Derrygrogan Little Solar Farm

Ecological Impact Assessment Report

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Prepared by:

Tetra Tech RPS

Prepared for:

Ballyteige Solar Limited

Executive Summary

Tetra Tech RPS was commissioned by RES on behalf of Ballyteige Solar Limited ('the Applicant') to produce an Ecological Impact Assessment (EcIA) to support a planning application for a proposed solar farm on land at Derrygrogan Little and Derrygrogan Big, Co. Offaly, Republic of Ireland (RoI) (Irish Grid Reference ~ centre point: N 41020 29166) ('the Application Site') .

The Proposed Development involves the construction of photovoltaic (PV) panels mounted on metal frames, string inverters, transformer stations, electrical cabling and ducting, internal access tracks and hardstanding areas, perimeter fencing and access gate, CCTV, a temporary construction compound and other ancillary infrastructure. The Proposed Development will occupy 10 fields across the Application Site. The Proposed Development will connect into the consented Derrygrogan Big solar farm (planning reference 22/378) via Derrygrogan Little Road. It is important to note a grid connection to the national grid does not form part of this planning application.

The EcIA includes the results of consultation, a desk study and an Extended Phase 1 Habitat Survey in order to identify potential impacts associated with the Proposed Development; to evaluate the likely significance of effects; to implement the mitigation hierarchy; and to highlight potential opportunities for ecological enhancement.

The Proposal Site is not located within the boundary of any statutory or non-statutory designated sites of international, national or local nature conservation importance. The site is hydrologically linked to Murphy's Bridge Esker Proposed National Habitat Areas (pNHA), Grand Canal Proposed National Habitat Areas (pNHA), River Shannon Callows Special Area of Conservation (SAC), Middle Shannon Callows Special Protection Area (SPA), River Shannon Callows pNHA, Lough Derg, North-east Shore SAC, Lough Derg (Shannon) SPA and Lough Derg pNHA.

A Report to inform Screening for Appropriate Assessment (RISAA) and a Natura Impact Statement (NIS) have been prepared and submitted alongside this EcIA report. The RISAA concludes that the possibility of likely significant in-combination water quality effects cannot be excluded at the screening stage in the absence of mitigation measures. The NIS then in turn evaluates this potential adverse effect on each of the qualifying interests and special conservation interests of River Shannon Callows SAC, Middle Shannon Callows SPA, Lough Derg, North-east Shore SAC and Lough Derg (Shannon) SPA with reference to their site specific conservation objectives. A suite of pollution prevention mitigation measures were then applied to construction phase of the Proposed Development. The NIS concludes that there will be no adverse effects upon the integrity of any European site consequent upon the implementation mitigation measures prescribed in the NIS.

The principal habitats on site include arable crops, improved agricultural grassland, scrub, wet grassland / drainage ditches (dry), tall ruderal / recolonising bare ground and hedgerows / treelines. The Proposed Development has been designed to retain as the majority of hedgerows / treelines, with minimal removal to allow for new access lanes. The design provided to the author at the time of reporting includes a setback distance of more than 15m between the closest solar array and the Kilmurry stream. Best practice mitigation measures will be implemented across the site, in regard to protecting watercourses (including pre-cautionary measures for dry drainage ditches). Additionally, pre-cautionary measures have been recommended for potential commuting otter associated with the nearby Kilmurry stream, bordering plantation woodlands and bog habitats. Finally, the timing of works will ensure that the removal or management of vegetation including trees and scrub will take place outside the bird breeding season, which extends between 1st March and 31st August inclusive, to ensure breeding birds are protected from harm. If the removal and management of vegetation is required during the breeding birds' season, an ECoW will undertake a survey to check for breeding birds immediately prior to works.

Compensation planting for the loss of hedgerows will be implemented along the northeastern boundary of the site, providing additional screening. Recommendations have been given for the provision of a minimum of five bat boxes to compensate for the proposed tree trimming.

The Proposed Development will have **No Significant Effect** on the ecological features identified within the Proposal Site due to the design of the Proposed Development and the implementation of mitigation measures.

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1 Introduction

Tetra Tech RPS was commissioned by RES on behalf of Ballyteige Solar Limited ('the Applicant') to produce an Ecological Impact Assessment (EcIA) to support a planning application for a proposed solar farm on land at Derrygrogan Little and Derrygrogan Big, Co. Offaly, Republic of Ireland (RoI) (Irish Grid Reference ~ centre point: N 41020 29166) ('the Proposal Site').

1.1 Ecological Impact Assessment

EcIA is the process of identifying, quantifying and evaluating the potential effects of a proposed project on ecological features based on objective assessment of the best information available (CIEEM 2018[1]). An ecological feature is defined as a species, habitat or ecosystem that has the potential to be affected by a proposed project.

The aim of the EcIA is therefore to describe the existing ecological environment within and surrounding the Proposed Development; to identify important ecological features; to identify the potential impacts associated with the proposed project; to evaluate the likely significance of effects on the important ecological features; to apply the mitigation hierarchy to avoid, mitigate and compensate for significant ecological effects; to highlight potential opportunities for ecological enhancement; and to set out requirements for post-construction monitoring (CIEEM 2018[1]).

The EcIA has been written in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM 2018[1]).

1.2 Proposed Development

The Proposed Development seeks planning permission for the following:

"The development will consist of planning permission for a period of 10 years to construct and complete a Solar PV development with a total site area of c.28.1 hectares, to include solar PV ground mounted support structures, string inverters, transformer stations, electrical cabling and ducting, internal access tracks and hardstanding areas, perimeter fencing and access gate, CCTV, a temporary construction compound and other ancillary infrastructure including drainage, additional landscaping and habitat enhancement as required and associated site development works relating to the access of the site. The solar farm will be operational for 40 years in the townlands of Derrygrogan Little and Derrygrogan Big, Tullamore, Co. Offaly. A Natura Impact Statement (NIS) has been submitted with this application".

The Proposed Development will occupy 10 fields across the Application Site. The Proposed Development will connect into the consented Derrygrogan Big solar PV development (planning reference 22/378) via Derrygrogan Little Road. It is important to note the national grid connection does not form part of this planning application. The Proposed Development can be summarised as follows:

- Solar arrays and metal support structures or on concrete foundations if archaeological mitigation measures are required (TBC);
- 7 no. LV/MV Transformer Stations with associated hardstanding areas;
- Internal access track with two perimeter gates;
- No.47 CCTV camera units;
- Site access via Derrygrogan Road Little with associated visibility splay;
- Security fencing incorporating timber posts and deer fencing;
- Cable trenching and backfilling;
- Temporary construction compound; and

- Structural landscape planting and ecological enhancement measures

The location of the site and the red line boundary are illustrated in **Figure 1.0 Site Location**.

2 Legislation & Planning Policy

2.1 International Directives

Council Directive on the Conservation of Natural Habitats of Wild Fauna and Flora (92/43/EEC) (The Habitats Directive)

The main aim of the Directive is to promote the maintenance of biodiversity through the conservation of natural habitats and wild species listed on the Annexes of the Directive. Member States are required to take measures to maintain or restore, at favourable conservation status, biodiversity whilst taking account of economic, social, cultural requirements and regional and local characteristics.

It gives effect to site and species protection measures through establishment of the Natura 2000 network and designation of European Sites including Special Areas of Conservation (SAC) and Special Protected Areas (SPA). It also establishes a list of species (other than birds) whose habitats must be protected to secure their survival. These priority species and habitats are subject to a higher level of protection.

The Directive also requires appropriate assessment of any plan or project not directly connected with or necessary to the management of a European Site, but likely to have significant effects upon a European site, either individually or in combination with other plans or projects.

2.2 Irish Planning Policy

S.I. No. 355 of 2015 provides that the following shall be construed together as one:

- Wildlife Act 1976;
- Wildlife (Amendment) Acts of 2000, 2010, and 2012;
- European Communities (Birds and Natural Habitats) (Restrictions of the Use of Poison Bait) Regulations 2010;
- European Communities (Birds and Natural Habitats) Regulations 2011;
- European Communities (Birds and Natural Habitats) (Amendment) Regulations of 2013, 2015; and
- Wildlife Amendment Bill 2016.

European Communities (Birds and Natural Habitats) Regulations

The Regulations give effect to requirements relating to the designation of protected sites under the Birds Directive and Habitats Directive. The Regulations provide for the protection and management of European Sites and place obligations on all public authorities to have regard to the requirements of the Habitats Directive beyond the realms of planning related consents issues under the Planning and Development Act 2000, as amended. The Regulations also provide for the protection of species of European importance.

Wildlife Acts

The Wildlife Acts [which include inter alia the Wildlife Act 1976, the Wildlife (Amendment) Act 2000, the Wildlife (Amendment) Act 2010, the Wildlife (Amendment) Act 2012, the Heritage Act 2018, including Part 3 thereof, and the Planning, Heritage and Broadcasting (Amendment) Act 2021, including Chapter 3 thereof] are the principal legislative mechanism for the protection of wildlife in Ireland.

A network of nationally protected Nature Reserves, which public bodies have a duty to protect, is established under the Wildlife Acts. Sites of national importance for nature conservation are afforded protection under planning policy and the Wildlife Acts. Natural Heritage Areas (NHAs) are sites that are designated under the Wildlife Acts for the protection of flora, fauna, habitats, and geological features of interest.

Proposed Natural Heritage Areas (pNHAs) are published sites identified as of similar conservation interest, but which have not been statutorily proposed or designated – but are nonetheless afforded some protection under planning policies and objectives.

The Wildlife Acts also protect species of conservation value from injury, disturbance, and damage to certain species or to their breeding and resting places. All species listed on the relevant Schedules to the Wildlife Acts therefore constitute a material consideration in the planning process.

Development Plans

County Offaly Development Plan

The Offaly County Development Plan 2021 – 2027 was adopted on 10.09.2021, it sets out a strategic policy framework with objectives and strategic policies to be delivered through to 2027. Key features include a focus on sustainable development, community engagement and the implementation of strategies.

Key focuses for the conservation, protection and enhancement of natural heritage include:

- Designated Site for Nature Conservation (24 Natura 2000 sites, 51 potential Natural Heritage Areas (pNHA), 7 Natural Heritage Areas (NHA, 4 Statutory Nature Reserves and 4 Ramsar sites)
- Sites designated for the protection of plants, species and habitats
- Occurrences of protected species under the Flora Protection Order (1999)
- Geology, Eskers and Quarries
- Peatlands
- Lakes, Waterways and Wetland Landscapes
- Trees, Forestry and Hedgerows
- Green Infrastructure (i.e. parks, gardens, green roofs, green walls, rivers, lakes, canals, peatland, wetland landscapes, uplands, greenways, blueways, woodlands and farmlands)
- All Ireland Pollinator Plan 2015 – 2020
- Invasive Species (primarily Japanese Knotweed and Himalayan Balsam)
- Areas of High Amenity
- Landscape (i.e. protection of key scenic views, prospects and key amenity routes)

Key planning policies for the conservation, protection and enhancement of natural heritage are detailed further under BLP-01 – BLP-45 within the County Offaly Development Plan.

2.3 Local Biodiversity Action Plans

The Proposal Site is located within land covered by the County Offaly Local Biodiversity Action Plan (LBAP) 2025 - 2030 which highlights the priority habitats, priority species and key threats to biodiversity within the council area and outlines action to ensure their protection and enhancement.

Broad habitats selected for priority action include: (1) bog, (2) farmland, (3) cutaway bog, (4) rivers, (5) hedgerows, (6) smaller stands of trees, (7) scrub land, (8) smaller wetlands, (9) woodland, (10) natural / semi-natural grassland, (11) ponds, (12) raised bogs, (13) eskers, (14) demesne parkland.

Species selected for priority action include: (1) barn owl (2) swifts (3) Japanese knotweed (4) Himalayan balsam (5) hen harrier, (6) corncrake, (7) curlew, (8) redshank, (9) *rhododendron Ponticum*, (10) cherry laurel, (11) alpine newt, (12) Quagga mussel, (13) bat species, (14) moth species, (15) mallard, (16) coot, (17) sedge warbler, (18) dragonflies, (19) damselflies, (20) water beetles, (21) bee species, (22) butterfly species (23) stonechat. Additionally, the LBAP reiterates the species protected under the various wildlife directives and acts referred to above.

3 Methodology

3.1 Statement of Authority

Tetra Tech RPS confirm that the professional judgement expressed herein is the true and bona fide opinion of our professional ecologists. The information prepared and provided is accurate at the time of issue of this report and has been prepared and provided in accordance with the CIEEM Code of Professional Conduct (CIEEM 2025[2]).

The report has been approved for issue by James McCrory, Technical Director of Ecology with RPS. James holds a BA (Hons) in Natural Sciences (Mod) Botany and a MSc in Habitat Creation and Management. James is a Chartered Environmentalist (CEnv), a Chartered Ecologist (CEcol), a Chartered Biologist (CBiol) and a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and the Royal Society of Biology (MRSB). James is a former member of the CIEEM Irish Section Committee and CIEEM Policy Review Group in Ireland and a member of the CIEEM technical working group updating the Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland. James currently sits on the CIEEM technical working group for EcIA accreditation across the Institutes practitioner network.

The report has been reviewed and edited by Roisin Ward, a Senior Ecologist within RPS. Roisin holds a BSc (Hons) in Land Use and Environmental Management and has over 11 years of experience in the field of ecology and environmental consultancy. Roisin has extensive experience of habitat, mammal, amphibian, reptile and invertebrate survey and is a protected species licence holder. Roisin is an Associate member of the Chartered Institute of Ecology and Environmental Management (CIEEM).

Conor Finlay, author and lead surveyor, carried out the Extended Phase 1 Habitat Survey and Potential Roosting Feature (PRF) Inspection Survey. Conor is an Ecologist with RPS and holds a BSc (Hons) in Environmental Science, a MSc in Ecological Management and Conservation Biology with over four years of experience in ecological consultancy. Conor has experience of habitat, mammal, reptile, and bird survey and is a protected licence holder. Conor is a Qualifying member of the CIEEM and a volunteer with the Northern Ireland Amphibian and Reptile Group.

Dave Welsh, assistant surveyor, assisted with the PRF Inspection Survey. Dave is a Principal Ecologist with RPS and holds a BSc (Hons) in Marine Science, a MSc in Ecological Management and Conservation Biology with over eight years of experience in ecological consultancy. Dave has extensive experience of habitat, mammal, amphibian, reptile and invertebrate survey and is a protected species license holder. Dave is an Associate member of the CIEEM and a former volunteer with the Northern Ireland Bat Group and Northern Ireland Badger Group.

3.2 Zone of Influence

The Zone of Influence (ZoI) is the area over which ecological features may be affected by biophysical changes resulting from the Proposed Development and its associated activities. The ZoI varies for different ecological features depending on their sensitivity to environmental change and therefore further details on the specific ZoI for each ecological feature is described below under the relevant sections. In some instances, the ZoI may extend beyond the red line boundary of the site.

3.3 Desk Study

A desk study was undertaken to review existing information relevant to the site of the Proposed Development and the surrounding environment. The information gathered is third party controlled data purchased or obtained for the purposes of this report only. Tetra Tech RPS cannot guarantee its accuracy and cannot be held liable for any inaccuracies.

The National Biodiversity Network (NBN) Atlas (NBN Atlas Partnership 2021) and the National Biodiversity Data Centre (NBDC) were used to identify the existence of historical records of protected species or species

of natural heritage importance within 1 km of the site of the proposed project. This was extended to 10 km for bat species and for marsh fritillary, including its food plant devil's-bit scabious.

3.4 Extended Phase 1 Habitat Survey

An Extended Phase 1 Habitat Survey was carried out in May 2024 and September 2025 within the Proposal Site. Phase 1 Habitat Survey (JNCC 2010) is the standard system used to rapidly record, categorise and map habitats. Habitats are mapped using standard colour codes and target notes are used to describe any features of ecological or natural heritage importance. Aerial photographs were used as an aid to map habitats. The survey was extended to include further information on the potential of the habitats identified to support species protected by law or of natural heritage importance.

It should be noted that whilst every effort has been made to provide a comprehensive description of the site no survey can consist of a complete characterisation and prediction of the ecological environment. The habitat survey will remain valid for a period of one year of being carried out.

3.5 Ecological Survey for Invasive Species

The Phase 1 Habitat Survey was extended to include an Invasive Non-Native Species Survey within Proposal Site. The aim of the survey was to identify plant species listed on the European Union (Invasive Alien Species) Regulations 2024.

3.6 Ecological Survey for Bats

The Phase 1 Habitat Survey was extended to include a Preliminary Ecological Appraisal for Bats within the Proposal Site and within the ZoI of the Proposed Development. The aim of the survey was to observe, assess and record the potential suitability of the site to support bat roosting, commuting and/or foraging habitat and to determine the requirement for further bat surveys. Habitat features were classified as Further Assessment Required (FAR), Low roost suitability or Potential Roosting Feature – Individual (PRF-I), and High roost suitability or Potential Roosting Feature – Multiple (PRF-M) in accordance with Bat Conservation Trust (BCT) Good Practice Guidelines (Collins 2023).

Ecological Survey for Bats including a Daytime Bat Walkover (DBW), Ground Level Tree Assessment (GLTA) and a Potential Roost Feature (PRF) Inspection Survey was carried out over three days in September 2025 to inform the EcIA. Full details of the bat survey methods, results and an interpretation of the results can be found in **Appendix B.** A summary of the results can be found below in **Section 4.3 Bats**.

3.7 Ecological Survey for Otter

The Phase 1 Habitat Survey was extended to include a Preliminary Otter Survey within the Proposal Site within 30 m of the red line boundary, and 150 m upstream and downstream of any watercourse within the red line boundary. The aim of the survey was to establish the presence of otter *Lutra lutra*, otter holts and / or otter foraging areas within the ZoI of the proposed project and determine the requirement for further survey. The results can be found below in **Section 4.4 Otter**.

3.8 Ecological Survey for Badger

The Phase 1 Habitat Survey was extended to include a Preliminary Badger Survey within Proposal Site and within 30 m of the red line boundary. The aim of the survey was to establish the presence of badger *Meles meles*, badger setts and / or badger foraging areas within the ZoI of the Proposed Development and determine the requirement for further badger surveys.

3.9 Ecological Survey for Marsh Fritillary

The Phase 1 Habitat Survey was extended to include a habitat survey for marsh fritillary *Euphydryas aurinia* butterfly within the Proposal Site. The aim of the survey was to establish the presence of devil's bit scabious *Succisa pratensis* within the Proposal Site and determine the requirement for further marsh fritillary surveys.

3.10 Ecological Survey for Smooth Newt

The Phase 1 Habitat Survey was extended to identify ponds within the Proposal Site. The aim of the survey was to establish the potential for smooth newt *Lissotriton vulgaris* with in the ZoI of the Proposed Development and determine the requirement for further smooth newt surveys.

3.11 Ecological Impact Assessment

The EcIA has been prepared taking into consideration guidelines produce by the CIEEM (CIEEM 2018).

The ecological value of a feature was determined using a geographic frame of reference as set out below in **Table 1**. Professional judgement was used to define the geographic framework based on available guidance, existing criteria, historical trends and information on the distribution, abundance and status of the ecological feature.

The assessment takes into account the source-pathway-receptor model. The source is defined as the individual elements of the proposed project that have the potential to affect identified ecological features. The pathway is defined as the means or route by which a source can affect the ecological feature. The receptor is defined as the ecological feature (species, habitat or ecosystem) of natural heritage importance. Each element can exist independently however an effect is created where there is a linkage between the source, pathway and receptor.

For the purposes of this assessment an impact is defined as an action that results in changes to an ecological feature. An effect is defined as the outcome to an ecological feature from an impact. The likely significance of effects is the combined function of the value of the ecological feature; the type, magnitude and duration of the impact and/or effect; the extent to which the impact and/or effect occurs; the timing and frequency of the impact and the reversibility of impacts and/or effects (CIEEM 2018). The geographic level at which the ecological feature is considered important needs to be considered when assessing the likely significance of effects.

A significant effect is a positive or negative effect that either supports or undermines the conservation objectives of a designated site; results in changes in ecosystem structure and function; or affects the conservation status of habitats or species. Effects can be considered significant at a wide range of scales from international to site level.

CIEEM (2018) defines a significant effect as "...*an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project. A significant effect is a positive or negative ecological effect that should be given weight in judging whether to authorise a project: it can influence whether permission is given or refused and, if given, whether the effect is important enough to warrant conditions, restrictions or further requirements such as monitoring*".

BS 42020:2013 states *"...if an effect is sufficiently important to be given weight in the planning balance or to warrant the imposition of a planning condition, e.g. to provide or guarantee necessary mitigation measures, it is likely to be "significant" in that context at the level under consideration. The converse is also true: insignificant effects would not warrant a refusal of permission or the imposition of conditions*".

Table 1 Geographic Frame of Reference for Important Ecological Features

Ecological Value	Criteria
International	• 'European Sites' including Special Areas of Conservation (SAC) & Special Protection Areas (SPA) • Sites that satisfy 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 RoI National Site Network • Sites containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive • Resident or regularly occurring populations (assessed to be important at the national level) of the following: – Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or – Species of animal and plants listed in Annex II and/or IV of the Habitats Directive • Ramsar Sites (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971) • World Heritage Sites (Convention for the Protection of World Cultural & Natural Heritage, 1972) • Sites hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979) • Sites hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979)
National	• Wildlife Refuge for species protected under the Wildlife Acts • Resident or regularly occurring populations (assessed to be important at the national level) of the following: • Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or • Species of animal and plants listed in Annex II and/or IV of the Habitats Directive • Natural Heritage Areas (NHA) or proposed NHA • National Nature Reserves (NNR) • Marine Nature Reserve (MNR)
County	• Sites listed as part of the Ecological Network in the County Development Plan (CDP) • Areas subject to a Tree Preservation Order in a CDP • Resident or regularly occurring populations (assessed to be important at the County level) of the following: • Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive • Species of animal and plants listed in Annex II and/or IV of the Habitats Directive • Species protected under the Wildlife Acts (1976-2018) and/or • Species listed on the relevant Red Data list • Sites containing areas of the habitat types listed in Annex I of the Habitats Directive that occur outside of designated International (SAC/SPA/Ramsar) or National (NHA/pNHA) sites • Regionally important populations of species or viable areas of semi-natural habitats or natural heritage features identified in a Biodiversity Action Plan (BAP) prepared for an administrative area, if this have been prepared • Sites containing natural habitat types with high biodiversity in a regional context and a high degree of naturalness, or populations of species that are uncommon within the County
Local (Higher)	• Locally important populations of a priority or protected species; or habitats or features of natural heritage importance identified in a BAP, if this has been prepared • 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 (Lower)	• 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

4 Baseline Ecological Conditions

4.1 Designated Sites

The Proposal Site is not located within the boundary of any statutory or non-statutory designated sites of international, national or local nature conservation importance. There are however a number of designated sites hydrologically linked to the Proposed Development. In addition, there are also a number of other habitats and features of natural heritage importance including watercourses within the ZoI of the Proposed Development.

Table 2 below provides descriptive details of designated sites located outside the Proposal Site but connected to it through an identifiable impact pathway. The boundary of each of the designated sites in relation the proposed project is illustrated in **Figure 2.0 Designated Sites and Feature of Natural Heritage Importance**.

Table 2 Designated Sites & Features of Natural Heritage Importance

Designated Site/Feature	Distance from Site (km)	Description
Raheenmore Bog SAC	2.70 km northeast "as the crow flies"	Conservation Objectives To maintain each feature in favourable condition, as defined by a series of attributes and targets. – Active raised bogs – Degraded raised bogs still capable of natural regeneration – Depressions on peat substrates of the Rhynchosporion
Raheenmore Bog pNHA	3.94 km (upstream)	See Raheenmore Bog SAC Conservation Objectives above.
Murphy's Bridge Esker pNHA	4.56 km (downstream)	The esker forms part of the larger Ballinasloe-Split Hills-Clonmacnoise-Clara Esker system.
Grand Canal pNHA	5.23 km (downstream)	A significant waterway that connects Dublin to the River Shannon. The greenway spans 70 km, starting in Edenderry and ending at Shannon Harbour.
River Shannon Callows SAC	47.10 km (downstream)	Conservation Objectives To maintain each feature in favourable condition, as defined by a series of attributes and targets. – Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) – Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) – Alkaline fens – Limestone pavements – Alluvial forests with Alnus glutinosa, Fraxinus excelsior (Alno Padion, Alnion incanae, Salicion albae) – Lutra lutra (otter)
Middle Shannon Callows SPA	47.10 km (downstream)	Conservation Objectives To maintain each feature in favourable condition, as defined by a series of attributes and targets. – Whooper swan (Cygnus cygnus) – Corncrake (Crex crex) – Golden plover (Pluvialis apricaria) – Lapwing (Vanellus Vanellus) – Black-tailed godwit (Limosa limosa) – Black-headed gull (Chroicocephalus ridibundus) – Wigeon (Mareca penelope) – Wetland and Waterbirds
River Shannon Callows pNHA	47.10 km (downstream)	See River Shannon Callows SAC and SPA Conservation Objectives above.
Lough Derg, North-east Shore SAC	73.94 km (downstream)	Conservation Objectives To maintain each feature in favourable condition, as defined by a series of attributes and targets. – Juniperus communis formations on heaths or calcareous grasslands

Designated Site/Feature	Distance from Site (km)	Description
		– Calcareous fens with Cladium mariscus and species of Caricion davallianae – Alkaline fens – Limestone pavements – Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) – Taxus baccata woods of the British Isles
Lough Derg (Shannon) SPA	73.94 km (downstream)	Conservation Objectives To maintain each feature in favourable condition, as defined by a series of attributes and targets. – Cormorant (Phalacrocorax carbo) – Tufted duck (Aythya fuligula) – Goldeneye (Bucephala clangula) – Common tern (Sterna hirundo) – Wetland and Waterbirds
Lough Derg pNHA	73.94 km (downstream)	See Lough Derg, North-east Shore SAC and Lough Derg (Shannon) SPA Conservation Objectives above.

4.2 Habitats

A map illustrating the red line boundary and the existing habitats on the site can be found in **Figure 3.0 Extended Phase 1 Habitat Survey.** Species abundance was described using the DAFOR Scale (D = Dominant, A = Abundant, F = Frequent, O = Occasional and R = Rare).

4.2.1 Arable Crops

The majority of the site comprises arable crops (see **Plates 2 and 3**) (~ 16.47 ha or 59.02% of the total area) which is utilised for growing a mixture of rutabaga *Brassica napus rapifera* and barley *Hordeum vulgare*. These areas are generally species poor, being largely a monoculture, with a low ecological value. Forbs are generally present at very low density and principally confined to the field margins. The dominant species within this habitat switches from barley to rutabaga depending on the field. It should be noted that the arable field located at the southeast corner of the site was based of peaty soils and appeared to be recently sown.

Species present include barley (D), rutabaga (D), perennial rye-grass *Lolium perenne* (A), hairy bitter-cress *Cardamine hirsuta* (F), rosebay willowherb *Chamaenerion angustifolium* (R), broad-leaved dock *Rumex obtusifolius* (R), common nettle *Urtica dioica* (R), curled dock *Rumex crispus* (R), spear thistle *Cirsium vulgare* (R) and cleavers *Galium aparine* (R).

Arable crops are considered of ecological value at a local (lower) level.

4.2.2 Improved Agricultural Grassland

A large portion of the site comprises improved agricultural grassland (~9.18 ha or 32.88% of the total area) which is utilised for grazing cattle. Like the arable crop's fields, these areas are generally species poor and are principally confined to the field margins. The dominant species within this habitat is perennial ryegrass.

Species present include perennial ryegrass (D), white clover *Trifolium repens* (F), broad-leaved dock (O), cock's-foot *Dactylis glomerata* (O), creeping buttercup *Ranunculus repens* (O), curled dock (O), dandelion *Taraxacum officinale* (O), blackberry *Rubus fruticosus* (R), common chickweed *Stellaria media* (R), common nettle (R), common ragwort *Senecio jacobaea* (R), common sorrel *Rumex acetosa* (R), daisy *Bellis perennis* (R), greater plantain *Plantago major* (R), herb-Robert *Geranium robertianum* (R), redshank *Persicaria maculosa* (R), silverweed *Potentilla anserina* (R), soft-rush *Juncus effusus* (R) and spear thistle (R).

Improved agricultural grassland is considered of ecological value at a local (lower) level.

4.2.3 Scrub

Primarily located along and within the various hedgerows and treelines around the site are long strips of scrub, with additional patches within the centre of fields, associated with areas exhibiting lower levels of management (~ 1.72 ha or 6.16% of the total area). The dominant species within this habitat is blackberry.

Species present include blackberry (D), gorse *Ulex europaeus* (O), male-fern *Dryopteris filix-mas* (O), rosebay willowherb (O), bush vetch *Vicia sepium* (R), common figwort *Scrophularia nodosa* (R), corn mint *Mentha arvensis* (R), harts-tongue fern *Asplenium scolopendrium* (R), hogweed *Heracleum sphondylium* (R), lords-and-ladies *Arum maculatum* (R), meadowsweet *Filipendula ulmaria* (R), prickly sow-thistle *Sonchus asper* (R), ribwort plantain *Plantago lanceolata* (R) and sweet violet *Viola odorata* (R),

Scrub is considered of ecological value at a local (higher) level.

4.2.4 Wet Grassland / Drainage Ditches (Dry)

Based solely within two dry ditches are thin strips of wet grassland (~ 0.13 ha or 0.46% of the total area). Within the eastern most dry ditch was a single small stand of devil's-bit scabious *Succisa pratensis*. The underlying field drain exhibited no obvious flow with the dominant species being soft-rush.

Species present include soft-rush (D), cock's-foot (A), blackberry (O), corn mint (O), creeping bent *Agrostis stolonifera* (O), creeping buttercup (O), curled-dock (O), dandelion (O), marsh thistle *Cirsium palustre* (O), marsh woundwort *Stachys palustris* (O), meadowsweet (O), bulrush *Typha latifolia* (R), common ragwort (R), devil's-bit scabious (R), meadow vetchling *Lathyrus pratensis* (R), narrow-leaved vetch *Vicia sativa subsp. Nigra* (R), spear thistle (R) and water horsetail *Equisetum fluviatile* (R).

Wet grassland / drainage ditches are considered of ecological value at a local (higher) level.

4.2.5 Tall Ruderal / Recolonising Bare Ground

There are three significant patches of tall ruderal vegetation, exhibiting a taller sward length to the surrounding grasslands (~0.11 ha or 0.39% of the total area). Two patches are present along fencing where hedgerows / treelines aren't present, and a single additional patch is located at the boundary of an arable field. The dominant species within this habitat is common nettle.

Species present include common nettle (D), spear thistle (A), hawthorn *Crataegus monogyna* (F), blackberry (O), blackthorn *Prunus spinosa* (O), curled-dock (O) and ash *Fraxinus excelsior* (R).

Tall ruderal / recolonising bare ground is considered of ecological value at a local (lower) level.

4.2.6 Hedgerows / Treelines

The existing site supports many hedgerows / treelines which separate the grassland fields and form the site boundary (~ 1646 m of hedgerows / treelines on site). These features have varying degrees of management consisting of recently trimmed / manicured hedgerows (primarily along boundaries with road and access lanes), treelines of immature trees and treelines with a significant number of mature / semi-mature trees. The vast majority of hedgerows / treelines are further buffered out with additional dense scrub species. Hedgerows / treelines were also broken down further into "species rich" and "species poor". The dominant species within this habitat is hawthorn.

Species present within the species rich hedgerows / treelines include hawthorn (D), ash (A), ivy *Hedera helix* (A), blackthorn (O), dog-rose *Rosa canina* (O), goat willow *Salix caprea* (O), grey willow *Salix cinerea* (O), hazel *Corylus avellana* (O), holly *Ilex aquifolium* (O), elder *Sambucus nigra* (R), silver birch *Betula pendula* (R), sitka spruce *Picea sitchensis* (R), sycamore *Acer pseudoplatanus* (R) and wild cherry *Prunus avium* (R).

Species present within the species poor hedgerows / treelines include hawthorn (D), blackberry (A), blackthorn (A), ash (O), dog-rose (O), ivy (F), beech *Fagus sylvatica* (R), garden privet *Ligustrum ovalifolium* (R), holly (R) and sycamore (R).

Hedgerows / treelines are considered of ecological value at a regional level. This is due to it being highlighted as an important habitat within the Offaly County Council LBAP.

4.3 Bats

Consultation with the NBN Atlas identified no historical records of bat species within the site or 5 km of the site.

Consultation with NBDC identified one record of both common pipistrelle and brown long-eared bat within 1 km grid squares (4029). Additionally, a total of 1459 records were returned within 10 km grid squares (N32 = 758, N33 = 621, N42 = 72 and N43 = 8). Therefore, a total of 1461 bat records were returned highlighting the following species within 10 km of the site: soprano pipistrelle *Pipistrellus pygmaeus*, common pipistrelle *Pipistrellus pipistrellus*, Nathusius' pipistrelle *Pipistrellus nathusii*, Leisler's bat *Nyctalus leisleri*, brown long-eared bat *Plecotus auritus*, Daubenton's bat *Myotis daubentoni* and Natter's bat *Myotis nattereri*.

4.3.1 Ground Level Tree Assessment

Trees within the Proposal Site were subject to a Ground Level Tree Assessment (GLTA) to identify Potential Roosting Features (PRFs) and determine the potential suitability of trees to provide roosting habitat for bat species.

A total of 16 trees were identified from ground level as "Further Assessment Required" (FAR), with their location displayed in **Figures 4.1 – 4.4** and the results of the GLTA shown in **Appendix B**.

- T1 – T6, T8, T10 – T13, T15 and T16 are not to be affected by lighting, cutting or felling
- T7, T9 and T14 are to be retained with some cutting back proposed

4.3.2 PRF Aerial Inspection Survey

Following the completion of the GLTA an additional PRF Inspection Survey was carried out on trees flagged as potential requiring cutting back and / or felling. Therefore, T6 – T9 and T14 – T16 were climbed and inspected with an endoscope.

- T6, T8, T15 and T16 were deemed unsuitable upon further assessment = None
- T7, T9 and T14 were deemed suitable for a small number of individual bats = PRF-I

4.4 Otter

The NBN Atlas NI (NBN Atlas Partnership 2021) identified one historical records of otter within 1 km of the site (1980) (see **Appendix A**).

Consultation with NBDC identified no historical records of otter within 1 km of the site.

There were no otter underground holts, above ground couches or evidence of otter recorded within the site or within 30 m of the boundary of the site. Otter has therefore been removed from any further assessment, with pre-cautionary mitigation for commuting otters potentially utilising the nearby Kilmurry stream.

4.5 Badger

The NBN Atlas NI (NBN Atlas Partnership 2021) identified no historical records of badger within 1 km of the site.

Consultation with NBDC identified two historical records of badger within 1 km of the site (dating from 2004).

There were no badger setts or evidence indicating the presence of badger recorded within the site or within 30 m of the Proposal Site. Badger has therefore been removed from any further assessment.

4.6 Marsh Fritillary

The NBN Atlas NI (NBN Atlas Partnership 2021) identified no historical records of marsh fritillary butterfly or its food plant within 10 km of the proposed project.

Consultation with NBDC identified 42 historical records of devil's-bit scabious and 18 records of marsh fritillary butterfly (most recent record from 2023) within 10 km of the Proposed Development (grid squares N32, N33, N42 and N43).

4.7 Birds

The NBN Atlas NI (NBN Atlas Partnership 2021) identified no historical records of birds within 1 km of the site.

Consultation with NBDC identified 18 records of birds within 1 km of the site. Species include blackbird, blackcap, bullfinch, dunnock, goldcrest, goldfinch, lesser redpoll, long-tailed tit, reed bunting, robin, song thrush, spotted flycatcher, swallow, whitethroat, willow warbler, woodpigeon, wren and yellowhammer.

The site has potential to provide habitat for an assemblage of common and widespread breeding bird species associated with grasslands, scrubland and hedgerows / treelines habitat on the site.

5 Ecological Impact Assessment

5.1 Designated Sites

Potential Impacts & Effects

International Designated Sites (SACs, SPAs & Ramsar Sites)

The site is located ~ 2.70 km southwest "as the crow flies" and 3.94 km downstream of the Raheemore Bog SAC. It is therefore deemed that no suitable pathway connects the site to the Raheemore Bog SAC as the designated site is upstream (further up the hydraulic flow-gradient) of the Proposal Site.

The site is hydrologically linked to River Shannon Callows SAC, Middle Shannon Callows SPA, Lough Derg, North-east Shore SAC and Lough Derg (Shannon) SPA. These designated sites are located approximately 47.10 km downstream (Callows sites) and 73.94 km downstream (Lough Derg sites) of the Proposal Site respectively.

Pre-construction site clearance and construction works have limited potential to indirectly impact on the Kilmurry stream which joins with the Derrygrogan little stream flowing into the Puttaghan stream, Silver (Tullamore) River, Clodiagh (Tullamore) River, Brosna River, Shannon River (lower) and eventually Lough Derg.

A Report to inform Screening for Appropriate Assessment (RISAA) and a Natura Impact Statement (NIS) have been prepared and submitted alongside this EcIA report. That Habitats Regulations appraisal concludes that the Proposed Development will not result in deterioration of water quality flowing into the designated sites located downstream of the proposed project alone, but notes that there a number of other solar farm, battery storage and HV electrical connection projects located in the immediate area surrounding the Proposal Site and it is possible that a number of those projects could move to construction stage at the same time.

The RISAA concludes that the possibility of likely significant water quality effects cannot be excluded at the screening stage in the absence of mitigation measures. The NIS then in turn evaluates this potential adverse

effect on each of the qualifying interests and special conservation interests of River Shannon Callows SAC, Middle Shannon Callows SPA, Lough Derg, North-east Shore SAC and Lough Derg (Shannon) SPA with reference to their site specific conservation objectives. A suite of pollution prevention mitigation measures were then applied to construction phase of the Proposed Development.

On that basis, the NIS concluded that "*having considered the further investigation and analysis, which is set out in the NIS, the conclusion of the Stage 2 Appropriate Assessment appraisal is that the competent authorities can conclude, based on best scientific knowledge, that there will be no adverse effects upon the integrity of any European site consequent upon the implementation mitigation measures prescribed in this NIS. Accordingly, the competent authorities can conclude, beyond reasonable scientific doubt, that the Proposed Development, whether considered alone or in combination with other plans and projects, will not adversely affect the integrity of any European site*."

So, to relay this 'AA' process back to the EcIA, construction of the proposed project in combination with other relevant projects has the potential to have a **Significant Negative Effect** on internationally important designated sites in the absence of mitigation measures.

Operation of the proposed project will have **No Significant Effect** of internationally important designated sites due to the nature and design of the proposal.

National Designated Sites (pNHAs and NHAs)

The site is located ~ 2.70 km southwest "as the crow flies" and 3.94 km downstream of the Raheemnore Bog pNHA. It is therefore deemed that no suitable pathway connects the site to the Raheemore Bog pNHA.

The site is hydrologically linked to Murphy's Bridge Esker pNHA, Grand Canal pNHA, River Shannon Callows pNHA and Lough Derg pNHA. These designated sites are located approximately 4.56 km, 5.23 km, 47.10 km and 73.94 km downstream of the Proposed Development respectively.

Pre-construction site clearance and construction works have limited potential to indirectly impact on Kilmurry stream which joins with the Derrygrogan Little stream flowing into the Puttaghan stream, Silver (Tullamore) River, Clodiagh (Tullamore) River, Brosna River, Shannon River (lower) and eventually Lough Derg.

In the event that the construction phase of the Proposed Development was to result in the inadvertent release of sediments or pollutants into the Kilmurry stream, it is considered unlikely that such inputs would give rise to measurable increase in the background levels of such materials within the waters of the River Shannon and Lough Derg or any of the designated sites noted above. This conclusion is drawn in light of the length of the hydrological pathway over which significant settlement and dilution of sediments or pollutants would occur, in addition to the associated volumes of water, including within Lough Derg, the substances would be diluted to *de minimis* levels by the time they reach the habitats of any designated site.

Operation of the Proposed Development involves cleaning panels with deionised water. No activities associated with operational maintenance are predicted to have **No Significant Effect** of nationally important designated sites due to the nature and design of the proposal.

Avoidance & Mitigation Measures

The Proposed Development has limited potential to give rise to **Significant Negative Effects** upon the Kilmurry stream along the northeastern boundary of the site. This is due to the proposed layout of the development which includes an approximately 15m separating distance from the Kilmurry stream to the nearest solar array.

Construction stage Environmental Management Plan

A Construction stage Environmental Management Plan (CEMP) containing methods to manage and minimise the potential for accidental pollution at construction phase of the Proposed Development shall be implemented.

An outline CEMP has been prepared and is submitted with the planning application. A finalised CEMP shall be submitted to and agreed with the planning authority in advance of the commencement of construction.

The finalised CEMP shall contain *inter alia* the measures outlined below to manage and minimise the potential for accidental pollution at construction phase. For the avoidance of doubt, please refer to the outline CEMP and the NIS for a full and complete list of measures proposed to manage and minimise the potential for accidental pollution at construction phase of the Proposed Development.

General Protection of Surface Waters

The construction works shall be undertaken within a framework of environmental protection practices defined and co-ordinated through the CEMP. The CEMP shall provide measures that meet legislative requirements, and key regulatory guidance that define good working practices during construction, including *inter alia*:.

- Stockpiling of construction materials shall be strictly prohibited within 15 m of any existing surface water drainage, ditch or water-laden channel;
- Excavations shall be left open for minimal periods to avoid acting as a conduit for surface water flows;
- All ready-mixed concrete shall be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline waste waters or contaminated storm water to the underlying subsoil. Wash down and washout of concrete transporting vehicles will take place at an appropriate location within the site;
- Concrete shall be contained and managed appropriately to prevent pollution of watercourses.
- Waste materials shall be stored in designated areas that are isolated from surface water drains.
- Skips will be closed or covered to prevent materials being blown or washed away and to reduce the likelihood of contaminated water leakage;
- No harmful materials shall be deposited into nearby watercourses, including drainage ditches / pipes, on or adjacent to the site;
- Protection measures shall be put in place to ensure that all hydrocarbons used during the Construction are appropriately handled, stored and disposed of in accordance with recognised standards. These measures will include:
  - Hazardous materials including diesel, fuel oils, solvents, paints and / or lubricants stored on site will be stored within suitably designed bunded areas with a bund volume of 110% of the capacity of the largest tank / container.
  - Re-fuelling of plant will not occur within 50 m of any watercourse or surface water / groundwater feature. Drip trays will be used and spill kits will be kept available;
  - Machinery used on site will be regularly inspected to ensure there is no leakage from them and to ensure the machinery will not cause contamination of watercourses;
  - Where required, fuel will be transported in a mobile, double skinned tank and a spill tray will be used when refuelling (if taking place outside a compound area);
  - Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or re-cycling;
  - Only emergency breakdown maintenance will be carried out on site. Emergency procedures and spillage kits will be readily available at strategic site locations and construction staff will be familiar with emergency procedures; and
  - Any spillage of fuels, lubricants of hydraulic oils will be immediately contained, with an appropriate emergent response put in place. Any contaminated soil will be removed from the site and properly disposed of.

Best Practice Guidance

Best practice guidance is to be followed across the site, and will include but is not limited to:

- Guidelines on the control of water pollution from construction sites developed by the Construction Industry Research and Information Association (CIRIA, 2001);

- Netregs Guidance for Pollution Prevention series (GPP), Pollution prevention guidelines (PPGs) in relation to a variety of activities developed by the Environment Agency (EA), the Scottish Environmental Agency (SEPA).
  - GPP2: Above Ground oil storage tanks
  - PPG3: use and design of oil separators in surface water drainage
  - GPP5: Works and maintenance in or near water
  - PPG6: Working at construction and demolition sites
  - GPP8: Safe Storage and disposal of used oils
  - GPP13: Vehicle washing and cleaning
  - PPG20: Dewatering underground ducts and chambers
  - GPP21: Pollution incident response planning
  - GPP22: Dealing with spills
- Fisheries Guidelines for Local Authority Works. Department of Communications, Marine & Natural Resources, Dublin, (Anonymous, 1998);
- Guidelines on protection of fisheries habitats during construction projects (Eastern Regional Fisheries Board, 2006); and
- Control of Substances Hazardous to Health (COSHH) Handling of Hazardous Materials.

The use of oils and chemicals on-site will receive significant care and attention. The following procedures will be followed to reduce the potential risk from oils and chemicals:

- Fuel, oil, and chemical storage will be sited on an impervious base within a bund and secured. The base and bund walls must be impermeable to the material stored and of adequate capacity. The control measures in GPP2: Above Ground Oil Storage Tanks and PPG 26 “Safe storage – drums and intermediate bulk containers” (Environment Agency, 2011) shall be implemented to ensure safe storage of oils and chemicals;
- The safe operation of refuelling activities shall be in accordance with PPG 7 “Safe Storage – The safe operation of refuelling facilities” (Environment Agency, 2011).

Subject to the implementation of the above best practice guidance, in addition to the designated sites significant downstream distance of the various designated sites from the Proposal Site and the overland distance from the solar panels to the Kilmurray stream, it is considered that any potential effects associated with water quality, including pollutants and sediments, would be diluted to background levels long before reaching the European sites.

Site Specific

As a further precaution, it should be noted that the dry drainage ditches on site have the potential to act as suitable impact pathways, connecting to the Kilmurry stream during periods of prolonged rain. Therefore, it is recommended that a 5 m protection buffer is created. Where works are to occur within protection buffer, the following pre-cautionary mitigation measures are to be implemented when there is a potential flow (due to current or predicted weather conditions):

- Works will be carried out in dry weather with low flows (preferably no flows) in the ditches with forecasts for dry weather to be in place for the duration of the works and no heavy rainfall forecasted (i.e. Met Éireann Orange and Red rain warning).

- The Contractor will monitor weather forecasts for heavy rain and where required, certain works and in particular excavations / earthworks will cease in order to minimise exposed soil entering surface water run-off.
- Machinery used will stay on adjacent areas of agricultural land; machinery will not be permitted to enter the ditch channel.
- The areas adjacent to the ditches will be lined with sandbags and silt fences consisting of a geotextile membrane appropriate to prevent runoff from the works reaching the ditches wherever possible. The design of these features shall also allow for the safe removal of accumulated silt away from the channel.
- Clean sandbags will be used to dam flows on the upstream side of the proposed structure. Sandbags will be placed by hand at a suitable location to take advantage of any natural pool but set back from the works to permit unhindered excavation.
- A second sandbag dam will be placed on the downstream side of the cut channel to prevent backflow into the works and contain any groundwater seepage that is likely to be turbid.
- Sandbagging requires careful attention to detail if it is to be effective. All bags must be laid neck uppermost and seams aligned. Bags must not be overfilled, or they will not tamp together or will burst with ease.
- If topography permits, the water will be piped over the work area by gravity flow, otherwise, it will be pumped. Discharge will be via break tank or similar approved storage onto a splash-plate or rip-rap (gabion basket) to dissipate energy and avoid scour or erosion of the ditch bend or banks. The pump will be filled with a screen.
- All plant and equipment will be serviced and cleaned before entry to site to limit risk of oil spillage and for biosecurity.
- Any spoil generated will be removed to designated safe area beyond 15 m from the watercourse. Some of this spoil may be saturated and will require bunding and sheeting over.
- If bank material needs to be removed it will be stored separately and reinstated accordingly.

The implementation of the best practice and site-specific mitigation measures as set out above will reduce the likely significance of effects on international and national designated sites from **Significant Negative Effect** to **No Significant Effect**.

Significance of Residual Effects

The Proposed Development will have **No Significant Effect** on any designated site.

5.2 Habitats

Potential Impacts & Effects

The Proposed Development has been designed, as far as possible, to avoid the loss of hedgerows / treelines.

Pre-construction site clearance and construction works will result in a direct impact to habitats with the removal of small stretches of hedgerows, underlying scrub and tall ruderal / recolonizing bare soil within the construction footprint. This is to provide a new network of access lanes throughout the site with appropriate safety clearance. Additionally, large sections of existing improved agricultural grassland and arable crops are to be subject to increased shading. However, it should be noted that although solar arrays have a large land take (shading), the ground impact is considered negligible. The only intrusion will be from proposed galvanised steel pile-driven posts and the estimated ground impact for each solar array is ~ 0.0014 m^2 (worst case scenario), which results in a total ground impact of ~ 69 m^2.

Table 3 below provides a summary of the habitat loss associated with the Proposed Development.

Table 3 Habitat Loss

Habitat Type	Total Area (m^2)	Habitat Loss (m^2)
Arable Crops	~ 164,725	~ 164,725

Habitat Type	Total Area (m^2)	Habitat Loss (m^2)
Improved Agricultural Grassland	~ 91,753	Negligible (~ 56,847 increased shading)
Scrub	~ 17,182	~ 1820
Wet Grassland / Drainage Ditches (dry)	~ 1,272	~ 23
Tall Ruderal / Recolonising Bare Ground	~ 1,102	~ 525
Hedgerows / Treelines (native species rich)	~ 2403	~ 147
Hedgerows / Treelines (native species poor)	~ 66	~ 18

Operation of the Proposed Development will have **No Significant Effect** of habitats on site due to the nature and design of the proposal.

The Proposed Development will have a **Significant Negative Effect** at a regional scale with the permanent loss (40 years) of short stretches of hedgerows and **Significant Negative Effect** at a local level with the permanent loss (40 years) of scrub, wet grassland / drainage ditches (dry), tall ruderal / recolonising bare ground and increased shading to large sections of existing arable crops and improved agricultural grassland.

Avoidance & Mitigation Measures

The existing vegetation within the Proposed Development site boundary will be largely retained, which aids in integrating construction phase activities within the surround landscape context. Small sections of hedgerow, proposed to be removed to facilitate the main site access as well as internal access between fields (associated with the access track formation) will, were visible, be perceived as a localised minor alteration to the vegetation cover within this development site. A single tree will be removed to facilitate access and provision of an internal track. No individual trees, group of trees or woodlands that are subject to or protected by a Tree Preservation Order are within proximity to the Proposed Development.

Best practice mitigation measures will be implemented across the site in order to protect the Kilmurry stream from potential adverse effects during all phases of the proposed project, in addition to the approximately 15m distance that was included in the design at the time of writing between the closest solar array and the stream.

Compensation

A new section of hedgerow will be hand planted along the northeastern boundary to compensate for the sections of hedgerows lost for the new access and tracks.

Biodiversity Enhancement

Landscape design should aim to deliver no net loss of habitat; incorporate planting that prioritises the use of native and wildlife friendly species; include both species diversity and structural diversity; leave areas of the site for natural succession with no active management; and enhance the ecological connectivity of the site to the surrounding environment.

There is potential on site to create a species rich grassland underneath the footprint of the proposed solar arrays. This can be done through the seeding of shade tolerant species seed mic. The seed mix can include:

- Suitable grass species: Crested dogstail *Cynosurus cristatus*, cock's-foot, creeping red fescue *Festuca rubra*, perennial ryegrass, meadow fescue *Lolium pratense*, smaller cat's tail *Phleum bertolonii*, smooth-stalked meadowgrass *Poa pratensis* and red clover *Trifolium pratense*.
- Suitable flower species: Yarrow *Achillea millefolium*, chicory *Cichorium intybus*, sainfoin *Onobrychis vicifolia*, sheep's parsley *Petroselenium crispum*, ribwort plantain and salad burnet *Paterium sanguisorba*.

The areas proposed for reseeding should be prepared through repeated harrowing and rolling during June – July, prior to sowing in August – September. Due to the scale of the area needing sowed, mechanical cultivators may be used. Care should be taken to sow the seed no deeper than 10 mm. The grass seed should be thoroughly mixed before and during sowing to avoid separation. After sowing, the site should be rolled to ensure good contact between the seed and soil to ensure rapid germination and establishment. Any failed areas of grass during the growing season should be re-seeded when weather conditions permit, using the original specified seed mix or wildflower plugs.

In combination with the above seed mix application, low intensity conservation sheep grazing may be used (pending stock availability) to prevent weed species overgrowth, maintain sward height (below 60 cm) and overall help ensure the development of a biodiverse grassland. If sheep stocking is not possible on the site due to availability concerns, mechanical cutting composed of strimming and mowing every year (removing cuttings) will ensure the establishment of a species rich grassland (with an average sward height of less than 5cm) and prevent the dominance of weed species (e.g. nettles, brambles etc). Mechanical cutting should be carried out in late summer and / or autumn to optimise habitat value for pollinator species.

Additional ecological enhancement measures recommended on site include:

- One hibernaculum for amphibian species within the eastern extent of the site;
- Five bird boxes to be incorporated within the retained hedgerows / treelines on site;
- Five bat boxes to be incorporated within the retained hedgerows / treelines on site and;
- Two invertebrate hotels around the extent of the proposed wildflower area

Please see the associated landscape drawings for further information.

Significance of Residual Effects

The implementation of mitigation and enhancement measures as set out above will ensure **No Significant Effect** on habitats, with potential for an overall **Significantly Positive Effect** in the long term.

5.3 Bats

Potential Impacts & Effects

Construction works will result in significant changes to the physical characteristics of the site alongside visual and noise disturbance from physical construction over the construction period.

Operation of the Proposed Development will have **No Significant Effect** of bats on site due to the nature and design of the proposal (no external lighting proposed).

The proposed project will have a **Significant Negative Effect** on bats with impacts from trimming on three trees (T7, T9 and T14) identified as providing roosting potential for a small number of individual bats (PRF-I).

Avoidance & Mitigation Measures

All trees assessed as having potential for roosting bats will be retained, with the exception of T7, T9 and T14 requiring trimming for access tracks. Therefore, it is recommended that a pre-construction PRF-Inspection survey is carried out 24-hours prior to proposed trimming works to check for roosting bats.

Biodiversity Enhancement

There is an opportunity to incorporate artificial bat roosts into the Proposed Development and this would be strongly recommended given the location of the site. Bat boxes can be attached the exterior of retained trees, with a recommendation for a minimum of five. An Ecological Clerk of Works can provide advice to the type and location of artificial bat boxes.

Significance of Residual Effects

The Proposed Development will have **No Significant Effect** on bats in the long-term following the implementation of mitigation and compensation recommended above.

5.4 Marsh Fritillary

Potential Impacts & Effects

A single small stand of devil's-bit scabious is present within the easternmost wet grassland / drainage ditch (dry). However, this section is not to be affected and lacks a suitably large stand of devil's-bit scabious, coupled with the most recent record of marsh fritillary being from 26.05.2023 (NBDC grid square N42), it is considered highly unlikely that marsh fritillary is present on site.

Significance of Residual Effects

The Proposed Development will have **No Significant Effect** on marsh fritillary.

5.5 Otter

Potential Impacts & Effects

There were no otter underground holts, above ground couches or evidence of otter recorded within the site or within 30 m of the boundary of the site. However, there is potential for commuting otters to utilise the Kilmurry stream, bordering plantation woodlands and nearby bogs to the northeast. Therefore, additional precautionary mitigation has been recommended for nocturnal otter foraging and commuting activity.

Operation of the Proposed Development will have **No Significant Effect** on otters in the absence of mitigation measures.

Avoidance & Mitigation Measures

Open excavations and / or trenches will either be covered to avoid access by mammals, or a means of escape installed to facilitate egress at the end of each working day over the construction period. All pipes will be capped overnight to prevent access by mammals over the construction period. Finally, construction works on site are to cease two hours prior to sunset.

Significance of Residual Effects

The Proposed Development will have **No Significant Effect** on otter.

5.6 Birds

Potential Impacts & Effects

There is suitable habitat on site that provides nesting, roosting and foraging habitat for bird species. Most hedgerows / treelines, in addition to underlying scrub along the boundaries of the site will be retained.

Pre-construction site clearance and construction works will require the removal of small stretches of hedgerows underlying scrub and tall ruderal / recolonizing bare soil. Additionally, large sections of existing improved agricultural grassland are to be subject to increased shading across the site that will result in changes to the physical characteristics of the site (tables are likely to be at a 15 degree tilt and shading would not be significant). The works have potential to result in destruction of bird nests and disturbance to breeding birds, if

carried out during the bird breeding season, which extends between 1st March and 31st August inclusive. Construction works will result in visual and noise disturbance from physical construction over the construction period. Therefore, in the absence of mitigation, the proposed project will have a **Significant Negative Effect** on birds.

Operation of the proposed project will have **No Significant Effect** of birds on site due to the nature and design of the proposal.

Avoidance & Mitigation Measures

Timing of works will ensure that the removal or management of vegetation including trees and scrub will take place outside the bird breeding season, which extends between 1st March and 31st August inclusive, to ensure breeding birds are protected from harm. If pre-construction site clearance and removal of vegetation is deemed unavoidable within the bird breeding season an Ecological Clerk of Works (ECoW) will undertake a survey to check for breeding birds immediately prior to works. If breeding birds are found to be present the ECoW will establish species-specific Ecological Exclusion Zones around active nests to ensure birds will be protected from disturbance or harm during works.

Significance of Residual Effects

The implementation of the mitigation as set out above will ensure the proposed project will have **No Significant Effect** on breeding birds.

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NPWS (2024) Lough Derg (Shannon) SPA: Conservation Objectives [Accessed 23 October 2025] Lough Derg (Shannon) SPA | National Parks & Wildlife Service (npws.ie)

PLATES

Plate 1 Example of Native Species Poor Hedgerow

Plate 2 Example of Arable Crops (Rutabaga)

Plate 3 Example of Arable Crops (recently harvested barley)

Plate 4 Example of Native Species Rich Treeline

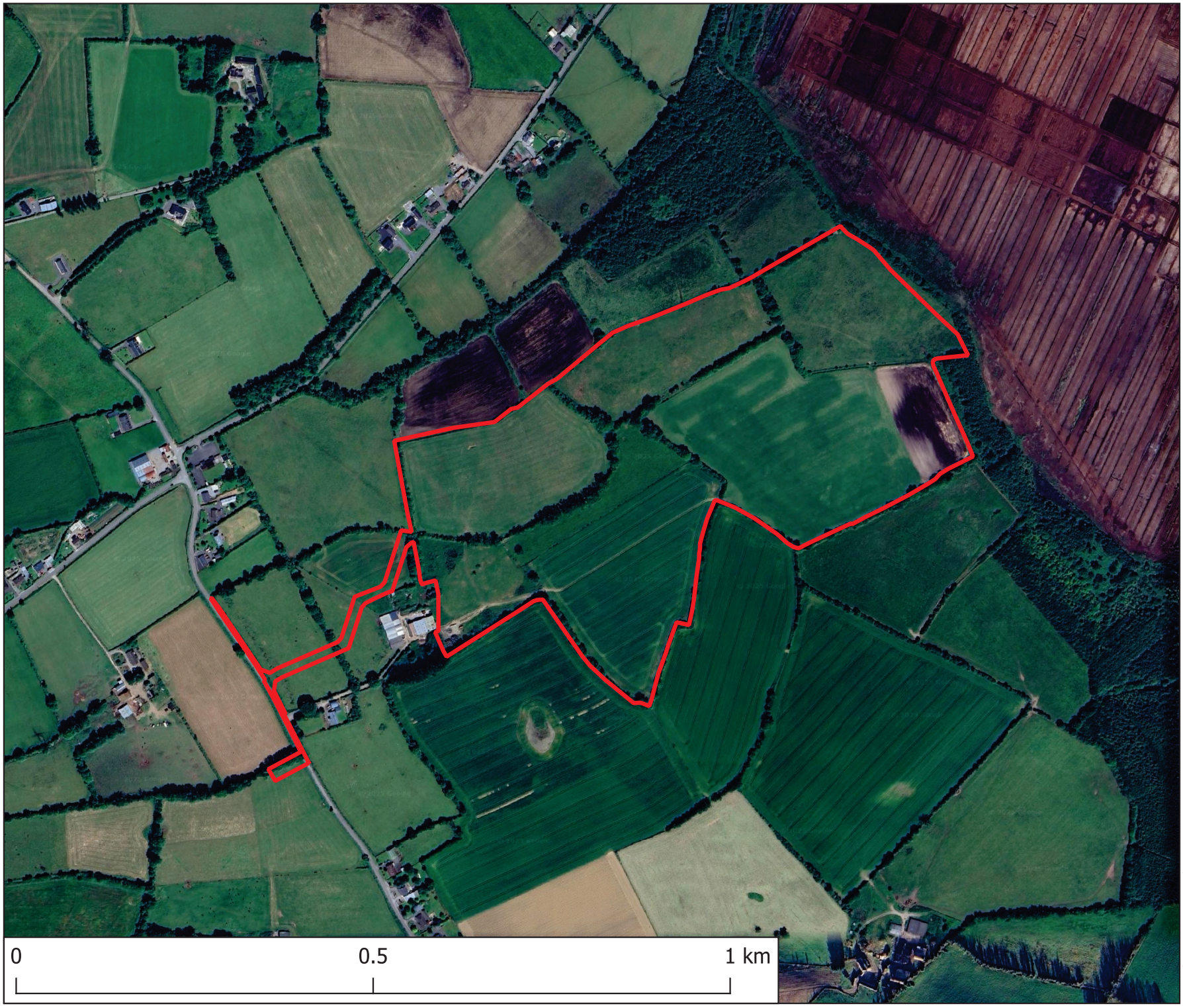
Plate 5 Example of Wet Grassland / Drainage Ditch (dry)

Plate 6 Small stand of devil's-bit scabious within Drainage Ditch (dry)

Plate 7 Example of Tall Ruderal / Recolonizing Bare Ground

FIGURES

LIST OF FIGURES



Legend

Site Boundary

rps
A TETRA TECH COMPANY
Elmwood House
74 Boucher Road
Belfast
BT12 6RZ
T +44(0) 28 90 667914
F +44(0) 28 90 668286
W www.rpsgroup.com/ireland
E ireland@rpsgroup.com

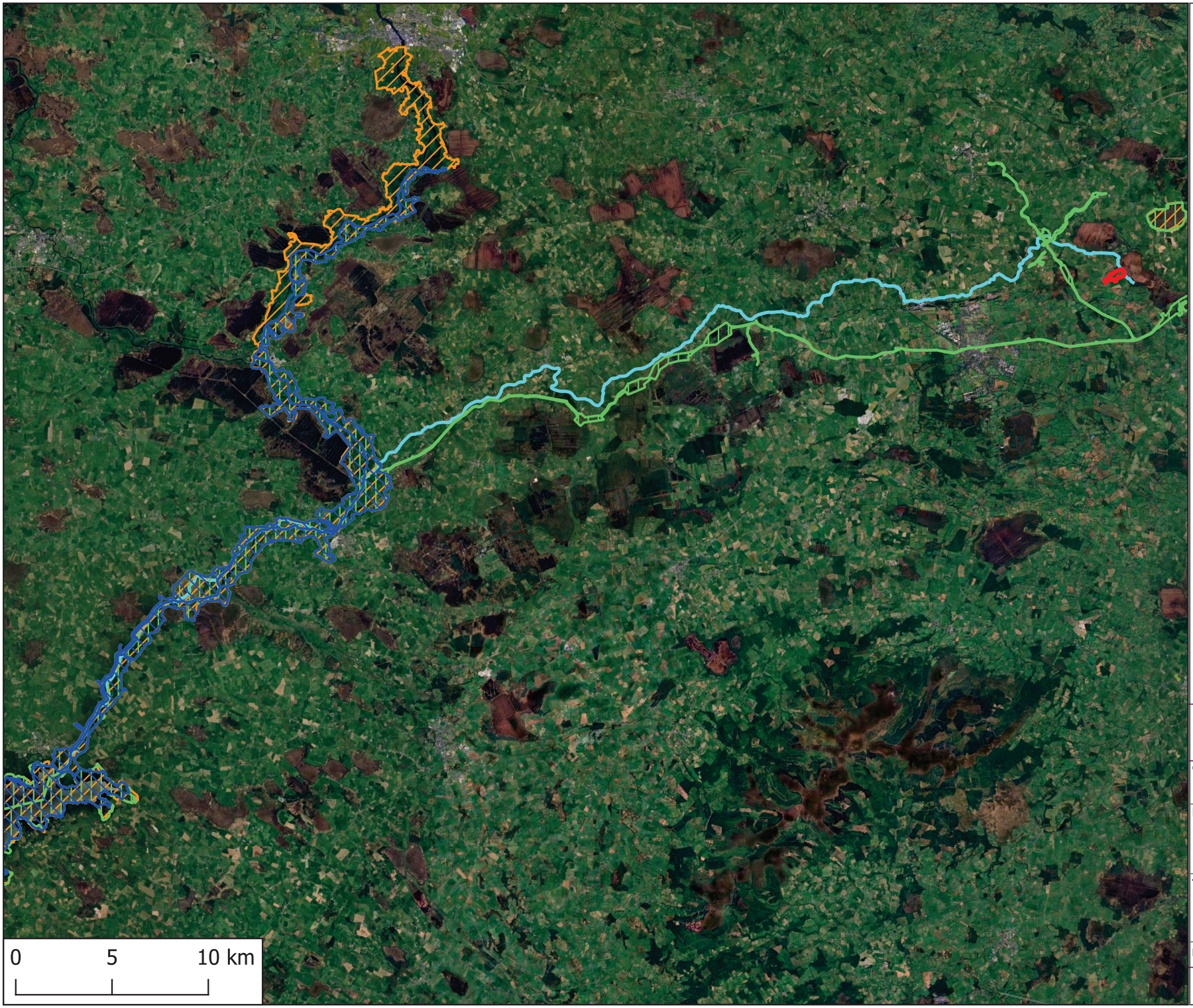
Client: RES

Project: Derrygrogan Solar

Title: Site Location

Figure No. 1.0

Project No.	Date	Revision
02898	23.10.2025	D01



Legend

- Site Boundary
- SPA
- pNHA
- SAC
- Rivers

rps
A TETRA TECH COMPANY
Elmwood House
74 Boucher Road
Belfast
BT12 6RZ
T +44(0) 28 90 667914
F +44(0) 28 90 668286
W www.rpsgroup.com/ireland
E ireland@rpsgroup.com

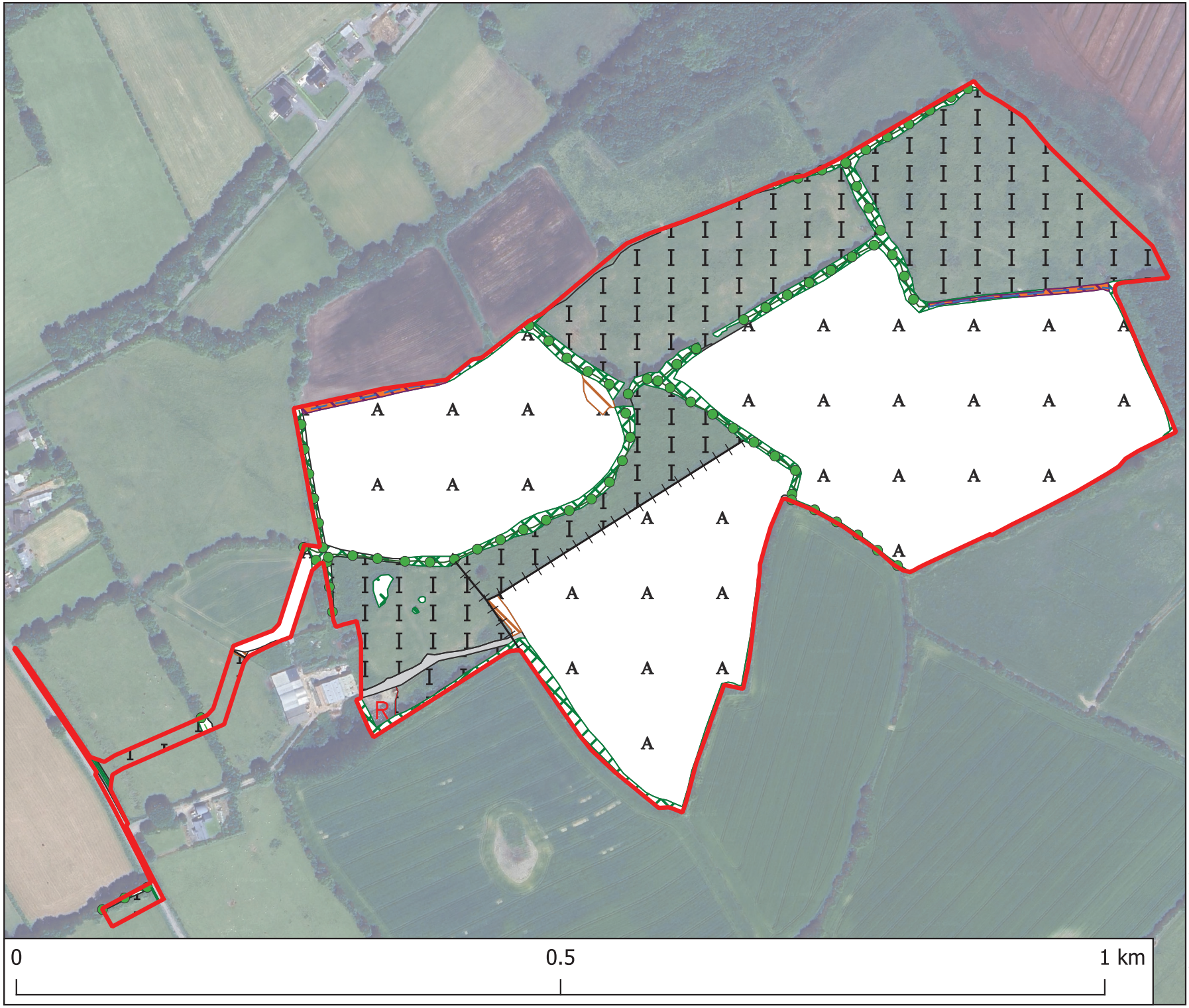
Client: RES

Project: Derrygrogan Solar

Title: Designated Sites

Figure No. 2.0

Project No.	Date	Revision
02898	23.10.2025	D01



Legend

- Site Boundary
- Native Species Poor Hedgerow
- Native Species Rich Treeline
- Native Species Poor Treeline
- Fencing
- Drainage Ditch (Dry)
- Dense Scrub
- Scattered Scrub
- Improved Agricultural Grassland
- Wet Grassland
- Tall Ruderal / Recolonising Bare Ground
- Refuse
- Arable Crops
- Hardstanding / Bare Ground

rps
A TETRA TECH COMPANY
Elmwood House
74 Boucher Road
Belfast
BT12 6RZ
T +44(0) 28 90 667914
F +44(0) 28 90 668286
W www.rpsgroup.com/ireland
E ireland@rpsgroup.com

Client: RES

Project: Derrygrogan Solar

Title: Extended Phase 1 Habitat Map

Figure No. 3.0

Project No.	Date	Revision
02898	23.10.2025	D01

Legend

- Site Boundary
- Devils bit scabious
- Hedgerow / Treeline Removal

Trees with Bat Roost Potential

- FAR
- None
- PRF-I

rps A TETRA TECH COMPANY

Elmwood House
74 Boucher Road
Belfast
BT12 6RZ

T +44(0) 28 90 667914
F +44(0) 28 90 668286
W www.rpsgroup.com/ireland
E ireland@rpsgroup.com

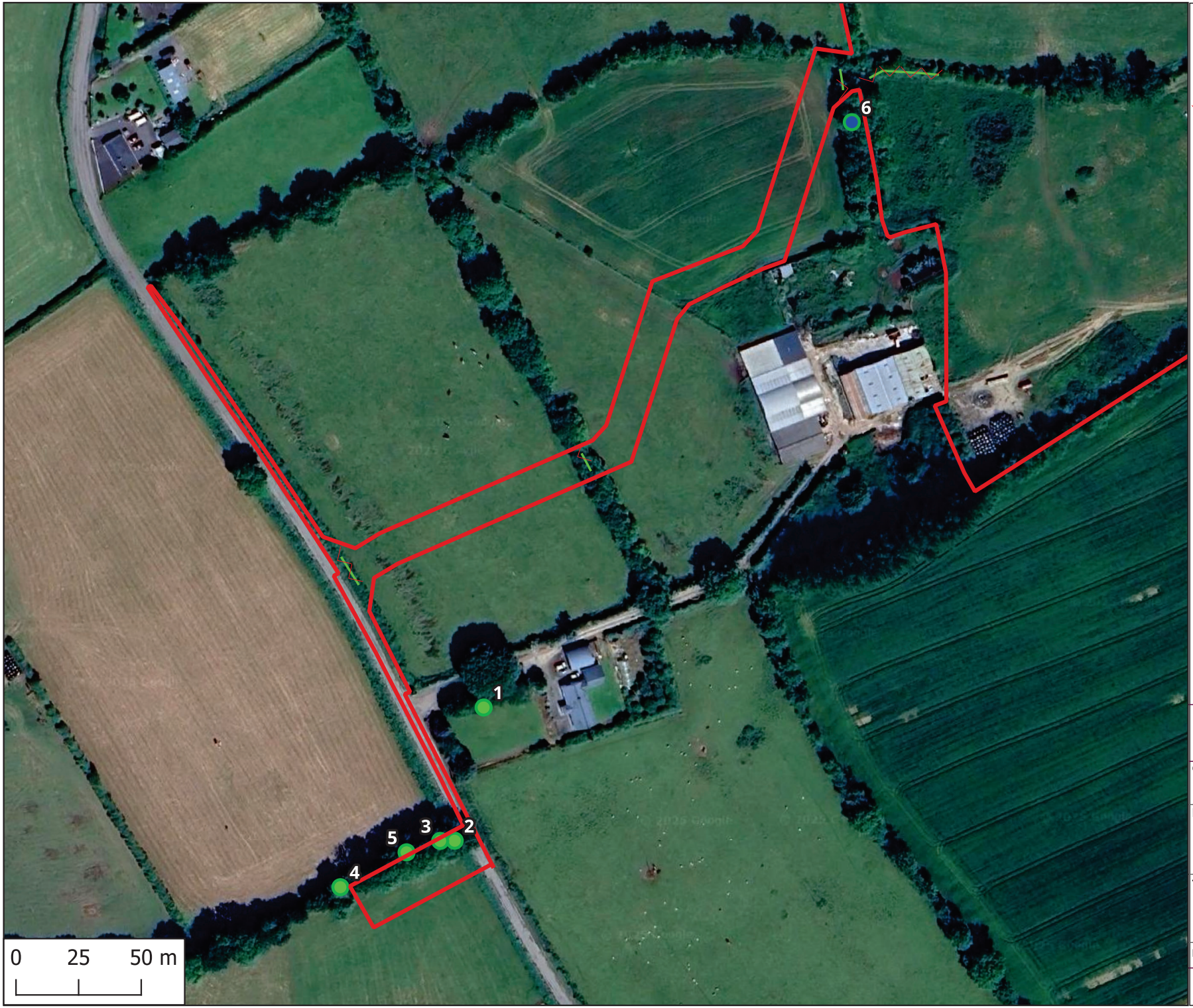
Client: RES

Project: Derrygrogan Solar

Title: Ecological Constraints Map - Overview

Figure No. 4.1

Project No.	Date	Revision
02898	01.12.2025	D02



Legend

- Site Boundary
- Hedgerow / Treeline Removal

Trees with Bat Roost Potential

- FAR
- None

rps
A TETRA TECH COMPANY
Elmwood House
74 Boucher Road
Belfast
BT12 6RZ
T +44(0) 28 90 667914
F +44(0) 28 90 668286
W www.rpsgroup.com/ireland
E ireland@rpsgroup.com

Client: RES

Project: Derrygrogan Solar

Title: Ecological Constraints Map - Zoom 1

Figure No. 4.2

Project No.	Date	Revision
02898	01.12.2025	D02

Legend

- Site Boundary
- Hedgerow / Treeline Removal

Trees with Bat Roost Potential

- FAR
- None
- PRF-I

RPS
A TETRA TECH COMPANY
Elmwood House
74 Boucher Road
Belfast
BT12 6RZ
T +44(0) 28 90 667914
F +44(0) 28 90 668286
W www.rpsgroup.com/ireland
E ireland@rpsgroup.com

Client: RES

Project: Derrygrogan Solar

Title: Ecological Constraints Map - Zoom 2

Figure No. 4.3

Project No.	Date	Revision
02898	01.12.2025	D02

Legend

- Site Boundary
- Devils bit scabious
- Hedgerow / Treeline Removal

Trees with Bat Roost Potential

- FAR
- None
- PRF-I

RPS
A TETRA TECH COMPANY
Elmwood House
74 Boucher Road
Belfast
BT12 6RZ
T +44(0) 28 90 667914
F +44(0) 28 90 668286
W www.rpsgroup.com/ireland
E ireland@rpsgroup.com

Client: RES

Project: Derrygrogan Solar

Title: Ecological Constraints Map - Zoom 3

Figure No. 4.4

Project No.	Date	Revision
02898	01.12.2025	D02

APPENDICES

Appendix A

National Biodiversity Network Dataset and National Biodiversity Data Centre Citations

Table A 1: NBN Atlas Records within 1 km of the site

Common Name	Taxon Latin Name	Event Date	Event Location
European Otter	*Lutra lutra*	1980	N400300

Table A 2: NBN Atlas Dataset Citations for 10 km search

Name	DOI	Citation	Rights	More Information	Records in Download
Biological Records Centre	-	Records provided by Biological Records Centre, accessed through NBN Atlas website.	-	For more information: email brc@ceh.ac.uk, or https://registry.nbnatlas.org/public/show/dp77	58
British Bryological Society	-	Records provided by British Bryological Society, accessed through NBN Atlas website.	-	For more information: email oliver.pescott@ceh.ac.uk, or https://registry.nbnatlas.org/public/show/dp74	797
British Lichen Society	-	Records provided by British Lichen Society, accessed through NBN Atlas website.	-	For more information: https://registry.nbnatlas.org/public/show/dp30	293
Bee, wasp and ant (Hymenoptera: Aculeata) records verified via iRecord	10.15468/idirhy	Biological Records Centre. [Date downloaded]. Bee, wasp and ant (Hymenoptera: Aculeata) records verified via iRecord.	Creative Commons with Attribution 4.0 (CC-BY) CC BY Creative Commons Attribution	For more information: https://registry.nbnatlas.org/public/show/dr2140	1
Bob Merritt Coleoptera Dataset	doi:10.15468/hjlqbw	Biological Records Centre ([Insert download year]). Bob Merritt Coleoptera Dataset. Occurrence dataset on the NBN Atlas	Creative Commons with Attribution 4.0 (CC-BY) CC-BY	For more information: email brc@ceh.ac.uk, or https://registry.nbnatlas.org/public/show/dr1275	12
Opiliones (Harvestman) Dataset	doi:10.15468/ukhdhe	Biological Records Centre ([Insert download year]). Opiliones (Harvestman) Dataset. Occurrence dataset on the NBN Atlas	Creative Commons with Attribution 4.0 (CC-BY) CC-BY	For more information: email brc@ceh.ac.uk, or https://registry.nbnatlas.org/public/show/dr1234	18
Balfour-Browne Club	-	Records provided by Balfour-Browne Club, accessed through NBN Atlas website.	-	For more information: email latissimus@btinternet.com, or https://registry.nbnatlas.org/public/show/dp124	12
Water Beetle Surveys from Britain and Ireland	doi:10.15468/npcgrp	Balfour-Browne Club ([Insert download year]). Water Beetle Surveys from Britain and Ireland. Occurrence dataset on the NBN Atlas	Creative Commons Zero v1.0 (CC0) CC0	For more information: email Latissimus@btopenworld.com, or https://registry.nbnatlas.org/public/show/dr686	12
Soldierflies and Allies Recording Scheme - data verified via iRecord	doi:10.15468/6pghte	Soldierflies and Allies Recording Scheme ([data of download]). Records via iRecord.	Creative Commons with Attribution 4.0 (CC-BY) CC BY Creative Commons Attribution	For more information: https://registry.nbnatlas.org/public/show/dr680	2
Cranefly (Diptera; Tipuloidea) records for Britain to 2016	doi:10.15468/wggm3t	Records provided by Cranefly (Diptera; Tipuloidea) records for Britain to 2016, accessed through NBN Atlas website.	Creative Commons with Attribution 4.0 (CC-BY) CC-BY	For more information: email brc@ceh.ac.uk, or https://registry.nbnatlas.org/public/show/dr683	6
Atomariine Beetle (Coleoptera) records for	doi:10.15468/w95cxa	Biological Records Centre ([Insert download year]). Atomariine Beetle	Creative Commons with Attribution 4.0 (CC-BY) CC-BY	For more information: email brc@ceh.ac.uk, or https://registry.nbnatlas.org/public/show/dr1338	3

Britain and Ireland to 1992		(Coleoptera) records for Britain and Ireland to 1992. Occurrence dataset on the NBN Atlas			
Crayfish (Crustacea; Astacura) data for Britain and Ireland to 2003	doi:10.15468/aznmq1	Biological Records Centre ([Insert download year]). Crayfish (Crustacea; Astacura) data for Britain and Ireland to 2003. Occurrence dataset on the NBN Atlas	Creative Commons with Attribution 4.0 (CC-BY) CC-BY	For more information: email brc@ceh.ac.uk, or https://registry.nbnatlas.org/public/show/dr725	1
Mammal records from Britain from the Atlas of Mammals (1993), with some subsequent records	doi:10.15468/1qyxis	Biological Records Centre ([Insert download year]). Mammal records from Britain from the Atlas of Mammals (1993), with some subsequent records. Occurrence dataset on the NBN Atlas	Creative Commons with Attribution 4.0 (CC-BY) CC-BY	For more information: email brc@ceh.ac.uk, or https://registry.nbnatlas.org/public/show/dr743	5
Soldierflies and Allies Recording Scheme	-	Records provided by Soldierflies and Allies Recording Scheme, accessed through NBN Atlas website.	-	For more information: https://registry.nbnatlas.org/public/show/dp37	2
Bryophyte data for Great Britain and Ireland from the British Bryological Society held by BRC	10.15468/5cxsnk	Please cite both Blockeel TL, Bosanquet SDS, Hill M , Preston C (eds) 2014. Atlas of British and Irish bryophytes. Newbury: Pisces Publications. (data up to 2013) and the specific DOI associated with this dataset here on the NBN (post-2013 data).	Creative Commons with Attribution 4.0 (CC-BY)	For more information: https://registry.nbnatlas.org/public/show/dr3044	797
Hypogean macro-Crustacea records	doi:10.15468/jzjzcr	Hypogean Crustacea Recording Scheme ([Insert download year]). Hypogean macro-Crustacea records. Occurrence dataset on the NBN Atlas	Open Government Licence (OGL) OGL	For more information: email lee.knight@talk21.com , or https://registry.nbnatlas.org/public/show/dr1243	2
Ground Beetle Recording Scheme - data verified via iRecord	10.15468/gj8bkp	Ground Beetle Recording Scheme. [Date of download] Records verified via iRecord.	Creative Commons with Attribution 4.0 (CC-BY) CC BY Creative Commons Attribution	For more information: https://registry.nbnatlas.org/public/show/dr2377	2
Lacewings and allied insects records from Britain and Ireland to 1999	doi:10.15468/su1ho7	Biological Records Centre ([Insert download year]). Lacewings and allied insects records from Britain and Ireland to 1999. Occurrence dataset on the NBN Atlas	Creative Commons with Attribution 4.0 (CC-BY) CC-BY	For more information: email brc@ceh.ac.uk, or https://registry.nbnatlas.org/public/show/dr1266	1
Reptiles and Amphibians Dataset	doi:10.15468/1lhrhx	Biological Records Centre ([Insert download year]). Reptiles and Amphibians Dataset. Occurrence dataset on the NBN Atlas	Creative Commons with Attribution 4.0 (CC-BY) CC-BY	For more information: email brc@ceh.ac.uk, or https://registry.nbnatlas.org/public/show/dr1385	3
Ladybird Survey of the UK	doi:10.15468/3kvvxb	Biological Records Centre ([Insert download year]).	Creative Commons with Attribution 4.0 (CC-BY) CC-BY	For more information: email brc@ceh.ac.uk, or	4

		Ladybird Survey of the UK. Occurrence dataset on the NBN Atlas		https://registry.nbnatlas.org/public/show/dr695	
BLS Mapping Scheme dataset, 1750-2009	doi:10.15468/glbi05	Records provided by BLS Mapping Scheme dataset, 1750-2009, accessed through NBN Atlas website.	Creative Commons with Attribution 4.0 (CC-BY) CC-BY	For more information: email datamanager@britishlichensociety.org.uk, or https://registry.nbnatlas.org/public/show/dr753	293
Conchological Society of Great Britain & Ireland: non-marine molluscs (1999 Atlas dataset)	doi:10.15468/gbawsj	Conchological Society of Great Britain & Ireland (2017), Conchological Society of Great Britain & Ireland: non-marine molluscs (1999 Atlas dataset). Occurrence dataset	Creative Commons with Attribution 4.0 (CC-BY) CC-BY	For more information: email secretary@conchsoc.org, or https://registry.nbnatlas.org/public/show/dr676	394
Hypogean Crustacea Recording Scheme	-	Records provided by Hypogean Crustacea Recording Scheme, accessed through NBN Atlas website.	-	For more information: https://registry.nbnatlas.org/public/show/dp157	2
Grasshopper and Cricket (Orthoptera) and related species records from Britain and Ireland to 2007	doi:10.15468/nvyurg	Biological Records Centre ([Insert download year]). Grasshopper and Cricket (Orthoptera) and related species records from Britain and Ireland to 2007. Occurrence dataset on the NBN Atlas	Creative Commons with Attribution 4.0 (CC-BY) CC-BY	For more information: email brc@ceh.ac.uk, or https://registry.nbnatlas.org/public/show/dr713	2
Conchological Society of Great Britain & Ireland	-	Records provided by Conchological Society of Great Britain & Ireland, accessed through NBN Atlas website.	-	For more information: https://registry.nbnatlas.org/public/show/dp117	394

Table A 3: NBDC Records within 1 km grid squares around the site

Species Group	Species Name	Record Count	Date of Last Record	Title of Dataset	Designation
Terrestrial mammal	Brown Long-eared Bat (Plecotus auritus)	1	08/08/1999	National Bat Database of Ireland	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts
Terrestrial mammal	Pipistrelle (Pipistrellus pipistrellus sensu lato)	1	08/08/1999		
Conifer	Norway Spruce (Picea abies)	1	20/08/2001	Species Data from the National Vegetation Database	N/A
Fern	Bracken (Pteridium aquilinum)	2	20/08/2001		

Fern	Broad Buckler-fern (Dryopteris dilatata)	3	20/08/2001		
Fern	Hart's-tongue (Phyllitis scolopendrium)	1	20/08/2001		
Fern	Male-fern (Dryopteris filix-mas)	1	20/08/2001		
Fern	Narrow Buckler-fern (Dryopteris carthusiana)	2	20/08/2001		
Flowering plant	Ash (Fraxinus excelsior)	3	20/08/2001		
Flowering plant	Beech (Fagus sylvatica)	1	20/08/2001		
Flowering plant	Bramble (Rubus fruticosus agg.)	3	20/08/2001		
Flowering plant	Bush Vetch (Vicia sepium)	1	20/08/2001		
Flowering plant	Carnation Sedge (Carex panicea)	1	20/08/2001		
Flowering plant	Cock's-foot (Dactylis glomerata)	1	20/08/2001		
Flowering plant	Common Sallow (Salix cinerea)	2	20/08/2001		
Flowering plant	Downy Birch (Betula pubescens)	3	20/08/2001		
Flowering plant	Greater Pond-sedge (Carex riparia)	1	20/08/2001		
Flowering plant	Greater Tussock-sedge (Carex paniculata)	2	20/08/2001		
Flowering plant	Hawthorn (Crataegus monogyna)	1	20/08/2001		
Flowering plant	Hazel (Corylus avellana)	1	20/08/2001		
Flowering plant	Herb-Robert (Geranium robertianum)	2	20/08/2001		
Flowering plant	Holly (Ilex aquifolium)	3	20/08/2001		
Flowering plant	Honeysuckle (Lonicera periclymenum)	3	20/08/2001		
Flowering plant	Hybrid Oak (Quercus petraea x robur = Q. x rosacea)	1	20/08/2001		
Flowering plant	Ivy (Hedera helix)	3	20/08/2001		
Flowering plant	Marsh-bedstraw (Galium palustre)	2	20/08/2001		
Flowering plant	Purple Moor-grass (Molinia caerulea)	3	20/08/2001		
Flowering plant	Raspberry (Rubus idaeus)	1	20/08/2001		
Flowering plant	Red Fescue (Festuca rubra)	1	20/08/2001		
Flowering plant	Remote Sedge (Carex remota)	1	20/08/2001		
Flowering plant	Rough Meadow-grass (Poa trivialis)	2	20/08/2001		
Flowering plant	Sycamore (Acer pseudoplatanus)	1	20/08/2001		Invasive Species: Medium Risk Invasive Species (2013 Report)
Flowering plant	Yorkshire-fog (Holcus lanatus)	1	20/08/2001		N/A
Terrestrial mammal	Badger (Meles meles)	1	31/12/2004	Badger Setts of Ireland Database	Protected Species: Wildlife Acts
Terrestrial mammal	Badger (Meles meles)	1	31/12/2004		
Bird	Blackbird (Turdus merula)	1	30/06/2012	Birds of Ireland	N/A

Bird	Blackcap (Sylvia atricapilla)	1	30/06/2012		
Bird	Bullfinch (Pyrrhula pyrrhula)	1	30/06/2012		
Bird	Dunnock (Prunella modularis)	1	30/06/2012		
Bird	Goldcrest (Regulus regulus)	1	30/06/2012		Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Goldfinch (Carduelis carduelis)	1	30/06/2012		N/A
Bird	Lesser Redpoll (Acanthis cabaret)	1	30/06/2012		
Bird	Long-tailed Tit (Aegithalos caudatus)	1	30/06/2012		
Bird	Reed Bunting (Emberiza schoeniclus)	1	30/06/2012		
Bird	Robin (Erithacus rubecula)	1	30/06/2012		Protected Species: Wildlife Acts
Bird	Song Thrush (Turdus philomelos)	1	30/06/2012		N/A
Bird	Spotted Flycatcher (Muscicapa striata)	1	30/06/2012		Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Swallow (Hirundo rustica)	1	30/06/2012		
Bird	Whitethroat (Curruca communis)	1	30/06/2012		N/A

Bird	Willow Warbler (Phylloscopus trochilus)	1	30/06/2012		Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Woodpigeon (Columba palumbus)	1	30/06/2012		N/A
Bird	Wren (Troglodytes troglodytes)	1	30/06/2012		
Bird	Yellowhammer (Emberiza citrinella)	1	30/06/2012		Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Terrestrial mammal	Red Fox (Vulpes vulpes)	1	30/01/2015	General Biodiversity Records from Ireland	N/A
Flowering plant	Greater Stitchwort (Stellaria holostea)	1	07/04/2023	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
Conifer	Scots Pine (Pinus sylvestris)	2	27/07/2023		
Flowering plant	Alder Buckthorn (Frangula alnus)	1	03/09/2023		
Flowering plant	Beech (Fagus sylvatica)	1	03/09/2023		
Flowering plant	Late Cotoneaster (Cotoneaster lacteus)	1	03/09/2023		
Flowering plant	Spindle (Euonymus europaeus)	1	03/09/2023		

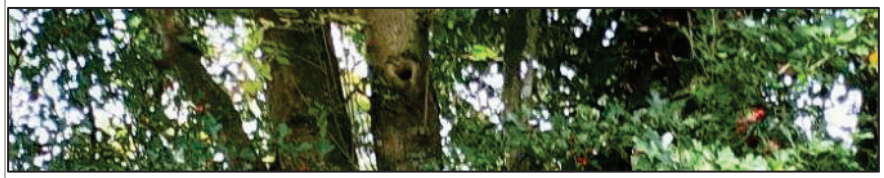
Appendix B
Ecological Survey for Bats

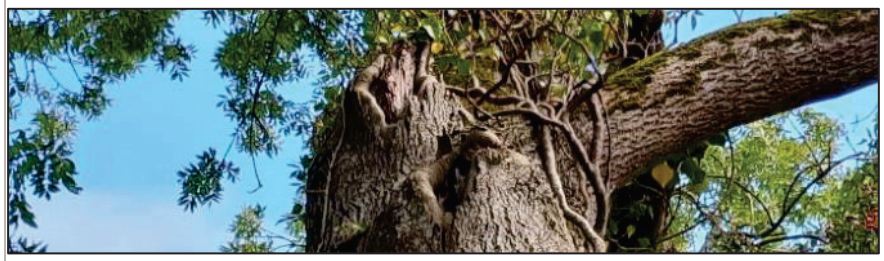
Table A1.1: Preliminary Roost Assessment of Trees

No.	Date	Photo	Description	Evidence of Bats	GLTA	PRF Inspection Survey
1	10.09.25		Mature beech Feature 1: Large broken branch on the southern aspect ~ 5.5 m up  Feature 2: Large broken branch on the southeastern aspect ~ 6 m up 	None	**FAR**	Not climbed Not to be affected

2	10.09.25		Mature ash Feature 1: Knothole on the southeastern aspect ~ 9.5 m up  Feature 2: X2 knotholes on the southwestern aspect ~ 4 m up  Feature 3: Knothole on the southwestern aspect ~ 9.5 m up 	None	**FAR**	Not climbed Not to be affected

3	10.09.25		Semi-mature ash Feature 1: Knothole on the southeastern aspect ~ 9.5 m up 	None	**FAR**	Not climbed Not to be affected
4	10.09.25		Semi-mature ash Feature 1: Old tear out with crevice present at top on the southwestern aspect ~ 9 m up 	None	**FAR**	Not climbed Not to be affected

5	10.09.25		Semi-mature ash Feature 1: Knothole on the southern aspect ~ 3.5 m up 	None	**FAR**	Not climbed Not to be affected
6	10.09.25		Semi-mature ash Feature 1: Knothole on the eastern aspect ~ 3.5 m up 	None	**FAR**	Climbed: 24.09.25 <u>Feature 1:</u> Superficial = None Not to be affected

7	10.09.25		Mature ash Feature 1: tear out with potential cavities present on the western aspect ~ 7.5 m up  Feature 2: Knothole on the eastern aspect ~ 3 m up 	None	**FAR**	Climbed: 24.09.25 <u>Feature 1:</u> Upward facing orientation, damp interior and relatively exposed = None <u>Feature 2:</u> ~ 15 cm long and 8 cm wide with a dry interior (woodlice present) = **PRF-I** **To be retained with cutting back**
8	10.09.25		Mature ash Feature 1: Knothole on the western aspect ~ 7.5 m up 	None	**FAR**	Climbed: 24.09.25 <u>Feature 1:</u> Superficial = None Not to be affected

9	10.09.25		Mature ash with dense ivy Feature 1: Old tear out (now covered in ivy) on the western aspect ~ 8 m up 	None	**FAR**	Climbed: 24.09.25 <u>Feature 1:</u> Relatively exposed, travels downwards dry interior with limited shelter from wind = **PRF-I** **To be retained with cutting back**
10	10.09.25		Mature ash with dense ivy Feature 1: Knothole on overhanging branch on the western aspect, facing south ~ 9.5 m up 	None	**FAR**	Not climbed Not to be affected
11	10.09.25		Dead semi-mature ash Feature 1: Old woodpecker hole on the eastern aspect ~ 4 m up 	None	**FAR**	Not climbed Not to be affected

12	10.09.25		Mature ash Feature 1: Knothole on overhanging branch on the eastern aspect, facing east ~ 8 m up 	None	**FAR**	Not climbed Not to be affected
13	10.09.25		Mature ash with dense ivy Feature 1: Tear out on the western aspect ~ 9 m up 	None	**FAR**	Not climbed Not to be affected
14	10.09.25		Mature oak Feature 1: Tear out on the northeastern aspect ~ 7.5 m up 	None	**FAR**	Climbed: 25.09.25 <u>Feature 1:</u> Ramshorn ~ 18 cm long, relatively exposed, dry interior = **PRF-I** <u>Feature 2:</u> Superficial = None

		Feature 2: Knothole on the northeastern aspect ~ 7.5 m up  Feature 3: Dead overhanging branch on the eastern aspect with cavity, facing north ~ 6 m up  Feature 4: Dead overhanging branch on the southeastern aspect with cavity ~ 6 m up 			Feature 3a: Ramshorn feature superficial = None Feature 3b: Hazard beam is relatively exposed, with an old wasp nest present = **PRF-I** Feature 4: Superficial = None Feature 5: Shallow and small ~ 2 cm wide at entrance with a shallow dry cavity = **PRF-I** **To be retained with cutting back**

			Feature 5: Knothole on the eastern aspect 			
15	10.09.25		Semi-mature ash Feature 1: Knothole on the southern aspect ~ 6 m up 	None	**FAR**	Climbed: 25.09.25 <u>Feature 1:</u> Superficial = None Not to be affected
16	10.09.25		Semi-mature ash with dense ivy Feature 1: Knothole on the southern aspect ~ 8 m up 	None	**FAR**	Climbed 25.09.25 <u>Feature 1:</u> Superficial = None Not to be affected

RPS

James McCrory
Technical Director | Ecology

Elmwood House
74 Boucher Road
Belfast
BT12 6RZ
Northern Ireland

T +44 2890 667 914