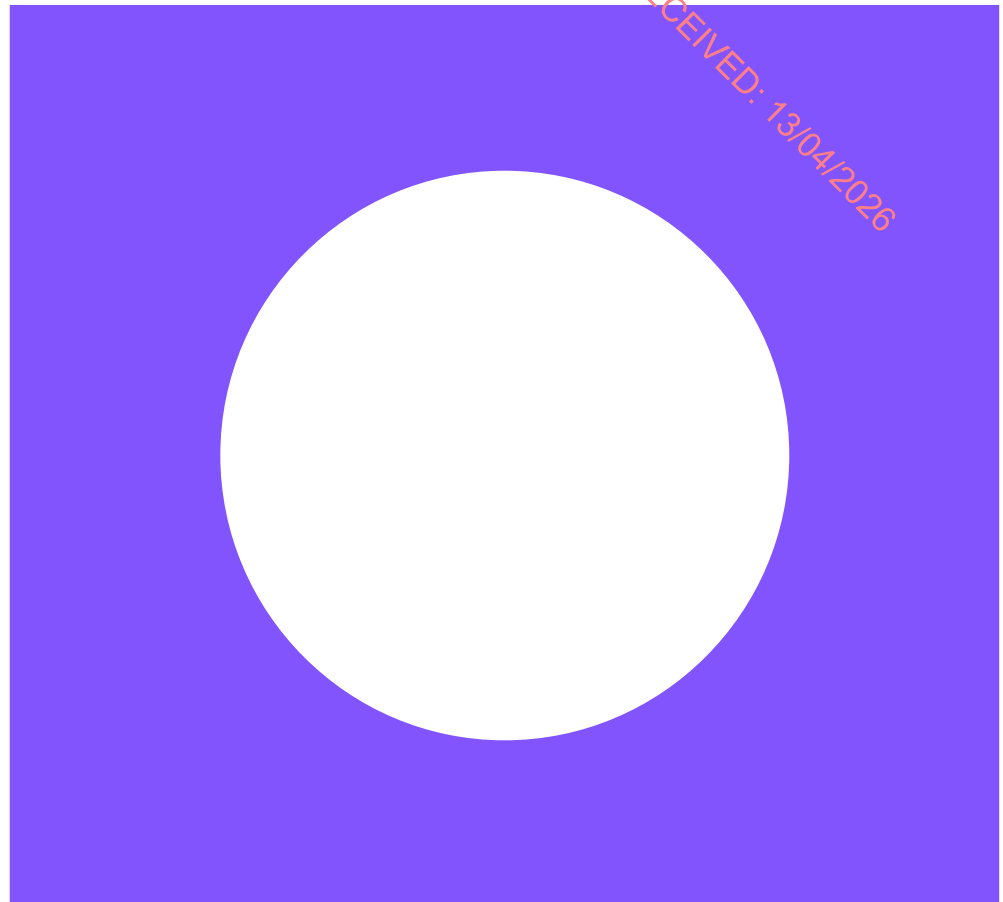


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Shelburne Energy Farm Environmental Impact Assessment Report

Chapter 7 Biodiversity

April 2026

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Shelburne Energy Farm Environmental Impact Assessment Report

Chapter 7 Biodiversity

April 2026

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7 Biodiversity

7.1 Introduction

This chapter assesses the likely significant effects from the Proposed Project on biodiversity. Biodiversity (or “biological diversity”), as defined at the United Nations Convention on Biological Diversity (CBD)¹, is *‘the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes genetic diversity within species, between species and of ecosystems’*.

This EIAR chapter was prepared by Mott MacDonald with specialist inputs as required. The details regarding the specialist inputs are provided below in the relevant sections which describe the surveys undertaken to inform this assessment.

The assessment is based on the development as described in Chapter 3.

7.1.1 Constraints and Design approach

This EIAR Chapter follows, and was informed by, a series of biodiversity studies carried out on the site for the Proposed Project.

As outlined previously in Chapter 5, the design of the Proposed Project has been an iterative process. In the early stages of the project, ecological sensitivities formed part of the consideration of alternatives, for example sensitive habitats were outlined to the designers to avoid. This has continued into the design of the Proposed Project for consent, in that, where Important Ecological Features (IEFs) have been identified, the design has been amended to avoid / minimise risk of effects in the first instance. Biodiversity assessments provided a comprehensive consideration of the biodiversity identified and communicated constraints at the earliest opportunity to the design team.

A preliminary Ecological Assessment including a site visit and desk study was conducted at the commencement of the project programme to inform the proposed design and identify sensitive ecological receptors within the site for avoidance of infrastructure as far as possible.

The key general design approaches to avoid / minimise effects on IEFs included;

- Avoiding conservation sites including European sites that form part of the Natura 2000 network. European sites comprise:
 - Special Areas of Conservation (SACs) (and candidate SACs) designated under the Habitats Directive (92/43/EEC) due to their significant ecological importance for species and habitats protected under Annexes I and II respectively of the Habitats Directive; and,
 - Special Protection Areas (SPAs), designated for the protection of populations and habitats of
- Avoiding National and proposed National Heritage Areas.
- Avoiding known areas used by bird species protected under the EU Birds Directive (Council Directive 2009/409/EEC).
- Avoid rivers and riparian areas and ensure buffers are maintained between the development and water courses

¹

<https://www.cbd.int/>

- The proposed surface water retention pond will incorporate ecological design to allow a wetland and semi natural grassland develop.
- Minimise tree and bush clearance where feasible.
- Avoidance of sensitive semi natural woodland and wetland habitats where possible.
- Avoid developing infrastructure in unimproved wet grassland and marsh habitat identified within the site.

Potential effects of the Proposed Project on European sites are presented in this EIAR Chapter, within the EIA framework. Within the framework of Article 6(3) of the Habitats Directive, an assessment of likely significant effects from the Proposed Project on European sites, in combination with other plans or projects is presented, along with an assessment of adverse effects on European site integrity from the Proposed Project in combination with other plans or projects, in the 'Screening for Appropriate assessment and Natura Impact Statement', in ++.

7.1.2 Policy

The following plan has been the primary policy used to inform this chapter:

- Wexford County Development Plan 2022 – 2028 (WCDP)

The WCDP takes account of the overall objectives of the National Biodiversity Action Plan and translates them into a local County Wexford context. The plan has 28 natural heritage objectives with the overall goal being to 'protect, conserve and where appropriate enhance the natural, built and cultural heritage of the county.'

7.1.3 Legislation

The assessment of likely significant effects on biodiversity arising from the Proposed Project, has been carried out in accordance with relevant legislation, including the following:

- EIA Directive (2014/52/EU);
- Planning and Development Acts 2000, as amended and the Planning and Development Regulations 2001, as amended;
- Wildlife Act 1976, as amended;
- EU Habitats Directive (92/43/EEC)
- EU Birds Directive 2009/147/EEC
- Flora (Protection) Order 2022;
- EU Water Framework Directive 2000/60/EC;
- European Communities (Birds and Natural Habitats) Regulations 2011 (as amended);
- Ireland's 4th National Biodiversity Action Plan 2023–2030.

7.1.4 Guidance

In surveying, valuing and describing the ecological receptors and the potential impacts on biodiversity arising from construction and operation of the Proposed Project, the following guidance was considered including;

- Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2024)²
- Best Practice Guidance for Habitat Survey and Mapping (Smith et al., 2011).

² CIEEM (2024) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine.

- Guidelines for Assessment of Ecological Impacts of National Road Schemes (National Roads Authority, 2009).
- Ecological Surveying Techniques for Protected Flora and Fauna during the planning of National Road Schemes (National Roads Authority, 2009).
- Guidelines for the Treatment of Badgers Prior to the Construction of National Road Schemes (National Roads Authority, 2005).
- Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes (National Roads Authority, 2008).
- A Guide to Habitats in Ireland (Fossitt, 2000)³
- Best Practice Guidance for Habitat Survey and Mapping (Smith *et al.*, 2011)⁴
- Guidelines for the Treatment of Bats During the Construction of National Road Schemes (National Roads Authority, 2005).
- Countryside Bird Survey (2012) CBS Manual Guidelines for Countryside Bird Survey participants.
- Bat Surveys for Professional Ecologists: Good Practice Guidelines, 4th Edition (Bat Conservation Trust, 2023).
- Kilroy G, Dunne F, Ryan J, O'Connor A, Daly D, Craig M, Coxon C, Johnston P and Henning M (2008). A Framework for the Assessment of Groundwater Dependent Terrestrial Ecosystems under the Water Framework Directive. Environmental Research Centre Report. Environmental Protection Agency Ireland.
- Department of Arts, Heritage and the Gaeltacht – National Parks and Wildlife Service (DAHG NPWS) (2012) Marine Natura Impact Statements in Ireland Special Areas of Conservation, A Working Document.

7.2 Methodology

The approach to this impact assessment comprises analysis of data from a desktop study and ecological field data. Conclusions are then drawn as to whether (and to what extent) baseline conditions are likely to change as a result of the Proposed Project, and whether these changes represent likely significant ecological effects.

7.2.1.1 Zone of Influence

In the context of an ecological impact assessment generally (CIEEM, 2018)⁵ the Zone of Influence (Zol) to potential impacts from a proposed development is defined as:

“the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities. This is likely to extend beyond the project site, for example where there are ecological or hydrological links beyond the site boundaries” and that “the zone of influence will vary for different ecological features depending on their sensitivity to an environmental change.”

The Zol varies depending on the construction and operational activity and the sensitivity of the receptor (e.g., flora, birds, terrestrial mammals) to the effect encountered.

The Zol identified for various ecological receptors, having regard to the potential for impact as outlined previously are as detailed below:

- Footprint of the Proposed Project for direct damage to habitats.

³ Fossitt, J.A. (2000). A Guide to Habitats in Ireland.

⁴ Smith, G.F., O'Donoghue, P., O'Hara, K. and Delaney, E. (2011) Best Practice Guidance for Habitat Survey and Mapping.

- Localised dust deposition may occur during construction. Dust effects to ecological receptors was identified as 50m based on scale of works proposed and also considering construction traffic. As such, the maximum Zol is taken as 100m for dust effects within this EIAR.
- 34m for high noise effects⁶ to wetland bird species, based on noise modelling carried out which indicates that the noise levels drop to below 72dB within 32m of the Proposed Project. Noise levels will be below 55dBA (imperceptible levels) within 185m of the Proposed Project.
- 150m for breeding otter holts⁷
- 8km for marsh fritillary (*Euphydryas aurinia*)
- 1km for breeding raptors
- Catchment wide Zol for surface waterbodies
- 250m for groundwater dependant terrestrial ecosystems (GWDTEs)⁸

7.2.2 Desktop Study

7.2.2.1 Overview

A desk study was undertaken in August Month 2025 to review existing ecological baseline information available in the public domain, investigate the potential for connectivity to designated and ecological sensitive areas to obtain relevant information held by third parties. Table 7.1 presents an overview of ecological receptors and data sources reviewed/consulted during the desk study.

Table 7.1: Overview of desk study

Category	Ecological Receptor	Data Source
International and European Designated Sites including:	Ramsar Site	Irish Ramsar Wetland Committee
	Special Area of Conservation (SAC) and candidate SAC (cSAC)	Conservation Objectives reports, Site Synopses, Natura 2000 Data forms, Backing Documents and Maps prepared by the NPWS; NPWS Designations Viewer
	Special Protection Area (SPA)	• Conservation Objectives reports, Site Synopses, Natura 2000 Data forms, Backing Documents and Maps prepared by the NPWS; • NPWS Designations Viewer
Statutory Designated Sites	Natural Heritage areas (NHA)	NPWS Designations Viewer
	Proposed Natural Heritage Areas (pNHA)	NPWS Designations Viewer
Species and Habitat	Habitats	• the Environmental Protection Agency (EPA) (https://gis.epa.ie/),
	Mammals	• the National Biodiversity Data Centre (NBDC) (https://maps.biodiversityireland.ie/Map)
	Birds	• National Parks and Wildlife Services (NPWS) (https://www.npws.ie/maps-and-data);
	Herpetofauna	• Published and unpublished NPWS reports on protected habitats and species including Irish Wildlife Manuals and associated reports
	Fish	• Maps of landscape favourability for each Irish bat species at a 5km resolution as per the NBDC mapping website;
	Terrestrial Invertebrates	• Article 17 reporting data on Qualifying Interests (QI) (NPWS, 2019a, NPWS, 2019b, NPWS, 2019c);
	Flora	• Article 12 reporting data on Special Conservation Interests (SCI); and

Category	Ecological Receptor	Data Source
		- Habitats within and/ or immediately adjacent to the proposed development areas which might be affected by the Proposed Project were identified and their suitability to support sensitive, rare and/or protected species was assessed (having regard to the typical ranges of species known to occur in the locality and the Zone of Impact (Zol) of the works). - Consultation with NPWS on sensitive data - NPWS FPO Map Viewer – Bryophytes and Vascular Plants

In addition to the sources noted above, the desk study made use of free online resources to assess the context of the land associated with the Project as well as to assess habitat suitability for species within the Study Area (accessed January 2024 – March 2025):

- Bing maps (<https://www.bing.com/maps/>);
- Google Earth;
- EPA maps (<https://gis.epa.ie/EPAMaps/>);
- Flood maps (<https://floodinfo.ie/>);
- National Biodiversity Data Centre (NBDC) Biodiversity Maps (<https://maps.biodiversityireland.ie/Map/>); and
- Review of any other relevant ecological reports and literature – cited as necessary.

7.2.2.2 Designated Site Data

The latest site boundary data was interrogated to identify designated sites within the Zol of the Proposed Project. Designated sites included:

Sites of International Importance:

- Special Protection Areas (SPA) and Special Areas of Conservation (SAC):** The Birds Directive (2009/147/EC) and the Habitats Directive (92/42/EEC) put an obligation on EU Member States to establish the Natura 2000 network. The Natura 2000 network comprises sites of the highest biodiversity importance for rare and threatened habitats and species across the EU. In Ireland, the Natura 2000 network of European sites comprises Special Areas of Conservation (SAC) and Special Protection Areas (SPA). SACs are selected for the conservation of Annex I habitats (including priority types marked by * which are in danger of disappearance) and Annex II species (other than birds). SPAs are selected for the conservation of Annex I birds and other regularly occurring migratory birds and their habitats.
- Ramsar Sites:** Ramsar are wetland sites designated to be of international importance under the Ramsar Convention. The Ramsar Convention is an intergovernmental environmental treaty which was established in 1971 by UNESCO and came into force in 1975.

Sites of National Importance:

- National Heritage Areas (NHA):** The basic designation for areas of ecological importance in Ireland is the Natural Heritage Area (NHA). These sites comprise areas which are considered important for the habitats, or species of plants and animals whose habitat needs protection. Under the Wildlife Acts, NHAs are legally protected from damage from the date they are formally proposed for designation.
- Proposed NHAs (pNHA):** are sites which were published on a non-statutory basis in 1995 (and again in the 2010s) but have not since been statutorily designated. These sites are of significance for wildlife and habitats. Prior to statutory designation, pNHAs are still subject to limited protection, in the form of: Agri-environmental farm planning schemes which support the objective of maintaining and enhancing the conservation status of pNHAs. There is a

requirement for the Forest Service to gain NPWS approval before they will pay afforestation grants on pNHA lands; and a recognition of the ecological value of pNHAs by Planning and Licencing Authorities.

- Other Nature Conservation sites include features such as:
 - Nature Reserves,
 - Biosphere Reserves, and
 - Wildfowl Sanctuaries.

7.2.3 Field Surveys

7.2.3.1 Overview

Ecological field surveys were carried out by suitably experienced Mott MacDonald ecologists as outlined in Table 7.2.

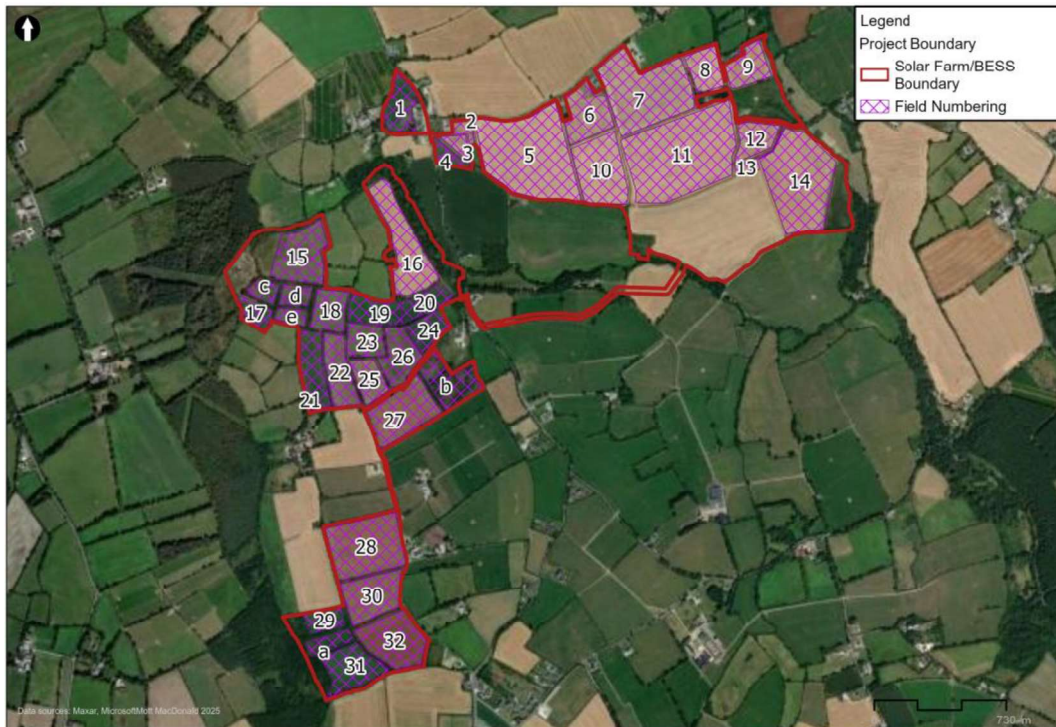
Surveys and locations outlined in Table 7.2 are indicated in Figure 7.1 below.

Table 7.2: Overview of Ecological Field Surveys

Survey Type	Date	Survey Area (refer to Figure 7.1)
Ecological walkover	15 February 2023 10 March 2023 7 May 2024 08 May 2024 09 May 2024 29 May 2024	All numbered fields including fields not numbered within planning boundary,
Bat nighttime walkovers	Survey 1: 12 June 2024 Survey 2: 13 June 2024 Survey 3: 13 June 2024 Survey 4: 13 June 2024	Four transects conducted across the site including arable farmland (Fields 14 west to 3) woodland / hedgerow (Field 17, 18, 19, 23, 25 and 27, 16, 28, 30, 32, 29 and 31) edge and riparian areas (Field 9, 14 and south of substation site)
Bat static surveys	D4: 30 May – 13 June 2024 D5: 29 May – 13 June 2024 D6: 30 May – 13 June 2024 D7: 29 May – 13 June 2024 D8: 29 May – 13 June 2024 D2: 26 May - 31 May 2025 D6: 26 May - 31 May 2025 D7: 26 May - 31 May 2025 D8: 26 May - 31 May 2025	Field 17, e Field 14 (south substation site) Field 16 Field 26 Filed 5 Field 29 Field 10 Field 31 Field 11
Bat roost emergence/activity survey	16 and 17 July 2024 24 July 2025	Field 3 and 4. An emergent roost at a derelict farmyard with dilapidated buildings, overgrown with scrub (. Field 9. An activity survey at a revegetating field with scrub, wet grassland, treeline and drainage ditch habitats, adjacent to the River Owenduff (centred at 52.326320, - 6.845439).
Breeding bird survey	April 2025: 02/04/2025, 03/04/2025 May 2025: 14 May 2025, 15 May 2025	Surveys conducted throughout field, riparian and woodland edges of the site

Survey Type	Date	Survey Area (refer to Figure 7.1)
	June 2025: 03 June 2025, 04 June 2025	
Wintering bird survey	February and March 2023 January, February, and March 2025.	Surveys conducted throughout field, riparian and woodland edges of the site
Woodcock survey	7-8 May 2024	Location 1: Woodland edge west Field 17C Location 2: Woodland edge west Fields 29 and 31.
Marsh fritillary survey	16 August 2024	Fields 15c, 15d, 15E, 17 and 27b.
Detailed botanical surveys	28-30 May 2024 17-18 July 2024 16 August 2024	Field 15, 17c, 17d, 17e, 18, 27b, 29, Field 27B, woodland east Field 16
Aquatic Survey	03 May 2025	Two locations on Owenduff River. One upstream (ITM 678761, 620033) and one downstream (678960, 619791) of Kilbrawey Bridge. One location on Tellarought stream (ITM 645801, 5798919)

Figure 7.1: Field Numbering within the Proposed Project Site



7.2.3.2 Walkover Survey

Preliminary Ecological assessment

A preliminary ecological appraisal (PEA) was conducted during the February 2023. The PEA was carried out to provide:

- A broad overview on biodiversity features and potential ecological constraints for the Proposed Project within the landholding,
- Outline initial areas that provide ecological enhancement opportunities; and
- Recommend potential further surveys that may be required to inform on the potential impacts to biodiversity.

The key findings of the PEA are incorporated into this chapter where relevant and informed the design approach detailed in Chapter 4.

Habitat

A habitat survey was carried out with regard to 'Best Practice Guidance for Habitat Survey and Mapping' (Heritage Council, 2011).

Habitats were classified to Fossitt level three in accordance with 'A Guide to Habitats in Ireland' (Fossitt, 2000). Fossitt habitat classifications are not directly comparable to the descriptions of Annex I habitats, e.g., CW2 - Tidal Rivers under Fossitt are linked to Estuaries (1130) under the EU Interpretation Manual for EU Habitats. Thus, as relevant, the habitat classification system and the corresponding European Annex I habitats was informed with reference to the EU Interpretation Manual for EU Habitats (European Commission, 2013) having regard to the Irish Vegetation Classification where relevant. The habitat survey had regard for habitats which may offer supporting habitat for QI and SCI associated with European Sites.

Particular attention was paid to the possible occurrence of:

- Annex 1 (including priority Annex 1⁵) habitats designated under the EU Habitats Directive 92/43/EEC
- Protected plant species listed in the 2022 Flora Protection Order S.I. No. 235/2022; European Communities (Birds and Natural Habitats) Regulations 2011
- Flowering plants of conservation concern in the Ireland Red List (No. 10): Vascular Plants (Wyse Jackson *et al.*, 2016)
- Invasive plant species scheduled to the Birds and Habitats Regulations
- Species and habitats of special conservation significance identified within relevant Biodiversity Action Plans
- Rivers and streams that may support aquatic species and habitats including Lamprey species, Freshwater Crayfish, Atlantic salmon, Fresh water Pearl Mussel and floating river vegetation
- Sensitive wetlands and peat habitats including; unimproved wet grassland and marsh which are rare habitats in Co Wexford.
- Semi natural woodland habitats including scrub, wet willow/ alder dominated woodland, bog woodland and oak woodland
- Springs and localised flushes (adjacent to rivers, below hills and edge bogs)

Badger

Survey for evidence of badger (*Meles meles*) was carried out during the walkover surveys in particular where hedgerows/ wooded areas are crossed and adjacent roadside hedgerows.

⁵ Priority Annex 1 habitats are those in danger of disappearance.

These surveys followed Surveying Badgers (Harris et al, 1989). The extent of survey area was defined with regard to Guidelines for the Treatment of Badgers during the Construction of National Road Schemes (NRA, 2006) as 150m beyond the proposed works where access was available from landowners on affected lands.

Otter

A survey for evidence of otter (*Lutra lutra*) was carried out along water courses encountered within the survey area and where vegetation may be disturbed adjacent to drains and streams. These surveys followed Monitoring the Otter *Lutra lutra* (Chanin, 2003). The extent of survey area was defined with regard to 'Guidelines for the Treatment of Otters during the Construction of National Road Schemes' (NRA, 2008).

Bat Surveys

A daytime bat survey of the site was carried out in accordance with "Bat Surveys for Professional Ecologists: Good Practice Guidelines" (4th edn) (Collins, 2023). The visual assessment was carried out in line with Bat Tree Habitat Key (Andrews, H et al., 2013) to determine potential roost features. Trees which might be affected by the works were examined for potential roost features.

The suitability of habitat features for bats, within the survey area, were assessed in accordance with Collins (2023) as described in Table 7.3 below.

Table 7.3: Guidelines for Assessing Potential Bat Roosts in Structures

Suitability	Description/Roosting Habitats	Commuting and Foraging Habitats
None	No habitat features on site likely to be used by any roosting bats at any time of the year (i.e. a complete absence of crevice/suitable shelter at all ground/underground levels)	No habitat features on site likely to be used by any commuting or foraging bats at any time of the year (i.e. no habitats that provide continuous lines of shade/protection for flight lines or generate/shelter insect populations available to foraging bats).
Negligible	No obvious habitat features on site likely to be used by roosting bats; however, a small element of uncertainty remains as bats can use small and apparently unsuitable features on occasion.	No obvious features on site likely to be used as flight paths or by foraging bats; however, a small element of uncertainty remains in order to account for non-standard bat behaviour.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically at any time of the year. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity and not a classic cool/stable hibernation site but could be used by individual hibernating bats).	Habitat that could be used by small numbers of bats as flightpaths such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by another habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions, and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only, such as maternity and hibernation – the categorisation described in this table is made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for flight paths such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland, or water.
High	A structure with one or more potential roost sites that could be used that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due	Continuous high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by bats for flight paths such as river valleys, streams,

Suitability	Description/Roosting Habitats	Commuting and Foraging Habitats
	to their size, shelter, protection, conditions, and surrounding habitat. These structures have the potential to support high conservation status roosts, e.g. maternity or classic cool/stable hibernation site.	hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses, and grazed parkland. Site is close to and connected to known roosts.

Source: Collins 2023

Trees and buildings / structures were assessed as having a Moderate or High suitability for bats (structures) and potential roost features (PRF-I or PRF-M as outlined in **Table 7.4**) were examined further for evidence of bat activity using an endoscope.

Table 7.4: Guidelines for Categorising the Potential Suitability of Potential Roost Features on a Proposed Project Site for Bats, to be Applied Using Professional Judgement

Suitability	Description
PRF-I	PRF is only suitable for individual bats or very small numbers of bats either due to size or lack of suitable surrounding habitats.
PRF-M	PRF is suitable for multiple bats and may therefore be used by a maternity colony.

Source: Collins 2023

7.2.3.3 Bat Activity Surveys

An array of night-time bat surveys were completed in 2024 and 2025 by two experienced surveyors as detailed earlier within Table 7.2 The methodology for each of these bat surveys is presented below.

Emergence Bat Surveys

Emergence surveys started 15 minutes prior to sunset and were undertaken for a minimum of 2 hours of surveying. Surveys were completed during mild and dry weather conditions. Handheld bat detectors, Anabat Walkabout Full Spectrum bat detectors, were used by both survey

Preparation for dusk survey started approximately 60 minutes prior to sunset and the following actions were undertaken:

- Re-inspection of building to be surveyed to determine surveyor and filming locations (external and internal (where possible) inspections).
- Internal inspection of building (applicable only to derelict structures and agricultural buildings) to document any visible bats or audible noises (bats are more audible prior to dusk activity).
- Positioning of filming equipment and surveyors.
- Completion of dusk survey.
- Post surveys, a repeat internal inspection of the surveyed building was undertaken (only applicable to derelict structures and agricultural buildings) to document any visible bats within the structure.

Walking Transects

Walking transects involved surveyors walking accessible sections of the Proposed Project site (i.e. where landowner permission was provided) and adjacent local roads using Anabat Walkabout Full Spectrum bat detectors.

Walking transect surveys were completed from 20 minutes after sunset with the surveyors following transects within the Proposed Project site.

All walking transects were completed during weather conditions suitable for bat activity and walking transects tended to be at least 90 minutes long and varied in length depending on accessibility.

Static Detector Deployments

Four Anabat Express static detectors (Titley Scientific Inc.) fitted with omni-directional microphones were deployed at various locations across the Site between May and June in 2024 (5 detectors) and 2025 (4 detectors) to provide information on baseline bat activity on the site. These were set out on site for 6 nights (2024) and 15 nights (2025)

Average night length was 7.5 hours during the sampling period, so this gives a total survey effort of 180 sampling hours. We consider this to provide a good representation of bat activity during the peak period of bat activity (typically between May and September).

Weather conditions were relatively warm and calm during the survey period, with air temperatures of between 12 and 20 °C, no rain and light winds. This provides a sample of bat activity in ideal weather conditions.

Sound Analysis

Sonograms from automated bat detectors were obtained in the 'zero-crossing' format and viewed using Anabat Insight software (Titley Scientific). Species were identified with reference to *British Bat Calls: A Guide to Species Identification* (Russ 2012), based primarily on frequency and call shape. Filters were initially used to provide an indicative classification, and then all sonograms were verified visually by the author. An automated bat classifier was not used.

Calculation and comparison of bat activity indices

At present there is no standardised system to categorise bat activity as low, moderate or high, because activity levels vary depending on the species involved and the surrounding landscape. In some parts of the British Isles the Ecobat tool (managed by the Mammal Society, Lintott et al. 2018) can be used to benchmark activity levels based on other data collected in the region, but at the time of writing the tool is offline for maintenance purposes.

Therefore, for the purposes of this report we use a bespoke system to discuss and compare levels of bat activity at the Site, as outlined in Table 7.8. For ease of comparison, bat activity levels are classified into four categories - negligible, low, moderate, high - based on the total number of bat passes recorded per night. In some tables we highlight these categories using shades of blue for ease of reference; this colour scheme is shown in Table 7.8.

Table 7.5: Terminology and colour-scheme used to categorise bat activity levels

Category	Number of bat passes
Negligible	≤9
Low	10 - 49
Moderate	50 - 99
High	≥100

For the avoidance of doubt, the number of bat passes recorded on a static detector does not accurately represent the number of bats present at a site. 100 bat passes may represent single passes from 100 different bats, but it may also represent a single bat that flew back and forth past the detector 100 times. In this context, bat activity data should be considered a proxy for the suitability of a habitat for bats, rather than an accurate count of the number of bats present in an area.

Potential Bat Roosts Activity Surveys

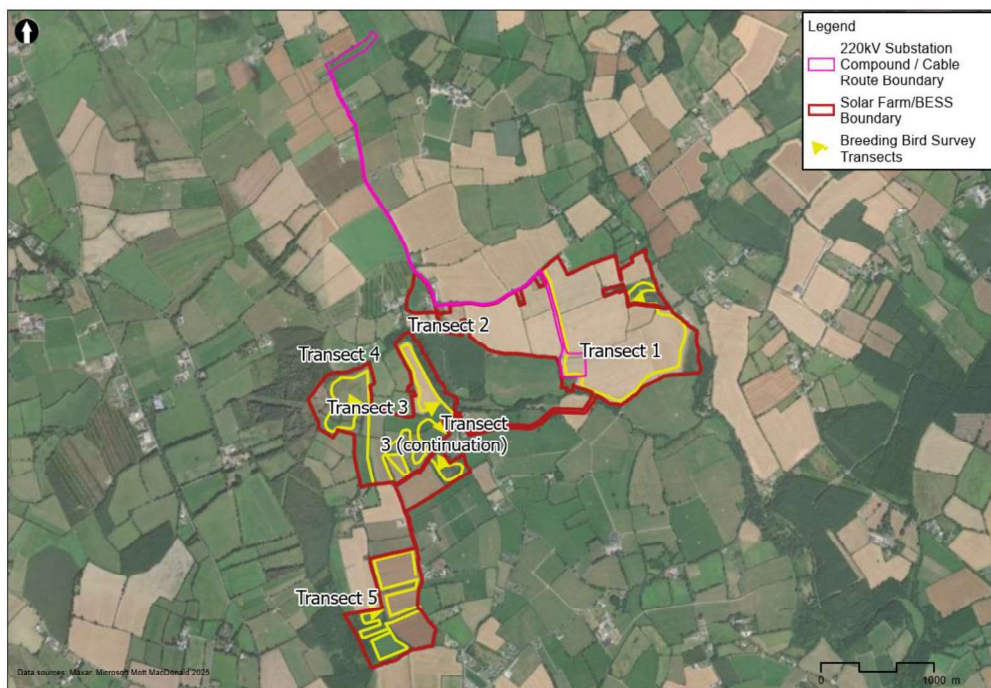
Potential bat roosts identified were subject to dusk surveys during summer 16th and 17th July 2024 and July 24th, 2025, at two locations; an emergent roost and activity survey at a derelict farmyard with dilapidated buildings, overgrown with scrub. Equipment used include Anabat detectors and a night vision infrared camera.

7.2.3.4 Bird

Breeding Bird Surveys

Breeding Bird Surveys were carried out within the Proposed Project site and wider Zol. A combination of transect line and vantage point surveys were used to record breeding birds in the study area, in accordance with Gilbert et al. (1998), Bibby et al. 1992 and Bird Survey & Assessment Steering Group (2022). Survey transects are indicated in Figure 7.2.

Figure 7.2: Breeding Bird Survey Transects



Source: Mott MacDonald

Birds of moderate (amber) and high (red) Conservation Concern in Ireland (BoCCI)⁶ and those listed under Annex 1 (Birds Directive) were recorded. A list of target species was formed based

⁶ Gilbert, G., Stanbury, A., and Lewis, L. 2021. Birds of Conservation Concern in Ireland 4: 2020–2026.

on the habitats present within the site and National Biodiversity Data Centre records in the area (Table 7.6). Almost all farmland birds and open habitat breeding bird species are of some conservation concern (amber and red listed) in Ireland. Commoner birds (green listed) while not specifically are generally associated with hedgerows and woody habitats on the site. All birds are considered regarding mitigation for potential disturbance to breeding habitat in Section 7.5.

Table 7.6: Target Species for Breeding Bird Surveys

Species	BOCCI Status
Farmland	
Yellowhammer	Red
Tree sparrow	Amber
Stock dove	Red
Skylark	Amber
Meadow pipit	Red
Barn owl	Red
Kestrel	Red
Snipe	Red
Swallow	Amber
Swift	Red
House martin	Amber
Starling	Amber
House sparrow	Amber
Green finch	Amber
Linnet	Amber
Riparian	
Grey wagtail	Red
Dipper	Green
Kingfisher	Amber
Mallard	Amber
Woodland	
Woodcock	Red
Goldcrest	Amber

Optical equipment used during all surveys included 8x42 Opticron binoculars and a Hawke Nature-Trek 80mm scope.

Woodcock Survey

Dedicated woodcock surveys were carried out within the Proposed Project site and wider Zol. Surveys were carried out in line with British Trust for Ornithology 'Woodcock Annual Monitoring Survey Instructions'.

Woodcock breed in both deciduous and coniferous woodland and commence their unique roding behaviour soon after sunset and shortly before dawn. Roding flights of individual birds can last 5-45 minutes with the bird flying in circuits 3-30m above the woodland canopy.

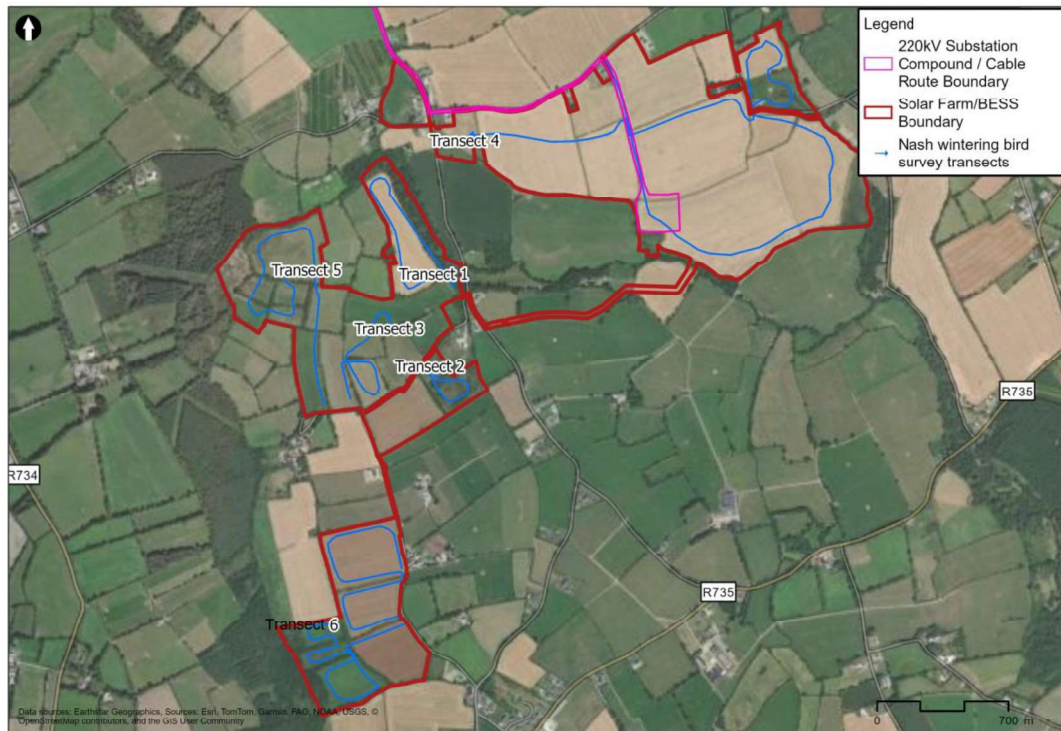
Woodcock surveys took place woodland sites which were assessed to have potential for woodcock, over the course of two nights in May 2024.

Surveys began 15 minutes before sunset and lasted for a total duration of 75 minutes

Wintering Bird Surveys

In line with survey methodologies recommended by the British Trust for Ornithology 'Winter farmland bird survey', (based on Bibby, 2000), survey transects were defined to cover all the land parcels within the proposed project red line boundaries, ensuring that all habitat types and the specific target species potentially present, were comprehensively considered. Figure 7.3 illustrates the transects utilised.

Figure 7.3: Wintering Bird Survey Transects



Source: Mott MacDonald

Survey transects were walked at a slow amble pace, stopping periodically to scan priority habitat and features at a distance, to ensure all birds were captured in the data including species more susceptible to disturbance. In the context of this proposed project, priority habitats to survey for ex situ waterfowl of European sites (in the wider region) included open fields with potential for ground foraging species. Also surveyed were dense hedgerows particularly those laden with berries, wet habitats such as rivers and riparian zones and ephemeral water accumulations in fields.

All transect walks attempted to ensure full visual coverage of the entirety of each of the land holding. Some consideration was also given to habitats beyond the red line boundary, particularly those that could be considered potentially impacted upon for wintering birds. Of consideration was the presence of semi natural woodlands and riverine habitats adjacent to the red line boundaries at several locations. Although weather conditions are typically less restrictive during winter bird surveys, than during breeding bird surveys, all surveys avoided inclement weather conditions that could reduce bird detection. All field surveys were conducted by the experienced Senior Ecologist, Fintan Damer.

The nature of the dominant habitats present on the Proposed Project site (primarily open arable fields and pastoral field) and the generally low suitability for wetland birds (such as waders, ducks, geese and swans), was significant in determining the number of visits required to fully

comprehend the usage of and numbers of species likely to occur on the Proposed Project site. Three site visits, once per month, were carried out between the hours of 8am and 4pm (or otherwise according to daylight changes). This included the mid-winter period when numbers of wintering birds are generally accepted to be at their most significant.

All bird species were recorded but particular attention was placed on waterfowl species that may potentially be associated with European sites in the wider region in particular Bannow Bay SPA. These included:

- Species present in internationally important numbers (>1% of the national threshold figure of significance for waterbirds) (Burke et al., 2018).
- Red or amber listed species as Birds of conservation concern in Ireland (BOCCI) (Gilbert et al. 2021).
- Annex I species listed in the EU Bird Directive.

Surveys were carried out in February and March 2023, and January, February, and March 2025 as detailed within Table 7.2.

7.2.3.5 Marsh Fritillary Surveys

Targeted field surveys were conducted in August 2024 for Marsh fritillary *Euphydryas aurinia*, within areas where larval foodplant *Succisa pratensis* were recorded in unimproved wet grassland fields at the northwestern landholding. Areas of wet grassland with potential for Marsh Fritillary were identified as being of high ecological value and not included in the project design.

7.2.3.6 Aquatic Surveys

Baseline aquatic surveys were conducted to provide up to date information on ecological water quality and fisheries value in the Owenduff River (EPA Code: 13O01) - two locations, and Tellarought (EPA Code: 13T14) – 1 location. The methodology included EPA protocol (Toner et al 2005)⁷ and the Small Stream Score Assessment methodology⁸. Suitability and evidence of salmonids (*Salmo trutta*) and other fish species were also noted. In addition, a dry field ditch where a proposed surface water headwall is proposed was confirmed as unsuitable for fisheries and not a significant aquatic habitat on the southern boundary of Field 13 and 14. This drainage ditch links into the Owenduff River. These surveys were conducted by an experienced aquatic ecologist from Mott MacDonald ecology team.

7.2.3.7 Other Protected Species

During walkover surveys of the Proposed Project site, the potential was also noted for habitats of other protected species, including: common lizard (*Zootoca vivipara*), common frog (*Rana temporaria*), smooth newt (*Lissotriton vulgaris*), marsh fritillary (*Euphydryas aurinia*), pine marten (*Martes martes*), and hedgehog (*Erinaceus europaeus*).

In the case of the marsh fritillary butterfly, searches were made for suitable habitats (degraded bog and less managed wet grassland) for the larval food plants of marsh fritillary, devil's-bit scabious (*Succisa pratensis*).

⁷ Toner, P., Bowman, J., Clabby, K., Lucey, J., McGarrigle, M., Concannon, C., ... & MacGarthaigh, M. 2005. "Water Quality in Ireland. Environmental Protection Agency, Co. Wexford, Ireland."

⁸ SSRS-in-Enforcement-of-UWWDA.pdf

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7.2.4 Approach to Impact Assessment

7.2.4.1 Ecological Valuation

The *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (NRA, 2009) were adopted as part of this methodology for the purpose of evaluating the importance of ecological features within the survey area. The site evaluation criteria from this assessment methodology are reproduced in Table 7.7.

In accordance with NRA guidelines (2009) and CIEEM (2018), impact assessment is only undertaken of Important Ecological Features (IEFs). These are features within the zone of influence of the proposed scheme which are “both of sufficient value to be material in decision making and likely to be affected significantly”. According to NRA guidelines (NRA, 2009), IEFs are of local importance (higher value) or higher as per NRA value criteria. Features of local importance (lower value) are not considered in the guidance to be IEFs and are therefore excluded from impact assessment.

Table 7.7: Site Evaluation Criteria (NRA, 2009)

Ecological Value	Description
Internationally Important	Sites designated (or qualifying for designation) as a SAC or SPA under the EU Habitats or Birds Directives Undesignated sites that fulfil criteria for designation as a European Site Features essential to maintaining the coherence of the Natura 2000 network Sites containing ‘best examples’ of the habitat types listed in Annex I of the Habitats Directive Resident or regularly occurring populations of birds listed in Annex I of the Birds Directive and species listed in Annex II and/or Annex IV of the Habitats Directive Ramsar Sites World Heritage Sites Biosphere Reserves Sites hosting significant species populations under the Bonn Convention Sites hosting significant populations under the Berne Convention Biogenetic Reserves European Diploma Sites Salmonid waters
Nationally Important	Sites or waters designated or proposed as an NHA Statutory Nature Reserves Refuge for fauna and flora protected under the Wildlife Acts National Parks Undesignated sites fulfilling criteria for designation as an NHA; Statutory Nature Reserves; Refuge for Fauna and Flora protected under the Wildlife Act and/or a National Park; Resident or regularly occurring populations (assessed to be important at the national level) of species protected under the Wildlife Acts and/or species listed on the relevant Red Data list) Sites containing viable areas of the habitat types listed in Annex I of the Habitats Directive
County Importance	Areas of Special Amenity Areas subject to a Tree Preservation Order Areas of High Amenity, or equivalent, designated under the County Development Plan Resident or regularly occurring populations (assessed to be important at the County level) of species of birds listed in Annex I of the Birds Directive, species listed in Annex II and/or IV of the Habitats Directive, species protected under the Wildlife Acts and/or species listed on the relevant Red Data list Site containing area(s) of the habitat types listed in Annex I of the Habitats Directive that do not fulfil criteria for valuation as of International or National Importance

Ecological Value	Description
	County important populations of species, or viable area of semi-natural habitats or natural heritage features identified in the National or local Biodiversity Action Plan Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level
Local Importance (higher value)	Locally important populations of priority species or habitats or natural heritage features identified in the Local Biodiversity Action Plan Resident or regularly occurring populations (assessed to be important at the Local level) of species of birds listed in Annex I of the Birds Directive, species listed in Annex II and/or IV of the Habitats Directive, species protected under the Wildlife Acts and/or species listed in the relevant Red Data list Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value
Local Importance (lower value)	Sites containing small areas of semi-natural habitat that are of some local importance for wildlife Sites of features containing non-native species that are of some importance in maintaining habitat links

Source: NRA 2009

7.2.4.2 Assessment of Likely Impacts

Impacts were assessed and characterised in accordance with the 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' EPA (2022) as reproduced in Table 7.8. Important Ecological Features impacts are assessed.

Table 7.8: Impact Magnitude and Duration Criteria (EPA, 2022)

Impact Magnitude	Definition
Quality of Effects	Positive Effects A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
	Neutral Effects No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error
	Negative/adverse Effects A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).
Significance of Effects	Imperceptible An effect capable of measurement but without significant consequences.
	Not significant An effect which causes noticeable changes in the character of the environment but without significant consequences.
	Slight Effects An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate Effects An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.

Impact Magnitude	Definition
	Significant Effects An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment
	Very Significant An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
	Profound Effects An effect which obliterates sensitive characteristics
Duration and Frequency of Effects	Momentary Effects Effects lasting from seconds to minutes
	Brief Effects Effects lasting less than a day
	Temporary Effects Effects lasting less than a year
	Short-term Effects Effects lasting one to seven years
	Medium-term Effects Effects lasting seven to fifteen years.
	Long-term Effects Effects lasting fifteen to sixty years.
	Permanent Effects Effects lasting over sixty years
	Reversible Effects Effects that can be undone, for example through remediation or restoration
	Frequency of Effects Once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually

Source: EPA, 2022

7.2.5 Limitations

Every effort has been made to provide comprehensive descriptions of the baseline conditions. No significant limitations were identified.

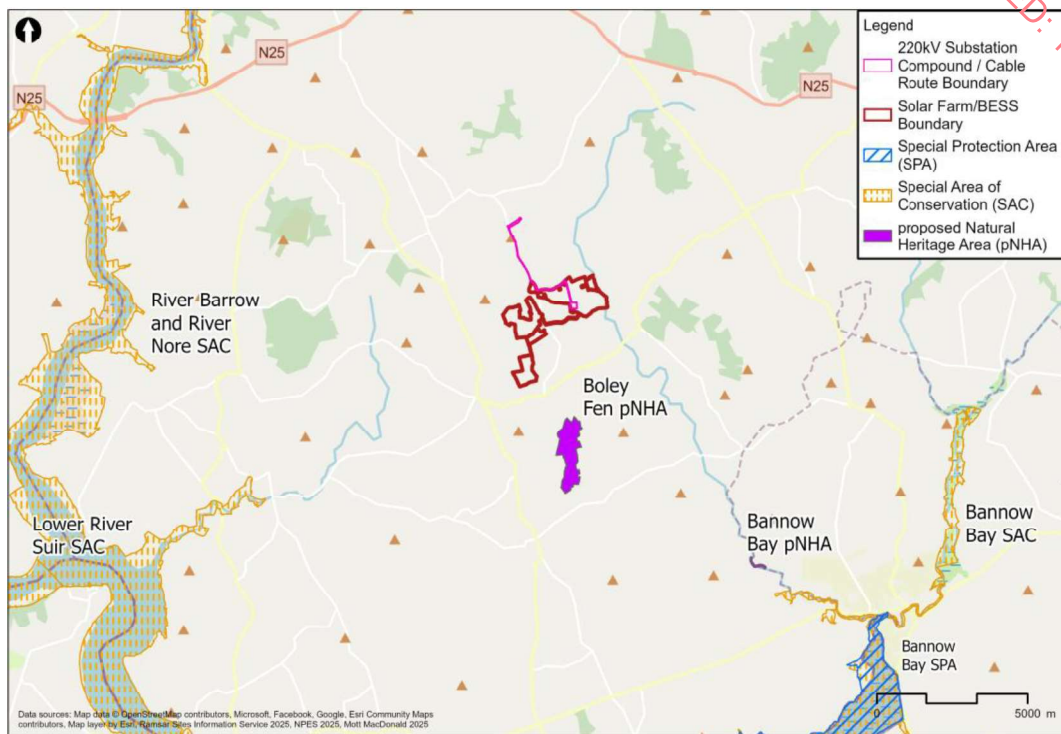
7.3 Receiving Environment

7.3.1 Desktop Study

7.3.1.1 European and Nationally Designated Sites

The location of International and Nationally designated sites in relation to the Proposed Project is presented in Figure 7.4.

Figure 7.4: European and Nationally Designated Sites in the vicinity of the Proposed Project.



Source: Mott MacDonald

RAMSAR

Ramsar sites are wetland sites designated to be of international importance under the Ramsar Convention. The Ramsar Convention is an intergovernmental environmental treaty established in 1971 by UNESCO and that came into force in 1975.

There is one Ramsar site, Bannow Bay [840] identified within the Zol of the Proposed Project as outlined in Table 7.9.

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Table 7.9: Ramsar Site with Connectivity to the Proposed Project

Site Name	Distance (Km)	straight line	Links to other sites	QI
Bannow Bay [840]	15.9		Bannow Bay SAC [000697] Bannow Bay SPA [004033] Bannow Bay Wildfowl Sanctuary	Ecological communities Saltmarsh community <i>Zostera noltii</i> community 1130 Estuaries 1140 Mudflats and sandflats not covered by seawater at low tide 1210 Annual vegetation of drift lines 1220 Perennial vegetation of stony banks 1310 Salicornia and other annuals colonising mud and sand 1330 Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) 1410 Mediterranean salt meadows (<i>Juncetalia maritimi</i>) 1420 Mediterranean and thermo-Atlantic halophilous scrubs (<i>Sarcocornetea fruticos</i>) 2110 Embryonic shifting dunes 2120 Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) 2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)*
Species				
Otter (<i>Lutra lutra</i>)				
Harbour seal (<i>Phoca vitulina</i>)				
Eurasian teal (<i>Anas crecca</i>)				
Eurasian wigeon (<i>Anas penelope</i>)				
Light-bellied brent goose (<i>Branta bernicla hrota</i>)				
Goldeneye (<i>Bucephala clangula</i>)				
Dunlin (<i>Calidris alpina</i>)				
Red knot (<i>Calidris canutus</i>)				
Little egret (<i>Egretta garzetta</i>)				
Great northern diver (<i>Gavia immer</i>)				
Red-throated diver (<i>Gavia stellata</i>)				
Eurasian oystercatcher (<i>Haematopus ostralegus</i>)				
Bar-tailed godwit (<i>Limosa lapponica</i>)				
Black-tailed godwit (<i>Limosa limosa</i>)				
Eurasian curlew (<i>Numenius arquata</i>)				
Cormorant (<i>Phalacrocorax carbo</i>)				
Golden plover (<i>Pluvialis apricaria</i>)				

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Site Name	Distance (Km) straight line	Links to other sites	QI
			Great-crested grebe (<i>Podiceps cristatus</i>)
			Little grebe (<i>Tachybaptus ruficollis</i>)
			Shelduck (<i>Tadorna tadorna</i>)
			Redshank (<i>Tringa tetanus</i>)
			Lapwing (<i>Vanellus vanellus</i>)

European Sites

The Birds Directive (2009/147/EC) and the Habitats Directive (92/42/EEC) put an obligation on EU Member States to establish the Natura 2000 network. The Natura 2000 network comprises sites of the highest biodiversity importance for rare and threatened habitats and species across the EU. In Ireland, the Natura 2000 network of European sites comprises SACs and SPAs. SACs are selected for the conservation of Annex I habitats (including priority types marked by *) which are in danger of disappearance) and Annex II species (other than birds). SPAs are selected for the conservation of Annex I birds and other regularly occurring migratory birds and their habitats. These are collectively referred to as “European sites”.

European sites identified as present in the study area and potentially within the Zol of the Proposed Project are outlined below in Table 7.10.

Table 7.10: European Sites with Connectivity to the Proposed Project

Site Name	Distance between the Proposed Project and European Sites (straight line) at closest point (km)	QI / SCI
Special Protected Areas (SPAs)		
Bannow Bay SPA (004033) ⁹	13.7	Birds AO46 Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) AO48 Shelduck (<i>Tadorna tadorna</i>) AO54 Pintail (<i>Anas acuta</i>) A130 Oystercatcher (<i>Haematopus ostralegus</i>) A140 Golden Plover (<i>Pluvialis apricaria</i>) A141 Grey Plover (<i>Pluvialis squatarola</i>) A142 Lapwing (<i>Vanellus vanellus</i>) A143 Knot (<i>Calidris canutus</i>) A149 Dunlin (<i>Calidris alpina</i>) A156 Black-tailed Godwit (<i>Limosa limosa</i>) A157 Bar-tailed Godwit (<i>Limosa lapponica</i>) A160 Curlew (<i>Numenius arquata</i>) A162 Redshank (<i>Tringa totanus</i>) Habitats Wetlands
Special Areas of Conservation (SACs)		
Bannow Bay SAC (000697) ¹⁰	10.6	Habitats 1130 Estuaries 1140 Mudflats and sandflats not covered by seawater at low tide 1210 Annual vegetation of drift lines 1220 Perennial vegetation of stony banks 1310 Salicornia and other annuals colonising mud and sand 1330 Atlantic salt meadows (<i>Glaux-Puccinellietalia maritima</i>) 1410 Mediterranean salt meadows (<i>Juncetalia maritimi</i>) 1420 Mediterranean and thermo-Atlantic halophilous scrubs (<i>Sarcocornetea fruticosi</i>) 2110 Embryonic shifting dunes 2120 Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) 2130 Fixed coastal dunes with herbaceous vegetation (grey dunes) [*]

⁹ NPWS (2012) Conservation Objectives: Bannow Bay SPA 004033. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

¹⁰ NPWS (2012). Conservation Objectives: Bannow Bay SAC 000697. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht

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7.3.1.2 Sites of National Importance

Natural Heritage Areas

Natural Heritage Areas (NHA) are the basic wildlife designation in Ireland. These areas are considered nationally important for the habitats present, or which that holds species of plants and animals whose habitats needs protection. Under the Wildlife Amendment Act (2000), NHAs are legally protected from damage from the date they are formally proposed for designation (source: www.npws.ie).

No Natural Heritage Areas were identified as present in the study area.

The closest NHA to the Proposed Project is the Slievenamon Bog NHA (002388), located approximately 46.5km west of the Proposed Project, which is assessed as outside the ZoI¹¹.

Proposed Natural Heritage Areas

Proposed NHAs, (pNHAs), are sites which were published on a non-statutory basis in 1995 (and again in the 2010s) but that have not since been statutorily proposed or designated. These sites are of significance for wildlife and habitats. Prior to statutory designation, pNHAs are still subject to limited protection, in the form of:

- Agri-environmental farm planning schemes support the objective of maintaining and enhancing the conservation status of pNHAs;
- There is a requirement for the Forest Service to gain NPWS approval before they will pay afforestation grants on pNHA lands; and,
- A recognition of the ecological value of pNHAs by Planning and Licencing Authorities.

Proposed Natural Heritage Areas identified as present in the study area and potentially within the Zone of Influence of the Proposed Project are outlined below in Table 7.11.

¹¹ NPWS 2004, Slievenamon Bog NHA (002388), Site Synopsis

Table 7.11: Proposed Natural Heritage Areas with Connectivity to the Proposed Project

Site Name	Distance between the Proposed Project and Proposed Natural Heritage Areas (straight line) at closest point (km)	Corresponding European Sites	QI
Boley Fen (000699) ¹²	1.0	No	Intermediate fen with wet grassland and tall sedge (<i>Carex</i> spp.) communities. Of interest due to its location, fens are uncommon in the south-east of Ireland. Nationally important for rare species of <i>Diptera</i> (flies). • <i>Anasimyia lunulata</i>, • <i>Psacadina zernyi</i>, • <i>Parhelophilus consimilis</i>, • <i>Pteronicta angustipennis</i>, • <i>Tetanocera puntifrons</i>
Bannow Bay (000697) ¹³		Bannow Bay SAC Bannow Bay SPA Bannow Bay Ramsar Site	See Table 7.10

¹² NPWS (1995), Boley Fen (000699), Site Synopsis

¹³ No specific synopsis available as the site corresponds to European sites. Specific features of interest for these sites are as per Tables 5.6 and 5.7

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7.3.2 Records of Protected/Rare Species and Habitats of Note

7.3.2.1 Mammals

The NBDC compiles records of species across Ireland. Within the database they collect records of protected mammals, both marine and terrestrial.

Records from the NBDC were interrogated for records of protected mammals within the 10km grid squares where the Proposed Project is located, S71 and S72. Additionally, records of rare and protected species received from the NPWS were also consulted. These compiled records are presented within Table 7.12.

Table 7.12: Terrestrial Mammal Species Recorded in the Vicinity of the Proposed Project

Species Name	Protection Level	Grid Squares In Which Recorded
Brown long-eared bat (<i>Plecotus auratus</i>)	Protected Species: EU Habitats Directive, Protected Species: EU Habitats Directive Annex IV, Protected Species: Wildlife Acts	S72
Daubenton's bat (<i>Myotis daubentonii</i>)	Protected Species: EU Habitats Directive, Protected Species: EU Habitats Directive Annex IV, Protected Species: Wildlife Acts	S71, S72
Eurasian badger (<i>Meles meles</i>)	Protected Species: Wildlife Acts	S71, S72
Eurasian pygmy shrew (<i>Sorex minutus</i>)	Protected Species: Wildlife Acts	S71, S72
Eurasian red squirrel (<i>Sciurus vulgaris</i>)	Protected Species: Wildlife Acts	S71, S72
European otter (<i>Lutra lutra</i>)	Protected Species: EU Habitats Directive, Protected Species: EU Habitats Directive Annex II, Protected Species: EU Habitats Directive Annex IV, Protected Species: Wildlife Acts	S71, S72
Leisler's bat (<i>Nyctalus leisleri</i>)	Protected Species: EU Habitats Directive, Protected Species: EU Habitats Directive Annex IV, Protected Species: Wildlife Acts	S71, S72
Pine marten (<i>Martes martes</i>)	Protected Species: EU Habitats Directive, Protected Species: EU Habitats Directive Annex V, Protected Species: Wildlife Acts	S71, S72
Pipistrelle (<i>Pipistrellus pipistrellus sensu lato</i>)	Protected Species: EU Habitats Directive, Protected Species: EU Habitats Directive Annex IV, Protected Species: Wildlife Acts	S71, S72
West European hedgehog (<i>Erinaceus europaeus</i>)	Protected Species: Wildlife Acts	S71, S72
Common dolphin (<i>Delphinus delphis</i>)	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive Annex IV Protected Species: Wildlife Acts	S71

Species Name	Protection Level	Grid Squares In Which Recorded
Common porpoise (<i>Phocoena phocoena</i>)	Protected Species: EU Habitats Directive, Protected Species: EU Habitats Directive Annex II, Protected Species: EU Habitats Directive Annex IV, Protected Species: Wildlife Acts, Threatened Species: OSPAR Convention	S71, S72
Common pipistrelle (<i>Pipistrellus pipistrellus sensu stricto</i>)	Protected Species: EU Habitats Directive, Protected Species: EU Habitats Directive Annex IV, Protected Species: Wildlife Acts	S71, S72
Irish hare (<i>Lepus timidus subsp.</i>)	Protected under the Wildlife Acts	S71, S72
Irish stoat (<i>Mustela erminea subsp.</i>)	Protected under the Wildlife Acts	S71, S72
Natterer's bat (<i>Myotis nattereri</i>)	Protected Species: EU Habitats Directive, Protected Species: EU Habitats Directive Annex IV, Protected Species: Wildlife Acts	S71, S72
Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>)	Protected Species: EU Habitats Directive, Protected Species: EU Habitats Directive Annex IV, Protected Species: Wildlife Acts	S71, S72
Whiskered bat (<i>Myotis mystacinus</i>)	Protected Species: EU Habitats Directive, Protected Species: EU Habitats Directive Annex IV, Protected Species: Wildlife Acts	S71

7.3.2.2 Birds

SCIs for relevant European Sites are outlined in Section 7.3.1.1. As described above, a Screening Statement for AA and NIS has been prepared for the Proposed Project, to consider potential adverse effects on SCIs of relevant European sites.

Annex I of the Birds Directive lists species which are:

- In danger of extinction;
- Vulnerable to change in their habitat;
- Considered rare due to small population sizes or a restricted local distribution; and,
- Require attention due to the nature of their habitat.

The National Biodiversity Data Centre (NBDC) contains records of bird species recorded in the 10km grid squares (S71 and S72) within which the Proposed Project is located. Records of bird species of potential conservation interest are provided in Table 7.13.

Table 7.13: Annex I Bird Species Recorded in 10km Grid Squares Overlapping the Proposed Project (S71 and S72)

Species Name	Reasons for Protection / Inclusion of the Species	BOCCI Status	Grid Squares Recorded In
Barn Owl (<i>Tyto alba</i>)	The widespread loss of breeding habitats and some nests are robbed by egg-collectors and to supply a clandestine trade for falconry	Red	S71, S72
Bar-tailed Godwit (<i>Limosa lapponica</i>)	The species is vulnerable due to its concentration at a few suitable coastal wetlands outside the breeding season.	Amber	S71
Common Kingfisher (<i>Alcedo atthis</i>)	Its range has expanded this century, but populations have recently fallen in several countries.	Amber	S71, S72
Corn Crake (<i>Crex crex</i>)	Habitat loss and high mortality caused by the intensification and mechanization of hay and silage making	Red	S71, S72
Dunlin (<i>Calidris alpina</i>)	None given.	Red	S72
European Golden Plover (<i>Pluvialis apricaria</i>)	The main threats for the species are the loss and deterioration of habitat and disturbances at the breeding period.	Red	S71
Hen Harrier (<i>Circus cyaneus</i>)	The widespread loss of breeding habitats and the occurrence of localized persecution and destruction of nests.	Amber	S71, S72
Little Egret (<i>Egretta garzetta</i>)	The loss and deterioration of habitats due to drainage and to agricultural and development projects are the major threats that the species is now facing. Extreme weather and predation by Corvids have also been identified as notable threats to the species (Fennelly & Cannon 2015).	Green	S71, S72
Merlin (<i>Falco columbarius</i>)	The main threats to this species are loss of habitats, contamination of birds with organochlorines from agriculture, human disturbance and nest-robbing by falconers.	Amber	S71
Peregrine Falcon (<i>Falco peregrinus</i>)	The widespread post-1960 decline in Peregrine numbers were caused by food-chain contamination with persistent toxic chemical residues, mainly of agricultural organochlorines insecticides. The restrictions and later bans on the majority of persistent organochlorines over most of Europe were followed by the general recovery in Peregrine numbers. Today, some nests are robbed by egg-collectors and to supply a clandestine trade for falconry.	Green	S72
Short-eared Owl (<i>Asio flammeus</i>)	The widespread loss of breeding habitats and increase in predator densities causing an increase in nest predation.	Amber	S72
Mediterranean Gull (<i>Larus melanocephalus</i>)	Loss of habitat, disturbance and tourism development on coastal areas are the major threats for the species. In winter and during migration, Mediterranean Gulls are threatened by illegal hunting, oil pollution and changes in fishing practices.	Amber	S71

In summary, based on the desk study alone the following specific bird species/ groups were considered relevant to the project based on the desk assessment as they may occur within the Zol of the Proposed Project.

- Barn owl (farmland and old buildings)
- Common kingfisher (riparian areas)
- Waterfowl and gulls (within wider Zol)

The field surveys focused on these species while recording other potential Target Species that may not be recorded by the NBDC that are known generally to occur in farmland and woodland in Wexford, refer to Table 7.20.

7.3.2.3 Other Species of Note

NBDC records of rare and protected amphibians, reptiles, fish and invertebrates identified within the 10km grid squares the Proposed Project located in is presented in Table 7.14.

Table 7.14: Other Species of Note

Species Name	Conservation Status/Protection Level	Grid Squares in Which Recorded
Common Frog (<i>Rana temporaria</i>)	Protected species: Habitats Directive, Wildlife Acts	S71, S72
Smooth newt (<i>Lissotriton vulgaris</i>)	Protected species: Wildlife Acts	S72
Atlantic Cod (<i>Gadus morhua</i>)	Threatened species: OSPAR Convention	S71
Gatekeeper (<i>Pyronia tithonus</i>)	Threatened species: Near Threatened	S71
Grayling (<i>Hipparchia semele</i>)	Threatened species: Near Threatened	S71
Wall (<i>Lasiommata megera</i>)	Threatened species: Endangered	S71
Hairy Yellow-face (<i>Hylaeus hyalinatus</i>)	Threatened species: Vulnerable	S71
Northern Colletes (<i>Colletes floralis</i>)	Threatened species: Vulnerable	S71
Bronze Furrow Bee (<i>Halicutis tumulorum</i>)	Threatened Species: Near threatened	S72
Buffish Mining Bee (<i>Andrena nigroaenea</i>)	Threatened Species: Near threatened	S72
Furry-claspered Furrow Bee (<i>Lasioglossum lativentre</i>)	Threatened Species: Critically Endangered	S72
Groove-faced Mining Bee (<i>Andrena angustior</i>)	Threatened Species: Vulnerable	S72
Painted Mining Bee (<i>Andrena fucata</i>)	Threatened Species: Near threatened	S72
Panzer's Nomad Bee (<i>Nomada panzeri sensu lato</i>)	Threatened Species: Near threatened	S72
Red-tailed Bumblebee (<i>Bombus lapidarius</i>)	Threatened species: Near threatened	S71, S72

Tufted Furrow Bee (<i>Lasioglossum nitidiusculum</i>)	Threatened species: Vulnerable	S71, S72
Shiny-margined Mini-miner (<i>Andrena semilaevis</i>)	Threatened Species: Vulnerable	S72
Shrill Carder Bee (<i>Bombus sylvarum</i>)	Threatened Species: Endangered	S72
Tufted Furrow Bee (<i>Lasioglossum nitidiusculum</i>)	Threatened Species: Vulnerable	S72
Yellow Shell (<i>Camptogramma bilineata</i>)	Threatened species: near threatened	S71
Common Lizard (<i>Zootoca vivipara</i>)	Protected species: Wildlife Act	S71, S72

7.3.2.4 Rare and Protected Flora

Records from the NBDC were interrogated for records of rare and protected flora species within the 10km grid squares the Proposed Project is located in; S71 and S72. The species recorded within the last 50 years are presented below in Table 7.15 along with rare/protected flora records received from NPWS, but excluding extinct, and so-called 'Waiting List' species.

Table 7.15: Protected and Rare Flora Records

Species Name	Conservation Status	Protection	Grid Squares Recorded In
Betony (<i>Stachys officinalis</i>)	Threatened Species: Near threatened	Flora Protection Order S.I. No. 235/2022	S71, S72
Borren's Saltmarsh-grass (<i>Puccinellia fasciculata</i>)	Threatened Species: Vulnerable	Flora Protection Order S.I. No. 235/2022	S71
Chives (<i>Allium schoenoprasum</i>)	Threatened Species: Vulnerable	Flora Protection Order S.I. No. 235/2022	S71
Clustered clover (<i>Trifolium glomeratum</i>)	Threatened Species: Endangered	Flora Protection Order S.I. No. 235/2022	S71
Divided sedge (<i>Carex divisa</i>)	Threatened Species: Regionally Extinct	Flora Protection Order S.I. No. 235/2022	S71
Meadow barley (<i>Hordeum secalinum</i>)	Threatened Species: Endangered	Flora Protection Order S.I. No. 235/2022	S71, S72
Meadow saffron (<i>Colchicum autumnale</i>)	Threatened Species: Critically Endangered	Flora Protection Order S.I. No. 235/2022	S72

7.3.2.5 Invasive Species

Records of invasive species listed under the Third Schedule to the European Communities (Birds and Natural Habitats) Regulations 2011 were interrogated from the NBDC within 10km grid squares in which the proposed project is located;

Table 7.16: Invasive Species Records

Species Name	Grid Square
Canadian waterweed (<i>Elodea canadensis</i>)	S71
Common cord-grass (<i>Spartina anglica</i>)	S71
Himalayan balsam (<i>Impatiens glandulifera</i>)	S71, S72

Species Name	Grid Square
Japanese knotweed (<i>Fallopia japonica</i>)	S71, S72
Rhododendron (<i>Rhododendron ponticum</i>)	S71, S72
Spanish bluebell (<i>Hyacinthoides hispanica</i>)	S71
Three-cornered leek (<i>Allium triquetrum</i>)	S71, S72
American mink (<i>Mustela vison</i>)	S71, S72
Brown rat (<i>Rattus norvegicus</i>)	S72
Eastern grey squirrel (<i>Sciurus carolinensis</i>)	S72
Giant-rhubarb (<i>Gunnera tinctoria</i>)	S71
Salmonberry (<i>Rubus spectabilis</i>)	S71
Sea-buckthorn (<i>Hippophae rhamnoides</i>)	S71
Harlequin ladybird (<i>Harmonia axyridis</i>)	S71
Dace (<i>Leuciscus leuciscus</i>)	S72
Muntjac deer (<i>Muntiacus reevesi</i>)	S72

These species in particular terrestrial plants were checked for during surveys in areas of potential impact

7.3.3 Field Survey Results

The following summarises results from surveys carried out on site for the Proposed Project. Results are presented in full in the Appendix section.

Figure 7.1 indicates fields where surveys were conducted

7.3.3.1 Habitat Overview

A description of the habitats located within the Proposed Project site is presented hereunder. Habitats were described in accordance with Fossitt (2000). An assessment of the habitats was undertaken in accordance with the NRA Guidance (2009) and CIEEM Guidelines (2018).

A habitat map of the proposed development and surrounding areas is provided in Appendix 7.1. The ecological value of habitats has been defined using the classification scheme outlined in the *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (NRA, 2009). It should be noted that the value of a habitat is site specific and will be partially related to the amount of that habitat in the surrounding landscape.

- Habitats that are considered to be good examples of Annex I and Priority habitats are classes as being of International or National Importance.
- Semi-natural habitats with high biodiversity in a county context and that are vulnerable, are considered to be of County Importance.
- Habitats that are semi-natural, or locally important for wildlife, are considered to be of Local Importance (higher value).
- Sites containing small areas of semi-natural habitat, or which maintain connectivity between habitats are considered to be of Local Importance (lower value).

A general description of the habitats encountered within the Red Line Boundary is presented Table 7.17 along with their ecological valuation.

Areas which were subject to detailed botanical survey are outlined in Section 7.3.4.2. These surveys informed the design with habitats of high ecological value avoided or impacts minimised

Table 7.17: Description of Habitats Recorded within the Proposed Project Site

Habitat Type (Fossitt Code)	Description/Species	Valuation	Image
Improved Agricultural Grassland (GA1)	Species recorded included typical common species such as broad leaved dock (<i>Rumex obtusifolius</i>), common chickweed (<i>Stellaria media</i>), clovers (<i>Trifolium spp.</i>), creeping buttercup (<i>Ranunculus repens</i>), creeping thistle (<i>Cirsium arvense</i>), daffodil (<i>Narcissus pseudonarcissus</i>), daisy (<i>Bellis perennis</i>), dandelion (<i>Taraxacum spp.</i>), hairy mouse-ear (<i>Cerastium sp.</i>), hawkbit (<i>Hedypnois spp.</i>), meadow buttercup (<i>Ranunculus acris</i>), mouse ear hawkweed (<i>Pilosella officinarum</i>), common nettle (<i>Urtica dioica</i>), plantain (<i>Plantago spp.</i>), rye grass (<i>Lolium spp.</i>), selfheal (<i>Prunella vulgaris</i>), sheep's sorrel (<i>Rumex acetosella</i>), spear thistle (<i>Cirsium vulgare</i>), and white clover (<i>Trifolium repens</i>). These areas of low ecological value are the focus of the proposed development.	Improved agricultural grassland within the footprint of the Proposed Project is assessed as being of Local Importance (Lower Value) .	 Photo 7.1: Improved Agricultural Grassland (GA1)
Arable crop (BC1)	Arable crop was noted as a commonly occurring habitat within the study area (Photo 7.2). This habitat typically comprises large, open fields of crop, bordered by hedgerows and treelines. This habitat is managed for agricultural land use. These areas of low ecological value are the focus of the proposed development.	This habitat is evaluated as Local Importance (Lower Value) .	 Photo 7.2: Arable crop habitat (BC1)

Habitat Type (Fossitt Code)	Description/Species	Valuation	Image
Tilled land (BC3)	Similar to arable crop tilled land is commonly occurring habitat within the study area (Figure 7.2). This habitat was comprised of tilled fields which had not yet been reseeded for arable crop. These areas of low ecological value are the focus of the proposed development.	This habitat is evaluated as Local Importance (Lower Value) .	 Photo 7.3: Tilled Land (BC2)
Wet Grassland (GS4)	Wet grassland was recorded locally on the site including east Field 14 and Fields a, c, b, 17 and 15. Species recorded within this habitat included rush (<i>Juncus sp.</i>), blue sedge (<i>Carex flacca</i>), wood sedge (<i>Carex sylvatica</i>), dandelion (<i>Taraxacum vulgaria</i>), cuckooflower (<i>Cardamine pratensis</i>), lesser spearwort (<i>Ranunculus flammula</i>), meadowsweet (<i>Filipendula ulmaria</i>), meadow buttercup (<i>Ranunculus acris</i>), silverweed (<i>Potentilla anserina</i>). These areas were identified at an early stage and are largely avoided.	This habitat is evaluated for specific locations in Table 7.18.	 Photo 7.4: Wet Grassland (GS4)
Marsh (GM1)	Marsh was recorded east of Field 14 and west of Fields 15, c and 17. This habitat was recorded grading into wet grassland (GS4) and scrub (WS1). Species recorded within this habitat included rushes (<i>Juncus sp.</i>) purple loosestrife (<i>Lythrum salicaria</i>), meadowsweet (<i>Filipendula ulmaria</i>), flag iris (<i>Iris pseudacorus</i>), great willowherb (<i>Epilobium hirsutum</i>), pondweed (<i>Potamogeton spp.</i>), water dropwort (<i>Oenanthe lachenalii</i>), reed canary grass (<i>Phalaris arundinacea</i>), bindweed	This habitat is evaluated for specific locations in Table 7.18.	No image available

Habitat Type (Fossitt Code)	Description/Species	Valuation	Image
	<i>(Convolvulus arvensis)</i> , greater tussock sedge (<i>Carex paniculata</i>), wild Angelica (<i>Angelica sylvestris</i>). These areas were identified at an early stage and are avoided.		
Treeline (WL2)	Treelines were recorded throughout the red line boundary for the proposed development (Figure 5.1). Species recorded within the treelines included silver birch (<i>Betula pendula</i>), downy birch (<i>Betula pubescens</i>), willow (<i>Salix</i> spp.), holly (<i>Ilex aquifolium</i>), gorse (<i>Ulex europaeus</i>), beech (<i>Fagus sylvatica</i>), blackthorn (<i>Prunus spinosa</i>), brambles (<i>Rubus fruticosus</i>), ivy (<i>Hedera helix</i>), bird cherry (<i>Prunus padus</i>), ash (<i>Fraxinus excelsior</i>), sycamore (<i>Acer pseudoplatanus</i>), hawthorn (<i>Crataegus monogyna</i>), and elder (<i>Sambucus nigra</i>). This habitat is avoided.	Treelines are assessed as being of Local Importance (Higher Value) .	 Photo 7.5: Treeline (WL2) Source: Mott MacDonald 2023
Hedgerow (WL1)	Hedgerows were recorded throughout the red line boundary for the proposed development (Figure 5.2). In the northern sections of the Proposed Development the hedgerows were highly managed, with those recorded further south generally less managed examples. Species recorded within this habitat included ash (<i>Fraxinus excelsior</i>), hawthorn (<i>Crataegus monogyna</i>), gorse (<i>Ulex europaeus</i>), blackthorn (<i>Prunus spinosa</i>), brambles (<i>Rubus fruticosus</i>), honeysuckle (<i>Lonicera periclymenum</i>), elder (<i>Sambucus nigra</i>), and sycamore (<i>Acer pseudoplatanus</i>). Except for localised works at some access road crossings this habitat is largely avoided.	Hedgerows are assessed as being of Local Importance (Higher Value) .	 Photo 7.6: Hedgerow (WL1) Source: Mott MacDonald (2024)

Habitat Type (Fossitt Code)	Description/Species	Valuation	Image
Earth Banks (BL2) / Stone Walls (BL1)	Earth banks were recorded in on the boundaries of Fields 5, 7, 10 and 11, as field boundaries in a number of locations these earth banks had developed over old stone walls. These earth banks were vegetated typically with species including Yorkshire fog (<i>Holcus lanatus</i>), brambles (<i>Rubus fruticosus</i>), ivy (<i>Hedera helix</i>), and bracken (<i>Pteridium aquilinum</i>). This habitat is largely avoided and some areas are proposed for biodiversity enhancement with additional tree planting.	Earth bank/Stone walls are assessed as being of Local Importance (Lower Value) .	 Photo 7.7: Earth Bank (BL2) Source: Mott MacDonald (2024)
Drainage ditches	Drainage ditches were generally recorded in association with treelines and hedgerows as part of field boundaries (Figure 7.8). Except for localised works on the boundary of the proposed BESS and locally at some access road crossings this habitat is largely avoided.	This habitat is evaluated as being of local importance (Lower value)	 Photo 7.8: Drainage Ditch alongside a treeline Source: mott MacDonald (2023)

Habitat Type (Fossitt Code)	Description/Species	Valuation	Image
Wet Willow Alder Ash woodland (WN6)	This habitat was recorded in riparian areas along the Owenduff River and eastern boundary of Field 16. It was also recorded west of Firds a, 29 and 31. Ash (<i>Fraxinus excelsior</i>), elm (<i>Ulmus glabra</i>), sycamore (<i>Acer pseudoplatanus</i>), elm (<i>Ulmus glabra</i>), willow (<i>Salix spp.</i>), poplar (<i>Populus spp.</i>), hawthorn (<i>Crataegus monogyna</i>), alder (<i>Alnus glutinosa</i>), blackthorn (<i>Prunus spinosa</i>), elder (<i>Sambucus nigra</i>), holly (<i>Ilex aquifolium</i>), water dropwort (<i>Oenanthe crocata</i>), flag iris (<i>Iris pseudacorus</i>), golden saxifrage (<i>Chrysosplenium oppositifolium</i>), remote sedge (<i>Carex remota</i>), hogweed (<i>Heracleum sphondylium</i>), wild Angelica (<i>Angelica sylvestris</i>), nettles (<i>Urtica dioica</i>), lesser celandine (<i>Ficaria verna</i>), broad buckler fern (<i>Driopteris dilitata</i>), lady's fern (<i>Athyrium filix-femina</i>), harts tongue fern (<i>Asplenium scolopendrium</i>). This habitat is avoided by the proposed development.	Wet willow alder ash woodland habitat is assessed as being of County Importance.	 Photo 7.9: Wet willow ash woodland Source: Mott MacDonald (2024)
Scrub (WS1)	This woodland is dominated by willow, bramble and marsh species locally within the site and is largely avoided. It forms mosaic habitat with marsh and wet grassland.	Scrub is assessed as being of Local Importance (higher value).	No image

7.3.3.2 Detailed Botanical Surveys

Detailed botanical surveys were carried out in semi natural habitats, including GS4, GM1, WN4 and WN6, previously identified during walkover surveys. Surveys were carried out in Fields 15, 17, 29 and 31 as well as fields c, d, w, b and a, refer to Figure 7.1.

Survey results are described within Table 7.18 with the ecological valuation concluded for each field. Species lists for each field, including habitat mosaics, are provided in Appendix 7.2.

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Table 7.18: Results of detailed botanic survey

Field Number	Habitat Type	Habitat Description	Value
Field a	Wet grassland, scrub, marsh, dense bracken and elements of wet heath – GS4 / WS1 / GM1 / HD1 / HH3.	Overall, this field is very species rich and is of high ecological value. This field is adjacent to wet willow woodland. This field can be split roughly into thirds in terms of habitat types. The eastern third (entrance to the field) is cut regularly similar to the adjacent fields to the north and south, access to these fields is also through this part of the field. This part of the field is made up entirely of wet grassland, it is also more species rich than adjacent fields. The middle third is mostly unmanaged wet grassland and scrub/ heath species mosaic, abundant with Molinia and immature willow. Moss cover on the ground increases here and heather (<i>Calluna vulgaris</i>) becomes rare to occasional. There is a notable patch of dense bracken on the south side of this section. The western, wettest and most species diverse portion of the field, is unmanaged marsh and wet grassland mosaic with elements of wet heath.	This field is of County Importance .
Field b	Wet Grassland, Marsh and Scrub mosaic – GS4 / GM1 / WS1	This northern half of this field is a mosaic of wet grassland and scrub. The southern half of the field is very wet with pools forming in areas and is a mosaic of marsh, wet grassland and scrub.	This field is of Local (higher) Importance .
Field c	Wet Grassland – GS4	Similar to field 1 but drier and more birch and gorse regeneration. This field is slightly less species rich than the adjacent field with more scattered devil's bit scabious. This habitat aligns most closely with a number of plant communities in the Irish vegetation classification including GL1c- <i>Mollina caerulea-Succisa pratensis</i> grassland and GL1b <i>Agrostis stolonifera-Filipendula ulmaria</i> marsh-grassland. Other habitats include Wet grassland GS4, Marsh GM1 and to an extent EU Annex I habitat 6410 Molinia meadow. Given it has a frequent component of Devils bit scabious, it is also likely to be an important site for Annex II species Marsh Fritillary. Both IVC habitat types are almost completely absent from Co. Wexford (O'Neill 2013) with just one known site at Ballynamona Co. Wexford. These IVC habitats otherwise largely only occur in the midlands and northwest.	This field is assessed as being of County Importance .
Field d	Dry Calcareous and Neutral Grassland, with some Wet Grassland – GS1 / GS4.	This field is managed (cut frequently) and drier than the immediately adjacent fields (field c and e) but wetter towards the west end. It was freshly cut during botanical surveys but nevertheless is relatively species poor and has been reseeded in past.	This field is of Local (lower) importance .
Field e	Wet Grassland - GS4	This habitat aligns most closely with a number of plant communities in the Irish vegetation classification including GL1c- <i>Mollina caerulea-Succisa pratensis</i> grassland and GL1b <i>Agrostis stolonifera-Filipendula ulmaria</i> marsh-grassland. Other habitat classifications it shows an	This field is of County Importance .

Field Number	Habitat Type	Habitat Description	Value
Field 17	Wet Grassland with elements of heath – GS4.	This habitat aligns most closely with a number of plant communities in the Irish vegetation classification including GL1c- <i>Mollina caerulea-Succisa pratensis</i> grassland and GL1b <i>Agrostis stolonifera-Filipendula ulmaria</i> marsh-grassland. Other habitat classifications it shows an affinity towards include Wet grassland GS4, Marsh GM1 and to an extent EU Annex I habitat 6410 Mollinia meadow. Given it has an abundant component of devils bit scabious, it is also very likely to be an important site for Annex II species Marsh Fritillary. Both IVC habitat types are almost completely absent from Co. Wexford (O'Neill 2013) with just one known site at Ballynamona Co. Wexford. These IVC habitats otherwise largely only occur in the midlands and northwest.	This field is of County Importance.
Field 29	Dry meadow and wet grassland – GS2 / GS4.	This northern field is mostly dry meadow which is more managed, cut more regularly, than the adjacent field to the south. Although, there are patches of wet grassland on the north side of this field.	This field is of Local (higher value) importance.
Field 31	Dry meadow, wet grassland and marsh – GS2 / GS4 / GM1	This field is similar to field 29 in that it is cut quite regularly, and as a result is not as species rich as field a situated between 29 and 31.	This field is assessed as being of Local Importance (Higher Value) importance.

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7.3.3.3 Aquatic Survey

The aquatic surveys provided up to date information on the baseline ecological quality of the Owenduff and Tellarought River.

Owenduff River

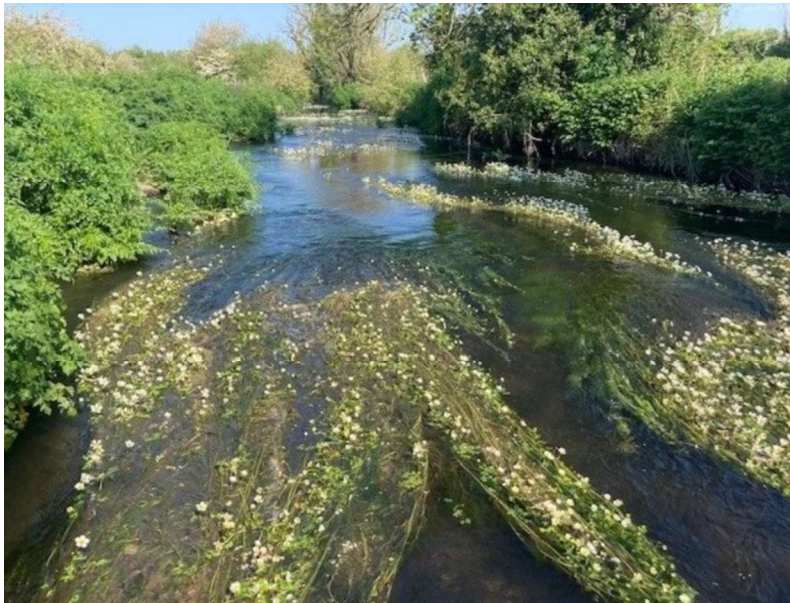
Brown trout are present in the Owenduff River (2025 observation). Other fish species may include Salmon, Lamprey Species and Eels as habitat is suitable and water quality (Q3-4) is relatively good, albeit not currently of high quality.

The May 2025 SSSRS assessment determined a score of >7.25 i.e. the river is “probably not at Risk”.

The Q value (Toner et al 2005) assessment determined Q3-4 (Moderate) which is similar to the most recent EPA data (2022) at the closest monitoring point¹⁴ to the site

The River has floating river vegetation consistent with the Annex 1 habitat watercourses of plain to montane levels with the *Ranunculus fluitans* and *Callitriche-Batrachion* vegetation (3260).

Figure 7.5: River Owenduff with mats of floating river vegetation and glides with abundant trout (*Salmo trutta*)



Tellarought River

This river is a tributary of the Owenduff river.

It has similar water quality to the Owenduff and is likely an important salmonid (sp.) spawning stream.

The SSSRS assessment determined a score of >7.25 i.e. the river is “probably not at Risk”.

The Q value (Toner et al 2005) assessment determined Q3-4 (Moderate).

¹⁴[EPA Maps](#) Station Code: RS13O010100

Evaluation

The Owenduff and Tellarought River are very important aquatic ecology features in the wider Wexford region and are evaluated as **County Importance**.

7.3.3.4 Non Volant Mammals

Badgers

Evidence of badger activity was noted throughout the Proposed Project site and is described within Table 7.19. A total of four active badger setts were identified within the Proposed Project site boundary.

Location information is detailed within a separate confidential report and the design and mitigation will rule out a disturbance risk.

Table 7.19: Badger Signs Recorded During Field Surveys

Feature ID	Feature Recorded	Location Relative to the Proposed Project	Notes
1	Sett (Sett 1)	Located along a southern field boundary, 30m from the Proposed Project layout.	Active badger sett identified within a hedgerow field boundary above a drainage ditch. A total of four sett entrances were recorded at this sett with well-worn paths observed leading to and from the sett entrances along the field boundary and drainage ditch. The sett exhibited evidence of recent activity with fresh spoil and bedding piled up outside of entrances.
2	Sett (Sett 2)	Located within a woodland area, 30m from the Proposed Project layout.	Active badger sett identified within the undergrowth of the woodland corridor habitat with some sett entrances located beneath root systems. A total of seven sett entrances were recorded at this sett. Evidence of recent activity due to fresh spoil located by entrances and well-worn paths leading to and from the sett suggest the sett is currently active.
3	Sett (Sett 3)	Located approximately 65m outside the Proposed Project layout.	Active badger sett identified within the undergrowth of the woodland corridor habitat with some sett entrances located beneath root systems. A total of six sett entrances were recorded at this sett. Evidence of recent activity due to fresh spoil located by entrances and well-worn paths leading to and from the sett suggest the sett is currently active.
4	Sett (Sett 4)	Located within woodland area approximately 30m from the Proposed Project layout.	Active badger sett identified within the undergrowth of the wet woodland habitat with some sett entrances located beneath root systems. A total of twelve sett entrances were recorded at this sett. Evidence of recent activity due to fresh spoil located by entrances and well-worn paths leading to and from the sett suggest the sett is currently active.
5	Snuffle holes	Located within a woodland area approximately 58m west of the Proposed Project site boundary.	Snuffle hole located suggesting recent foraging activity has occurred in the area.
6	Snuffle holes	Located within a woodland corridor area approximately 100m north of the Proposed Project boundary.	Snuffle hole located suggesting recent foraging activity has occurred in the area.
7	Snuffle holes	Located within a treeline field boundary approximately 17m east of a proposed access.	Snuffle hole located suggesting recent foraging activity has occurred in the area.

Feature ID	Feature Recorded	Location Relative to the Proposed Project	Notes
		track within the Proposed Project layout.	
8	Snuffle holes	Located within the southwest corner of a field approximately 20m west of a proposed access track within the Proposed Project layout and inside the Proposed Project red line boundary.	Snuffle hole located suggesting recent foraging activity has occurred in the area,
9	Snuffle holes	Located within a field approximately 4m north of the Proposed Project site's easement, outside of the Proposed Project red line boundary.	Snuffle hole located suggesting recent foraging activity has occurred in the area
10	Dung	Located within the western boundary of a field 50m south of the Proposed Project layout within the red line boundary of the Proposed Project.	Dung was identified along a field boundary, not within a latrine
11	Tracks	Fresh tracks were identified within the southern area of the proposed development site located within land parcel UID-004, IGR (S 77667 19063)	

The site supports at least four active badger sett complexes. These setts are located in woodland areas where impacts will be avoided. This small local badger population is evaluated as **Local Importance (Higher)** value. The population using the area around and within the site is likely to be of Local Importance (Higher) value relative to the Wexford County population i.e. less than 1% of the county population.

Otter

No otter holts were identified within the proposed development site. Riparian and river corridors including the Owenduff are used by otters and will be avoided.

The Owenduff River is likely to be an important habitat in the region for otter with connected habitat that runs to Bannow Bay. The otter population using the area around the site is likely to be of Local Importance (Higher) value relative to the Wexford County population i.e. less than 1% of the county population.

7.3.3.5 Volant Mammals - Bats

The key summary findings of the bat survey methods are as follows

Bat Roost sites

Two separate bat roosts were recorded in 2024 within a cluster of old derelict farm buildings at a location adjacent and offsite of the proposed substation. One roost included a single *Myotis* sp, and a separate roost included three Common pipistrelle. A survey conducted again in 2025 here did not record a roost. This roost will not be disturbed by the proposed development and surrounding habitats including woodland and treelines will be retained.

No tree or structure features with potential as bat roosts will be impacted by the proposed development.

Bat activity on the site

2024 Static Detector Data

The most abundant species was common pipistrelle, followed by soprano pipistrelle, Leisler's bat and *Myotis* species. This is a typical species assemblage for lowland farmland.

The majority of activity was recorded was in the mature hedgerows, with high levels of common pipistrelle activity every night, moderate activity by soprano pipistrelles on a regular basis, and occasional nights of moderate activity by Leisler's bat and *Myotis* spp. Field e and Field 26 also had some nights of moderate activity by common pipistrelles and soprano pipistrelles, but Fields 16 and 5 had negligible or low activity by all species.

2025 Static detector Data

Similar to 2024 data the most abundant species was common pipistrelle, followed by soprano pipistrelle. Leisler's bat and *Myotis* species were recorded in low numbers. This is a typical species assemblage for lowland farmland.

The majority of activity was recorded was from the static Detector in Field 16, with high levels of common pipistrelle activity every night, and several nights with high activity of soprano pipistrelle. Low to moderate activity of common pipistrelles and soprano pipistrelles was recorded at all other sampling sites.

Summary

In summary based on 2024 and 2025 data the most important areas for foraging and commuting bats, as expected, were the boundaries of the site near woodland and riparian areas. The smaller fields with higher hedgerow levels at the western part of the site had moderate levels of activity.

In the context of the wider area the bat population in the site is evaluated as being of **Local Importance (Higher Value)**

The extensive open areas of arable and improved farmland had negligible or low bat activity.

7.3.3.6 Breeding Birds

Habitat Suitability for Breeding Birds

Habitats within the Proposed Project site are considered suitable for a variety of common breeding bird species; particularly those associated with farmland, scrub and woodland habitat, including species listed on the BoCCI red and Amber lists.

Breeding Bird Surveys

A total of 11 target bird species (refer to Table 7.6) were recorded during the breeding bird surveys, including those which are listed on the BoCCI4 Red or Amber list (Gilbert et al. 2021) and those listed under Annex 1 (Birds Directive). Table 7.20 summaries the key results of these surveys.

Table 7.20: Breeding Bird Survey Results (2023, 2024 and 2025)

Target and non target (noteworthy) Species Recorded	BOCCI Status	Habitats (fossitt codes)	Max count for individual transect	Transects	Notes
Yellowhammer	Red	BC1, WL2, WS1, GS4, GA1	3	1, 3, 4, 2 and 5	Widespread throughout site.
Swallow	Amber	GA1, GS4, GM1, BL1	4	1	Nesting in stone buildings
Starling	Amber	BC1, WL1, WL2	17	1	
Linnet	Amber	WS1, GS4, GM1	1	1,3	
Willow warbler	Amber	WS1	5	Widespread	
Spotted Flycatcher	Amber	WS1, GS4, GM1	1	1	
Grey wagtail	Red	FW1	1	Owenduff River off site	
<i>Dipper</i>	Green	FW1	2	Owenduff River off site	2 dipper nesting in Neighbourly Bridge, recorded during bat survey
Kingfisher	Amber	FW1	1	Owenduff River off site	
Mallard	Amber	FW1, GS4	3	Owenduff River off site	
Goldcrest	Amber	WN6, WL1, WL2	1		
<i>Buzzard</i>	Green	WN, BC1, GA1, GS4	2	1,	Dead Juvenile found
<i>Sparrow hawk</i>	Green	WS1, GS4	1		
<i>Lesser Black Backed Gull</i>	Amber	BC1	2	1	
<i>Great spotted woodpecker</i>	Green	WN6	2	6	
Woodcock	Red	WS1, WN6, WD3 (off site)	0	2	None recorded. Potential habitat avoided.

No evidence of breeding woodcock was recorded during the dedicated breeding woodcock surveys in May 2024. However, two separate live individuals were recorded during the winter season when flushed from wet grassland during walkover surveys in February 2023.

Incidental Bird Records

Incidental records of birds during walkover and non-bird related surveys are listed in Table 7.21 below.

Table 7.21: Incidental Records of Note

Target Species and <i>non target</i> (noteworthy) Recorded	BOCCI Status	Habitats (fossitt codes)	Date	Max count	Field Number	Notes
<i>Tree creeper</i>	Green	WN6	May 2024	2	16	
Yellowhammer	Red	WL1, BC1	May 2024	1	7, 8, 9, 11, 12, 13, 14	Multiple incidental records, constant presence in these fields
<i>Rook</i>	Green	WL2	May 2024	4 nests	10	Rookery
<i>Buzzard</i>	Green	GA1	May 2024	2	22, 23, 24, 25, 26.	
<i>Long-eared owl</i>		FW2, GS4, WS1	May 2024	1	Flying upstream Owenduff River, entered field northwest of Neighbourly bridge	Seen during bat survey

In the context of the wider area the breeding bird population in **key breeding areas** of the site is evaluated as being of **Local Importance (Higher Value)**

In summary relatively important **breeding bird habitats** on the site and adjacent areas include

- Owenduff River and riparian area (wet grassland, scrub, marsh and woodland). Noteworthy species included; kingfisher, reed bunting, grey wagtail, dipper and stonechat. Off site and no impacts to habitat except pollution considerations.
- The hedgerows and treelines around most of the site which include typical concentrations of red listed yellowhammer a red listed species relatively common in the area. Other noteworthy species include skylark, linnet and a single spotted flycatcher.
- Wet grassland and semi natural woodland and plantation forestry on the western boundary of the site. Snipe, great spotted woodpecker, goldcrest and relatively higher. densities of common passerine species.
- The site also includes a range of common (green listed) breeding passerine species widespread throughout Ireland e.g. wren, robin, blackbird etc. These species typically nest in overgrown and wooded habitats. This fact is considered in Mitigation Section 7.5.

Key breeding bird habitats (wooded areas) are evaluated as being of Local Importance (Higher) value for breeding birds. Open farmland is not an IEF for breeding birds.

The extensive arable farmland fields have limited value for breeding birds with the exception of low densities of breeding skylark. The field edges are used by hedgerow nesting species including yellowhammer, greenfinch and linnet.

7.3.3.7 Wintering Birds

Table 7.22 summarises the survey results from the wintering bird surveys undertaken in 2023 and 2025.

Table 7.22: Winter Bird Survey Results (Summary)

Target (bold) and non target noteworthy species Recorded	BOCCI ¹⁵ Status	Peak Count	
		2023 Surveys	2025 Surveys
Woodcock	Red	1	1
Snipe	Red	22	17
Golden plover	Red	1	-
Cormorant	Amber	1	-
Yellowhammer	Red	8	9
<i>Greenfinch</i>	Amber	2	1
<i>Redwing</i>	Red	10	75
<i>Skylark</i>	Amber	1	90
<i>Owl (unidentified, owl pellet found)</i>	N/A	1	-
<i>Dipper</i>	Green	2	-
<i>Buzzard</i>	Green	2	2
<i>Raven</i>	Green	1	-
<i>Great spotted woodpecker</i>	Green	1	5
<i>Long tailed tit</i>	Green	Unknown	-
<i>Mistle thrush</i>	Green	1	-
<i>Fieldfare</i>	Green	5	6
Jacksnipe	Green	1	-
<i>Jay</i>	Green	-	3
Meadow pipit	Red	-	60
<i>Reed bunting</i>	Green	-	17
<i>Stonechat</i>	Green	-	3

Very low numbers of four waterfowl species (Woodcock, Jack snipe, cormorant and golden plover) were recorded. Snipe was the only abundant waterfowl species noted, and this species is very widespread in Ireland during the winter. Snipe (and Jack Snipe) were mainly recorded in wet grassland and marsh which is avoided by the proposed development. Woodcock is a species of scrub and woodland which is avoided by the proposed development. Cormorant use rivers or fly over the site. Golden plover are attracted to large arable fields, but very low numbers (1 on one occasion) indicate that the site is not core habitat for wintering golden plover and abundant alternative fields exist in the region for flocks that move around in the winter.

Red listed passerine (Yellowhammer and meadow pipit) are common on arable farmland in the winter. The arable farmland areas also attract flocks of other wintering small passerines species e.g. linnet (incidental record 200+ noted), meadow pipit (incidental record 60+ noted) and skylark.

In the context of the local area large arable fields and wet grassland / marsh (avoided) are evaluated as being of Local Importance (Higher) value predominantly due to winter passerine flocks. The wetter habitats attract one species snipe and possibly woodcock in locally important numbers and these areas are avoided.

¹⁵ Gilbert, G., Stanbury, A., Lewis, L., (2021) Birds of Conservation Concern in Ireland 4: 2020–2026

7.3.3.8 Marsh Fritillary

The dedicated marsh fritillary surveys did not identify any evidence of the species despite presence of the food source plant *Succisa pratensis* throughout fields surveyed within the Proposed Project site.

7.3.3.9 Invasive Species

No schedule 3 listed invasive species were recorded.

7.3.3.10 Other Terrestrial Fauna

Other common mammal species recorded included Irish hare, rabbit and fox.

No amphibian or reptile species were noted. Key habitats including wetlands and scrub for these species are avoided

7.3.4 Summary Evaluation of Important Ecological Features (IEF)

Based on review of the ecological baseline, an evaluation of IEFs identified are provided in Table 7.23. Justification is provided for the omission or inclusion of IEFs. Only designated and notable conservation sites which were deemed to have connectivity with the site are considered.

Only IEFs deemed of local importance (higher value) or above will be carried through to the assessment stage.

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Table 7.23: Evaluation of IEFs

Ecological Feature	Justification for Inclusion		Conservation Valuation	Important Ecological Features (IEF) Status
Designated Sites and Notable Sites	Bannow Bay SPA (004033)	Hydrological connectivity via Owenduff river adjacent to the site	International	Yes
	Bannow Bay SAC (000697)	Hydrological connectivity via Owenduff river adjacent to the site	International	Yes
	Bannow Bay (000697) pNHA	Hydrological connectivity via Owenduff river adjacent to the site County Yes	International	Yes
	Wet Grassland (GS4)	Habitat is avoided except locally	Local Importance (Higher) and County examples	Yes
Habitats	Marsh (GM1)	Habitat is avoided. A site ecologist is required to ensure indirect impacts are avoided.	Local Importance (Higher) and County examples	Yes
	Hedgerow (WL1)/ Treelines (WL2)	Habitat is largely avoided except locally for some new access points through field boundaries.	Local Importance (Higher)	Yes
	Wet Willow Alder Ash Woodland (WN6)	Habitat is avoided in design. A site ecologist is required to ensure indirect impacts are avoided.	Local Importance (Higher) and County examples	Yes
	Owenduff and Tellarought River and riparian areas	Habitat is avoided in design. A site ecologist is required to ensure indirect impacts are avoided.	County	Yes
Aquatic Habitats, riparian areas, fish				
Badger	Four separate badger setts identified away from proposed works areas	Badger are protected under the Wildlife Act. One sett is adjacent to proposed fencing. Three others are well removed from potential disturbance areas.	Local (Higher)	Yes
Otter	No holts recorded. Riparian areas are used by badgers	Otter are protected under the Wildlife Act. No disturbance likely as no works proposed near riparian areas	County	Yes
Volant Mammals (Bats)	Roost site identified, treeline, riparian and woodland forage habitat	Roost site is avoided. Impacts to habitat are minimal. Key consideration is lighting and indirect disturbance during construction and operation phase.	Local (Higher)	Yes

Ecological Feature	Justification for Inclusion	Conservation Valuation	Important Ecological Features (IEF) Status
Breeding Birds	Common farmland bird assemblage includes Yellowhammer, Riparian birds associated with Owenduff River, Woodland and some wetland species on western site boundary	Potential localised woody vegetation clearance. Riparian and more extensive woodland and wetland areas are avoided	Local Importance (Higher Value) within key breeding bird habitats only. Yes
Breeding Birds	Open farmland	Low densities of breeding skylark on large arable fields	Local Importance (Lower value) No
Wintering Birds	Open farmland in particular arable farmland is used by relatively large numbers of passerines in the winter period. Wet grassland and marsh areas support locally important concentrations of snipe during the winter	Potential loss habitat for wintering finches is a consideration	Local Importance (Higher Value) – Arable farmland and wetland. Yes
Marsh Fritillary	Wet grassland and marsh is potential supporting habitat for rare populations in the wider region	Potential loss of suitable wet grassland habitat for Marsh Fritillary. This habitat is largely avoided in the design, but a site ECoW is required to demarcate potential habitat during construction	Local Importance (Higher Value) – Arable farmland and wetland. Yes
Invasive Species	None recorded but may become established in future and risk of introduction during construction phase	Pre construction survey required in works areas.	Yes
Herpetofauna	Amphibians (Common frog and smooth newt)	Common frog and smooth newt are protected under the Wildlife Act. Suitable habitat for foraging common frog and smooth newt is present within the hedgerows and puddles throughout the site	Local Importance (Higher Value) Yes

Ecological Feature	Justification for Inclusion	Conservation Valuation	Important Ecological Features (IEF) Status
Reptile (Common lizard)	Common lizard is protected under the Wildlife Act. Suitable Habitats within the Site are suitable for common lizard, notably well as loose rocks and dead wood, often associated with hibernacula. No evidence of this species was recorded during surveys, but their presence is assumed as a precaution, noting the potential for occupancy within the site prior to the commencement of works.		

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7.4 Do Nothing Scenario/Future Baseline

As recommended by CIEEM (2024), consideration should be given to the likely baseline situation at the time of project construction, as it may not be the same as the conditions at the time of the impact assessment. To determine this, any changes that will alter the conditions prior to the start of the proposed construction should be considered. Construction works related to the Proposed Project will likely begin within 3 years.

Within this timeframe, there will likely be no major changes to the condition and presence of flora and fauna on the site. Disturbance will remain consistent with agricultural activities and mowing continuing as well as maintenance of existing access tracks.

Consequently, baseline conditions are not likely to significantly change. The impact would be neutral.

7.5 Likely Significant Effects

This section aims to quantify the ecological effects of the Proposed Project, with reference to ecological evaluation presented in Table 7.23. All potential impacts are identified in the absence of control measures or mitigation.

Impacts are outlined for Construction Phase (Section 7.5.2). Operational and Maintenance Phase (Section 7.5.3) and Decommissioning Phase (Section 7.5.4).

The assessment informs the requirement of mitigation and / or monitoring measures, which are presented later in Section 7.6, while Section 7.8 presents the predicted residual effects, following the implementation of mitigation and / monitoring measures.

7.5.1 Identification of Impact -Effect Pathways: Rational

Following a review of information within Chapter 1 (Introduction), Chapter 9 (Water), Chapter 10 (Air Quality) and Chapter 11 (Noise and Vibration) of this EIAR, potential effect pathways are considered in line with the rational described in Table 7.24.

Table 7.24: Impact Pathways Rationale

Impact	Rationale	Potential IEF Effected
Construction Phase		
Disturbance/Mortality	Pollutant runoff to watercourses, disturbance of mammal and bird breeding sites	Badger, fish and breeding birds.
Dust	- Large dust emissions will result from earthworks associated with levelling the site where the BESS units are located (not from the solar farm). In addition, underground cables installed from the transformer substation to the terminal substation along the L40332 and L4030. - Medium dust emissions will result from construction of the solar energy farm, BESS units and substation.	Direct - Habitats including wet grassland, marsh, hedgerow/treelines and wet alder ash woodland as well as aquatic habitats and flora, fish, otters and amphibians are low sensitivity receptors within 20m of the Impact. - Increased traffic will increase the risk of introduction of invasive flora species.
Habitat Loss	- Habitat loss due to construction of BESS Units - Habitat loss due to substation - Habitat loss due to access tracks.	Direct: Localised hedgerow loss due to new access tracks Indirect: Loss of foraging habitat for IEFs including badgers, herptofauna, bats, breeding and wintering birds
Increased Noise and Vibration	- Construction activities are predicted not to result in significant effects - On less trafficked roads, there are predicted significant impacts from noise due to the low existing traffic flows.	Noise impacts from traffic may affect sensitive IEFs including breeding and wintering birds,
Invasive species	No Schedule 3 invasives noted on site but there is a risk of introduction from machinery during construction phase	Imported machinery from other sites with soil material may assist spread of invasive plants such as Himalayan balsam and three-cornered leek.
Light	No impact likely	n/a
Surface and ground water	- Impact to surface water quality from sediment runoff, spillages and discharges - Impacts on drainage patterns from working near watercourses - Impacts from a new water supply and wastewater infrastructure - Impacts on flood risk	Direct: - Habitats including wet grassland, marsh and wet alder woodland are sensitive receptors to changes in water regimes. - Fish and other aquatic species are sensitive to increase sediment, hydrocarbon spills, release of concrete and cement. No instream or riparian works/ disturbance are proposed. - Surface water drainage for the substation and BESS compound will be discharged via an existing drainage ditch which is hydrologically connected to the Owenduff River, potentially affecting aquatic habitats and species. Possible contaminated

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Impact	Rationale	Potential IEF Effected
Visual	Disturbance to wildlife during the construction phase	water from a fire (emergency) will be collected in a separate underground chamber to surface water collection on the site. None likely as no significant wintering waterfowl or sensitive ground nesting bird species recorded.
Maintenance and Operation Phase		
Disturbance/Mortality	No impacts identified	n/a
Dust	The effects of operation road and traffic contributions from the Proposed Project are low and not significant.	n/a
Habitat Loss	No impacts identified	n/a
Increased Noise and Vibration	No impacts identified	n/a
Invasive species	No impacts identified	n/a
Light	Additional light pollution associated with the new substation and BESS development. Security lighting etc. Refracted/polarised light and lake effect from solar panels on birds	Disturbance to a recorded small bat roost adjacent to the proposed substation. Localised disturbance to commuting and foraging bat populations near hedgerows and treelines. No impacts are likely from refracted light and "lake effect" associated with solar panels., refer to Section 7.5.3.
Surface and ground water	- Filter drains are proposed along proposed access tracks and silt traps and oil/fuel interceptor proposed located upstream of detention pond minimising effect of run off on IEFs. Adverse impacts on surface water quality during operation will be imperceptible (Chapter 9). - Abstraction of ground water for potable water and firefighting purposes will not result in any adverse impacts on surface water quality and is assessed as imperceptible. No groundwater fed habitats (e.g. fens) occur in the vicinity of the proposed BESS development that will be affected.	Direct: - Proposed detention basin will create habitat for amphibians and foraging bats as well as attract invertebrates. - No IEFs are likely to be affected by run off during the maintenance/operation phase or due to abstraction.
Visual	No impacts identified	n/a
Decommissionings Phase		
Summary	No detailed information is available on the decommissioning phase. However, the impacts noted for the construction phase should be referred to.	

7.5.2 Construction Phase Effects

Construction Phase Impacts to IEF are summarised in Table 7.25.

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Table 7.25: Construction Phase Potential Impacts

Ecological Receptor	Evaluation	Potential for Impact in the absence of Mitigation
Bannow Bay SPA Bannow Bay SAC Bannow Bay pNHA	International	There is a hydrological link to Bannow Bay SPA. The site is not an important area for wintering SCI of these European sites. In the absence of mitigation there is potential for increased soil water runoff during the construction phase. Given the distance (>6km) of the project up stream and the relatively localised nature of works within the overall Bannow Bay catchment, impacts are likely to be temporary and imperceptible at a county scale.
Wet Grassland	Local Importance (Higher) and County examples	This habitat is avoided in the design of the proposed development. No drainage works are proposed in the vicinity of wet grassland habitat. During the construction phase there is potential for temporary and slight effects at a local scale if accessed by machinery, temporary laydown areas etc
Marsh	Local Importance (Higher) and County examples	This habitat is avoided in the design of the proposed development. No drainage works are proposed in the vicinity of marsh habitat. During construction phase there is potential for temporary and slight effects at a local scale if accessed by machinery, temporary laydown areas etc
Hedgerow (WL1)/ Treelines (WL2)	Local Importance (Higher)	The potential impacts are summarised as follows. - Total linear metres of hedgerow removed – 665m - Total hedgerow removed at site entrances – 590m - Total hedgerow removed internally (including for MV cabling crossing) – 77m In the absence of mitigation this is assessed as a permanent moderate effect at a local scale.
Wet Willow Alder Ash Woodland (WN6)	Local Importance (Higher)	This habitat is avoided in the design of the proposed development. No drainage works are proposed in the vicinity of marsh habitat. During construction phase there is potential for temporary and slight effects at a local scale if accessed by machinery, temporary laydown areas etc.
Aquatic and riparian habitats, fisheries: Owenduff and Tellarought River and associated bankside habitats (riparian)	County Importance	This habitat is avoided in the design of the proposed development. Given riparian areas are very close to proposed works areas there is a potential for a pollution incident (s) during the construction phase and disturbance to riparian habitat at the Owenduff and Tellarought River During construction phase there is potential for significant runoff as there will be extensive earthworks and land reprofiling associated with the BESS groundworks. Impacts assessed as

Potential for Impact in the absence of Mitigation

Evaluation

Ecological Receptor

			temporary and significant effect at a county scale in the absence of mitigation.
Badger (4x sett away from Proposed Project)	Local (Higher) Importance		Three of the badger setts are well removed from the proposed development and are not at risk of disturbance. One sett is close to proposed fencing (<10m). There is low potential for disturbance to badgers at this location (Confidential). During construction phase there is potential for temporary and moderate effects at a local scale in the absence of mitigation
Otters	County Importance		No other holts are likely to be disturbed. There is potential that a holt could establish in works areas i.e. drainage ditch between the most recent survey and construction phase. During construction phase there is potential for short term and moderate effects at a local scale in the absence of mitigation
Bats	Local (Higher) Importance		No trees with potential as bat roosts will be disturbed. There is potential for noise and vibration disturbance to a very small bat roost (local importance) adjacent to the proposed substation. In the absence of mitigation there is potential for short-term slight effects at a local scale. The small roost may bats temporarily get disturbed during construction phase though bats would likely return post construction.
Breeding birds	Local (Higher) Importance		Localised hedgerow clearance (see hedgerow impact above) during construction may lead to disturbance if trees are removed during the bird breeding season (March – September inclusive). In the absence there is potential for short term slight effects at a local scale.
Wintering birds	Local (Higher) Importance		Works during the wintering period will likely lead to localised disturbance / displacement to flocks of wintering passerine species that use the site. This effect is likely to be imperceptible as abundant alternative habitat is available in the locality.
Marsh Frithillary	Local (Higher) Importance		Potential for suitable habitat to be impacted / damaged in construction phase. No Marsh frithillary noted but important to retain potential habitat as this species is very rare in region. This effect is likely to be imperceptible at a local scale.
Invasive Flora	Schedule 3 listed invasive species		None recorded on the site. A risk exists of transfer of invasive species to the site and adjacent aquatic habitats during the construction phase. In the absence of mitigation potential for permanent moderate effects at a local

Ecological Receptor	Evaluation	Potential for Impact in the absence of Mitigation
		scale. Noted that three cornered leek and Himalayan balsam may be introduced which are currently scarce locally, but very common in other parts of Ireland and spread rapidly if introduced.
Amphibians	Local (Higher) Importance	Suitable breeding and typical forage habitat will be avoided by the proposed development, no direct impacts. There is potential for disturbance to suitable habitat during the construction phase. In the absence of mitigation, there is potential for imperceptible effects at a local scale.
Reptiles	Local (Higher) Importance	Suitable breeding and typical forage habitat will be avoided by the proposed development, no direct impacts. There is potential for disturbance to suitable habitat during the construction phase. In the absence of mitigation there is potential for imperceptible effects at a local scale.

7.5.3 Operational and Maintenance Phase

Operational including Maintenance Phase Impacts to IEF are summarised in Table 7.26.

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Table 7.26: Operational Phase Potential Impacts

Ecological Receptor	Evaluation	Potential for Impact in the absence of Mitigation
Bannow Bay SPA Bannow Bay SAC Bannow Bay pNHA	International	A key consideration is potential risk of runoff from contaminated water associated with a fire which would present a risk to wintering birds in Bannow Bay SPA. This is addressed in more detail in the NIS. Design mitigation includes a fire water storage system which will avoid risk of toxic runoff to the Owenduff river which is hydrologically connected to Bannow Bay SAC, SPA, pNHA. No significant impacts are likely. The site is not important as an ex situ wintering bird site based on desk and field surveys conducted. The presence of a large array of solar panels potentially attracting waterbirds is discussed here and in the accompanying NIS. No measurable adverse effects are likely to remote SCI birds that may possibly fly/ migrate over the site from the new solar and other developments (including additional overhead line and other infrastructure for the new substation and BESS). It is acknowledged that migrating waterfowl may potentially fly over the site, but in general based on the field surveys conducted, and desk study, the baseline is that the area of the proposed development is not attractive to wetland birds. The only waterfowl species of note using the site in winter is the locally common snipe which are widespread across Ireland in the winter. Studies on "lake effect hypotheses" i.e. solar park looking like a lake which may attract waterfowl which collide with solar panels, were reviewed. Studies include Diehl <i>et al</i> (2021)¹⁶ identify that solar parks can influence flight patterns in that birds may fly closer to "look" at solar arrays in arid areas, but generally reorientate and continue flights. No dead birds were found in solar facilities for this study. As the Proposed Project is well removed from wetlands in the wider region it is likely that risks to migrating birds from "lake effect hypothesis" are imperceptible and not a likely significant effect.
Wet Grassland	Local Importance (Higher) and County examples	The management of these habitats will require consideration during the operational phase as some areas may be cut off and not grazed or excessively grazed if sheep are used. In the absence of mitigation (ecologist advice for

¹⁶ Diehl, Robert, Bruce Robertson, Karl Kosciuch, 2021. Investigating the "Lake Effect" Influence on Avian Behavior From California's Utility-Scale Photovoltaic Solar Facilities . California Energy Commission, Publication Number: CEC-500-2024-055.

Potential for Impact in the absence of Mitigation

Evaluation

Ecological Receptor

			management of these habitats) operational (indirect) impacts may be long term moderate at a local scale, if these habitats are not retained and revert to a low value rank grassland or woodland type habitat.
Marsh	Local Importance (Higher) and County examples		The management of these habitats will require consideration during the operational phase as some areas may be cut off and not grazed or excessively grazed if sheep are used. In the absence of mitigation (ecologist advice for management of these habitats) operational (indirect) impacts may be long term moderate at a local scale, if these habitats are not retained and revert to a low value rank grassland or woodland type habitat.
Hedgerow (WL1)/ Treelines (WL2)	Local Importance (Higher)		No significant effects are likely.
Wet Willow Alder Ash Woodland (WN6)	Local Importance (Higher)		No significant effects are likely.
Aquatic and riparian habitats as well as fish: Owenduff and Tellarought River and riparian areas	County Importance		The proposed design including a separate chamber for collection of potential contaminated water in the event of a fire and a separate attenuation pond mean no significant pollution or other impacts to aquatic habitats and fisheries are likely.
Badger (4x sett away from Proposed Project)	Local (Higher) Importance		No significant effects are likely.
Otters	County Importance		No significant effects are likely.
Bats	Local (Higher) Importance		Low level security (automatic) lighting is proposed at the substation and BESS plant. It is likely that this will lead to localised increased levels within 100m of a small bat roost and commuting and forage habitat (Hedgerows) local to the roost. This is likely to result in a permanent imperceptible effect noting that similar developments have been assessed by Mott MacDonald ecologists where bats continue to roost in roost features adjacent to new substations
Breeding birds	Local (Higher) Importance		Impacts to suitable hedgerow breeding habitat have been carefully considered and will be minimised with additional replanting post construction. There will be a change in land management to grassland under the solar panels and localised additional hedgerow and other biodiversity enhancement away from new, refer to Section 7.7 and 7.8. This may result in less food availability locally for Yellowhammer, Linnet and more specialised breeding birds of farmland.

Ecological Receptor	Evaluation	Potential for Impact in the absence of Mitigation
		Given low numbers and abundant alternative habitat as well as likely more "weedy" areas developing near hedgerows, impacts are likely to be long-term imperceptible .
Wintering birds	Local (Higher) Importance	There will be permanent loss of relatively extensive areas of arable farmland used by wintering flock of passerines including meadow pipit, and skylark. This impact is assessed as long term slight adverse at a local scale
Marsh Fritillary	Local (Higher) Importance	No significant effects are likely.
Invasive Flora	Schedule 3 listed invasive species	No significant effects are likely.
Amphibians	Local (Higher) Importance	No significant effects are likely.
Reptiles	Local (Higher) Importance	No significant effects are likely.

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7.5.4 Decommissioning Phase

Subject to the granting of statutory approval, the Shelburne Energy Farm and grid connections will form part of the national electrical grid infrastructure. The design life of the PV Solar Farm and BESS is 30 years and 20 years respectively, where the planning permission for the operational life span of the Proposed Project overall is 40 years. The Shelburne Energy Farm is to be decommissioned in line with the Decommissioning and Land Restoration Plan.

It is expected that the 220kV Grid Connection will remain a permanent part of the national electricity transmission network and will be refurbished and / or redeveloped as required rather than be decommissioned.

The activities associated with the decommissioning phase will be similar to those associated with the construction phase. Therefore, provided that appropriate mitigation is used, the impacts of the decommissioning phase should be, as a worst-case scenario, similar to those at construction phase. Cumulative Effects

Cumulative effects take account of the addition of many minor or significant effects to create larger, more significant effects. As outlined in the EIAR Guidelines, while a single activity may itself result in a minor impact, it may, when combined with other impacts (minor or significant), result in a cumulative impact that is collectively significant.

A single effect which may, on its own, have a significant effect, may also have a reduced and insignificant impact when combined with other effects. This section 7.6 addresses the cumulative effects of the project alone (including the various project elements) and 'other developments' which may act cumulatively.

7.5.5 Intra-Project Cumulative Effects

In the case of the proposed development, potential intra-project parts (solar, BESS and substation) effects are considered under the project alone (Section 7.5).

The BESS, substation and solar park effects are outlined specifically where potential impacts are likely due to impacts on specific biodiversity receptors in sections 7.5.2 (construction) and 7.5.3 (operation). The main impacts overall include localised loss of hedgerows (new access tracks), potential surface water pollution and lighting.

7.5.6 Other Projects/Developments

The nature and scale of the other development has been evaluated and the potential for temporal overlap within the topic-specific zone of influence (ZoI) has been assessed, having regard to the potential for significant cumulative effects. It is considered that given the nature and scale of the Proposed Project and nature of potential impacts that a local scale (10km from the proposed development) is the maximum distance for possible cumulative effects.

A planning search for applications was conducted in August 2025 (including An Bord Pleanála, Wexford, Kilkenny and Waterford County Council's websites) of projects within 10km, Table 7.27. The full list of projects considered is available in Chapter 3 – EIA Methodology.

None of these projects occur locally to the Proposed Project which is a rural farming area. The key cumulative impacts considered are loss of habitat and water quality risks (Owenduff River catchment) linked to the downstream Bannow Bay SAC/ SPA.

Table 7.27: Projects and Proposals that Might Act in-Combination with the Proposed Development

Reference	Description	Address	Date Granted	Distance (km)	Potential to act in combination
Local Authority - S34.					
Wexford County Council					
20181743	PERMISSION FOR RETENTION OF UPGRADES TO WASTEWATER TREATMENT PLANT, PERMISSION FO	New Ross M.D.	13th March 2019	10km	An Appropriate Assessment screening report concluded that there is no potential for significant effects to Natura 200 sites. There is also no hydrological connection to the Proposed Development. As such, given the nature and scale of the development, no potential for in-combination effect is identified. No cumulative effects are likely to other biodiversity receptors described for the proposed development.
20220900	Permission for a 10-year planning permission for development which will consist of the construction of a solar PV farm with an operational life of 35 years on a site of 12.6 hectares.	Ballygowry, Killesk	26th August 2022	5km	A Natura Impact Statement was produced in relation to this development. The report identified the following effects with potential to adversely affect the conservation objectives of Bannow Bay SPA and Bannow Bay SAC: Loss of, or disturbance to habitats, and the potential impairment of water quality. Mitigation measures were proposed within the report to ameliorate this risk. No cumulative effects are likely to other biodiversity receptors described for the proposed development. Given the location of the development relative to the Proposed Development, should works be carried out concurrently there is potential for cumulative impacts with the proposed development due to loss of or disturbance to habitats, and degradation in water quality.
20230871 / ABP-318204-23	Permission for development consisting of: A 10 year planning permission for the construction of a Grid Stability Service Development and all associated site clearance and site development works. The proposed grid stability service development consists of the provision of a synchronous condenser within a building circa 13 metres in height; elevated modular containers to house electrical and control equipment and all associated plant/apparatus including: a) a generator circuit breaker, b) transformers, c) outdoor cooler equipment, d) underground cabling (including a connection to the existing substation, e) all associated above ground cabling, piping and electrical connections, f) 1 no. generator and associated diesel tank, g) firewater tank and pumphouse, h) perimeter fencing and 2 no. gates and i) all associated site development works including hardstanding, drainage, gabion wall and landscaping. The proposed site clearance works include the removal of a temporary portacabin and construction rubble from the site. The application relates to an establishment which holds an Integrated Pollution Prevention and Control (IPPC) license and to which the major accident regulations apply.	Great Island, Kilmokea	Case is due to be decided by 22/02/2024	9km	An appropriate assessment provided with the application states that this project will not have any significant effects on any Natura 2000 site.
Kilkenny County Council					

Reference	Description	Address	Date Granted	Distance (km)	Potential to act in combination
2314510	development from townland of Marshmeadows, New Ross, Co. Wexford to townland of Raheen, Rosbercon, Co. Kilkenny. The project passes under the River Barrow across the county boundaries of Wexford and Kilkenny. The development consists of (1) Medium Voltage (MV) electricity system improvement by the installation of a new 20kV electricity underground cable (UGC) by means horizontal directional drilling (HDD) under the River Barrow to connect the Lake Region circuit at Marshmeadows, County Wexford to the Beechgrove circuit at Raheen, Rosbercon, County Kilkenny. From end to end the UGC measures approximately 580m. The majority of the circuit, approximately 365m will be installed by HDD under the River Barrow. The remainder of the circuit, approximately 215m will be a UGC installed by traditional trenching and ducting means. Approximately 355m of this UGC will be installed within County Wexford and the remaining 225m will be installed within County Kilkenny. (2) A second "spare" duct will be installed within the HDD to enable a second circuit to be installed at a future date to further enhance and future proof the network. (3) Permission is sought for all associated works including temporary works required. Planning permission is sought for a ten (10) year period. A Natura Impact Statement (NIS) has been prepared and will be submitted to the planning authority with the application	Raheen , Rosbercon , Co. Kilkenny	December 8, 2023	10	ESB report (NIS within "Planning & Environmental Considerations Report") state that the project will have no adverse effects on the Natura 2000 sites. No cumulative effects are likely to other biodiversity receptors described for the proposed development.
Waterford County Council					
SID/ ABP Developments					
308906	Proposed development will form part of the Greenlink Interconnector and will consist of the development of a new converter station, tail station, MV substation and 23km of high voltage direct current (JVDC) electricity cables, 420m of high voltage alternating current (HVAC) cables, 23-42km of fibre optic cable and all associated site works with an overall proposed development site area of 83.8ha.	Great Island, Kilmarnock, Dunbrody, Salmills, Grange, Kilhite, Roseltown, Coleman, Ramsgrange, Kibride, Ballinuan, Aldridge, Booley, Broomhill, Lewistown, Kildoggan, Templetown, Graigue Little, Graigue Great, Lambstown and Ramstown in Co. Wexford	June 23, 2021	7km	The NIS created by DixonBrosnan have stated that the project will not have significant effects as long as mitigation is followed. No cumulative effects are likely to other biodiversity receptors described for the proposed development.
302475	Ten-year permission for a solar farm on a site of approximately 152.8 hectares	Raheenduff, Haresmead, Rossple, Coolcliffe, Horetown North, Clongeen, Co Wexford	July 5, 2019	8.52 km	Natura sites screened out due to no hydrological connection. No cumulative effects are likely to other biodiversity receptors described for the proposed development.
318103	Development of a new electricity circuit. A Natura Impact Statement (NIS) has been prepared.	New Ross, Co. Wexford	Case is due to be decided by 07/02/2024		NIS resulted in no significant effects on the Natura 2000 network. No cumulative effects are likely to other biodiversity receptors described for the proposed development.
318204	Grid stability service development and associated site works.	Great Island Power Station, Great Island, Campile, New Ross, Co. Wexford	Case is due to be decided by 22/02/2024	8.94km	Decision status still live. NIS is required but no documents are available at the link provided. No cumulative effects are likely to other biodiversity receptors described for the proposed development.
315856	The development consists of an existing 25 metre high telecommunications support structure and associated works as previously granted under local authority reference 13/30.	Dumdowney Upper Townland , Murraghstown , Co. Kilkenny	26/03/2024	10.84 km	Inspectors report states that the AA screening screened out effects on any Natura site. No cumulative effects are likely to other biodiversity receptors described for the proposed development.
307962	Construction of an 18 metre high free standing communications structure.	Grange (ED Feithard), Feithard, Co. Wexford.	04/02/2021	13.69 km	No AANIS/EIAR done as project was deemed too small to require one. No cumulative effects are likely to other biodiversity receptors described for the proposed development.

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Reference	Description	Address	Date Granted	Distance (km)	Potential to act in combination
318914	110kV substation and 110kV underground grid connection	in the townland of Great Island, Kilmokea, County Wexford. (kilmokeagreatislandsustation.ie)	Case is due to be decided by 17/07/2024	8.75 km	AA screening determined the proposed project to not affect any Natura 2000 site, directly or indirectly. No cumulative effects are likely to other biodiversity receptors described for the proposed development.

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7.6 Mitigation and Monitoring Measures

Mitigation is prescribed in accordance with the EPA guidance on EIAR (EPA, 2022) which requires mitigation by avoidance as a first approach. Where this is not feasible, measures to prevent impacts from giving rise to adverse effects will be adopted (e.g. design of bunded storage for chemicals). Where impacts cannot be avoided, e.g. generation of noise, mitigation by reduction of impact is required to limit the exposure of the receptor to an acceptable level (often achieved by interrupting the pathway between the source and receptor).

Mitigation is prescribed hereunder to address the impacts such that adverse effects do not occur.

Mitigation is described with respect to:

- how the measures will avoid/prevent/reduce the adverse impacts on the site to an acceptable level;
- the degree of confidence in their likely success;
- the timescale, relative to the project, when they will be implemented;
- how and when the measures will be monitored.

Care has been taken throughout the design process to avoid impacts to sensitive ecological receptors. Additional mitigation measures to ameliorate the impacts as described in this chapter are outlined hereunder. These are incorporated into the CEMP contained within Appendix 5.1, Volume 3 of this EIAR, for the proposed development.

Mitigation measures were designed in accordance with the mitigation hierarchy. This is a sequential order of mitigation actions whereby the preference for mitigation measures is as outlined below:

- Avoidance: Steps to avoid harm to biodiversity.
- Minimisation: Where adverse effects cannot be avoided, action is taken to minimise these effects.
- Compensation: Only considered after all possibilities for avoidance and minimisation of effects have been implemented.

As outlined previously in Chapter 5, the design of the Proposed Project has been an iterative process. In the early stages of the project, ecological sensitivities formed part of the consideration of alternatives. This has continued into the design of the Proposed Project for consent, in that, where Important Ecological Features (IEFs) have been identified, the design has been amended to avoid / minimise risk of effects in the first instance. Biodiversity assessments provided a comprehensive consideration of the biodiversity identified and communicated constraints at the earliest opportunity to the design team.

A preliminary Ecological Assessment including a site visit and desk study was conducted at the commencement of the project programme to inform the proposed design and identify sensitive ecological receptors within the site for avoidance of infrastructure as far as possible.

Additional mitigation measures to further avoid and/or reduce the effects as described in Section 7.5 are outlined hereunder.

These will be incorporated into the CEMP for the Proposed Development as outlined in Chapter 5.

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7.6.1 Construction Phase

7.6.1.1 Pre-Construction Confirmatory Surveys

Given the dynamic distribution of species and habitats over time significant changes can arise between baseline surveys and construction. For example, invasive species distribution may change following treatment, or dispersal by humans, animals, or water.

In advance of enabling works, the Contractor will commission targeted pre-construction confirmatory surveys of IEFs outlined in this EIAR. Surveys will specifically confirm updated distribution of, and inform any revisions to proposed mitigation for:

- Otter breeding/resting sites within the Zol of the Proposed Development, 150m for breeding sites; noting that TII guidance recommends 20m for non-breeding sites.
- Badger setts within the Zol of the Proposed Development (locations as per Appendix 7.2).
- Invasive species a resurvey.
- Confirm presence of wetland (Marsh and wet grassland) habitats

Invasive species surveys will be carried out having regard to Guidance of Transport Infrastructure Ireland¹⁷. All other surveys will be carried out having regard to relevant guidance e.g. NRA (2009).

The Contractor's ECoW will conduct confirmatory otter surveys in advance of the commencement of any works within 150m of river crossings. Survey methods will be as per *Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes* where access is available within third party lands affected by infrastructure. This will allow for the identification of any holts have been established prior to commencement of works. The confirmatory otter survey will be conducted no more than 10-12 months prior to construction commencing.

The Contractor's ECoW will conduct confirmatory badger surveys having regard to *Surveying Badgers* (Harris et al.1989) and record signs of badgers including tracks, hair, latrines and setts.

The extent of survey area for badger surveys will be defined with regard to *Guidelines for the Treatment of Badgers during the Construction of National Road Schemes* (NRA, 2006) as 150m beyond all works areas within suitable habitat.

Should works progress within habitat identified as suitable for amphibians during the spawning season (March/April are the peak breeding months within the programme of the works) a pre-construction confirmatory survey for frogs and newts will be undertaken within peatland habitat.

All surveys will be undertaken by a suitably qualified ecologist (s) who may be the Contractors ECoW, but who will have demonstrable experience in the survey and assessment of the feature.

The results of pre-construction confirmatory surveys will inform the refinement of mitigation measures (if required) in Contractor method statements, and all results will be incorporated into Contractor's constraint mapping.

Ecological Clerk of Works (ECoW)

An ECoW will be employed by the Contractor to oversee implementation of mitigation. This will include monitoring and auditing the works and contractor programmes and works method statements, to ensure mitigation is correctly implemented.

¹⁷ TII (2020) <https://www.tiipublications.ie/library/GE-ENV-01105-01.pdf>

The ECoW will be suitably experienced and will have experience of identifying species rich wet grasslands and marsh habitats to be avoided or works areas minimised if no alternative access available noting habitat will be retained and expected to recover post construction.

The Contractor's ECoW will have stop works authority, in agreement with the Independent ECoW within the Employer's Representative Team.

The ECoW will be a full member of a relevant environmental institute, such as the Chartered Institute of Ecology and Environmental Management (CIEEM), and have demonstrable experience in ecological supervision, water quality protection during construction and habitat restoration works.

No disturbance licenses are required based on baseline surveys up to September 2025. However, bats, otter and badger breeding sites may become established in the next few years in areas that could be disturbed before construction commences. The Contractor's ECoW will also ensure any disturbance licenses are arranged based on relevant details outlined in this EIAR and any significant findings of confirmatory pre-construction surveys outlined above. The Contractor's ECoW will advise on mitigation measures implementation including the scheduling of works and will be included in regular liaison meetings between project teams to ensure that plans are co-ordinated, and effects are minimised. The ECoW will have stop/ start work authority in particular in relation to water pollution protection measures.

The Contractor will provide all necessary method statements to the Contractor's ECoW to demonstrate how mitigation measures will be implemented. Such method statements will include the installation and removal of silt control measures (silt fence, silt traps) and ground protection (i.e. bog mats).

Independent Ecological Clerk of Works (ECoW)

An independent Ecological Clerk of Works (ECoW) will be employed on behalf of the Employer's Representative team, who will review and comment on the pre-construction survey reports, mitigation proposals, monitoring and compliance reports generated by the Contractor's ECoW.

Reporting

Survey reporting and mapping will also be provided to the Developer, and as additionally required by any planning conditions.

7.6.1.2 Terrestrial Habitats

Semi natural wet grassland and marsh habitat identified in Appendix 7.1 Habitat Map will be avoided. If localised access is required for machinery to cross these areas then the area will be minimised in consultation with the site ECoW. Wet grassland and marsh will not be used as laydown or storage areas. The site ECoW will mark these areas and/ or outline them to Contractors to ensure they are not impacted.

In relation to hedgerows loss a detailed Landscape plan (Appendix 5.3, Volume 3 of this EIAR) has been developed for the site which will result in a net increase in hedgerow and linear woodland planting on the site compared to hedgerow loss including;

- 590 linear metres of reinstated hedgerow across site access entrances.
- 2,700 linear meters of degraded hedgerow (earth bank (BL2) with few woody species will be replanted and reinforced to develop high quality hedgerows.
- 3,800 linear meters existing hedgerow will be retained and reinforced with new planting.
- 8,590 linear meters of higher quality hedgerow will be retained with no works proposed.

- Retention of key habitats of biodiversity habitat (wet grassland, marsh and woodland) within the site and avoiding important offsite riparian and river habitats (Owenduff and Tellerought Rivers).

Construction phase total hedgerow loss will extend to 665m. This will be mitigated (at a minimum) by reinstatement of 590m of hedgerow across site access entrances, plus new hedgerow on earth bank (2,700m). This results in a minimum increase of 2,625m of hedgerow. This replanting and reinforcement planting of low diversity earth bank (BL2) field boundary habitat far exceeds the hedgerow that will be permanently lost to facilitate new access points and the proposed cable route.

In addition, biodiversity enhancement measures are proposed that will further increase biodiversity value and woodland extent on the site, refer to Section 7.7. This includes extensive additional woodland planting within a 2.3Ha site that will be managed for biodiversity.

In summary over 15% of the total development area of the Energy Farm will be set aside for Biodiversity conservation and enhancement.

7.6.1.3 Badgers

Where applicable following the preconstruction survey, heavy machinery will not be permitted within 30 m of an active badger sett, although lighter machinery may be used within 20 m and light work such as vegetation clearance can generally be undertaken within 10 m of setts (NRA, Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes, 2005). Where avoidance measures and exclusion zones cannot be used, consultation with NPWS will be necessary to permit disturbance (noting that the NPWS does not presently issue derogation licences for badger sett disturbance or destruction but can give authorisation and should be consulted). This assessment assumes that if authorisation is granted then appropriate mitigation and compensation will be provided. During the breeding season (December to June inclusive), none of the above works shall be permitted within 50 m of any active setts.

7.6.1.4 Otters

In advance of construction works, the Contractor will commission pre-construction confirmatory surveys of IEFs outlined in the EIAR. These surveys will update the findings of the surveys completed to date. Surveys will specifically confirm updated distribution of, and inform any revisions to proposed mitigation for:

- Otter breeding/resting sites within the Zol of the Proposed Project (150 m for breeding sites, where access allows at river crossings);
- The Contractor's ECoW will conduct confirmatory otter surveys in advance of the commencement of any works within 150m of the works areas (where access is available from affected landowners) as per Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes. This will allow for the identification of any holts have been established prior to commencement of works. The confirmatory otter survey will be conducted no more than 10-12 months prior to construction commencing.

7.6.1.5 Bats

No features likely to support bat roosts requiring removal were identified within potential works areas.

Temporary lighting may be required during the construction phase of the works. Any temporary lighting associated with the construction works will be placed strategically by the Contractor following consultation with the ECoW, such that illumination beyond the works area is controlled and kept to a minimum. Lighting will be cowed and directional, to reduce significant light splay.

Lighting will be directed away from potential roosts and foraging habitats. Low level security (automatic – triggers only when persons enter substation) lighting is proposed at the substation and BESS plant. It is likely that this will lead to localised increased levels within 100m of a small bat roost and commuting and forage habitat (Hedgerows) local to the roost. However this will not be consistent lighting and most of the time the substation lighting will be same as baseline (pre development).

7.6.1.6 Breeding Birds

Pre-construction nest check surveys will be carried out for breeding birds prior to removal of limited areas of required hedgerow. Surveys will also be conducted within arable farmland for skylark prior to construction of access tracks, earthworks, construction of BESS units and substation construction. If nesting activity is observed, then the programme of works will be modified to avoid significant disturbance risk e.g. vehicular movements, exclusion zones and personnel present. The nest area will be monitored until fledging occurs, or the nest site becomes inactive after which works can commence.

The removal of vegetation which may be used as nesting sites by breeding birds, will be cleared where possible outside of the birds nesting season (1st March to 31st August inclusive).

Where vegetation clearance is proposed within the nesting season, a suitably qualified ECoW will conduct pre-construction surveys to assess risk of disturbance to nesting birds to inform vegetation clearance activity. In the event where pre-construction surveys confirm or presume nesting birds are present, an exclusion zone will be established around the nesting bird (to include the risk of abandonment due to indirect disturbance), and no vegetation clearance may proceed until young have fledged, or nesting has failed. Pre-construction confirmatory surveys will be undertaken no more than 72 hours before clearance, after which repeat surveys will be required if vegetation has not been cleared.

The loss of hedgerow will be compensated for by the planting of a greater extent of hedgerow along the periphery of the Proposed Project site, as outlined in the restoration plan.

7.6.1.7 Wintering Birds

No specific mitigation is required for wintering birds during the construction phase

7.6.1.8 Marsh Fritillary

Potential habitat for Marsh Fritillary occurs at the northwest of the site near Fields 15 and 17, Refer to Figure 7.1. These areas include semi natural wet grassland and marsh habitat identified in Appendix 7.1 Habitat Map.

These areas will not be used as laydown or storage areas. The site ECoW will mark these areas and/ or outline them to Contractors to ensure they are not impacted, and any access is minimised and habitat retained.

7.6.1.9 Herpetofauna

Should works progress within habitat identified as suitable for amphibians during the breeding season (March and April) a pre-construction confirmatory survey for frogs will be undertaken. The Contractor will commission pre-construction confirmatory surveys of amphibians within drainage ditches where works are proposed.

Where common frog is recorded within the footprint of the works, any spawn or adult frogs recorded will be captured and removed from affected habitat by hand net and translocated to the nearest area of available suitable habitat. This will be carried out under license from the NPWS.

Should hedgerow removal occur during the hibernation period (October to March), impacts to torpid reptiles will be mitigated. Hedgerow removal should occur by cutting down and raking off the vegetation to allow for the displacement of common lizards.

7.6.1.10 Invasive species

No schedule 3 listed species were recorded. However, they could establish before construction phase. Prior to works commencing a full confirmatory invasive species survey will be carried out by the contractor's ECoW in accordance with Guidance of Transport Infrastructure Ireland¹⁸. All other surveys will be carried out having regard to guidance of NRA (2009). The pre-construction invasive species surveys will be carried out within the works areas, including compound locations and laydown areas, and along proposed access tracks to identify the presence of all invasive species within and adjacent to works areas.

Any additional findings of this invasive species survey will be incorporated into the final CEMP for the works. The measures relating to the Invasive Species will be identified prior to any works commencing. These measures will be regularly reviewed and updated throughout the works to include for any additional invasive species encountered.

The Invasive Species Management Plan will set out site-specific and species-specific measures to manage invasive species. It will incorporate the following measures as a minimum:

- All machinery will be steam-cleaned prior to entering site
- Any stands of invasive species that are recorded within the site will be clearly marked out as restricted areas. This exclusion zone will incorporate a buffer such that below ground growth is accounted for, noting the reduced extents for Japanese knotweed based on recent research (Fennell et al., 2018). No works will be carried out within the exclusion zones unless fully supervised by the Contractor's ECoW.
- The Contractor's ECoW will carry out a toolbox talk for all construction personnel which will provide information on how to identify and manage invasive species.
- A Check, Clean, Dry protocol will be undertaken with all equipment, machinery and vehicles entering and leaving the application site boundary.
- Any fill that is required will be from a licensed facility identified by the contractor.

7.6.1.11 Mitigation Against Water Quality Impacts to Surface Water

Mitigation measures will ensure all impacts associated with construction are controlled and managed.

The measures prescribed are best practice measures and are proven technologies/methods. Mitigation and monitoring will be legally binding and outlined as a requirement in contracts.

Pollution prevention measures will be in place before the construction works commence and maintained throughout the construction and post construction including landscaping stages.

Daily monitoring of all pollution control measures will be required to be carried out and recorded by the Contractor. As outlined monitoring and maintenance of effective pollution prevention measures based on standard best practise outlined herein will be legally binding and detailed in contracts in advance of project authorisation.

¹⁸ TII (2020) The Management of Invasive Alien Plant Species on National Roads – Technical Guidance. Available online: <https://cdn.tii.ie/publications/GE-ENV-01105-01.pdf> [Accessed 11 September 2025]

All pollution control measures will be designed, installed, and maintained in accordance with CIRIA guidance for '*Environmental Good Practice on Site*' (C741) and '*Control of water pollution from linear construction projects. Technical guidance*' (C648).

The following shall apply with regard to contractor responsibility:

- A waste management plan to ensure that waste generated during the project will be managed in a way that ensures the relevant provisions of the Waste Management Act 1996 and associated amendments and regulations are met, particularly with regard to the use of appropriately permitted Waste Contractors and destinations for waste materials.
- A Sediment Erosion and Pollution Control Plan will be implemented for all construction works. This includes measures to manage soil and silt-laden water on site, accidental leaks/spills to ground and water quality monitoring to ensure compliance with environmental quality standards specified in the relevant legislation. The plan for erosion and sediment control will also specifically deal with the potential impacts of material deposition areas during the construction phase of the project, see Appendix C within CEMP, Volume 3 of this EIAR.
- All construction staff will be properly trained to respond to accidental discharge or leaks and appropriate spill management kits will be in place to allow rapid response on site. An Incident Response Plan will be in place detailing the procedures to be undertaken in the event of spillage of chemical, fuel or other hazardous substances or wastes, logging of non-compliance incidents and any such risks that could lead to a pollution incident at any point over the proposed working areas.
- Prior to commencement of construction, the contractor will prepare method statements for discharge of construction water discharges. Further discussions will take place with the relevant authority to determine the required permit licence agreements to permit the discharge of water during the construction phase to either sewer or to ground.
- Under no circumstances will treated water be discharged to a water course without the respective water quality meeting the statutory limits as set under the relevant EU environmental objectives for surface water.
- A groundwater monitoring plan will be in place, to provide early warnings and prevent possible impacts on groundwater resource during constructions works and to monitor post construction conditions.
- Some of the standard mitigation measures proposed to minimise effects of impacts involved with the proposed construction activities comprise of:
 - The provision of boundary treatments such as silt fencing and berms will be installed prior to the commencement of any construction works in order to enhance the protection of surrounding environment during the full construction phase.
 - Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, will take place in a designated and controlled area. Furthermore, temporary stockpiles of excavated material will be managed on a site-per-site basis and designated areas will be suitably sized and isolated from open excavations or sensitive receptors.
 - Where possible excavated material will be reused within the project for the construction of embankments, in backfill, for bunding and landscaping requirements.
 - If any potentially contaminated material is encountered, it will need to be segregated from clean/inert material, tested and classified as either non-hazardous or hazardous using an approved classification method.
 - Excavated contaminated soils will be segregated and stored in an area where there is no possibility of runoff generation or infiltration to ground or surface water drainage. Care will be taken to ensure no cross-contamination with clean soils elsewhere throughout the site.

- If the water table is encountered during excavation works, groundwater management measures (sheet piles installation, dewatering, etc..) will be implemented to provide a dry working environment. Silt fencing will be installed around the works to prevent silt / suspended solid run off.
- If a daily abstraction volume higher than 25 m³ is required for dewatering activities, a dewatering / discharge permit should be obtained (with specific mitigation measures specified in the permit). If possible, any abstracted water, if of suitable quality, should be discharged back into the same waterbody. There will be regular checks on the treatment system as well as continuous monitoring equipment to measure, but not limited to, pH, temperature, conductivity, Total Suspended Solids and Totals Dissolved Solids.
- A programme of water quality monitoring (groundwater and surface water) will be implemented by the Contractor. The CEMP Volume 3, Appendix D contains a water quality management plan which will be further developed by the Contractor, prior to any construction on site. In the event that parameters are breached during the construction period, additional mitigation will be implemented to ensure that water quality is not adversely affected by the works.
- Potential impacts resulting from the proposed development are reduced due to the programme of works being carried out within the dry season. During the dry season, in the majority of locations, groundwater will not be encountered. However, if groundwater will be encountered, which is likely during maximum recorded groundwater level conditions, the appropriate mitigation measures will be carried out as described above.
- A full-time on-site Environmental Clerk of Works (EnCoW) will be appointed prior to commencement of works.
- No instream works are proposed. Any works in the vicinity of drains (no fisheries importance) or watercourses will be carried out in accordance with the guidelines set out by IFI in 'Guidelines on Protecting Fisheries During Construction Works in and Adjacent to Waters' (IFI, 2016).
- The IFI Biosecurity Protocol for Field Survey Works¹⁹ will be complied with. The applicant should provide a detailed biosecurity plan to prevent the spread of invasive species, including a protocol disinfect plant, equipment and PPE and the facilities in place to allow for same in particular machinery from other sites will be cleaned and disinfected before they commence work on the site.
- In the case of a warning of a flood event, plant and materials vulnerable to flooding in 'at risk' construction compounds will be relocated to parts of the compound that are considered to be not at risk of flooding.

The following mitigation measures will be implemented prior to commencement and throughout the duration of the construction works:

- Activities will be planned in advance and machinery will be managed to ensure that the number of trips is limited to the minimum required at each location i.e. the more times a piece of ground is tracked, the more likely it is that vegetative cover will be removed and ruts will be created that will act as miniature rivers where dirty water will flow.
- Tracking beside streams will be avoided to avoid damage to the bankside.
- Geotextile or timber matting will be used on soft ground, and in all protected areas
- A buffer zone of 10m will be maintained between storage and working areas and watercourses, taking account of the minimum working area required to facilitate the works.
- The time period over which areas of clearance are left open will be reduced insofar as is reasonably practicable.

¹⁹ [research_biosecurity_biosecurity_for_fieldsurveys_2010.pdf](#)

- Re-instatement method statements will be subject to approval by the EnCoW.
- Concrete will be brought to site by covered truck. Wet concrete operations adjacent to watercourses will be avoided.
- The Contractor will ensure that all concrete truck wash watering / cleaning is undertaken offsite where possible and remote from watercourses.
- In order to reduce the risk of contamination arising as a result of spills or leakages, measures including, but not limited to, the following will be employed.
 - All collected waste will be managed in accordance with the Waste Management Act 1996, and associated Regulations:
 - Fuels, chemicals, liquid and solid waste will be stored on impermeable surfaces;
 - Refuelling of plant, equipment and vehicles will be carried out on impermeable surfaces;
 - All tanks and drums will be banded in accordance with established best practice guidelines; and
 - Spill kits will be provided at all compound locations and carried by all crews during underground cable installation works.
- Works will not be carried out during extreme rainfall or high flow events. An early flood warning system will be set up to allow the removal of plant and material from construction areas located in Flood Zones A and B in the event of a flood warning. The duration of works within Flood Zone A and B will be minimised to reduce the potential of impact.
- Temporary works will be designed so as not to increase flood risk elsewhere from overland flow, by limiting excavated lengths and providing suitable drainage provision.
- Silt fences (to Hy-Tex Premium specification or similar) and silt traps will be installed prior to commencement of works and will be inspected daily to inform adaptive management as required. The locations of same will be determined by the EnCoW.
- Any instream works will be conducted during the period July – September to avoid effects on fisheries, or otherwise agreed with IFI.

Silt Control Measures

- Silt control measures will be used to control silt generated from activities on site and prevent it gaining access to surface drainage which could convey silt to larger streams and watercourses. These areas include all drainage ditches adjacent to works areas that link to the Owenduff and Tellerought Rivers.
- Silt control measures include silt traps which can be located in small drains where flow is small and silt fences where runoff from large areas needs to be controlled.
- Silt fences must be installed in the working areas and not at the watercourse.
- Access routes will be delineated such that an appropriate set back distance from watercourses is maintained. Where works are to be undertaken adjacent to watercourses the setback distance will be delineated by the EnCoW on site.
- Where distances between the works and watercourse allow, a minimum setback distance of 30m from the watercourse will be maintained.
- Where the site is constrained, the best available set back distance will be employed taking account of the minimum working area required to facilitate the works.

Silt Fences

- Silt fences will be installed downslope of the area where silt is being generated on disturbed ground.
- To be effective the silt curtain must contain the area where silt is generated and must terminate on high ground (i.e. an elevated area not in the watercourse).

- Silt fences will be constructed using a permeable filter fabric (e.g. Hy Tex Terrastop Premium silt fence or similar) and not a mesh.
- The base of the silt fence will be bedded at least 15-30 cm into the ground at 2 metre intervals.
- Once installed the silt fence will be inspected by the Environmental Clerk of Works regularly, daily during the proposed works, weekly on completion of the works for at least one month, but particularly after heavy rains.
- The integrity of the silt fencing will be checked daily by the EnCoW and after poor weather conditions (rain or wind) and any failures rectified immediately.
- Two lines of silt curtain / fence will be installed, where considered necessary, by the EnCoW.
- Any build-up of sediment along the fence boundary will be removed daily.
- Silt fences will be maintained until vegetation on the disturbed ground has re-established. Re-instatement method statements will be subject to approval by the EnCoW.
- The silt fencing must be left in place until the works are completed (which includes removal of any temporary ground treatment).
- Silt fences will not be removed during heavy rainfall.
- The silt fence will not be pulled from the ground but cutaway at ground level and posts removed.
- A record of when it was installed, inspected and removed will be maintained by the EnCoW.

Silt Traps

The purpose of the trap is to reduce the level of solids in the slowly flowing water. The silt trap works by allowing a build-up of water behind it slowing flow and allowing solids to settle out. The following requirements will apply:

- Silt traps will only be placed in drains downstream of working areas where the volume of water flow is expected to be low.
- Silt traps will be made of terram or similar material, not mesh.
- The trap will be staked into the banks of the drain / watercourse such that no water can flow around the sides.
- The material will be bedded into the drain bed/watercourse to prevent water flowing beneath it.
- The height of the trap will be lower than the bank heights. The upper edge will be fixed to a timber cross piece. This will allow water to overtop the silt trap and not burst through or around it.
- Inspections will be carried out daily; during the proposed works, weekly on completion of the works for at least one month, and after heavy rains, and monthly thereafter until bare areas have developed new growth.
- Any build-up of solids will be carefully removed without removing any vegetation growing on the bottom.
- In sensitive areas a series of silt traps will be placed in the drain.
- The silt trap will not be pulled from the ground but cutaway at ground level and posts removed.
- A record of when it was installed, inspected and removed will be maintained by the EnCoW.

Stockpiling Material

- All excavated material will be stored a minimum of 50m from rivers and any drainage ditches hydrologically connected to the watercourse.

- Silt fences or gravel drains will be positioned around the stockpiles to prevent surface water run-off. The silt fences and gravel drains will be regularly inspected and maintained.
- Stockpiled material, comprising soil, earth, stone etc. will be covered in order to prevent surface water run-off.

Concrete

The pouring of concrete will be required for foundation works. No pouring of concrete will be undertaken at the stormwater outfall location.

- No on-site batching will be permitted at the proposed works areas. Concrete will instead be transported to the site within a concrete truck.
- Quick setting concrete mixes will be used to reduce the risk of contaminated runoff to the nearby watercourses.
- Where concrete pours are to take place instream, they will only take place within an isolated, dry, works area.
- Where the isolated working area requires constant pumping to maintain a dry works area, pumps shall be turned off during the pour and remain off until concrete has hardened negating a runoff risk; and such that the discharge will not result in a change in pH of +/-0.5 units.
- The Contractor's EnCoW will ensure that covers are available for freshly poured concrete to avoid wash off in the event of rain.
- Waste concrete slurry will be allowed to dry and taken to a licensed waste depot for disposal.
- The Contractor will schedule concrete works during relatively dry weather conditions (i.e. when there are no active Met Eireann yellow, orange or red warnings) to reduce the elevated risk of runoff.
- Concrete trucks will be washed down within a designated wash down area within the construction compound only and will be washed into appropriately sized containers which shall be inspected for defects in advance. Where the container is defective it shall not be used. Concrete trucks will be washed down in a sealed mortar bin/skip which has been examined in advance for any defects. This requirement will be communicated to each concrete truck driver prior to entering into the works area.
- The Contractor will ensure that all concrete truck wash watering / cleaning is undertaken offsite where possible and remote from waterbodies.
- Wet concrete operations adjacent to waterbodies will be avoided where possible.

Hydrocarbons

- A spill response plan should be in place and all employees and site staff made aware of it to mitigate impacts of any potential spills or leaks.
- Where mobile equipment is required, e.g. generators, these will be housed in a suitably sized bund/plant nappy such that any leaks/spills are intercepted. All mobile equipment used at the proposed discharge outfall will be stored within a plant nappy.
- All chemicals and hydrocarbons (oils, fuels and lubricants etc) should be stored in containers of up to 110% capacity to ensure there is a reduced risk of overflow spill and should be stored an absolute minimum of 10m from any watercourses and/or drains. If more than 200 litres of any oil type are to be stored on site, this must be stored in oil storage containers including drums and intermediate bulk containers (IBCs). All chemicals and hydrocarbons are to be stored within a bunded area, within the construction compound. All hand-held equipment and generators will be stored on site in appropriately sized bunds when not in use.
- Fuelling and lubrication of plant and equipment will be restricted to the construction compound site only. No refuelling will be permitted to occur within 10m of watercourses, waterbodies or drainage ditches.

- All waste fuels, oils, and other hazardous wastes will be disposed of in accordance with the requirements of the Waste Management Acts 1996, as amended.
- Spill-kits and hydrocarbon absorbent packs will be stored in the cabin of each vehicle and operators will be fully trained in the use of this equipment.
- Welfare/hygiene facilities will be located within temporary construction compounds a minimum of 50m from any watercourse/drainage ditch.
- All water from wheel washes will be removed from site and disposed of in line with Waste Legislation. No water will be discharged into any watercourses or drainage ditches.

Silt Fences

- Silt fences will be installed throughout the scheme, around stockpiles of material and around the designated vegetated areas where groundwater will be discharged.
- Silt fences will be installed in advance of any ground disturbance.
- The silt fences must be positioned to allow an appropriate working area within the site. Where possible the silt fences will be positioned above areas prone to flood.
- The silt fences will have the following design features:
 - the geotextile fabric will be entrenched at least 100mm into the ground with the ends upturned inward towards the works;
 - the fence posts will have a maximum spacing of 2m to prevent sag on the fence; and
 - the geotextile fabric will be anchored to the fence posts as opposed to wrapped.
- Daily inspection of silt fences will be carried out by the Contractor to assess the effectiveness of the measures, to carry out maintenance, and to determine if there has been any damage/breach to the control measures. The silt fences will also be inspected immediately following heavy rainfall or strong winds (equating to a yellow weather warning). Where repair is necessary, this will be carried out immediately and may require replacement of any damaged/degraded material.
- Accumulated silt will be removed regularly from the base of silt fences and will be removed offsite. Silt will not be permitted to build up such that it reaches half the height of the fence or exceeds 15cm in height (whichever is the lesser value). Note commercially available fences will show a maximum height which should not be exceeded.
- Silt fences will remain in place until the disturbed areas within the sites have been reinstated and revegetated.
- Silt fences will only be removed during dry weather.

Dewatering

- Any water ingress associated with the compound excavation will be removed to facilitate suitable working conditions. The water will be over pumped and treated via a filter bag before being discharged within a vegetated area located north of the construction compound. Silt fences will be installed around the vegetated area to ensure there is no runoff of sediment laden surface water. Any contaminated water unsuitable to be discharged to ground will be removed and disposed of offsite.

7.6.1.12 Mitigation of Dust Effects

Dust emissions during the construction phase of the Proposed Development is unavoidable throughout the scheme as a degree of dust will be generated from ground works. As such this is an unavoidable impact which is expected to occur but should impose minimal risk of impacts with suitable mitigation:

- Development and implementation of a Dust Management Plan (DMP) for the site prior to commencement of works, this plan is to be agreed upon and all site staff aware of it's measures and adhere to them.

- Carry out regular site inspections to monitor compliance with the DMP, record inspection results and update of log.
- Ensure suitable dust suppression is carried out at times when certain construction activities which may increase dust generation is being carried out as well as during days where dust generation may be increase i.e. hot dry days.
- Revegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
- Communication and Site Management
 - Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
 - Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager / engineer or the site manager.
 - Display the head or regional office contact information.
 - Develop and implement a dust management plan (DMP), which may include measures to control other emissions, approved by the Local Authority.
 - Record all dust and air quality complaints, identify causes and take appropriate measures to reduce emissions in a timely manner and record the measures taken.
 - Make a complaint log available to the planning authority, when requested.
 - Record any exceptional incidents that cause dust and or air emissions, either on or off site, and the action taken to resolve the situation in the logbook.
- Monitoring
 - Carry out regular site inspections, record inspection results and make an inspection log available to the planning authority, when requested.
 - Increase frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
 - Agree dust deposition, dust flux, or real-time PM10 continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.
- Preparing and maintaining the site
 - Plan site layout so that machinery and dust causing activities are located away from receptors, as far as possible.
 - Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
 - Avoid site runoff of water or mud.
 - Keep site fencing and barriers clean using wet methods.
 - Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site.
 - Cover, seed or fence stockpiles to prevent wind whipping.
- Operations vehicles / machinery and sustainable travel:
 - Ensure all vehicles switch off engines when stationary – no idling vehicles.
 - Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment, where practicable

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- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
- Operations
 - Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction.
 - Ensure an adequate water supply on the site for effective dust/ particulate matter suppression/ mitigation using non-potable water, where possible and appropriate.

An ECoW will be employed by the Contractor to oversee implementation of mitigation. This will include monitoring and auditing the works and contractor programmes and works method statements, to ensure mitigation is correctly implemented.

The ECoW will oversee implementation of mitigation and deliver toolbox talks and preconstruction confirmatory ecology surveys, as appropriate. This will include monitoring and auditing the works and contractor programmes and works method statements, to ensure mitigation is correctly implemented and impacts to IEFs are minimised and avoided where practical.

The ECoW will also ensure any disturbance licenses (if required later) are arranged if any significant findings are determined from confirmatory pre-construction surveys outlined above. The ECoW will seek advice on mitigation measures and oversee implementation including the scheduling of works and will be included in regular liaison meetings between project teams to ensure that plans are co-ordinated and effects are minimised.

The ECoW will be a full member of a relevant environmental institute, such as the Chartered Institute of Ecology and Environmental Management (CIEEM) and have demonstrable experience in ecological supervision.

The Contractor's ECoW will also ensure any disturbance licenses (if required later) are arranged based on relevant details outlined in this EIAR and any significant findings of confirmatory pre-construction surveys outlined above. The Contractor's ECoW will advise on mitigation measures implementation including the scheduling of works and will be included in regular liaison meetings between project teams to ensure that plans are co-ordinated, and effects are minimised.

All monitoring reports will be provided to the Employer's Representative team and to the local authority or other parties where required by condition. An independent Environmental Clerk of Works (EnCoW) will be employed on behalf of the Employers Representative team, who will review and comment on the pre-construction survey reports, mitigation proposals, monitoring and compliance reports generated by the Contractor's ECoW.

7.6.2 Operational Phase

The perimeter fencing for the Proposed Project will have mammal gates installed at regular intervals (small mammal gates every panel (between posts) and large mammal passes every tenth panel) to allow the mammal access points to ensure species such as foxes, badgers, rabbits, hares etc. have unfettered movement throughout the solar farm.

The surface water drainage pond will be maintained and managed as wetland feature for biodiversity enhancement purposes. The emergency storage pond for possible storage of fire water will be maintained as per manufacturers specification and any effluent will be removed and treated off site in a suitable waste management facility. There will be no discharges to groundwater or surface waters draining the site.

Wet grassland and marsh in Fields b, c, d and e (Figure 7.1) will require appropriate management during the operational phase as some areas may be cut off and not grazed or

excessively grazed if sheep are used. An appropriately experienced ecologist will be retained to advise on appropriate management of these habitats to ensure they are maintained as species rich wet grassland and marsh potentially suitable for marsh fritillary. This will likely require low density grazing by cattle (<0.5 LU/ HA and specific seasonal grazing²⁰) and avoidance of farm improvement activities including drainage and reseedling. This will be a positive outcome for retention of a declining and now rare habitat in the locality. Some parts of these fields are species rich unimproved wet grassland consistent with the Annex 1 habitat *Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)* (6410).

7.7 Biodiversity Enhancement Measures

Biodiversity Enhancement Measures

Drawing 25WX01-DR-0120 summarises areas that will be managed for biodiversity within the site. The proposed landscaping is illustrated in the accompanying landscape plan (refer to Appendix 5.3, Volume 3 of this EIAR).

Over 15% of the total development area of the Energy Farm will be set aside for Biodiversity conservation and enhancement.

As an outcome of the landscape and visual impact assessment, mitigation in the form of hedgerow and woodland planting is proposed. This will bolster existing hedgerows within and on the boundaries of the project development site to provide further screening.

Other biodiversity enhancements are based on the preservation of existing local habitats which support flora and fauna of local, regional or national importance. In this regard, areas of marsh, scrub and wet woodland habitats will be retained. Any retained habitats are best managed via low maintenance methods, i.e. reduced grazing or self-regeneration, while no pesticides or herbicide usage will be employed within the Project site.

Sheep grazing will be used to provide a natural form of grass management throughout the solar farm, this has biodiversity benefits to maintain meadow areas and prevent scrub encroachment.

The predominate enhancements are focused on bolstering existing hedgerows on the eastern part of the Project site, where current agricultural practices (intense arable farming) have resulted in rigorous management of hedgerows. Hedgerows will be bolstered with the planting of native hedgerow species, such as hawthorn, sloe, hazel, holly, spindle and guelder rose. Where trees will be planted within hedgerows these species include a mix of oak, crab apple, wild cherry and Scots pine.

In addition, areas of the site will be planted with native deciduous woodland species common to the area. Species planted will be of Irish provenance.

A 2.31 hectare field at the northeast corner of the site (Figure 7.6) has been identified for specific biodiversity enhancement. This site is currently undergoing regrowth of semi natural vegetation following plantation tree removal in the recent past. This field comprises a river floodplain with remnant fen and wet woodland habitat. Tree planting predominantly alder and oak (on drier areas) will be conducted by hand under the supervision of an ecologist to ensure that tree planting is located outside remnant fen/ wet woodland, which will be retained. This will enhance biodiversity within the floodplain of the Owenduff River which forms a boundary of the Project site.

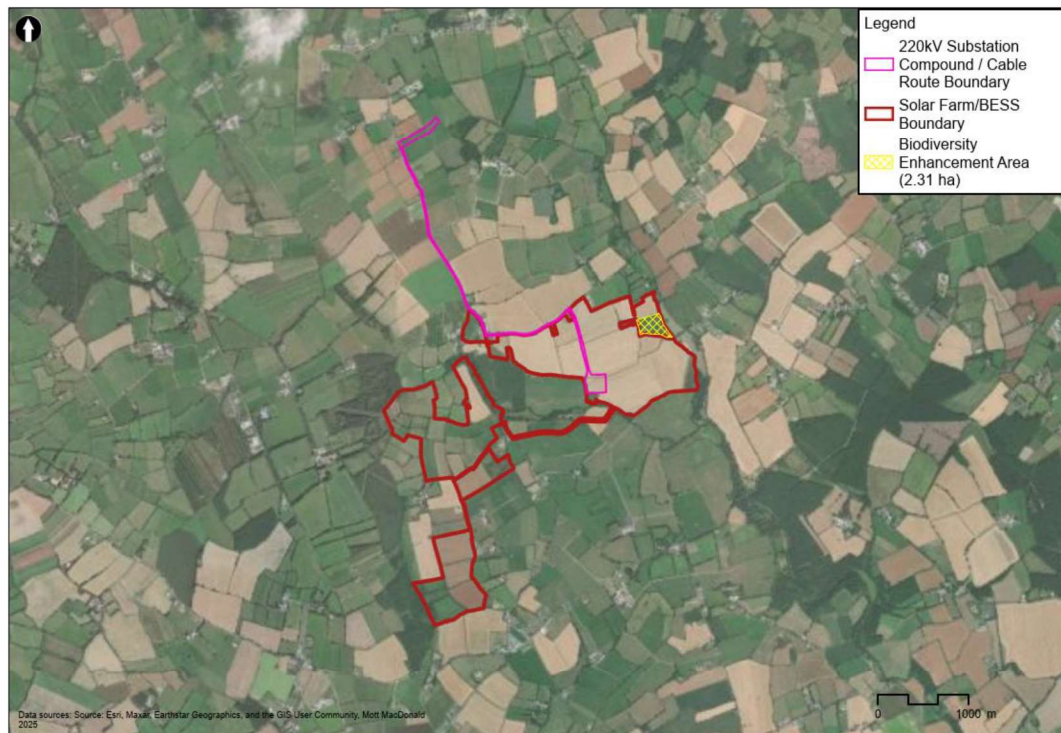
The planting of alder and oak has been identified as appropriate within areas of the Project site (refer to drawing 25WX01-DR-0120 in Appendix 5.3, Volume 3 of this EIAR).

²⁰ [Conservation Grazing Stocking Rates and Timing | Irish Native Rare Breed Society](#)

The biodiversity enhancement measures are listed below.

- 2.01 hectares of existing wet grassland and scrub mix to be conserved and managed to protect existing habitats.
- 2.64 hectares of existing marsh and scrub mix to be conserved and managed to protect existing habitats.
- 5.33 hectares of existing marsh, wet grassland, and scrub mix to be conserved and managed to protect existing habitats.
- Retention of 0.73 hectares including an existing building and bat roost to be left undisturbed.
- Retention of 1.45 hectares of mixed woodland.
- 3.66 hectares of former agricultural pasture and tillage land is to be planted with native woodland; Alder and Oak on lower lying ground adjacent streams and flood prone areas and Hazel and Oak woodland on drier ground.
- Additional mitigation planting adjoining dwellings will consist of dense native woodland and shrub planting and provides a cumulative area of 1.03 hectares.
- Replanting of degraded hedgerows over and a cumulative area of 1.35 hectares.

Figure 7.6: Field with remnant marsh proposed for soft planting alder (wetter areas - floodplain) and oak (drier areas).



Source: Mott MacDonald

7.8 Residual Effects

7.8.1 European and Nationally Designated Sites

The assessment which is provided in the NIS for the Proposed Project concluded that the mitigation measures detailed will ensure no adverse effects on the integrity of any European sites in light of the site's conservation objectives. In EIA terms, there are no residual effects

likely on European sites. Based on the assessment of the Proposed Development alone and in combination with other projects and plans, including the implementation of mitigation measures, it can be concluded that no adverse effects on the integrity of any European sites will arise, in view of the site's conservation objectives.

No residual adverse effects are likely to Nationally designated sites including proposed Natural Heritage areas.

7.8.2 Other Important Ecological Features

No significant residual effects are likely. It is expected that with mitigation and biodiversity enhancement measures outlined that there will be

- Retention of the vast majority of existing semi natural habitat within the site except for localised gaps required for access routes,
- Additional hedgerow planting and reinforcement will far exceed the amount of hedgerow removal
- Protection and retention of key sensitive habitats (including Owenduff and Tellarought Rivers) on and adjacent to the site including riparian corridors, woodland and wet grassland/ marsh areas.
- Additional biodiversity improvement on the site including biodiversity enhancement measures (Section 7.8), management of new silt ponds as wildlife areas and additional hedgerow planting. These measures will be expected to improve overall biodiversity on the site and increase the overall area which is managed for biodiversity on the site compared to the baseline.

A summary of residual effects on IEF during the construction, operation and decommissioning phased are detailed in Table 28.

Table 7.28: Residual Impacts to Important Ecological Features Following Implementation of Mitigation Procedures

Receptor		Evaluation	Potential for Impact in the Absence of Mitigation	Residual Impact
Habitats	Wet grassland	Local importance (higher value)	Temporary slight negative effect at a local geographic scale.	Imperceptible
	Marsh	Local importance (higher value)	Temporary moderate negative effect at a local geographic scale.	Imperceptible
	Hedgerow (WL1)/ Treelines (WL2)	Local importance (higher value)	Permanent moderate effect at a local scale geographic scale.	Positive (net increase in woodland and hedgerow within the site)
	Wet willow alder ash woodland	Local importance (higher value)	Temporary slight negative impact at a local geographic scale.	Positive (Increased woodland)
Mammals	Otter	County Importance	Short-term moderate negative effect at a local scale.	Imperceptible
	Badger (4x sett away from Proposed Project)	Local (Higher) Importance	Short-term moderate negative effect at a local scale.	Imperceptible

Receptor		Evaluation	Potential for Impact in the Absence of Mitigation	Residual Impact
	Bat roosts	Local Importance (Higher Value)	short-term slight effects at a local scale (construction phase) Imperceptible (operation phase)	Imperceptible
River, riparian and fisheries	Aquatic and riparian habitats, fisheries: Owenduff and Tellarought River and riparian areas	County Importance	Temporary and significant at a county scale	Neutral
Breeding birds	Assemblages of breeding birds	Local importance (Higher Value)	short-term slight effects at a local scale (construction phase) Imperceptible (operation phase)	Imperceptible (Potentially positive)
Wintering Birds	Assemblages of wintering waterfowl	Local importance (Higher Value)	short-term slight effects at a local scale (construction phase) Imperceptible (operation phase)	Long term slight adverse at a local scale (loss arable farmland for winter passerine flocks)
Amphibians	Common frog	Local importance (Higher Value)	Imperceptible	Imperceptible
	Smooth newt	Local importance (Higher Value)	Imperceptible	Imperceptible
Reptiles	Viviparous lizard	Local importance (Higher Value)	Slight temporary negative effect at a local scale.	Imperceptible
Invertebrates	Marsh fritillary	Local importance (Higher Value)	Imperceptible	Neutral (suitable habitat retained and managed appropriately)
Invasive Species	Schedule 3 listed invasive species	Schedule 3 listed invasive species	Permanent moderate effects at a local scale. (invasive species introduced to site)	Imperceptible

In summary while there will be some localised loss of winter bird habitat for flocks of passerines the main effects of the proposed development will be positive regarding biodiversity. There would be an expected significant increase in biodiversity on the site due to increased woodland planting and reduced farming intensity within the solar array area in particular. This conclusion considers the baseline where the focus of development is within intensively managed farmland of low ecological value. The design, mitigation and biodiversity enhancement have been led by principles of avoidance and protection of IEF both within and off site.

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