breeding pairs in UK) and less common birds of prey. Species listed on Annex I of the EU bird's directive. Regularly occurring relevant migratory species which are rare or vulnerable.	National Importance	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.	Other non-cited species which contribute to integrity of SPA Ecologically sensitive species (<100 breeding pairs nationally to align with "Birds of Conservation 2020-2026" (Gilbert <i>et al.</i> , 2021) and less common birds of prey. Species listed on Annex I of the EU Bird's Directive. Regularly occurring relevant migratory species which are rare or vulnerable. Resident or regularly occurring populations (assessed to be important at the national level) of the following: Species protected under the Wildlife Acts; and/or Includes species listed on the relevant Red Data list that have experienced recent population declines or range contraction (BoCCI Red List).
Medium	Species present in regionally important numbers (>1% of regional population).	County Importance	Resident or regularly occurring populations (assessed to be important at the County level) of the following: Species of bird, listed in Annex I and/or	Species present in regionally important numbers (>1% of regional population). Species occurring within SPA's but not crucial to the integrity of the site.

Sensitivity of bird feature	Percival (2007) Criteria	NRA resource evaluation	NRA Criteria	Combined criteria
	Species occurring within SPA's but not crucial to the integrity of the site. Species listed as priority species in the UK BAP subject to special conservation measures.		referred to in Article 4(2) of the Birds Directive; County important populations of species. Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.	Resident or regularly occurring populations (assessed to be important at the County level) of the following: Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; County important populations of species. Species that are rare or are undergoing a decline in quality or extent at a national level. This includes all other BoCCI Red-listed species not included under "High" sensitivity and Amber-listed species that have experienced recent population declines or range contraction.
Low	Species covered above which are present very infrequently or in very low numbers. Any other species of conservation interest not covered above, e.g. species listed on the red or amber lists of the BoCCI.	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 protected under the Wildlife Acts; and/or Species listed on the relevant Red Data list.	Locally important populations of priority species identified in the Local BAP, if this has been prepared. Resident or regularly occurring populations (assessed to be important at the Local level) of the following: Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; Species protected under the Wildlife Acts; and/or Species listed on the relevant Red Data list. Amber listed species (BoCCI) excluding those under "Medium" sensitivity which have experienced population decline/range contraction.
Negligible	Species that remain common and widespread.	Local Importance (Lower Value)	N/A.	Species that remain common and widespread. Green Listed Species.

4.4.1.1. Determining Magnitude of Impacts to Biodiversity Receptors (Percival 2007)

A definition of terms used in respect of the magnitude of impacts for bird species evaluations is outlined in **Table 4.3**. This rating system has also been used as a general guide for magnitude quantification of impacts for other biodiversity receptors throughout this report.

Table 4.3: *Determining Magnitude of Impacts (Percival 2007).*

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

4.4.1.2. Determining Risk of Effects to Biodiversity Receptors (Percival, 2007)

The guideline probability rating definitions used to inform species evaluations in conjunction with the probability definitions are detailed in **Table 4.4** and **Table 4.5**, below. In some instances, consideration of a species’ sensitivity and/or separation distance has merited an evaluation of less than *Low* in respect of the probability of impacts. This is referenced in the text where applicable.

Table 4.4: *Risk Classifications or Likelihood that an Impact will occur on Biodiversity Receptors (Percival, 2007).*

Probability	Description	Comments
High	Impact is likely to occur (>50% likelihood).	Species known to be vulnerable to specific impact.
Medium	Impact may occur (5-50% likelihood).	Species may be affected by specific impact.
Low	Impact is very unlikely (<5% likelihood).	Species known to be tolerant to specific impact.

Table 4.5: Probability of effects (EPA, 2022).

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

4.4.1.3. Determining Significance of Effect to Birds (Percival 2007 & EPA 2022 combined)

The Percival significance matrix used for bird species evaluations is provided in the table below. This matrix has also been used as a guide for determining the significance of impacts in relation to other biodiversity receptors throughout this report. The equivalent EPA significance ratings have been applied to the table by the authors. EPA guidelines (2022) also define the probability of effects to be considered in EIARs are detailed in **Table 4.6** below.

Table 4.6: Determining the Significance of Impacts (Percival 2007 with equivalent EPA Significance Ratings).

Significance		Sensitivity			
		Very high	High	Medium	Low
Magnitude	Very high	Very high/ Very significant	Very high/ Very significant	High/ Significant effects	Medium/ Moderate effects
	High	Very high/ Very significant	Very high/ Very significant	Medium/ Moderate effects	Low/ Slight effects
	Medium	Very high/ Very significant	High/ Significant effects	Low/ Slight effects	Very low/ Not Significant
	Low	Medium/ Moderate effects	Low/Slight effects	Low/Slight effects	Very low/ Not Significant
	Negligible	Low/ Slight effects	Very low/ Not Significant	Very low/ Not Significant	Very low/ Not Significant

Note: ‘Very Low’ significance (as per Percival 2007) is considered equivalent to the EPA definitions for ‘Not Significant’, or ‘Imperceptible’ or ‘Neutral’ depending on the context of the magnitude of the impact or the sensitivity of the receptor, determined by the authors based on their professional ecological judgement and experience. Similarly, the significance of impacts where the magnitude is Negligible is determined by the authors based on the context of the impact and their professional ecological judgement and experience.

4.4.1.4. EPA EIAR Guidance Definitions of Effects

Terminology regarding the significance of effects described in this EclA references guidelines published in CIEEM (2024) and EPA (2022). Definitions for the level of significance outlined in EPA (2022) are presented below in **Table 4.7** and **Table 4.8** summarises how those criteria correspond to the equivalent level of significance defined by CIEEM (2024).

Table 4.7: EPA Guidelines for Determining Significance of Ecological Effects

Effect	Significance	Definition
Following EPA Guidelines		
Profound		Significant effect on an internationally designated site. An effect which obliterates sensitive characteristics. Total/near total loss of feature populations due to mortality or displacement. Total/near total loss of productivity of a feature population due to disturbance. Guide: >80% of population lost through additive mortality.
Very significant		Significant effect on a nationally designated site. An effect which, by its character, magnitude, duration, or intensity significantly alters most of a sensitive aspect of the environment. Major reduction in the status or productivity of a feature population due to mortality, displacement, or disturbance. Guide: 21-80% of population lost through additive mortality.
Moderate		An effect that alters the character of the environment that is consistent with existing and emerging trends. Partial reduction in the status or productivity of a feature population due to mortality, displacement, or disturbance. Guide: 6-20% of population lost through additive mortality.
Slight		An effect which causes noticeable changes in the character of the environment without affecting its sensitivities. Small but discernible reduction in the status or productivity of a feature population due to mortality, displacement, or disturbance. Guide: 1-5% of population lost through additive mortality.
Not significant		An effect which causes noticeable changes in the character of the environment but without significant consequences. Very slight reduction in the status or productivity of a feature population due to mortality, displacement, or disturbance. Reduction barely discernible, approximating to the “no change” situation. Guide: <1% population lost through additive mortality.

Table 4.8: Comparison of CIEEM and EPA effect terminology.

Significance Following CIEEM (2024) Criteria	Equivalent Significance Using the EPA (2022) Criteria
Significant effect on a feature of International importance	Profound effect
Significant effect on a feature of National importance	Very significant effect
Significant effect on a feature of County importance	Moderate effect
Significant effect on a feature of Local (Higher) importance	Slight effect
Significant effect on a feature of Local (Lower) importance	Not significant effect

As outlined above, a significant effect at the international level under the CIEEM guidelines would equate to a profound effect using the EPA guidelines. As a deviation from the standard EIA methodology, minor effects identified within this chapter have been classified as negligible to ensure that (as per the CIEEM guidelines) a clear statement is made as to whether an effect is “significant” or “not significant”.

4.5. Mitigation Hierarchy

In accordance with CIEEM Guidelines for Ecological Impact Assessment (CIEEM, 2024), a sequential process has been adopted to avoid, mitigate, and offset negative ecological impacts and resulting effects, otherwise known as the ‘mitigation hierarchy’. As part of this project, avoidance, mitigation, offsetting, and enhancement measures have been identified as part of the impact assessment process. These principles underpin any EclA and are adapted from CIEEM (2024) as follows:

Avoidance: seek options that avoid harm to ecological features (for example, by relocating the proposed development to an alternative site);

Mitigation: negative effects should be avoided or minimised through mitigation measures, either through the design of the project or subsequent measures that can be guaranteed (for example, through a planning condition or obligation);

Offsetting: where there are significant negative effects despite the mitigation proposed, these should be offset through the provision of appropriate compensatory measures; and

Enhancement: seek to provide benefits for biodiversity over and above requirements for avoidance, mitigation, and offsetting.

Wherever possible, strategies of avoidance have been implemented to minimise any impacts on ecological features. If and where avoidance has not been possible, mitigation and offsetting measures are proposed, as described in **Section 9** of this chapter.

4.6. Assumptions and Limitations

The information provided in this EclA accurately and comprehensively describes the ecological baseline of the site and provides a prediction of the likely ecological effects of the Proposed Development, along with prescriptions for mitigation as necessary. The specialist studies, analysis, reporting, and assessment methodologies have all been undertaken in accordance with the appropriate guidelines. No significant limitations in relation to the scope, scale, or context of the impact assessment have been identified.

Whilst desk study data is useful in providing supplementary ecological information for a site, it should be acknowledged that these data are dependent on the submission of records to the relevant organisation. As such, a lack of records for a particular species does not necessarily mean that the species is absent from the site and/or wider search area. Similarly, records of a particular species do not necessarily mean that the species is still present within the site and/or wider search area.

It should be noted that ecological features are transient, and that the distributions of habitats and species may be subject to change. As such, in line with CIEEM guidance, the ecological survey data presented in this report are considered valid for at least two years (CIEEM, 2019), after which it may be necessary for further field surveys to be undertaken.

In summary it is considered that no significant constraints exist, and the survey data provides accurate detail on the baseline biodiversity in relation to fauna and flora within the receiving environment of the Proposed Development.

No other significant limitations were encountered during the course of the ecological baseline surveys.

5. ECOLOGICAL BASELINE

5.1. Desk Study

5.1.1. Habitats and Invasive/Protected Species

The EU Protected Species and Habitats Map Viewer² was used to confirm the presence of designated habitats within the Proposed Development boundary and the surrounding environment. The nearest Annex I habitat is tidal mudflats [1140], Mediterranean salt meadows [1410], and salicornia mud [1310] located within the estuaries [1130] habitat, which forms part of the Blackwater River (Cork/Waterford) SAC, located 2.2km east of the Proposed Development site boundary. Old oak woodland [91A0] was recorded 507.6m south of the Proposed Development site boundary.

There is hydrological connectivity via the Youghal Park River, which flows into the Tourig River, which has hydrological connectivity to the Blackwater River (Cork/Waterford) SAC and River Blackwater SPAs located 3.5km downstream.

The Proposed Development therefore has downstream hydrological connectivity to the following Annex I habitats: tidal mudflats [1140], Mediterranean salt meadows [1410], and salicornia mud [1310] located within the estuaries [1130].

The Proposed Development is located within the NBDC X08 10km NBDC grid square. A number of invasive species are recorded in the X08 grid square (**Table 5.2**). This includes a total of 22 records of Japanese Knotweed were recorded during the desk study, two of which were adjacent to the southwest parcel, both recorded on 8th April 2021, and one of which was located in the same 2km square as the northeast parcel on 19th July 2005. The most recent was recorded on 14th May 2023 (NBDC, 2025). A total of 17 records of Cherry Laurel were also recorded during the desk study. The most recent record was on the 23/08/2012, however none of the instances of Cherry Laurel were recorded within the footprint of the Proposed Development (NBDC, 2025).

Desk study results indicated there is one Protected Flora species within the X08 OS grid square (NBDC, 2025) (Killarney Fern *Vandenboschia speciosa*) (Protected Flora Order 2022). A total of 13 records of Killarney Fern were recorded in the Lackaroe and Glendine areas, and as such, they have the potential to be within the receiving environment of the Proposed Development. Therefore, this species is considered a **Key Ecological Receptor (KER)** under the precautionary principle.

The short-term and long-term population trends for Killarney Fern are stable (NPWS, 2019). There were no high-impact pressures/threats identified at any of the individual populations monitored. A total of 86 populations has been documented across Ireland. The extremes in predicted weather from warm, wet winters to periodic droughts in summer could negatively impact Killarney Fern colonies, particularly the sporophyte generation, which is sensitive to desiccation (NPWS, 2019c). This plant species is therefore likely to face a significant decline in the future baseline in a “Do Nothing Scenario” for the receiving environment.

Protected and threatened species within the X08 grid square are outlined in Table 5.2 below. Invasive species recorded within the X08 grid square are also outlined Table 5.2.

Table 5.1: NBDC records of protected and threatened species.

Common name	Scientific name	Date of Record	Designation
Killarney Fern	<i>Trichomanes speciosum</i>	20/06/2005	Protected Species: EU Habitats Directive Annex II, Annex IV Flora Protection Order (FPO) 2022 Schedule A (Vascular Plants)

Table 5.2: NBDC records of invasive species in the X08 10km grid square.

Common name	Scientific name	Date of Record	Designation
Cherry Laurel	<i>Prunus laurocerasus</i>	23/08/2012	Regulation S.I. 374
Common Cord-grass	<i>Spartina anglica</i>	23/08/2012	Regulation S.I. 374
Himalayan Balsam	<i>Impatiens glandulifera</i>	29/07/2022	Regulation S.I. 374
Himalayan Knotweed	<i>Persicaria wallichii</i>	24/05/2009	Regulation S.I. 374
Japanese Knotweed	<i>Fallopia japonica</i>	14/05/2023	Regulation S.I. 374
Rhododendron ponticum	<i>Rhododendron ponticum</i>	08/05/2024	Regulation S.I. 374
Three-cornered Garlic	<i>Allium triquetrum</i>	20/05/2016	Regulation S.I. 374

5.1.2. Mammals, Amphibians and Invertebrates

The terrestrial receptors recorded within the X08 10km NBDC grid square are outlined below in Table 5.3 (NBDC, 2025). This data was accessed on 9th September 2025.

Table 5.3: NBDC records of designated protected and invasive species within the Proposed Development (X08 10km grid square).

Common name	Record count	Scientific name	Date of record	Designation
Terrestrial Mammals				
Badger	105	<i>Meles meles</i>	31/12/2016	Wildlife Acts
Hedgehog	22	<i>Erinaceus europaeus</i>	25/09/2022	Wildlife Acts
Irish Hare	26	<i>Lepus timidus subsp. hibernicus</i>	25/05/2023	N/A
Irish Stoat	11	<i>Mustela erminea subsp. hibernica</i>	03/08/2024	N/A

Common name	Record count	Scientific name	Date of record	Designation
Otter	51	<i>Lutra lutra</i>	02/05/2017	Wildlife Acts; EU Habitats Directive – Annex II; Annex IV
Pine Marten	3	<i>Martes martes</i>	31/12/2012	Wildlife Acts; EU Habitats Directive; Annex V
Pygmy Shrew	2	<i>Sorex minutus</i>	20/01/2023	Wildlife Acts
Red Fox	33	<i>Vulpes vulpes</i>	03/09/2015	N/A
Red Squirrel	21	<i>Sciurus vulgaris</i>	20/10/2018	Wildlife Acts
Brown Long-eared Bat	1	<i>Plecotus auritus</i>	01/07/1984	Wildlife Acts; EU Habitats Directive; Annex IV
Soprano Pipistrelle	1	<i>Pipistrellus pygmaeus</i>	09/07/2008	Wildlife Acts; EU Habitats Directive; Annex IV
Amphibians & Reptiles				
Common Frog	7	<i>Rana temporaria</i>	20/02/2018	Wildlife Acts; EU Habitats Directive; Annex V
Smooth Newt	1	<i>Lissotriton vulgaris</i>	26/07/2020	Wildlife Acts
Invasive Species				
American Mink	8	<i>Neovison vison</i>	24/06/2015	High Impact Invasive Species Regulation S.I. 374
Bank Vole	1	<i>Myodes glareolus</i>	31/12/1992	Medium Risk Invasive Species
Brown Rat	1	<i>Rattus norvegicus</i>	21/09/2012	High Risk Invasive Species
Fallow Deer	30	<i>Dama dama</i>	24/10/2018	High Impact Invasive Species Regulation S.I. 477
Greater White-toothed Shrew	1	<i>Crocidura russula</i>	03/06/2015	Medium Risk Invasive Species
Grey Squirrel	1	<i>Sciurus carolinensis</i>	31/12/2012	High Impact Invasive Species Regulation S.I. 374
Rabbit	54	<i>Oryctolagus cuniculus</i>	29/12/2022	Medium Risk Invasive Species
Invertebrates				

Common name	Record count	Scientific name	Date of record	Designation
Dog's Tooth	1	<i>Lacanobia suasa</i>	29/06/1995	Red list; Threatened Species: Near threatened
Marsh Fritillary	1	<i>Euphydryas aurinia</i>	31/12/1975	Wildlife Acts; EU Habitats Directive – Annex II; Red list; Threatened Species: Vulnerable
Dark Green Fritillary	1	<i>Speyeria aglaja</i>	06/06/1971	Red list; Threatened Species: Vulnerable
Small Heath	2	<i>Coenonympha pamphilus</i>	10/07/2018	Red list; Threatened Species: Near threatened
Wall	1	<i>Lasiommata megera</i>	29/08/2000	Red list; Threatened Species: Endangered
Grey-banded Mining Bee	1	<i>Andrena denticulata</i>	29/07/2024	Red list; Threatened Species: Vulnerable
Gypsy Cuckoo Bee	2	<i>Bombus bohemicus</i>	29/04/2022	Red list; Threatened Species: Near threatened
Moss Carder Bee	1	<i>Bombus muscorum</i>	05/09/2012	Red list; Threatened Species: Near threatened
Red-tailed Bumblebee	3	<i>Bombus lapidarius</i>	18/06/2025	Red list; Threatened Species: Near threatened
Willughby's Leafcutter Bee	1	<i>Megachile willughbiella</i>	22/08/2023	Red list; Threatened Species: Near threatened

NPWS records show records of Common Frog *Rana temporaria* and Otter *Lutra lutra* within the surrounding environment of the Proposed Development². The closest record in relation to the Proposed Development was Otter, recorded 270.7m south of the Proposed Development site boundary, the sighting was recorded in the Tourig River.

The Bat suitability values for the Proposed Development site were documented, with the results provided in **Table 5.4** below.

Table 5.4: Bat suitability values for the Proposed Development.

Bat Landscape Suitability Index	
All bats	24.56
Soprano Pipistrelle	34
Brown Long-eared Bat	36

² <https://storymaps.arcgis.com/collections/1a721520030d404f899d658d5b6e159a?item=2>

Bat Landscape Suitability Index	
Common Pipistrelle	38
Lesser Horseshoe Bat	1
Leisler's Bat	30
Whiskered Bat	21
Daubenton's Bat	20
Nathusius' Bat	6
Natterer's Bat	35

5.1.3. Birds

Two SPAs were identified within the relevant ZOI: Blackwater Estuary SPA (004028) and Ballymacoda Bay SPA (004023). Neither of these sites are within the Proposed Development site boundary.

Two International Bird and Biodiversity Areas (IBAs) and Ramsar sites were identified within the ZOI, these include: Blackwater estuary and Ballymacoda. These IBAs have overlapping territories and listed species as the SPA listed above, and have been advocated to become designated SPAs for all elements identified for their IBA designation (Auchincloss *et al.*, 2025). Neither of these two sites are within the Proposed Development site boundary.

NBDC records of bird species recorded within the Proposed Development (X08 10km grid square) are outlined in **Table 5.5** below (NBDC, 2025).

Table 5.5: NBDC records of bird species within the Proposed Development (X08 10km grid square).

Common name	Record Count	Scientific name	Date of record	Designation
Bar-tailed Godwit	5	<i>Limosa lapponica</i>	30/10/2018	Wildlife Acts; EC Birds Directive – Annex I; Red list
Black-headed Gull	40	<i>Chroicocephalus ridibundus</i>	28/01/2023	Wildlife Acts; Amber list
Black-tailed Godwit	28	<i>Limosa limosa</i>	18/03/2023	Wildlife Acts; Red list
Brent Goose	2	<i>Branta bernicla</i>	31/12/2011	Wildlife Acts; Amber list
Buzzard	40	<i>Buteo buteo</i>	29/07/2024	Wildlife Acts; Green list
Common Gull	12	<i>Larus canus</i>	26/01/2020	Wildlife Acts; Amber list
Common Sandpiper	9	<i>Actitis hypoleucos</i>	15/11/2023	Wildlife Acts; Amber list
Cormorant	32	<i>Phalacrocorax carbo</i>	26/01/2020	Wildlife Acts; Amber list
Curlew	53	<i>Numenius arquata</i>	18/03/2023	Wildlife Acts; EC Birds Directive – Annex II; Red list

Common name	Record Count	Scientific name	Date of record	Designation
Grey Plover	3	<i>Pluvialis squatarola</i>	31/12/2011	Wildlife Acts; Red list
Grey Wagtail	25	<i>Motacilla cinerea</i>	13/02/2024	Wildlife Acts; Red list
Hen Harrier	11	<i>Circus cyaneus</i>	22/04/2015	Wildlife Acts; EC Birds Directive – Annex I; Amber list
Herring Gull	16	<i>Larus argentatus</i>	10/12/2018	Wildlife Acts; Amber list
House Martin	20	<i>Delichon urbicum</i>	02/06/2021	Wildlife Acts; Amber list
House Sparrow	36	<i>Passer domesticus</i>	05/12/2012	Wildlife Acts; Amber list
Kestrel	21	<i>Falco tinnunculus</i>	02/05/2021	Wildlife Acts; Red list
Kingfisher	7	<i>Alcedo atthis</i>	21/12/2020	Wildlife Acts; EC Birds Directive – Annex I; Red list
Knot	2	<i>Calidris canutus</i>	31/12/2011	Wildlife Acts; Red list
Lapwing	10	<i>Vanellus vanellus</i>	20/01/2023	Wildlife Acts; EC Birds Directive – Annex II; Red list
Lesser Black-backed Gull	5	<i>Larus fuscus</i>	31/12/2011	Wildlife Acts; Amber list
Linnet	30	<i>Linaria cannabina</i>	13/02/2024	Wildlife Acts; Amber list
Little Egret	34	<i>Egretta garzetta</i>	28/01/2023	Wildlife Acts; EC Birds Directive – Annex I
Dunlin	6	<i>Calidris alpina</i>	28/01/2023	Wildlife Acts; EC Birds Directive - Annex I; Red list
Goldcrest	43	<i>Regulus regulus</i>	30/01/2024	Wildlife Acts; Amber list
Golden Plover	8	<i>Pluvialis apricaria</i>	28/01/2023	Wildlife Acts; EC Birds Directive - Annex I; Red list
Great Crested Grebe	2	<i>Podiceps cristatus</i>	31/12/2011	Wildlife Acts; Amber list
Mallard	54	<i>Anas platyrhynchos</i>	07/02/2024	Wildlife Acts; EC Birds Directive – Annex II; Annex III; Amber list
Meadow Pipit	31	<i>Anthus pratensis</i>	31/12/2011	Wildlife Acts; Red list
Mediterranean Gull	2	<i>Ichthyophaga melanocephalus</i>	31/12/2011	Wildlife Acts; EC Birds Directive – Annex I; Amber list
Merlin	3	<i>Falco columbarius</i>	31/12/2011	Wildlife Acts; EC Birds Directive - Annex I; Amber list
Mute Swan	3	<i>Cygnus olor</i>	31/07/1991	Wildlife Acts; Amber list
Oystercatcher	35	<i>Haematopus ostralegus</i>	18/03/2023	Wildlife Acts; Red list

Common name	Record Count	Scientific name	Date of record	Designation
Peregrine	7	<i>Falco peregrinus</i>	21/03/2022	Wildlife Acts; EC Birds Directive - Annex I; Green list
Razorbill	1	<i>Alca torda</i>	31/12/2011	Wildlife Acts; Red list
Red Kite	4	<i>Milvus milvus</i>	30/01/2024	Wildlife Acts; Red list
Red-breasted Merganser	6	<i>Mergus serrator</i>	08/10/2018	Wildlife Acts; EC Birds Directive – Annex II; Amber list
Redshank	31	<i>Tringa totanus</i>	18/03/2023	Wildlife Acts; Red list
Redwing	11	<i>Turdus iliacus</i>	31/12/2011	Wildlife Acts; Red list
Sand Martin	9	<i>Riparia riparia</i>	31/12/2011	Wildlife Acts; Amber list
Sandwich Tern	1	<i>Thalasseus sandvicensis</i>	19/08/2019	Wildlife Acts; Amber list
Shelduck	21	<i>Tadorna tadorna</i>	20/01/2023	Wildlife Acts; Amber list
Skylark	10	<i>Alauda arvensis</i>	31/12/2011	Wildlife Acts; Amber list
Snipe	14	<i>Gallinago gallinago</i>	26/01/2020	Wildlife Acts; Red list
Spotted Flycatcher	13	<i>Muscicapa striata</i>	02/07/2022	Wildlife Acts; Amber list
Spotted Redshank	2	<i>Tringa erythropus</i>	31/12/2011	Wildlife Acts; Amber list
Starling	41	<i>Sturnus vulgaris</i>	15/04/2020	Wildlife Acts; Amber list
Stock Dove	19	<i>Columba oenas</i>	31/12/2011	Wildlife Acts; Red list
Swallow	40	<i>Hirundo rustica</i>	26/04/2023	Wildlife Acts; Amber list
Teal	18	<i>Anas crecca</i>	28/01/2023	Wildlife Acts; EC Birds Directive – Annex II, Annex III; Red list
Tufted Duck	2	<i>Aythya fuligula</i>	31/12/2011	Wildlife Acts; EC Birds Directive – Annex II; Annex III; Amber list
Turnstone	2	<i>Arenaria interpres</i>	31/12/2011	Wildlife Acts; Amber list
White-tailed Eagle	3	<i>Haliaeetus albicilla</i>	23/04/2023	Wildlife Acts; Red list
Wigeon	11	<i>Mareca penelope</i>	28/01/2023	Wildlife Acts; EC Birds Directive – Annex II; Annex III; Amber list
Willow Warbler	23	<i>Phylloscopus trochilus</i>	31/12/2011	Wildlife Acts; Amber list
Woodcock	11	<i>Scolopax rusticola</i>	11/02/2024	Wildlife Acts; EC Birds Directive – Annex II; Annex III; Red list

Common name	Record Count	Scientific name	Date of record	Designation
Woodpigeon	47	<i>Columba palumbus</i>	14/05/2022	Wildlife Acts; EC Birds Directive – Annex II; Annex III; Green list
Yellowhammer	33	<i>Emberiza citrinella</i>	05/09/2012	Wildlife Acts; Red list

5.2. Field Study

5.2.1. Designated Sites

A number of designated sites are present within the 15km precautionary Zol of the Proposed Development in consideration of wider pathways for QIs or SCIs of European sites, national sites, or areas of national conservation concern that may potentially be impacted as a result of the Proposed Development. The Zol is defined as ‘the area over which ecological features may be affected by biophysical changes as a result of the Proposed Development and associated activities’ (CIEEM, 2024). The Zol varies per receptor. In line with OPR (2021) guidance, the Proposed Development will be evaluated based on a species/habitat specific Zol with regard to the potential Source-Pathway-Receptor (S-P-R) for receptors and is defined to include all areas functionally connected to the Proposed Development, such as foraging grounds, flight paths, or roosting sites and is consistent with CIEEM (2024) guidance, which considers direct impacts and indirect effects causing a species to move out of the Zol.

Connectivity was identified between some of these sites and the Proposed Development. These sites were brought forward for impact assessment from the Proposed Development. EU sites within 10km of the Proposed Development designated under the Birds Directive were also included for further consideration based on the potential for species listed as Special Conservation Interests passing through the Proposed Development. Where field surveys recorded bird species with wider foraging ranges than the precautionary 10km area, SPAs listing these SCIs within the species-specific foraging range were also considered. No such species were observed.

5.2.1.1. Internationally Designated Sites

Relevant European sites of nature conservation importance, including SPAs, SACs, IBAs and Ramsar sites, are summarised in **Table 5.6** below. These European sites and their hydrological catchments are detailed in the Appropriate Assessment Report.

A precautionary approach was adopted when identifying relevant European sites, assessing all European sites within a 15km radius of the Proposed Development as well as more distant sites where potential hydrological linkage exists (OPR, 2021).

As presented in **Table 5.6** below, seven European sites were identified for assessment in relation to the Proposed Development: specifically, four SPAs and three SACs. Two sites have hydrological connectivity to the Proposed Development (Blackwater River (Cork/Waterford) SAC and Blackwater Estuary SPA). These sites were scoped in for the impact assessment regarding the hydrological connectivity and the mobile SCIs travelling across the greater area and their potential interaction with the Proposed Development. One IBA and Ramsar site was also scoped in based on this principle (Blackwater estuary IBA and the Blackwater estuary Ramsar site).

The remaining relevant internationally designated sites located within the precautionary 15km ZOI were determined not to have any potential pathway with the Proposed Development.

Table 5.6: Internationally Designated sites within the Zol of the Proposed Development.

Site code	Site name	Distance to Proposed Development (km)	Hydrological Distance (km)
Special Area of Conservation			
002170	Blackwater River (Cork/Waterford) SAC	2.01	3.50
000077	Ballymacoda (Clonpriest and Pillmore) SAC	6.26	-
002123	Ardmore Head SAC	14.38	-
Special Protection Area			
004028	Blackwater Estuary SPA	2.09	3.50
004023	Ballymacoda Bay SPA	6.28	-
004192	Helvick Head to Ballyquin SPA	15.8	-
004237	Seas off Wexford SPA	61.20	-

5.2.1.2. Nationally Designated Sites

NHAs are nationally designated sites of nature conservation importance protected under the Wildlife (Amendment) Act 2000. Whilst pNHAs do not have the legal protection afforded to NHAs until designation is confirmed, these should still be taken into consideration when establishing the potential for impacts from a plan or project on a precautionary basis.

As presented in **Table 5.7** below, 10 pNHAs were identified for assessment in relation to the Proposed Development, no NHAs were identified within the Zol. One site has direct hydrological connectivity to the Proposed Development (Blackwater River and Estuary pNHA).

The remaining relevant nationally designated sites located within the precautionary Zol were determined not to have any potential pathway with the Proposed Development.

Table 5.7: Nationally Designated sites within the Zol of the Proposed Development.

Site code	Site name	Distance to Proposed Development (km)	Hydrological Distance (km)
Proposed Natural Heritage Area			
000072	Blackwater River And Estuary pNHA	2	3.5
000078	Ballyvergan Marsh pNHA 4.08km	4.08	-
000077	Ballymacoda (Clonpriest And Pillmore) pNHA	6.26	-
001235	Ballyquirk Pond pNHA	6.36	-
001183	Clasharinka Pond pNHA	8.85	-
000670	Tallow (Disused Church) pNHA	10.42	-
000083	Capel Island And Knockadoon Head pNHA	10.75	-
000446	Loughs Aderry And Ballybutler pNHA	10.91	-

Site code	Site name	Distance to Proposed Development (km)	Hydrological Distance (km)
000076	Ballycotton, Ballynamona And Shanagarry pNHA	12.35	-
001042	Carrigshane Hill pNHA	14.39	-

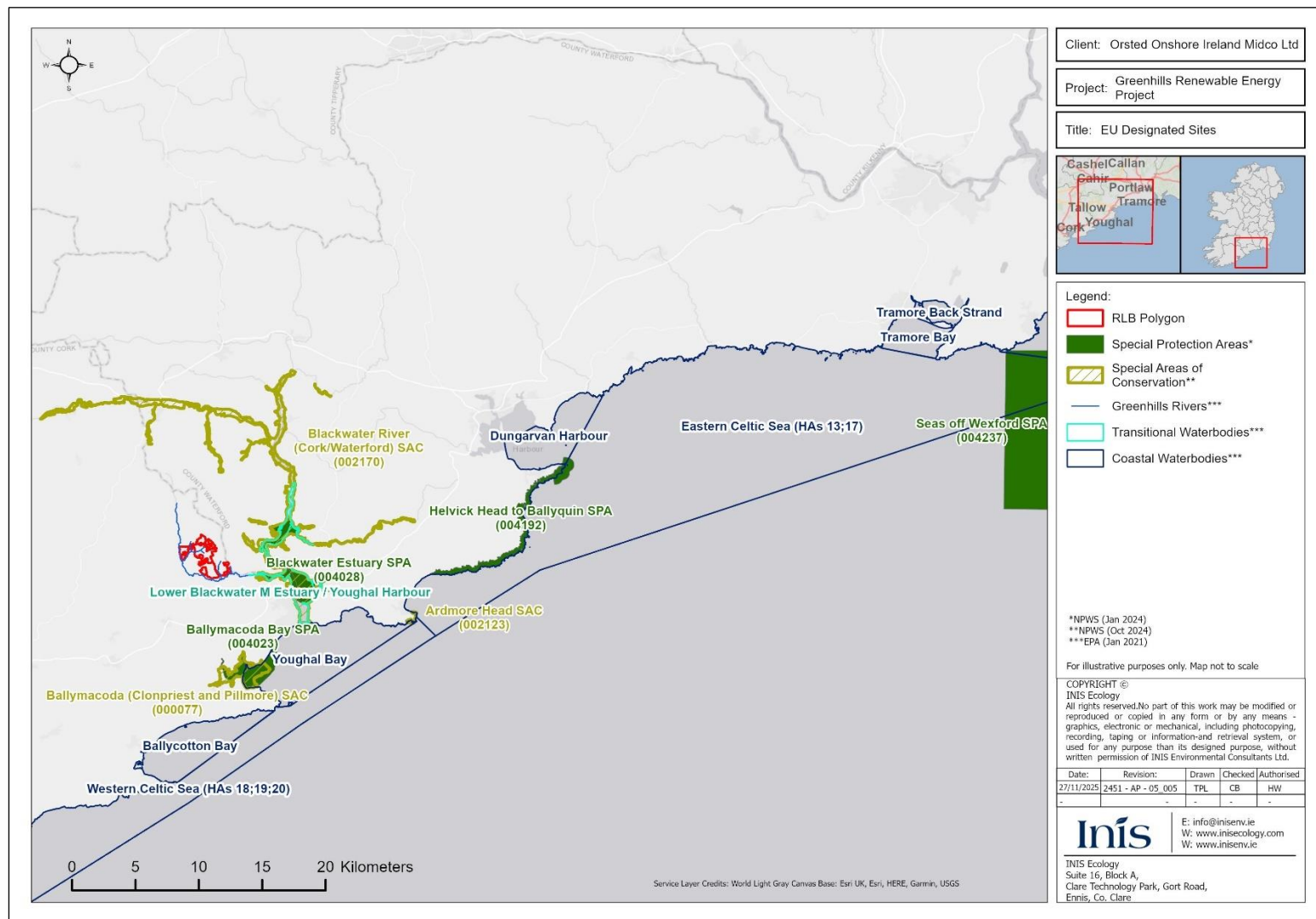


Figure 5.1: Overview of European Sites.

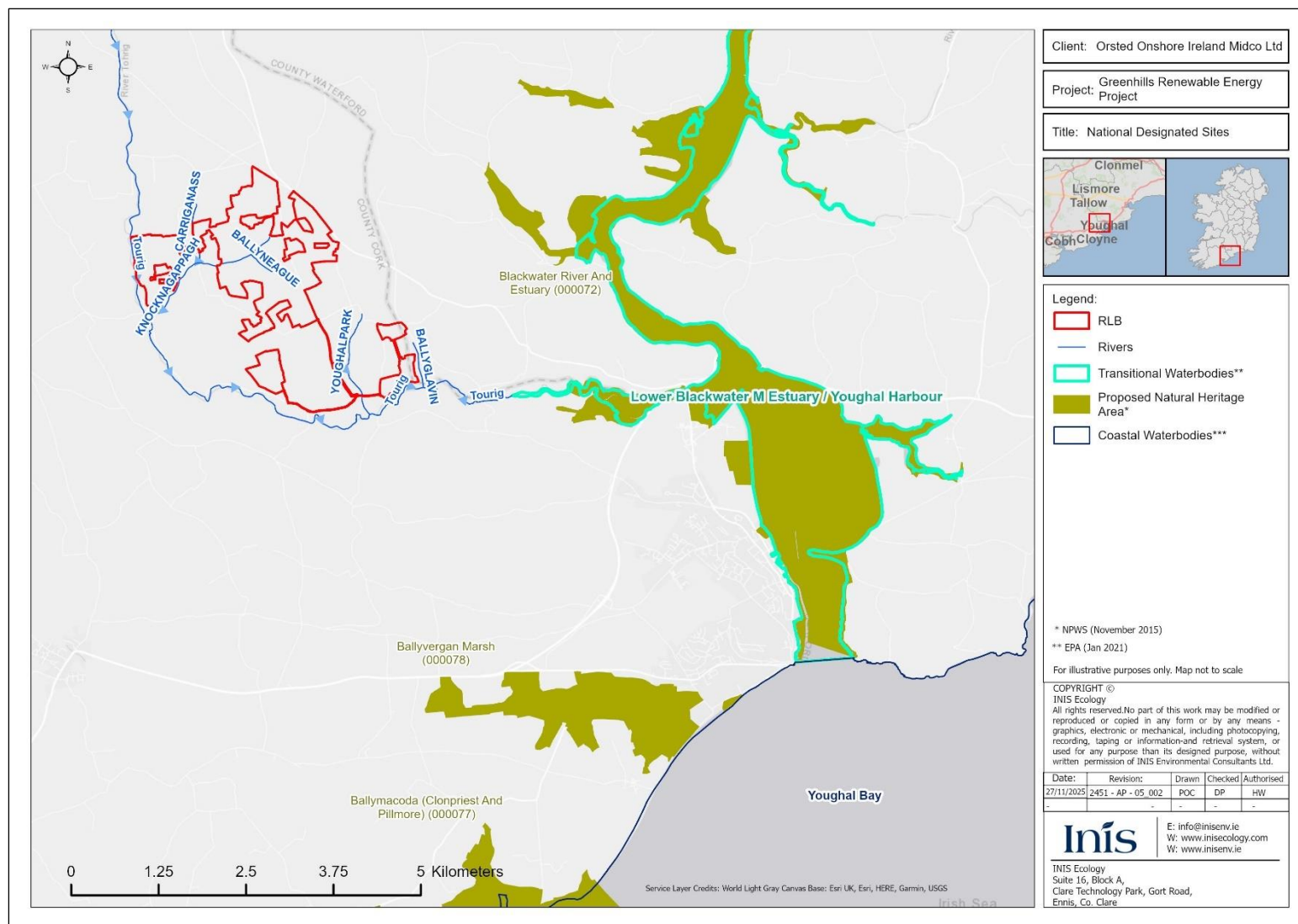


Figure 5.2: Overview of National Sites.

5.2.2. Terrestrial Habitats

5.2.2.1. Survey Results and Importance

A total of 29 habitat types (including 15 types of habitat mosaic), comprising 344.60ha (of area habitats) and 44,484.59m (of linear habitats) in total, occurred within the survey area of the Proposed Development. All habitats present within the field study area and the area occupied by each habitat type are presented in **Table 5.8**. No Annex I habitats were observed within the Proposed Development site boundary. Mapped results of habitats are provided in **Figure 5.1 – Figure 5.3**. The dominant habitats included fields of improved agricultural grassland (GA1) (291.10ha), and arable crops (BC1) 33.09ha (Fossitt, 2000). These comprised 84.47% and 9.6% of the total area of the Proposed Development site boundary. Other less common habitats included: tilled land (BC3), mixed broadleaved woodland (WD1) and scrub (WS1).

The linear habitats recorded predominantly consisted of buildings and artificial surfaces in the form of existing roads within the Proposed Development site boundary (BL3) (12,565m), hedgerow (WL1) (11,767.13m) and hedgerow/treeline mosaic (WL1/WL2) (7,303.32m) (Fossitt, 2000).

Table 5.8: Total area and lengths of habitats within the Proposed Development.

Fossitt Code	Area (ha)	Length (m)
Improved agricultural grassland (GA1)	291.10	-
Arable crops (BC1)	33.09	-
Tilled land (BC3)	8.45	-
Mixed broadleaved woodland (WD1)	3.263	-
Scrub (WS1)	2.65	636.30
Mixed broadleaved woodland/Scrub (WD1/WS1)	2.65	-
Buildings and artificial surfaces (BL3)	2.37	12,565
Spoil and bare ground/ Recolonising bare ground (ED2/ED3)	0.63	-
Amenity grassland/Scrub/ Scattered trees and parkland (GA2/WS1/WD5)	0.29	-
Scrub/Improved agricultural grassland (WS1/GA1)	0.07	-
Conifer plantation (WD4)	0.03	-
Buildings and artificial surfaces/Amenity grassland (BL3/GA2)	0.005	-
Amenity grassland (GA2)	0.002	-
Hedgerow/Treeline (WL1/WL2)	0.0004	7,303
Hedgerow (WL1)	-	11,767
Treeline/Hedgerow (WL2/WL1)	-	5,680

Fossitt Code	Area (ha)	Length (m)
Hedgerow/Drainage ditch (WL1/FW4)	-	2,080
Eroding/upland rivers (FW1)	-	1,537
Treeline (WL2)	-	917
Hedgerow/Treeline/Drainage ditch (WL1/WL2/FW4)	-	616
Treeline/Hedgerow/Drainage ditch (WL2/WL1/FW4)	-	572
Hedgerow/Stone walls and other stonework (WL1/BL1)	-	223
Hedgerow/Buildings and artificial surfaces (WL1/BL3)	-	194
Drainage ditch (FW4)	-	127
Treeline/Hedgerow/Stone walls and other stonework (WL2/WL1/BL1)	-	121
Stone walls and other stonework/Hedgerow (BL1/WL1)	-	62
Treeline/Stone walls and other stonework (WL2/BL1)	-	51
Stone walls and other stonework (BL1)	-	18
Depositing/lowland rivers (FW2)	-	7

The Knocknagappagh River, Tourig River and Carriganass Rivers were both classified as eroding/upland rivers (FW1). The Youghal Park River was classified as a depositing/lowland rivers (FW2). These rivers have downstream connectivity to the Blackwater River (Cork/Waterford) SAC and Blackwater Estuary SPA. Furthermore, evidence of Otter was recorded using the Tourig River during the desk study and field survey. As such, given that these rivers have hydrological connectivity to two European sites and provide suitable habitat to internationally important populations of Otter, these rivers are of **National Importance** under the precautionary principle and **are** considered **KERs** for further consideration within the impact assessment.

The remaining habitats that have significant habitat coverage within the Development landscape did not exceed **Local Importance (Lower Value)** and are **not** considered **KERs** for further consideration. The importance of the remaining habitats is provided in **Table 5.15**.

5.2.2.2. Sensitivity to Change

The main sensitivities to habitats within the Proposed Development include agricultural improvements (e.g. fertilisers, nutrient dumping) and habitat loss/change resulting in the loss of habitat both locally and within the wider landscape. Direct land take, pollution, and environmental changes resulting from modification such as increased drainage. Encroachment from invasive species which may out-compete local native species. Habitats are also sensitive to human activities such as burning and recreational use.

The Proposed Development has the potential to create these sensitivity sources that will affect KERs.

5.2.2.3. Trends in the Baseline Environment (Do-Nothing)

In a 'Do-Nothing' scenario, the baseline environment is likely to experience a continued increase in the presence and spread of invasive species. Without active management or intervention, invasive species can outcompete native flora and fauna, leading to reductions in biodiversity, alterations in ecosystem function, and the displacement of native species. Climate change, global trade, and land-use changes further exacerbate these trends by creating new pathways for introduction and expanding the suitable habitat range for many invasive species. Over time, the ecological and economic impacts are expected to intensify, making future control efforts more difficult and costly. This highlights the importance of early detection and proactive management to mitigate long-term consequences.

Hedgerow mosaic habitats will likely experience a overall decline of condition and distribution in the Do-Nothing scenario based on the existing agricultural management to facilitate maximum use of the improved agricultural grassland for grazing and for tilling cropland. Climate change projections include an expectation of reduced annual rainfall and warmer, more intense summers with severe rain events becoming more frequent (Ref). These scenarios will put increased pressure on these linear habitat KERs in concert with the agricultural anthropogenic pressures and will likely exacerbate conditions of the riverine habitats related to the Proposed Development (**Table 5.8**). As such, in a Do-Nothing scenario, the habitat KERs identified for the Proposed Development are expected to decline in condition quality and biodiversity over the next 40 years absent the Proposed Development taking place.

5.2.2.4. Receiving Environment (Baseline + Trends)

It is assumed in this report that the baseline environment in relation to terrestrial habitats, as identified above, will be the receiving environment at the time of the Proposed Development commencement.

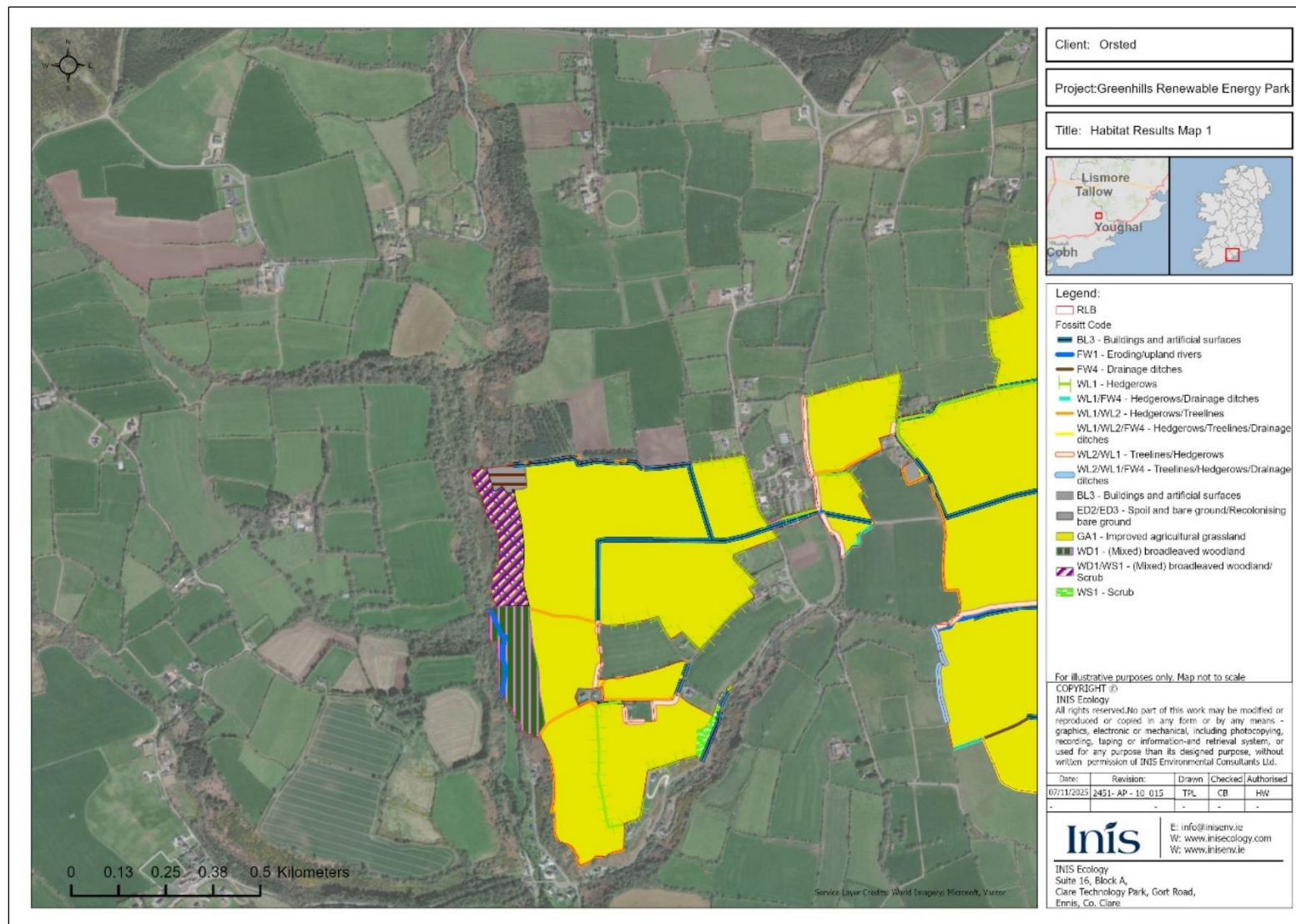


Figure 5.3: Habitat Results Map 1.

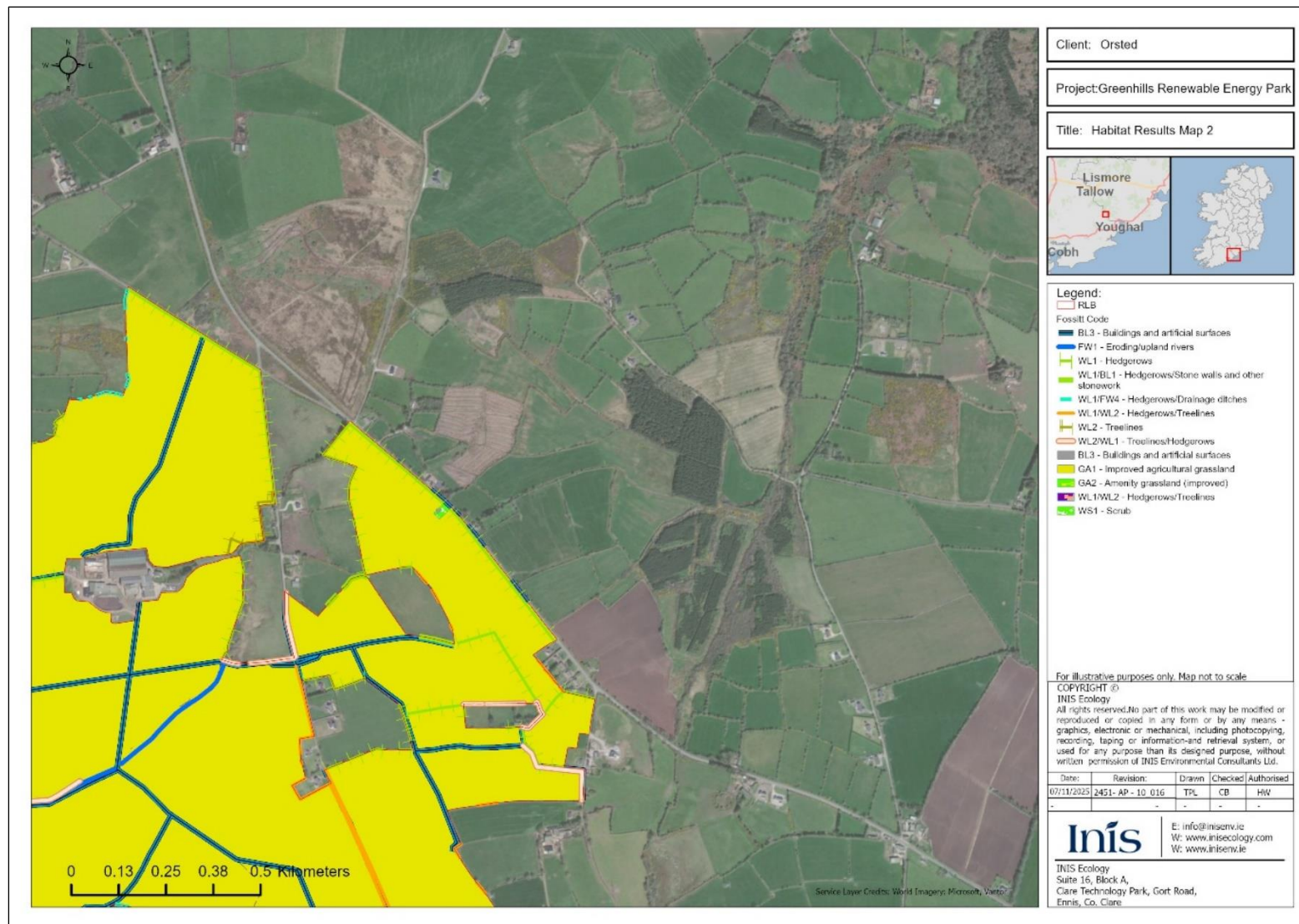


Figure 5.4: Habitat Results Map 2.

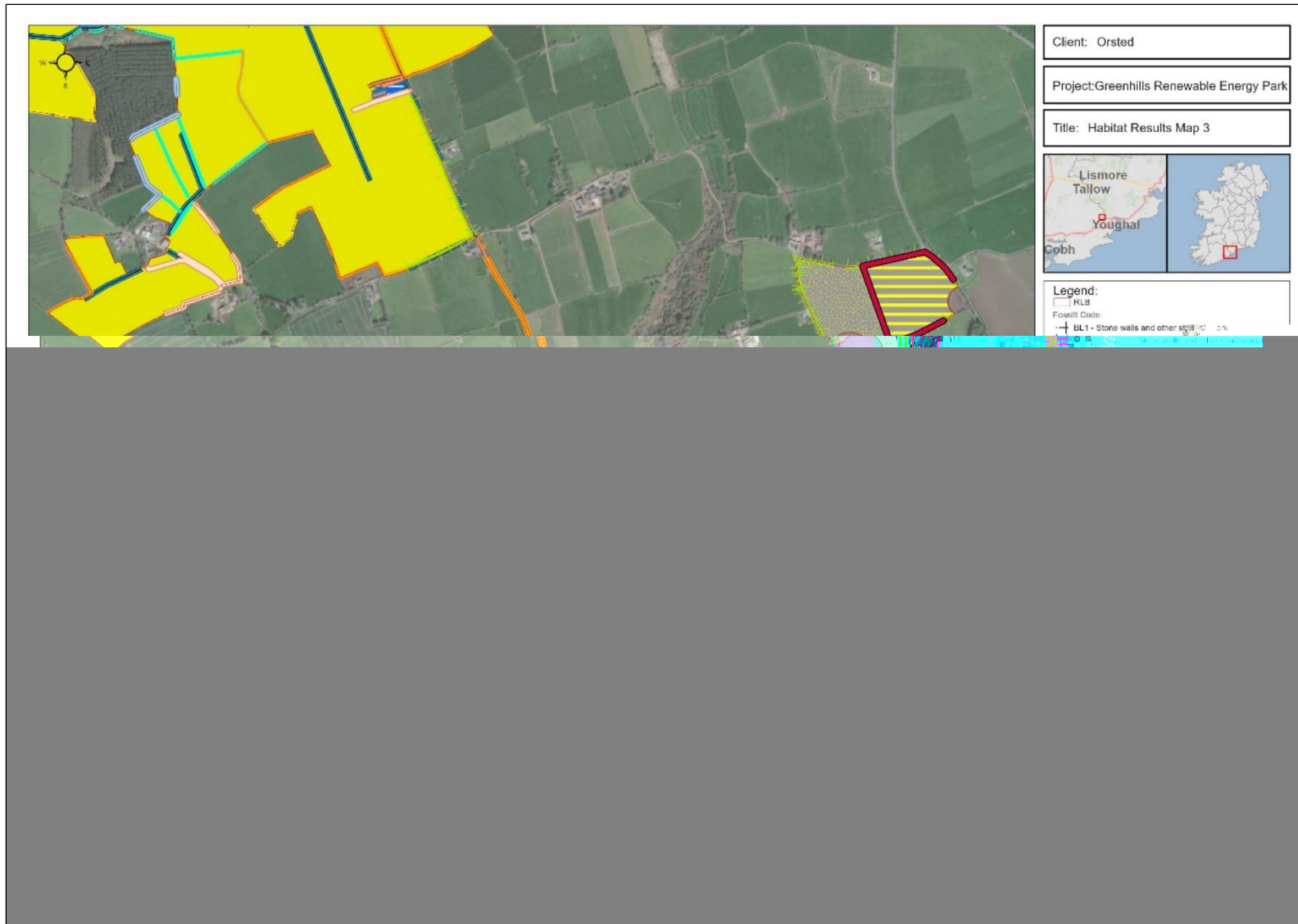


Figure 5.5: *Habitat Results Map 3.*

5.2.3. Invasive Alien Species

5.2.3.1. Survey Results

Three invasive mammal species was recorded during the mammal and habitat surveys. Fallow Deer *Dama dama* and Rabbit *Oryctolagus cuniculus* were both recorded within the Proposed Development site (**Appendix B, Table B.1**). Secondary evidence of American Mink *Neovison vison* (spraint) was recorded in the Tourig River, located adjacent to the Proposed Development site boundary, footprints were also recorded along the Tourig River, 962m downstream of the Proposed Development site boundary.

Rabbits are a 'Medium Impact Invasive Species' and are not regulated under Irish law. Therefore, they are not considered a threat to any habitats or species KERs related to the Proposed Development.

Fallow Deer and American Mink are listed as a high impact species and are listed under the third schedule of the S.I. 477 and first schedule of the S.I. 347 legislation. **Figure 5.6**).

As such, given the high impact nature of both Fallow Deer and American Mink, these species pose likely significant effects to KERs.

A total of nine records of invasive plant species were recorded within the Proposed Development site boundary (**Figure 5.7; Table 5.9**).

Eight stands of Cherry Laurel *Prunus laurocerasus* and one stand of Japanese Knotweed were recorded during invasive species surveys adjacent to the Proposed Development. This species is a High Impact Invasive Species listed under Regulations 49 and 50 of the SI No. 347 of the EU (Invasive Alien Species) Regulations 2024. While Cherry Laurel is not listed under the Third Schedule, it is considered to be a High-Impact invasive species.

The results of the invasive species survey are provided in **Figure 5.6, Figure 5.7** and **Table 5.9**.

Table 5.9: Records of invasive flora and fauna found in the vicinity of the Proposed Development.

Date	Species	ITM	Area/Length (Ha/m)	Designation	Notes
Invasive Faunal Species					
27/01/2025	Fallow Deer	603471.45, 581698.38	N/A	First Schedule (S.I. 374/2024)	Footprint found along hedgerow
27/01/2025	Fallow Deer	603134.73, 581979.43	N/A	First Schedule (S.I. 374/2024)	Feeding
11/02/2025	Fallow Deer	601459.38, 582510.60	N/A	First Schedule (S.I. 374/2024)	Well defined trail. Presence of hoof prints
28/02/2025	Fallow Deer	603228.46, 581522.05	N/A	First Schedule	Presence of species

Date	Species	ITM	Area/Length (Ha/m)	Designation	Notes
				(S.I. 374/2024)	
12/03/2025	Fallow Deer	605030.26, 580377.72	N/A	First Schedule (S.I. 374/2024)	Hoof prints evident
12/03/2025	Fallow Deer	605126.11, 580523.44	N/A	First Schedule (S.I. 374/2024)	Heavily used track
12/03/2025	Fallow Deer	605421.73, 580558.25	N/A	First Schedule (S.I. 374/2024)	Heavily worn track along hedgerow
12/03/2025	Fallow Deer	605188.71, 580871.04	N/A	First Schedule (S.I. 374/2024)	Heavily used area
28/03/2025	American Mink	605197.36, 580398.80	N/A	First Schedule (S.I. 374/2024) Third Schedule (S.I. 477/2011)	Good requirements for Otter. Mink footprints visible along sections of river
Invasive Alien Plant Species					
27/03/2025	Cherry Laurel	602204.12, 582489.35	1m	High Impact Invasive Species	
27/03/2025	Cherry Laurel	602196.24, 582485.03	5m	High Impact Invasive Species	Quite a tall plant.
27/03/2025	Cherry Laurel	602138.49, 582472.97	2m	High Impact Invasive Species	
19/08/2025	Cherry Laurel	604027.01, 580138.27	35m	High Impact Invasive Species	
19/08/2025	Cherry Laurel	603998.27, 580124.66	12m	High Impact Invasive Species	Situated along wall of premises
19/08/2025	Cherry Laurel	603827.36, 580161.66	50m	High Impact Invasive Species	Outside of Proposed Development site boundary

Date	Species	ITM	Area/Length (Ha/m)	Designation	Notes
19/08/2025	Japanese Knotweed	603732.63, 580203.68	5m	First Schedule (S.I. 374/2024) Third Schedule (S.I. 477/2011)	Very tall in height and dense
19/08/2025	Cherry Laurel	603697.79, 580229.55	5m	High Impact Invasive Species	Located at entrance of gate outside of RLB
19/08/2025	Cherry Laurel	604170.80, 581058.81	25m	High Impact Invasive Species	Two individual plants present along with ornamental species

5.2.3.2. Trends in the Baseline Environment (Do-Nothing)

In a 'Do-Nothing' scenario, the baseline environment is likely to experience a continued increase in the presence and spread of invasive species. Without active management or intervention, invasive species can outcompete native flora and fauna, leading to reductions in biodiversity, alterations in ecosystem function, and the displacement of native species. Climate change, global trade, and land-use changes further exacerbate these trends by creating new pathways for introduction and expanding the suitable habitat range for many invasive species. Over time, the ecological and economic impacts are expected to intensify, making future control efforts more difficult and costly. This highlights the importance of early detection and proactive management to mitigate long-term consequences.

5.2.3.3. Receiving Environment (Baseline + Trends)

It is assumed in this report that the baseline environment in relation to terrestrial habitats, as identified above, will be the receiving environment at the time of the Proposed Development commencement.

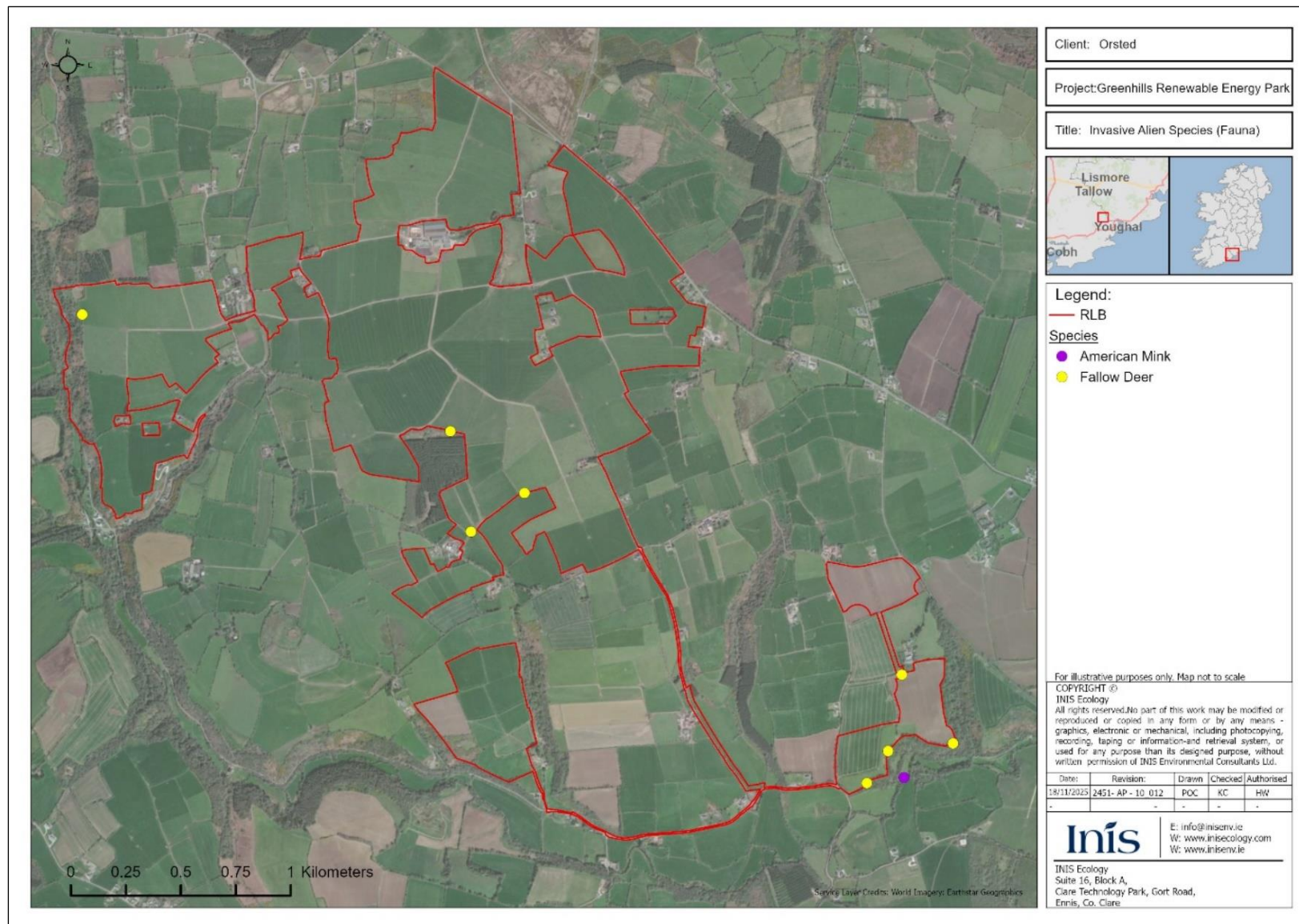


Figure 5.6: Invasive Alien Species (Fauna).

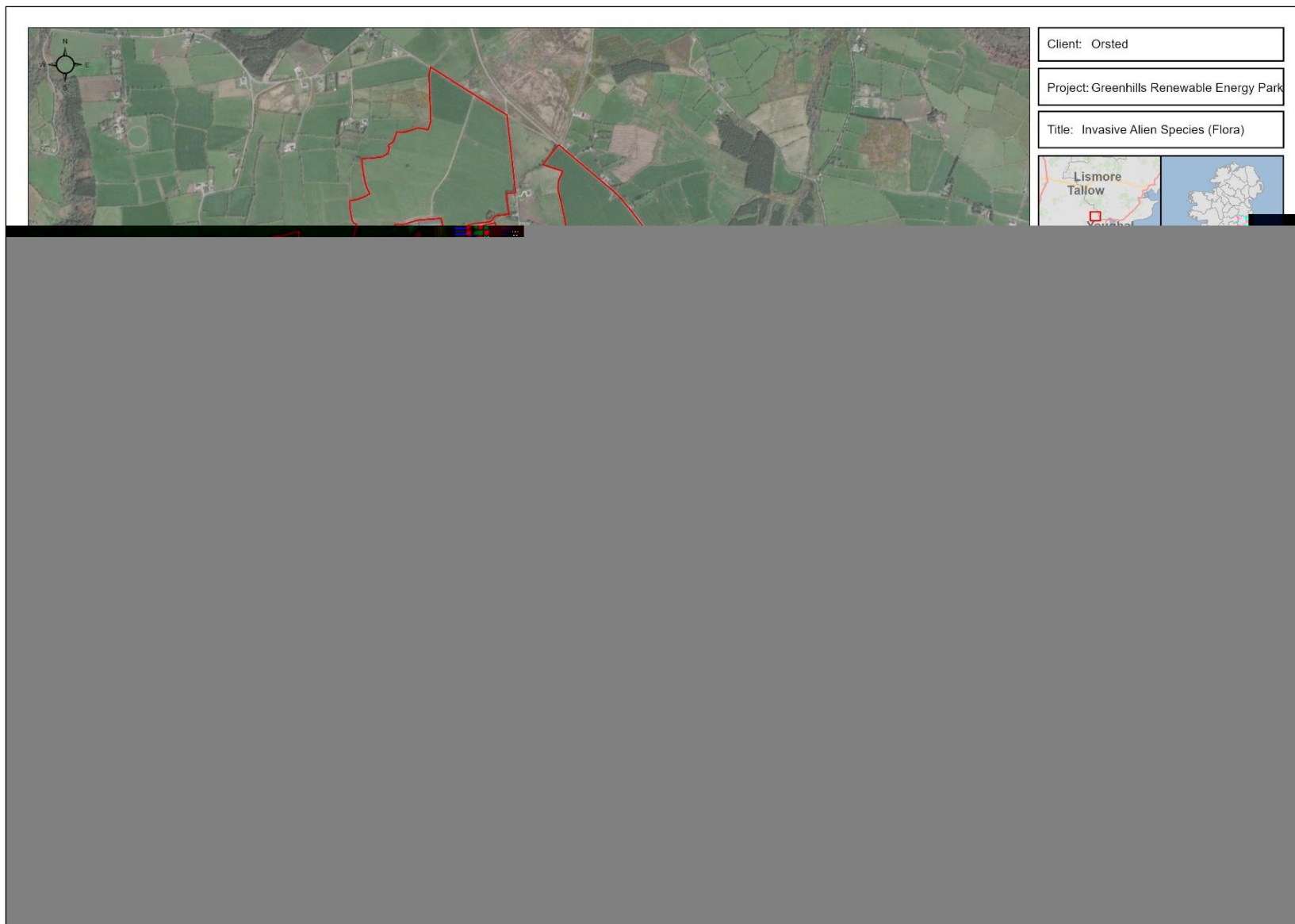


Figure 5.7: *Invasive Alien Species (Flora).*

5.2.4. Terrestrial Mammals, Amphibians and Invertebrates

5.2.4.1. Survey Results and Importance

5.2.4.1.1. Otter

Otters are protected under the Wildlife Acts and are listed on Annex II and IV of the EU Habitats Directive.

A footprint belonging to Otter was recorded within the Proposed Development site boundary (ITM: 601392.49, 582405.54) on the Tourig River (**Figure 5.8**). The Tourig River flows southeast of the Proposed Development and was surveyed for Otter and found to have 'High' suitability for, offering both foraging and breeding opportunities (**Table B.1**). Otter is a QI of the nearby Blackwater River (Cork/Waterford) SAC, which is hydrologically connected to the Proposed Development. Furthermore, desk study records recorded Otter within the surrounding environment, with the closest record in relation to the Proposed Development recorded 270.7m south of the Proposed Development site boundary recorded in the Tourig River. As such, Otter is considered a KER of **International Importance** under the precautionary principle and is considered **a KER** for detailed consideration in the impact assessment.

5.2.4.1.2. Badger

Badgers are legally protected under the Wildlife Acts. Suitable habitat for Badger is abundant in the study area, this includes areas of mixed broadleaved woodland, several hedgerow/treeline mosaic features which are near farmland or open habitats (e.g. GA1).

The NBDC records were reinforced by evidence of the presence of Badger identified during the walkover survey. Badger prints and evidence of digging were recorded throughout the site during the field assessment surveys along hedgerow (WL1) habitat and improved agricultural grassland (GA1) within 50m of the Proposed Development site boundary (**Table B.1; Table B.2; Figure 5.9**). A total of six potential Badger setts were recorded during the walkover surveys, four of which were recorded within the Proposed Development site boundary (**Table B.2; Figure 5.10**). Two incidental sightings of Badger evidence were recorded (Badger tracks) on 11/03/2025 (ITM: 602939.69, 582305.82; ITM: 603045.59, 582361.04).

Due to the confirmed presence of Badger activity within the Proposed Development, and high levels of activity detected based on secondary evidence observed within the Proposed Development, Badger is considered a KER of **Local Importance (Higher Value)** and is considered **a KER** for detailed consideration in the impact assessment.

5.2.4.1.3. Irish Hare

Irish Hare *Lepus timidus subsp. hibernicus* is protected under the Wildlife Acts. It is considered to be widespread and common in Ireland. It is a species of Least Concern in Europe (International Union for Conservation of Nature (IUCN)) and Ireland (Marnell *et al.*, 2019).

Irish Hares are usually found in peatland areas (e.g., upland blanket bog (PB2)) and pastures (e.g., improved agricultural grassland (GA1)). Pastures comprise a large area of the Proposed Development site, as such, there is ample habitat available within the Proposed Development for this species. Irish Hare individuals were not identified during the field surveys.

The ecological and cultural value of the Irish Hare in Ireland gives it intrinsic value and is considered of **Local Importance (Higher Value)** in the context of Ireland. However, despite its absence from field assessment results, Irish Hare is considered a **KER** for detailed consideration in the impact assessment.

5.2.4.1.4. Pine Marten

Pine Martens *Martes martes* are protected under the Wildlife Acts and Annex V of the EU Habitats Directive. It is a species of Least Concern in Europe (IUCN) and Ireland (Marnell *et al.*, 2019). There were three records of Pine Marten sightings recorded during the desk study, the most recent record on 31/12/2012 (NBDC, 2025).

Suitable but limited habitat exists within the Proposed Development for Pine Marten, i.e., forests of mixed broadleaved woodland. No Pine Marten individuals were identified during the field surveys. Due to the presence of suitable habitat within the Proposed Development boundary and desk study records, Pine Marten is considered to be of **Local Importance (Higher Value)** for detailed consideration in the impact assessment is therefore considered to be a **KER** for detailed consideration in the impact assessment.

5.2.4.1.5. Irish Stoat

Irish Stoats *Mustela erminea subsp. hibernica* are protected under the Wildlife Acts. It is considered to be underrepresented in research to date (Marnell *et al.*, 2019). It is a species of Least Concern in Europe (IUCN) and Ireland (Marnell *et al.*, 2019). There were nine records of Irish Stoat sightings recorded during the desk study, the most recent record on 09/06/2015 (NBDC, 2025).

No activity or evidence of Irish Stoat was recorded during field surveys in the Proposed Development.

Irish Stoats occur in most habitats with sufficient cover and occur most often in wooded areas. Suitable habitat for Irish Stoat in the form of mixed broadleaved woodland was recorded within the Proposed Development site boundary; however, this habitat was limited within the Proposed Development site.

Suitable but limited habitat exists within the Proposed Development for Irish Stoat, i.e., forests of mixed broadleaved woodland. No Irish Stoat individuals were identified during the field surveys. Due to the presence of suitable habitat within the Proposed Development and confirmed desk study records (11), it is considered to be of **Local Importance (Higher Value)** for detailed consideration in the impact assessment and is therefore considered to be a **KER** for detailed consideration in the impact assessment.

5.2.4.1.6. Red Squirrel

Red Squirrels *Sciurus vulgaris* are protected under the Wildlife Acts. It is a species of Least Concern in Europe (IUCN) and Ireland (Marnell *et al.*, 2019).

Red Squirrels occur in most habitats with sufficient cover and occur most often in wooded areas. Suitable habitat for Red Squirrel was recorded within the Proposed Development (mixed broadleaved woodland); however, this habitat was limited within the Proposed Development site boundary for use by Red Squirrel.

Furthermore, no activity or evidence of Red Squirrel was recorded by field surveys in the Proposed Development. Suitable but limited habitat exists within the Proposed Development for Red Squirrel, i.e., forests of mixed broadleaved woodland. No Red Squirrel individuals were identified during the field surveys. Due to the presence of suitable habitat within the Proposed Development site boundary and confirmed desk study records (21), it is considered to be of **Local Importance (Higher Value)** for detailed consideration in the impact assessment and is therefore considered to be a **KER** for detailed consideration in the impact assessment.

5.2.4.1.7. Red Fox

Red Foxes are highly adaptive mammals that can inhabit any type of land area, from woodland (e.g. WD2) to urban areas (e.g., BL3). Secondary evidence of Red Fox was identified during the field surveys (**Table B.1; Figure 5.9**). One sighting was recorded during field assessment surveys (ITM: 602763.93, 583132.77), the individual was recorded jumping into a section of hedgerow.

Red Fox is a species of Least Concern in Europe (IUCN) and Ireland (Marnell *et al.*, 2019) and is a species of **Local Importance (Lower Value)**. There is no evidence of population decline in Ireland. Due to the low ecological value of Red Fox, it is **not** considered a KER for detailed consideration in the impact assessment.

5.2.4.1.8. Hedgehog

No secondary evidence of Hedgehog was recorded during mammal surveys. However, potential habitat for hedgehogs exists in areas of scrub, open grasslands (GA1) and hedgerow/treelines.

Suitable habitat exists within the Proposed Development for Hedgehog, i.e., bordering forests of mixed broadleaved woodland and hedgerows (WL1). No Hedgehog individuals were identified during the field surveys. Hedgehog is evaluated as a 'Near Threatened' species by the IUCN. Due to the extensive availability of suitable habitat within the Proposed Development site boundary, confirmed desk study records (22) and IUCN status, Hedgehog is considered to be of **Local Importance (Higher Value)** for detailed consideration in the impact assessment and is therefore considered to be a **KER** for detailed consideration in the impact assessment.

5.2.4.1.9. Pygmy Shrew

Pygmy Shrew *Sorex minutus* is protected under the Wildlife Act but has been listed as of Least Concern in the recent Red List for terrestrial mammals in Ireland.

No evidence of Pygmy Shrew was observed on the site. However, suitable habitat for Pygmy Shrew exists at areas of woodlands and open grasslands (GA1).

No Pygmy Shrew individuals were identified during the field surveys. Due to the presence of suitable habitat within the Proposed Development site boundary and recent desk study records (2), it is

considered to be of **Local Importance (Higher Value)** and is therefore considered to be a **KER** for detailed consideration in the impact assessment.

5.2.4.1.10. Amphibians

Common Frog and Smooth Newt *Lissotriton vulgaris* are species of 'Least Concern' (IUCN Irish Status) and are protected under Wildlife Acts and Annex V of the Habitats Directive. There are records of both of these species within the receiving environment (NBDC, 2025).

Limited suitable habitat was recorded within the Proposed Development in the form of drainage ditches (FW4) with both slow flowing and static water and flooded areas (**Table B.3**). However, no amphibians were recorded during field surveys and it is unlikely that either of these species are utilising the Proposed Development as a spawning habitat. Furthermore, no presence of indicator species was recorded. Common Frog and Smooth Newt are both considered to be of **Local Importance (Lower Value)**, Common Frog and Smooth Newt **are not** considered **KERs** for detailed consideration in the impact assessment.

5.2.4.1.11. Invertebrates

Desk study records for red-listed invertebrate species within the X08 grid square are presented in **Table 5.3**. One Marsh Fritillary record was recorded during the desk study; however, the record was dated in 1975 and is no longer considered to be valid. Small Tortoiseshell *Aglais urticae* were recorded during a field assessment survey on 20/03/2025 (ITM: 603980.48, 582065.47) along suitable hedgerow and treeline mosaic habitat.

No other target invertebrates were recorded during survey efforts. Given the low activity of invertebrates and that the habitats within Proposed Development are of limited suitability and use for invertebrates (improved agricultural grassland), no species is considered to be of **Local Importance (Higher Value)**. However, pollinator invertebrates are considered **KERs** of **Local Importance (Higher Value)** for detailed consideration in the impact assessment in line with All-Ireland Pollinator Plan guidance for Solar Farm developments.

5.2.4.2. **Sensitivity to Change**

All mammals are sensitive to the direct effects of disturbance/displacement from breeding and foraging ranges as a result of noise and visual intrusion. Some species show variable or flexible responses such as Otter where research from English Nature (Chanin, 2003) indicates that Otters will rest under roads, in industrial buildings, close to quarries, and at other sites close to high levels of human activity. Mammals are also sensitive to habitat loss and additive mortality from inadvertent contact with operating machinery or vehicles.

5.2.4.2.1. Otter

Otters require aquatic prey and safe refuges where they can rest in order to survive. The main threats to the otter include pollution – particularly organic pollution resulting in fish kills; and accidental deaths (e.g. collision with road traffic). Disturbance to riverbank habitat also negatively impacts otters (Marnell *et al.*, 2019).

Otter is listed as a QI for the Blackwater River (Cork/Waterford) SAC which has hydrological and ecological connectivity to the Proposed Development via the Tourig River hence, is evaluated as of **International Importance**, which is equivalent to a **Very high sensitivity** rating.

5.2.4.2.2. Badger

Badgers are susceptible to anthropogenic threats, such as illegal persecution (snaring, hunting with dogs, disturbance of setts) and road casualties (Marnell *et al.*, 2019). Bovine tuberculosis is present in the Irish badger population. Roadkill analysis from specimens in the North suggests an infection rate of 15% (Courcier *et al.*, 2018) however, a wide range of localised differences occur. Badger removal programmes in response to TB outbreaks in cattle have been operated by the Department of Agriculture in Republic of Ireland. A Badger vaccine programme is gradually being rolled out since 2019 but culling is still in practise in some areas and in extreme cases of TB (DAFM, 2018).

Badger setts are sensitive to land take/machinery operations within 30m of sett location, and up to 50m to an active breeding sett. Where piling or blasting works take place, active setts up to 150m are sensitive to disturbance, displacement or mortality related effects. Habitat loss greater than 25% of any social group's territory size is deemed as significant (NRA). Disturbance to foraging individuals may occur from construction noise and visual intrusion especially during periods of night-time working. Habitat loss or the construction of significant barriers may also dissect territories. Badgers may also be killed or injured by road traffic as they attempt to access foraging areas.

Badgers are legally protected under the Wildlife Acts. Local populations of Badger are evaluated as **Local Importance (Higher Value)**, which is equivalent to **Low sensitivity**. However, due to the works related to the proposed development, and the extent of active setts within the baseline. Works in proximity to active sett support increase sensitivity to active Badger setts as **Medium sensitivity**.

5.2.4.2.3. Red Squirrel

Due to their close association with forest habitat, red squirrels are severely impacted by deforestation; its abundance is directly related to woodland availability. Red squirrels invariably lose out to grey squirrel populations in broadleaf and mixed woodland habitat, due to competition and the impact of squirrel pox virus, which is carried by the grey squirrel (Marnell *et al.*, 2019).

Red Squirrel is protected under the Wildlife Acts. Local populations of Red Squirrel are evaluated as **Local Importance (Higher Value)**, which is equivalent to **Low sensitivity**, due to their protection under the Wildlife Act.

5.2.4.2.4. Pine Marten

The main threats to Pine Marten populations include land use change, forest management practices such as harvesting, habitat fragmentation, inbreeding, illegal persecution either through generic poisoning or deliberate killing and destruction of forest/scrub habitat for development. Pine Marten is susceptible to habitat loss and human persecution in Ireland (O'Mahoney *et al.*, 2012).

Pine Marten are protected under the Wildlife Acts and Annex V of the EU Habitats Directive. Local populations of Pine Marten are evaluated as **Local Importance (Higher Value)**, which is equivalent to **Low sensitivity**, due to their protection under the Wildlife Act.

5.2.4.2.5. Irish Stoat

The main threat to Irish Stoat populations is local persecution by gamekeepers due to the perceived threat to game birds. However, the Irish Stoat is considered to be underrepresented in research to date and population estimates for Ireland are not available (Marnell *et al.*, 2019).

Irish Stoat are protected under the Wildlife Acts. It is considered to be underrepresented in research to date (Marnell, 2019). Local populations of Irish Stoat are evaluated as **Local Importance (Higher Value)**, which is equivalent to **Low sensitivity**, due to their protection under the Wildlife Act.

5.2.4.2.6. Irish Hare

Agricultural intensification is leading to some reduction in habitat quality, and a number of related threats have been identified, but the hare has a broad habitat niche, so the impacts of these changes on habitat extent and quality are unknown (NPWS, 2019b). Other threats include invasive species, roads and motorways, urbanised areas/human habitation, and hunting, along with habitat loss and fragmentation leading to isolation and inbreeding. Climate change is also identified as a threat, affecting competitive relationships between Irish Hare and Brown Hare species. Such competition is present on the Island of Ireland where Brown Hare has established presence in the North of the Island (NBDC, 2022).

The ecological and cultural value of the Irish hare in Ireland gives it intrinsic value. This led to the formation of the Irish Hare All-Ireland Species Action Plan in 2005 (National Parks and Wildlife Service and Environment & Heritage Service, 2005), aiming to maintain and increase the area and quality of suitable Hare habitat throughout the island (Reid *et al.*, 2007). Local populations of Irish Hare are evaluated as of **Local Importance (Higher Value)**, which is equivalent to **Low sensitivity**.

5.2.4.2.7. Hedgehog

Hedgehogs are vulnerable to pesticides used in gardens, and many are killed by eating poisoned slugs. Severe winters may kill hibernating hedgehogs, and not reaching a sufficient weight before hibernating is also fatal. Many hedgehogs are recorded from roadkill deaths, although this is not thought to be impacting their populations. Recent reports of global loss of invertebrates could signify a major threat to their food supply (Eisenhauer *et al.*, 2019).

Hedgehog are protected under Appendix III of The Bern Convention and under the Wildlife Acts. Local populations of Hedgehog are evaluated as **Local Importance (Higher Value)**, which is equivalent to **Low sensitivity**, due to their protection under the Wildlife Act.

5.2.4.3. Trends in the Baseline Environment (the 'Do-Nothing' scenario)

Available trends on general Irish mammals are limited however the most recent 'Red List' (Marnell *et al.*, 2019) has judged most of Ireland's terrestrial mammal species to be of 'least concern'.

5.2.4.3.1. Otter

Otters was previously assessed as Near Threatened in Ireland (Marnell *et al.*, 2019) based on a 20-25% decline between 1980 and 2005 (Bailey & Rochford, 2006). However, more recent data showing population recovery and widespread distribution, justify the improved assessment of least concern (Reid *et al.*, 2013; NPWS, 2019). The most recent national survey indicated a full recovery and an adult population size in the order of 16-22,000 individuals (Reid *et al.*, 2013).

Ireland remains a stronghold for the Otter – the most recent distribution data show that the otter is widespread throughout Ireland in a wide variety of habitat types. The overall status of otter is considered to be favourable (NPWS, 2019b). A total of 44 SACs has been designated for otter comprising of river channels, coastline habitats, lakes and blanket bog systems (NPWS, 2019b).

5.2.4.3.2. Badger

Badgers were previously assessed as of least concern in Ireland and have remained at this classification (Marnell *et al.*, 2019). Despite localised removals for Tuberculosis management, badgers remain widespread, in a broad range of habitats. Irish badgers have stable population, estimated in Northern Ireland as 33,500 (Reid *et al.*, 2008) and in the Republic of Ireland as 84,000 (Sleeman *et al.*, 2009).

5.2.4.3.3. Pine Marten

Pine Marten was previously assessed as least concern (Marnell *et al.*, 2019). Expert opinion and survey data from 2005-07 (O'Mahony *et al.*, 2012) 2012 (Lawton *et al.*, 2015) and 2010- 2015 (O'Mahony, 2016) confirms a range expansion and continued status of least concern.

The species was formerly widespread in Ireland but declined in the 17th century with the deforestation of the country. Pine Marten suffered further in the 19th and early 20th centuries due to persecution by gamekeepers and trappers. However, the species is now undergoing a phase of re-colonisation. It has greatly increased its range in recent decades and although its population is still low, it is rising. The animal's resurgence is largely attributed to the banning of strychnine and other poisons; the legal protection afforded the species since 1976 under the Wildlife Acts and the steady increase in afforestation. There is ample habitat available across the country to allow the species to continue its spread and to allow the population to expand as well. While some threats have been identified, none of them are considered sufficiently serious to undermine the continued recovery of the species. Therefore, the Overall Status of the Pine Marten is assessed as Favourable, unchanged since the previous reporting period (NPWS, 2019).

5.2.4.3.4. Irish Stoat

The Irish Stoat is a species of Least Concern on a national, European and international scale (Marnell *et al.*, 2019). Due to a lack of research data, no population estimates are available for the Irish Stoat but there is no evidence of decline. The population density of Irish Stoat is variable and dependent on the density of available food.

The Irish Stoat is a subspecies of *Mustela erminea* and is restricted to Ireland and the Isle of Man (Martinkova *et al.*, 2007). It is widespread throughout Ireland, with records from every county. The distribution of the Irish Stoat is locally limited only by the availability of suitable cover and sufficient food (Sleeman, 2016).

5.2.4.3.5. Red Squirrel

The Red Squirrel was previously assessed as 'near threatened' due to a 20% decline in range in Ireland since the introduction of the grey squirrel (Marnell *et al.* 2009). Recent surveys, however, have shown the red squirrel has expanded its range once again in the midlands of Ireland, following the loss of grey squirrels in those areas (Lawton *et al.*, 2015). This recovery, plus the overall widespread distribution across the island of Ireland justify a change of status to least concern.

The population of the red squirrel was previously estimated at 40,000 individuals (NPWS & EHS, 2008); the current figure may be higher in correlation with the recent range expansion (NPWS, 2019).

5.2.4.3.6. Irish Hare

Comprehensive distribution and abundance data is available for this species. Irish hare was previously assessed as least concern (Marnell *et al.*, 2019). Its widespread distribution and large population justify retention of this assessment.

The range for this species covers nearly the entire landmass of Ireland including some offshore islands. Despite natural inter-annual fluctuations in population density, the animal is widespread and in places abundant. The Overall Status of the hare is Favourable (NPWS, 2019).

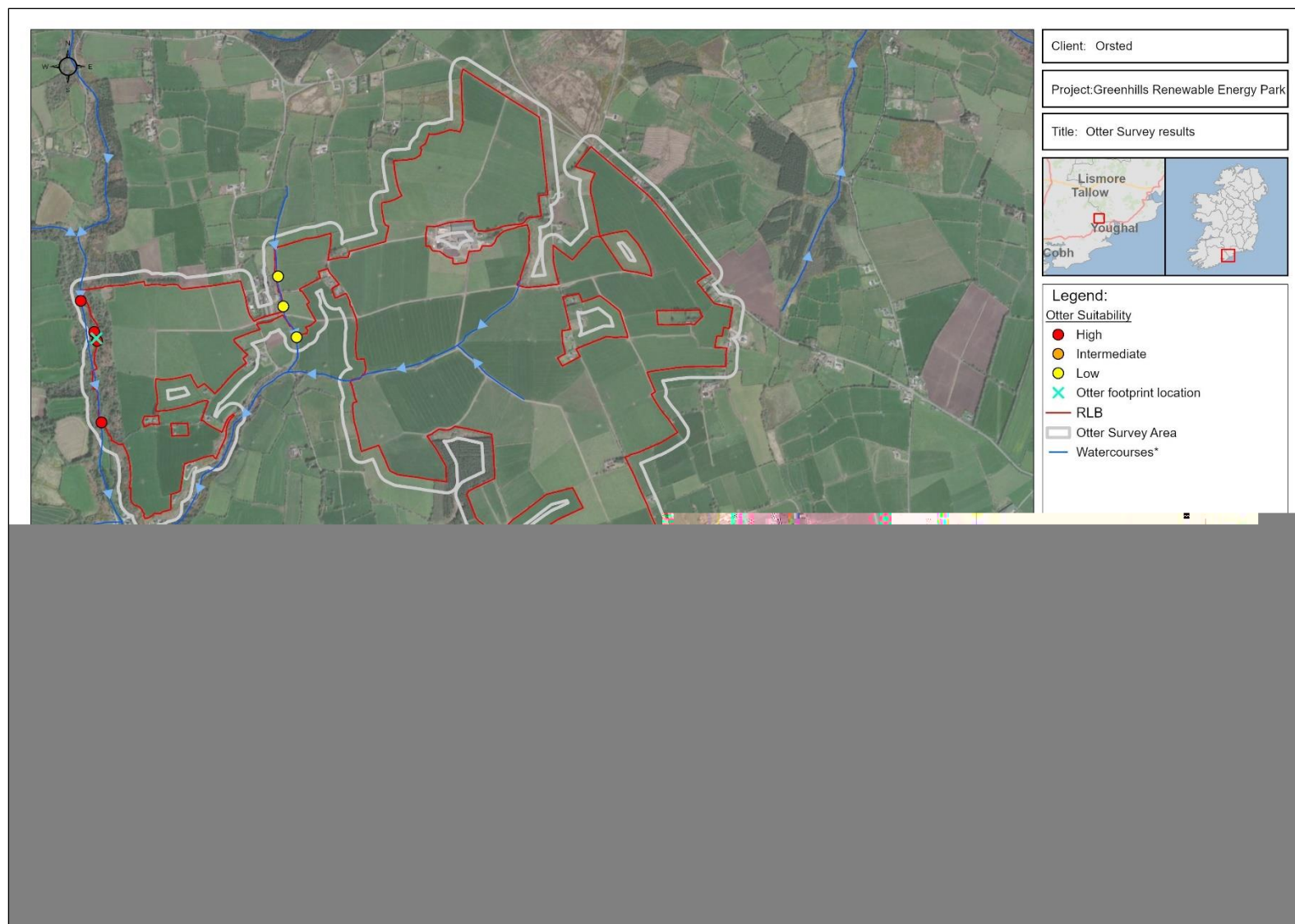
5.2.4.3.7. Hedgehog

Hedgehog was previously assessed as least concern (Marnell *et al.*, 2019). The widespread range across Ireland, increased records and the European status of least concern justify this assessment.

In other areas of its distribution, it has been found to be on the decline; in Ireland it is uncertain whether this is also the case. A report on the state of Britain's mammals in 2011 stated that while the hedgehog population was estimated at 30 million in the 1950s, by the 1990s this had declined to 1.5 million (Haigh *et al.*, 2012a; Haigh *et al.*, 2012b).

5.2.4.4. **Receiving Environment (the Baseline + Trends)**

It is assumed in this report that the baseline environment in relation to Non-Volant Mammal species, amphibians and invertebrates as described herein, will be the receiving environment at the time of construction with ongoing trends as identified expected to be reflected during the operational and decommissioning phases.



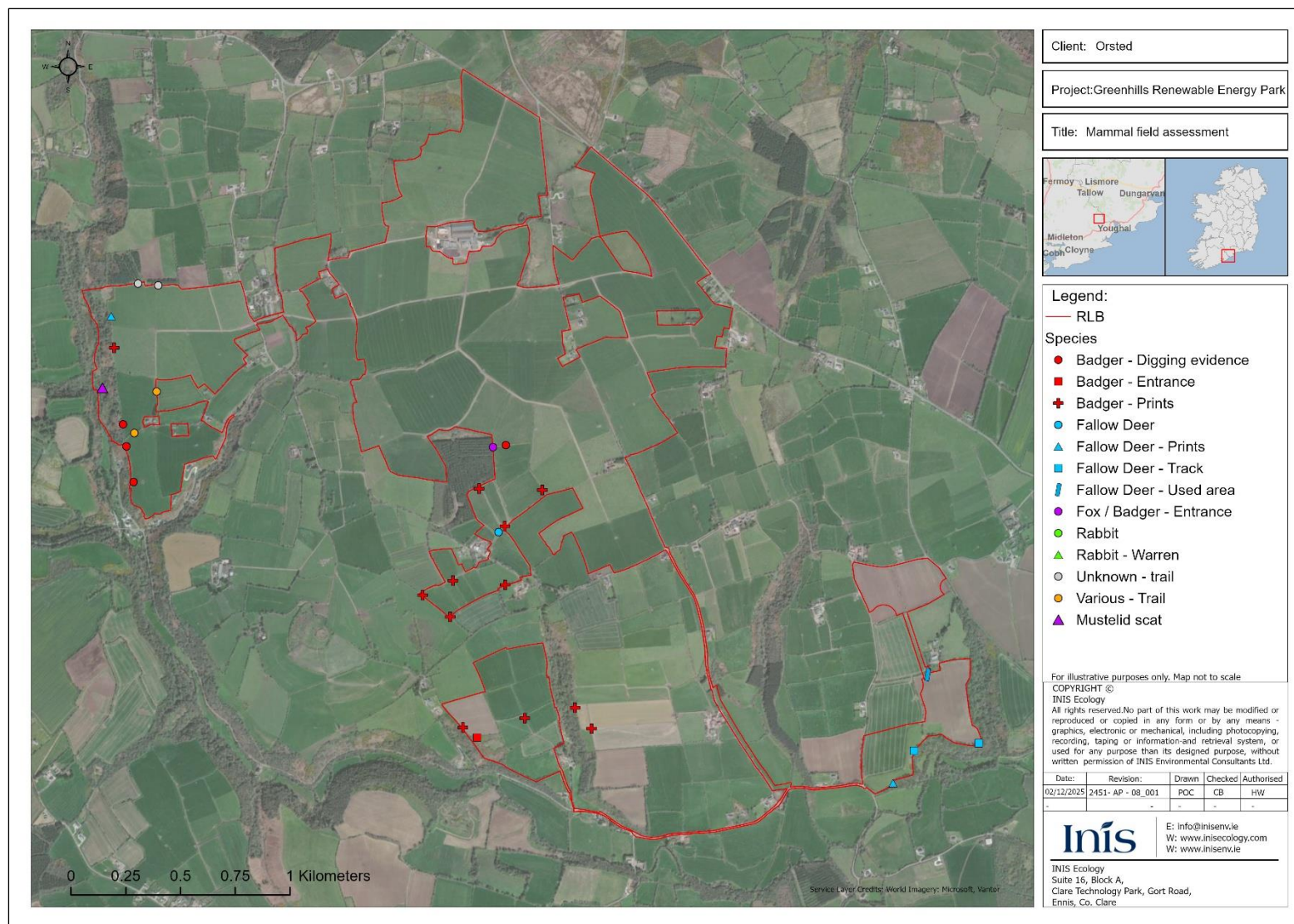


Figure 5.9: Mammal Field Assessment Results.

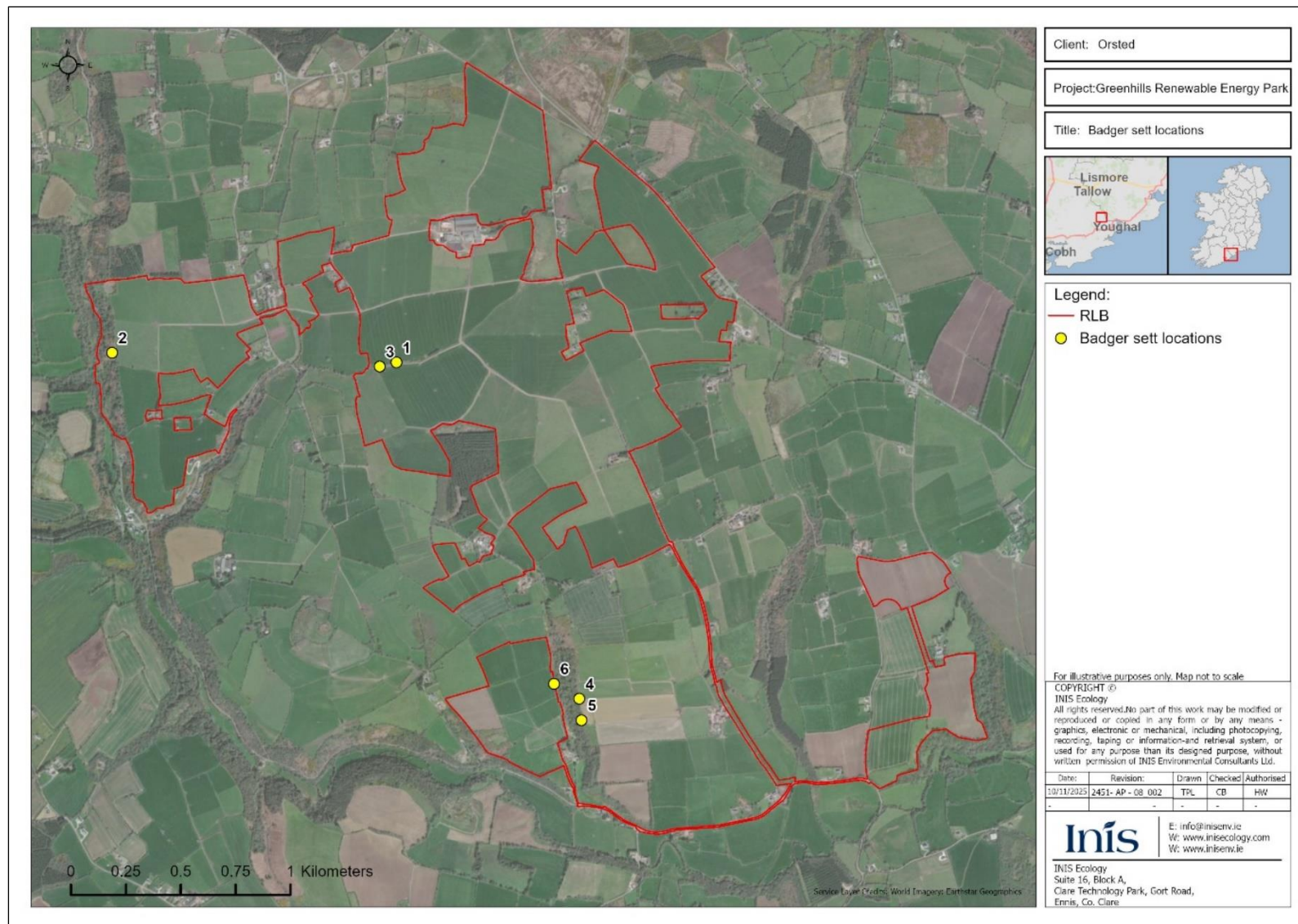


Figure 5.10: Badger Sett Locations.

5.2.5. Bats

5.2.5.1. Survey Results and Importance

5.2.5.1.1. PRA Surveys

PRAs were carried out throughout the Proposed Development site and within 500m to assess the likelihood of bats being present at various structures, i.e. trees, bridges and watercourse crossings. Four buildings and three trees were recorded within the study area.

The results of the PRA undertaken in the Development site are shown in **Table 5.10** and **Figure 5.11**. Photos of the three buildings with moderate suitability or higher are provided in **Appendix C**.

Table 5.10: PRA Results of Structures and Trees with roosting potential within the Proposed Development 2025.

Date	Structure type	Structure Code	Coordinates (ITM)	Roosting Potential	Notes
15/05/2025	Stone Buildings	BL1	605204.51, 580960.25	High	Large building - attic spaces visible
15/05/2025	Stone Building with corrugated roof	BL2	603731.53, 581835.83	Low	Open faced shed - largely occupied by Swallow's
15/05/2025	Shed with derelict house attached	BL3	603744.78, 581818.37	High	Adjacent to building BL2
15/05/2025	Tree	TR4	603715.28, 581792.03	PRF-I	Beech tree with broken limb
15/05/2025	Tree	TR5	602959.73, 583176.84	PRF-I	Beech tree in open area, one cavity seen. Tree largely in leaf now
15/05/2025	Stone Building	BL6	603886.27, 583040.74	Moderate	Stone Building, covered in ivy
15/05/2025	Tree	TR7	603696.56, 581786.84	PRF-I	Beech tree, one or two limbs broken off, tree is quite hollow on the inside. Adjacent to structure 4

5.2.5.1.2. Bat Activity Surveys- Emergence Surveys

The PRAs identified three buildings to be surveyed for bat roosting, these included BL1, BL3 and BL6 (**Figure 5.9**). The trees were found to have low roosting potential respectively, as such they were not surveyed for bat roosting.

BL1 is a large stone building with 'High' roosting potential, three emergence surveys were carried out on 15th July and 5th August and 2nd September 2025.

BL3 is a shed attached to a derelict house with 'High' roosting potential, three emergence surveys were carried out on 16th July and 7th and 28th August 2025.

BL6 is a stone building with 'Moderate' roosting potential, two emergence survey was carried out on 22nd July and 9th September 2025.

All emergence surveys were carried out with two surveyors for each effort having a shared view of the buildings. The survey results for all three sites are in **Table 5.11**. BL1 and BL3 were visited three times, BL6 was visited twice.

One roost was identified at BL3, with 12 Common Pipistrelles *Pipistrellus pipistrellus* and five Soprano Pipistrelles *Pipistrellus pygmaeus* recorded emerging from the site. No other roosts were identified at BL1 and BL6. Soprano Pipistrelle, Common Pipistrelle and Leisler's Bat *Nyctalus leisleri* commuting and foraging was recorded. The emergence survey results for BL1, BL3 and BL6 are provided in **Figure 5.12- Figure 5.19**, only the flightlines of bats that were seen are mapped.

Table 5.11: Emergence Survey Results.

Visit No.	Date	Species	Behaviour	Occurrence (no. of flight passes)
BL1				
1	15/07/2025	Leisler's Bat	Commuting	9
			Foraging	23
			Emerging	0
		Common Pipistrelle	Commuting	3
2	05/08/2025	Common Pipistrelle	Commuting	2
			Foraging	0
			Emerging	0
		Leisler's Bat	Commuting	1
			Foraging	145
			Emerging	0
		Soprano Pipistrelle	Commuting	7
			Foraging	9
			Emerging	0
3	02/09/2025	Common Pipistrelle	Commuting	6
			Foraging	84
			Emerging	0
		Leisler's Bat	Commuting	10
			Foraging	124
			Emerging	0
		Soprano Pipistrelle	Commuting	4
			Foraging	11

Visit No.	Date	Species	Behaviour	Occurrence (no. of flight passes)
			Emerging	0
BL3				
1	16/07/2025	Common Pipistrelle	Commuting	2
			Foraging	60
			Emerging	0
		Leisler’s Bat	Commuting	9
			Foraging	36
			Emerging	0
2	07/08/2025	Common Pipistrelle	Commuting	4
			Foraging	81
			Emerging	12
		Leisler’s Bat	Commuting	6
			Foraging	4
			Emerging	0
		Soprano Pipistrelle	Commuting	3
			Foraging	0
			Emerging	5
3	28/08/2025	Common Pipistrelle	Commuting	23
			Foraging	27
			Emerging	0
		Leisler’s Bat	Commuting	2
			Foraging	0
			Emerging	0
		Myotis spp.	Commuting	5
			Foraging	0
			Emerging	0
		Soprano Pipistrelle	Commuting	16
			Foraging	4
			Emerging	0
BL6				
1	22/07/2025	Common Pipistrelle	Commuting	3
			Foraging	2
			Emerging	0
		Leisler’s Bat	Commuting	2
			Foraging	3
			Emerging	0
		Soprano Pipistrelle	Commuting	3
			Foraging	2
			Emerging	0
2	09/09/2025	Brown Long-eared Bat	Commuting	3
			Foraging	0
			Emerging	0
		Common Pipistrelle	Commuting	5
			Foraging	0
			Emerging	0

Visit No.	Date	Species	Behaviour	Occurrence (no. of flight passes)
		Leisler's Bat	Commuting	7
			Foraging	37
			Emerging	0
		Soprano Pipistrelle	Commuting	7
			Foraging	12
			Emerging	0

5.2.5.1.3. Common Pipistrelle

Common Pipistrelle is an Annex IV protected species of the EU Habitat Directive and is protected under the Wildlife Acts, it is a population of 'Least Concern' (Marnell *et al.*, 2019). No Common Pipistrelle records were recorded during the desk study (NBDC, 2025).

Commuting activity was recorded at BL1 for Common Pipistrelle. Emerging, commuting and foraging activity was recorded at BL3 for Common Pipistrelle (**Table 5.14**).

Common Pipistrelle is the most common and widely distributed bat species in Ireland. Given that Common Pipistrelle was recorded roosting at BL3, high levels of commuting and foraging activity was recorded during emergence surveys and the availability of suitable commuting and foraging habitat within the Proposed Development, Common Pipistrelle is considered to be of **Local Importance (Higher Value)** and is included for further consideration as a KER for detailed impact assessment.

5.2.5.1.4. Soprano Pipistrelle

Soprano Pipistrelle is an Annex IV protected species of the EU Habitat Directive and is protected under the Wildlife Acts, it is a population of 'Least Concern' (Marnell *et al.*, 2019).

Commuting and foraging activity for Soprano Pipistrelle was recorded at all three emergence survey sites; emergence behaviour was also recorded at BL3 (**Table 5.14**).

Soprano Pipistrelles are common and widely distributed bat species in Ireland. Given that Soprano Pipistrelle was recorded roosting at BL3, commuting and foraging activity was recorded during emergence surveys and the availability of suitable commuting and foraging habitat within the Proposed Development, Soprano Pipistrelle is considered to be of **Local Importance (Higher Value)** and is included for further consideration as a KER for detailed impact assessment.

5.2.5.1.5. Leisler's Bat

Leisler's bat is an Annex IV protected species of the EU Habitat Directive and is protected under the Wildlife Acts, it is a population of 'Least Concern' (Marnell *et al.*, 2019). No Leisler's Bat records were recorded during the desk study (NBDC, 2025).

Commuting and foraging activity for Leisler's Bat was recorded at all three emergence survey sites, notably, a high level of foraging activity was recorded at BL1 (145 flight passes) (**Table 5.14**).

Leisler's bats are a common and widely distributed bat species in Ireland. Given that commuting and foraging activity was recorded for Leisler's Bat during emergence surveys and the availability of suitable commuting and foraging habitat within the Proposed Development, Leisler's Bat is considered to be of **Local Importance (Higher Value)** and is included for further consideration as a KER for detailed impact assessment.

5.2.5.1.6. Brown Long-eared Bat

Brown Long-eared is an Annex IV protected species of the EU Habitat Directive and is protected under the Wildlife Acts, it is a population of 'Least Concern' (Marnell *et al.*, 2019).

Commuting activity for Brown Long-eared Bat was recorded at all BL6 (**Table 5.14**).

Brown Long-eared Bat are a common and widely distributed bat species in Ireland. Given that Long-eared Bat was recorded commuting at BL6 and given the availability of suitable commuting and foraging habitat within the Proposed Development, Brown Long-eared Bat is considered to be of **Local Importance (Higher Value)** and is included for further consideration as a KER for detailed impact assessment.

5.2.5.1.7. Myotis spp.

Myotis spp. are Annex IV protected species of the EU Habitat Directive and are protected under the Wildlife Acts. *Myotis spp.* are collectively a population of 'Least Concern' (Marnell *et al.*, 2019).

Myotis spp. were recorded during emergence surveys commuting at BL3 (five flight passes). *Myotis spp.* are common and widely distributed bat species in Ireland. Due to the low activity of *Myotis spp.* recorded within the Proposed Development site boundary for the entire survey period, *Myotis spp.* is considered to be of **Local Importance (Lower Value)** and is not included for further consideration as a KER for detailed impact assessment.

5.2.5.2. **Sensitivity to Change**

All bat species, and their breeding/resting places, are legally protected in Ireland under the Wildlife Act. BL3 was identified as a bat roost within the study area as Common Pipistrelle and Soprano Pipistrelle both displayed emergence behaviour. The roost structure is a shed attached to a derelict house large stone building. As such, due to the number of species utilizing the structure and the availability of commuting and foraging hedgerow and treeline habitat surrounding the roost site, is considered a KER of **Local Importance (Higher Value)**, which is equivalent to **Low sensitivity**.

The key sensitivities of bats are the destruction or disturbance of their roosting places, and the modification of their commuting routes and foraging habitats (NPWS 2013, Collins, 2023). During the day, bats roost in man-made structures (typically houses, farm buildings and bridges), mature trees, and caves. They are most sensitive to effects during their maternity and hibernation periods, which are from May to August and November to March, respectively. After sunset, bats 'commute' from their roosts to a suitable feeding area and spend most of the night foraging for insect prey. They typically favour linear habitat features (e.g., hedgerows and forest edges) for commuting and foraging and usually avoid brightly-lit areas (Lundy *et al.*, 2011). They may travel several kilometres from their roost and may use different feeding areas on different nights. Local populations of bats are evaluated as **Local Importance (Higher Value)**, which is equivalent to **Low sensitivity**.

5.2.5.3. **Trends in the Baseline Environment (the 'Do-Nothing' scenario)**

Under Article 17 of the Habitats Directive, the Irish government is obliged to assess and report on the conservation status of all habitats and species listed in Annexes I, II, IV and V of the directive, including bats. In the latest submission (NPWS 2019), all Irish bat species are considered to be of favourable conservation status. Most bat species are listed as 'Least Concern' on the all-Ireland red list of mammals (Marnell *et al.*, 2019), including the Nathusius' Pipistrelle. Leisler's Bat is listed as 'Near-Threatened' because Ireland supports an internationally important population, but the overall

population status of this species is known to be stable or increasing. The abundance of Irish bats is monitored by Bat Conservation Ireland (Roche *et al.*, 2012) using annual public surveys such as the 'Car-Based Monitoring Scheme', the 'All-Ireland Daubenton's Bat Waterways Survey', and roost monitoring assessments for Brown Long-eared Bats and Lesser Horseshoe Bats. In combination, these surveys monitor all Irish species except Natterer's Bat and Whiskered Bat. To date, the populations of all monitored species appear to be stable or increasing. If the Proposed Development does not proceed, the site is expected to remain in the baseline condition and to be used by bat species on an occasional to regular basis. Based on the national trends of these species, the abundance of bats in the surrounding landscape is expected to remain stable, or to increase at a slow rate.

5.2.5.4. Receiving Environment (the Baseline + Trends)

As the conservation status of all Irish bat species is considered to be stable, it is expected that the baseline levels of bat activity will not change significantly by the time of construction of the Proposed Development.

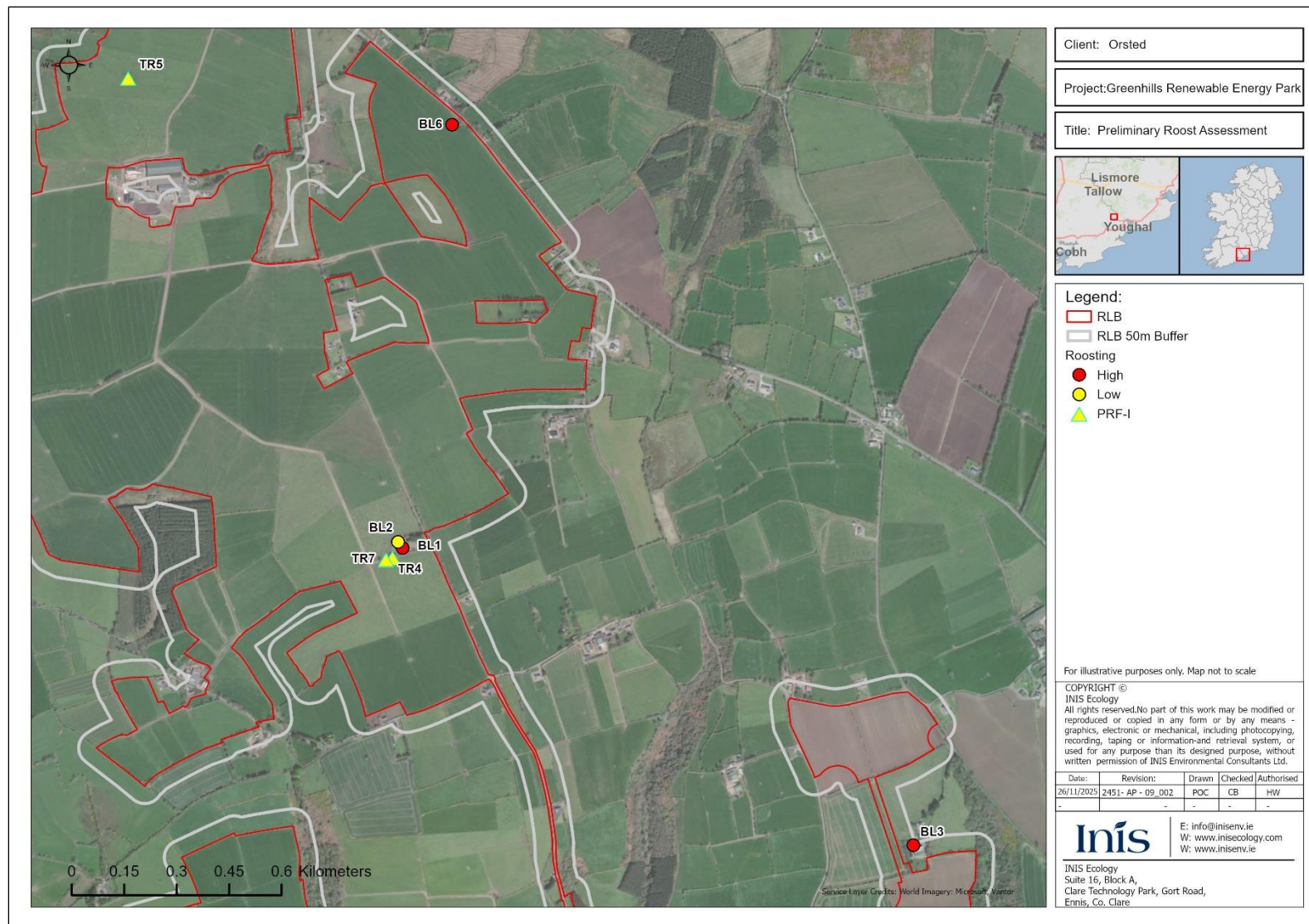


Figure 5.11: PRA Results.

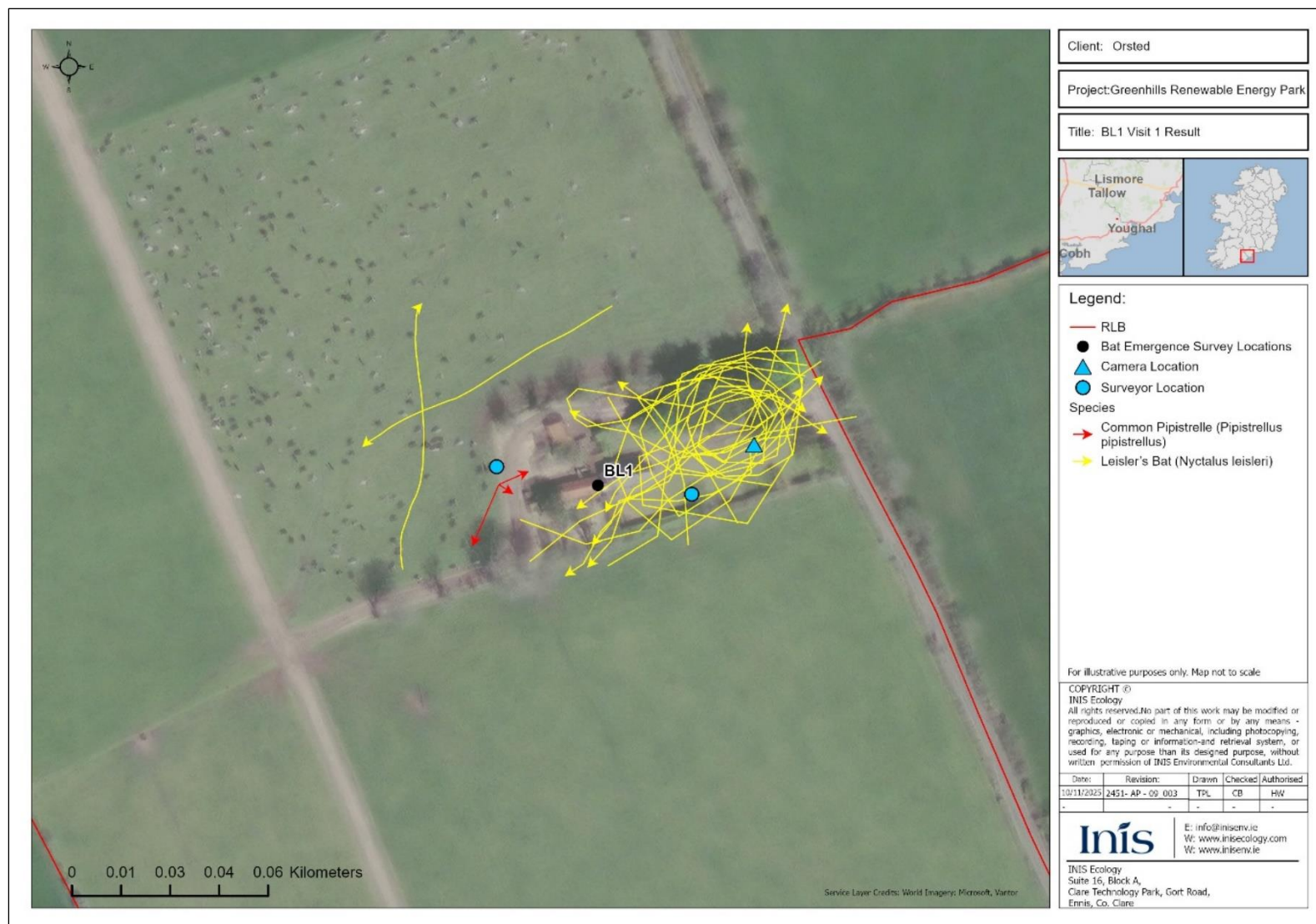


Figure 5.12: BL1 Visit 1 Results.

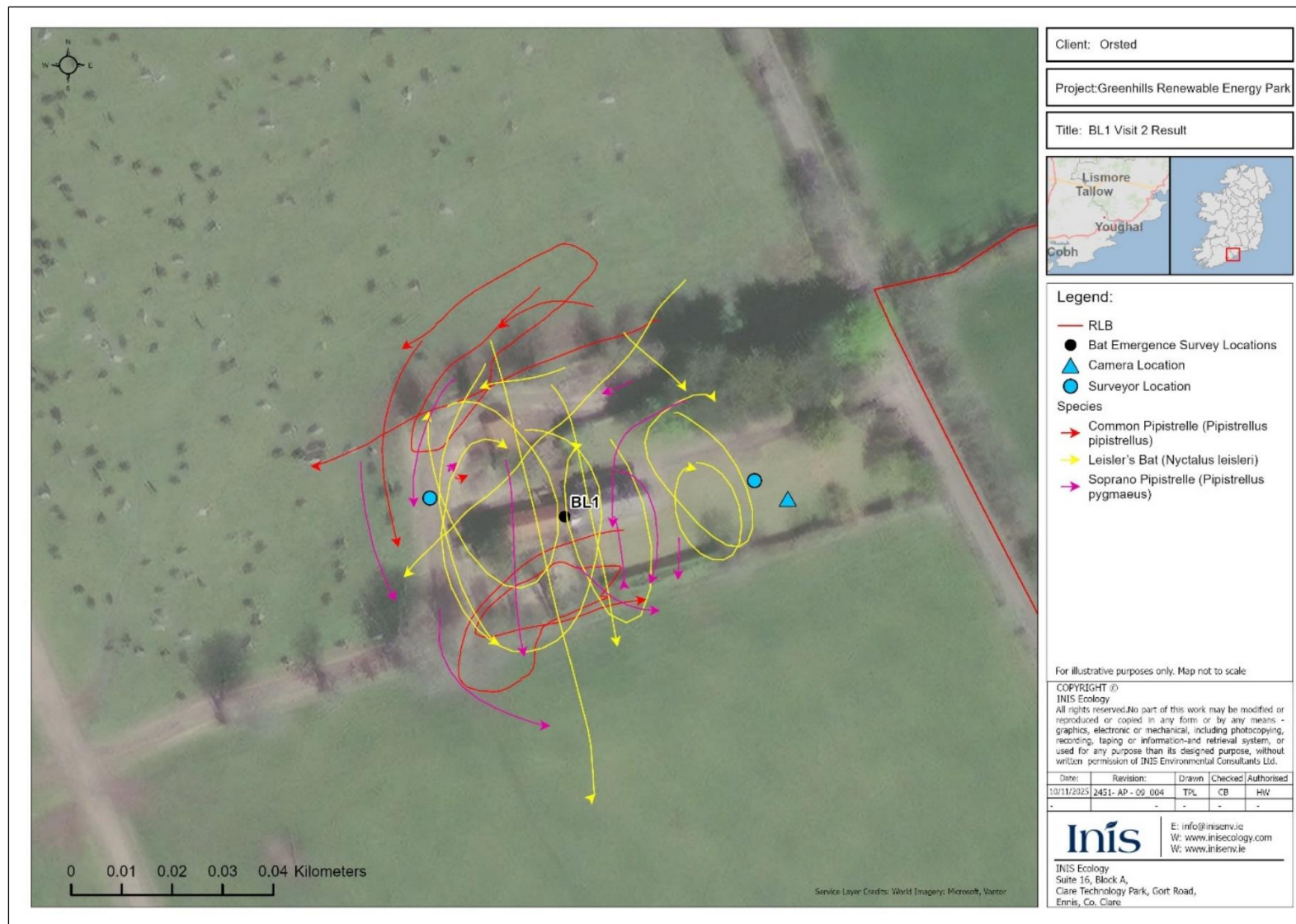


Figure 5.13: BL1 Visit 2 Results.

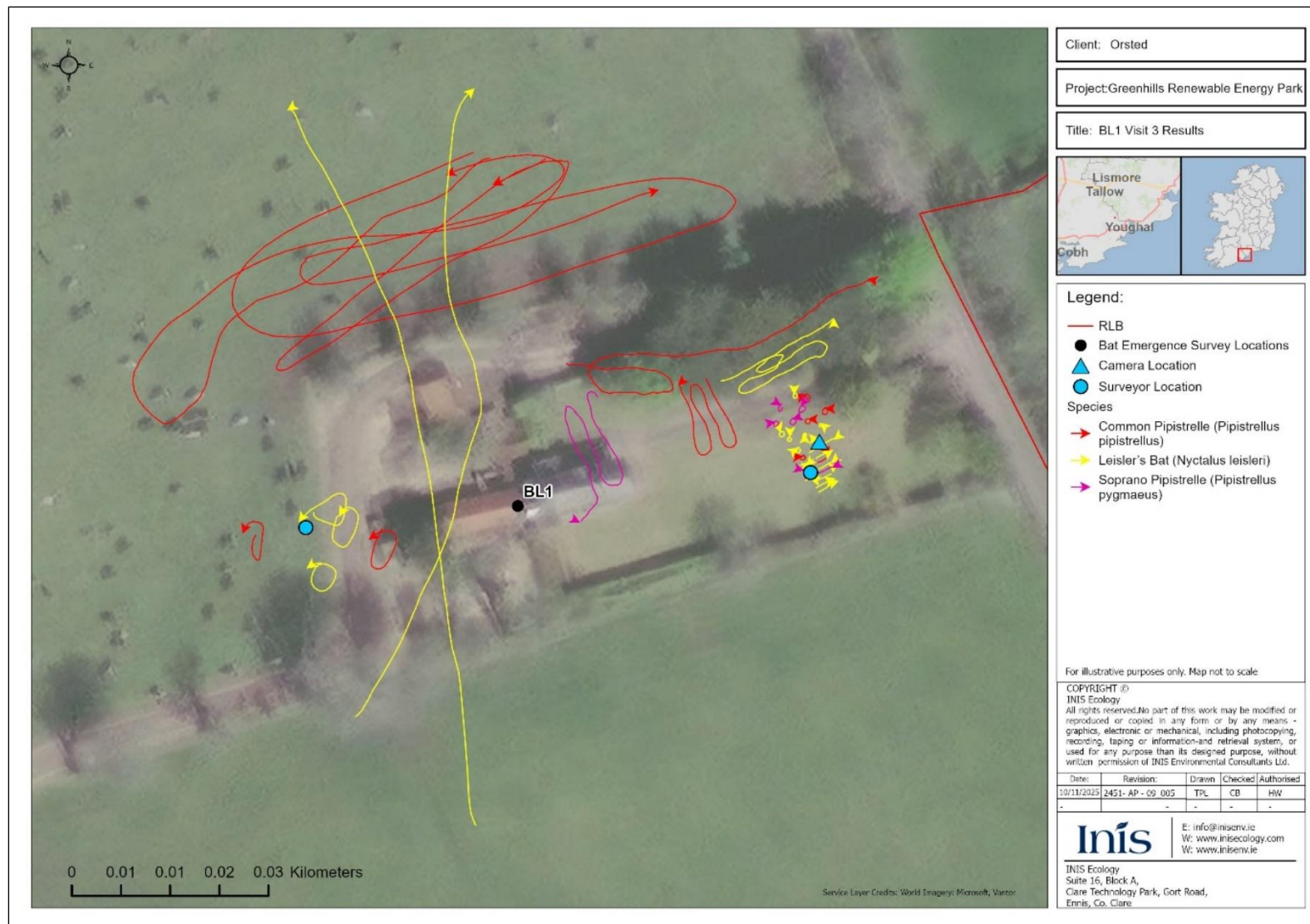


Figure 5.14: BL1 Visit 3 Results.

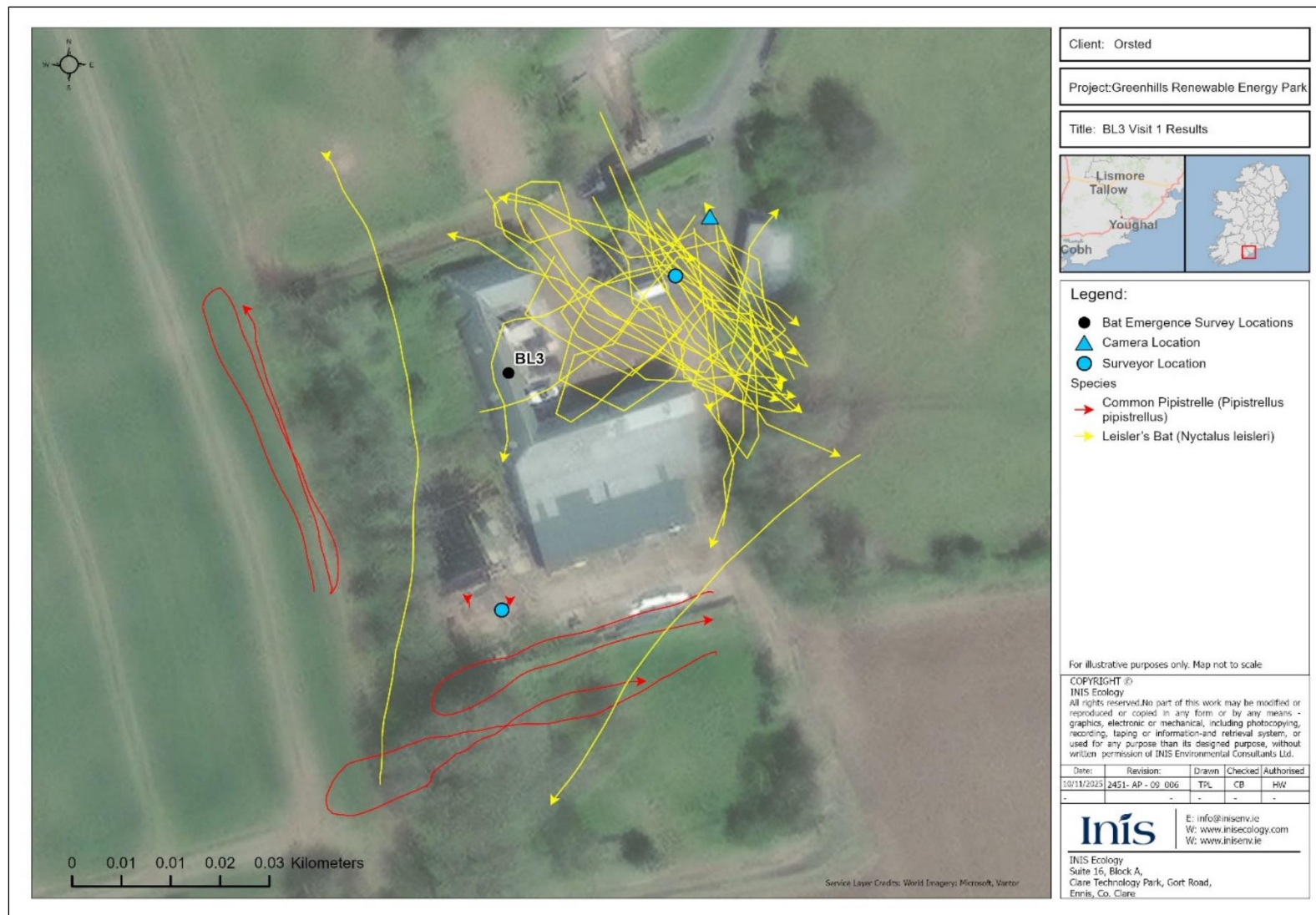


Figure 5.15: BL3 Visit 1 Results.

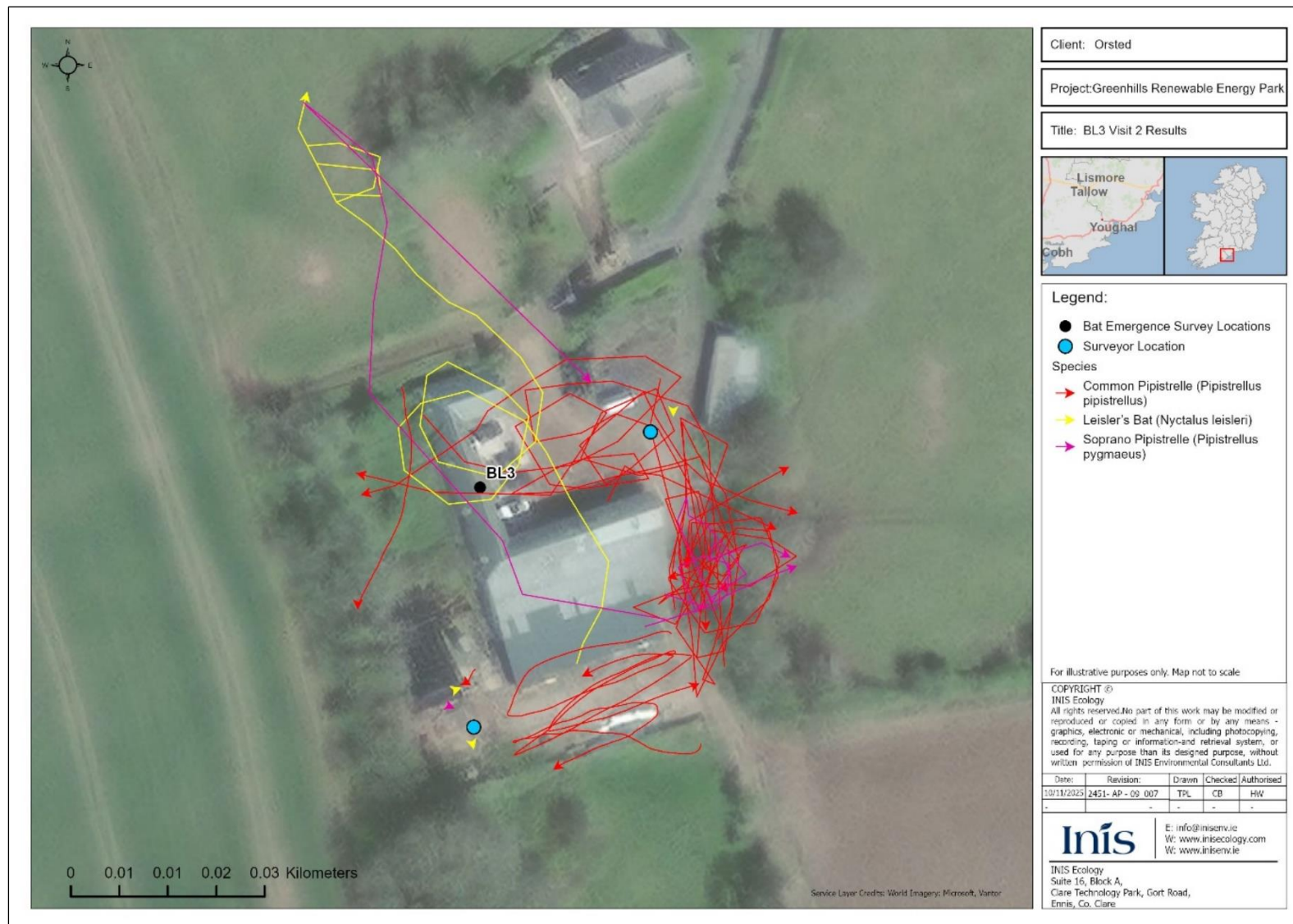


Figure 5.16: BL3 Visit 2 Results.

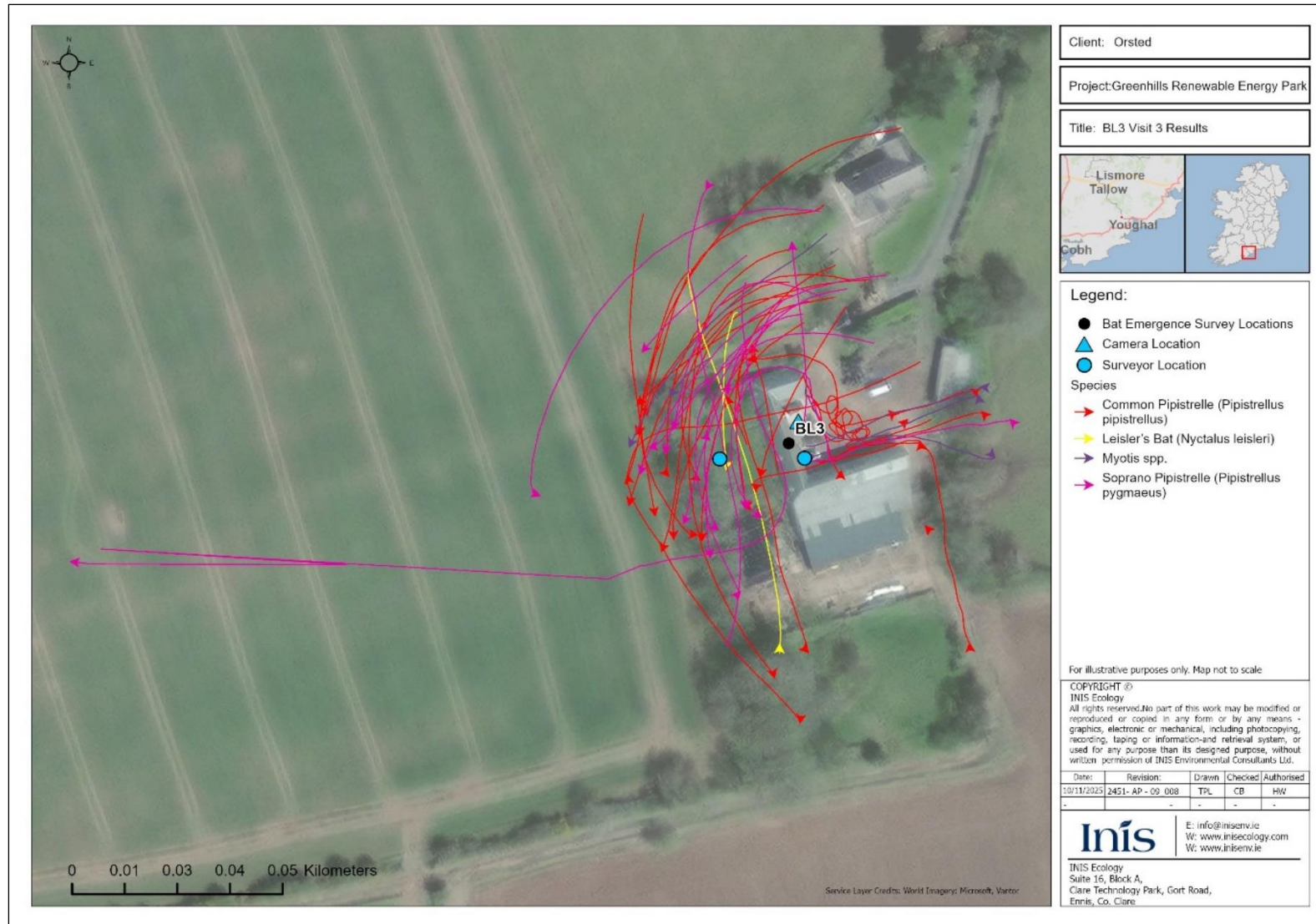


Figure 5.17: BL3 Visit 3 Results.

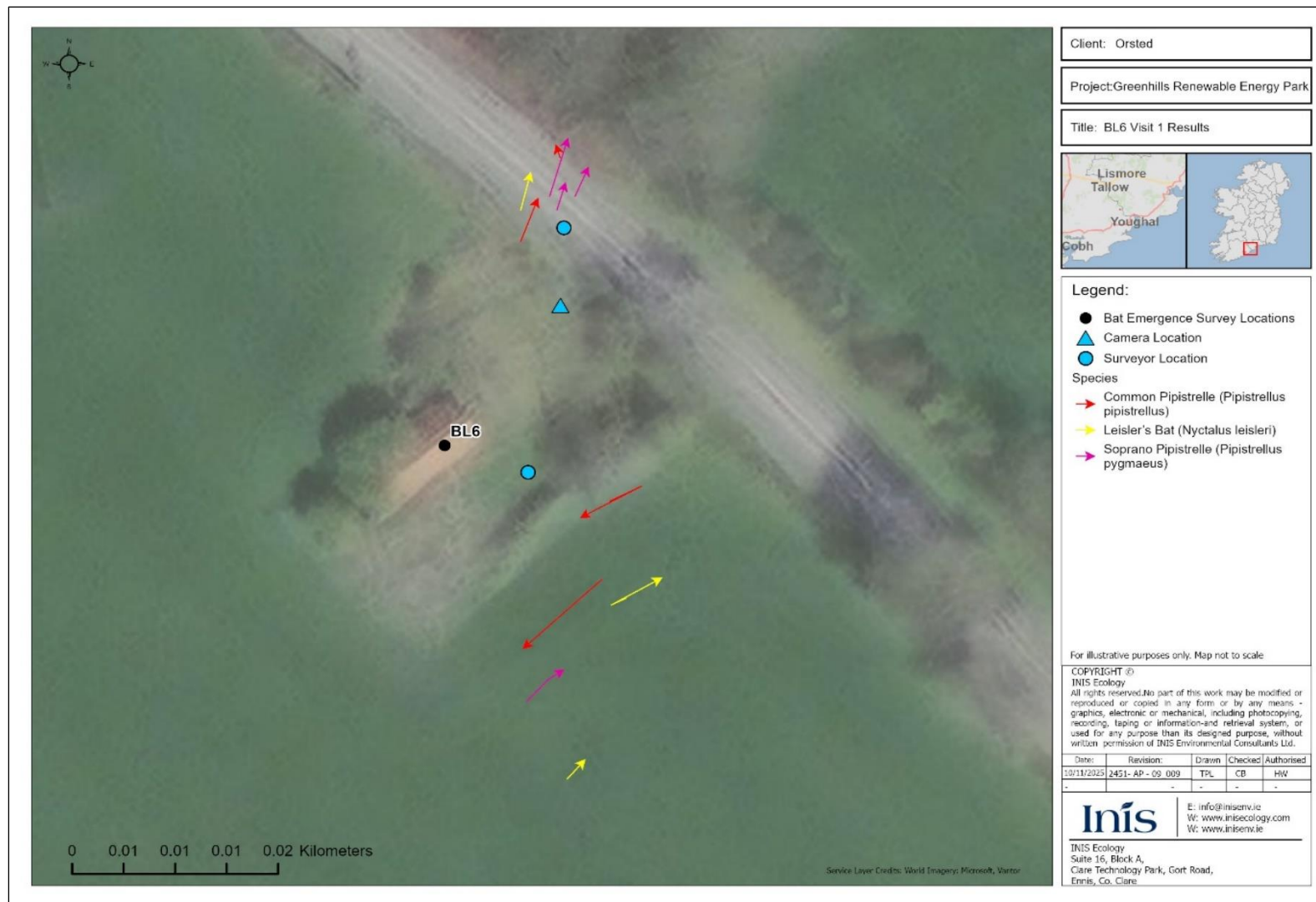


Figure 5.18: BL6 Visit 1 Results.

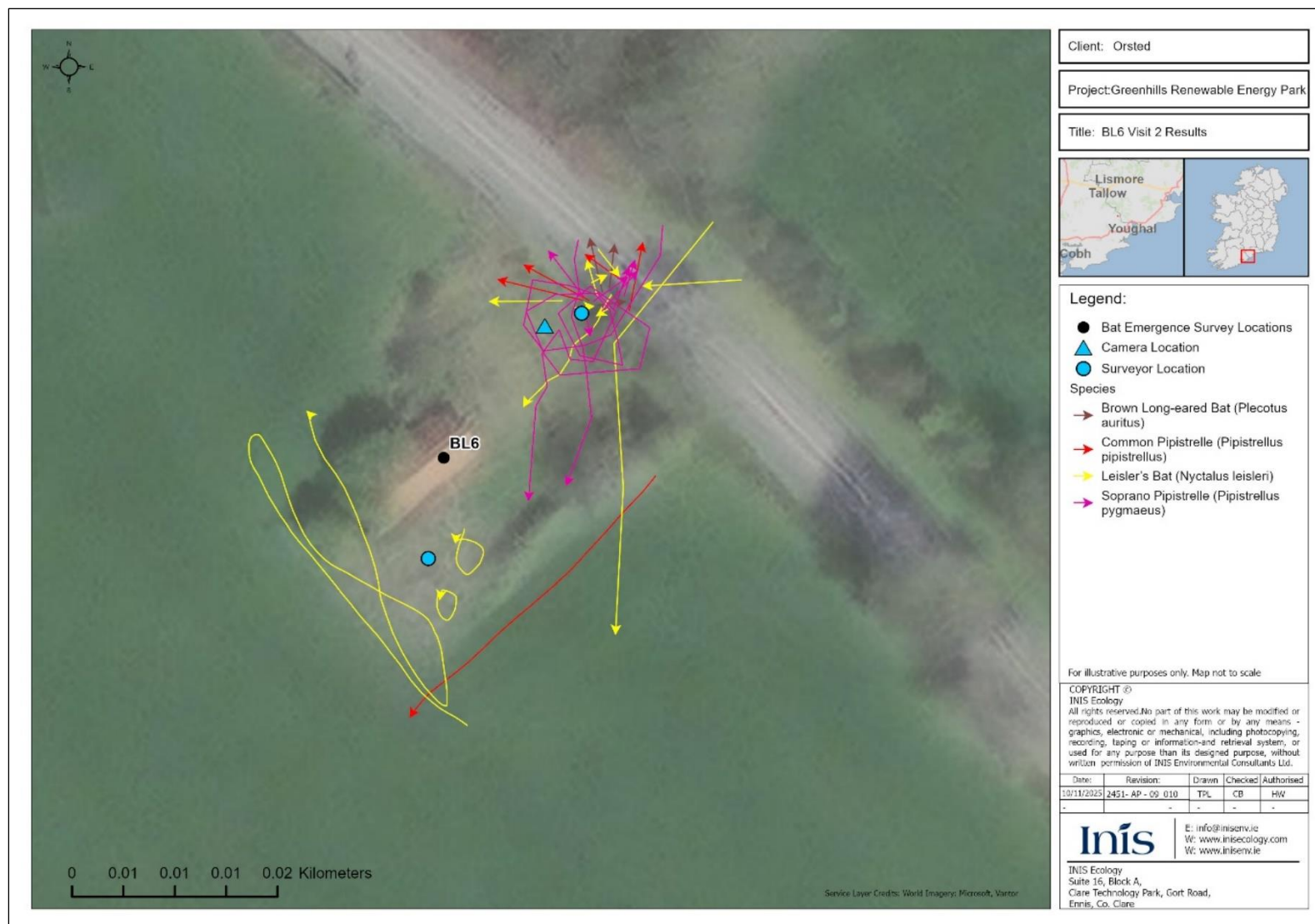


Figure 5.19: BL6 Visit 2 Results.

5.2.6. Birds

A number of gulls, passerine, wetland and waterbird species that are BoCCI Red- or amber-listed were recorded within the wider receiving environment of the Proposed Development. These species are listed below addressing the reasoning for scoping in or out of these receptors as KERs.

5.2.6.1. Survey Results and Importance

5.2.6.1.1. Countryside Bird Surveys

A total of 32 species were recorded during the breeding season 2025 transect surveys (See **Table 5.12**). BoCCI Amber- listed species included Goldcrest *Regulus regulus*, Linnet *Linaria cannabina*, Starling *Sturnus vulgaris*, Swallow *Hirundo rustica* and Willow Warbler *Phylloscopus trochilus* (Gilbert *et al.*, 2021). Red listed species included: Meadow Pipit *Anthus pratensis* and Yellowhammer *Emberiza citrinella* (Gilbert *et al.*, 2021).

Table 5.12: Breeding Season 2025 CBS Transect Survey Results.

Date	May			Jun			Total
Transect	T1	T2	T3	T1	T2	T3	
Blackbird	6	5	10	3	9	7	40
Blackcap	2	-	4	1	2	2	11
Blue Tit	-	2	-	1	-	-	3
Buzzard	-	-	1	-	-	1	2
Chaffinch	3	-	6	4	-	3	16
Chiffchaff	3	10	2	3	3	2	23
Coal Tit	-	-	-	2	-	-	2
Dunnoek	2	1	1	-	6	-	10
Goldcrest	1	3	2	1	-	-	7
Goldfinch	2	5	-	1	-	-	8
Great Tit	-	-	-	-	1	1	2
Greenfinch		1	-	-	-	-	1
Hooded Crow	1	-	-	2	-	1	4
Jackdaw	-	1	2	-	-	-	3
Linnet	3	3	3	-	-	1	10
Magpie	-	-	-	-	1	-	1
Mistle Thrush	-	1	-	-	-	-	1
Meadow Pipit	-	3	-	-	-	-	3
Pheasant	-	-	2	-	-	1	3
Reed Bunting	2	-	-	-	-	-	2

Date	May			Jun			Total
Transect	T1	T2	T3	T1	T2	T3	
Robin	10	2	1	4	2	3	23
Rook	3	1	-	2	13	-	19
Siskin	1	-	-	3	-	-	4
Song Thrush	1	4	6	-	5	5	21
Starling	-	10	-	-	-	3	13
Stonechat	1	2	-	-	1	-	4
Swallow	-	-	-	-	4	-	4
Whitethroat	-	-	1	-	-	2	3
Willow Warbler	3	1	1	3	-	-	8
Woodpigeon	5	13	9	9	5	11	52
Wren	6	7	9	4	5	7	38
Yellowhammer	1	-	4	-	4	3	12

5.2.6.1.2. I-WeBS

A total of five species were recorded during the I-WeBS. Great Black-backed Gull *Larus marinus* and Grey Heron *Ardea cinerea* are Green-listed species (Gilbert *et al.*, 2021). Black-headed Gull *Chroicocephalus ridibundus*, Herring Gull and Lesser Black-backed Gull are on the BoCCI Amber list (Gilbert *et al.*, 2021) (Table 5.13; Figure 5.18).

Table 5.13: *I-WeBS results.*

Species	Jan	Feb	Mar	May	Jun	Total
Black-headed Gull	22	-	-	-	-	22
Great Black-backed Gull	6	-	-	-	-	6
Grey Heron	-	1	-	-	-	1
Herring Gull	-	-	-	-	7	7
Lesser Black-backed Gull	41	1	-	2	3	47

5.2.6.1.3. Water Connectivity Survey

A total of four species were recorded during water connectivity surveys. These species were Great Black-backed Gull, Herring Gull, Lesser Black-backed Gull and Snipe *Gallinago gallinago*. Great Black-backed Gull is on the BoCCI Green list (Gilbert *et al.*, 2021). Herring Gull and Lesser Black-backed Gull are on the BoCCI Amber list, and Snipe is on the BoCCI Red list (Gilbert *et al.*, 2021) (**Table 5.14**). Each species is colour-coded with a ‘traffic light system’ with ‘red’ species of high conservation concern, ‘amber’ species of medium conservation concern, and ‘green’ species of low conservation concern as part of the BoCCI (Gilbert *et al.*, 2021).

Flightline activity for all species are shown **Figure 5.19 – Figure 5.22**.

Table 5.14: *Water Connectivity VP Species Counts.*

Species	Jan	Feb	Mar	Apr	May	Jun	Total
Great Black-backed Gull	3	141	-	-	-	-	144
Herring Gull	-	-	-	-	-	15	15
Lesser Black-backed Gull	30	189	-	-	-	15	234
Snipe	5	-	1	-	-	-	6

5.2.6.1.4. Barn Owl

Barn Owl *Tyto alba* is included on the BoCCI Red List (Gilbert *et al.*, 2021). One ‘Low’ suitability structure was identified on 28th March 2025. No evidence of Barn Owls was observed during field assessment survey efforts.

Due to the absence of Barn Owl Evidence within the Proposed Development, its negligible sensitivity to solar farm projects, it is evaluated as **Local Importance (Lower Value)** and is **not** considered a KER for detailed consideration in the impact assessment.

5.2.6.1.5. Buzzard

Buzzard is a common resident species in Ireland with a widespread distribution and increasing population size both in long-term and short-term (Hardey *et al.*, 2013; Gilbert *et al.*, 2021).

Two Buzzards were observed during the breeding season 2025 CBS transect surveys (**Table 5.12**). Two Buzzards were observed as incidental sightings flying over grassland habitat on 04/02/2025. Buzzard was observed on three occasions as incidental sightings on 11/03/2025, behaviours observed included

perching and flying (ITM: 603858.02, 581963.45; ITM: 603320.01, 580416.56; ITM: 603780.51, 583165.37).

Given the low Buzzard activity and no nesting activity recorded within the Proposed Development and its negligible sensitivity to solar farm projects, the population of Buzzard within the Development and surrounding area is considered to be of **Local Importance (Lower Value)** and is **not** considered a KER for detailed consideration in the impact assessment.

5.2.6.1.6. Sparrowhawk

Sparrowhawk *Accipiter nisus* is a common and widespread resident species in Ireland and is included on the BoCCI Green list (Gilbert *et al.*, 2021).

One female Sparrowhawk observed as an incidental sighting on 04/02/2025 flying over grassland habitat. Evidence of Sparrowhawk was recorded in the form of a plucked Woodpigeon (ITM: 602734.51, 582260.96) on 11/02/2025.

Given the low Sparrowhawk activity and no nesting activity recorded within the Proposed Development and its negligible sensitivity to solar farm projects, the population of Sparrowhawk within the Development and surrounding area is considered to be of **Local Importance (Lower Value)** and is **not** considered a KER for detailed consideration in the impact assessment.

5.2.6.1.7. Kestrel

Whilst a common and widespread raptor species in Ireland, Kestrel *Falco tinnunculus* is included on the BoCCI Red list due to its widespread decline (Gilbert *et al.*, 2021).

An incidental sighting of a male Kestrel was recorded on 20/03/2025 (ITM: 603932.32, 582035.8).

No nest sites were identified within the Proposed Development site boundaries, and no territories were recorded throughout the survey period. Given the low activity recorded the population of Kestrel within the Proposed Development and its negligible sensitivity to solar farm projects, it is considered to be of **Local Importance (Lower Value)** and is **not** considered a KER for detailed consideration in the impact assessment.

5.2.6.1.8. Goldcrest

Goldcrest is an Amber listed species (Gilbert *et al.*, 2021). Seven observations were recorded during breeding season 2025 CBS transect surveys (**Table 5.12**). Due to the low levels of activity and nesting potential for this species within the Proposed Development site boundary during the breeding season, the populations of Goldcrest found within and adjacent to the site are considered to be of **Local Importance (Lower Value)** and is **not** considered a KER for detailed consideration in the impact assessment.

5.2.6.1.9. Linnet

Linnet is an Amber listed species (Gilbert *et al.*, 2021). Ten observations were recorded during breeding season 2025 CBS transect surveys (**Table 5.12**). Due to the low levels of activity and nesting potential for this species within the Proposed Development site boundary during the breeding season, it is considered to be of **Local Importance (Lower Value)** and is **not** considered a KER for detailed consideration in the impact assessment.

5.2.6.1.10. Meadow Pipit

Meadow Pipit is a Red listed species (Gilbert *et al.*, 2021). Three observations were recorded during the breeding season 2025 CBS transect surveys (**Table 5.12**). Due to the confirmed sightings and suitable breeding habitat (scrub and pasture) located within the Proposed Development, populations of Meadow Pipit found within and adjacent to the site are considered to be of **Local Importance (Higher Value)** and is considered a **KER** for detailed consideration in the impact assessment.

5.2.6.1.11. Starling

Starling is an Amber listed species (Gilbert *et al.*, 2021). A total of 13 observations of Starling were recorded during the breeding season 2025 transect surveys (**Table 5.12**). Due to the low levels of activity of this species and limited suitable habitat within the Proposed Development, populations of Starling found within and adjacent to the site are considered to be of **Local Importance (Lower Value)** and is **not** considered a KER for detailed consideration in the impact assessment.

5.2.6.1.12. Swallow

Swallow is an Amber listed species (Gilbert *et al.*, 2021). Four observations of Swallow were recorded during breeding season 2025 CBS transect surveys (**Table 5.12**). Due to the low levels of activity and nesting potential for this species within the Proposed Development, the populations of Swallow found within and adjacent to the site are considered to be of **Local Importance (Lower Value)** and is **not** considered a KER for detailed consideration in the impact assessment.

5.2.6.1.13. Willow Warbler

Willow Warbler is an Amber listed species (Gilbert *et al.*, 2021). A total of eight observations of Willow Warbler were recorded during breeding season 2025 CBS transect surveys (**Table 5.12**). Due to the low levels of activity and lack of suitable habitat for this species within the Proposed Development, the populations of Willow Warbler found within and adjacent to the site are considered to be of **Local Importance (Lower Value)** and is **not** considered a KER for detailed consideration in the impact assessment.

5.2.6.1.14. Yellowhammer

Yellowhammer is a Red listed species (Gilbert *et al.*, 2021). A total of 12 observations of Yellowhammer were recorded during breeding season 2025 CBS transect surveys (**Table 5.12**). An incidental sighting of Yellowhammer was recorded on 20/03/2025 (ITM: 604131.88, 582276.58). A pair of Yellowhammers were observed as incidental sightings flying along a hedgerow (ITM: 604886.25, 580382.96) on 28/03/2025, indicating potential breeding behaviour.

Due to the significance number recorded in the desk study, its confirmed presence within the Proposed Development, its restricted distribution in Ireland and its Red listed status (Gilbert *et al.*, 2021), populations of Yellowhammer found within and adjacent to the site are considered to be of **Local Importance (Higher Value)** and is considered a **KER** for detailed consideration in the impact assessment.

5.2.6.1.15. Kingfisher, Dipper and Grey Wagtail

The streams crossed by the Proposed Development site boundary were determined to have 'Low' to 'High' suitability. Secondary evidence of these species was recorded in the form of faeces on rocks at a 'High' suitability site on the Carriganass River (ITM: 602307.58, 582415.9) within the Proposed Development site boundary. No Kingfisher *Alcedo atthis* was observed during field assessment survey efforts. Dipper *Cinclus cinclus* was observed on two occasions during field assessment surveys within

'High' suitability habitat on the Tourig River. The closest sighting was recorded 531m downstream of the Proposed Development site boundary via the Youghal Park River.

One Grey Wagtail was observed as an incidental sighting flying (ITM: 603583.17, 580533.33) 61m east of the Proposed Development site boundary on 28/02/2025.

'High' suitability habitat for Kingfisher, Dipper and Grey Wagtail *Motacilla cinerea* exists both within the Proposed Development and the surrounding areas, however, given the low activity observed within the vicinity of the Proposed Development and absence of all three species within the Proposed Development, they are considered to be of **Local Importance (Lower Value)** and are **not** considered KERs for detailed consideration in the impact assessment.

5.2.6.1.16. Snipe

Snipe is included on the BoCCI Red list (Gilbert *et al.*, 2021). Six Snipe observations were recorded during the water connectivity surveys (**Table 5.14; Figure 5.21**). Flightlines were recorded partially within the Proposed Development site boundary to the north.

Several Snipe were observed as incidental sightings; the sightings were as follows:

- One Snipe disturbed on 27/01/2025 (ITM: 602674.12, 581895.37);
- One Snipe observed on 04/02/2025 (ITM: 604173.54, 582327.69);
- Four individuals disturbed on 11/02/2025 (ITM: 602348.23, 582654.64; ITM: 601733.84, 581862.39; ITM: 601877.36, 581914.19); and
- Ten Snipe individuals were disturbed and flew away on recorded on 27/03/2025 (ITM: 602355.22, 582753.72; ITM: 603472.89, 581775.09) on 27/03/2025.

Although no breeding behaviours such as drumming or the presence of breeding pairs were observed within the Proposed Development and the lack of suitable breeding habitat available (e.g., grassy tussock, wet grassland, moorland or bog), due to the presence of the species and high activity levels recorded within the Proposed Development, the site population of Snipe is evaluated as **Local Importance (Higher Value)** and is considered a **KER** for detailed consideration in the impact assessment.

5.2.6.1.17. Black-headed Gull

Black-headed Gull is included on the BoCCI Amber list (Gilbert *et al.*, 2021). A total of 22 counts of Black-headed Gull were recorded during I-WeBS, all counts were recorded within the Proposed Development feeding on grassland (**Table 5.13; Figure 5.18**).

Given the Black-headed Gull recorded within the Proposed Development, the population of Black-headed Gull within the Proposed Development and surrounding area is considered to be of **Local Importance (Higher Value)** and is considered a **KER** for detailed consideration in the impact assessment.

5.2.6.1.18. Great Black-backed Gull

Great Black-backed Gull breeds on the ground in colonies all around the coast of Ireland and is included on the BoCCI Green list (Gilbert *et al.*, 2021) and it is a species of Least Concern (IUCN). During the water connectivity surveys, 144 observations of the species were recorded, 111 individuals were recorded flying over the western section of the Proposed Development site boundary, the remaining

sightings were recorded flying 230.66m west of the Proposed Development site boundary (**Figure 5.22**). Six counts of Great Black-backed Gull were recorded during I-WeBS, all six counts were recorded within the Proposed Development feeding on grassland (**Table 5.13; Figure 5.20**).

With the exception of high number of Great Black-backed Gulls flying over the western section of the Proposed Development, low activity was recorded within the Proposed Development site boundary. Furthermore, taking into account the Green-listed status of the species, any population of Great Black-backed Gull within the Proposed Development and surrounding area is considered to be of **Local Importance (Higher Value)** and is considered a **KER** for detailed consideration in the impact assessment.

5.2.6.1.19. Herring Gull

Herring Gull is included on the BoCCI Amber list (Gilbert *et al.*, 2021). During the water connectivity surveys, 15 observations of the species were recorded within northern section of the Proposed Development site boundary (**Table 5.14; Figure 5.23**). A total count of seven Herring Gulls were recorded during I-WeBS (**Table 5.13**), all counts were recorded within the Proposed Development (**Figure 5.20**). Behaviours observed included feeding on grassland.

The conservation objectives of the Helvick Head to Ballyquin SPA, located approximately 15.8km east of the Proposed Development notes that Herring Gull can forage up to 92km from the nest site during the breeding season (Power *et al.*, 2021). Given the presence of Herring Gull within the Proposed Development, and that sightings could potentially be associated with populations of the Helvick Head to Ballyquin SPA, the population of Herring Gull within the Development and surrounding area is considered to be of **Local Importance (Higher Value)** and is considered a **KER** for detailed consideration in the impact assessment.

5.2.6.1.20. Lesser Black-backed Gull

Lesser Black-backed Gull is included on the BoCCI Amber list (Gilbert *et al.*, 2021). A total count of 47 Lesser Black-backed Gulls was recorded during I-WeBS (**Table 5.13**), all counts were recorded within the Proposed Development (**Figure 5.20**). Behaviours observed included flying over the site and feeding on grassland. During the water connectivity surveys, 234 observations of the species were recorded, 142 observations were partially recorded within northern section of the Proposed Development site boundary, the remaining flightlines were recorded north of the Proposed Development site boundary (**Table 5.14; Figure 5.24**).

The conservation objectives of the Seas off Wexford SPA, located approximately 61.2km east of the Proposed Development notes that Lesser Black-backed Gull can forage up to 533km from the nest site during the breeding season (Power *et al.*, 2021). Given the high number of Lesser Black-backed Gulls recorded flying over the northern section of the Proposed Development and high counts of the species foraging within the Proposed Development site boundary and that sightings could potentially be associated with populations of the Seas off Wexford SPA, Lesser Black-backed Gull within the Proposed Development and surrounding area is considered to be of **Local Importance (Higher Value)** and is considered a **KER** for detailed consideration in the impact assessment.

5.2.6.1.21. Grey Heron

Grey Heron is a Green listed species (Gilbert *et al.*, 2021). One Grey Heron was recorded during I-WeBS flying over grassland (**Table 5.13; Figure 5.20**) within the Proposed Development. Given the low level

of activity recorded within the Proposed Development, the population of Grey Heron within the Proposed Development and surrounding area is considered to be of **Local Importance (Lower Value)** and is not considered a KER for detailed consideration in the impact assessment.

5.2.6.2. Sensitivity to Change

5.2.6.2.1. Meadow Pipit

Losses of marginal land from parts of the breeding range have been linked to the decline (Gibbons *et al.*, 1993). Changes to grazing regimes can influence breeding abundance could potentially have driven UK trends but this has not been proven.

5.2.6.2.2. Yellowhammer

Reductions in winter seed availability as a result of agricultural intensification (for example, the loss of winter stubbles and a reduction in weed densities) are widely believed to have contributed to the population decline, presumably through impacts on survival rates (Kyrkos, 1997). Kyrkos *et al.* (1998) found that Yellowhammer breeding density decreased with increasing proportion of farmland under grassland. It may be that modern improved grassland has neither the weed density required by adult Yellowhammers nor sufficient invertebrate prey for birds feeding nestlings. Morris *et al.* (2005) showed that increased use of pesticides results in reduced invertebrate abundance, lower brood production and fewer chicks fledging. Hart *et al.* (2006) also demonstrated how insecticide applications can depress Yellowhammer breeding productivity. Local populations of Yellowhammer are evaluated as **Local Importance (Higher Value)**, which is equivalent to **Low sensitivity**.

5.2.6.2.3. Snipe

Lowland breeding waders such as Snipe are sensitive to habitat loss or fragmentation through afforestation, habitat loss from peat extraction, ground-based predation, destruction from agricultural machinery and flooding. Local populations of Snipe are evaluated as **Local Importance (Higher Value)**, which is equivalent to **Low sensitivity**.

5.2.6.2.4. Gulls

Gulls are characterised as being late to mature and slow to reproduce but they are long-lived, with natural adult mortality typically very low. Thus, their populations can only increase slowly, even if environmental conditions are favourable and any additional pressure increasing adult mortality or affecting annual breeding productivity can have a particularly strong negative influence on overall population dynamics (Furness, 2003). Relevant sensitivities to gull species include the following: residential, recreational, industrial or commercial activities and structures generating marine macro- and micro- particulate pollution (e.g. plastic bags, Styrofoam). Bycatch and incidental killing (due to fishing and hunting activities). Desynchronisation of biological / ecological processes due to climate change. Decline or extinction of related species (e.g. food source / prey, predator / parasite, symbiote, etc.) due to climate change (Cummins *et al.*, 2019). Local populations of Black-headed Gull, Great Black-backed Gull, Herring Gull and Lesser Black-backed Gull are evaluated as **Local Importance (Higher Value)**, which is equivalent to **Low sensitivity**.

5.2.6.3. Trends in the Baseline Environment (the 'Do-Nothing' scenario)

The 'future baseline' (i.e., without development scenario) describes the bird populations as they would be in the opening year/year of operation, in the absence of the Proposed Development. They

are influenced by future developments and factors that have a high degree of uncertainty, such as future land management and climate change. Planned future developments within the zone of influence are detailed in **Section 11** and have been considered during this assessment.

Long-term climatic predictions suggest that warmer, wetter, winters and drier summers will become more frequent, with more extreme weather events likely. Combined with changes in land management, increased urbanisation and changes in species interactions and pressures such as predation or competition, climate change may lead to an increase in the national, regional and local populations and distributions of some bird species (e.g., certain migratory species) but a decrease in other species (Pearce-Higgins & Morris, 2022). However, such changes are unlikely to be material during the intervening period between the time when the field surveys undertaken between January 2025 – June 2025 were undertaken to inform this assessment and the opening year of operation of the Proposed Development.

There are no committed or forecasted changes in land management proposals within the Proposed Development that will likely materially alter the baseline conditions in the absence of the Proposed Development. It is therefore assumed that the survey data informing this baseline remain valid and current for the purposes of this EclA, consistent with EPA (2022) and CIEEM (2024) guidance on data validity, and the value of the ornithological features that are relevant to the Proposed Development will be consistent with that presented herein.

5.2.6.4. Receiving Environment (the Baseline + Trends)

It is assumed in this report that the baseline environment in relation to bird species, as described herein, will be the receiving environment at the time of construction with ongoing trends as identified expected to be reflected during the operational and decommissioning phases.

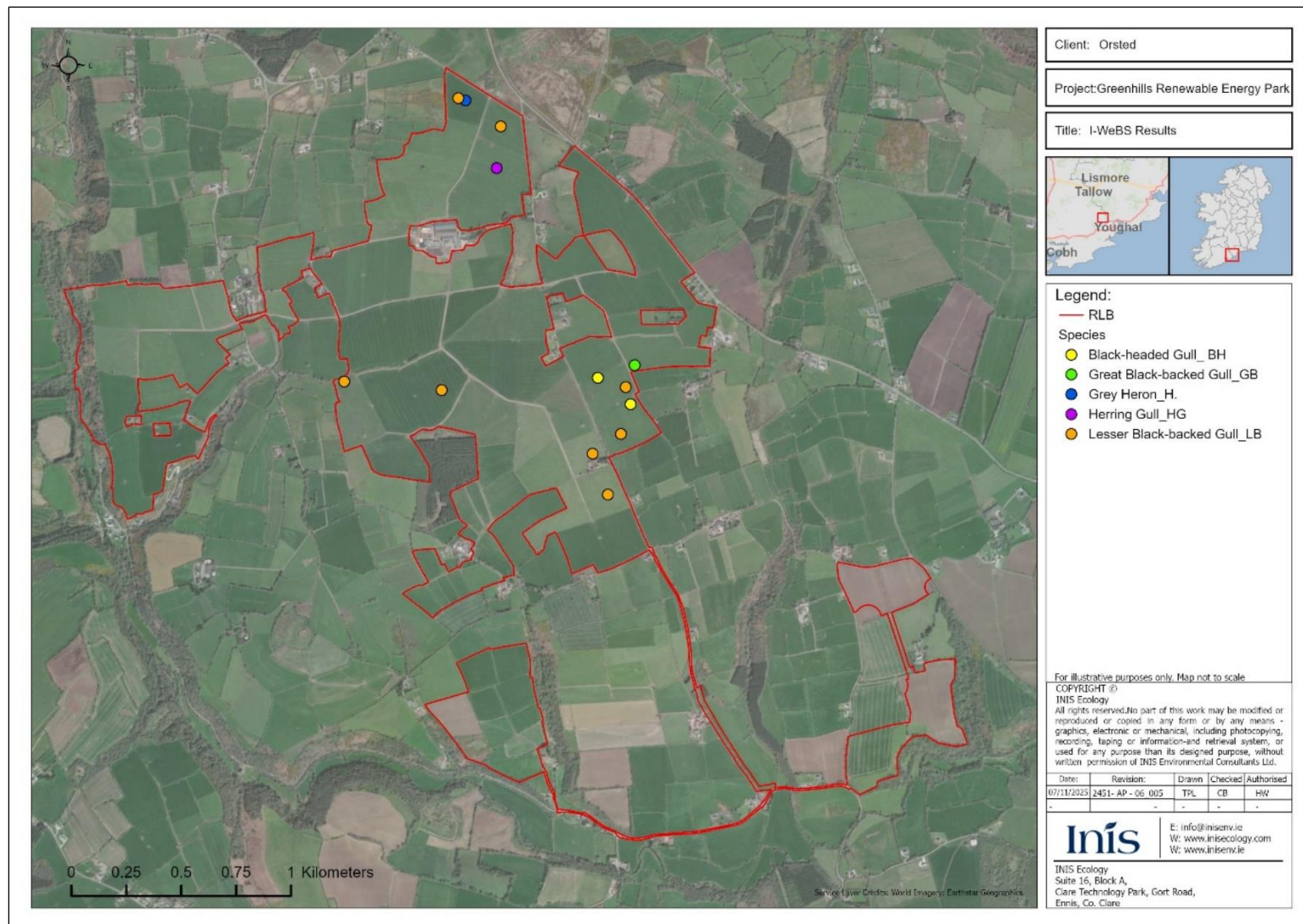


Figure 5.20: I-WeBS Results.

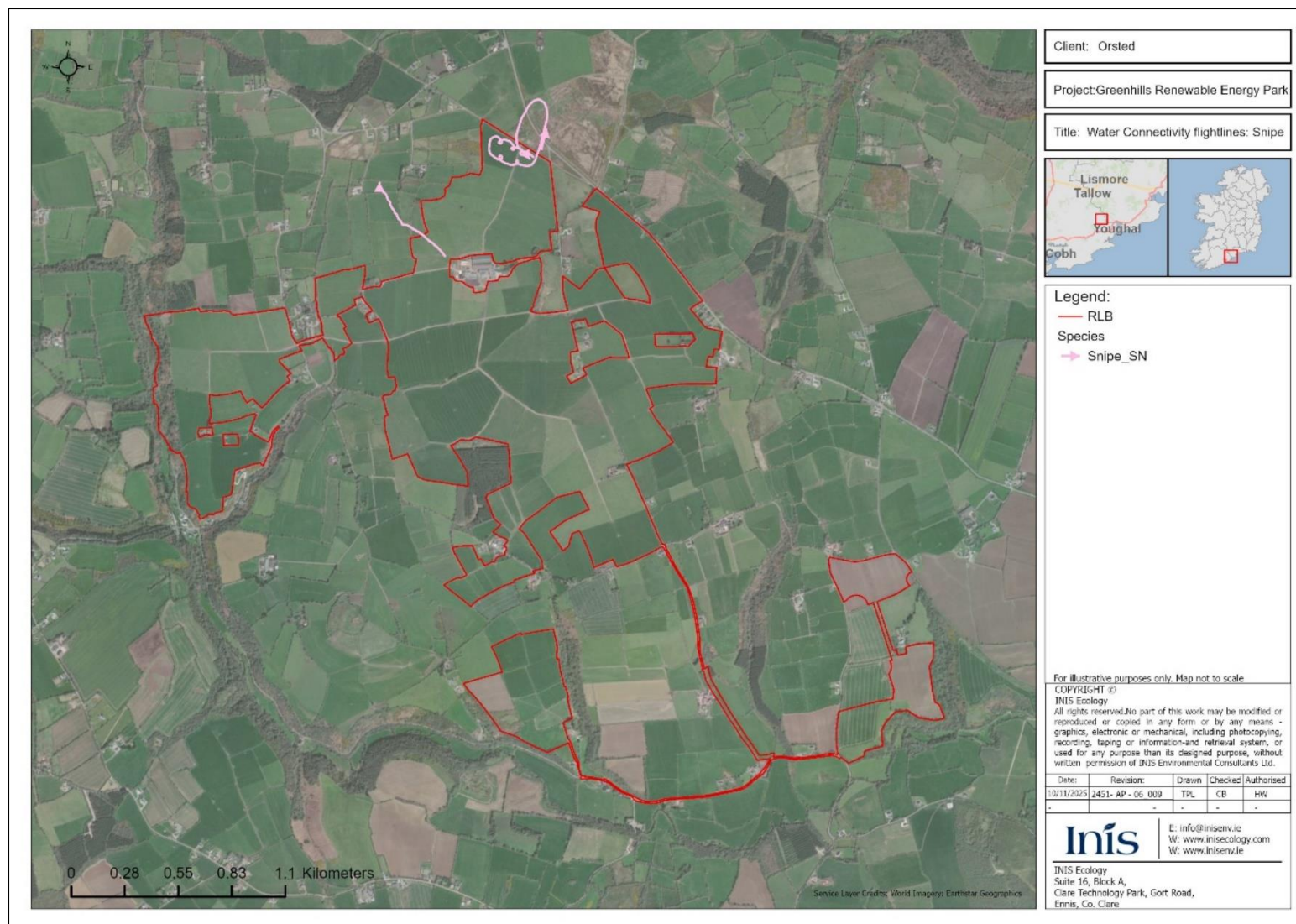


Figure 5.21: Water Connectivity Flightlines: Snipe.



Figure 5.22: *Water Connectivity Flightlines: Great Black-backed Gull.*

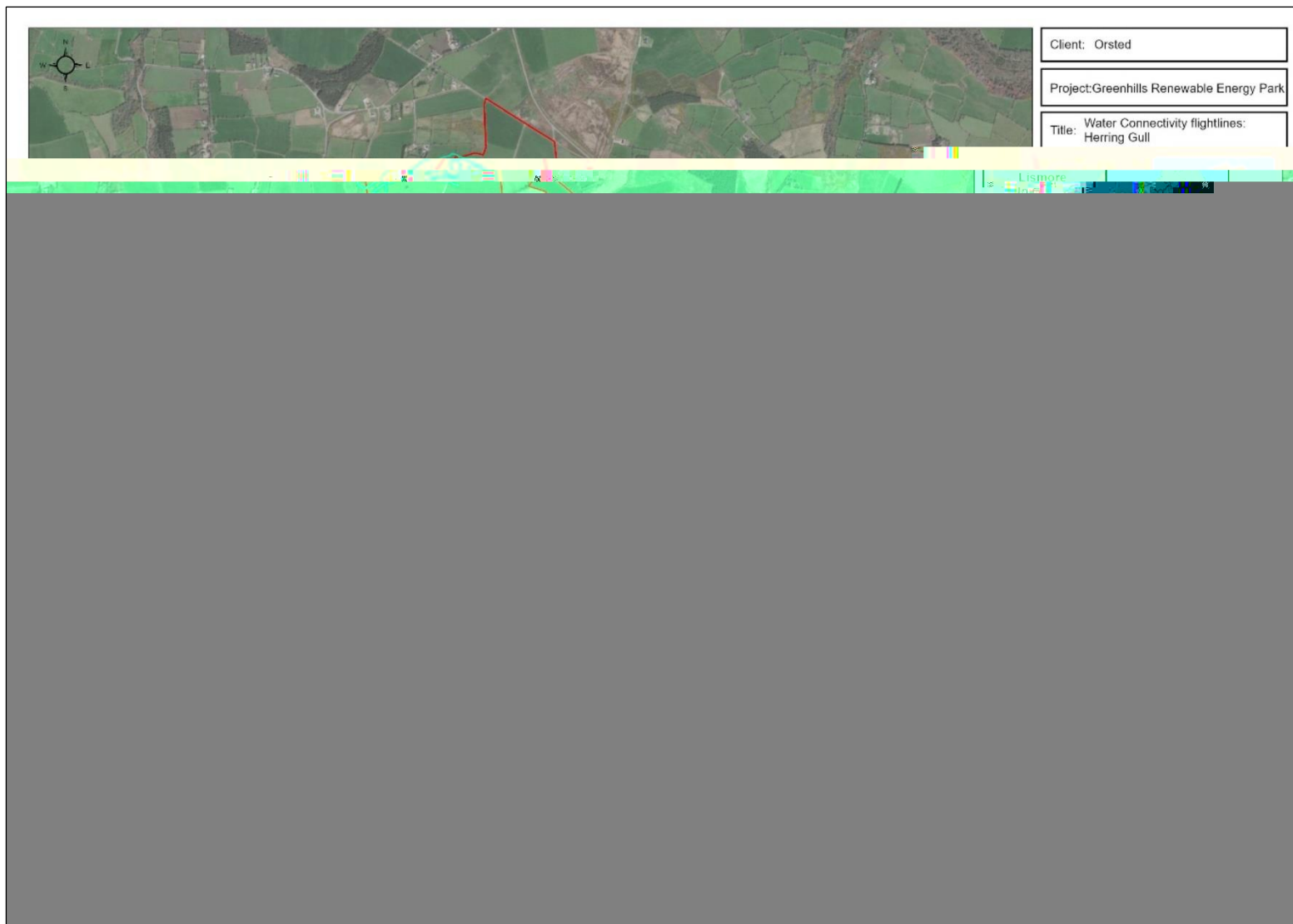


Figure 5.23: *Water Connectivity Flightlines: Herring Gull.*

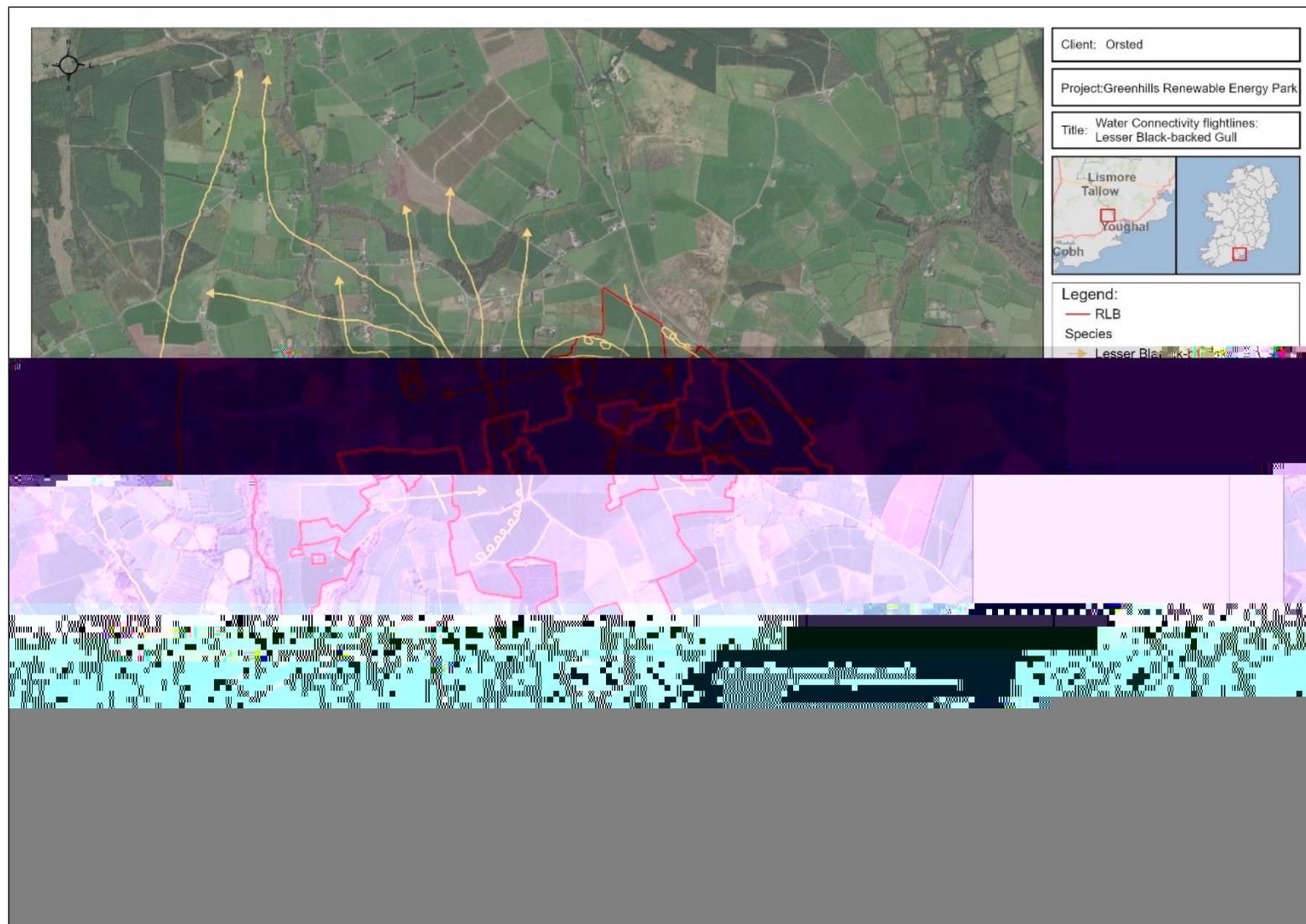


Figure 5.24: Water Connectivity Flightlines: Lesser Black-backed Gull.

5.3. Summary of Ecological Receptors

The importance of each of the ecological features identified within the ZOI of the Project are summarised in **Table 5.15**, including confirmation of whether a feature (i.e., designated site, habitat or species/species group) is scoped in as a Key Ecological Receptor for further assessment of potential effects. Features of Local (Lower value) or Negligible importance, and those for which impacts can be categorically ruled out, are scoped out from requiring further assessment, and are therefore not considered further in this assessment. It should be noted that a precautionary approach has been adopted in determining which features are taken forward for further assessment, taking into consideration conservation statuses, population trends and potential importance to relevant designated sites.

Table 5.15: *Summary of KERs.*

Group	Ecological Feature	Conservation Status	Rationale	Importance	Key Ecological Receptors
Designated sites	Blackwater River (Cork/Waterford) SAC [002170]	EU Habitats Directive	3.5km downstream (Tourig_020).	International	Yes
Designated sites	Black Water Estuary RAMSAR	Ramsar Convention	3.5km downstream (Tourig_020).	International	Yes
Designated sites	Blackwater Estuary SPA [004028]	EU Birds Directive	3.5km downstream (Tourig_020).	International	Yes
Designated sites	Blackwater Estuary IBA	EU Birds Directive	3.5km downstream (Tourig_020).	International	Yes
Designated sites	Blackwater River And Estuary pNHA [000072]	Wildlife Acts	3.5km downstream (Tourig_020).	National	Yes
Habitats	Improved agricultural grassland (GA1)	N/A	Based on level of value to birds/mammals/amphibians.	Local Importance (Lower Value)	No
Habitats	Arable crops (BC1) Tilled land (BC3)	N/A	Low ecological value.	Local Importance (Lower Value)	No
Habitats	Mixed broadleaved woodland (WD1)	N/A	High ecological value, supporting protected and notable species of flora and fauna, namely birds and mammals.	Local Importance (Higher Value)	Yes
Habitats	Scrub (WS1)	N/A	High ecological value, supporting protected and notable species of flora and fauna.	Local Importance (Higher Value)	Yes
Habitats	Mixed broadleaved woodland/Scrub (WD1/WS1)	N/A	High ecological value, supporting protected and notable species of flora and fauna.	Local Importance (Higher Value)	Yes
Habitats	Buildings and artificial surfaces (BL3)	N/A	Common and widespread through the receiving environment and is of little importance to local biodiversity.	Local Importance (Lower Value)	No

Group	Ecological Feature	Conservation Status	Rationale	Importance	Key Ecological Receptors
Habitats	Spoil and bare ground/ Recolonising bare ground (ED2/ED3)	N/A	Low importance to local biodiversity.	Local Importance (Lower Value)	No
Habitats	Amenity grassland/Scrub/ Scattered trees and parkland (GA2/WS1/WD5)	N/A	Very low coverage and throughout the Proposed Development site (0.29ha), low ecological value.	Local Importance (Lower Value)	No
Habitats	Scrub/Improved agricultural grassland (WS1/GA1)	N/A	Limited biodiversity value, due to the influence of agricultural management.	Local Importance (Lower Value)	No
Habitats	Conifer plantation (WD4) Buildings and artificial surfaces/Amenity grassland (BL3/GA2) Amenity grassland (GA2)	N/A	Low biodiversity value.	Local Importance (Lower Value)	No
Habitats	Hedgerow/Treeline (WL1/WL2) Hedgerow (WL1) Treeline/Hedgerow (WL2/WL1) Hedgerow/Drainage ditch (WL1/FW4)	N/A	High ecological value to birds and mammals (including bats) for foraging, nesting, roosting and commuting purposes.	Local Importance (Higher Value)	Yes
Habitats	Eroding/upland rivers (FW1)	N/A	Downstream connectivity to the Blackwater River (Cork/Waterford) SAC and Blackwater Estuary SPA. Desk study records of Otter utilising the Tourig River (IE_SW_18T030700).	National Importance	Yes
Habitats	Treeline (WL2) Hedgerow/Treeline/Drainage ditch (WL1/WL2/FW4)	N/A	High ecological value to birds and mammals (including bats) for	Local Importance (Higher Value)	Yes

Group	Ecological Feature	Conservation Status	Rationale	Importance	Key Ecological Receptors
	Treeline/Hedgerow/Drainage ditch (WL2/WL1/FW4)		foraging, nesting, roosting and commuting purposes.		
	Hedgerow/Stone walls and other stonework (WL1/BL1)				
	Hedgerow/Buildings and artificial surfaces (WL1/BL3)				
Habitats	Drainage ditch (FW4)	N/A	High ecological value to birds, mammals (including bats), and amphibians for foraging and commuting purposes.	Local Importance (Higher Value)	Yes
	Treeline/Hedgerow/Stone walls and other stonework (WL2/WL1/BL1)				
Habitats	Stone walls and other stonework/Hedgerow (BL1/WL1)	N/A	High ecological value to birds and mammals (including bats) for foraging, nesting, roosting and commuting purposes.	Local Importance (Higher Value)	Yes
	Treeline/Stone walls and other stonework (WL2/BL1)				
Habitats	Stone walls and other stonework (BL1)	N/A	Potential ecological value to support a limited range of species, such as lichens, mosses and ferns.	Local Importance (Lower Value)	No
Habitats	Depositing/lowland rivers (FW2)	N/A	Downstream connectivity to the Blackwater River (Cork/Waterford) SAC and Blackwater Estuary SPA (Youghal Park River (IE_SW_18T030700)).	National Importance	Yes
Mammals	Otter	Wildlife Acts, Habitats Directive Annex II, Annex IV;	Species is a QI of Blackwater River SAC, which is connected to the Proposed Development via	International	Yes

Group	Ecological Feature	Conservation Status	Rationale	Importance	Key Ecological Receptors
		Appendix II of the Bern Convention.	the (Tourig_020) (IE_SW_18T030700).		
Mammals	Badger	Wildlife Acts; Appendix III of the Bern Convention.	Active Badger setts (four within the site boundary) were recorded during the walkover surveys. Evidence of and ample habitat species within the Proposed Development. Sightings within the receiving environment.	Local Importance (Higher Value)	Yes
Mammals	Pine Marten	Wildlife Acts; Annex V of the EU Habitats Directive; Appendix III of the Bern Convention.	Ample habitat within the Proposed Development, and sightings within the receiving environment, Pine Marten are likely to utilise the Proposed Development.	Local Importance (Higher Value)	Yes
Mammals	Irish Stoat	Wildlife Acts; Appendix III of the Bern Convention.	Ample habitat within the Proposed Development, and sightings within the receiving environment, Irish Stoat are likely to utilise the Proposed Development.	Local Importance (Higher Value)	Yes
Mammals	Irish Hare	Wildlife Acts; Annex V of the EU Habitats Directive; Appendix III of the Bern Convention.	Ample habitat within the Proposed Development, and sightings within the receiving environment, Irish Hare are likely to utilise the Proposed Development.	Local Importance (Higher Value)	Yes

Group	Ecological Feature	Conservation Status	Rationale	Importance	Key Ecological Receptors
Mammals	Red Squirrel	Wildlife Acts; Appendix III of the Bern Convention.	Ample habitat within the Proposed Development, and sightings within the receiving environment, Red Squirrels are likely to utilise the Proposed Development.	Local Importance (Higher Value)	Yes
Mammals	Hedgehog	Wildlife Acts; Appendix III of the Bern Convention.	Suitable habitat exists within the Proposed Development for Hedgehog, i.e., bordering forests of mixed broadleaved woodland and hedgerows (WL1).	Local Importance (Higher Value)	Yes
Mammals	Pygmy Shrew	Wildlife Acts; Appendix III of the Bern Convention.	Suitable habitat within the Proposed Development (woodlands and open grasslands).	Local Importance (Higher Value)	Yes
Mammals	Common Pipistrelle	Habitats Directive Annex IV; Appendix III of the Bern Convention.	Common Pipistrelle and Soprano Pipistrelle roosted emerging from BL3. Ample suitable habitats for foraging and commuting bats.	Local (Higher) Importance	Yes
	Soprano Pipistrelle	Habitats Directive			
	Leisler's Bat	Annex IV			
Amphibians	Common Frog	Wildlife Acts and Habitats Directive; Annex V	Generally unsuitable habitat recorded within the Proposed Development. Absence of sightings.	Local Importance (Lower Value)	No
	Smooth Newt	Wildlife Acts			
Birds	Snipe	Wildlife Acts; Red list	High activity levels recorded within the Proposed	Local Importance (Higher Value)	Yes

Group	Ecological Feature	Conservation Status	Rationale	Importance	Key Ecological Receptors
			Development. Multiple incidental sightings recorded.		
Birds	Black-headed Gull	Wildlife Acts; Amber list	High desk study records (40) records. Recorded during I-WeBS, all counts (22) were recorded within the Proposed Development feeding on grassland.	Local Importance (Higher Value)	Yes
Birds	Great Black-backed Gull	Wildlife Acts; Green list	High flightline activity recorded during water connectivity VP surveys (144). Recorded during I-WeBS, all counts (6) were recorded within the Proposed Development feeding on grassland.	Local Importance (Higher Value)	Yes
Birds	Herring Gull	Wildlife Acts; Amber list	Flightlines observed within Redline Boundary during water connectivity VP surveys (15). Recorded during I-WeBS, all counts (7) were recorded within the Proposed Development feeding on grassland.	Local Importance (Higher Value)	Yes
Birds	Lesser Black-backed Gull	Wildlife Acts; Amber list	Very high flightline activity recorded during the water connectivity VP surveys (234), observations of the species were	Local Importance (Higher Value)	Yes

Group	Ecological Feature	Conservation Status	Rationale	Importance	Key Ecological Receptors
			partially recorded within northern section of the Redline Boundary. High counts recorded during I-WeBS (47), all counts were recorded within the Proposed Development, flying over the site and feeding on grassland.		
Birds	Meadow Pipit	Wildlife Acts; Red list	High desk study records (31) records of Meadow Pipit. Recorded during breeding season CBS transect surveys (3).	Local Importance (Higher Value)	Yes
Birds	Yellowhammer	Wildlife Acts; Red list	High desk study records (33) records of Yellowhammer. Recorded during breeding season CBS transect surveys (12). Incidental sightings recorded. A pair of Yellowhammers were observed as incidental sightings flying along a hedgerow, indicating potential breeding behaviour.	Local Importance (Higher Value)	Yes

6. POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

All of the impacts during the construction, operation and decommissioning phases are described herein are assessed and evaluated as occurring in the absence of mitigation measures.

6.1. Designated Sites

6.1.1. Construction Phase

- **Disturbance:** Construction activities (Noise/vibration/ visual disturbance): Potential disturbance to mobile SCIs/QIs including birds and mammals that are noise sensitive species, are not possible as a result of increased noise construction activities;
- **Mortality:** Direct mortality as a result of construction activities onsite is an unlikely event for QIs and SCIs of European Sites within the relevant ZOI and is not considered further in this report;
- **Habitat loss/fragmentation:** The various habitats present on the Proposed Development site are of low foraging suitability to bird species in general. There is potential for these habitats to be of value to ex-situ SCIs, as such likelihood of significant effects is assessed for SPAs within the relevant ZOI;
- **Pollution/Contamination:** Surface water run-off carrying suspended silt or contaminants – hydrocarbons could cause potential contamination within the catchment area by flowing into the Tourig river. Construction machinery, installation of the 33kV interconnector cables and concrete foundation works pose the highest risk for this source-pathway impact; and
- **Spread of invasive species:** habitat effects via the spread of invasive species have the potential to occur via machinery/vehicle/personnel movements along transport routes (Japanese Knotweed).

6.1.2. Operation Phase

- **Disturbance:** Potential disturbance to mobile SCIs/QIs including birds and mammals is possible as a result of increased noise from humans and the movement of vehicles during the maintenance works of the Proposed Development;
- **Mortality:** Mortality is an unlikely event but is considered forward to identify the extent of the significance in a worst-case scenario; and
- **Spread of invasive species:** habitat effects via the spread of invasive species have the potential to occur via machinery/vehicle/personnel movements along transport routes (Japanese Knotweed).



6.3.2. Operational Phase

- **Disturbance and displacement:** disturbance of protected and/or priority species from additional noise originating from operational machinery and human activity, with the possibility of causing displacement; and
- **Direct mortality of individuals:** fatalities or injuries to sensitive species caused by operational activities.

7. MITIGATION BY DESIGN

7.1. Construction Phase

The Contractor will adhere to best practice guidance and requirements as detailed below, particularly:

- CIRIA guidance document C532 Control of water pollution from construction sites;
- EU Construction and Demolition Waste Management Protocol – BIBM;
- IEMA's latest 'Impact Assessment Guidance, A New Perspective on Land and Soil in Environmental Impact Assessment' (Feb 2022); and
- Machinery Directive. See Guide to application of the Machinery Directive 2006/42/EC Edition 2.2 – October 2019 (Update of 2nd Edition).

The construction approach will also adhere to the requirements set out in the Inland Fisheries Ireland guidance document 'Requirements for the Protection of Fisheries Habitat during Construction and Development Works and Development Sites'. Additional reference guidance material includes:

- Pollution Prevention Guidance (PPG) 1: Understanding your environmental responsibilities - good environmental practices;
- Guidance for Pollution Prevention (GPP) 2: Above ground oil storage tanks;
- PPG 3: Use and design of oil separators in surface water drainage systems;
- GPP 4: Treatment and disposal of wastewater where there is no connection to the public foul sewer;
- GPP 5: Works and maintenance in or near water;
- PPG 6: Working at construction and demolition sites Pollution Prevention Guidelines;
- PPG 7: Safe storage - The safe operation of refueling facilities;
- GPP 8: Safe storage and disposal of used oils;
- GPP 19: Vehicles: Service and Repair;
- GPP 21: Pollution incident response planning;
- GPP 22: Dealing with spills;
- GPP 26 Safe storage - drums and intermediate bulk containers;
- PPG 27: Installation, decommissioning and removal of underground storage tanks;
- CIRIA: Environmental Good Practice on Site (fourth edition (C741));
- CIRIA: Control of Water Pollution from construction sites. Guidance for consultants and contractors;
- CIRIA Control of Water Pollution from Linear Construction Sites. Technical Guidance C648.
- CIRIA: The Suds Manual (C753F);
- CIRIA SuDS Manual Technical Guidance C697;
- CIRIA Report Number C532 (2001): Control of water pollution from construction sites - Guidance for consultants and contractors;
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8. ASSESSMENT OF EFFECTS

All of the impacts during the construction, operation and decommissioning phases described herein are assessed and evaluated as occurring in the absence of mitigation measures.

8.1. Assessment of effects on Designated Sites

8.1.1. International Designated Sites

One SAC (Blackwater River (Cork/Waterford) SAC), and one SPA (Blackwater Estuary SPA) were identified to have potential impacts as a result of the Proposed Development. The two European sites have direct hydrological connectivity to the Proposed Development and therefore, there are potential impacts to the Blackwater River (Cork/Waterford) SAC's QIs. The Blackwater Estuary SPA has ornithological connectivity and therefore the Proposed Development has potential impacts on the mobile SCIs. Per the AA Screening, SPAs within the wider ZOI based on the mean foraging range of their relevant SCIs (i.e. Herring Gull, 14km; Lesser Black-backed Gull, 43.3km) were determined not likely to experience significant effect as a result of the Proposed Development based on the separation distance between the worst-case scenario sources and the site's locations, the wider environment remaining unchanged and being of higher suitability for foraging ex-situ SCIs. As such, the following SPAs were not considered further as they are unlikely to be KERs of the Proposed Development:

- Ballymacoda Bay SPA (004028);
- Ballycotton Bay SPA (004022); and
- Cork Harbour SPA (004030).

8.1.1.1. Blackwater River (Cork/Waterford) SAC

The Blackwater River (Cork/Waterford) SAC has 18 QI's that are identified to have potential impacts as a result of the Proposed Development: Estuaries [1130], Mudflats and sandflats not covered by seawater at low tide [1140], Perennial vegetation of stony banks [1220], Salicornia and other annuals colonising mud and sand [1310], Atlantic salt meadows (*Glauco-Puccinellietalia maritima*) [1330], Mediterranean salt meadows (*Juncetalia maritimi*) [1410], Water courses of plain to montane levels with the *Ranunculus fluitantis* and *Callitriche-Batrachion* vegetation [3260], Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0], Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) [91E0], *Taxus baccata* woods of the British Isles [91J0], Freshwater Pearl Mussel *Margaritifera margaritifera* [1029], White-clawed Crayfish *Austropotamobius pallipes* [1092], Sea Lamprey *Petromyzon marinus* [1095], Brook Lamprey *Lampetra planeri* [1096], River Lamprey *Lampetra fluviatilis* [1099], Twaite Shad *Alosa fallax fallax* [1103], Salmon *Salmo salar* [1106], Otter [1355] and Killarney Fern [6985].

8.1.1.1.1. Estuaries/ Mudflats and sandflats not covered by seawater at low tide/Perennial vegetation of stony banks

Pollution/Contamination

The Knocknagappagh River, Tourig River, Carriganass River and Youghal Park River all have downstream connectivity to the Blackwater River (Cork/Waterford) SAC within which these habitats are located. Due to the hydrological separation distance between this site and the Proposed

Development's nearest contamination source, even in a worst-case scenario of sediment run-off entering the Tourig river, contamination will be unlikely to cause any significant effects on the habitats within this SAC. This is based on the extent of dilution between the worst-case scenario source point and the nearest mapped area of the SAC (3.5km downstream), as such in-situ habitats and species are unlikely to experience significant effects as a result of the Proposed Development's construction or post-construction phases. As such, this impact source would pose **Negligible** magnitude effects to these habitats.

Furthermore, mitigation by design measures within the CEMP include buffer zones of 20m for mapped rivers and 10m for drains and watercourses and no instream works are proposed as part of the Proposed Development works. However, this measure on its own is unlikely to full remove the likelihood for contamination related effects on these QIs ex-situ of the SAC, as such significant effects on these KERs cannot be ruled out at this stage. Under the precautionary principle additional mitigation measures are required to remove both likelihood and magnitude of potential impacts.

As such, in consideration of the design measures presented, the Proposed Development is unlikely to result in significant effects on this habitat KER.

8.1.1.1.2. Salicornia and other annuals colonising mud and sand/Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)/Mediterranean salt meadows (*Juncetalia maritimi*)

Pollution/Contamination

These habitats are mapped within the X08 grid square based on 'Status of EU Protected Habitat and Species' Map Viewer Tool. Per the precautionary principle, these habitats may be present further upstream of the SAC. As such, absent detailed surveys of the Tourig river, both of these QIs are considered for likely significant effects under the precautionary principle. Construction effects via pollution or contamination of these downstream habitats would result in **Significant** effects on these **Very high** sensitivity QIs.

Mitigation by design measures include buffer zones of 20m for mapped rivers and 10m for drains and watercourses and no instream works. However, this measure on its own is unlikely to full remove the likelihood for contamination related effects on these QIs ex-situ of the SAC, as such significant effects on these KERs cannot be ruled out at this stage. Under the precautionary principle additional mitigation measures are required to remove both likelihood and magnitude of potential impacts.

As such, in consideration of the design measures presented, the Proposed Development is likely to result in significant effects on these habitat KERs.

8.1.1.1.3. Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation/ Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles/ *Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)/ **Taxus baccata* woods of the British Isles

Pollution/Contamination

The Knocknagappagh River, Tourig River and Carriganass Rivers and Youghal Park River both have downstream connectivity to the Blackwater River (Cork/Waterford) SAC within which these habitats are located. Due to the hydrological separation distance between this site and the Proposed Development's nearest contamination source, even in a worst-case scenario of sediment run-off entering the Tourig river, contamination will be unlikely to cause any significant effects on the habitats

within this SAC. This is based on the extent of dilution between the worst-case scenario source point and the nearest mapped area of the SAC (3.5km downstream), as such in-situ habitats and species are unlikely to experience significant effects as a result of the Proposed Development's construction or post-construction phases. As such, this impact source would pose **Negligible** magnitude effects to these habitats.

Furthermore, mitigation by design measures within the CEMP include buffer zones of 20m for mapped rivers and 10m for drains and watercourses and no instream works are proposed as part of the Proposed Development works. However, this measure on its own is unlikely to full remove the likelihood for contamination related effects on these QIs ex-situ of the SAC, as such significant effects on these KERs cannot be ruled out at this stage. Under the precautionary principle additional mitigation measures are required to remove both likelihood and magnitude of potential impacts.

As such, in consideration of the design measures presented, the Proposed Development is unlikely to result in significant effects on this habitat KER.

8.1.1.1.4. Freshwater Pearl Mussel *Margaritifera margaritifera*

Pollution/Contamination

Freshwater Pearl Mussel are particularly sensitive to subtle changes in hydrology leading to erosion and permanent loss of juvenile substratum, as well as damage through habitat exposure during low flows. Sediment settling on and, in the riverbed, also results in habitat degradation for this species depriving them of oxygen as well as preventing new juveniles from colonising the substratum. Increased nutrient levels promote the growth of filamentous algae, diatoms and other algae acting as a physical barrier between the open water and the riverbed. Where mussel habitat is impacted by increases in sediment and nutrient levels, rooted plants expand and further compound the problems. The presence of organic matter results in severe deoxygenation of the riverbed, creating a barrier of fungal and bacterial biomass.

Reduction in water quality could potentially result from pollutants entering watercourses in water runoff from construction works areas. These pollutants include suspended solids (sediment) from excavation and movement of soils, hydrocarbons from fuel/oil spills or leaks. However, the mapped distribution and suitable habitat for this species are located upstream of any impact sources related to the Proposed Development (Map 8; NPWS, 2012a).

Effects on host fish species (juvenile salmonids) within the river Tourig would pose potential effects on this QI's reproductive cycle and distribution within the SAC. A decline in host species would result in a **High** magnitude effect on this **Very high** sensitivity receptor, resulting in **Very significant** effects.

Mitigation by design measures within the CEMP include buffer zones of 20m for mapped rivers and 10m for drains and watercourses and no instream works. However, this measure on its own is unlikely to full remove the likelihood for contamination related effects on these QIs ex-situ of the SAC, as such significant effects on these KERs cannot be ruled out at this stage. Under the precautionary principle additional mitigation measures are required to remove both likelihood and magnitude of potential impacts.

As such, in consideration of the design measures presented, the Proposed Development is likely to result in significant effects on this KER.

8.1.1.1.5. White-clawed Crayfish *Austropotamobius pallipes*

Pollution/Contamination

White-clawed Crayfish require high quality freshwater river habitat and are particularly sensitive to subtle changes in hydrology leading to erosion and permanent loss of juvenile substratum (vegetation, gravel and fine tree-roots).

Reduction in water quality could potentially result from pollutants entering watercourses in water runoff from construction works areas. These pollutants include suspended solids (sediment) from excavation and movement of soils, hydrocarbons from fuel/oil spills or leaks. However, the mapped population for this species are located within the Awbeg River, significantly upstream of any impact sources related to the Proposed Development (Map 9; NPWS, 2012a).

The mapped area for this QI is located within a separate sub-catchment (Blackwater Munster). Given the separation distance between the known area of this QI, pollution and contamination effects will be unlikely to cause any significant effects on the habitats within this SAC. As such, this impact source would pose a **Negligible** magnitude of effects.

Mitigation by design measures within the CEMP include buffer zones of 20m for mapped rivers and 10m for drains and watercourses and no instream works. However, this measure on its own is unlikely to full remove the likelihood for contamination related effects on these QIs ex-situ of the SAC, as such significant effects on these KERs cannot be ruled out at this stage. Under the precautionary principle additional mitigation measures are required to remove both likelihood and magnitude of potential impacts.

As such, in consideration of the design measures presented, the Proposed Development is unlikely to result in significant effects on this KER.

8.1.1.1.6. Sea Lamprey *Petromyzon marinus*/Brook Lamprey *Lampetra planeri*/River Lamprey *Lampetra fluviatilis*

Pollution/Contamination

All three Lamprey species have areas mapped for all stages of their respective life cycles within this SAC; no areas are mapped within the Tourig River in proximity to the Proposed Development. However, given the anadromous nature of its life cycle, and suitable river network upstream of the SAC via the Tourig River, these species are considered for potential impacts on ex-situ distribution.

Pollution or contamination effects on suitable Lamprey habitat within the Tourig River would pose potential effects on this QI's reproductive cycle and distribution within the SAC, resulting in a **High** magnitude effect on this **Very high** sensitivity receptor, resulting in **Very significant** effects.

Mitigation by design measures within the CEMP include buffer zones of 20m for mapped rivers and 10m for drains and watercourses and no instream works. However, this measure on its own is unlikely to full remove the likelihood for contamination related effects on these QIs ex-situ of the SAC, as such significant effects on these KERs cannot be ruled out at this stage. Under the precautionary principle additional mitigation measures are required to remove both likelihood and magnitude of potential impacts.

As such, in consideration of the design measures presented, the Proposed Development is likely to result in significant effects on these KERs.

8.1.1.1.7. Twaite Shad *Alosa fallax fallax*/Atlantic Salmon *Salmo salar*

Pollution/Contamination

Distribution information regarding these species is not available within the Tourig River at the time of writing. However, given suitable river network upstream of the SAC via the Tourig, these species are considered for potential impacts on ex-situ distribution. This European Site is included in the current screening assessment for this QI.

Pollution or contamination effects on suitable salmonid habitat within the Tourig River would pose potential effects on this QI's reproductive cycle and distribution within the SAC, resulting in a **High** magnitude effect on this **Very high** sensitivity receptor, resulting in **Very significant** effects.

Mitigation by design measures within the CEMP include buffer zones of 20m for mapped rivers and 10m for drains and watercourses and no instream works. However, this measure on its own is unlikely to full remove the likelihood for contamination related effects on these QIs ex-situ of the SAC, as such significant effects on these KERs cannot be ruled out at this stage. Under the precautionary principle additional mitigation measures are required to remove both likelihood and magnitude of potential impacts.

As such, in consideration of the design measures presented, the Proposed Development is likely to result in significant effects on these KERs.

8.1.1.1.8. Otter

Otter is discussed separately in **Section 8.2.1.3**.

8.1.1.1.9. Killarney Fern *Trichomanes speciosum*

Habitat loss/fragmentation/Pollution/Contamination

Killarney Fern requires shaded rock cervices, caves or gullies in or near to known colonies. No loss of woodland canopy at or near known locations within the SAC can occur, water must also be visible at all locations (NPWS, 2012a).

Reduction in water quality could potentially result from pollutants entering watercourses in water runoff from construction works areas. These pollutants include suspended solids (sediment) from excavation and movement of soils, hydrocarbons from fuel/oil spills or leaks. However, the mapped population for this species are located upstream of any impact sources related to the Proposed Development (Map 10; NPWS, 2012a).

In a worst-case scenario, should pollutants enter downstream watercourses, affecting both water quality and riverbed nutrient assemblage, due to the hydrological separation distance between this SAC and the Proposed Development's nearest contamination source, surface water run-off will be unlikely to cause any significant effects on the habitats within this SAC. As such, this impact source would pose **Negligible** magnitude effects.

Mitigation by design measures within the CEMP include buffer zones of 20m for mapped rivers and 10m for drains and watercourses and no instream works, effects are unlikely, even in a worst-case scenario, and would pose less than a **Negligible** magnitude effect on Killarney Fern.

As such, in consideration of the design measures presented, the Proposed Development is unlikely to result in significant effects on this KER.

Spread of invasive species

Japanese Knotweed was recorded at a gate entrance just outside the Proposed Development site boundary. In the absence of additional mitigation, Japanese Knotweed could spread throughout the Proposed Development via the movement of plant/machinery and delivery vehicles, and natural materials such as soil, fencing posts, hedging and trees onto the Proposed Development site. Japanese Knotweed infestations could also be spread through the disturbance of vegetation, groundworks and the movement of soils. The spread of invasive Japanese Knotweed during construction is considered to have a **Very high magnitude** effect on Killarney Fern, resulting in a **Very significant effect**. However, given the intervening distance between known populations of this species and mitigation by design measures which include a 7m buffer from invasive species, this magnitude is reduced to **Low**, resulting in **Medium/moderate** effects.

As such, the Proposed Development is likely to result in significant effects on this KER.

8.1.1.2. Blackwater Estuary SPA

Blackwater Estuary SPA has nine SCIs that are identified to have potential impacts as a result of the Proposed Development: Golden Plover *Pluvialis apricaria*, Lapwing *Vanellus vanellus* [A142], Dunlin *Calidris alpina* [A149], Black-tailed Godwit *Limosa limosa* [A156], Bar-tailed Godwit *Limosa lapponica* [A157], Curlew *Numenius arquata* [A160], Redshank *Tringa totanus* [A162], Wigeon *Mareca penelope* [A855] and Wetland and Waterbirds [A999] (NPWS, 2012b).

Disturbance

None of the SCIs above were recorded within the Proposed Development site boundary during the survey period. This SPA is located 2.09km from the nearest point for the Proposed Development. This places the Proposed Development within the foraging range of these SCIs.

Distance to these SCIs resulting from construction activities (noise/vibration/ visual disturbance) is unlikely to occur as the Proposed Development site contains generally unsuitable habitat for the majority of SCIs making them unlikely to traverse far enough to interact with the Proposed Developments sources. The known maximum disturbance distance for all SCIs is 200-650m for wintering Curlew (Goodship & Furness, 2022), these disturbance distances are located outside of the zone of disturbance during the proposed works. Therefore, disturbance to these SCIs would pose **Negligible** magnitude effects, resulting in an overall **Low/Slight** effect. In EIA terms, this is **Not Significant**.

As such, in consideration of the design measures presented, the Proposed Development is unlikely to result in significant effects on this SPA.

8.1.2. National Designated Sites

There is one national site that have been considered for potential adverse effects due to the Proposed Development works: Blackwater River And Estuary pNHA [000072].

This site overlaps with the relevant European sites, the Blackwater River (Cork/Waterford) SAC and Blackwater Estuary SPA. These sites have hydrological connectivity to the Proposed Development via the Knocknagappagh River, Tourig River and Carriganass River and Youghal Park River.

As the European sites were determined to have no likely significant effect following the mitigation by design measures, this National site is as unlikely to experience effects as a result of the Proposed Development.

The Blackwater River And Estuary pNHA has no specific site synopsis available. However given its name and boundaries, it covers the entire Lower Blackwater Estuary/Youghal Harbour transitional waterbody that makes up the QIs for the Blackwater River (Cork/Waterford) SAC and SCIs of the Blackwater Estuary SPA. As such, it is considered for the same QIs and SCIs as its SAC and SPA counterparts. **Section 8.1.1.1** provides scoping for these KERs as receptors of International Importance, assigning National importance to these species would result in lower levels of sensitivity equating to a lower level of significance pre-mitigation by design measures, and no effect once accounting for these measures.

As such, in consideration of the design measures presented, the Proposed Development is unlikely to result in significant effects on the Blackwater River And Estuary pNHA.

8.2. Assessment of Effects on KERs

8.2.1. Construction Phase Habitats

Habitat loss in this EclA assumes the worst-case scenario of all habitats overlapped by elements of the Proposed Development will be permanently lost (**Figure 8.1, Table 8.1, Table 8.2**). A number of habitats are projected to experience habitat loss as a result of the Proposed Development. None of the Annex I candidate habitats or areas within the SAC boundaries are likely to experience any habitat loss. One KER habitat is allocated for habitat loss related effects (hedgerow) which is of **Local Importance (Higher Value)**.

Table 8.1: *Habitat Loss within the Proposed Development site.*

Fossitt Code	Habitat Type	Area (ha)	Area (ha) Loss	% loss
GA1	Improved agricultural grassland	289.06	143	49.12
BC1	Arable crops	22.26	11.12	33.61
BC3	Tilled land	8.45	4.2	49.7
WD1	Mixed broadleaved woodland	3.263	-	-
WS1	Scrub	2.65	-	-
WD1/WS1	Mixed broadleaved woodland/Scrub	2.65	-	-
BL3	Buildings and artificial surfaces	2.37	-	-
ED2/ED3	Spoil and bare ground/ Recolonising bare ground	0.63	-	-
GA2/WS1/WD5	Amenity grassland/Scrub/ Scattered trees and parkland	0.29	-	-
WS1/GA1	Scrub/Improved agricultural grassland	0.07	-	-
WD4	Conifer plantation	0.03	-	-
BL3/GA2	Buildings and artificial surfaces/Amenity grassland	<0.01	-	-
GA2	Amenity grassland	<0.01	-	-
WL1/WL2	Hedgerow/Treeline	<0.01	-	-

Table 8.2: Linear loss within the Proposed Development site.

Fossitt Code	Habitat Type	Length (m)	Length (m) Loss	% loss
BL3	Buildings and artificial surfaces	12,565	-	-
WL1	Hedgerow	11,767	395	3.36
WL1/WL2	Hedgerow/Treeline	7,303	-	-
WL2/WL1	Treeline/Hedgerow	5,680	-	-
WL1/FW4	Hedgerow/Drainage ditch	2,080	-	-
FW1	Eroding/upland rivers	1,537	-	-
WL2	Treeline	917	-	-
WS1	Scrub	636	-	-
WL1/WL2/FW 4	Hedgerow/Treeline/Drainage ditch	616	-	-
WL2/WL1/FW 4	Treeline/Hedgerow/Drainage ditch	572	-	-
WL1/BL1	Hedgerow/Stone walls and other stonework	223	-	-
WL1/BL3	Hedgerow/Buildings and artificial surfaces	194	-	-
FW4	Drainage ditch	127	-	-
WL2/WL1/BL1	Treeline/Hedgerow/Stone walls and other stonework	121	-	-
BL1/WL1	Stone walls and other stonework/Hedgerow	62	-	-
WL2/BL1	Treeline/Stone walls and other stonework	51	-	-
BL1	Stone walls and other stonework	18	-	-
FW2	Depositing/lowland rivers	7	-	-

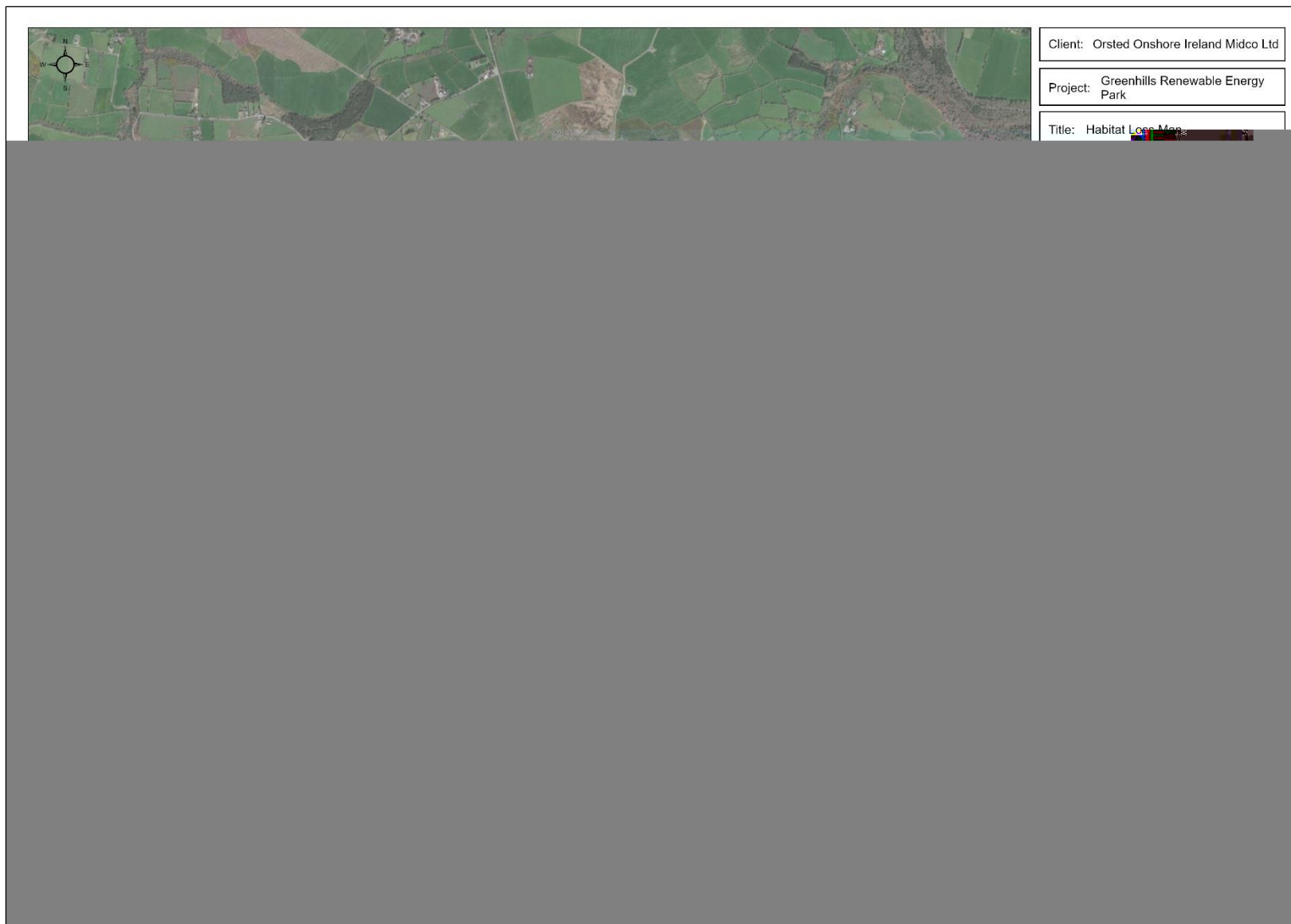


Figure 8.1: *Habitat Loss Areas.*

8.2.1.1.1. Hedgerow (WL1)

Habitat Loss

machinery, and other vehicles during the construction phase results in the potential for direct mortality of animals should they be hit by moving traffic. Mitigation by design includes the cessation of work activity during night, when Otter activity is highest. Mortality to Otter is not expected to occur as a result of operational machinery from the Proposed Development construction phase. Even in a worst-case scenario, any such collision risks are unlikely to exceed a **Negligible** magnitude which equates to **Very low/Not significant** effects.

As such, in consideration of the design measures presented, the Proposed Development is unlikely to result in significant effects on this KER.

Invasive Species

American Mink is assumed to be present onsite based on field results, as there is suitable habitat onsite and a scat was recorded onsite (601419.54, 582175.85) which, due to its' age, size and neighbouring habitats, could not be ruled out as American Mink. Fallow Deer was also recorded onsite across the Proposed Development.

The spread of Fallow Deer and American Mink could result in impacts of High magnitude on features of High sensitivity (rivers and hedgerows), resulting in Very significant effects.

As such, the Proposed Development is likely to result in significant effects from the spread of invasive species.

Pollution of habitats

Pollution of Otter habitat via reductions in water quality caused by increases in sediment could cause a direct loss of suitable Otter couching sites, and of freshwater habitats, which could impact on species distribution. Suitable habitat was recorded within and adjacent to the Proposed Development site boundary, namely the Tourig River which had recorded the presence of Otter during field surveys. Given that Otter is a QI of the downstream Blackwater River (Cork/Waterford) SAC, it is a species of **International Importance**, pollution to this receptor's habitat during construction will result in **Very significant** effects to this **Very high sensitivity** receptor.

Significant reductions in downstream water quality, including sedimentation, are not expected to occur given the implantation of the mitigation by design measures provided in **Section 7** which include the use of hydrological buffers.

It is therefore evaluated that any magnitude of any effects on suitable habitat availability and couching sites potentially located within the river waterbodies located within the Proposed Development and the downstream Blackwater River (Cork/Waterford) SAC will be **Low**, resulting in **Medium/moderate** effects.

As such, in consideration of the design measures presented, the Proposed Development is likely to result in significant effects on this KER.

8.2.1.2.2. Badger

Direct habitat loss and fragmentation

A significant area of suitable foraging habitat (improved agricultural grassland) (143ha) and hedgerow (395m) will be removed as part of construction works. Badger prints, latrine and setts were recorded throughout the site during the field assessment, and a total of six potential Badger setts were recorded

during the walkover surveys. As such, there is evidence that foraging, commuting and breeding Badger use this site.

As such, given the extent of Badger activity within the Proposed Development, the habitat loss of suitable foraging habitat is of **Moderate** magnitude based on the extent of improved agricultural grassland being impacts in the short term and the majority of hedgerows/treeline verge habitats remaining unaffected as a result of the Proposed Development. As such, given the short-term nature of this effect and the wider receiving environment remaining unchanged from baseline conditions, it is considered that Badger will experience a negative, short-term, **Moderate** effect as a result of habitat loss impacts. In EIA terms, this is **Not Significant**.

Habitat fragmentation will occur as a result of the construction works, excavations, heavy machinery, and changes to the improved agricultural grassland in the short-term. Any such fragmentation is not anticipated to result in permanent obstruction of Badger commuting or foraging opportunities throughout the Proposed Development. As such, although of **High** magnitude in short-term context, any impact would not be above **Moderate** effect as a result of habitat fragmentation in the construction phase. In EIA terms, this is **Not Significant**.

As such, in consideration of the design measures presented, the Proposed Development is unlikely to result in significant effects on this KER.

Disturbance and displacement (Non-breeding individuals)

Disturbance/displacement effects are likely to take place as a result of the Proposed Development due to the extent of noise, large vehicles traversing the area, plant machinery and human presence. These sources are present within the extensive suitable habitats present within the Proposed Development for foraging, commuting and breeding Badger, as such, should works take place where Badger is inhabiting, the Proposed Development poses a **High** magnitude effect on Badger.

Mitigation by design measures is in place as part of the Proposed Development design which include buffer distances (30m) to avoid disturbing any active setts, therefore, the magnitude of this effect is reduced to **Low** which equates to **Low/Slight effects** on this **High sensitivity** receptor.

As such, in consideration of the design measures presented, the Proposed Development is unlikely to result in significant effects on this KER.

Disturbance and displacement (Breeding individuals)

Disturbance/displacement effects are likely to take place as a result of the Proposed Development due to the extent of noise, large vehicles traversing the area, plant machinery and human presence. These sources are present within the extensive suitable habitats present within the Proposed Development for foraging, commuting and breeding Badger, as such, should works take place where Badger is inhabiting, the Proposed Development poses a **High** magnitude effect on Badger.

Works undertaken within 50m of active setts during the breeding season poses a **High** magnitude effect on Badger, resulting in **Very significant** effects on this **High sensitivity** receptor.

As such, the Proposed Development is likely to result in significant effects on this KER.

Direct mortality of individuals

Four potential Badger setts and secondary signs of Badger were identified within the construction works boundary. Badger also occurs in the wider local area, and there is potential for Badger to utilise

habitats within and adjacent to the Proposed Development and therefore the presence of operating plant and machinery and other vehicles during the construction phase results in the potential for direct mortality of animals should they be hit by moving traffic. However, such impacts are at worst of temporary duration and **Low** magnitude which equates to **Very low/Not significant** effects and is unlikely to affect Badger distribution (no significant decline).

As such, in consideration of the design measures presented, the Proposed Development is unlikely to result in significant effects on this KER.

8.2.1.2.3. Other Terrestrial Mammals (Irish Hare, Pine Marten, Irish Stoat, Red Squirrel, Hedgehog and Pygmy Shrew)

Direct habitat loss and fragmentation

A small area of linear hedgerow habitat (395m) will be removed as part of the construction works. There is a possibility that foraging, commuting and breeding individuals may use this habitat, however, it is unlikely considering that there is more suitable habitat nearby. As such, given the extent of more suitable habitat within the wider receiving area, habitat effecting these species is less than 1% of available suitable habitat within the wider ecological baseline, which equates to a **Negligible** magnitude despite the medium/long-term duration of the habitat loss.

As such, in consideration of the design measures presented, the Proposed Development is unlikely to result in significant effects on these KERs.

Disturbance and displacement

Despite the suitable habitat within the Proposed Development, these species were not recorded during surveys and are likely to utilize more suitable habitat nearby. Disturbance/displacement effects are likely to take place as a result of the Proposed Development due to the extent of noise, large vehicles traversing the area, plant machinery and human presence. These sources are present within the habitats that are suitable for foraging, commuting and breeding individuals. The Proposed Development poses a **Low** magnitude effect on these species.

Given the sensitivity for these KERs on this site is **Low**, the disturbance/displacement effect is **Very low/Not significant** in the worst-case scenario on this KER. Mitigation by design measures is in place as part of the Proposed Development design which include pre-construction surveys by an ECoW to ensure that significant effects to ecological features will be avoided. Therefore, even the worst-case scenario **Very low/Not significant** on these KERs via disturbance/displacement effects is considered unlikely to occur.

As such, in consideration of the design measures presented, the Proposed Development is unlikely to result in significant effects on these KERs.

Direct mortality of individuals

There is potential for these species to utilise suitable habitats within and adjacent to Proposed Development and therefore the presence of operating plant and machinery, and other vehicles during the construction phase results in the potential for direct mortality of animals should they be hit by moving traffic. Mortality to these species is not expected to occur as a result of operational machinery from the Proposed Development construction phase. Even in a worst-case scenario, any such collision risks are unlikely to exceed a **Negligible** magnitude of effect which equates to **Very low/Not significant** effects on these **Low Sensitivity** receptors.

As such, in consideration of the design measures presented, the Proposed Development is unlikely to result in significant effects on this KER.

8.2.1.3. Bats

Direct habitat loss and fragmentation

A small area of suitable commuting hedgerow habitat (395m) will be removed as part of construction works. As such, given the extent of bat activity within the Proposed Development, the habitat loss and fragmentation effecting bat is 1-5% of habitat loss within the wider ecological baseline, which equates to a **Low** magnitude, this permanent habitat loss equates to **Low/Slight** effect on this **High sensitivity** receptor.

As such, in consideration of the design measures presented, the Proposed Development is unlikely to result in significant effects on this KER.

Disturbance/Displacement to commuting, foraging and roosting bats

Many species of bat commute and forage along linear features, such as a stream/river, hedgerow or woodland edge. However, on occasion they will cross open features (particularly true of species such as Leisler's Bat that use strong echolocation). There is a possibility that the Proposed Development construction works may cause disturbance to commuting, foraging and roosting bats. Disturbance includes noise, human presence and lighting. Mitigation by design measures include buffer zones (10m from potential bat roosts) and pre-construction surveys to be carried out by an appropriately qualified ecologist at trees requiring felling to confirm no PRFs will be impacted by the felling works, to ensure disturbance/displacement of roosting bats, should it be required, is correctly scoped. This ensures such impacts are at worst of **Low** magnitude and not likely to affect the overall bat population (no significant decline). Where a tree with suitable PRFs is set for felling (none as of 2025 baseline surveys), and inspection surveys show roosting bats, all appropriate derogation measures and license applications will be provided and applied for prior to any works effecting these features commence.

As such, in consideration of the design measures presented, the Proposed Development is unlikely to result in significant effects on this KER.

8.2.1.4. Birds

Direct habitat loss and fragmentation

A significant area of suitable foraging habitat (improved agricultural grassland) (143ha) and hedgerow (395m) will be removed as part of construction works. Gulls and Snipe were observed foraging on improved agricultural grassland within the Proposed Development. Suitable breeding habitat was recorded for Meadow Pipit within the Proposed Development and Yellowhammer was observed flying along hedgerow habitat. The loss and fragmentation of improved agricultural grassland and hedgerow effecting birds is 1-5% of habitat loss within the wider ecological baseline, which equates to a **Low** magnitude, this permanent habitat loss equates to **Very low/Not significant** effects on these receptors.

As such, in consideration of the design measures presented, the Proposed Development is unlikely to result in significant effects on these KERs.

Disturbance/Displacement to breeding birds

No suitable breeding habitat exists within the Proposed Development site boundary for these KERs, so the effects of disturbance/displacement to these KERs is **Not Significant**. The exception is Yellowhammer, which can use arable crops as breeding habitat, 11.12ha of which will be lost during construction. This equates to a **High** magnitude; this permanent habitat loss equates to **Low/Slight effects** on this **Low Sensitivity** receptor. However, the loss of arable crop is not significant in the context of the wider landscape, which reduces the magnitude of effect to **Low**, equating to **Very low/Not significant** effects to Yellowhammer.

As such, the Proposed Development is unlikely to result in significant effects on these KERs.

8.2.2. Operational Phase Habitats

8.2.2.1.1. Habitat Loss/Degradation of habitat

There will be no removal of habitats during the operational phase of the Proposed Development. As a result, there is no potential for direct adverse effects to habitats arising from the operational phase of the Proposed Development. Post-construction, the overall condition of KER habitat (hedgerow) will be improved given the hedgerow planting measures proposed within the CEMP, Landscape Mitigation and Management Plan, and Biodiversity Enhancement Management Plan (BEMP) resulting in a long-term, positive effect.

As such, the Proposed Development is unlikely to result in significant effects on habitat KERs.

8.2.2.2. Invasive Non-Native Species

The spread of Japanese Knotweed during the operational phase can occur through vegetation clearance, mowing, hedge-cutting or other landscaping activities and the contamination of vehicles or equipment with seeds or plant fragments which are then transported to other areas.

The spread of invasive Japanese Knotweed during operational of the Proposed Development is considered to have a **High** magnitude effect on habitats, resulting in a **Very significant** effect.

The spread of Fallow Deer and American Mink could result in impacts of **High** magnitude on features of **High sensitivity** (rivers and hedgerows), resulting in **Very significant** effects.

As such, the Proposed Development is likely to result in significant effects from the spread of invasive species.

8.2.2.3. Terrestrial Mammals

8.2.2.3.1. Otter

Disturbance and displacement and Mortality

Disturbance/displacement effects are likely to take place as a result of the Proposed Development due to the extent of noise, large vehicles traversing the area, human presence, and related maintenance works. A footprint possibly belonging to Otter was recorded within the Proposed Development site boundary on the Tourig River. Otter presence is therefore likely to occur within this river which is partially located within the Proposed Development site boundary.

As such, should operational works take place where Otter is utilizing this river as a holt or couching site, it poses a **Very high** magnitude effect on Otter.

Given the sensitivity for Otter on this site is **Very high**, however, given that no works are required within suitable Otter habitat during the operation phase, the likelihood for this effect is reduced to **unlikely**.

As such, the Proposed Development is unlikely to result in significant effects on this KER.

Direct mortality of individuals

Mortality arising from operational phase effects is an unlikely event for Otter but is considered forward to identify the extent of the significance in a worst-case scenario. Although unlikely, there is potential for Otter to cross the site access tracks and public roads in use by machinery and project vehicles during maintenance works, mortality impacts as a result of the operation phase works are considered to be **Not significant**.

As such, the Proposed Development is unlikely to result in significant effects on this KER.

8.2.2.3.2. Badger

Disturbance and displacement and Mortality

Disturbance/displacement effects are likely to take place as a result of the Proposed Development due to the extent of noise, large vehicles traversing the area, human presence, and related maintenance. Any operational effects on Badger are assessed as being of **Low** magnitude, resulting in **Low/Slight** effects given that operational works will be temporary in nature and duration and unlikely to take place within suitable Badger habitat.

As such, the Proposed Development is unlikely to result in significant effects on this KER.

Direct mortality of individuals

Mortality arising from operational phase effects is an unlikely event for Badger but is considered forward to identify the extent of the significance in a worst-case scenario. Although unlikely, there is potential for Badger to cross the site access tracks and public roads in use by machinery and project vehicles during maintenance works, mortality impacts as a result of the operation phase works are considered to be **Not significant**.

As such, the Proposed Development is unlikely to result in significant effects on this KER.

8.2.2.3.3. Irish Hare, Pine Marten, Irish Stoat, Red Squirrel and Hedgehog

Disturbance/displacement effects are likely to take place as a result of the Proposed Development due to the extent of noise, large vehicles traversing the area, human presence, and related maintenance. Any operational effects on these species are assessed as being of **Low** magnitude, resulting in **Very low/Not significant** effects given that operational works will be temporary in nature and duration and unlikely to take place within suitable habitat.

As such, in consideration of the design measures presented, the Proposed Development is unlikely to result in significant effects on these KERs.

8.2.2.4. **Bats**

8.2.2.4.1. Disturbance/Displacement to commuting, foraging and roosting bats

Disturbance/displacement effects are likely to take place as a result of the Proposed Development due to the extent of noise, large vehicles traversing the area, human presence, and related maintenance. Any operational effects on bats are assessed as being of **Low** magnitude, resulting in **Low/Slight effects** given that operational works will be temporary in nature and duration and unlikely to take place within suitable bat habitat.

As such, in consideration of the design measures presented, the Proposed Development is unlikely to result in significant effects on this KER.

8.2.2.5. Birds

8.2.2.5.1. Disturbance/Displacement to breeding birds

Disturbance/displacement effects are likely to take place as a result of the Proposed Development due to the extent of noise, large vehicles traversing the area, human presence, and related maintenance. Any operational effects on birds are assessed as being of **Low** magnitude, resulting in **Low/Slight** effects given that operational works will be temporary in nature and duration and unlikely to take place within suitable bird habitat.

Considering the limited scale of operational disturbance, effects on breeding and wintering birds due to disturbance and displacement during the operational phase are considered **Low/Slight** effects.

As such, the Proposed Development is unlikely to result in significant effects on these KERs.

Direct mortality of individuals

Studies in Ireland regarding bird mortality via electrocution have mostly been carried out on the risk of bird electrocution on transmission lines rather than substations. One study concluded that the risk of electrocution on the high voltage transmission lines of the national grid is very limited (EirGrid, 2016). For the purposes of this report, it is considered that this operational effect on birds is assessed as being of **Low** magnitude, resulting in **Low/Slight** effects.

As such, the Proposed Development is unlikely to result in significant effects on these KERs.

8.2.3. Decommissioning Phase

Decommissioning of the Proposed Development will involve the complete removal of above ground components, disassembling each Inverter/Transformer and the removal of Inverter plinth foundations to below ground level. The ground will be covered by soils typical of the surrounding environment and then reseeded or left to re-vegetate according to ecological requirements. Considering the extent of habitat removal and alteration, effects from habitat loss and fragmentation during decommissioning are considered a **Not significant** effect in a worst-case scenario, with regard to the habitats themselves and the flora and fauna they support.

9. MITIGATION

9.1. Designated Sites

9.1.1. International Designated Sites

As stated in the NIS, the mitigation measures related to the Proposed Development are sufficient to ensure no likely significant effects on any European sites or their relevant QIs/SCIs and IBAs.

As such, no additional mitigation measures are required.

9.1.2. National Designated Sites

As stated in **Section 8.1**, the mitigation measures related to the Proposed Development are sufficient to ensure no likely significant effects on any National sites or their relevant QIs.

As such, no additional mitigation measures are required.

9.1.3. Hydrology and Drainage Management

Site drainage and drainage management and control is set out in **Planning and Environmental Report Section 11 Hydrology and Hydrogeology and in the Drainage Management Plan**.

A Surface Water Management Plan has been prepared for Proposed Development, see in **Appendix A** of the CEMP. The Contractor will implement in full the requirements of the Surface Water Management Plan provided.

The Proposed Development Hydrologist/Design Engineer will attend the site during the Construction Phase to ensure that the drainage design and drainage controls are constructed in accordance with the mitigation measures outlined in **Appendix A** of the CEMP and Planning and Environmental Report.

9.1.3.1. Drainage System

The drainage system includes the following:

- Drainage will be installed in parallel with access track construction;
- Swales and Check dams will be mainly used for linear track drainage;
- Silt fencing will be utilised during water crossings and around stockpiles; and
- Settlement-attenuation ponds will be used at every major excavation (Substation and BESS).

9.1.3.2. SuDS Drainage Design

The approach to treatment and attenuation of storm water is as follows:

- Additional drainage measures will only be added as necessary. The dimensions of these features will avoid intercepting large volumes of water;
- Where linear track drains are specified on the drainage stone filled check dams will be installed at a regular frequency, in order to reduce flow velocities and improve conditions for the settlement of solids in transit. It is intended that these dams will provide treatment of construction runoff at source. There will be outflow points (spillways) from the drains to the settlement ponds. No outflow will be permitted directly into natural watercourses;
- The roads within the Proposed Development will be constructed with an appropriate surface cross slope, so that all storm water flow will be directed towards the constructed swales

located along road verges or to French drains/soakaways. The width and depth of constructed swales will be minimised as far as practical in order to reduce ground disturbance, excavation footprint (and hence volume of excavated materials) and also disruption of local hydrology as far as possible;

- Drainage vegetation (vegetation including grasses established within a drainage channel can filter runoff water. Living and decomposing plants and roots and associated microorganisms trap sediments and take up excess nutrients used, will be similar in species to the local area and will be approved by the EnvCoW;
- Temporary erosion protection together with silt fences may be required;
- Permanent check dams will be installed at regular intervals within the swales in order to reduce erosion and allow for greater flow control;
- Stormwater runoff within the trackside drainage will be treated through the provision of check dams, within a range depending on local slope of the drain as significant levels of sediment are not expected because of the surface dressing of the access tracks. All trackside drainage will drain to settlement-attenuation ponds;
- The maximum spacing between check dams should be such that the toe of the upstream dam is at the same elevation as the top of the downstream dam;
- The centre of the check dam should be at least 0.2m lower than the outside edges;
- Side slopes should be 1:2 or less;
- A Terram membrane barrier or similar non-woven geotextile membrane will be placed around check dam;
- Check dams will be keyed at least 0.1m into the drainage channel bottom in order to prevent the dam washing out;
- Check dams will be maintained and monitored on a regular basis. Sediment will be removed before it reaches one half the original dam height;
- Discharging directly back into the surrounding area will assist in maintaining the hydrological characteristics of the Proposed Development;
- Where vegetation is removed from sloped areas during construction, these areas will be reinstated as early as possible using the same vegetation or similar vegetation as advised by the EnvCoW;
- A sump may be required for trench dewatering. Water will subsequently be pumped into settlement-attenuation ponds or a siltbuster; and
- The level of silt runoff during construction will be monitored and if found to be excessive of 25 mg/L in any area, will subsequently be managed by the provision of additional silt attenuation features such as silt fences or silt traps.

9.1.3.3. Silt Fencing

The fences will be installed (to manufacturers' recommendations) in a range of scenarios, including;

- Alongside any sensitive areas, e.g. watercourses, particularly where work occurs within drainage or surface water buffers. This can include dirty water containment at watercourse crossings;
- Large areas of stripped materials i.e. soils and subsoils, and areas used for temporary storage of materials, e.g. around the substation and BESS cut and Fill construction area;
- Downstream from drainage or water treatment outlets, and can usually be arranged in a horse-

- shoe style configuration to contain and allow settlement of suspended sediments; and
- Within temporary construction drains, alongside or in place of check dams.

9.1.3.4. Swales

Drainage Swales will be provided between the Proposed Development and watercourses. Drainage from site roads, compounds, inverter stations and other hardstand areas will be collected by these drainage swales and attenuated to greenfield equivalent in three-compartment silt ponds (which are also designed for attenuation) and dispersed overland via a “level spreader” or buffered outfalls where the outflow will mimic existing natural overland sheet flow.

Settlement ponds are to be securely fenced to prevent easy access. The ponds are utilised to attenuate and to aid the removal of suspended solids from site runoff water. Settlement ponds will be emplaced at 46 locations along the drainage footprint.

Flows controls shall be installed at the silt pond outflow points to ensure that flows are discharged at a limited rate up to the 1% AEP Climate Change event.

9.1.3.5. French Drains and Soakaways

French drains comprising 0.4m wide trenches up to 900mm deep will be filled with 32mm single sized crushed stone. These will be provided along edges of new tracks where no swales are proposed and also within localised hollows where surface water would otherwise accumulate and will connect such hollows to the road drainage.

Soakaways will be provided at the following locations:

- Site entrances;
- Substation; and
- Inverter/transformer stations.

At site entrances, the soakaway will comprise 1.8m diameter perforated precast concrete manhole rings to at least 1.2m deep filled with single 32mm sized crushed stone.

During operation, the Proposed Development will have no oil/fuels stored on site and will be drained via a comprehensive SuDS Management Train, so an interceptor is not required.

At the substation (see Section 3.2 of TLI Group Report Reference: 300101185-CS-R-02-00), a soakaway of 5m x 5m x 1.8m is proposed.

For the inverter (transformer/hardstand areas, a soakaway trench 0.6m wide x 8.0m long, 1.2m deep and filled with 32mm single sized crushed stone is proposed at the end of each unit.

9.1.4. Ecological Clerk of Works (ECoW)

An Ecological Clerk of Works (ECoW) will be appointed to address issues relating to ecological features during the construction and decommissioning phases, as described within the CEMP. Their responsibilities will include:

- Undertaking a pre-construction survey to ensure that significant effects to ecological features will be avoided;
- Inform and educate site personnel of sensitive ecological features within the Proposed Development site and how effects on these features could occur;
- Oversee management of ecological issues during the construction and decommissioning

period and advise on ecological issues as they arise;

- Provide guidance to contractors to ensure legal compliance with respect to protected habitats and species on site;
- Liaise with officers from consenting authorities and other relevant bodies and contractors with regular updates in relation to construction and/or decommissioning progress; and
- Ensure all hedgerow bolstering and new hedgerow establishment is carried out as specified in the Landscape Mitigation and Management Plan and BEMP.

The Contractor will implement the mitigation measures as set out in the Planning and Environmental Report which are summarised into **Appendix C** of the CEMP.

The appointed ECoW will have responsibility for monitoring activities that have the potential to impact on ecology or biodiversity associated with the site or linked to the site arising from site construction activities. The Contractor will adhere to the guidance by the appointed ECoW during construction.

The ECoW will ensure that all the mitigation measures set out in Planning and Environmental Report and in the NIS are being fully implemented.

The appointed ECoW will have the authority to issue Stop Work Orders until such time that issues which may impact on ecology or biodiversity are resolved.

9.1.5. Emergency Preparedness and Emergency Response

An Emergency Response Plan has been prepared for the Proposed Development and is attached to the CEMP as **Appendix F**.

Prior to commencement of construction, the Environmental Clerk of Works (EnvCoW) will prepare a register of corrective action and emergency response sub-contractors that can be called upon in the event of an environmental incident, and/or to give training on escalating incident where useful, including e.g. specialist hydrocarbon spill response, specialist hydrological and/or water quality response.

Mitigation measures as outlined in the previous sections will reduce the potential for contamination of waters during the construction phase of the Proposed Development. However, there remains the risk of accidental spillages and or leaks of contaminants, and excessive loading of surface water mitigation infrastructure.

The Emergency Response Plan sets out the requirements with respect to the following:

- Managing & Reporting Environmental Incidents;
- Roles and Responsibilities ;
- Spill Kits;
- Fire Prevention;
- Extreme Weather;
- Emergency Contacts;
- Incident Reporting and Investigation; and
- Incident Response.

The Emergency Response Plan is to be considered a live document which is to be updated on a regular

basis by the Site Manager.

9.1.6. Site Manager/Site Supervisor

The Site Manager shall be responsible for:

- Undertaking weekly Site Compound Checks, and appointing people to supervise refueling of tanks and bowsers;
- Ensuring the required consents are in place before work starts;
- Ensuring environmental and waste requirements are included on requisitions and in subcontracts and orders;
- Ensuring oil, including diesel, is stored in properly bunded tanks / drip trays;
- Ensuring Waste Transfer Notes / Waste Consignment Notes are checked against invoices before payment;
- Liaising with statutory authorities as required and ensuring records of communication (including verbal communication) are kept. Statutory authorities should always be accompanied on site visits;
- Ensuring employees, contractors and subcontractors implement the controls set out in the CEMP;
- Ensuring employees, contractors and subcontractors receive Induction Training (including Proposed Development environmental issues) and Toolbox Talks, as appropriate;
- Ensuring personnel needed for audits are available when required;
- Verifying actions resulting from Corrective Action Requests and Observations raised during audits are completed by the deadlines;
- Ensuring environmental training is provided;
- Reporting incidents immediately to the client, and to statutory authorities where required;
- Logging and monitoring incidents and non-conformances;
- Disseminating information, including changes to legislation, and relay to relevant contractor's employees;
- Identifying employees who require environmental training and maintain training records in line with the contract for the works;
- Providing advice and dealing with queries and correspondence on environmental issues.
- Identifying significant environmental impacts for the Proposed Development and assist in setting up contracts to include the necessary controls;
- Monitoring the progress in closing out Corrective Action Requests and Observations raised during audits;
- Ensuring all records are retained and readily available;
- Carrying out monthly site audits and reporting on energy data, water usage and waste disposal and their greenhouse gas emissions; and
- Appointing any third-party specialists as required.

9.1.7. Contamination

To ensure effective control of waste arising from construction activities and to minimise waste generation and final disposal requirements the Contractor will adhere to the requirements of the Surface Water Quality Management Plan (**Appendix A**), and Surface Water Monitoring Plan (**Appendix E**) for the Proposed Development which are provided in the CEMP.

9.1.7.1. Monitoring and Environmental Clerk

To ensure effective implementation of mitigation measures, environmental auditing, and monitoring of environmental obligations of the Developer, an EnvCoW will be assigned by the Developer to carry out monitoring at the Site during the construction and operational phases of the Development.

The EnvCoW role will be to actively and continuously monitor site conditions and advise on environmental issues and monitoring compliance, and will not be responsible for implementing measures, the due duty of implementing measures will be held by the Developer / contracted construction operator.

The EnvCoW will have the authority to temporarily stop works in a particular area of the site to ensure corrective measures are implemented and adverse environmental impacts are minimised if not avoided.

Monitoring of pollution prevention and mitigation undertaken by the EnvCoW assigned by the Developer will include:

- Monitoring site pollution prevention plan;
- Water quality monitoring;
- Advising on required pollution prevention measures (as described in this EIAR) and monitoring their effectiveness;
- Liaison with local authorities in relation to pollution instances if applicable; and
- Considering EnvCoW will be responsible for monitoring a broad range of environmental factors at the Site, technical monitoring and advice will be sought such as from specialist consultants as the need arises e.g., installation and website for telemetry.

9.1.8. Disturbance and Displacement of Mobile Species**9.1.8.1. Buffer distances**

Ecological buffers within the Proposed Development are presented in **Appendix D**. Inclusion of appropriate buffers for existing treelines and hedgerows, potential bat roosts, Badger setts and protected bird species if present on site are provided in the final design and are outlined as follows:

- Habitat - Scrub and Woodland: 7m;
- Habitat – Hedgerows, Treeline: 7m;
- Invasive Species: 7m;
- Potential Bat Roosts: 10m; and

Badger Setts: 30m.

9.1.9. Habitats

9.1.9.1. Hedgerow Replanting

Some limited loss of hedgerows will occur due to development of site access locations and due to upgrading and construction of new access tracks, gates and fences. In addition, trimming of hedgerows at site entrances due to routine maintenance to ensure unobstructed sight lines will be required. The loss of hedgerows will be offset by bolstering existing hedgerows and the establishment of new hedgerow areas. This is set out in the Landscape Mitigation and Management Plan and BEMP within the CEMP as mitigation and will serve both to screen the proposed development from viewpoints and also to offset hedgerow loss and enhance biodiversity and is summarised below:

- Bolster existing perimeter and internal hedgerows with under-planting and inter-planting of whip transplants in order to ensure dense and consistent screening of the site in perpetuity;
- Advanced nursery stock in the form of 8-10cm girth trees will be used to fill any noticeable gaps and plant species will be selected to complement the existing broadleaf hedgerow species mix around the site and will be of local provenance;
- Bolster approximately 31,000 linear meters of existing hedgerow;
- Where not already exceeded by existing vegetation, it is intended to manage hedgerows up to 3-4m in height by a combination of allowing lower sections of existing hedgerows to mature, filling obvious gaps with advanced nursery stock and providing an additional line of whip planting to selected hedgerows that require densification;
- Plant new 'Type 2' hedgerows, with whips and a high proportion of advance nursery stock trees (c.3m planted height), along the boundaries of some of the proposed parcels to further screen the Proposed Development from some of the nearest surrounding receptors;
- Allow planting to mature up to a maintained height of 3-4m; and
- Establish an estimated 1,400 linear meters of Hedgerow Type 2 (New Native hedgerow).

9.1.9.2. Native Woodland Planting

Native woodland thickets are also proposed in localised areas along the perimeter of the Proposed Development. These native thickets/woodlands will be provided in the form of high canopy (dominants) species, low canopy (sub-dominant) species, understory and fringe (higher shrubs) species and understory and edge (lower shrub) species and will comprise of a mix of advanced nursery stock and whip planting of local provenance. The proposed planting will be allowed to grow out to reach maturity and will break up the visual mass of the main solar array and substation development.

An estimated 1.96ha of native woodland will be established.

9.1.9.3. Biodiversity Enhancement Management Plan

The accompanying BEMP provides the following enhancement measures for high ecological value habitats within the Proposed Development:

- Cut back hedgerows between November and February and on a 3-year cycle, or at least stagger maintenance on different areas (cut one third of hedgerow every year instead of all at once) to allow for a constant food source for pollinators. Hedgerows should be at least 2.5m in height and trimmed in an A-shape for road access. Hedgerows will have a target height of 4m across the site boundaries;

- Establish species rich grasslands from local sources and allowed to grow naturally between solar panels and in designated areas left uncut between March-October, winter cuts either via livestock or manual cutting;
- Maintenance of scrub on south of the site;
- Eliminate the use of pesticides and herbicides with the exception of management of Invasive species;
- 1.96ha of native broadleaved woodland shelter belts be planted onsite: Hazel *Corylus avellana*, Rowan *Sorbus aucuparia*, Blackthorn *Prunus spinosa*, Hawthorn *Crataegus monogyna*, Oaks *Quercus spp.* etc. Species mixture will follow guidelines set out by the native tree area scheme;
- Installation of an artificial Otter holt within the Tourig River on the western boundary of the Proposed Development.

See the accompanying BEMP for detailed enhancement and implementation measures.

9.1.10. Invasive Alien Species

A detailed Invasive Species Management Plan (ISMP) has been prepared to avoid causing the spread of invasive plant species. This will be adopted during all stages (e.g. construction, operation and decommissioning) of the Proposed Development and reviewed/updated in response to any significant changes in the ecological baseline regarding invasive non-native plant species. Control measures within the ISMP will include:

9.1.10.1. Fallow Deer

There are no specific legal provisions associated with Fallow Deer in Ireland. Therefore, following the management measures outlined in **Section 9.1.9.5** are sufficient.

9.1.10.2. Cherry Laurel

There are no specific legal provisions associated with the growing of Cherry Laurel in Ireland. Therefore, following the management measures outlined in **Section 9.1.9.5** are sufficient.

9.1.10.3. Japanese Knotweed

As the Japanese Knotweed is located on private property, eradication may not be possible. Therefore, it is advised that a 7m radius around any Japanese Knotweed located onsite is cordoned off and marked with a restricted access sign. All soil excavated within this 7m radius must be treated as biohazardous material due to the potential for presence of rhizomes. Any vehicles which enter this precautionary 7m must undergo Check, Clean, Dry protocol after leaving the marked area to prevent potential spread of any seeds.

9.1.10.4. American Mink

There are no specific legal provisions associated with American Mink in Ireland. Therefore, following the management measures outlined in **Section 9.1.9.5** are recommended.

An artificial Otter holt will be placed on the western boundary of the Proposed Development. Increased Otter presence may in turn deter the presence of American Mink onsite, providing biological control for the invasive species, as they are in direct competition for resources and some studies have indicated that recovering Otter populations may reduce presence of American Mink (McDonald *et al.*, 2007).

9.1.10.5. General Management Measures

- If an Invasive Alien Species (IAS) is identified on site in addition to the already identified locations, contact your Site Supervisor/HSEQ Advisor for instructions on how to proceed;
- Implement controls as instructed by the HSEQ Advisor;
- Information on IAS/training will be provided at induction stage to all staff/Site Operatives; and
- If additional IAS are identified onsite, changes to the Invasives Species Report may be deemed necessary, and the Client should be contacted before proceeding with works.
- Appropriate signage for IAS will be used;
- Locations where Japanese Knotweed occurs will be fenced off where possible to prevent disturbance and prevent access. This involves fencing-off the IAS including a 10m buffer zone to stop workers and machinery entering these areas;
- Suppliers of any soil or aggregates, brought on to the site are required to assure that it is free of any IAS;
- All tyres and tracks should be checked/cleaned before leaving a site where an IAS has been identified to prevent inadvertently spreading the species;
- Soils and plant materials will be cleaned from tools, equipment, vehicles and work clothes before entering and leaving the work site;
- Before removing any plants and shrubs, they will be checked that they are not a Third Schedule/First Schedule Invasive Species; and
- Contaminated soils will be treated carefully. If wastes are being transported off site, ensure that they are appropriately transported by a licensed waste carrier who is informed that the waste material contains an invasive species as part of the waste transfer documentation.

9.1.11. Protected Species Otter

A full spectrum of surveys in line with Reid *et al.* (2013) and Highways Agency (1999) recommendations to identify the extent of Otter presence utilising the habitat within the Proposed Development site boundary will be conducted prior to any works commencing. Should an active holt be found within the 150m distance of the works (NRA, 2006), no works will take place until the holt has been confirmed vacant. Consultation will be conducted with NPWS and if required works will either wait for the holt to no longer be in use or derogation license to relocate the holt will be sought with appropriate measures in line with the Wildlife Acts and the EU habitats Directive. Should this derogation license be required, this effect will be re-assessed to address the changes to adverse effects on Otter. The creation of shelter for Otter via an artificial holt on the Tourig River will be actioned as part of the BEMP. Wildlife gates will be provided with the erection for stock proof fencing to avoid fragmentation.

9.1.11.2. Badger

A Pre-Construction Badger Survey should be undertaken in line with NRA (2006) *Guidelines for the Treatment of Badger Prior to the Construction of National Road Schemes*. National Roads Authority, Dublin, Ireland. This includes:

- A pre-construction Badger survey should be carried out no more than 10-12 months in advance of construction in order to identify sett entrances;

- Should an active Badger sett be identified within the Proposed Development, no construction works should take place within 30m of the active sett, any works within this area will require derogation licenses;
- No heavy machinery should be used within 30m of Badger setts (unless carried out in consultation with NPWS);
- Lighter machinery (generally wheeled vehicles) should not be used within 20m of a sett entrance; light work, such as digging by hand or scrub clearance should not take place within 10m of sett entrances;
- Any works within the Badger breeding season (December to June inclusive) will require an exclusion zone of 50m around the setts, any works within this area will require derogation licenses; and
- All excavations are to be securely covered or closed off at the end of each working day to prevent the accidental trapping of Badgers; and
- Wildlife gates will be provided with the erection for stock proof fencing to avoid fragmentation.

Signs of other Mammals should be observed and recorded during the Badger pre-construction survey.

9.1.11.3. Bats

The Proposed Development does not involve the removal of any trees or the identified roost (BL3) which is located just outside of the Proposed Development site boundary. In the event that a mature tree may require trimming or felling, the tree should be surveyed for potential bat roosts before any work commences.

All works required within 50m of confirmed roosts will not occur during the breeding season (April-October).

To minimise the potential for impacts on commuting and foraging bats, removal or alteration of suitable commuting and foraging habitat (e.g., hedgerows and treelines), wherever possible, be undertaken outside of the peak breeding season (i.e., outside of the period April to October inclusive).

Although not anticipated, if any mature trees ultimately require removal, it will need to be surveyed for PRF prior to removal, in line with Bat Conservation Trust guidelines (Collins, 2023). Further surveys will be required should this PRF check determine the tree to be of medium or high bat roosting potential. If removal of an active roost is required, all appropriate mitigation measures and derogation steps will be adhered to including, alternative design measures, bat boxes, and ECoW oversight of any felling of tree limbs with PRFs.

10. Do-Nothing Scenario

In a 'Do-Nothing Scenario', it is determined that the aforementioned KERs will undergo regular progression of population trends as provided in **Section 5**. It is likely that the sites would continue to be used for agricultural/community purposes.

Actions and goals relevant for the Nature Restoration Regulation have not been released for Ireland at the time of writing. Assuming all KERs will experience some net increase with these measures in relation to those recorded within the ecological baseline, and the Blackwater River (Cork/Waterford) SAC and Blackwater Estuary SPA, it can be inferred that the populations of KERs for the Proposed Development will remain the same as the existing baseline or increase in the Do-Nothing Scenario.

11. CUMULATIVE IMPACTS

Legislation, guidance and case law (**Section 1.1**) requires that in-combination effects with other plans or projects are considered. On this basis, a range of other plans and projects were considered in terms of their potential to have in-combination effects with the Proposed Development.

This section presents the list of other projects that have the potential to cause cumulative effects together with the Proposed Development.

In brief, the list of other projects was established from a desk study of relevant data sources completed in late November 2025 for any new and relevant sites. Planning applications older than five years since their approval were excluded from the list. These are likely to have already been built or no longer being progressed. The list includes projects within 2km of the Proposed Development. Older project with operational or longer construction periods were also considered.

This list was further refined based on likely significant cumulative effects arising to biodiversity. Scoped-in projects included local biodiversity and development action plans. A summary of these scoped-in projects is shown in below.

Due to the scale of the Proposed Development and the extent of potential effects, any project with potential for in-combination effects were screened-in for negative in-combination effects under the precautionary principle. A total of three projects were screened in for assessment as having the potential to give rise to likely significant in-combination effects (**Table 11.1**). None of the plans addressed in Section 11.1 were determined to have any interactions that would require consideration for in-combination effects on European sites, national sites or any other KERs relevant to the Proposed Development.

A full assessment of in-combination effects for scoped-in projects is presented in below.

11.1. Plans

11.1.1. Cork County Development Plan 2022-2028

This plan provides for the support of solar farm projects at appropriate locations, where such development does not have a negative impact on the surrounding environment, landscape, historic buildings, or local amenities. It also provides for the encouragement of the retention and integration of existing trees, hedgerows, woodland and other features of high natural value within new developments.

“Establish an appropriate balance in the spatial distribution of future population growth, in line with this Core Strategy, so that Bandon, Fermoy, Kinsale, Macroom and Youghal can accelerate their rate of growth and achieve a critical mass of population to enable them to maximise their potential to attract new investment in employment, services and public transport.”

Although no in-combination effects are predicted specifically between the Proposed Development and this plan. Where local authority plans to develop the area for more employment, population, services and public transport, specifically in the Youghal area, such plans will be consulted to verify no such works are planned to take place overlapping with the Proposed Developments' works. As such, no likely significant in-combination effect is anticipated.

11.1.2. Waterford County Development Plan 2022-2028

This plan provides for the support of solar farm projects at appropriate locations, where such development does not have a negative impact on the surrounding environment, landscape, historic buildings, or local amenities. It also provides for the encouragement of the retention and integration of existing trees, hedgerows, woodland and other features of high natural value within new developments.

The Proposed Developments' works do not overlap or interact with any aspect of County Waterford. As such, no in-combination interactions between this plan and the Proposed Development are anticipated.

11.1.3. National Biodiversity Action Plan 2023 – 2030

This is a broad national action plan setting the overall objectives with focused measurable targets to be implemented with more local and regional specific actions within biodiversity action plans created by local authorities and other government related departments to create more specific actions in line with achievable measures for biodiversity restoration and rehabilitation.

The five core Objectives are the following:

Objective 1: Adopt a Whole-of-Government, Whole-of-Society Approach to Biodiversity;

Objective 2: Meet Urgent Conservation and Restoration Needs;

Objective 3: Secure Nature's Contribution to People;

Objective 4: Enhance the Evidence base for Action on Biodiversity; and

Objective 5: Strengthen Ireland's Contribution to International Biodiversity Initiatives.

The Proposed Development will not pose interactions with the Objectives. No direct contradiction or in-combination effects are considered likely based on the nature of the Proposed Development and the Objectives not directly referring to the status or management measures for any KERs within the relevant Zol.

11.1.4. Youghal Biodiversity Action Plan 2022-2027

This Biodiversity Action Plan (BAP) sets considerations and actions for biodiversity including management of habitats such as grassland, woodland, hedgerows, treelines and scrub. No specific objectives are expected to interact in-combination with the Proposed Development on any KERs resulting in significant effects. As such, no likely significant effects are expected as a result of in-combination effects with this Plan.

Therefore, it is considered that in-combination effects will not be anticipated from the Proposed Development with other plans.

11.2. Projects

A search was conducted of planning applications (projects) within the vicinity of the Proposed Development, using the Cork County Council³ and Waterford City and County Council⁴ planning portals map viewer, the Department of Housing, Planning and Local Government EIA portal map viewer⁵ and An Coimisiún Pleanála Planning Map Search tool⁶. The search was limited to the five-year period preceding the date of issue of this report and excluded retention applications (i.e. typically local-scale residential or commercial developments where an impact has already occurred), incomplete, withdrawn or refused applications.

A number of projects within 2km of the Proposed Development pose potential to interact with the Proposed Development. However, only one project appears to have likely in-combination interactions to consider. The remaining projects are small-scale housing developments with significant separation distances. The relevant projects with potential for in-combination effects are detailed in **Table 11.1** below.

³ Available online at <https://planning.corkcoco.ie/ePlan/AppFileRefDetails/012478/0> Accessed **November 2025**

⁴ Available online at <https://www.eplanning.ie/WaterfordCCC/AppFileRefDetails/2460245/0> Accessed **November 2025**

⁵ Available online at housinggov.ie/maps.arcgis.com/. Accessed **November 2025**

⁶ Available online at www.pleanala.ie/h/. Accessed **November 2025**

Table 11.1: Relevant projects with potential for in-combination adverse effects to European sites. (Shaded cells represent scoped in for likely in-combination effects)

Project	Planning / Project Ref.	Nearest Distance to the Proposed Development	Description / Status (Commencement included if available)	Temporal Overlap with Proposed Development (Likely, Unlikely, No)	Scoped in / out for cumulative assessment
An Coimisiún Pleanála					
Turbine Delivery Route and Wind Farm Development (Lyrenacarriga Wind Farm, Co. Cork)	PA04.309121	1.19km (from Turbine Delivery Route works)	The proposed development, covering an area of approx. 724 hectares, straddles the administrative boundaries of Co. Waterford and Co. Cork. The development works and accommodation works on the turbine delivery route are within the townlands of Lyrenacarriga, Dunmoon South, Coolbeggan West, Propoge, Ballycondon Commons, Ballynatray Commons, Shanapollagh and Killea in Co. Waterford and Lyremountain, Lyre, Ballyanthony, Knockanarrig, Breeda, Rearour North and Rearour South in Co. Cork. The site is located approx. 5km to the south/south-east of Tallow Co. Waterford and c. 9 km to the north-west of Youghal in Co. Cork. Two clusters of turbines are proposed. The cluster in Waterford consists of 11 turbines (T1-T11) and that in Cork consists of 6 (T12-T17).	Likely	The NIS for the Wind Farm was reviewed. The NIS concluded that with the mitigation measures outlined, no residual adverse effects on European sites are anticipated. Considering predicted impacts and the adoption of prescribed mitigation measures for the project and the absence of major works for this project in proximity to the Proposed Development, no cumulative effects are considered likely to occur. Scoped out
Cork County Council					

Project	Planning / Project Ref.	Nearest Distance to the Proposed Development	Description / Status (Commencement included if available)	Temporal Overlap with Proposed Development (Likely, Unlikely, No)	Scoped in / out for cumulative assessment
Housing Development (David Lyons & Michelle Lyons, Cornaveigh, Park, Youghal, Co. Cork)	244643	Adjacent to the Proposed Development boundary	Permission to construct a new single storey residential extension to the rear of the existing dwelling along with all associated site works and services.	Likely	This project will involve construction works adjacent to the 33kV UGC connecting the substation to the south-east land parcel. This project's works and the Proposed Development works are in proximity to the Youghal Park stream, which is crossed by the UGC and adjacent to this project. Due to the overlap of a potential source pathway and this project likely taking place at the same time as the Proposed Development, in-combination effects cannot be ruled out at this stage. Scoped in
Housing Development (Sinead Fitzgerald, Knocknagappagh, Killeagh, Co. Cork)	217270	Adjacent to the Proposed Development boundary	Refurbish and make alterations to existing derelict dwelling; the construction of a part single-storey, part two-storey extension to the north (rear) of the existing derelict dwelling house, domestic garage, new walls and gates at existing site entrance,	Likely	Interactions will occur between the Proposed Development and this project, however, no interactions between these two projects will contribute to source magnitude or pathways identified for European sites within the relevant Zol. Scoped out
Housing Development	215844	2.2m	Construction of dwelling house & effluent treatment system together with associated site works. (Previous planning reference number 16/4786)	Likely	Interactions will not occur between the Proposed Development and this project, as any interactions between these two projects will not contribute

Project	Planning / Project Ref.	Nearest Distance to the Proposed Development	Description / Status (Commencement included if available)	Temporal Overlap with Proposed Development (Likely, Unlikely, No)	Scoped in / out for cumulative assessment
(Maeve & Geoff Gibbons, Cornaveigh, Youghal, Co. Cork)					to source magnitude or pathways identified for European sites within the relevant Zol. Scoped out
Housing Development (Ray Bryan, Youghal Park, Youghal, Co. Cork)	244962	249.84m	Permission to construct cattle shed with slatted tank and ancillary.	Likely	This project is outside of the footprint for potential interaction with the Proposed Development. Due to the absence of source pathways identified for European sites within the relevant Zol, no in -combination effects are considered likely to be significant. Scoped out
Housing Development (Declan Fitzgerald, Knocknagappagh, Killeagh, Co. Cork)	244647	340.46m	Permission to construct a new part single storey part 1.5 storey dwelling house, a detached domestic garage, an on-site wastewater treatment system, new bored water well, new entrance gate and piers at the existing site entrance and all associated ancillary works.	Likely	This project is located upstream of the Cariganass stream, via existing drainage pathways. Although minimal in nature, this project does interact with an identified pathway for the Proposed Development. As such, in combination effects cannot be ruled out at this stage. Scoped in
Housing Development (Brian O'Neill, Ballinvarrig Lower, Youghal, Co. Cork)	206261	381.63m	Construction of a dwelling, garage, wastewater treatment unit, polishing filter and associated site works.	Likely	Although overlapping with the Proposed Development construction phase, due to the separation distance and absence of shared pathways for potential receptors of European sites,

Project	Planning / Project Ref.	Nearest Distance to the Proposed Development	Description / Status (Commencement included if available)	Temporal Overlap with Proposed Development (Likely, Unlikely, No)	Scoped in / out for cumulative assessment
					LSEs as a result of in-combination effects are unlikely to occur. Scoped out
Housing Development (Niamh Fitzgerald, Knocknagappagh, Killeagh, Co. Cork)	216992	445.76m	Permission for a dwelling house, a domestic garage, an on-site sewage treatment system and all associated site development works.	Likely	Although overlapping with the Proposed Development construction phase, due to the separation distance and absence of shared pathways for potential receptors of European sites, LSEs as a result of in-combination effects are unlikely to occur. Scoped out
Site entrance (Maurice Noel O' Mahony, Knocknagappagh, Killeagh, Co. Cork)	225709	460.34m	Construction of new agricultural entrance and associated site works.	Likely	Although overlapping with the Proposed Development construction phase, due to the separation distance, the small scale of this project's works, and absence of shared pathways for potential receptors of European sites, LSEs as a result of in-combination effects are unlikely to occur. Scoped out
None of the remaining projects within 2km of the Proposed Development were of a scale or nature to support risk for in-combination interactions. The remaining projects within 2km of the Proposed Development have been scoped out for cumulative assessment based on the intervening distance (>500m) and small-scale nature of these projects. No interactions are expected with the Proposed Development.					
Waterford City and County Council					

Project	Planning / Project Ref.	Nearest Distance to the Proposed Development	Description / Status (Commencement included if available)	Temporal Overlap with Proposed Development (Likely, Unlikely, No)	Scoped in / out for cumulative assessment
Housing Development (Kieran Cunningham & Isis Cooper, Castlemiles, Lackaroe (Youghal), Co Waterford)	20739	131.34m	Construction of a single storey dwelling, domestic garage, new roadside entrance, new wastewater treatment system and all associated site works.	Likely	While there is potential overlap between this project and the Proposed Development solar farm delivery route, as there are no road alterations anticipated to facilitate the delivery route, no in-combination effects are anticipated. Scoped out
Upgrade/installation works (National Broadband Ireland, Youghal, Co. Waterford)	211006	581.29m	SECTION 254 LICENCE for 79 no. customer connection poles for upgrade/installation of Broadband Network (2021WD0534 / DA081).	Likely	Due to the small-scale nature of this project and the absence of shared source pathways with the Proposed Development, no in-combination effects are anticipated. Scoped out
Overground electronic communications infrastructure	21819	879.08m	The erection of overground electronic communications infrastructure and any associated physical infrastructure along public roads including: 1. The erection of new overground fibre optic cables on existing timber poles 2. The erection of new poles and associated fibre optic cables (2021WD0329)	Likely	Due to the small-scale nature of this project and the absence of shared source pathways with the Proposed Development, no in-combination effects are anticipated. Scoped out
Housing Development (Shane Barry, Newtown, Youghal, Co. Waterford)	22847	1.61km	For a dormer bungalow type dwelling house, new site entrance, wastewater treatment system & associated percolation area and all associated site works.	Unlikely	Scoped out for cumulative assessment based on the intervening distance and small-scale nature of this project, no in-combination effects are considered likely to occur.

Project	Planning / Project Ref.	Nearest Distance to the Proposed Development	Description / Status (Commencement included if available)	Temporal Overlap with Proposed Development (Likely, Unlikely, No)	Scoped in / out for cumulative assessment
					Scoped out
None of the remaining projects within 2km of the Proposed Development were of a scale or nature to support risk for in-combination interactions. The remaining projects within 2km of the Proposed Development have been scoped out for cumulative assessment based on the intervening distance (>500m) and small-scale nature of these projects. No interactions are expected with the Proposed Development.					

12. PREDICTED RESIDUAL IMPACTS

Table 12.1: *Residual impacts on KERs. (Shaded cells show KERs with remaining slight effects.*

Residual Impacts on KERs				
Receptor	KER Valuation	Identified Effects	Mitigation	Residual Effects
Designated Sites				
Blackwater River (Cork/Waterford) SAC [002170]	International	Disturbance/displacement Pollution/Contamination Otter [1355]	Mitigation by Design: • Buffer zones: 20m for mapped rivers which contain suitable Otter habitat; • Timing of works: restricted to daytime hours. Mitigation: • Pre-construction surveys (Reid <i>et al.</i>, 2013; Highways Agency, 1999); • No works to take place if holt identified within 150m of works (NRA, 2006); • Derogation license (if required) for holt relocation; • Artificial holt on the Tourig River; and • Wildlife gates. • Surface Water Management Plan; • Water Quality Management Plan; • Silt fences, silt traps, watercourse buffers (20m); • ECoW; • SuDS; and • Water Quality monitoring.	Unlikely; Negligible effect.

Residual Impacts on KERs				
Receptor	KER Valuation	Identified Effects	Mitigation	Residual Effects
		Pollution/Contamination: <i>Salicornia</i> and other annuals colonising mud and sand [1310] Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410]	Mitigation by Design: • Buffer zones: 20m for mapped rivers which contain suitable Otter habitat; • Timing of works: restricted to daytime hours. Mitigation:	
		Pollution/Contamination: Freshwater Pearl Mussel [1029] Sea Lamprey [1095] Brook Lamprey [1096] River Lamprey [1099] Twaite Shad [1103] Salmon [1106]	• Surface Water Management Plan; • Water Quality Management Plan; • Silt fences, silt traps, watercourse buffers (20m); • ECoW; • SuDS; and • Water Quality monitoring.	
		Spread of invasive species: Killarney Fern [6985]	Mitigation by Design: • Buffer zones: 7m from invasive species. Mitigation: • General Management Measures outlined in Section 9.1.9 and the ISMP.	Unlikely; Negligible effect.
Habitats				

Residual Impacts on KERs				
Receptor	KER Valuation	Identified Effects	Mitigation	Residual Effects
Hedgerow (WL1)	Local Importance (Higher Value)	Habitat loss; Degradation of habitat Spread of Japanese Knotweed	Mitigation by design: • Buffer zone: 7m for existing hedgerows. Mitigation: • Planting 1,400m of hedgerow (see Section 9.1.8 and BEMP); and • General Management Measures outlined in Section 9.1.9 and the ISMP.	Unlikely; Negligible effect.
Eroding/upland rivers (FW1)/Depositing/lowland rivers (FW2)	National Importance	Degradation of habitat Spread of Japanese Knotweed	Mitigation by Design: • Buffer zones: 20m for mapped rivers and 10m for drains and watercourses, 7m from invasive species. Mitigation: • Surface Water Management Plan; • Water Quality Management Plan; • Silt fences, silt traps, watercourse buffers (20m); • ECoW; • SuDS; • Water Quality monitoring; and • General Management Measures outlined in Section 9.1.9 and the ISMP.	Unlikely; Negligible effect.
Mobile species				

Residual Impacts on KERs				
Receptor	KER Valuation	Identified Effects	Mitigation	Residual Effects
Otter	International Importance	Disturbance/displacement Pollution/Contamination	As above.	Unlikely; Negligible effect.

Residual Impacts on KERs				
Receptor	KER Valuation	Identified Effects	Mitigation	Residual Effects
Badger	Local Importance (Higher) Value	Disturbance and displacement of breeding individuals	Mitigation by design: - No heavy machinery within 30m (Derogation Licence required). Mitigation: - Pre-commencement Badger Survey (NRA, 2006). - No heavy machinery within 30m (Derogation Licence required); - No lighter machinery permitted within 20m; - Lighter works (e.g. digging by hand or scrub clearance) permitted within 10m; - During the breeding season (December to June inclusive), none of the above works are permitted within 50m of active setts; - Any pits will be covered at night; and - Wildlife gates.	Unlikely; Negligible effect.
All Bats	Local Importance (Higher) Value	Disturbance/Displacement to foraging bats; Disturbance/Displacement to roosting bats	Mitigation by design: - Buffer zone: 10m from potential bat roosts; and - Timing of works: restricted to daytime hours.	Unlikely; Negligible effect.

Residual Impacts on KERs				
Receptor	KER Valuation	Identified Effects	Mitigation	Residual Effects
			Mitigation: • Pre-commencement roost inspection surveys; • No works within 50m of confirmed roosts between April-October; • Removal of suitable commuting and foraging habitat, undertaken outside of the peak breeding season (i.e., April to October inclusive); • Mature trees to be surveyed for PRF prior to removal (Collins, 2023); • If removal of an active roost is required, all appropriate mitigation measures and derogation steps will be adhered to including, alternative design measures, bat boxes, and ECoW oversight of any felling of tree limbs with PRFs; and • Planting 1,400m of hedgerow and 1.96ha of native woodland (see Section 9.1.8 and BEMP).	
Birds	Local Importance (Higher) Value	Direct habitat loss and fragmentation	Mitigation by design: • Buffer zone: 7m for suitable habitat (hedgerows, scrub and woodland). Mitigation: • Establish species rich grasslands (13.35ha) from local sources and allowed to grow naturally between solar panels and in designated areas left uncut between March-October, winter cuts either via livestock or manual cutting;	Unlikely; Negligible effect.

Residual Impacts on KERs				
Receptor	KER Valuation	Identified Effects	Mitigation	Residual Effects
			• Maintenance of scrub on south of the site; and • Planting 1,400m of hedgerow and 1.96ha of native woodland (see Section 9.1.8 and BEMP).	

13. CONCLUSION

Following consideration of the predicted residual impacts (post-mitigation), the Proposed Development at Greenhills Renewable Energy Park is **unlikely** to result in any significant impacts on the identified ecological receptors. The potential for impacts on European designated sites is fully described in the Natura Impact Assessment report (Inis Environmental Consultants Ltd., 2025). Impacts to Nationally designated sites were regarded as unlikely or not significant.

Following a precautionary approach, potential impacts to ecological receptors present at the Proposed Development were identified and evaluated.

In conclusion, the Proposed Development, either individually or in-combination with other plans or projects is **unlikely** to result in significant impacts on the ecological receptors of conservation or biodiversity value to the baseline.

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APPENDIX A: NRA ECOLOGICAL VALUATION CRITERIA (NRA, 2009A).

ECOLOGICAL VALUATION CRITERIA

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 Network⁷.

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)⁸ 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).⁹

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.

⁷ See Articles 3 and 10 of the Habitats Directive.

⁸ It is suggested that, in general, 1% of the national population of such species qualifies as an internationally important population. However, a smaller population may qualify as internationally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

⁹ Note that such waters are designated based on these waters' capabilities of supporting salmon (*Salmo salar*), trout (*Salmo trutta*), char (*Salvelinus*) and whitefish (*Coregonus*).

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)¹⁰ of the following:

- Species protected under the Wildlife Acts; and/or
- Species listed on the relevant Red Data list.

Site containing 'viable areas'¹¹ of the habitat types listed in Annex I of the Habitats Directive.

COUNTY IMPORTANCE:

Area of Special Amenity¹².

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)¹³ 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 Biodiversity Action Plan (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.

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;

¹⁰ It is suggested that, in general, 1% of the national population of such species qualifies as a nationally important population. However, a smaller population may qualify as nationally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

¹¹ A 'viable area' is defined as an area of a habitat that, given the particular characteristics of that habitat, was of a sufficient size and shape, such that its integrity (in terms of species composition, and ecological processes and function) would be maintained in the face of stochastic change (for example, as a result of climatic variation).

¹² It should be noted that whilst areas such as Areas of Special Amenity, areas subject to a Tree Preservation Order and Areas of High Amenity are often designated on the basis of their ecological value, they may also be designated for other reasons, such as their amenity or recreational value. Therefore, it should not be automatically assumed that such sites are of County importance from an ecological perspective.

¹³ It is suggested that, in general, 1% of the County population of such species qualifies as a County important population. However, a smaller population may qualify as County importance where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

Resident or regularly occurring populations (assessed to be important at the Local level)¹⁴ 16 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.

¹⁴ It is suggested that, in general, 1% of the local population of such species qualifies as a locally important population. However, a smaller population may qualify as locally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

APPENDIX B: FIELD SURVEY DATA TABLES

Table B.1: *Terrestrial Non-Volant Mammal Survey Results.*

Survey Type	Date	TM	Species	Notes
Field Assessment	27/01/2025	603635.38, 581350.47	Rabbit/Red Fox	First indication is rabbit, two to three entrances, shallow depth, narrow embankment. Presence of Red Fox in area due to strong smell and more than likely interfered with holes. Same scenario as map label no 3.
Field Assessment	27/01/2025	603604.67, 581434.23	Rabbit/Red Fox	
Field Assessment	27/01/2025	603596.86, 581452.41	Rabbit	First signs of rabbit. Faeces present.
Field Assessment	27/01/2025	603572.02, 581505.92	Rabbit	Strong indication of rabbit presence along hedgerow. Area maybe subject to other use of mammals.
Field Assessment	27/01/2025	603560.28, 581520.48	Red Fox	Red Fox scat found, clear evidence hedgerow has been used as a trail route.
Field Assessment	27/01/2025	603560.76, 581603.76	Badger/Red Fox	Strong smell of Red Fox, evidence of bedding, dead grass around entrance, single chamber, deepish
Field Assessment	27/01/2025	603592.67, 581673.95	Rabbit/Red Fox	First indication is rabbit, followed by strong smell of Red Fox, freshly dug area
Field Assessment	27/01/2025	603377.49, 581804.02	Red Fox	Well defined mammal trail.
Field Assessment	27/01/2025	603373.88, 581856.82	Red Fox/Deer	Well defined mammal trail.
Field Assessment	27/01/2025	602963.24, 581859.85	General mammal trail, deer and Red Fox, deer seen as incidental	Large track seen entering the woods.
Field Assessment	27/01/2025	602988.93, 581808.09	Badger	Low/negligible. Two dominant entrances, freshly dug but not going very deep, narrow embankment.
Field Assessment	04/02/2025	603913.03, 581903.63	Rabbit	Numerous entries, very active set of warrens along hedgerow.

Survey Type	Date	ITM	Species	Notes
Field Assessment	04/02/2025	603949.09, 581920.84	Badger	Two large openings in the bank. Big mound of dirt present. no fresh immediate signs. Tree collapsed in general area; narrow embankments present along hedgerow.
Field Assessment	04/02/2025	603975.43, 581932.02	Rabbit	Several rabbit size warrens' seen along ditch, small, shallow entrance.
Field Assessment	04/02/2025	604043.74, 581982.19	Rabbit/Red Fox	Numerous media to large size entrances present. First indication of rabbit given extent of warren's. Red Fox faeces present in area of both species.
Field Assessment	04/02/2025	603960.37, 582093.95	Rabbit	Large amount of rabbit like warren's present along ditch.
Field Assessment	04/02/2025	603928.7, 582200	Rabbit	Large number of rabbits like warren's present along ditch.
Field Assessment	04/02/2025	604138.8, 582547.08	Badger	Low/negligible. Overgrown area, no fresh signs. No signs of other mammal present. More than likely occupied by rabbits.
Field Assessment	04/02/2025	604069.4, 582656.24	Rabbit	Numerous rabbits like warren's along hedgerow. 1st physical sighting seen.
Field Assessment	04/02/2025	602596.63, 582319.27	Badger	Latrine found, old, no smell and broken down a bit by weather. No clear evidence along hedgerow.
Field Assessment	04/02/2025	602718.16, 582878.12	Rabbit	Large network of warren's along hedgerow, numerous rabbits seen.
Field Assessment	04/02/2025	602763.93, 583132.77	Red Fox	Physical sighting confirmed, seen jumping into section of hedgerow.
Field Assessment	11/02/2025	602459.49, 582825.9	Rabbit	Several warrens located along hedgerow.
Field Assessment	11/02/2025	602415.7, 582870.16	Rabbit	Very large presence of rabbits along hedgerow.

Survey Type	Date	ITM	Species	Notes
Field Assessment	11/02/2025	602355.45, 582585.15	Rabbit	Several warrens located along hedgerow.
Field Assessment	11/02/2025	601674.74, 582648.51	Unidentified	Well defined trail by mammals along hedgerow, deer present in area
Field Assessment	11/02/2025	601582.03, 582657.35	Unidentified	Well defined trail by mammals, same as previous bout.
Field Assessment	11/02/2025	601472.97, 582363.69	Badger	Numerous areas freshly dug up, no clear evidence in general of potential sett. Adjacent habitat, thick, overgrown and steep terrain. Area may need to revisit.
Field Assessment	11/02/2025	601514.37, 582014.38	Badger	Freshly dug out area, adjacent habitat very thick and not accessible in areas.
Field Assessment	11/02/2025	601565.23, 581974.93	Various	Well defined trail.
Field Assessment	11/02/2025	601529.81, 581913.4	Badger	Area has been recently dug out, adjacent habitat very thick view.
Field Assessment	11/02/2025	601561.79, 581751.04	Badger	N/A
Field Assessment	11/02/2025	601666.66, 582163.58	Various	Well defined trail.
Field Assessment	11/02/2025	601754, 582222.51	Rabbit	Several warrens located along hedgerow.
Field Assessment	11/02/2025	602045.12, 582367.44	Rabbit	Several warrens located along hedgerow.
Field Assessment	28/02/2025	603139.66, 581720.58	Badger	Footprint found.
Field Assessment	28/02/2025	603257.26, 581549.34	Badger	Evidence of species.

Survey Type	Date	ITM	Species	Notes
Field Assessment	28/02/2025	603203.76, 581910.1	Red Fox / Badger	Old evidence, single entry, no fresh signs of species. Shallow opening. Linear pattern is made up of stone walls.
Field Assessment	28/02/2025	603261.82, 581919.08	Badger	Evidence of digging, several located along hedgerow.
Field Assessment	28/02/2025	603428.42, 581714.37	Badger	Evidence of species.
Field Assessment	28/02/2025	603258.81, 581281.29	Badger	Evidence of species.
Field Assessment	28/02/2025	602947.9, 581360.81	Rabbit	Several warrens located along hedgerow.
Field Assessment	28/02/2025	602881.99, 581234.21	Badger	Evidence of species.
Field Assessment	28/02/2025	603007.81, 581135.21	Badger	Evidence of species.
Field Assessment	28/02/2025	603020.7, 581300.42	Badger	Evidence of species.
Field Assessment	28/02/2025	603653.75, 580624.81	Badger	Evidence of species.
Field Assessment	28/02/2025	603578.28, 580720.42	Badger	Not as fresh as previous bout. Debris within chamber, still fresh Badger prints in close proximity.
Field Assessment	28/02/2025	603580.24, 580552.83	Otter	Low suitability. Potential for species to move through area, unlikely to sett up holt.
Field Assessment	28/02/2025	603058.74, 580755.78	Rabbit	Several warrens located along hedgerow.
Field Assessment	28/02/2025	603065.95, 580630.14	Badger	Evidence of species.
Field Assessment	28/02/2025	603131.14, 580584.22	Badger	Two large openings, no fresh signs entering or leaving.

Survey Type	Date	ITM	Species	Notes
Field Assessment	28/02/2025	603269.02, 580665.8	Rabbit	Several warrens located along hedgerow.
Field Assessment	28/02/2025	603348.43, 580672.53	Badger	Evidence of species.
Field Assessment	12/03/2025	605477.3, 580649.34	Otter	Low suitability. Small running River, no fresh evidence seen along stretch of river.
Field Assessment	12/03/2025	605076.9, 580229.9	Otter	High suitability. Although no evidence found, still feel the river offers an opportunity in terms of foraging and potential breeding.
Field Assessment	12/03/2025	604630.21, 581502.71	Otter	Low suitability. Shallow narrow and fairly overgrown.
Field Assessment	27/03/2025	602222.14, 582688.09	Otter	Low suitability. Shallow, narrow, overgrown section of stream/river.
		602246.68, 582551.41		
		602306.22, 582410.77		
Field Assessment	27/03/2025	601321.85, 582576.33	Otter	High suitability. Although no direct evidence found, still feel this section holds desirable opportunities for the species.
		601382.53, 582434.74		
Field Assessment	27/03/2025	601392.49, 582405.54	Otter	Potential footprint
Field Assessment	27/03/2025	601395.06, 582394.28	Otter	High suitability. Evidence digging/scratching along sand bank
Field Assessment	27/03/2025	601419.54, 582175.85	Mustelid	Suspected American Mink, however due to age, size and neighbouring habitat, could not rule out Pine Marten

Survey Type	Date	ITM	Species	Notes
Field Assessment	27/03/2025	601416.58, 582021.15	Otter	High suitability. Potential footprint.
Field Assessment	27/03/2025	603085.44, 581870.31	General	Double checked area primarily for Badger, no evidence. Large evidence of fallow Deer.
Field Assessment	28/03/2025	605061.57, 580377.3	Red Fox/badger	Single entrance, no fresh signs in general area, entrance covered in debris.
Field Assessment	28/03/2025	605403.01, 580984.92	General	Area searched for Badger in particular but others too.
Field Assessment	28/03/2025	605420.41, 580452.54	Otter	High suitability. No direct signs found but area holds suitable requirements.
Field Assessment	28/03/2025	605059.71, 580230.13	Otter	High suitability. Series of footprints, large, too old to accurately define.
Field Assessment	28/03/2025	603557.23, 580659.03	Otter	Intermediate suitability. Suitable stream but less than main river.
General Mammal Walkover	19/08/2025	604860.88, 580375.41	Nil Sightings	No evidence of mammals along section.
General Mammal Walkover	21/08/2025	604629.05, 580359.36	Nil Sightings	No evidence of mammals found.
General Mammal Walkover	21/08/2025	604355.91, 580182.14	Nil Sightings	No evidence of mammals found.
General Mammal Walkover	21/08/2025	603779.11, 580187.63	Nil Sightings	No evidence of mammals found, very dense hedgerow.
General Mammal Walkover	21/08/2025	603558.48, 580309.6	Nil Sightings	No evidence of mammals found.

Survey Type	Date	ITM	Species	Notes
General Mammal Walkover	21/08/2025	604360.26, 580558.61	Nil Sightings	No evidence of mammals found.
General Mammal Walkover	21/08/2025	604124.04, 581233.86	Nil Sightings	No evidence of mammals found.

Table B2: Badger Sett Locations.

Sett No.	Date	ITM	Notes
1	11/02/2025	602747.63, 582269.13	Upon carrying out I-WeBS along hedgerow, fresh Badger prints found along hedgerow. Extensive search along hedgerow and embankment, found evidence of sett. Numerous entrances with bedding like material and well-worn tracks.
2	11/02/2025	601452.4, 582313.92	One large single entrance underneath thicket of bramble. Heavily worn tracks in area. No footprint of species present
3	11/02/2025	602671.37, 582249.96	Same as previous bout, fresh extensive digging along field margin in comparison to previous week survey. Several entrances located along embankment. Well-worn tracks, strong smell of Red Fox in area too. Initially missed due to thick vegetation and steep embankment.
4	28/02/2025	603580.96, 580736.32	Large entrance, well-worn entering. General evidence in area
5	28/02/2025	603591.1, 580639.27	Large single entrance, large amount of earth moved. General activity in the area.
6	28/02/2025	603465.74, 580805.34	Two large openings, one entrance has evidence of vegetation being dragged in.

Table B3: *Amphibians Field Assessment Survey Results.*

Survey Type	Date	NIM	Species	Notes
Field Assessment	27/01/2025	603536.33, 581509.45	Common Frog	Area of drainage, holding water easily.
Field Assessment	27/01/2025	603459.19, 581454.45	Common Frog	Water holding in drainage ditch due to vegetation.
Field Assessment	27/01/2025	603264.79, 581919.4	Common Frog	Drainage ditch, slow flow of water, no presence of indicator species.
Field Assessment	27/01/2025	603264.79, 581919.4	Common Frog	Low/negligible. Drain running length of hedgerow, shallow, water moving fast.
Field Assessment	27/01/2025	603201.33, 581934.57	Common Frog	Small channel depth, water holding, no presence of indicator species.
Field Assessment	27/01/2025	602749.09, 581943.67	Common Frog	Drainage channel, at time of surveying, quite high and strong flow due to recent heavy rain.
Field Assessment	27/01/2025	602578.18, 581994.03	Common Frog	Fast flowing stream going downhill.
Field Assessment	04/02/2025	603858.68, 581881.12	Common Frog	Slow flowing drainage ditch, water holding in areas. Overgrown in areas.
Field Assessment	04/02/2025	603276.18, 582567.13	Common Frog	Low/negligible. Fast flowing stream, overgrown in areas.
Field Assessment	04/02/2025	603074.34, 582399.08	Common Frog	Fast flowing, overgrown, deep in areas. Same as previous bout.
Field Assessment	04/02/2025	603021.8, 583351.34	Common Frog	Slow flowing area of water, covered in vegetation.
Field Assessment	04/02/2025	603069.04, 583408.69	Common Frog	Intermediate/low, shallow slow area of water, overgrown. Similarly, the same all along hedgerow.
Field Assessment	11/02/2025	602256.12, 582525.13	Common Frog	Accumulation of water present due to terrain and river. High at the minute due winter weather. Lots of sediment and effluent present due adjacent farm track. Located along river.
Field Assessment	28/02/2025	603134.84, 581579.32	Common Frog	Low/intermediate, drainage ditch holding water, slow flow exposed in areas.

Survey Type	Date	NTM	Species	Notes
Field Assessment	28/02/2025	603091.94, 581673.35	Common Frog	Drainage ditch holding water, overgrown, relatively shallow.
Field Assessment	28/02/2025	603130.01, 581722.24	Common Frog	Shallow, overgrown.
Field Assessment	28/02/2025	603191.19, 581633.65	Common Frog	Wide drainage ditch, heavily overgrown, no evidence of species along ditch.
Field Assessment	28/02/2025	603249.66, 581535.46	Common Frog	Water holding, deep, no evidence.
Field Assessment	28/02/2025	603230.77, 581698.58	Common Frog	Shallow, overgrown no evidence of target species.
Field Assessment	28/02/2025	603366.69, 581629.19	Common Frog	Shallow, moderately fast flowing, heavily overgrown.
Field Assessment	28/02/2025	603371.16, 581346.72	Common Frog	Flooded area due to terrain.
Field Assessment	28/03/2025	602906, 583316.85	Common Frog	Small flow of water, overgrown generally.
Field Assessment	28/03/2025	603001.53, 583350.02	Common Frog	Small flow of water, overgrown generally.
Field Assessment	28/03/2025	603067.95, 583491.87	Common Frog	Overgrown area, no flow of water.

APPENDIX C SITE PHOTOS



Figure C1: PRA Survey Images (BL1, BL3).



BL6—Stone building.

Figure C2: *PRA Survey Image (BL6).*



Figure C3: *Otter Footprint.*



Figure CA: *Potential Badger Sett.*

APPENDIX D: CONSTRAINTS MAPS

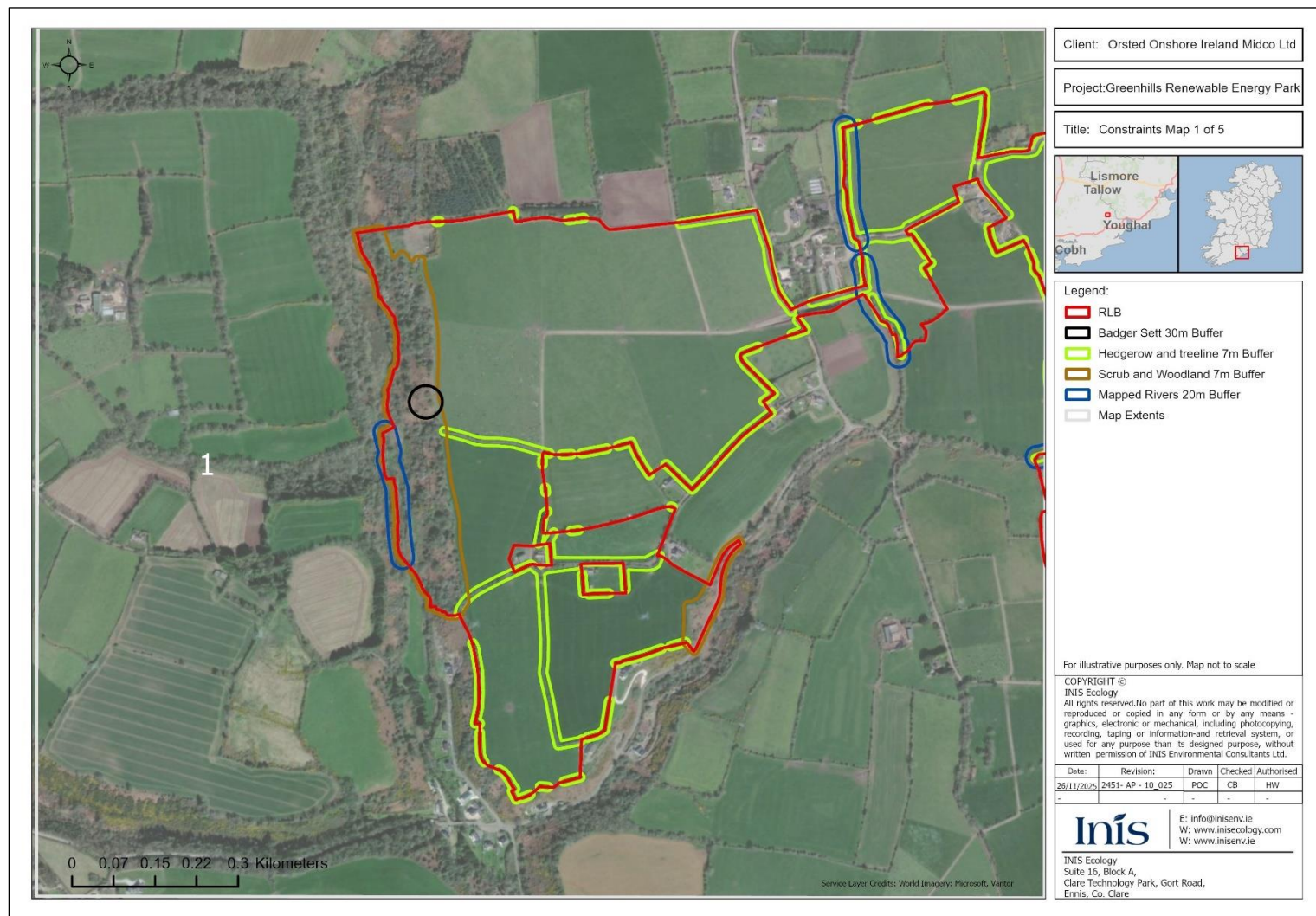


Figure D.1: Constraints Map with Buffers (Map 1 of 5).

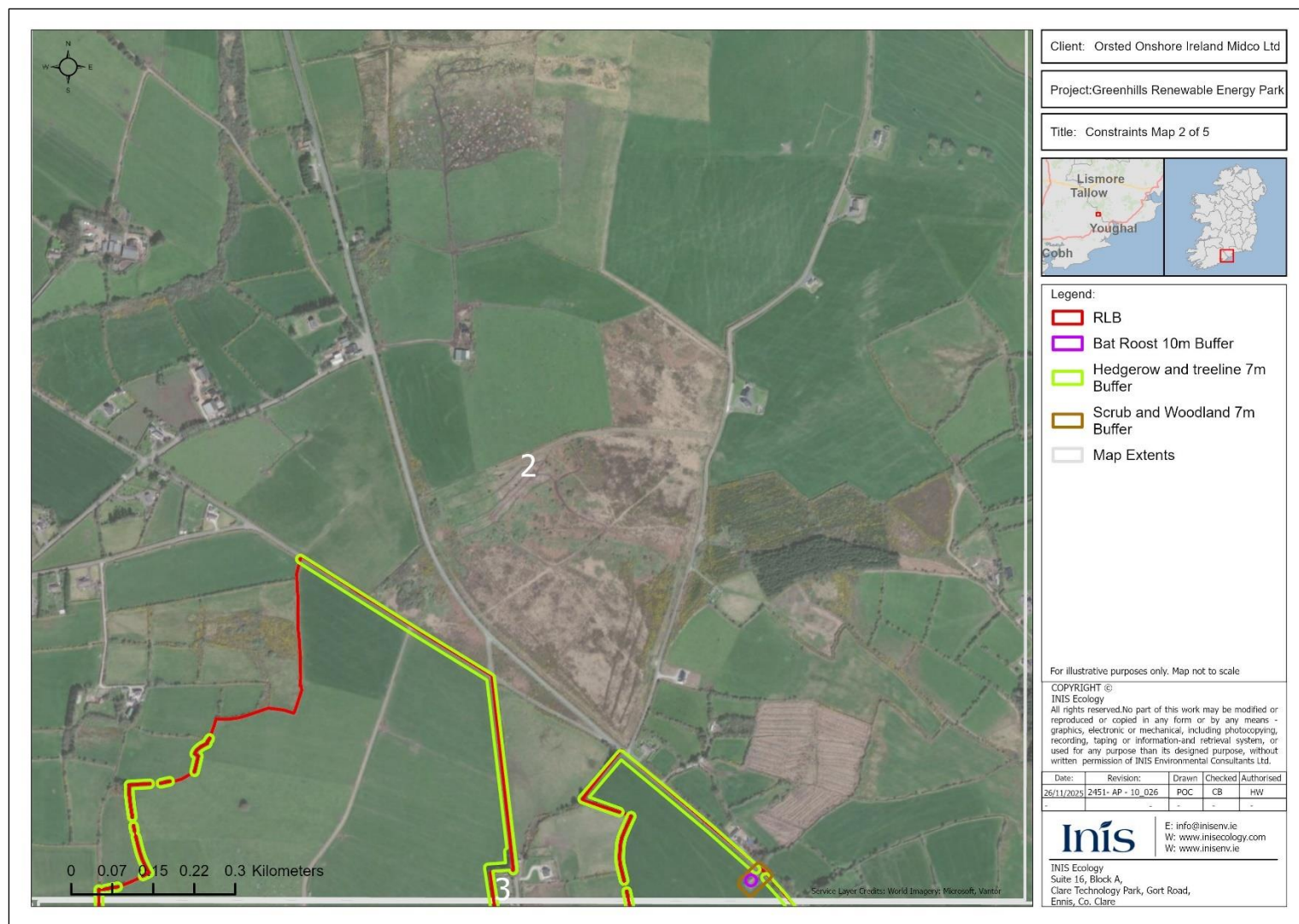


Figure D.2: Constraints Map with Buffers (Map 2 of 5).

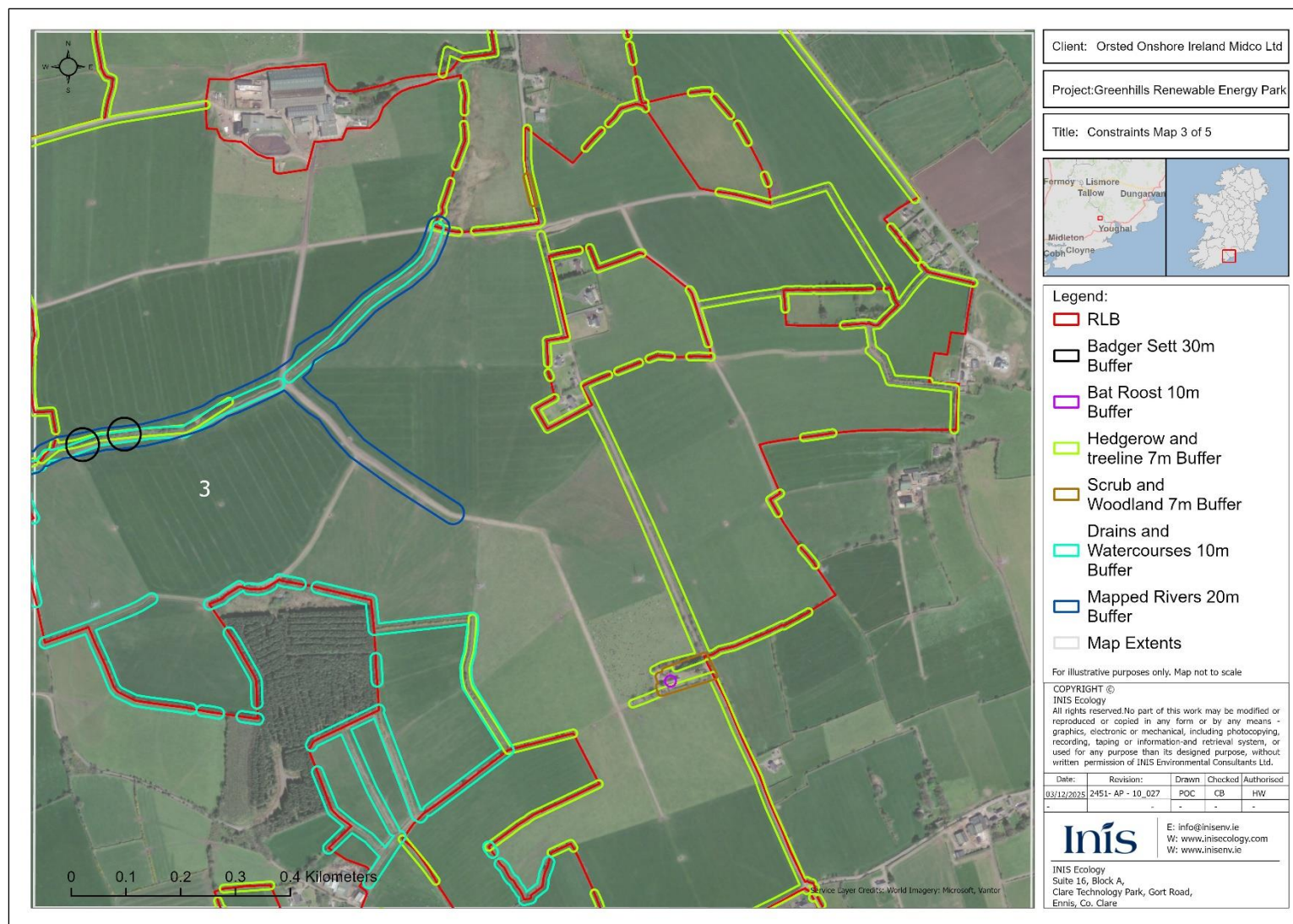


Figure D.3: Constraints Map with Buffers (Map 3 of 5).

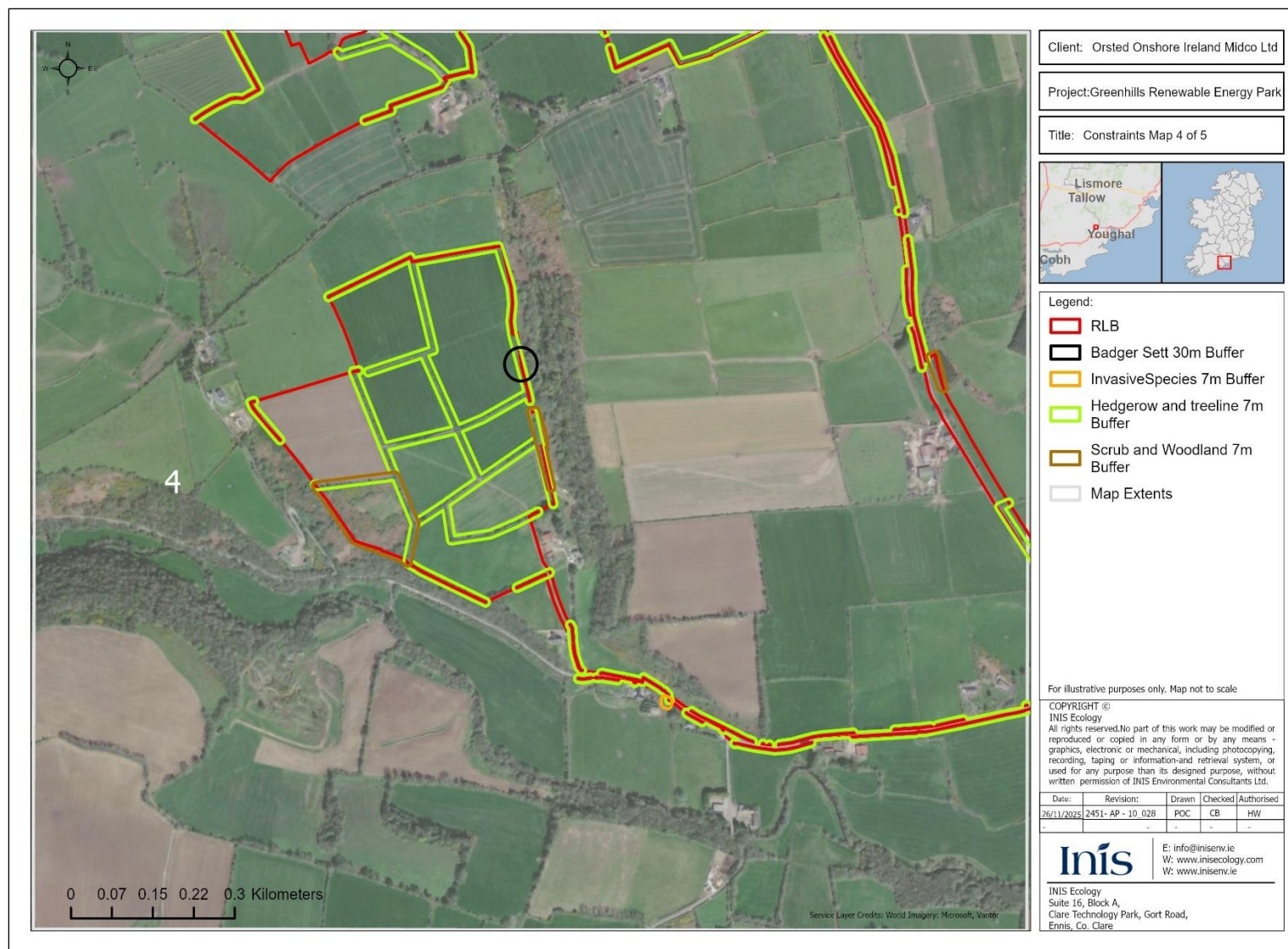


Figure D.4: Constraints Map with Buffers (Map 4 of 5).

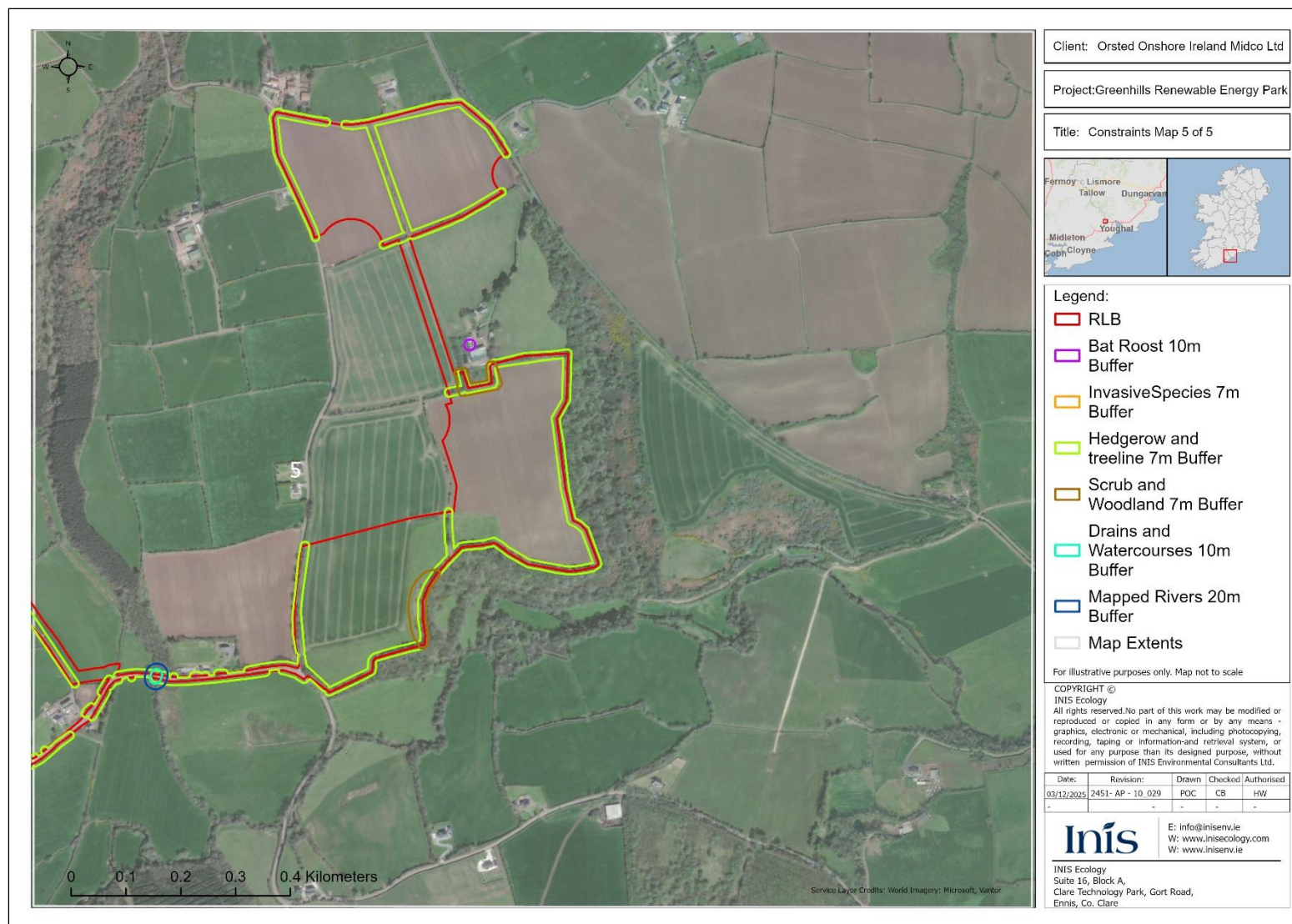


Figure D.5: Constraints Map with Buffers (Map 5 of 5).

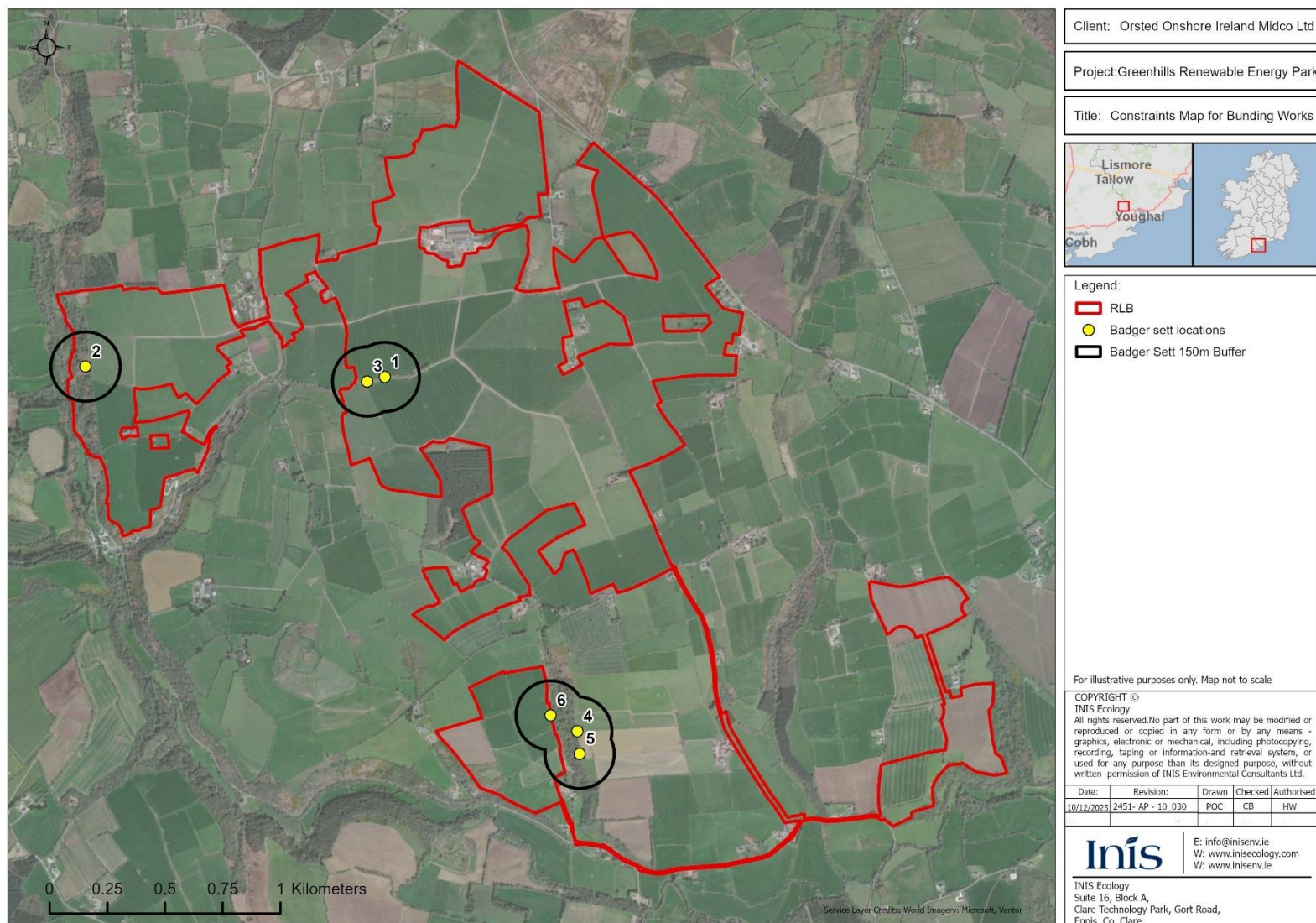


Figure D.6: Constraints Map for Bunding Works.