

## East Meath - North Dublin Grid Upgrade Environmental Impact Assessment Report (EIAR): Volume 2

Chapter 10 - Biodiversity

EirGrid

March 2024



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## 10. Biodiversity

### 10.1 Introduction

This Chapter presents the assessment of the likely potential biodiversity impacts of the East Meath – North Dublin Grid Upgrade (hereafter referred to as the Proposed Development) during the Construction and Operational Phases. A full description of the Proposed Development is provided in Chapter 4 (Proposed Development Description) in Volume 2 of this Environmental Impact Assessment Report (EIAR).

The assessment identifies, describes and assesses the potential direct and indirect significant impacts. The assessment is in accordance with the requirements of Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (hereafter referred to as the EIA Directive). Particular attention is afforded to species and habitats protected under Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (hereafter referred to as the Habitats Directive) and Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (hereafter referred to as the Birds Directives), and species protected pursuant to Number 39 of 1976 – Wildlife Act, 1976 (as amended) (hereafter referred to as the Wildlife Acts).

The EIA Directive does not provide a definition of biodiversity. The Convention on Biological Diversity (1993), however, gives the following formal definition of biodiversity in its article 2:

*"biological diversity means 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 diversity within species, between species and of ecosystems".*

Alongside the term 'biodiversity', the terms 'ecology' and 'ecological' are also used throughout this Chapter as a broader term to consider the relationships of biodiversity receptors to one another and to their environment.

This Chapter includes the following:

- Section 10.2 presents the methodology and includes the underpinning legislation and guidance and Section 10.2.3.2.3 describes the difficulties encountered in compiling information);
- Section 10.3 describes the existing baseline environment;
- Section 10.4 summarises the main characteristics of the Proposed Development which are of relevance for biodiversity, and evaluates the likely potential impacts of the Proposed Development on biodiversity;
- Section 10.5 describes the measures proposed to mitigate and monitor the likely potential impacts;
- Section 10.6 describes the residual impacts and proposed compensatory measures; and
- Section 10.7 presents the conclusion.

### 10.2 Methodology

An ecological impact assessment was carried out to determine the likelihood of significant negative impacts on ecological habitats and species of interest as a result of the Proposed Development. This Chapter of the EIAR provides a description of the existing ecological environment, the likely potential impacts likely to occur as a result of the Proposed Development, as well as an assessment of the significance of such impacts from an ecological perspective.

A separate Appropriate Assessment (AA) Screening Report and Natura Impact Statement (NIS) have been prepared for the Proposed Development (both are included as standalone documents in the planning

application pack) and focus on the European designated sites and the Qualifying Interests (QIs) / Special Conservation Interests (SCIs) for which such sites are designated. The NIS concluded that, with mitigation measures adopted, there will be no adverse effects on the integrity of any European sites, either alone or in combination with other plans or projects. Mitigation for the potential impacts of the Proposed Development on biodiversity is provided in Section 10.5 and residual impacts after mitigation are provided in Section 10.6.

## 10.2.1 Study Area

The study area was determined following best practice guidance (refer to Section 10.2.2.3) and by professional judgement, taking into account the likely significant impacts along the Proposed Development on the receiving environment during construction and / or operation. Table 10.1 details the study areas adopted for each of the biodiversity (ecological) receptors within the study area specified to assess the potential impacts within the Zone of Influence (Zoi) of the Proposed Development. The Zoi is the area over which ecological features may be affected by biophysical changes caused by the Proposed Development and associated activities (Chartered Institute of Ecology and Environmental Management (CIEEM) 2018). When determining the Zoi, the 'source-pathway-receptor' model has been applied taking consideration of all potential impact pathways connecting elements of the Proposed Development to the ecological receptor in view of their conservation objectives (where available).

Note that in this EIAR, and throughout this Chapter, 'water body' is used generically to refer to a watercourse, river, drainage ditch or pond, although it is most frequently used to refer to a river or watercourse with flowing water. Sometimes the specific terms drainage ditch or pond are used to avoid confusion, for instance to describe habitat characteristics associated with particular species/species groups or relevant mitigation options.

**Table 10.1: Study Areas for Ecological Receptors within the Zoi of the Proposed Development**

Ecological Receptor	Study Area Description <sup>NOTE 1</sup>
Terrestrial Habitats (Including rare and / or protected flora, and non-native invasive plant species)	A corridor along the Proposed Development where works are proposed and habitats that could be directly or indirectly affected during the Construction or Operational Phases. Habitats within a minimum of 150m (metres) of the Proposed Development (i.e. from the Planning Application Boundary (PAB)) were mapped using a combination of survey and aerial photographs. All hedgerows / treelines at proposed Joint Bays were inspected and where vegetation is likely to be impacted / lost (e.g., narrow roads). Habitats have been classified using A Guide to Habitats in Ireland (referred to as Fossitt 2000) (reprinted in 2007) (The Heritage Council 2000).
Wintering birds	Wintering bird surveys were carried out for all the route options as a preferred route was not available at the time of survey. Each of the four options in Step 4B (see Chapter 3 (Consideration of Reasonable Alternatives) in Volume 3 of the EIAR for further details) were surveyed to 800m on either side of the route option from Vantage Points and drive-bys, which was considered the distance in which birds could be directly or indirectly affected by construction / operation. The survey focused on areas of suitable habitat for foraging / roosting winter birds, including water bodies and wetlands.
Breeding birds (including kingfisher)	A corridor along the Proposed Development where works are proposed, and in locations where breeding birds could be directly or indirectly affected during the Construction or Operational Phases. Transect surveys (nine out of a planned 11 were completed) undertaken within a 250m survey corridor, however, extended outside of the 250m corridor on occasions at transects 4, 7 and 10. The surveys were carried out according to relevant guidance and the study areas are shown on Figure 10.5 in Volume 4 of the EIAR. The surveys focused on areas of suitable bird nesting habitat.
Bats	Only trees / structures potentially directly impacted by the Proposed Development during the Construction or Operational Phases were surveyed for potential bat roosts. Trees with identified bat roost potential were subject to emergence surveys. Static detectors were also deployed at key locations for a minimum of five days for each deployment.
Fauna species (other than bats (i.e. otter, badger, other small mammals, amphibians, reptiles, terrestrial invertebrates and fish))	A corridor of 100m from the PAB was surveyed for fauna species that are likely to be directly or indirectly affected during the Construction or Operational Phases of the Proposed Development. The study area extended to at least 150m from the PAB (i.e. along watercourses hydrologically linked to the PAB. The locations of these surveys are shown on Figure 10.7 in Volume 4 of the EIAR (Otter and Small Mammals and on Figure 10.8 in Volume 4 of the EIAR (eDNA sampling locations)

Ecological Receptor	Study Area Description <sup>NOTE 1</sup>
Aquatic habitats assessment	Watercourse crossing points, and a minimum of 100m to either side of the Proposed Development PAB, were visually assessed for their potential to support fish of conservation interest (i.e. brook lamprey, river lamprey, European eel, trout), and the invertebrates, white-clawed crayfish and freshwater pearl mussel (subject to access and safe working conditions). Where access and / or health and safety constraints prevented the full 100m extent of survey, data was collected from the nearest safe point of access to inform the overall assessment. Assessments identified sites that had appropriate habitat to support different age classes of fish and in particular for spawning and juvenile nursery areas. White-clawed crayfish habitat was assessed for features that provide suitable refuge such as substrates large enough to provide cover and not armored.
eDNA sampling	Following the aquatic habitats assessment, eDNA sampling was identified as suitable for 16 watercourses (rivers / tributaries / ditches) at 18 sampling points. However, only 14 could be accessed. These were considered to have the potential to support the following species of conservation interest (DNA for other vertebrate species will also be recorded): <ul style="list-style-type: none"> <li>• Atlantic salmon (<i>Salmo salar</i>);</li> <li>• Lamprey (<i>Petromyzontiformes sp.</i>);</li> <li>• European eel (<i>Anguilla anguilla</i>);</li> <li>• Smooth newt (<i>Lissotriton vulgaris</i>); and</li> <li>• White-clawed crayfish (<i>Austropotamobius pallipes</i>).</li> </ul>

NOTE 1: This column refers to minimum specified study areas. The study area was widened further than these areas in instances where potential or confirmed ecological features of interest were noted beyond that should be incorporated into the baseline and subsequent impact assessment.

## 10.2.2 Relevant Guidelines, Policy and Legislation

The assessment of the potential impacts of the Proposed Development on ecological resources has been carried out in accordance with legislation and policy documents listed below, for the purposes of preparing this Chapter.

### 10.2.2.1 International and National Legislation

The following International legislation was adhered to in the preparation of this Chapter:

- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (as amended); hereafter the 'Habitats Directive';
- Council Directive 2009/147/EC on the Conservation of Wild Birds (as amended); hereafter the 'Birds Directive'; and
- Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for Community action in the field of water policy (hereafter referred to as the Water Framework Directive (WFD)).

The following National legislation was adhered to in the preparation of this Chapter:

- Number 39 of 1976 - Wildlife Act, 1976 (as amended) (hereinafter referred to as the Wildlife Act). At a National level, the Wildlife Act is the principal piece of legislation for the protection and control of activities that may harm wildlife;
- Number 30 of 2000 - Planning and Development Act, 2000 (as amended) (hereafter referred to as the Planning and Development Act). The Planning and Development Act is the basis for land use planning in Ireland. Under this legislation, mandatory objectives for the conservation of natural heritage and for the conservation of European sites must be included in development plans (usually implemented at a local authority level);
- S.I. No. 600/2001 - Planning and Development Regulations, 2001(as amended) (hereafter referred to as the Planning Regulations);
- S.I. No. 477/2011 (as amended) - The Birds and Habitats Regulations. The transposition of the Habitats Directive and the Birds Directive into Irish law is through this legislation. Regulations

(49 and 50) that deal with invasive species (those included within the Third Schedule) are also included;

- S.I. No. 235/2022 - Flora (Protection) Order 2022 (hereafter referred to as the FPO). Species of plant which receive protection under Section 21 of the Wildlife Act are listed in the FPO; and
- European Communities (Birds and Natural Habitats) Regulations 2011 (as amended) (hereafter referred to as the Birds and Habitats Regulations); and
- Number 14 of 1959 - Fisheries (Consolidation) Act, 1959 (as amended) (hereafter referred to as the Fisheries Act).

### 10.2.2.2 Policy and Planning Documents

The following national and local authority plans and policies are considered relevant to the Proposed Development:

- Project Ireland 2040 - National Planning Framework (hereafter referred to as the NPF) (Government of Ireland 2018);
- Project Ireland 2040 - National Development Plan 2021-2030 (hereafter referred to as the NDP) (Government of Ireland 2021);
- Ireland's 4th National Biodiversity Action Plan 2023-2030 (National Parks and Wildlife Service (NPWS) 2023a);
- Ireland Pollinator Plan 2021-2025 (hereafter referred to as AIPP) (National Biodiversity Database 2021);
- Meath County Council (MCC) Meath County Development Plan 2021-2027 (MCC 2021), noting the key policies of HER POL 37 (to encourage the retention of hedgerows), HER39 (to recognise the importance of hedgerows), HER POL40 (woodland management);
- Fingal County Council (FCC) Fingal Development Plan 2023-2029 (FCC 2023a, noting the key policies of GINHP21 (protection of trees and hedgerows) GINHP22 (tree planting) GINHO44 (setback of new surface water drainage outfalls);
- Dublin City Council (DCC) Dublin City Development Plan 2022-2028 (DCC 2022);
- County Meath Biodiversity Action Plan 2015-2020 (hereafter referred to as the Meath BAP) (MCC 2015);
- Fingal Biodiversity Action Plan 2018-2023 (hereafter referred to as the Fingal BAP) (FCC 2018); and
- Forest of Fingal - A Tree Strategy (FCC 2023b).

EirGrid's Biodiversity Policies are as follows (as outlined in the Draft Grid Implementation Plan 2023-2088 (EirGrid 2023) (this Draft Grid Implementation Plan will be adopted, and an associated Strategic Environmental Assessment (SEA) Environmental Report and Statement will be published in due course):

- *"BIODP1: To protect flora, fauna and habitats, and sites designated in the Habitats Directive, the Birds Directive, the Wildlife Act 1976 (as amended), the Flora Protection Order (S.I. No. 235 of 2022), and the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended)";*
- *"BIODP2: To minimise the impact of grid development on existing trees and hedgerows, and all semi-natural habitats";*
- *"BIODP3: To protect and wherever possible enhance wooded, wetland and other habitats which function as wildlife corridors, in accordance with Article 10 of the EU Habitats Directive"; and*
- *"BIODP4 To design habitat creation, restoration and enhancement into project scopes wherever possible, in collaboration with ESB for onshore assets, while complying with relevant technical and safety standards".*



EirGrid's Climate Change Policies are as follows (as outlined in the Draft Grid Implementation Plan 2023-2088 (EirGrid 2023) (this Draft Grid Implementation Plan will be adopted, and an associated Strategic Environmental Assessment (SEA) Environmental Report and Statement will be published in due course):

- "CLIMP1: To integrate measures to address climate change into grid development, through effective mitigation and adaptation responses, in accordance with available guidance and best practice";
- "CLIMP2 : To support, through all activities, and in particular connection of low-carbon and renewable energy generation onshore and offshore, delivery of the Government's target of up to 80% electricity consumption generated from renewable energy sources by the year 2030"; and
- "CLIMP3: That there is no increase in flood risk as a result of grid development, and to ensure any flood risk to the development is appropriately managed".

### 10.2.2.3 Relevant Guidelines

Key guidance used in the assessment included the following:

- Ecological Guidelines for Electricity Transmission Projects. A Standard Approach to Ecological Impact Assessment of High Voltage Transmission Projects (EirGrid 2020);
- A Guide to Habitats in Ireland (referred to as Fossitt 2000) (reprinted in 2007) (The Heritage Council 2000);
- Bat Mitigation Guidelines for Ireland – V2 (Marnell, Kelleher and Mullen 2022);
- Bat Surveys for Professional Ecologists: Good Practice Guidelines (4<sup>th</sup> edition) (Collins 2023);
- The Bat Workers' Manual, 3rd Edition (Mitchell-Jones and McLeish 2004);
- National Roads Authority (NRA) Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes (NRA 2006a);
- Bird Monitoring Methods (Gilbert *et al.* 1998);
- Ecology of the White-clawed Crayfish. Conserving Natura 2000 Rivers Ecology Series No. 1. (Holdich 2003);
- Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (NRA 2008a);
- Guidelines on the information to be contained in Environmental Impact Assessment Reports (Environmental Protection Agency, 2022).
- Hedgerow Appraisal System – Best Practice Guidance on Hedgerow Survey, Data Collation and Appraisal (Foulkes *et al.* 2013);
- Scottish Environment Protection Agency (SEPA) Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems (SEPA 2017);
- Guidelines for Ecological Impact Assessment in the UK and Ireland - Terrestrial, Freshwater, Coastal and Marine (hereafter referred to as the CIEEM Guidance) (CIEEM, 2019);
- Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA 2009);
- Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes (NRA 2008b);
- Guidelines for the Treatment of Badgers during the Construction of National Road Schemes (NRA 2006b);
- Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (NRA 2010);
- The Irish Bat Monitoring Programme 2015-2017. Irish Wildlife Manuals, No. 103 (Aughney *et al.* 2018);

- National Parks and Wildlife Service (NPWS) The Status of EU Protected Habitats and Species in Ireland. Volume 1. Summary Overview. (NPWS 2019a);
- The Status of EU Protected Habitats and Species in Ireland. Habitat Assessments. Volume 2. (NPWS 2019b);
- The Status of EU Protected Habitats and Species in Ireland. Species Assessments. Volume 3. (NPWS 2019c);
- The Irish Vegetation Classification (Perrin *et al.* 2018);
- The Irish Semi-natural Grasslands Survey 2007-2012. Irish Wildlife Manuals No. 78 (O'Neill *et al.* 2013);
- The Monitoring and Assessment of Three EU Habitats Directive Annex I Grassland Habitats. Irish Wildlife Manuals 102 (Martin *et al.* 2018);
- Monitoring Guidelines for the Assessment of Petrifying Springs in Ireland. Irish Wildlife Manuals No. 94 (Lyons and Kelly 2016);
- Guidance on the Strict Protection of Certain Animal and Plant Species under the Habitats Directive in Ireland (NPWS 2021);
- Environmental Protection Agency (EPA) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the EPA Guidelines) (EPA 2022);
- Aerial imagery (Bing 2023; Google Earth 2023; ESRI 2023);
- National Tree Map (Bluesky 2023); and
- National Land Cover Map (Ordnance Survey Ireland 2023).

### 10.2.3 Data Collection and Collation

The ecological impact assessment comprised a desk-based study and field surveys which are set out in Section 10.2.3.1 and Section 0, respectively. The Zol for the Proposed Development varied according to the ecological receptor and the Zols are described in Section 10.2.1. The methodologies used to collate information on the baseline biodiversity environment are presented in Appendix A10.2 in Volume 3 of this EIAR.

#### 10.2.3.1 Desk Study

A desk-based study was carried out between September and October 2022 to inform the initial scope of the ecological surveys required to inform the assessment. The desk-based study involved collection and review of relevant published and unpublished sources of data, collation of existing information on the ecological environment and consultation with relevant statutory bodies. Details of the data sources and search distances used to inform the desk-based study and subsequent ecological assessment are presented in Table 10.2.



**Table 10.2: Desk Study Data Sources**

Receptor	Search Distances	Data Source
Statutory designated sites of European and national value	Source-receptor-pathway model	<ul style="list-style-type: none"> <li>• NPWS Mapping of European site boundaries (NPWS 2023);</li> <li>• Malahide Estuary Special Area of Conservation (SAC) 000205. Conservation Objectives (NPWS 2013a);</li> <li>• Baldoyle Bay SAC 000199. Conservation Objectives (NPWS 2012a);</li> <li>• Malahide Estuary Special Protection Area (SPA) 004025. Conservation Objectives (NPWS 2013b);</li> <li>• Baldoyle Bay SPA 004016. Conservation Objectives (NPWS 2013c);</li> <li>• North Bull Island SPA 004006. Conservation Objectives (NPWS 2015a);</li> <li>• South Dublin Bay and River Tolka Estuary SPA 004024. Conservation Objectives (NPWS 2015b);</li> <li>• Rogerstown Estuary SPA 004015. Conservation Objectives (NPWS 2013d);</li> <li>• Ireland's Eye SPA 004117. Conservation Objectives (NPWS 2022a);</li> <li>• Lambay Island SPA 004069. Conservation Objectives (NPWS 2022b);</li> <li>• Skerries Islands SPA 004122. Conservation Objectives (NPWS 2022c);</li> <li>• North-West Irish Sea SPA 004236. Conservation Objectives (NPWS 2023);</li> <li>• River Nanny Estuary and Shore SPA 004158. Conservation Objectives (NPWS 2012b);</li> <li>• Boyne Estuary SPA 004080. Conservation Objectives (NPWS 2013f); and</li> <li>• Dundalk Bay SPA 004026. Conservation Objectives (NPWS 2011).</li> </ul>
WFD water bodies	2km	<ul style="list-style-type: none"> <li>• EPA rivers and water quality data WFD status online at EPA Maps (2023)</li> </ul>
Protected and notable species (excluding plants and fungi – see below for reduced search area)	2km	<ul style="list-style-type: none"> <li>• Protected and invasive species data from the National Biodiversity Data Centre (NBDC) 2023;</li> <li>• The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill (NPWS 2019a);</li> <li>• The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill (NPWS 2019b); and</li> <li>• The Status of EU Protected Habitats and Species in Ireland. Volume 3: Species Assessments. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill (NPWS 2019c).</li> </ul>
Plants and fungi, and invasive species	200m	<ul style="list-style-type: none"> <li>• Protected and invasive species data from the NBDC online (NBDC 2023).</li> </ul>

### 10.2.3.2 Field Surveys

Field surveys were undertaken by Jacobs between October 2022 and October 2023 to inform the EIAR. A summary of the field surveys, including dates these were undertaken, is presented in Table 10.3.

**Table 10.3 Ecological Surveys Informing the EIAR**

Ecological Receptor	Survey Type/ Target Species	Survey Date(s)
Habitat	Walkover surveys including habitat classification	January 2023 to August 2023 (weeks commencing: 23.01.2023, 30.01.2023, 20.02.2023, 20.03.2023, 02.03.2023, 03.05.2023, 08.05.2023, 12.06.2023, 19.06.2023, 31.07.2023, 23.10.2023).
Habitat	Habitat suitability assessment/ reptile and amphibian	January 2023 to August 2023 (weeks commencing: 23.01.2023, 30.01.2023, 20.02.2023, 20.03.2023, 02.03.2023, 03.05.2023, 08.05.2023, 12.06.2023, 19.06.2023, 31.07.2023)
	Habitat suitability assessment/ terrestrial invertebrate (marsh fritillary)	
	Habitat suitability assessment/ fish, white-clawed crayfish	
Birds	Winter bird surveys	October 2022 to March 2023 (weeks commencing: 24.10.2022, 21.11.2022, 12.12.2022, 23.01.2023, 20.02.2023, 20.03.2023)
	Breeding bird surveys (including kingfisher)	April 2023 to June 2023 (Breeding birds: weeks commencing: 03.04.2023, 03/08.05.2023, 22.05.2023, 12.06.2023 kingfisher: 16.06.2023)
Bats	Identification of potential roost features (PRFs) in trees / buildings	January 2023 to April 2023 (weeks commencing 23.01.23, 30.01.23, 04.04.23, 17.04.2023, 08.05.2023)
	Static detector surveys	May 2023 to July 2023 (weeks commencing: Deployed 22.5.2023 – Collected 29.05.2023, Deployed 29.05.2023 – Collected 07.06.2023, Deployed 19.06.2023 – Collected 26.06.2023, Deployed 03.07.2023 – collected 11.07.2023)
	Emergence (trees)	May 2023 to July 2023 (weeks commencing: 22/29.05.2023, 19.06.2023, 03.07.2023)
Mammal species	Mammal species other than bats (i.e. otter, badger, red squirrel, etc.).	October 2022 to August 2023 (Checks for fauna species were carried out during habitat, bird, bat and aquatic surveys)
Smooth newt	eDNA sampling for smooth newt	August 2023 (9 August 2023 and 10 August 2023)
Freshwater fish	eDNA sampling for Atlantic salmon, lamprey and European eel	August 2023 (9 August 2023 and 10 August 2023)
White-clawed crayfish	eDNA sampling for white-clawed crayfish	August 2023 (9 August 2023 and 10 August 2023)

#### 10.2.3.2.1 Scoped Out Surveys

The following surveys were scoped out:

- **Amphibians and Reptiles:** Amphibian and reptile presence / likely absence surveys were scoped out. Habitat suitability was used as a proxy for species presence with the exception of smooth newt (*Lissotriton vulgaris*) for which eDNA surveys were undertaken at all suitable water bodies;

- **Bats:** Structures / trees outside of the Planning Application Boundary (PAB) were not subject to survey as these will not be directly impacted. Only structures / trees to be directly impacted were subject to survey, and as there are no structures within the PAB, none were surveyed;
- **Kingfisher:** Survey for kingfisher (*Alcedo atthis*) was limited to one river reach (i.e., the River Tolka – WB05). The remaining watercourses afforded limited habitat suitability and were therefore scoped out from further survey;
- **Aquatic Receptors:** An aquatic habitat assessment was undertaken to identify the presence of suitable habitat for aquatic species. No electrofishing, invertebrate or macrophytes surveys were carried out. A combination of existing WFD publicly available data along with data record searches and eDNA results was used to inform this EIAR;
- **Marsh Fritillary:** Surveys for marsh fritillary (*Euphydryas aurinia*) were not undertaken as no suitable habitat (i.e., grassland areas containing devil's bit scabious (*Succisa pratensis*) which is the caterpillar's preferred foodplant) were identified during the habitat surveys;
- **Irish Vegetation Classification (IVC):** No habitat condition assessment surveys were carried out as no Annex I habitat was recorded during Fossitt habitat mapping surveys; and
- **Aquatic macrophyte surveys:** No surveys were undertaken for aquatic macrophytes. However, species of conservation interest and / or invasive species, if present, were noted.

#### 10.2.3.2.2 Consultation

Relevant stakeholders were contacted as part of the Scoping Process for the Environmental Impact Assessment (EIA) Report for the East Meath – North Dublin Grid Upgrade (hereafter referred to as the Proposed Development). The stakeholders were contacted in November 2023 and were provided with an electronic copy of the EIA Scoping Memo for the Proposed Development. The stakeholders were invited to review the EIA Scoping Memo and make a submission related to its content or additional information or topics which they considered relevant to the development of the EIAR. A non-statutory consultation period of four weeks was provided for comment. However, responses were accepted post this consultation period.

A summary of scoping consultation responses is provided in Appendix A1.1 in Volume 3 of this EIAR.

#### 10.2.3.2.3 Difficulties Encountered in Compiling Information

Ecological surveys are limited by a variety of factors which affect the presence of flora and fauna (for example, climatic variation, season and species behaviour). Evidence of protected species is not always present during a survey. This does not mean that a species is absent, and hence, the surveys also record and assess the suitability of habitats to support species, and (where appropriate, for species with dynamic distributions) further pre-construction confirmatory surveys are proposed to verify any locations requiring additional mitigation. Ecological surveys provide evidence of ecological activity for a snapshot of time. No major limitations were encountered in gathering data. It is considered that the baseline data collected is sufficient to inform a robust and thorough assessment of potential impacts.

The following provides further information:

- **General:** Surveys were limited at times due to access constraints. Lack of access to certain land holdings (5.57% of the total study area) may have limited the selection of trees with bat roost potential, identification of mammal signs such as badger setts, and required habitat surveys to be undertaken via binoculars and desk-based reviews. This is not considered to be a significant limitation that could have otherwise compromised the integrity of the results as the majority of the proposed cable route will be within the road and the immediate vicinity of the route was surveyed;
- **Bat survey limitation:** Weather conditions during the third survey of trees with high potential (T06, T07, T08, T09, T10, T11, T12, T15) were sub-optimal (light rain). However, this is not considered a significant limitation as bat activity was recorded throughout the course of the

surveys; Wintering birds limitation: Surveys were carried out using a combination of drive-by assessment and Vantage Points, both standard methodologies for wintering bird surveys. Where surveys were carried out from inside cars driving along busy roads, some birds may well have been missed due to reduced visibility on the day. However, given that the surveys were repeated monthly over a six-month period and in the same locations, any aggregations of birds not fully seen in one month would be counted in subsequent visits. Therefore, it is considered that there is no limitation to the data collected during drive-by survey. There were no limitations due to site access or weather;

- Breeding birds limitation: Transects 6 and 8 were not surveyed for breeding birds or any other ecological surveys due to land access issues. A desk-based survey was used to classify the habitat as improved agricultural grassland and scrub. Therefore, at these locations there is the potential that breeding waders and red-listed farm birds could have been missed. However, taking the habitat into account, it is unlikely to host breeding waders. Transects 4, 7 and 11 were not surveyed in April due to land access issues but were surveyed in May and June. The habitats present at Transects 4 (improved grassland with tight sward and managed rushes), 7 (arable crops and tilled land) and 11 (arable crops, dry calcareous and improved grassland) were suitable for both breeding waders and red-listed farm land birds, so therefore, species could have been missed. However, it was considered likely that two visits would determine presence or absence of these birds of concern;
- Watercourses: Watercourses surveyed during summer 2023 were initially found to be dry due to the persistent heatwave across Ireland. These surveys were postponed and carried in August 2023. Sixteen watercourses were identified for eDNA sampling with 18 sampling locations visited and 14 samples taken due to access issues. eDNA could not be carried out at one watercourse (WB08) and two ditches (DD25 and DD35) due to dense vegetation growth preventing access for sampling. Watercourse characterisation was carried out when vegetation was much lower and the watercourses appeared suitable to support species of conservation interest at that point in time. However, given the highly shaded nature of the watercourses, it is unlikely that any species of conservation interest would be present, and therefore, no eDNA for these sites was not considered a limitation;
- Tree value: The classification of mature and veteran trees to assist in the determination of the level of residual impact was carried out by desk-based inspection of freely available aerial and street view imagery, in addition to incidental records found on other field-based surveys; and
- Habitat survey: Not all of the habitats within the study area were visited during field surveys. Where there were gaps, these were addressed using desk-based aerial imagery (Google Maps, accessed December 2023). Presence of invasive species at such locations will be addressed through pre-construction surveys.

## 10.2.4 Appraisal Method for the Assessment of Impacts

The criteria used to assess the ecological value and significance of the study area for habitats and species present follows the Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA 2009) and the Guidelines for Ecological Impact Assessment in the CIEEM Guidance (CIEEM 2018).

### 10.2.4.1 Valuing the Ecological Receptors

The value of an ecological feature is considered within a defined geographic context (e.g. International / National, Regional / Local). Habitats are assessed as a whole with the highest valuation provided. For example, the overall valuation of drainage ditches (FW4) is considered of Local Importance (Higher Level), although there are many ditches that are individually considered of Local Importance (Lower Level).

Impact assessment is only undertaken for Important Ecological Receptors (IERs) that are within the Zol of the Proposed Development and are "*both of sufficient value to be material in decision making*" and "*likely to be*

*affected significantly*" (NRA 2009). To qualify as IERs, features must be of Local Ecological Importance (Higher Value) or higher, as per the criteria from the Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA 2009). Features valued at Local Ecological Importance (Lower Value) are not subject to impact assessment.

#### 10.2.4.2 Impact Assessment Process

The impact assessment process (CIEEM 2018) involves:

- Identifying and characterising impacts and their effects;
- Incorporating measures to avoid and mitigate (reduce) these impacts and effects;
- Assessing the significance of any residual impacts, after mitigation;
- Identifying appropriate compensation measures to offset significant residual impacts; and
- Identifying opportunities for ecological enhancement.

The hierarchical process of avoiding, mitigating and compensating for ecological impacts is explained in Section 10.2.4.7.

In Ecological Impact Assessment (EclA), it is only essential to assess and report significant residual impacts (i.e. those that remain after mitigation measures have been taken into account). However, it is considered good practice for the EclA to make clear, both the potential significant impacts without mitigation, and the residual significant impacts, following mitigation. Alternatively, it should demonstrate the importance of securing the measures proposed through planning conditions or obligations (CIEEM 2018).

Positive and negative impacts / effects are determined according to whether the change is in accordance with nature conservation objectives and policy (if no significant impacts / effects are foreseen, the impact is considered neutral):

- Positive impact – a change that improves the quality of the environment (e.g., by increasing species diversity, extending habitat or improving water quality). Positive impacts may also include halting or slowing an existing decline in the quality of the environment; and
- Negative impact – a change which reduces the quality of the environment (e.g. destruction of habitat, removal of species foraging habitat, habitat fragmentation, pollution).

Positive and negative impacts and effect on ecological features are characterised based on predicted changes as a result of the proposed activities. In order to characterise the impacts and effects on each feature, the following parameters are considered:

- The magnitude of the impact. This refers to size, amount, intensity and volume;
- The spatial extent or geographical area over which the impact / effect would occur;
- The temporal duration of the impact and whether it relates to the Construction or Operational Phase of the Proposed Development. Impacts and effects may be short, medium, or long-term and permanent or temporary;
- The timing and frequency of the impact; and
- Whether the impact is reversible and over what time frame.

#### 10.2.4.3 Conservation Status

Consideration of conservation status is important for evaluating the effect of impacts on individual habitats and species and assessing their significance:

- Habitats – conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure, and function as well as its typical pieces within a given geographical range; and
- Species: conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area (CIEEM 2018).

Favourable condition is the satisfactory condition of an ecological feature. In some cases, favourable condition is specifically defined (e.g., for some designated sites).

#### **10.2.4.4 Impact Significance**

In accordance with the EPA Guidelines (EPA 2022) and with CIEEM Guidance (CIEEM 2018), all impacts are either significant or not significant. Significant impacts encompass impacts on structure and function of defined sites, habitats, or ecosystems and the conservation status of habitats and species within a given geographical area. The ecological value of a feature (i.e. Local, County, National, International) is related to the level of impact.

#### **10.2.4.5 Cumulative Impacts and Effects**

Consideration is also given to the potential for the Proposed Development to have significant impacts and effects, in-combination with other proposed developments in the local area. All mitigation measures for the Proposed Development are included in Section 10.5 of this Chapter and are also included in the Construction Environmental Management Plan (CEMP) which is included as a standalone document in the planning application pack.

#### **10.2.4.6 Overall Assessment**

An overall assessment of value and impact is provided. This is based upon the highest level or value of any of the features or species present, or likely to be present on the site. Similarly, the overall assessment of impact is the impact of greatest significance.

#### **10.2.4.7 Mitigation Hierarchy**

The following principles underpin EclA and have been followed, where applicable, in this assessment:

- Avoidance - Seek options that avoid harm to ecological features (for example, by locating the Proposed Development on an alternative site or safeguarding on-site features within the site layout design);
- Mitigation - Negative impacts should be avoided or minimised through mitigation measures, either through the design of the Proposed Development or subsequent measures that can be guaranteed (e.g., through a condition or planning obligation);
- Compensation - Where there are significant residual negative ecological impacts despite the mitigation proposed, these should be offset by appropriate compensatory measures; and
- Enhancement - Seek to provide net benefits for biodiversity over and above requirements for avoidance, mitigation or compensation.

### **10.3 Baseline Environment**

This Section describes the existing ecological environment within the Zol of the Proposed Development. Data on the ecological baseline was obtained from a combination of desk-based review and field surveys. The Zol varied according to the ecological receptor as shown in Table 10.1. The methodologies used to collate information on the ecological baseline are described in Appendix A10.2 in Volume 3 of this EIAR.

### 10.3.1 Desk-Based Study

#### 10.3.1.1 European Designated Sites

Applying the source-pathway-receptor model, 19 European sites that were potentially within the Zol of the Proposed Development due to their connectivity (proximity / ecological / hydrological etc.) were assessed. These sites, SPAs and SACs are shown in Figure 10.1 in Volume 4 of this EIAR and are listed below using SAC and SPA as the first level of list order, then by increasing direct distance from the Proposed Development:

1. Malahide Estuary SAC (000205) – approximately 3.6km;
2. Baldoyle Bay SAC (000199) - approximately 4km;
3. Rockabill to Dalkey Island SAC (003000) - approximately 8.8km;
4. Lambay Island SAC (000204) - approximately 13.4km;
5. Malahide Estuary SPA (004025) - approximately 3.6km;
6. Baldoyle Bay SPA (004016) - approximately 4km;
7. North-West Irish Sea SPA (004236) - approximately 4.5km;
8. North Bull Island SPA (004006) - approximately 4.6km;
9. South Dublin Bay and River Tolka Estuary SPA (004024) - approximately 5.5km;
10. Rogerstown Estuary SPA (004015) - approximately 7.8km;
11. Ireland's Eye SPA (004117) - approximately 8.6km;
12. Howth Head Coast SPA (004113) - approximately 10km;
13. Lambay Island SPA (004069) - approximately 13.4km;
14. Dalkey Islands SPA (004172) - approximately 17.5km;
15. Skerries Islands SPA (004122) - approximately 18.5km;
16. Rockabill SPA (004014) - approximately 19km;
17. River Nanny Estuary and Shore SPA (004158) - approximately 26km;
18. Boyne Estuary SPA (004080) - approximately 33km; and
19. Dundalk Bay SPA (004026) - approximately 50km.

The 19 European designated sites within the Zol and the QI habitats and species for which these sites are designated are shown in Table 10.4 (note that this Chapter uses the term QI for European sites rather than Species of Conservation Interest). *European sites are considered of International Importance.*

Seven additional European sites were considered to be within the vicinity of the Proposed Development but outside the Zol due to there being no hydrological connection, or there was a hydrological connection but there was a weak link only, and as such, no direct or indirect impacts are anticipated. The seven sites outside the Zol are Rye Water Valley / Carton SAC (001398), North Dublin Bay SAC (000206), South Dublin Bay SAC (000210), Rogerstown Estuary SAC (000208), Howth Head SAC (00202), Ireland's Eye SAC (002193) and Wicklow Mountains SPA (004040).



**Table 10.4: European Designated Sites (19 sites) and their Qualifying Interest Habitats and Species Within the Zol of the Proposed Development (sites with connectivity are coloured grey)**

Site Name	Qualifying Interest Habitats and Species	Location (Direct and Hydrological Distance)	Within the Zol?
<b>SAC</b>			
Malahide Estuary SAC (000205)	Mudflats and sandflats not covered by seawater at low tide [1140] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritima</i> ) [1330] Mediterranean salt meadows ( <i>Juncetalia maritimi</i> ) [1410] Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	Direct distance: 3.6km north-east Hydrological distance: 8.7km downstream via River Ward (Ward_030, Watercourse 16, WB19), 6.8km downstream via River Ward (Ward_030, Watercourse 17, WB20), and 6 km via River Ward (Ward_030, Watercourse 18, WB21)	Yes, hydrological connection via the Ward030
Baldoyle Bay SAC (000199)	Mudflats and sandflats not covered by seawater at low tide [1140] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritima</i> ) [1330] Mediterranean salt meadows ( <i>Juncetalia maritimi</i> ) [1410]	Direct distance: 4km east Hydrological distance: 5.1km downstream via the River Mayne and the River Sluice (Mayne_010, Watercourse 20, WB23)	Yes, hydrological connection via River Mayne 010 and River Sluice 010
Rockabill to Dalkey Island SAC (003000)	Reefs [1170] <i>Phocoena phocoena</i> (Harbour Porpoise) [1351]	Direct distance: 8.8km east Hydrological distance: 10.5km downstream via the River Mayne (Mayne_010, Watercourse 20, WB23) Baldoyle Estuary, and Irish Sea	Yes, hydrological connection via Irish Sea
Lambay Island SAC (000204)	Reefs [1170] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] <i>Halichoerus grypus</i> (Grey Seal) [1364] <i>Phoca vitulina</i> (Harbour Seal) [1365]	Direct distance: 13.4km Hydrological distance: 20km via the Irish Sea	Yes, hydrological connection via Irish Sea
<b>SPA</b>			
Malahide Estuary SPA (004025)	Great Crested Grebe ( <i>Podiceps cristatus</i> ) [A005] Light-bellied Brent Goose ( <i>Branta bernicla hrota</i> ) [A046] Shelduck ( <i>Tadorna tadorna</i> ) [A048] Pintail ( <i>Anas acuta</i> ) [A054] Goldeneye ( <i>Bucephala clangula</i> ) [A067] Red-breasted Merganser ( <i>Mergus serrator</i> ) [A069] Oystercatcher ( <i>Haematopus ostralegus</i> ) [A130] Golden Plover ( <i>Pluvialis apricaria</i> ) [A140] Grey Plover ( <i>Pluvialis squatarola</i> ) [A141] Knot ( <i>Calidris canutus</i> ) [A143] Dunlin ( <i>Calidris alpina</i> ) [A149] Black-tailed Godwit ( <i>Limosa limosa</i> ) [A156] Bar-tailed Godwit ( <i>Limosa lapponica</i> ) [A157] Redshank ( <i>Tringa totanus</i> ) [A162] Wetland and Waterbirds [A999]	Direct distance: 3.6km north-east Hydrological distance: 8.7km via River Ward	Yes, hydrological connection via Ward 030 and functional habitats for QI species as the Proposed Development is within the foraging range for multiple species.
Baldoyle Bay SPA (004016)	Light-bellied Brent Goose ( <i>Branta bernicla hrota</i> ) [A046]	Direct distance: 4km east	Yes, hydrological connection via the Mayne 010 and the

Site Name	Qualifying Interest Habitats and Species	Location (Direct and Hydrological Distance)	Within the ZOI?
	Shelduck ( <i>Tadorna tadorna</i> ) [A048] Ringed Plover ( <i>Charadrius hiaticula</i> ) [A137] Golden Plover ( <i>Pluvialis apricaria</i> ) [A140] Grey Plover ( <i>Pluvialis squatarola</i> ) [A141] Bar-tailed Godwit ( <i>Limosa lapponica</i> ) [A157] Wetland and Waterbirds [A999]	Hydrological distance: 5.7km via River Mayne	Sluice 010. The Proposed Development is also within foraging range for multiple species and so may cause disturbance to QI species in functional habitat.
North-West Irish Sea SPA (004236)	Common Scoter ( <i>Melanitta nigra</i> ) [A065] Red-throated Diver ( <i>Gavia stellata</i> ) [A001] Great Northern Diver ( <i>Gavia immer</i> ) [A003] Fulmar ( <i>Fulmarus glacialis</i> ) [A009] Manx Shearwater ( <i>Puffinus puffinus</i> ) [A013] Shag ( <i>Phalacrocorax aristotelis</i> ) [A018] Cormorant ( <i>Phalacrocorax carbo</i> ) [A017] Little Gull ( <i>Larus minutus</i> ) [A177] Kittiwake ( <i>Rissa tridactyla</i> ) [A188] Black-headed Gull ( <i>Chroicocephalus ridibundus</i> ) [A179] Common Gull ( <i>Larus canus</i> ) [A182] Lesser Black-backed Gull ( <i>Larus fuscus</i> ) [A183] Herring Gull ( <i>Larus argentatus</i> ) [A184] Great Black-backed Gull ( <i>Larus marinus</i> ) [A184] Little Tern ( <i>Sterna albifrons</i> ) [A195] Roseate Tern ( <i>Sterna dougallii</i> ) [A192] Common Tern ( <i>Sterna hirundo</i> ) [A193] Arctic Tern ( <i>Sterna paradisaea</i> ) [A194] Puffin ( <i>Fratercula arctica</i> ) [A204] Razorbill ( <i>Alca torda</i> ) [A200] Guillemot ( <i>Uria aalge</i> ) [A199]	Direct distance: 4.5km east Hydrological distance: 6.2km via Irish Sea	Yes, hydrological link via coastal waters of the Irish Sea. The Proposed Development is also within foraging range for multiple species and so may cause disturbance to QI species in functional habitat
North Bull Island SPA (004006)	Light-bellied Brent Goose ( <i>Branta bernicla hrota</i> ) [A046] Shelduck ( <i>Tadorna tadorna</i> ) [A048] Teal ( <i>Anas crecca</i> ) [A052] Pintail ( <i>Anas acuta</i> ) [A054] Shoveler ( <i>Anas clypeata</i> ) [A056] Oystercatcher ( <i>Haematopus ostralegus</i> ) [A130] Golden Plover ( <i>Pluvialis apricaria</i> ) [A140] Grey Plover ( <i>Pluvialis squatarola</i> ) [A141] Knot ( <i>Calidris canutus</i> ) [A143] Sanderling ( <i>Calidris alba</i> ) [A144] Dunlin ( <i>Calidris alpina</i> ) [A149] Black-tailed Godwit ( <i>Limosa limosa</i> ) [A156] Bar-tailed Godwit ( <i>Limosa lapponica</i> ) [A157] Curlew ( <i>Numenius arquata</i> ) [A160] Redshank ( <i>Tringa totanus</i> ) [A162] Turnstone ( <i>Arenaria interpres</i> ) [A169] Black-headed Gull ( <i>Chroicocephalus ridibundus</i> ) [A179] Wetland and Waterbirds [A999]	Direct distance: 4.6km south-east Hydrological distance: 23km via Irish Sea and River Tolka	Yes. The Proposed Development is also within foraging range for multiple species and so may cause disturbance or habitat degradation through pollution to QI species in functional habitat
South Dublin Bay and River Tolka Estuary SPA (004024)	Light-bellied Brent Goose ( <i>Branta bernicla hrota</i> ) [A046] Oystercatcher ( <i>Haematopus ostralegus</i> ) [A130] Ringed Plover ( <i>Charadrius hiaticula</i> ) [A137] Grey Plover ( <i>Pluvialis squatarola</i> ) [A141]	Direct distance: 5.5km south-east Hydrological distance: 20.8km via Irish Sea and River Tolka	Yes. The Proposed Development is also within foraging range for multiple species and so may cause disturbance or habitat

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Site Name	Qualifying Interest Habitats and Species	Location (Direct and Hydrological Distance)	Within the ZoI?
	Knot ( <i>Calidris canutus</i> ) [A143] Sanderling ( <i>Calidris alba</i> ) [A144] Dunlin ( <i>Calidris alpina</i> ) [A149] Bar-tailed Godwit ( <i>Limosa lapponica</i> ) [A157] Redshank ( <i>Tringa totanus</i> ) [A162] Black-headed Gull ( <i>Chroicocephalus ridibundus</i> ) [A179] Roseate Tern ( <i>Sterna dougallii</i> ) [A192] Common Tern ( <i>Sterna hirundo</i> ) [A193] Arctic Tern ( <i>Sterna paradisaea</i> ) [A194] Wetland and Waterbirds [A999]		degradation through pollution to QI species in functional habitat
Rogerstown Estuary SPA (004015)	Greylag Goose ( <i>Anser anser</i> ) [A043] Light-bellied Brent Goose ( <i>Branta bernicla hrota</i> ) [A046] Shelduck ( <i>Tadorna tadorna</i> ) [A048] Shoveler ( <i>Anas clypeata</i> ) [A056] Oystercatcher ( <i>Haematopus ostralegus</i> ) [A130] Ringed Plover ( <i>Charadrius hiaticula</i> ) [A137] Grey Plover ( <i>Pluvialis squatarola</i> ) [A141] Knot ( <i>Calidris canutus</i> ) [A143] Dunlin ( <i>Calidris alpina</i> ) [A149] Black-tailed Godwit ( <i>Limosa limosa</i> ) [A156] Redshank ( <i>Tringa totanus</i> ) [A162] Wetland and Waterbirds [A999]	Direct distance: 7.8km north-east	Yes. The Proposed Development is also within foraging range for multiple species and so may cause disturbance or habitat degradation to QI species in functional habitat
Ireland's Eye SPA (004117)	Cormorant ( <i>Phalacrocorax carbo</i> ) [A017] Herring Gull ( <i>Larus argentatus</i> ) [A184] Kittiwake ( <i>Rissa tridactyla</i> ) [A188] Guillemot ( <i>Uria aalge</i> ) [A199] Razorbill ( <i>Alca torda</i> ) [A200]	Direct distance: 8.6km east Hydrological distance: 10.5km via Irish Sea	Yes, via Irish Sea. The Proposed Development is also within foraging range for multiple species and so may cause disturbance or habitat degradation through pollution to QI species in functional habitat
Howth Head Coast SPA (004113)	Kittiwake ( <i>Rissa tridactyla</i> ) [A188]	Direct distance: 10km south-east Hydrological distance: 13km via Irish Sea	Yes, via Irish Sea
Lambay Island SPA (004069)	Fulmar ( <i>Fulmarus glacialis</i> ) [A009] Cormorant ( <i>Phalacrocorax carbo</i> ) [A017] Shag ( <i>Phalacrocorax aristotelis</i> ) [A018] Greylag Goose ( <i>Anser anser</i> ) [A043] Lesser Black-backed Gull ( <i>Larus fuscus</i> ) [A183] Herring Gull ( <i>Larus argentatus</i> ) [A184] Kittiwake ( <i>Rissa tridactyla</i> ) [A188] Guillemot ( <i>Uria aalge</i> ) [A199] Razorbill ( <i>Alca torda</i> ) [A200] Puffin ( <i>Fratercula arctica</i> ) [A204]	Direct distance: 13.4km north-east Hydrological distance: 22.1km via Irish Sea	Yes, via Irish Sea. The Proposed Development is also within foraging range for multiple species and so may cause disturbance or habitat degradation to QI species in functional habitat
Dalkey Islands SPA (004172)	Roseate Tern ( <i>Sterna dougallii</i> ) [A192] Common Tern ( <i>Sterna hirundo</i> ) [A193] Arctic Tern ( <i>Sterna paradisaea</i> ) [A194]	Direct distance: 17.5km Hydrological distance: 23km	Yes, via Irish Sea
Skerries Islands SPA (004122)	Cormorant ( <i>Phalacrocorax carbo</i> ) [A017] Shag ( <i>Phalacrocorax aristotelis</i> ) [A018] Light-bellied Brent Goose ( <i>Branta bernicla hrota</i> ) [A046]	Direct distance: 18.5km Hydrological distance: 29km Hydrological distance to impacted supporting	Yes, via Irish Sea. The Proposed Development is also within foraging range for multiple species and so may

Site Name	Qualifying Interest Habitats and Species	Location (Direct and Hydrological Distance)	Within the ZoI?
	Purple Sandpiper ( <i>Calidris maritima</i> ) [A148] Turnstone ( <i>Arenaria interpres</i> ) [A169] Herring Gull ( <i>Larus argentatus</i> ) [A184]	habitat from the Proposed Development: Baldoyle SPA: 4.8km Malahide SPA: 8.7km	cause disturbance or habitat degradation to QI species in functional habitat
Rockabill SPA (004014)	Purple Sandpiper ( <i>Calidris maritima</i> ) [A148] Roseate Tern ( <i>Sterna dougallii</i> ) [A192] Common Tern ( <i>Sterna hirundo</i> ) [A193] Arctic Tern ( <i>Sterna paradisaea</i> ) [A194]	Direct distance: 19km Hydrological distance: 30km	Yes, via Irish Sea. The Proposed Development is also within foraging range for multiple species and so may cause disturbance or habitat degradation to QI species in functional habitat
River Nanny and shoreline SPA (004158)	Oystercatcher ( <i>Haematopus ostralegus</i> ) [A130] Ringed Plover ( <i>Charadrius hiaticula</i> ) [A137] Golden Plover ( <i>Pluvialis apricaria</i> ) [A140] Knot ( <i>Calidris canutus</i> ) [A143] Sanderling ( <i>Calidris alba</i> ) [A144] Herring Gull ( <i>Larus argentatus</i> ) [A184] Wetland and Waterbirds [A999]	Direct distance: 26km Hydrological distance: 43km  Hydrological distance to impacted supporting habitat from the Proposed Development: Baldoyle SPA: 4.8km Malahide Bay SPA: 8.7km	No. There is a hydrological link to the SPA via other SPAs, but it is considered <i>de minimus</i> due to the intervening distance of and dilution rates. The distance of 43km means a pollution event is unlikely to reach this European site to cause significant impacts. However, there are hydrological links to the supporting habitat of Malahide Estuary and Baldoyle SPA of which there is overlapping QIs with this SPA.
Boyne Estuary SPA (004080)	Shelduck ( <i>Tadorna tadorna</i> ) [A048] Oystercatcher ( <i>Haematopus ostralegus</i> ) [A130] Golden Plover ( <i>Pluvialis apricaria</i> ) [A140] Grey Plover ( <i>Pluvialis squatarola</i> ) [A141] Lapwing ( <i>Vanellus vanellus</i> ) [A142] Knot ( <i>Calidris canutus</i> ) [A143] Sanderling ( <i>Calidris alba</i> ) [A144] Black-tailed Godwit ( <i>Limosa limosa</i> ) [A156] Redshank ( <i>Tringa totanus</i> ) [A162] Turnstone ( <i>Arenaria interpres</i> ) [A169] Little Tern ( <i>Sterna albifrons</i> ) [A195] Wetland and Waterbirds [A999]	Direct distance: 33km Hydrological distance: 52km  Hydrological distance to impacted supporting habitat from the Proposed Development: Baldoyle SPA: 4.8km Malahide Bay SPA: 8.7km	No. There is a hydrological link to the SPA via other SPAs, but it is considered <i>de minimus</i> due to the intervening distance of and dilution rates. The distance of 52km means a pollution event is unlikely to reach this European site to cause significant impacts. However, there are hydrological links to the supporting habitat of Malahide Estuary and Baldoyle SPA of which there is overlapping QIs with this SPA.
Dundalk Bay SPA (004026)	Great Crested Grebe ( <i>Podiceps cristatus</i> ) [A005] Greylag Goose ( <i>Anser anser</i> ) [A043] Light-bellied Brent Goose ( <i>Branta bernicla hrota</i> ) [A046] Shelduck ( <i>Tadorna tadorna</i> ) [A048] Teal ( <i>Anas crecca</i> ) [A052]	Direct distance: 50km Hydrological distance: 78km Hydrological distance to impacted supporting	No. There is a hydrological link to the SPA via other SPAs, but it is considered <i>de minimus</i> due to the intervening distance of and dilution rates. The

Site Name	Qualifying Interest Habitats and Species	Location (Direct and Hydrological Distance)	Within the Zol?
	Mallard ( <i>Anas platyrhynchos</i> ) [A053] Pintail ( <i>Anas acuta</i> ) [A054] Common Scoter ( <i>Melanitta nigra</i> ) [A065] Red-breasted Merganser ( <i>Mergus serrator</i> ) [A069] Oystercatcher ( <i>Haematopus ostralegus</i> ) [A130] Ringed Plover ( <i>Charadrius hiaticula</i> ) [A137] Golden Plover ( <i>Pluvialis apricaria</i> ) [A140] Grey Plover ( <i>Pluvialis squatarola</i> ) [A141] Lapwing ( <i>Vanellus vanellus</i> ) [A142] Knot ( <i>Calidris canutus</i> ) [A143] Dunlin ( <i>Calidris alpina</i> ) [A149] Black-tailed Godwit ( <i>Limosa limosa</i> ) [A156] Bar-tailed Godwit ( <i>Limosa lapponica</i> ) [A157] Curlew ( <i>Numenius arquata</i> ) [A160] Redshank ( <i>Tringa totanus</i> ) [A162] Black-headed Gull ( <i>Chroicocephalus ridibundus</i> ) [A179] Common Gull ( <i>Larus canus</i> ) [A182] Herring Gull ( <i>Larus argentatus</i> ) [A184] Wetland and Waterbirds [A999]	habitat from the Proposed Development: Baldoyle SPA: 4.8km Malahide Bay SPA: 8.7km	distance of 78km means a pollution event is unlikely to reach this European site to cause significant impacts. However, there are hydrological links to the supporting habitat of Malahide Estuary and Baldoyle SPA of which there is overlapping QIs with this SPA.

### 10.3.1.2 Nationally Designated Sites

Natural Heritage Areas (NHAs) are designated under Section 18 of Number 38 of 2000 - Wildlife (Amendment) Act, 2000 and encompass nationally important semi-natural and natural habitats, landforms and geomorphological features. NHAs are legally protected from damage from the date they are formally proposed for designation. In addition to NHAs, there are proposed NHAs (pNHAs). These are also sites of significance for wildlife and habitats and were published on a non-statutory basis in 1995 but have not since been statutorily confirmed or designated. Prior to statutory designation, pNHAs are subject to limited protection, in the form of:

- Agri-environmental farm planning schemes such as Rural Environment Protection Scheme (REPS 3 and 4) and Agri Environmental Options Scheme (AEOS) supported the objective of maintaining and enhancing the conservation status of pNHAs up until 2014. These were then replaced with the Green Low-Carbon Agri-Environment Scheme (GLAS) which operated from 2014-2023 and then the Agri-Climate Rural Environment Scheme (ACRES) which commenced in 2023;
- Forest Service requirement for NPWS approval before they will pay afforestation grants on pNHA lands; and
- Recognition of the ecological value of pNHAs by Planning and Licensing Authorities (NPWS 2019a).

No NHAs were identified within the Zol of the Proposed Development. Four pNHAs were identified within the potential Zol of the Proposed Development on the basis of hydrological connectivity. A further two pNHAs were considered to be in the vicinity of the Proposed Development, but outside the Zol due to there being a weak hydrological link. Therefore, no direct or indirect impacts are anticipated to these pNHAs. Further information in relation to the pNHAs and their distance from the Proposed Development is provided in Table 10.5. Detailed site synopses are not available for pNHAs that overlap European designated sites. *The pNHAs are considered of National Importance.*

**Table 10.5: pNHAs within the Study Area (those within the zone of influence are coloured grey)**

Site Name	Site Summary	Location	Within the ZoI?
Malahide Estuary pNHA (000205)	Site synopsis not available. pNHA boundary overlaps Malahide Estuary SAC/SPA.	3.5km north-east	Yes, hydrological connection via Ward_030
Sluice River Marsh pNHA (001763)	The site is comprised of freshwater marsh, wet grassland and willow scrub and is known to support wildfowl and other bird species.	3.6km east	Yes, hydrological connection via the Mayne_010 and the Sluice_010.
Baldoyle Bay pNHA (000199)	Site synopsis not available. pNHA boundary overlaps Baldoyle Bay SAC/SPA.	4km east	Yes, hydrological connection via the Mayne_010 and the Sluice_010.
North Dublin Bay pNHA (000206)	Site synopsis not available. pNHA boundary overlaps North Dublin Bay SAC/ North Bull Island SPA.	4.4km south-east	No
Howth Head pNHA (000202)	Site synopsis not available. pNHA boundary overlaps Howth Head SPA.	8.4km east	Yes, via Irish Sea
Ireland's Eye pNHA (000203)	Site synopsis not available. pNHA boundary overlaps Ireland's Eye SPA.	8.7km east	No

### 10.3.1.3 Annex I Habitats

No Annex I habitats other than those associated with European sites (see Table 10.4 and nationally designated sites were identified from the desk study.

### 10.3.1.4 Aquatic Environment

The main river catchments that will be interacted with by the Proposed Development are shown in Table 10.6. Table 10.6 shows all water bodies in the study area according to the EPA maps and the river water body WFD status for the 2016 to 2021 monitoring period, and the risk rating, where available (EPA 2022). The risk rating does not affect the assessment as the assessment takes cognisance only of the 2016 to 2021 status and is provided for completeness only.

**Table 10.6: WFD Water Bodies in the Proposed Development Study Area (Rivers are Listed from West to East)**

Water Body Name	No. River Interactions and their Locations According to the EPA	No. River Interactions After the Site Visit	WFD Status 2016-2021	Risk Rating
TOLKA_020 (IE_EA_09T010600)	2 crossings: WB04: O 01119 43261 WB05: O 01655 43968	2 crossings	Moderate	At risk
	Additional adjacent river WB01: N 94742 47221 (closest to route)	1 adjacent source.		
DUNBOYNE STREAM_010 (IE_EA_09D040500)	2 crossings: WB02: N 94483 46404 WB03: O 00537 42674	2 crossings	Poor	At risk
PINKEEN_010 (IE_EA_09P020500)	1 crossing: WB07: O 04094 44965	1 crossing	Moderate	At risk
	1 tributary source adjacent to cable: WB06: O 03952 45039	1 adjacent source.		
WARD_020 (IE_EA_08W010070)	1 tributary source adjacent to cable: WB08: O 05260 45264	No interaction in-road crossing.	Moderate	At risk
	3 crossings: WB12: O 07317 44650 WB13: O 07378 44541 WB14: O 07489 44351	3 crossings.		
WARD_010 (IE_EA_08W010050)	3 mapped crossings: WB09: O 05634 45422 WB10: O 05654 45457 WB11: O 06599 45597	2 actual crossings.	Poor	At risk
WARD_030 (IE_EA_08W010300)	7 tributary sources adjacent to cable: WB15: O 09528 44520 WB16: O 10245 45153 WB17: O 10370 45217 WB18: O 10840 45522	4 crossings.	Moderate	At risk
	3 crossings: WB19: O 11650 45815 WB20: O 13141 44724 WB21: O 14066 44606	3 crossings.		
SLUICE_010 (IE_EA_09S071100)	1 crossing: WB22: O 16415 44423	1 crossing.	Poor	At risk
MAYNE_010 (IE_EA_09M030500)	1 crossing: WB23: O 19003 42112	1 crossing.	Poor	At risk
NOTE 1: River interactions means both points where the cable transects a watercourse or where the cable passes in close proximity (<5m) from a watercourse				



### 10.3.1.5 Protected and Rare Species

Records of legally protected, rare and / or notable species within 2km of the Proposed Development PAB are listed in Table 10.7. Records of legally protected, rare and / or notable species within 150m of the Proposed Development PAB are listed in Table 10.8.

**Table 10.7: Records of Protected, Rare and Other Notable Fauna Within 2km of the Proposed Development (NBDC 2023) (Species in Bold are Designated Under European Sites within ZoI)**

Species Name	Scientific Name	Record Count	Date of Last Record	Closest Record to Site	Title of Dataset	Designation
Common frog	<i>Rana temporaria</i>	7	23/02/2023	20m	Amphibians and reptiles of Ireland	Wildlife Act
Smooth newt	<i>Lissotriton vulgaris</i>	2	01/06/2010	315m	Reptiles and Amphibians Distribution Atlas 1978 (An Foras Forbartha) Newt Survey 2010-2014	Protected Species: Wildlife Act
<b>Arctic tern</b>	<b><i>Sterna paradisaea</i></b>	1	14/05/2001	600m	Birds of Ireland	EU Birds Directive: Annex I Bird Species; Wildlife Act
Barn swallow	<i>Hirundo rustica</i>	3	31/12/2011	240m	Bird Atlas 2007 – 2011	Wildlife Acts
<b>Bar-tailed godwit</b>	<b><i>Limosa lapponica</i></b>	3	04/01/2003	625m	Birds of Ireland	EU Birds Directive: Annex I Bird Species; Wildlife Act
Black guillemot	<i>Cepphus grylle</i>	1	04/01/2003	625m	Birds of Ireland	Wildlife Act
<b>Black-headed gull</b>	<b><i>Larus ridibundus</i></b>	5	31/12/2011	0m	Bird Atlas 2007 – 2011	Wildlife Act
<b>Black-legged kittiwake</b>	<b><i>Rissa tridactyla</i></b>	2	03/01/2003	625m	Birds of Ireland	Wildlife Act
<b>Black-tailed godwit</b>	<b><i>Limosa limosa</i></b>	3	04/01/2003	625m	Birds of Ireland	Wildlife Act
<b>Brent goose</b>	<b><i>Branta bernicla</i></b>	4	04/01/2003	625m	Birds of Ireland	Wildlife Act
Common coot	<i>Fulica atra</i>	2	04/01/2003	625m	Birds of Ireland	EU Birds Directive: Annex II: Section I, Annex III: Section II Bird Species; Wildlife Act
<b>Common goldeneye</b>	<b><i>Bucephala clangula</i></b>	3	04/01/2003	625m	Birds of Ireland	EU Birds Directive: Annex II: Section II Bird Species; Wildlife Act
Common greenshank	<i>Tringa nebularia</i>	3	04/01/2003	625m	Birds of Ireland	Wildlife Act;
<b>Common guillemot</b>	<b><i>Uria aalge</i></b>	2	03/01/2003	625m	Birds of Ireland	Wildlife Act
Common kestrel	<i>Falco tinnunculus</i>	5	31/12/2011	0m	Bird Atlas 2007 – 2011	Wildlife Act
Common linnet	<i>Carduelis cannabina</i>	2	25/08/2011	625m	Birds of Ireland	Wildlife Act
Common pochard	<i>Aythya ferina</i>	2	04/01/2003	625m	Birds of Ireland	EU Birds Directive: Annex II: Section I, Annex III: Section II Bird Species; Wildlife Act

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Species Name	Scientific Name	Record Count	Date of Last Record	Closest Record to Site	Title of Dataset	Designation
Common redshank	<i>Tringa totanus</i>	3	03/01/2003	625m	Birds of Ireland	Wildlife Act
Common scoter	<i>Melanitta nigra</i>	1	04/01/2003	625m	Birds of Ireland	EU Birds Directive: Annex II: Section II & Annex III: Section III Bird Species; Wildlife Act
Common shelduck	<i>Tadorna tadorna</i>	6	04/01/2003	625m	Birds of Ireland	Wildlife Act
Common snipe	<i>Gallinago gallinago</i>	2	04/01/2003	625m	Birds of Ireland	EU Birds Directive: Annex II: Section I & Annex III: Section III Bird Species; Wildlife Act
Common starling	<i>Sturnus vulgaris</i>	9	18/05/2012	0m	Birds of Ireland Bird Atlas 2007 – 2011	Wildlife Act
Common wood pigeon	<i>Columba palumbus</i>	9	21/02/2017	625m	Birds of Ireland	EU Birds Directive: Annex II: Section I & Annex III: Section I Bird Species; Wildlife Act
Dunlin	<i>Calidris alpina</i>	3	04/01/2003	625m	Birds of Ireland	EU Birds Directive: Annex I Bird Species; Wildlife Act
Eurasian curlew	<i>Numenius arquata</i>	4	31/12/2011	0m	Bird Atlas 2007 – 2011	EU Birds Directive: Annex II, Section II Bird Species; Wildlife Act
Eurasian oystercatcher	<i>Haematopus ostralegus</i>	3	03/01/2003	625m	Birds of Ireland	Wildlife Act
Eurasian teal	<i>Anas crecca</i>	4	04/01/2003		Birds of Ireland	EU Birds Directive: Annex II: Section I & Annex III: Section II Bird Species; Wildlife Act
Eurasian tree sparrow	<i>Passer montanus</i>	1	31/12/2011	0m	Bird Atlas 2007 – 2011	Wildlife Act
Eurasian wigeon	<i>Anas penelope</i>	4	04/01/2003	625m	Birds of Ireland	EU Birds Directive: Annex II: Section I & Annex III: Section II Bird Species; Wildlife Act
European golden plover	<i>Pluvialis apricaria</i>	2	04/01/2003	625m	Birds of Ireland	EU Birds Directive: Annex I, Annex II: Section II & Annex III: Section III Bird Species
European shag	<i>Phalacrocorax aristotelis</i>	3	04/01/2003	625m	Birds of Ireland	Wildlife Act
Great black-backed gull	<i>Larus marinus</i>	3	03/01/2003	625m	Birds of Ireland	Wildlife Act
Great cormorant	<i>Phalacrocorax carbo</i>	5	04/01/2003	625m	Birds of Ireland	Wildlife Act
Great crested grebe	<i>Podiceps cristatus</i>	4	04/01/2003	625m	Birds of Ireland	Wildlife Act
Great northern diver	<i>Gavia immer</i>	1	04/01/2003	625m	Birds of Ireland	EU Birds Directive: Annex I Bird Species; Wildlife Act
Grey partridge	<i>Perdix perdix</i>	1	31/12/2011	0m	Bird Atlas 2007 – 2011	EU Birds Directive: Annex II: Section I & Annex III: Section I Bird Species; Wildlife Act
Grey plover	<i>Pluvialis squatarola</i>	2	04/01/2003	625m	Birds of Ireland	Wildlife Act

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Species Name	Scientific Name	Record Count	Date of Last Record	Closest Record to Site	Title of Dataset	Designation
Herring gull	<i>Larus argentatus</i>	5	18/01/2011	625m	Birds of Ireland	Wildlife Act
House martin	<i>Delichon urbicum</i>	2	31/12/2011	0m	Bird Atlas 2007 – 2011	Wildlife Act
House sparrow	<i>Passer domesticus</i>	7	12/06/2018	625m	Birds of Ireland	Wildlife Act
Lesser black-backed gull	<i>Larus fuscus</i>	2	01/01/2003	0m	Birds of Ireland Bird Atlas 2007 – 2011	Wildlife Act
Little egret	<i>Egretta garzetta</i>	2	16/02/2016	0m	Birds of Ireland Bird Atlas 2007 – 2011	EU Birds Directive: Annex I Bird Species; Wildlife Act
Little grebe	<i>Tachybaptus ruficollis</i>	2	04/01/2003	625m	Birds of Ireland	Wildlife Act
Mallard	<i>Anas platyrhynchos</i>	6	14/04/2012	270m	Birds of Ireland	EU Birds Directive: Annex II: Section I & Annex III: Section I Bird Species; Wildlife Act
Mediterranean gull	<i>Larus melanocephalus</i>	2	04/01/2003	625m	Birds of Ireland	EU Birds Directive: Annex I Bird Species; Wildlife Act
Merlin	<i>Falco columbarius</i>	2	31/12/2011	625m	Birds of Ireland Bird Atlas 2007 – 2011	EU Birds Directive: Annex I Bird Species; Wildlife Act
Mew gull	<i>Larus canus</i>	3	03/01/2003	185m	Birds of Ireland Bird Atlas 2007 – 2011	Wildlife Act
Mute swan	<i>Cygnus olor</i>	4	04/01/2003	0m	Birds of Ireland Bird Atlas 2007 – 2011	Wildlife Act
Northern lapwing	<i>Vanellus vanellus</i>	4	31/12/2011	0m	Bird Atlas 2007 – 2011 Bird Atlas 2007 – 2011	EU Birds Directive: Annex II: Section II Bird Species; Wildlife Act
Northern pintail	<i>Anas acuta</i>	2	04/01/2003	625m	Birds of Ireland	EU Birds Directive: Annex II: Section I B& Annex III: Section II Bird Species; Wildlife Act
Northern shoveler	<i>Anas clypeata</i>	1	01/01/2003	625m	Birds of Ireland	EU Birds Directive: Annex II: Section I B& Annex III: Section II Bird Species; Wildlife Act
Razorbill	<i>Alca torda</i>	2	03/01/2003	625m	Birds of Ireland	Wildlife Act
Red kite	<i>Milvus milvus</i>	2	01/02/2023	490m	Birds of Ireland	Wildlife Act
Red knot	<i>Calidris canutus</i>	1	06/01/2001	625m	Birds of Ireland	Wildlife Act
Red-breasted merganser	<i>Mergus serrator</i>	2	03/01/2003	625m	Birds of Ireland	EU Birds Directive: Annex II: Section II Bird Species; Wildlife Act
Red-throated diver	<i>Gavia stellata</i>	1	04/01/2003	625m	Birds of Ireland	EU Birds Directive: Annex I Bird Species; Wildlife Act

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Species Name	Scientific Name	Record Count	Date of Last Record	Closest Record to Site	Title of Dataset	Designation
Ringed plover	<i>Charadrius hiaticula</i>	2	04/01/2003	625m	Birds of Ireland	Wildlife Act
Short-eared owl	<i>Asio flammeus</i>	1	31/12/2011	0m	Bird Atlas 2007 – 2011	EU Birds Directive: Annex I Bird Species; Wildlife Act
Sky lark	<i>Alauda arvensis</i>	3	31/12/2011	0m	Bird Atlas 2007 – 2011	Wildlife Act
Stock pigeon	<i>Columba oenas</i>	2	31/12/2011	0m	Bird Atlas 2007 – 2011	Wildlife Act
Tufted duck	<i>Aythya fuligula</i>	2	04/01/2003	625m	Birds of Ireland	EU Birds Directive: Annex II: Section I & Annex III: Section II Bird Species; Wildlife Act
Water rail	<i>Rallus aquaticus</i>	1	04/01/2003	625m	Birds of Ireland	Wildlife Act
Whooper swan	<i>Cygnus cygnus</i>	1	04/01/2003	625m	Birds of Ireland	EU Birds Directive: Annex I Bird Species; Wildlife Act
Yellowhammer	<i>Emberiza citrinella</i>	3	02/05/2021	0m	Birds of Ireland Bird Atlas 2007 – 2011	Wildlife Act
Brown long-eared bat	<i>Plecotus auritus</i>	4	09/07/2004	470m	National Bat Database of Ireland	EU Habitats Directive: Annex IV; Wildlife Act
Eurasian badger	<i>Meles meles</i>	9	31/12/2016	0m	Atlas of Mammals in Ireland 2010-2015 Badger Setts of Ireland Database	Protected Species: Wildlife Act
Eurasian pygmy shrew	<i>Sorex minutus</i>	2	06/06/2018	795m	Mammals of Ireland 2016-2025	Protected Species: Wildlife Act
European otter	<i>Lutra lutra</i>	6	16/09/2004	35m	Otter Survey of Ireland 1982 Otter survey of Ireland 2004 & 2005	Protected Species: EU Habitats Directive: Annex II & Annex IV; Wildlife Act
Lesser noctule	<i>Nyctalus leisleri</i>	18	09/08/2012	0m	National Bat Database of Ireland	EU Habitats Directive: Annex IV; Wildlife Act
Natterer's bat	<i>Myotis nattereri</i>	6	31/12/2007	1315m	National Bat Database of Ireland	EU Habitats Directive: Annex IV; Wildlife Act
Pipistrelle	<i>Pipistrellus pipistrellus sensu lato</i>	42	13/08/2014	0m	National Bat Database of Ireland	EU Habitats Directive: Annex IV; Wildlife Act
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	10	15/07/2014	0m	National Bat Database of Ireland	EU Habitats Directive: Annex IV; Wildlife Act
West European hedgehog	<i>Erinaceus europaeus</i>	30	28/06/2022	0m	Hedgehogs of Ireland	Protected Species: Wildlife Act
Whiskered bat	<i>Myotis mystacinus</i>	1	18/07/1999	1280m	National Bat Database of Ireland	EU Habitats Directive: Annex IV; Wildlife Act

**Table 10.8: Records of Protected, Rare and Other Notable Flora and Fauna Within 200m of the Proposed Development (data from Meath BAP (2015) NPWS and the NBDC (2023))**

Species Group	Common Name	Scientific Name	Protection <sup>NOTE 1</sup>	Conservation Status
Lower Plants	N/A	N/A	No notable or protected species found within 200m of Proposed Development PAB.	N/A
Higher Plants	N/A	N/A	No notable or protected species found within 200m of Proposed Development PAB.	N/A
Invertebrates	N/A	<i>Andrena (Melandrena) nigroaenea</i>	Found 200m from the Proposed Development	Vulnerable
Invertebrates	Large Red Tailed Bumble Bee	<i>Bombus (Melanobombus) lapidarius</i>	N/A -Notable	Near threatened
Fish	N/A	N/A	No notable or protected species found within 200m of Proposed Development PAB.	N/A
Amphibians	Common frog	<i>Rana temporaria</i>	WA	Least concern
Reptiles	N/A	N/A	No notable or protected species found within 200m of Proposed Development PAB.	N/A
Birds	Little egret	<i>Egretta garzetta</i>	BDI, WA	Least concern
Birds	Yellowhammer	<i>Emberiza citrinella</i>	WA	Birds of Conservation Concern – Red List
Terrestrial mammals	Lesser noctule	<i>Nyctalus leisleri</i>	WA	Least concern
Terrestrial mammals	Natterer's Bat	<i>Myotis nattereri</i>	WA	Least concern
Terrestrial mammals	Eurasian badger	<i>Meles meles</i>	WA	Least concern
Terrestrial mammals	West European hedgehog	<i>Erinaceus europaeus</i>	WA	Least concern

Note 1: WA = Wildlife Act, BD = Birds Directive Annex I

### 10.3.1.6 Fish and Aquatic Invertebrates

No records for fish or aquatic invertebrates were returned in the NBDC desk-based search (NBDC 2023).

The study area is hydrologically linked to three main river catchments. These are the River Tolka located to the west and centre of the Proposed Development, the River Broadmeadow located to the centre and east, and the River Mayne located to the eastern extent of the Proposed Development.

Atlantic salmon, lamprey species, three-spined stickleback (*Gasterosteus aculeatus*), nine-spined stickleback (*Pungitius pungitius*), European eel (*Anguilla anguilla*), stone loach (*Barbatula barbatula*), brown trout (*Salmo trutta*) and minnow (*Phoxinus phoxinus*) are known to be present in the River Tolka and Pinkeen (Kelly *et al.* 2012; Matson *et al.* 2018a). Brown trout, eel, flounder (*Platichthys flesus*), minnow, nine-spined stickleback, sea trout, stone loach and three-spined stickleback are known to be present in the River Ward (Matson *et al.* 2018b). Three-spined stickleback and eel are known to be present in the River Mayne catchment (including Sluice\_010) (Kelly *et al.* 2012).

White-clawed crayfish are not present in the River Tolka, River Mayne and River Ward (no known records).

The NWPS freshwater pearl mussel sensitive areas dataset (Department of Housing, Local Government and Heritage 2017) indicates the likely absence of the species from all of the river catchments in the vicinity of the Proposed Development.

### 10.3.1.7 Invasive Species

Records of floral invasive species within 5km of the Proposed Development PAB are shown in Table 10.9 (NBDC 2023). To note, exact locations are not provided in data returns for invasive species desk-based searches of NBDC.

**Table 10.9: Records of Invasive Flora Species Within 2km of the Proposed Development Boundary (NBDC 2023) (Species in Bold are Designated as Third Schedule Invasive Species)**

Species Group	Species Name	Scientific Name	Record Count	Date of Last Record	Designation
Flowering plant	<b>Giant-rhubarb</b>	<i><b>Gunnera tinctoria</b></i>	1	24/09/2013	<b>Invasive Species: High Impact Invasive Species</b>
Flowering plant	Butterfly-bush	<i>Buddleja davidii</i>	4	28/06/2019	Invasive Species: Medium Impact Invasive Species
Flowering plant	Himalayan honeysuckle	<i>Leycesteria formosa</i>	1	21/09/2022	Invasive Species: Medium Impact Invasive Species
Flowering plant	Ragweed	<i>Ambrosia artemisiifolia</i>	1	24/09/2013	Invasive Species: Medium Impact Invasive Species
Flowering plant	Sycamore	<i>Acer pseudoplatanus</i>	6	29/11/2021	Invasive Species: Medium Impact Invasive Species

## 10.3.2 Results of the Site Visit

### 10.3.2.1 Habitats

The study area is largely characterised by farmland (arable and pasture) intersected by hedgerows, treelines, river catchments, and roads. Habitats recorded across the study area are summarised in and shown in Figure 10.2 in Volume 4 of this EIAR. No Annex I habitats were recorded within the study area.

**Table 10.10: Fossitt Habitats Recorded within the Study Area**

Broad Habitat Group	Fossitt Habitat Code	Fossitt Habitat Name	Annex 1 Habitat On-Site
Water features	FL8	Other artificial lakes and ponds	No
	FW2	Depositing lowland rivers	No
	FW4	Drainage ditches	No
Cultivated and built land	BC1	Arable crops	No
	BC2	Horticultural land	No
	BC3	Tilled land	No
	BC4	Flower beds and borders	No
	BL2	Earth banks	No
	BL3	Building or Artificial	No
Exposed rock / disturbed ground	ED2	Spoil and bare ground	No
	ED3	Re-colonising bare ground	No
Grassland and marsh	GA1	Improved agricultural grassland	No
	GA2	Amenity grassland	No
	GM1	Marsh	No
	GS1	Dry calcareous and neutral grassland	No
	GS2	Dry meadows and grassy verges	No
	GS4	Wet grassland	No
Woodland and scrub	WD1	(Mixed) broadleaved woodland	No
	WD2	Mixed broadleaved / conifer woodland	No
	WD4	Conifer plantation	No
	WD5	Scattered trees and parkland	No
	WL1	Hedgerows	No
	WL2	Treeline	No
	WN5	Riparian woodland	No
	WS1	Scrub	No
	WS2	Immature woodland	No
	WS3	Ornamental / non-native shrub	No
	WS5	Recently felled woodland	No

#### 10.3.2.1.1 Arable crops (BC1)

Arable cropland was prevalent in the centre and towards the eastern extent of the study area. The habitat is regularly crossed by the Proposed Development within the off-road sections. The dominant crops encountered during the survey included wheat, barley and rapeseed. *The habitat is considered of Less than Local Importance.*

#### 10.3.2.1.2 Horticultural land (BC2)

Horticultural land was infrequent throughout the study area and confined to an area south of St Margaret's Golf Course, immediately adjacent to the Proposed Development. *The habitat is considered of Less than Local Importance.*



#### 10.3.2.1.3 Tilled land (BC3)

Tilled land was occasionally encountered in the central and eastern areas of the study area which is characterised by an arable farmscape. This habitat is found where land has been prepared for planting, but the type of crop or future land use cannot be determined. The habitat is located immediately adjacent to the Proposed Development at the closest point. *The habitat is considered of Less than Local Importance.*

#### 10.3.2.1.4 Flower beds and borders (BC4)

A small community garden was recorded within the study area to the immediate east of the Proposed Development, to the north of Hollystown Golf Course alongside Kilbride Road. *The habitat is considered of Less than Local Importance.*

#### 10.3.2.1.5 Earth banks (BL2)

Earth banks were infrequent within the study area and confined to two areas north-east and north-west of Barstown, at the western extent of the Proposed Development. Both areas were characterised by linear spoil heaps that were partially vegetated with a mixture of ruderals, grasses, and broadleaved forbs. The habitat is located c.110m from the Proposed Development at the closest point. *The habitat is considered of Less than Local Importance.*

#### 10.3.2.1.6 Building or artificial surfaces (BL3)

This habitat classification includes all domestic, agricultural, industrial and community buildings and areas covered by artificial surfaces such as roads. The habitat is prevalent within the Proposed Development as much of the route is in-road. It is also commonly encountered near and within built up urban areas such as Dunboyne and is present at both Belcamp and Woodland Substations. *The habitat is considered to be of Less than Local Importance.*

#### 10.3.2.1.7 Spoil and bare ground (ED2)

Spoil and bare ground was infrequent within the study area and confined to four areas, south of the M3 Junction 5 roundabout, west of Stokestown, west of Ballymacarney, and north of Forrest Great. The habitat includes heaps of spoil and rubble, and other areas of bare ground that are either very transient in nature or persist for longer periods of time because of ongoing disturbance. The habitat is located c.95m from the Proposed Development at the closest point. *The habitat is considered of Local Importance (Lower Value).*

#### 10.3.2.1.8 Recolonising bare ground (ED3)

Recolonising bare ground was scattered throughout the study area, with larger concentrations of the habitat surrounding Woodland Substation and to the immediate south of Forrest Little Golf Club. This habitat type includes areas of bare or disturbed ground, often in derelict sites, with over 50% vegetation cover. Vegetation was mainly formed from ruderal, ephemeral, and short perennial species, and to a lesser extent grasses, such as nettle (*Urtica dioica*), willowherb (*Epilobium* sp.), creeping buttercup (*Ranunculus repens*), white clover (*Trifolium repens*), false oat grass (*Arrhenatherum elatius*) and Yorkshire fog (*Holcus lanatus*). *The habitat is considered of Local Importance (Higher Value).*

#### 10.3.2.1.9 Other artificial lakes and ponds (FL8)

Artificial ponds were infrequent throughout the study area. The closest instances of this habitat in relation to the Proposed Development include a small pond that overlaps a Horizontal Directional Drilling (HDD) site to the west of the M1 Road, which was not accessible due to its location directly under the M1 Motorway. There was an attenuation pond located to the immediate west of the Proposed Development, c.130m north of the HDD site that crosses the M3 Road. *The habitat is considered of Local Importance (Higher Value).*

#### 10.3.2.1.10 Depositing / lowland rivers (FW2)

Several watercourses within the study area fall within this habitat category including the Dunboyne Stream, River Tolka, River Pinkeen, River Ward, River Mayne and River Sluice. Water Framework Directive water bodies in the vicinity of the proposed development are listed in Table 2.6. The table includes the water body (WB) name, EU code, grid reference of the crossing location, WB reference number, WFD status and risk ratings are included in the table. *The habitat is considered of Local Importance (Higher Value).*

##### 10.3.2.1.10.1 Dunboyne Stream Catchment

The Proposed Development will cross the Dunboyne Stream\_010 at two locations (at WB02 and WB03). The river was approximately 2m and 3m wide respectively with slow flow upstream and moderate flow at the second crossing point. The river was between 15cm and 50cm deep at the crossing points and was shaded by vegetation along more than 75% of the river. The presence of erosion and undercutting, along with the variation of substrate sizes suggest habitat suitability for white-clawed crayfish and small fish. There was also potential for commuting otter to be present in this area. The riparian vegetation present was bramble, canary reed grass, hawthorn, thistle, ash and nettles and emergent vegetation of water cress also present.

##### 10.3.2.1.10.2 River Tolka Catchment

The Proposed Development will cross the Tolka\_020 at two tributaries (WB04 and WB05). At the first crossing point (WB04) the river was approximately 2m wide, 10cm deep with minimal undercutting present. It was shaded by vegetation along more than 75% of this stretch and had low flow. Substrate was mostly fine sediment and flow types were a mix of glide, run and pool. The second crossing point (WB05) was 4m wide, 50cm deep with some undercutting present. It was shaded by vegetation over more than 75% of this stretch but open in sections. The substrate was composed mostly of fine sediment with some larger cobbles. This crossing point was deemed to have low fish potential due to the heavy shading of the watercourse.

##### 10.3.2.1.10.3 River Pinkeen Catchment

The Proposed Development will cross the Pinkeen\_010 at one location (WB07). The river was approximately 2.5m wide, 30cm deep, with minimal undercutting present. It was shaded by vegetation along more than 75% of this stretch. The substrate was composed of mostly fine sediment with some larger gravel, pebble and cobble sized stones were present in low abundance, although with some artificial substrate. Otter spraint was recorded here during surveys.

##### 10.3.2.1.10.4 River Ward Catchment

The Proposed Development will cross three tributaries to the River Ward (i.e., Ward\_010, Ward\_020 and Ward\_030). These water bodies will be crossed at seven different locations and will also be in close proximity to the Proposed Development at a further six locations.

The Ward\_010 will be crossed at three locations (WB09, WB10 and WB11) and was approximately 2m to 3m wide, 25cm deep, heavily shaded by vegetation, had moderate flow with a mix of riffles, runs and glides and some pooling present, minimal erosion seen, and substrate was mainly a mix of silt and pebble with some gravel, cobble and artificial sediment present as well.

The Ward\_020 will be crossed at two locations (WB12 and WB13) and was described as being slow flowing, approximately 2m to 3m wide and 10cm and 40cm deep at the respective crossing points. Both sections of the river were shaded by vegetation along more than 75% of the stretches surveyed. The substrate was composed of mostly silt with some gravel, sand and pebble in low abundance. Flow types were mainly pool and some glide. The river was deemed unsuitable for amphibians due to the flow and shading present.

Ward\_030 will be crossed at three locations (WB19, WB20 and WB21). River descriptions at each differ. At WB19 the river had a moderate flow, and was approximately 150cm wide and 15cm deep. The flow characteristics were a mix of run, riffle, glide, pool and cascade, and there was minimal undercutting present.

The substrate composition consisted of pebble, cobble, silt, gravel, overlying silt and artificial and hair algae was observed anchored to the ground. The river was shaded by vegetation along more than 75% of this stretch. WB20 was described as being 1.5m wide and approximately 15cm deep with moderate flow. The river was largely unshaded as the banks were lined by grasses and some scrub. WB21 more closely resembled a ditch. It was heavily vegetated and shaded by scrub. The water depth was low (approximately 5cm).

#### 10.3.2.1.10.5 River Sluice Catchment

The Proposed Development will cross the Sluice\_010 at one point (WB22). At the proposed crossing point, WB22 is culverted under the road so assessment was carried out downstream. It was approximately 50cm wide and 0.5m deep with a slow flow and signs of moderate pollution as it passes through a golf course. The river was shaded by vegetation along more than 75% of the stretch. The substrate composition was a mix of sand, gravel and pebble with cobble also present in low abundance. An artificial pond was also present which featured several steps to hold the water, which would impede fish movement. Some small sticklebacks were recorded in the river.

#### 10.3.2.1.10.6 River Mayne Catchment

The Proposed Development will cross the Mayne\_010 at one point (WB23). The river was described as approximately 1.75m wide, 20cm deep and fast flowing. The substrate was composed of predominantly sand, silt and pebble substrate. There was some undercutting and erosion recorded. The flow was mainly glide with some pools and runs. The river was shaded by vegetation along more than 75% of the stretch and the riverbanks were vegetated by herbaceous species and scrub.

#### 10.3.2.1.11 Drainage ditches (FW4)

Drainage ditches both wet and dry were recorded throughout the study area (DD01-DD35), many of which will be intersected by the Proposed Development. Several ephemeral ditches were not on the EPA mapping tool application (EPA 2023) and were mostly associated with areas flowing alongside roads and housing developments or farmland drains. Many were heavily modified, artificial, straightened, narrow and dredged for flood prevention. Habitat features recorded included stagnant water, shallow water depths and had vegetation and detritus covering the substrates. Several were culverted under roads and fields and although hydrologically linked to larger downstream tributaries, many were dry when surveyed and unsuitable for fish or invertebrates. Species recorded within the ditches included common reed, reed canary grass (*Phalaris arundinacea*), great willowherb *Epibolium hirsutum*, rosebay willowherb *Chamerion angustifolium*, duckweed *Lemna* sp., starwort *Stellaria graminea*, reedmace *Typha latifolia*, water cress *Rorippa nasturtium-aquaticum*, water mint *Mentha aquatica* and *Juncus* sp. *The habitat is considered of Local Importance (Higher Value).*

#### 10.3.2.1.12 Improved agricultural grassland (GA1)

Improved agricultural grassland managed for hay production or grazed intensively by sheep and cattle was prevalent across the study area. The habitat is regularly crossed by the Proposed Development within the off-road sections. The species-poor sward was dominated by a few fast-growing grasses on fertile, neutral soils. *The habitat is considered to be of Less than Local Importance.*

#### 10.3.2.1.13 Amenity grassland (GA2)

Amenity grassland, characterised by an intensively managed and regularly mown grassland sward, was common and widespread throughout the study area within playing fields, residential gardens and green spaces. The sward was generally species poor and characterised by an abundance of rye-grasses (*Lolium* spp.), white clover (*Trifolium repens*), daisy (*Bellis perennis*), greater plantain (*Plantago major*), and common dandelion (*Taraxacum officinale*). *The habitat is considered to be of Less than Local Importance.*

#### 10.3.2.1.14 Marsh (GM1)

A small area of marsh habitat was recorded next to a commercial area in Killamonan, c. 50m from the Proposed Development at the closest point. The species composition included rushes (*Juncus* spp.), sedges (*Carex* spp.), meadowsweet (*Filipendula ulmaria*), and common broadleaved forbs. *The habitat is considered of Local Importance (Higher Value).*

#### 10.3.2.1.15 Dry calcareous and neutral grassland (GS1)

A moderate occurrence of dry calcareous and neutral grassland was recorded within the study area, with the habitat recorded at both Woodland and Belcamp Substations and along roadside verges within the central areas of the Proposed Development. The species composition of the sward was predominantly associated with neutral conditions, such as meadow foxtail (*Alopecurus pratensis*), cock's foot (*Dactylis glomerata*), meadow buttercup (*Ranunculus acris*), common knapweed (*Centaurea nigra*), and ribwort plantain (*Plantago lanceolata*). However, species commonly associated with neutral to slightly alkaline conditions such as false-oat grass and sweet vernal grass (*Anthoxanthum odoratum*) were also recorded as the land throughout the study area is largely characterised by a fine loamy drift with limestone. *The habitat is considered of Local Importance (Higher Value).*

#### 10.3.2.1.16 Dry meadows and grassy verges (GS2)

The habitat was common and widespread throughout the study area along the roadside verges. The habitat regularly lies immediately adjacent to the Proposed Development. The species composition was defined by a higher proportion of tall, coarse, and tussocky grasses such as false oat grass and cock's foot and tall broadleaved herbs such as hogweed (*Heracleum mantegazzianum*), nettle, and cow parsley (*Anthriscus sylvestris*), due to the corresponding management, which typically comprises an annual or biannual cutting regime with no grazing or fertiliser application. *The habitat is considered of Local Importance (Higher Value).*

#### 10.3.2.1.17 Wet grassland (GS4)

The study areas feature several connecting fields of wet grassland to the south of Woodland Substation, which is crossed by the Proposed Development. Smaller, isolated areas of wet grassland were also recorded elsewhere within the study area, mostly located away from the Proposed Development route except for a small area beside Ward River. The species composition recorded was largely characterised by an abundance of soft rush (*Juncus effusus*), meadow sweet (*Filipendula ulmaria*), Yorkshire fog, creeping bent (*Agrostis stolonifera*) and marsh thistle (*Cirsium palustre*). Further species recorded included meadow foxtail, meadow buttercup, creeping buttercup, cuckoo flower (*Cardamine pratensis*), white clover, and round-fruited rush (*Juncus compressus*). Hairy sedge (*Carex hirta*) was very common in the sward at Woodland substation.

*The habitat is considered of Local Importance (Higher Value).*

#### 10.3.2.1.18 (Mixed) broadleaved woodland (WD1)

Broadleaved plantation woodland was widespread throughout the study area. The main stands were located along the motorways (M1, M2, and M3), R132 Road and Naul Road (west of the M1), and to the south of Belcamp Substation, with smaller pockets of plantation woodland spread evenly across the study area. The stands primarily consisted of ash (*Fraxinus excelsior*), sessile oak (*Quercus petraea*), silver birch (*Betula pendula*), beech (*Fagus sylvatica*), hazel (*Corylus avellana*), sycamore (*Acer pseudoplatanus*), plum (*Prunus* sp.), hawthorn (*Crataegus monogyna*), alder (*Alnus glutinosa*), and poplar (*Populus* sp.). The habitat is crossed by the Proposed Development near to the open-cut crossing of Ward\_010 River, and along Naul Road to the west of the M1 Road. However, most stands lie immediately adjacent to or away from the Proposed Development. *The habitat is considered of Local Importance (Higher Value).*

#### 10.3.2.1.19 Mixed broadleaved / conifer woodland (WD2)

Mixed broadleaved/conifer woodland was infrequent throughout the study area with five small stands confined to the north-west of Dunboyne, east of the M3, south of Nuttstown, north-west of Belgree, and north of Belcamp Substation. All stands within the centre of the study area lie immediately adjacent to the Proposed Development. The stands were mostly formed from ash, Leyland cypress (*Cupressus × leylandii*), Scot's pine (*Pinus sylvestris*), sycamore, poplar, beech, oak and Sitka spruce (*Picea sitchensis*). *The habitat is considered of Local Importance (Higher Value).*

#### 10.3.2.1.20 Conifer plantation (WD4)

Conifer plantations were infrequent within the study area. The main stands were located to the north-east of Kilcorne and north-west of Dunboyne, with smaller stands to the north of M3 Junction 5 and north of the Pinkeen River. The stands were made up of over 75% conifer species for commercial use and were planted with pines (*Pinus* sp.) and spruce species such as Sitka and Norwegian spruce (*Picea abies*). The habitat is located c.20m from the Proposed Development at the closest point (north of M3 Junction 5), although most stands are typically sited further afield. *The habitat is considered of Local Importance (Lower Value).*

#### 10.3.2.1.21 Scattered trees and parkland (WD5)

Scattered trees and parkland habitat, which is characterised by areas where trees cover less than 30% of the total area but remain a prominent feature, was represented on golf courses and gardens featuring within the centre and towards the east of the study area. The largest areas of this habitat type were found within St Margaret's Golf Course and Forrest Little Golf Course, both of which lie immediately adjacent to the Proposed Development. *The habitat is considered of Local Importance (Lower Value).*

#### 10.3.2.1.22 Hedgerows (WL1)

Hedgerows were common and widespread throughout the study area along roadside verges and field boundaries. The habitat is regularly crossed by the Proposed Development within the off-road sections and lies immediately adjacent to the Proposed Development within the on-road sections. Hedgerows were primarily in good condition and were dominated by hawthorn, blackthorn (*Prunus spinosa*), ash, bramble (*Rubus fruticosus*), dog rose (*Rosa canina*), ivy (*Hedera helix*), elder (*Sambucus nigra*), willow (*Salix* sp.) and sycamore. Although all hedgerows are classified under Fossitt (2020) as WL1, in this survey hedgerows were divided into species rich and species poor categories. Species rich hedgerows are defined as having at least five woody species making up a 30m stretch of hedgerow (DEFRA, 2007). The lengths of species rich and species poor hedgerows are shown in Table 10.25. *Species-rich hedgerows are considered of County importance, whereas species-poor hedgerows are considered of Local Importance (Higher Value).*

#### 10.3.2.1.23 Treeline (WL2)

Treelines were common and widespread throughout the study area along roadside verges and field boundaries. The habitat is regularly crossed by the Proposed Development within the off-road sections and lies immediately adjacent to the Proposed Development within the on-road sections. Species commonly encountered included ash, hazel, hawthorn, beech, holly, cypress sp., lime (*Tilia* sp.), pine sp., oak sp., sycamore and horse chestnut (*Aesculus hippocastanum*). Treelines along road edges typically had a hedgerow understory. *The habitat is considered of Local Importance (Higher Value).*

#### 10.3.2.1.24 Riparian woodland (WN5)

A 10m wide strip of riparian woodland was recorded along the Ward River in the centre of the study area, which is crossed by the Proposed Development to the west of the M3 Road. The canopy and understorey layers were largely formed from alder, willow sp., hawthorn, ash, bramble, ivy, blackthorn and elder. Species within the field layer included meadowsweet, willowherb, hogweed, nettle, reed canary grass, wood dock (*Rumex sanguineus*), lesser celandine (*Ficaria verna*), bittercress sp. (*Cardamine* sp), garlic mustard (*Alliaria*



*petiolate*), cow parsley and horsetail (*Equisetum arvense*). It lies adjacent to the Ward River, as is likely to be seasonally flooded. However, as it is not part of low-lying wetland and not part of a successional series of habitats that includes fen and swamp, so does not meet the criteria for an Annex 1 Alluvial forest. *The habitat is considered of Local Importance (Higher Value).*

#### 10.3.2.1.25 Scrub (WS1)

The habitat was common and widespread throughout the study area. Recorded species included bramble, ivy, hawthorn, blackthorn, elder, dogrose (*Rosa canina*), ash, and sycamore. *The habitat is considered of Local Importance (Higher Value).*

#### 10.3.2.1.26 Immature woodland (WS2)

Immature woodland was infrequent within the study area and was mainly confined to roadside verges such as the R157 Road to the north and west of Dunboyne, the R121 (west of St Margaret's Golf Course), Naul Road to the south of Forrest Little Golf Club, and the M1 Road north of Junction 2 Roundabout. This habitat includes areas that are dominated by young or sapling trees that have not yet reached the threshold heights. Species recorded in this habitat included birch, hawthorn and poplar. *The habitat is considered of Local Importance (Lower Value).*

#### 10.3.2.1.27 Ornamental / non-native shrub (WS3)

Ornamental/non-native shrub was infrequent within the study area and mainly confined to the west of M3 Junction 5 Roundabout (which is crossed by the Proposed Development) and along the settlement edge of Hollystown off from Kilbridge Road. Typical species recorded included fuchsia (*Fuchsia magellanica*), willow sp., beech and cherry laurel (*Prunus laurocerasus*). *The habitat is considered of Less than Local Importance.*

#### 10.3.2.1.28 Recently-felled woodland (WS5)

At the time of survey, a small stand named Wesley's Woods, located within the centre of the study area to the east of Ward River and north-east of Nuttstown, had been recently felled. The habitat is located approximately 10m from the Proposed Development at the closest point. *The habitat is considered of Local Importance (Lower Value).*

### 10.3.2.2 Ground Water Dependent Terrestrial Ecosystems (GWDTE)

Marsh (GM1), wet grassland (GS4), and riparian woodland (WN5) can be considered Ground Water Dependent Terrestrial Ecosystems (GWDTE) when groundwater significantly influences soil moisture levels and helps sustain the unique flora and fauna associated with these habitats. For the purpose of this Chapter, these habitats are considered potential GWDTE although the dependence on groundwater may vary depending on the hydrological conditions, water sources, geographical location and seasonal variation. For riparian woodland habitat, it is also important to note surface water flow may dominate, especially in regions with highly permeable soils and rapid groundwater recharge.

Those areas supporting marsh (GM1), wet grassland (GS4) and riparian woodland (WN5) that are considered potential GWDTE within the study area are summarised in Table 10.11 and shown in Figure 10.2 in Volume 4 of this EIAR. Further information on groundwater receptors is presented in Chapter 11 (Soils, Geology and Hydrogeology) in Volume 2 of the EIAR. No further GWDTE habitats were identified within the study area.

**Table 10.11: Potential GWDTE Within the Study Area**

GWDTE Site No.	Fossitt Habitat	Location
1	Wet grassland (GS4)	The proposed cable route will pass off-road through approximately 580m of wet grassland at the western extent of the Proposed Development, approximately 1.55km south of Woodland Substation at the closest point (N 94487 46397). Note the GWDTE incorporates a number of adjacent fields in this location (mapped as four separate polygons) which are considered part of the same ecosystem virtue of proximity. Dunboyne Stream (WB02) and Rye Water_030 lie adjacent to the GWDTE.
2	Wet grassland (GS4)	Field corner is located approximately 15m south of the proposed cable route [in-road] (N 94599 45038) within Lynaghstown. The potential GWDTE lies adjacent to the southern side of the R156 Regional Road.
3	Riparian woodland (WN5)	The proposed cable route will pass off-road through approximately 35m of riparian woodland (O 01641 43994), to the immediate east of the River Tolka (WB05), west of the M3 Motorway Junction 5 Roundabout.
4	Marsh (GM1)	Small area of marsh beside a commercial area, approximately 50m east of the proposed cable route (O 09046 43764). The habitat is located approximately 90m from an unnamed ditch (no reference) that is connected to the Ward_030 water body at the closest point.
5	Wet grassland (GS4)	The proposed cable route will pass off-road through approximately 35m of wet grassland (O 04115 45120), to the immediate east of the Pinkeen_010 water body (WB07).
6	Wet grassland (GS4)	Small island of wet grassland within the centre of an arable field, approximately 120m north of the proposed cable route (O 13669 44786), which will pass off road to the east of Kilreesk. There are no water bodies in proximity of this habitat, with the closest being the Ward_030 water body (WB21, approximately 375m south-east).

### 10.3.2.3 Aquatic Environment

Fifty-eight water bodies were identified within the study area and assessed using professional judgement, and in accordance with best practice guidance, in terms of the stream width and depth, the substrate type, the flow type, the presence / absence of instream and bankside vegetation, and the level of shading.

In this EIAR, and throughout this Chapter, 'water body' is often used generically to refer to a watercourse, river, drainage ditch or pond. Although it is most frequently used to refer to a river / watercourse. Sometimes the specific terms drainage ditch or pond are used, to avoid confusion.

Most of the water bodies within the study area (33 in total) were typified by low-energy river typologies with substrate siltation. These are WB01 / WB02 / DD01 / DD03 / DD04 / WB04 / WB05 / DD06 / DD08 / DD09 / DD10 / DD12 / DD17 / WB08 / DD24 / WB11 / WB12 / WB13 / DD25 / DD26 / DD27 / WB15 / WB17 / WB18 / DD28 / WB19 / DD29 / WB20 / DD32 / WB22 / DD33 / DD34 / DD35.

Six water bodies conversely supported more habitat diversity (relative to those water bodies included within the survey) in terms of water depth, flow characteristics, substrate composition, water clarity, and in-stream vegetation. These are WB03 / WB06 / WB07 / WB10 / WB16 / WB23.

The remaining 19 water bodies were recorded as dry / ephemeral at the time of survey, and these are DD02 / DD05 / DD07 / DD11 / DD13 / DD14 / DD15 / DD16 / DD18 / DD19 / DD20 / DD21 / DD22 / DD23 / WB09 / WB14 / DD30 / WB21 / DD31.

It is important to note that WFD water bodies are referenced as 'WB', whereas all non-WFD water bodies are referenced as Drainage Ditch ('DD'). Further details relating to the assessment of each water body is presented in Appendix A10.3 in Volume 3 of this EIAR. The eDNA sample location of the water bodies and their WFD status is shown in Figure 10.8 in Volume 4 of this EIAR.



#### **10.3.2.4 Plants and Fungi**

No records were returned for protected or notable plant or fungi species within 200m of the Proposed Development and none were recorded during the site survey. Protected and notable plants and fungi are therefore considered to likely be absent from the ZOI and are not considered further within this Chapter.

#### **10.3.2.5 Wintering Birds**

The results of the winter bird survey results (peak counts, distribution, and conservation importance) are summarised in Table 10.12 (the peak month is highlighted in grey) and shown in Figure 10.4 in Volume 4 of this EIAR.

The majority of species observed were observed in a range of habitats across the length of the Proposed Development. However, black-tailed godwit, Brent goose, coot, little grebe, mute swan and oystercatcher were observed exclusively in Darndale Park which is located approximately 38m to the south-east of Belcamp Substation.

SCI species are considered of International importance. All other Red, Amber and Green listed bird species (non-SCI breeding populations) are considered of Local Importance (Higher Value).

**Table 10.12: Winter Bird Survey Results with Peak Count Month Highlighted Grey, Distribution, Conservation Importance and Distance to Nearest SPA Where Applicable.**

Common Name	Scientific Name	BTO Code	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Distribution in the Study Area	Within the Zol (Yes/No)	Conservation Interest		
											BoCCI	Annex I	Nearest SPA Designated for SCI Species
Black-headed gull	<i>Larus ridibundus</i>	BH	197	394	172	52	114	3	Recorded in 47 locations across the Proposed Development in each survey month. They were observed in a range of aggregation sizes from individuals to 100 individuals in public parks, residential areas, agricultural fields and flying overhead.	Yes	Red List	No	North Bull Island SPA (4.6km)
Black-tailed godwit	<i>Limosa limosa</i>	BW	23	0	0	0	0	1	Recorded twice in the same location in both October and March. They were found in the playing fields in Darndale Park.	Yes	Amber List	No	Malahide Estuary SPA (3.6km)
Brent goose	<i>Branta bernicla</i>	BG	0	240	231	200	0	0	Recorded in four locations from November to January. They were found in the playing fields in Darndale Park and surrounding amenity grasslands in aggregations ranging from 80 – 240 individuals.	Yes	Amber List	No	Malahide Estuary SPA (3.6km)
Buzzard	<i>Buteo buteo</i>	BZ	0	0	0	0	9	2	Recorded in 10 locations in February and March across the Proposed Development. They were mostly seen alone, with one instance where two birds were observed at once. They were recorded, in a range of agricultural habitats.	No	N/A	No	N/A
Common gull	<i>Larus canus</i>	CM	2	33	7	5	3	0	Recorded in 15 locations from October to February across the Proposed Development. They were seen in small aggregations of 1-4 individuals with only one group of 27 individuals observed. They were seen in agricultural habitats and Darndale Park.	Yes	Amber List	No	North-West Irish Sea SPA (~6km)
Coot	<i>Fulica atra</i>	CO	0	2	0	2	0	0	Recorded twice in the same location in November and January. They were recorded in two separate instances of two birds present within the pond in Darndale Park.	No	Amber List	No	Lough Ennell SPA (52.8km – outside Zol)
Fieldfare	<i>Turdus pilaris</i>	FF	0	0	65	0	212	68	Recorded in 14 locations across the Proposed Development in December, February and March. They were observed in small to medium sized aggregations of 1-48 individuals with one large group of 120 individuals observed.	No	N/A	No	N/A
Golden plover	<i>Pluvialis apricaria</i>	GP	0	0	137	0	2	0	Recorded in seven locations across the Proposed Development in December and February. They were observed in small to medium aggregations of 1-66 individuals in agricultural habitats.	yes	Red List	Yes	Malahide Estuary SPA (c.3.6km)

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Common Name	Scientific Name	BTO Code	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Distribution in the Study Area	Within the Zol (Yes/No)	Conservation Interest		
											BoCCI	Annex I	Nearest SPA Designated for SCI Species
Great black-backed gull	<i>Larus marinus</i>	GB	0	2	2	0	0	0	Recorded in three locations in the middle and east of the Proposed Development in November and December. Two separate instances of two individuals were observed in both arable fields and Darndale Park.	Yes	N/A	No	North-West Irish Sea SPA (c.6km)
Herring gull	<i>Larus argentatus</i>	HG	113	192	74	96	91	154	Recorded in 88 locations across the Proposed Development in each survey month. They were observed in a range of aggregation sizes from individuals to 70 individuals in public parks, residential areas, agricultural fields and flying overhead.	Yes	Red List	No	Ireland's Eye SPA (c.8.6km)
Lapwing	<i>Vanellus vanellus</i>	L	0	0	99	0	0	0	Recorded in 10 locations across the Proposed Development in December. They were seen in aggregations of 1-26 individuals flying over and foraging in agricultural fields.	Yes	Red List	No	Boyne Estuary SPA (c.29.7km)
Lesser black-backed gull	<i>Larus fuscus</i>	LB	0	0	7	21	7	7	Recorded in 11 locations across the Proposed Development from December to March. They were aggregation of 1-20 individuals in public parks, residential areas, agricultural fields and flying overhead.	Yes	Amber List	No	Lambay Island SPA (c.13.4km)
Little Egret	<i>Egretta garzetta</i>	ET	1	2	1	1	0	0	Recorded four times in one location in a flooded field adjacent to the Tolka_020 river. All records here were of single birds apart from December when two birds were recorded together.	No	N/A	Yes	N/A
Little Grebe	<i>Tachybaptus ruficollis</i>	LG	0	0	0	1	1	0	Recorded twice in one location in January and February. Observed as an individual in the Darndale Park pond.	No	N/A	No	N/A
Mallard	<i>Anas platyrhynchos</i>	MA	0	8	2	2	1	0	Recorded in a public park/playing fields 1km south-east of Belcamp Substation	No	Amber List	No	N/A
Mediterranean gull	<i>Larus melanocephalus</i>	MU	0	2	0	0	0	0	Recorded once in November in a residential area south of Belcamp Substation, where two individuals were recorded together.	No	Amber List	No	N/A
Moorhen	<i>Gallinula chloropus</i>	MH	0	0	0	1	0	0	Recorded once in January, this species was observed as an individual in a pond in a golf course.	No	N/A	No	N/A
Mute Swan	<i>Cygnus olor</i>	MS	0	2	1	1	0	0	Recorded three times in the same location from November to January. Two individuals were recorded in separate dates, while two were observed together in the pond in Darndale Park.	No	Amber List	No	N/A

Common Name	Scientific Name	BTO Code	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Distribution in the Study Area	Within the ZOI (Yes/No)	Conservation Interest		
											BoCCI	Annex I	Nearest SPA Designated for SCI Species
Oystercatcher	<i>Haematopus ostralegus</i>	OC	37	18	3	0	0	0	Recorded five times one location from October to December. They were observed in aggregations of 1-20 individuals in Darndale Park.	Yes	Red List	No	Malahide Estuary SPA (c.3.6km)
Red Kite	<i>Milvus milvus</i>	KT	0	0	3	0	1		Recorded four times in roughly the same location in December and February. One individual was observed resting and flying in agricultural habitats by The Ward Cross and N2 road.	No	Red List	Yes	N/A
Redwing	<i>Turdus iliacus</i>	RE	0	0	720	0	13	84	Recorded in 32 locations across the Proposed Development from December, February and March. They were observed in a range of aggregation sizes from individuals to 150 individuals in agricultural habitats.	No	Red List	No	N/A
Reed Bunting	<i>Emberiza schoeniclus</i>	RB	0	0	0	0	0	1	Recorded once in March in a hedgerow east of the Woodlands Substation.	No	N/A	No	N/A
Rook	<i>Corvus frugilegus</i>	RO	0	0	0	0	5	0	Recorded in one location in a rookery west of the Dublin Airport with five individuals using the rookery.	No	N/A	No	N/A
Snipe	<i>Gallinago gallinago</i>	SN	0	2	8	0	7	0	Recorded in seven locations between the Woodland Substation and the M3 motorway in November, December and February. They were observed in aggregations of 1-5 individuals in agricultural habitats.	No	Red List	No	N/A
Starling	<i>Sturnus vulgaris</i>	SG	0	0	0	350	0	0	Recorded once in January in a large aggregation of 350 individuals using an arable field for foraging.	No	Amber List	No	N/A
Teal	<i>Anas crecca</i>	T	0	4	0	0	0	0	Recorded once in a flooded field adjacent to the Tolka_020 river. They were seen here in a group of four individuals.	Yes	Amber List	No	North Bull Island SPA (c.4.6km)
Yellowhammer	<i>Emberiza citrinella</i>	Y	0	0	2	0	2	2	Recorded four times between the Woodland Substation and Kilbride in December, February and March. They were observed in hedgerows adjacent to agricultural habitats.	No	Red List	No	N/A

### **10.3.2.6 Breeding Birds**

Three visits for breeding bird surveys were carried out across nine transects. Eighteen SCIs were recorded in total, comprising 10 Red List species (including two SCI species listed in nearby SPAs), six Amber List species, and two Green List species listed as SCIs from nearby SPAs. No Annex I species were recorded during the course of surveys. The survey results are tabulated in Table 10.13 and shown in Figure 10.5 in Volume 4 of this EIAR.

Red, Amber and Green listed bird species (non-SCI breeding populations) are considered of Local Importance (Higher Value).

**Table 10.13: Breeding Bird Survey Results, Species of Conservation Importance and Distance to Nearest SPA Where Applicable**

Common Name	Scientific Name	BTO Code	Total recorded across all visits	Estimated Minimum number of territories across all visits *	BTO Breeding Evidence	Conservation Importance		
						BoCCI	Annex I	Nearest SPA Designated for SCI Species
House martin	<i>Delichon urbicum</i>	HM	3	3	Possible	Amber	No	N/A
House sparrow	<i>Passer domesticus</i>	HS	25	14	Probable	Amber	No	N/A
Skylark	<i>Alauda arvensis</i>	S	29	22	Probable	Amber	No	N/A
Starling	<i>Sturnus vulgaris</i>	SG	152	50	Confirmed	Amber	No	N/A
Swallow	<i>Hirundo rustica</i>	SL	53	28	Possible	Amber	No	N/A
Willow warbler	<i>Phylloscopus trochilus</i>	WW	6	6	Possible	Amber	No	N/A
Cormorant	<i>Phalacrocorax carbo</i>	CA	3	0	Non-breeding	Amber	No	Irelands Eye SPA (breeding population), 8.6km
Lesser black back gull	<i>Larus fuscus</i>	LB	59	0	Non-breeding	Amber	No	Lambay Island SPA (breeding population), 13.4km
Curlew	<i>Numenius arquata</i>	CU	1	0	Non-breeding	Red	No	North Bull Island SPA (wintering population), 4.6km
Great black-backed gull	<i>Larus marinus</i>	GB	9	0	Non-breeding	Green	No	North-West Irish Sea SPA (breeding population), 4.5km
Greenfinch	<i>Carduelis chloris</i>	GR	8	7	Probable	Amber	No	N/A
Herring gull	<i>Larus argentatus</i>	HG	112	0	Non-breeding	Amber	No	Irelands Eye SPA (breeding population), 8.6km
Kestrel	<i>Falco tinnunculus</i>	K	1	0	Non-breeding	Red	No	N/A
Mallard	<i>Anas platyrhynchos</i>	MA	13	2	Breeding	Amber	No	Dundalk SPA (wintering population), 50km
Meadow pipit	<i>Anthus pratensis</i>	MP	10	9	Probable	Red	No	N/A
Snipe	<i>Gallinago gallinago</i>	SN	16	1	Possible	Red	No	N/A

Common Name	Scientific Name	BTO Code	Total recorded across all visits	Estimated Minimum number of territories across all visits *	BTO Breeding Evidence	Conservation Importance		
						BoCCI	Annex I	Nearest SPA Designated for SCI Species
Stock dove	<i>Columba oenas</i>	SD	3	3	Probable	Red	No	N/A
Swift	<i>Apus apus</i>	SI	2	0	Non-breeding	Red	No	N/A
Yellowhammer	<i>Emberiza citrinella</i>	Y	44	39	Probable	Red	No	N/A

\* Confirmed, probable and possible breeding behaviours (as per BTO categories) were used to determine minimum breeding territories across all visits.



### 10.3.2.7 Bats

#### 10.3.2.7.1 Ground-Level Tree Assessment

Nineteen trees were identified with moderate or high bat roost potential during the ground-level tree assessment (GLTA). A summary of the results is presented in Table 10.14. The location of the trees with moderate or high bat potential are shown in Figure 10.6 in Volume 4 of this EIAR. For ease of surveying and recording, trees with low potential were not given a tree reference and are not shown on the map as they did not require further surveying to rule out bat roosting.

Bats are considered of Local Importance (Higher Value).

**Table 10.14: Ground Level Tree Assessment (GLTA) Results**

Potential	Bat Conservation Trust Description (Collins, 2023)	No. of Trees	Tree Reference
Confirmed roost	A tree with a known roost.	0	N/A
High potential	A tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	8	T06 / T07 / T08 / T09 / T10 / T11 / T12 / T15
Moderate potential	A 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	11	T01 / T02 / T03 / T04 / T05 / T13 / T14 / T16 / T17 / T18 / T19
Low potential	A tree of sufficient size and age to contain Potential Roost Features but none seen from the ground or features seen with only very limited roosting potential.	38	N/A

#### 10.3.2.7.2 Emergence Surveys

Emergence surveys were carried out on all 19 trees with moderate or high bat roost potential during the GLTA. In accordance with practice guidance (Collins 2016; Collins 2023; Andrews and Gardener 2016), two emergence surveys were carried out on trees of moderate potential, and three emergence survey for trees of high potential. No bat roosts were recorded during those surveys. Table 10.15 presents the dates on which these surveys were conducted and the corresponding weather conditions during the surveys.

**Table 10.15: Emergence Surveys Dates and Weather Conditions**

Tree Reference	Survey Number	Date	Weather
T01	1	22/05/2023	12°C. Mild, slightly cloudy, light breeze
	2	19/06/2023	15°C. Clear sky, no wind
T02	1	22/05/2023	12°C. Mild, slightly cloudy, light breeze
	2	19/06/2023	15°C. Clear sky, no wind
T03	1	22/05/2023	12°C. Mild, slightly cloudy, light breeze
	2	19/06/2023	15°C. Clear sky, no wind
T04	1	22/05/2023	12°C. Mild, slightly cloudy, light breeze
	2	19/06/2023	15°C. Clear sky, no wind
T05	1	23/05/2023	13°C. Mild, clear sky, no wind
	2	19/06/2023	15°C. Clear sky, no wind
T06	1	23/05/2023	13°C. Mild, clear sky, no wind
	2	19/06/2023	15°C. Clear sky, no wind
	3	26/06/2023	12°C. Moderate cloud cover, moderate wind, light rain on and off
T07	1	23/05/2023	13°C. Mild, clear sky, no wind
	2	20/06/2023	15°C. Clear sky, no wind
	3	27/06/2023	14°C. Light cloud cover, light wind
T08	1	23/05/2023	13°C. Mild, clear sky, no wind
	2	20/06/2023	15°C. Clear sky, no wind
	3	27/06/2023	14°C. Light cloud cover, light wind
T09	1	23/05/2023	13°C. Mild, clear sky, no wind
	2	20/06/2023	15°C. Clear sky, no wind
	3	27/06/2023	14°C. Light cloud cover, light wind
T10	1	24/05/2023	11°C. Mild, slightly cloudy, light breeze
	2	20/06/2023	15°C. Clear sky, no wind
	3	28/06/2023	15°C. Light cloud cover, light wind, light rain on and off
T11	1	24/05/2023	11°C. Mild, slightly cloudy, light breeze
	2	20/06/2023	15°C. Clear sky, no wind
	3	28/06/2023	15°C. Light cloud cover, light wind, light rain on and off
T12	1	24/05/2023	11°C. Mild, slightly cloudy, light breeze
	2	20/06/2023	15°C. Clear sky, no wind
	3	28/06/2023	15°C. Light cloud cover, light wind, light rain on and off
T13	1	24/05/2023	11°C. Mild, slightly cloudy, light breeze
	2	21/06/2023	12°C. Clear sky, light wind, no rain
T14	1	24/05/2023	11°C. Mild, slightly cloudy, light breeze
	2	21/06/2023	12°C. Clear sky, light wind, no rain
T15	1	25/05/2023	12°C. Moderate cloud cover, light breeze
	2	21/06/2023	12°C. Clear sky, light wind, no rain
	3	29/06/2023	10°C. High cloud cover, light wind, brief showers
T16	1	22/05/2023	12°C. Mild, slightly cloudy, light breeze
	2	22/06/2023	11°C. Clear sky, light wind, no rain
T17	1	25/05/2023	12°C. Moderate cloud cover, light breeze
	2	22/06/2023	11°C. Clear sky, light wind, no rain
T18	1	25/05/2023	12°C. Moderate cloud cover, light breeze
	2	22/06/2023	11°C. Clear sky, light wind, no rain

Tree Reference	Survey Number	Date	Weather
T19	1	25/05/2023	12°C. Moderate cloud cover, light breeze
	2	22/06/2023	11°C. Clear sky, light wind, no rain

It is important to highlight that despite the Bat Surveys for Professional Ecologists: Good Practice Guidelines 4<sup>th</sup> edition (Collins 2023) recommending the use of night vision aids during surveys, unique operational constraints were encountered. Specifically, all the trees were situated along a road. Due to safety concerns and the impracticality of relocating infrared cameras each time a vehicle approached, night vision aids were not utilised.

Additionally, as the trees were located along the road, traditional tree climbing methods were unfeasible due to the inherent danger posed by passing cars. This safety concern further emphasised the need to adapt survey methodologies.

In alignment with the most current guidance available at the time that the surveys were undertaken (surveys undertaken May 2023 to June 2023), it was determined that dawn surveys were no longer recommended, and therefore, dusk surveys were deemed the most practical approach under the given circumstances. The decision to conduct surveys during this time was not only based on the guidance but also took into account the constraints imposed by the setting of the Proposed Development.

Despite the absence of night vision aids, the impact on survey accuracy was mitigated by the fact that the trees were situated along a road, providing some ambient lighting. These circumstances allowed for continuous visibility of features throughout the surveys, minimising the significance of not employing night vision aids in this particular context to the extent that they are reliable in accordance with best practice guidance. As the night vision aids are employed in best practice guidance to aid in seeing emergencies in low light levels, the ambient lighting present renders the impact of not using night vision aids *de minimus*

The Bat Surveys for Professional Ecologists: Good Practice Guidelines 4<sup>th</sup> edition states that potential roosting features in trees must be recorded with their occupancy levels using a new system of PRF-I for individual or low numbers of bats and PRF-M for multiple bats or a maternity. However, the Bat Surveys for Professional Ecologists: Good Practice Guidelines 4<sup>th</sup> edition was published in October 2023, while the bat surveys were conducted between May 2023 and June 2023. For this reason, the surveys were undertaken using the latest available guidance at the time (i.e. the Bat Surveys for Professional Ecologists: Good Practice Guidelines 3<sup>rd</sup> edition (Collins 2016)). Therefore, the potential roosting features were not measured according to the Bat Surveys for Professional Ecologists: Good Practice Guidelines 4<sup>th</sup> edition, as it was not yet in place. The methodology employed took into consideration factors such as lighting levels and safety constraints, ensuring that the surveys adhered to the best practices applicable to the circumstances.

### 10.3.2.7.3 Bat Activity

Eight static detectors were deployed across the study area to establish bat species richness, and to provide a measure of relative species abundance. Each detector recorded for a period of six days, and each detector was deployed twice providing 96 recording days in total. A summary of the logistics of the static detector deployment is presented in Table 10.16 and shown in Graph 10.1. Bat data from the statics were analysed using Kaleidoscope Analysing Software.

**Table 10.16: Static Bat Detector Deployment Logistic Information**

Static Detector No.	Recording Height (from Ground Level)	Recording Duration	Location and Habitat	Dates Deployed	Weather
SD1	1.5m	6 days; 7.5 hours recording per night	Hedgerow along R156 Road in Waynestown (N 96989 44036) bordered by grassland	22/05/2023 – 29/05/2023	Varied between 6°C and 20°C. Mostly dry, very little rain
				19/06/2023 – 26/06/2023	Varied between 10°C and 24°C. Mostly dry, only one night of occasional light rain
SD2	2m	6 days; 7.5 hours recording per night	Hedgerow along L5026 Road, east of the N3 Road (O 02515 44606), beside farm	23/05/2023 – 30/05/2023	Varied between 6°C and 20°C. Mostly dry, very little rain
				19/06/2023 – 26/06/2023	Varied between 10°C and 24°C. Mostly dry, only one night of occasional light rain
SD3	1.5m	6 days; 7.5 hours recording per night	Hedgerow along L1010 Road in Stokestown (O 03600 44769), west of the Pinkeen River, bordered by arable fields	23/05/2023 – 30/05/2023	Varied between 6°C and 20°C. Mostly dry, very little rain
				20/06/2023 – 27/06/2023	Varied between 10°C and 24°C. Mostly dry, only one night of occasional light rain
SD4	2m	6 days; 7.5 hours recording per night	Hedgerow along L1010 Road (O 04954 44996), in-between the Pinkeen River and Ward River, bordered by arable fields	29/05/2023 – 05/06/2023	Varied between 5°C and 18°C. Dry with clear skies
				20/06/2023 – 26/06/2023	Varied between 10°C and 24°C. Mostly dry, only one night of occasional light rain
SD5	1.5m	6 days; 7.5 hours recording per night	Treeline along L1010 Road (O 05199 45268), west of Ward River, bordered by grassland	30/05/2023 – 06/06/2023	Varied between 5°C and 18°C. Dry with clear skies
				26/06/2023 – 03/07/2023	Varied between 9°C and 22°C. One night of moderate rain and one of light rain
SD6	1.5m	6 days; 7.5 hours recording per night	Field gate along R121 Road, west of the M2 Road (O 09262 44172), bordered by grassland	30/05/2023 – 06/06/2023	Varied between 5°C and 18°C. Dry with clear skies
				26/06/2023 – 03/07/2023	Varied between 9°C and 22°C. One night of moderate rain and one of light rain
SD7	2m	6 days; 7.5 hours recording per night	Treeline along R121 Road, east of the M2 Road (O 10053 45007), bordered by houses	22/05/2023 – 29/05/2023	Varied between 6°C and 20°C. Mostly dry, very little rain
				26/06/2023 – 03/07/2023	Varied between 9°C and 22°C. One night of moderate rain and one of light rain
SD8	2m	6 days; 7.5 hours recording per night	Large tree on field boundary, east of Ward River (O 11789 45755)	29/05/2023 – 05/06/2023	Varied between 5°C and 18°C. Dry with clear skies
				26/06/2023 – 03/07/2023	Varied between 9°C and 22°C. One night of moderate rain and one of light rain

Five species were recorded in total during the activity surveys. A summary of the species recorded, along with details relating to abundance, distribution and conservation status at a regional and national level is presented in Table 10.17.

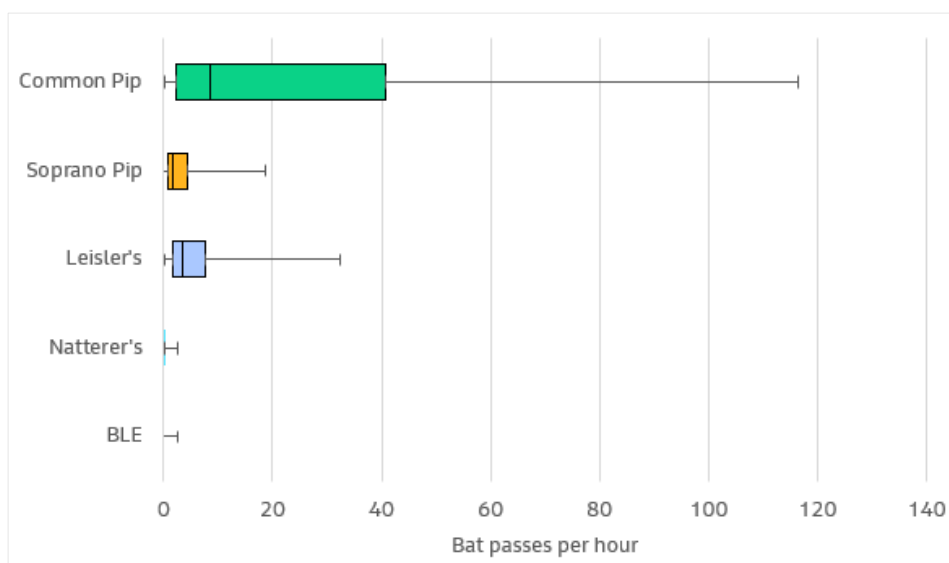
**Table 10.17: Bat Species Recorded from Activity Surveys, determined using Kaleidoscope Analysing Software**

Common Name	Scientific Name	Regional Abundance and Distribution (Collins, 2023)	Conservation Status
Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Widespread and abundant	Least Concern
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	Widespread and abundant	Least Concern
Leisler's	<i>Nyctalus leisleri</i>	Widespread and frequent	Near Threatened (assigned this status due to importance of Irish population)
Natterer's	<i>Myotis nattereri</i>	Widespread and uncommon	Least Concern
Brown long eared (BLE)	<i>Plecotus auritus</i>	Widespread and frequent	Least Concern

The proportion of bat activity recorded for each bat species for all of the static locations based on their average number of passes per night is shown in Table 10.18. In summary, common pipistrelle had a higher median (central tendency) and a wider interquartile range (IQR) than all other recorded species, indicating a higher level of recorded activity within the study area and greater variability in the dispersion of data values. Outliers were identified for common pipistrelles, soprano pipistrelles and Leisler's (values that are significantly higher than the typical level of species activity recorded per hour), although this might be reflective of a smaller sample size (six days recording per detector).

**Table 10.18: Summary Statistics for Remote Detectors (Bat Pass Rate Per Hour)**

Data Measurement	Common Pipistrelle	Soprano Pipistrelle	Leisler's	Natterer's	Brown Long Eared (BLE)
Minimum	0.13	0	0.13	0	0
First quartile (Q1)	2.3	0.8	1.73	0	0
Mean	22.68	3.79	5.99	0.17	0.06
Median	8.53	1.6	3.6	0	0
Third quartile (Q3)	40.6	4.33	7.67	0.13	0
Maximum	116.40	18.80	32.27	2.53	2.53
Standard deviation	26.87	4.90	6.88	0.43	0.37

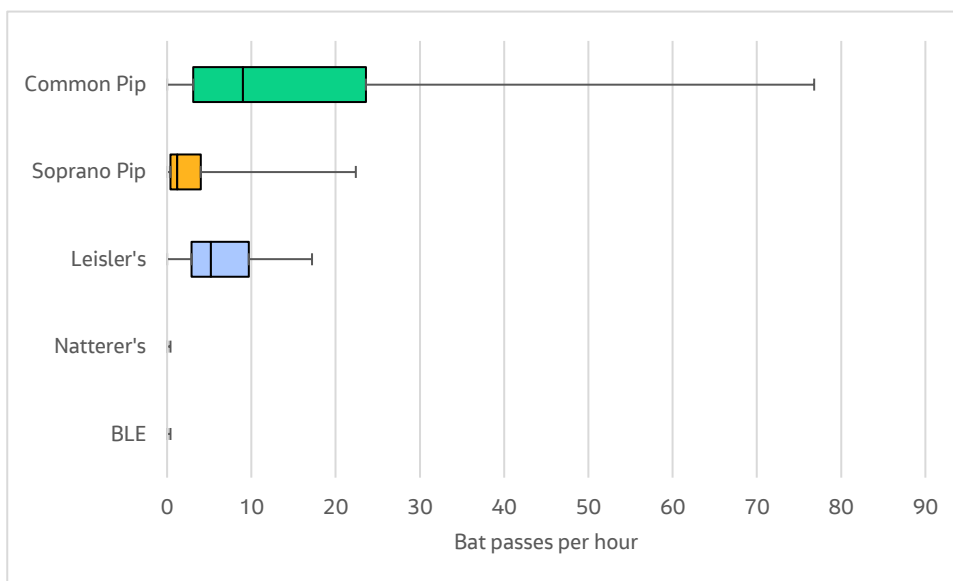


**Graph 10.1: Box Plot Showing Bat Data Recorded from Remote Detectors**

Bat activity was also recorded as incidental data during the emergence surveys as shown in Table 10.19. The summary statistics demonstrate a similar pattern to the remote detector survey results, with a higher central tendency and greater IQR for common pipistrelle, and lower values for Natterer's and Brown Long Eared (BLE). Outliers were also recorded for common and soprano pipistrelle, which are likely to reflect the small sample size. A box plot showing incidental bat activity data recorded from the emergence surveys is shown in Graph 10.2.

**Table 10.19: Summary Statistics for Incidental Data (Bat Pass Rate Per hour)**

Data Measurement	Common Pipistrelle	Soprano Pipistrelle	Leisler's	Natterer's	Brown Long Eared (BLE)
Minimum	0.00	0.00	0.00	0.00	0.00
First quartile (Q1)	3.10	0.40	2.90	0.00	0.00
Mean	16.80	2.94	6.24	0.04	0.04
Median	9.00	1.20	5.20	0.00	0.00
Third quartile (Q3)	23.60	4.00	9.70	0.00	0.00
Maximum	76.80	22.40	17.20	0.40	0.40
Standard deviation	20.47	4.81	4.11	0.12	0.12



**Graph 10.2: Box Plot Showing Incidental Bat Activity Data Recorded from the Emergence Surveys**

### 10.3.2.8 Otter

The water bodies that intersect the study area can provide suitable riparian habitat for otter. Otters are considered widespread at a regional and national level and of Least Concern conservation status. The species can be found wherever there is suitable aquatic prey and nearby terrestrial habitat for resting undisturbed. However, no holts or resting sites were recorded during the surveys within proximity of the proposed water crossings for the proposed cable route. One potential holt, one slide and one spraint were recorded away from the proposed water crossings at the following locations (refer also to Figure 10.7 in Volume 4 of this EIAR):

- One potential holt was discovered along watercourse Ward\_030 (WB19, west of Dublin Airport), approximately 145m south of the PAB with a slide recorded next to a torn-out tree root. No spraints were recorded within or surrounding this feature;

- A slide and prints were recorded along the watercourse Dunboyne Stream\_010 (WB03, north-west of Dunboyne), approximately 173m north of the PAB; and
- Otter spraint (droppings) was recorded on a boulder within watercourse Pinkeen\_010 (WB07, south-east of Nuttstown), approximately 33m east of the PAB.

Results from the eDNA analysis returned positive results for otter at WB06 (location of eDNA samples at water bodies is shown in Figure 10.8 in Volume 4 of this EIAR).

### 10.3.2.9 Badger

Sensitive information relating to the location of badger setts is provided in a confidential appendix (Appendix A10.1 and Figure 10.10), which are provided to An Bord Pleanála and the NPWS separately.

The mosaic of pasture grasslands, woodland, scrub, treelines and hedgerows provide suitable habitat within the study area for sett excavation, foraging and dispersal. Badgers are considered widespread at a national and regional level and of Least Concern conservation status.

During the surveys, 10 badger setts were recorded in total alongside signs of badger activity (i.e. latrines, pathways, prints, and snuffle holes), as outlined in Table 10.20, and Figure 10.10 in Appendix A10.1 (confidential appendix). Badger is considered of Local Importance (Higher Value).

**Table 10.20: Summary of Badger Setts**

Sett No.	Sett Type	Description	Location
S1	Inactive outlier	Single entrance was covered with vegetation at the time of survey.	CONFIDENTIAL
S2	Main sett	The sett comprises three active entrances (one main and two working holes with large spoil heaps) along a hedgerow field boundary that features a dry ditch. A second active sett (single entrance) was recorded along the same hedgerow. Due to the proximity of this entrance, it is considered part of the main sett. A single latrine was also discovered in-between the entrances.	CONFIDENTIAL
S3	Inactive outlier	The sett was formed from a single collapsed entrance.	CONFIDENTIAL
S4	Inactive outlier	Single inactive entrance filled with debris at the time of survey. One latrine was also discovered nearby to the south of the road.	CONFIDENTIAL
S5	Active outlier	Three prints, one latrine and one snuffle hole were also recorded within proximity of the riparian habitat.	CONFIDENTIAL
S6	Inactive outlier	Single entrance sett. Badger print also recorded in proximity of the sett.	CONFIDENTIAL
S7	Active annex	The sett is formed from multiple entrances (active and inactive) that are connected to a network of trails leading into a woodland. Badger activity: latrines, prints, and pathways were found in proximity of the proposed cable route.	CONFIDENTIAL
S8	Active subsidiary	Two active entrances with fresh bedding present outside one.	CONFIDENTIAL
S9	Active outlier	Single active entrance. Badger pathways and prints were noted in proximity of the sett, with further prints and a latrine found fairly evenly distributed in-between S8 and S9.	CONFIDENTIAL
S10	Active outlier	Single active entrance. No further signs of activity noted in proximity of the sett although a latrine and prints were recorded further afield c.1km north of the sett at the closet point.	CONFIDENTIAL



### 10.3.2.10 Other Protected Mammals

The study area supports suitable habitat for other protected mammals as outlined in Table 10.21. All these species are considered likely present from habitat suitability alone. Detailed surveys were not required to inform the impact assessment of the Proposed Development.

Other protected mammal species are considered of Local Importance (Higher Value).

**Table 10.21: Other Protected Mammals – Habitat Suitability**

Species	Habitat Preference, Distribution, and Conservation Status	Incidental Sightings and/or Fields Signs Recorded
Red squirrel ( <i>Sciurus vulgaris</i> )	Typically prefers coniferous woodland, although can also inhabit broadleaved woodland. The species is highly arboreal and dependent on a moderate-high density of trees. Red squirrels are widespread at a regional and national level and of Least Concern conservation status, although distribution is often patchy due to grey squirrels.	Possible signs of presence (droppings) were recorded to the north of Hollystown golf course, approximately 460m east of the proposed cable route
Hedgehog ( <i>Erinaceus europaeus</i> )	Edge habitat and pasture – prefers areas bordering deciduous woodland, scrub and open grassland. The species is considered widespread at all geographic levels and of Least Concern conservation status, although populations have suffered from habitat loss.	Two dead hedgehogs found. One 100m south of the proposed cable route adjacent to Belgree Court. One found 90m north of the proposed route along the road in Stokestown. Additionally, three possible signs of presence (two droppings and one potential print) were recorded. The print was recorded 450m west of the route in between Stockhole and Baskin. The droppings were found 180m north of the route near Kilbride Road; and 330m east of the route near Ballymacarney.
Irish stoat ( <i>Mustela erminea hibernica</i> )	Highly adaptable to different habitats providing there is good vegetative cover. Often associated with lowland farms, hedgerows, woodland, and marshes. The species is considered widespread at a regional and national level and of Least Concern conservation status.	None
Pygmy shrew ( <i>Sorex minutus</i> )	Hedgerows, grassland, and woodlands with good ground cover. The species is considered widespread at all geographic levels and of Least Concern conservation status, although population have suffered from changes to farming practice (pesticides and herbicides resulting in habitat degradation) and an increase in predation from domestic and feral cats.	None
Red deer ( <i>Cervus elaphus</i> )	Commonly found in both forested and open landscapes, displaying adaptability to diverse environments. Red deer favour mixed woodlands, coniferous forests, and open grasslands, showcasing a preference for areas that offer a blend of dense vegetation for cover and open spaces for grazing. Additionally, proximity to water sources such as rivers and lakes is crucial for their survival. The species is considered widespread at a regional and national level and of Least Concern conservation status.	Results from eDNA analysis returned positive results for red deer at Dunboyne Stream_010 (WB03) to the north of the Dunboyne roundabout, 10m north of the proposed route. The deer is likely to have used the watercourse further upstream as the area the sample was taken from is urban.

### 10.3.2.11 Reptiles and Amphibians

The study area supports suitable aquatic and terrestrial habitat for common frog (*Rana temporaria*) and smooth newt (*Lissotriton vulgaris*). Both species are common and widespread at all geographic scales and of Least Concern conservation status. Ponds and ditches provide opportunity for breeding and foraging, whereas damp areas of grassland, scrub and woodland, particularly where these are found in proximity to ponds and ditches, provide suitable conditions for terrestrial foraging and shelter. Three incidental sightings of common frog were recorded during the multi-disciplinary walkover surveys:

- Juvenile frog observed within woodland (O 05666 45456) near watercourse Ward\_010 (WB10), approximately 15m north of the proposed cable route;
- Adult frog observed on the far side of the Ward\_010 (west of WB11; O 06396 45506), approximately 75m south of the proposed cable route; and
- Adult frog observed along watercourse (WB13; O 07313 44425), approximately 120m south-west of the proposed cable route.

Results from eDNA sampling were negative for smooth newt.

The study area also supports suitable habitat for common lizard (*Zootoca vivipara*), which is considered common and widespread at all geographic scales. Common lizard favour habitats that are sunny, open, undisturbed and south facing. They require a mosaic of habitats such as rough grassland / tall ruderals for foraging, open areas for basking and suitable refugia (e.g. log piles) for winter hibernation (Froglife Advice Sheet 10 1999). Suitable habitat within the study area includes grassy verges, hedgerows, and open woodland. No incidental sightings of common lizard were recorded during the survey. Results from eDNA sampling were negative for common lizard.

Reptiles and amphibians are considered of Local Importance (Higher Value).

### 10.3.2.12 Fish

A visual assessment was carried out at or near to proposed water body crossings points, or at smaller watercourses, over a 200m stretch to assess the water bodies' potential to support fish of conservation interest (Atlantic salmon, brown trout, sea trout, lampreys, and European eel).

As outlined in Section 10.3.2.3, most of the surveyed water bodies (excluding those that were dry / ephemeral) were low-energy river typologies with substrate siltation. These water bodies were therefore considered largely unsuitable for salmon, trout and lampreys on this basis.

Six water bodies conversely provided more suitable conditions in terms of water depth, flow characteristics, substrate composition, water clarity, and in-stream vegetation. However, due to the absence / limited availability of spawning gravels, and well-stoned beds for alevins (needed to provide shelter and more territory to accommodate fry), these were not considered optimal as spawning or nursery areas for salmon and trout. Lampreys also have similar habitat requirement for spawning as trout. The general lack of sand / silt deposits, a general requirement of lamprey larvae, demonstrate a deficiency of optimal juvenile habitat across the surveyed water bodies.

The freshwater habitat requirements of European eel are less widely known due to their complex life cycles and cryptic behaviour. However, the presence of habitat features such as aquatic plants, submerged root systems, woody debris, undercut banks and channel substrates all provide physical structures that eels could use as refuges or ambush points. Sixteen water bodies within the study area (WB03 / WB06 / WB07 / WB10 / WB16 / WB23 / WB01 / WB02 / WB04 / WB05 / DD06 / WB11 / WB12 / DD25 / WB19 / DD35) support at least one of the aforementioned habitat features that could be used by eel (as presented in Appendix A10.3 in Volume 3 of this EIAR).

Water body assessments are presented in Appendix A10.3 in Volume 3 of this EIAR, and locations of water bodies sampled are shown in Figure 10.8 in Volume 4 of this EIAR.

Sixteen watercourses were identified for eDNA sampling with 18 sampling locations visited and 14 samples taken due to access issues. Results from eDNA analysis returned positive results for lamprey species (*Lampetra* spp.) and brown trout at WB05, and for European eel at WB22. No other species of conservation interest were recorded. Three-spined stickleback was present in all watercourses with the exception of WB23. Minnow was present in watercourses WB03 and WB05. Stone loach was present in WB05. No other fish species were present.

Atlantic salmon are considered of County Importance. Other fish species (including trout) are considered of Local Importance (Higher Value).

### 10.3.2.13 White-Clawed Crayfish

The study area supports suitable habitat for white-clawed crayfish. The species typically occurs in rivers, streams and lakes with a calcareous influence and good water quality. The results of the eDNA sampling confirmed their likely absence from 14 watercourses, as presented in Table 10.22 and detailed in Appendix A10.3 in Volume 3 of this EIAR. Four watercourses were inaccessible for survey although the risk of presence is considered very low based on habitat conditions present. White-clawed crayfish are therefore considered to be likely absent from the Zol. However, a negative eDNA result is not proof of absence, and therefore, a precautionary approach is adopted in the mitigation section (refer to Section 10.5). The full results of the white-clawed crayfish eDNA surveys are shown in Appendix A10.3 in Volume 3 of this EIAR.

White-clawed-crayfish are considered of County Importance.

**Table 10.22: Summary of White-Clawed Crayfish eDNA Results**

eDNA Result	Watercourse Reference number
Positive	None
Negative	WB03 / WB04 / WB05 / WB06 / WB07 / WB10 / WB11 / WB12 / WB13 / WB16 / WB19 / WB22 / WB23 / DD26
Not surveyed (no access)	<ul style="list-style-type: none"> <li>▪ WB08 (O 05260 45264) – densely vegetated drainage ditch. In road section of the cable route (no works within the roadside verge in proximity to the ditch)</li> <li>▪ DD25 (O 07758 44011) – densely vegetated drainage ditch. Off road section of the cable route (works within field in proximity to the ditch)</li> <li>▪ DD35 (O 18860 42755) – densely vegetated drainage ditch, access not permitted. Off road section of the cable route (works within field in proximity to the ditch)</li> </ul>

### 10.3.2.14 Non-Native Invasive Plant Species

Five Third Schedule invasive species were recorded during the surveys, as outlined in Table 10.23. Locations are shown in Figure 10.9 in Volume 4 of this EIAR. A further four invasive species not listed on the Third Schedule were also recorded during the survey and populations of these species are not known to pose risk of impact to protected, notable and rare species of conservation concern and are only reported for completeness.

**Table 10.23: Invasive Plant Species**

Invasive species	Location	Eastings and Northings (in sequ
<b>Third Schedule invasive species</b>		
Three-cornered leek ( <i>Allium triquetrum</i> )	Along roadside verge adjacent to Joint Bay 6.	N 95657 44458
Spanish bluebell ( <i>Hyacinthoides hispanica</i> )	<ul style="list-style-type: none"> <li>▪ c. 260m from cable route along road</li> <li>▪ c. 38m from cable route along road</li> </ul>	O 01451 44549 O 13454 44629
Giant hogweed ( <i>Heracleum mantegazzianum</i> )	<ul style="list-style-type: none"> <li>▪ c. 1m from the cable route</li> <li>▪ c. 86m from the cable route</li> </ul>	O 01639 44009 O 03724 45107
Japanese knotweed ( <i>Reynoutria japonica</i> )	<ul style="list-style-type: none"> <li>▪ c90m from the cable route along the road</li> <li>▪ c. 114m from the cable route along the road</li> <li>▪ c. 488m from the cable route along the road</li> <li>▪ c. 92m from the cable route</li> </ul>	O 18925 43146 O 18894 43144 O 02051 43691 O 16230 44547
Rhododendron ( <i>Rhododendron ponticum</i> )	c. 6m from cable route on the banks of a watercourse near the cable crossing point	O 05654 45437
<b>Non-Third schedule species</b> <sup>NOTE 1</sup>		
Winter heliotrope ( <i>Petasites pyrenaicus</i> )	On roadside verges all along the cable route	Multiple locations
Buddleia ( <i>Buddleja</i> sp)	Within multiple hedgerows along the cable route	Multiple locations
Snowberry ( <i>Symphoricarpos albus</i> )	On roadside hedgerows along the cable route	Multiple locations
Sycamore ( <i>Acer pseudoplatanus</i> )	Dispersed throughout the Proposed Development	Multiple locations
Cherry laurel ( <i>Prunus laurocerasus</i> )	Dispersed throughout the Proposed Development often within areas of ornamental/non-native shrub (WS3)	Multiple locations
NOTE 1 – Locations of winter heliotrope and buddleia are included on Figure 10.9 in Volume 4 of this EIAR; however, due to the prevalence of snowberry, sycamore, and cherry laurel these species were not individually mapped.		

### 10.3.2.15 Non-Native Invasive Animal Species

Results from eDNA analysis of samples taken from water bodies returned positive results for two invasive animal species, neither of which are considered Third Schedule invasive species in the areas sampled. Rabbit (*Oryctolagus cuniculus*) was present in the samples for WB06 and WB12. Brown rat (*Rattus norvegicus*) was present in WB03, WB04, WB05, WB12, WB13, and WB16. It is likely these species are commuting across these water bodies or utilising the surrounding areas leading to their DNA entering these water bodies, for example, through their droppings.

### 10.3.3 Evaluation

The ecological receptors in this Chapter have been valued within a defined geographical context (International, National, County, Local importance), taking cognisance of the methodology described in the CIEEM Guidance (CIEEM 2018) and the Guidelines for Assessment of Ecological Impacts of National Roads Schemes (NRA 2009). The geographic categories of ecological receptor valuation (i.e., International, National, County and Local) are fully defined in Appendix A10.2 in Volume 3 of this EIAR, as taken from the Guidelines for Assessment of Ecological Impacts of National Roads Schemes. 'Local importance' has two categories, 'higher' and 'lower'. The value of the ecological receptors described in this Chapter are shown in Table 10.24. The valuation of ecological receptors shown in this table represents the geographical level which potential impacts are considered significant (e.g. for Section 10.4.2.9 (Otter), "there is potential for negative effects from mortality, disturbance and pollution at county level"). Receptors with a value of less than Local importance (lower value), are not considered to be a IER (also termed an 'Important Ecological Feature' in the CIEEM Guidance) and are not included in this EIAR. However, it does not mean that they have no ecological

value, rather than they are widespread, unthreatened and resilient to impacts from the Proposed Development and will remain viable and sustainable during construction and operation.

All designated areas for nature conservation that lie within the Zol of the Proposed Development are considered to be IERs, given that they are sites selected specifically for biodiversity conservation and are potentially at risk of impacts from the Proposed Development. Those designated areas for nature conservation that lie beyond the Zol of the Proposed Development are not considered to be at risk of impact, and are therefore not considered to be IERs.

Non-native invasive plant species are not considered as a IER and are not assigned a value, as they can result in negative effects on biodiversity, but it is in that context that they are included within the impact assessment.

**Table 10.24: Ecological Evaluation of IERs (Those Important for the Proposed Development are Highlighted Bold and Shaded Grey)**

Ecological Receptor	Ecological Valuation	IER for the Proposed Development?	
Designated Sites	<b>Malahide Estuary SAC (000205)</b>	<b>International Importance</b>	<b>Yes</b>
	<b>Baldoye Bay SAC (000199)</b>	<b>International Importance</b>	<b>Yes</b>
	Rockabill to Dalkey Island SAC (003000)	International Importance	No, no potential for likely significant effects identified in the NIS
	Lambay Island SAC (000204)	International Importance	No, no potential for likely significant effects identified in the NIS
	<b>Malahide Estuary SPA (004025)</b>	<b>International Importance</b>	<b>Yes</b>
	<b>Baldoye Bay SPA (004016)</b>	<b>International Importance</b>	<b>Yes</b>
	<b>North-West Irish Sea SPA (004236)</b>	<b>International Importance</b>	<b>Yes</b>
	<b>North Bull Island SPA (004006)</b>	<b>International Importance</b>	<b>Yes</b>
	<b>South Dublin Bay and River Tolka Estuary SPA (004024)</b>	<b>International Importance</b>	<b>Yes</b>
	<b>Rogerstown Estuary SPA (004015)</b>	<b>International Importance</b>	<b>Yes</b>
	<b>Ireland's Eye SPA (004117)</b>	<b>International Importance</b>	<b>Yes</b>
	Howth Head Coast SPA (004113)	International Importance	No, no potential for likely significant effects identified in the NIS
	<b>Lambay Island SPA (004069)</b>	<b>International Importance</b>	<b>Yes</b>
	Dalkey Islands SPA (004172)	International Importance	No, no potential for likely significant effects identified in the NIS
	<b>Skerries Islands SPA (004122)</b>	<b>International Importance</b>	<b>Yes</b>
	Rockabill SPA (004014)	International Importance	No, no potential for likely significant effects identified in the NIS
	<b>River Nanny Estuary and Shore SPA (004158)</b>	<b>International Importance</b>	<b>Yes</b>
	<b>Boyne Estuary SPA (004080)</b>	<b>International Importance</b>	<b>Yes</b>
	<b>Dundalk Bay SPA (004026)</b>	<b>International Importance</b>	<b>Yes</b>
	<b>Malahide Estuary pNHA (000205)</b>	<b>National Importance</b>	<b>Yes</b>
<b>Sluice River Marsh pNHA (001763)</b>	<b>National Importance</b>	<b>Yes</b>	

Ecological Receptor	Ecological Valuation	IER for the Proposed Development?	
	<b>Baldoyle Bay pNHA (000199)</b>	<b>National Importance</b>	<b>Yes</b>
	<b>North Dublin Bay pNHA (000206)</b>	<b>National Importance</b>	<b>Yes</b>
	<b>Howth Head pNHA (000202)</b>	<b>National Importance</b>	<b>Yes</b>
	<b>Ireland's Eye pNHA (000203)</b>	<b>National Importance</b>	<b>Yes</b>
Habitats	Arable crops (BC1)	Less than local Importance	No
	Horticultural land (BC2)	Less than local Importance	No
	Tilled land (BC3)	Less than local Importance	No
	Flower beds and borders (BC4)	Less than local Importance	No
	Earth banks (BL2)	Less than local Importance	No
	Building or Artificial (BL3)	Less than local Importance	No
	Spoil and bare ground (ED2)	Local Importance (Lower Value)	No
	Recolonising bare ground (ED3)	Local Importance (Higher Value)	Yes
	Other artificial lakes and ponds (FL8)	Local Importance (Higher Value)	Yes
	Depositing lowland rivers (FW2)	Local Importance (Higher Value)	Yes
	Drainage ditches (FW4)	Local Importance (Higher Value)	Yes
	Improved agricultural grassland (GA1)	Less than local Importance	No
	Amenity grassland (GA2)	Less than local Importance	No
	Marsh (GM1)	Local Importance (Higher Value)	Yes
	Dry calcareous grassland (GS1)	Local Importance (Higher Value)	Yes
	Dry meadows and grassy verges (GS2)	Local Importance (Higher Value)	Yes
	Wet grassland (GS4)	Local Importance (Higher Value)	Yes
	(Mixed) broadleaved woodland (WD1)	Local Importance (Higher Value)	Yes
	Mixed broadleaved / conifer woodland (WD2)	Local Importance (Higher Value)	Yes
	Conifer plantation (WD4)	Local Importance (Lower Value)	No
	Scattered trees and parkland (WD5)	Local Importance (Lower Value)	No
	Hedgerows (WL1) species rich	County Importance	Yes
	Hedgerows (WL1) species poor	Local Importance (Higher Value)	Yes
	Treeline (WL2)	Local Importance (Higher Value)	Yes
	Riparian woodland (WN5)	Local Importance (Higher Value)	Yes
	Scrub (WS1)	Local Importance (Higher Value)	Yes
Immature woodland (WS2)	Local Importance (Lower Value)	No	

Ecological Receptor		Ecological Valuation	IER for the Proposed Development?
	Ornamental / non-native shrub (WS3)	Less than local Importance	No
	Recently-felled woodland (WS5)	Local Importance (Lower Value)	No
Protected, Notable and Invasive Species and Species Groups	<b>SCI bird species</b>	<b>International Importance</b>	<b>Yes</b>
	<b>European eel</b>	<b>County Importance</b>	<b>Yes</b>
	White-clawed crayfish	County Importance	No
	<b>Otter</b>	<b>County Importance</b>	<b>Yes</b>
	Atlantic salmon	County Importance	No
	<b>Lamprey spp.</b>	<b>County Importance</b>	<b>Yes</b>
	<b>All other Red, Amber or Green listed bird species (non-SCI breeding populations)</b>	<b>Local Importance (Higher Value)</b>	<b>Yes</b>
	<b>Bats</b>	<b>Local Importance (Higher Value)</b>	<b>Yes</b>
	<b>Badger</b>	<b>Local Importance (Higher Value)</b>	<b>Yes</b>
	<b>Other small mammal species protected under the Wildlife Act</b>	<b>Local Importance (Higher Value)</b>	<b>Yes</b>
	<b>Smooth newt</b>	<b>Local Importance (Higher Value)</b>	<b>Yes</b>
	<b>Common frog</b>	<b>Local Importance (Higher Value)</b>	<b>Yes</b>
	<b>Common lizard</b>	<b>Local Importance (Higher Value)</b>	<b>Yes</b>
	<b>Other fish species (including trout)</b>	<b>Local Importance (Lower Value)</b>	<b>Yes</b>
<b>Non-native invasive plant species</b>	<b>N/A</b>	<b>Yes</b>	

## 10.4 Potential Impacts

This Section describes the likely potential impacts of the Proposed Development on IERs during the Construction and Operational Phases using the broad categories outlined in Table 10.24. This includes consideration of the 'Do Nothing' impact scenario (i.e., the potential impact on biodiversity in the absence of the Proposed Development). Potential impacts are described in this Section, in the absence of mitigation.



Table 10.25 summarises the likely potential impacts and effects of IERs, and the Zol in which they occur.

**Table 10.25: Potential Impacts and Effects on IERs**

Potential Impact and Effect	Potential Receptor	Zol
Direct habitat loss due to vegetation removal associated with land take including earth banks, removal of mature trees and hedgerows. Habitat loss results in disturbance / displacement / fragmentation / degradation. Effects are temporary or permanent during construction and / or operation.	Terrestrial and aquatic habitats.	Land within the PAB including proposed access tracks, Temporary Construction Compounds and Horizontal Directional Drilling (HDD) Compounds.
Changes in water quality from hydrological impacts. Effects are temporary during construction.	Aquatic plant and animal species.	Changes in surface water quality from the Proposed Development associated with the potential for contaminated water runoff, including bentonite slurry from HDD, are assessed downstream of the Proposed Development / water body crossings, but the potential spatial extent of effects is difficult to quantify due to the significant variables including the varying concentrations / types of contaminants which could be released during construction / operation (e.g. sediment, hydrocarbons etc), the resilience of different receiving water bodies (i.e. assimilative capacity) and the sensitivity of the receiving waters.
Direct mortality. Effects are permanent during construction.	Terrestrial species	Land within PAB, including construction compounds, HDD platforms and access routes.
	Aquatic plant and animal species	Includes all freshwater species within the PAB and downstream of the proposed water body crossings.
Spread of invasive non-native species resulting in habitat degradation. Effects are temporary or permanent during construction and operation.	Protected sites / designated sites; Sensitive habitats; Terrestrial species; and Aquatic plant and animal species	Land within and adjacent to the PAB proposed access tracks, Temporary Construction Compounds.
Disturbance from noise, light and vibration for example impacting foraging / roosting SCI birds. Effects are temporary during construction.	Terrestrial species	Assessed within 500m of the PAB (e.g. for wintering birds) but can be a significantly lower distance (e.g. 150m for otter and or badger resting places).
Human / machinery presence resulting in disturbance to highly sensitive bird species at significant distance from works. Effects are temporary during construction.	Bird species	Assessed within 500m of the PAB (e.g. for wintering birds).

### 10.4.1 'Do Nothing' Scenario

In the Do Nothing scenario, the Proposed Development would not be implemented. Thus, the existing baseline environment would remain with no immediate significant changes in the terrestrial and aquatic biodiversity (flora and fauna) of the area, as there would be no significant Construction Phase or Operational Phase impacts from the Proposed Development. If the Proposed Development is not constructed, the impact would be Neutral upon biodiversity, solely in its absence.

## 10.4.2 Construction Phase

### 10.4.2.1 European Designated Sites

The AA Screening Report (included as a standalone document in the planning application pack) concluded, that of the 19 European designated sites within the Zol, likely significant effects were excluded on the basis of objective evidence for the following five European sites, as there is considered to be sufficient assimilative capacity of pollution in the water bodies linking the Proposed Development to these European sites:

- Rockabill to Dalkey Island SAC, located approximately 8.8km to the east of the Proposed Development at its nearest location and approximately 10.5km hydrologically downstream;
- Lambay Island SAC, located approximately 13.4km to the north-east of the Proposed Development at its nearest location and approximately 20km hydrologically downstream;
- Rockabill SPA, located approximately 19km to the east of the Proposed Development at its nearest location and approximately 30km hydrologically downstream;
- Howth Head Coast SPA, located approximately 10km to the east of the Proposed Development at its nearest location and approximately 11km hydrologically downstream; and
- Dalkey Islands SPA, located approximately 17.5km to the east of the Proposed Development at its nearest location and 24km hydrologically downstream. There is a hydrological link to the SPA via the Irish Sea, but it is considered de minimum due to the intervening distance and dilution rates.

The AA Screening Report concluded that there is the potential for likely significant effects on 14 European sites, as discussed from Section 10.4.2.1.1 to Section 10.4.2.1.14. For each of these sites, a summary of the number of attributes of the QI feature likely to be impacted by a potential pollution event is provided.

#### 10.4.2.1.1 Malahide Estuary SAC (Approximately 3.6km from the Proposed Development)

The Proposed Development will be hydrologically linked to the Malahide Estuary SAC by the following water bodies:

- Ward\_020;
- Ward\_010; and
- Ward\_030.

The shortest hydrological distance between the Proposed Development and Malahide Estuary SAC will be approximately 8.7km commencing at WB10. The QI features of this SAC are mudflats and sandflats not covered by seawater at low tide (*Salicornia* and other annuals colonising mud and sand; Atlantic salt meadows; Mediterranean salt meadows; shifting dunes along the shoreline with *Ammophila arenaria* and fixed coastal dunes with herbaceous vegetation). There is the potential for impacts to occur on the following, in the absence of mitigation:

- Five out of five attributes of the conservation objectives of mudflats and sandflats that are not covered by seawater at low tide;
- Nine out of 10 attributes of the conservation objectives of *Salicornia* and other annuals colonising mud and sand;
- Nine out of 10 attributes of the conservation objectives of Atlantic salt meadows; and
- Nine out of 10 attributes of the conservation objectives of Mediterranean salt meadows.

The attributes of shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) and of fixed coastal dunes with herbaceous vegetation (grey dunes) are not considered sensitive to hydrological pollution and are therefore not considered further.

Therefore, there is the potential for negative impacts at an International Level on the SAC from a pollution event.

#### 10.4.2.1.2 Baldoyle Bay SAC (Approximately 4km from the Proposed Development)

The Proposed Development will be hydrologically linked to the Baldoyle Bay SAC by the following water body:

- Mayne\_010.

The shortest hydrological distance between the Proposed Development and Baldoyle Bay SAC will be approximately 5.1km, commencing at WB23. The QI features of this SAC are mudflats and sandflats not covered by seawater at low tide (*Salicornia* and other annuals colonising mud and sand, Atlantic salt meadows and Mediterranean salt meadows). There is the potential for impacts to occur on the following, in the absence of mitigation:

- Two out of two attributes of the conservation objectives of mudflats and sandflats that are not covered by seawater at low tide;
- Nine out of 10 attributes of the conservation objectives of *Salicornia* and other annuals colonising mud and sand;
- Nine out of 10 attributes of the conservation objectives of Atlantic salt meadows; and
- Nine out of 10 attributes of the conservation objectives of Mediterranean salt meadows.

Therefore, there is the potential for negative impacts at an International Level on the Baldoyle Bay SAC from a pollution event.

#### 10.4.2.1.3 Malahide Estuary SPA (Approximately 3.6km from the Proposed Development)

The Proposed Development will be hydrologically linked to the Malahide Estuary SPA by the following water bodies:

- Ward\_020;
- Ward\_010; and
- Ward\_030.

The shortest hydrological distance between the Proposed Development and Malahide Estuary SPA will be approximately 8.7km, commencing at WB20. The QI features of this SPA are great crested grebe (*Podiceps cristatus*), light-bellied Brent goose (*Branta bernicla hrota*), shelduck (*Tadorna tadorna*), pintail (*Anas acuta*), goldeneye (*Bucephala clangula*), red-breasted merganser (*Mergus serrator*), oystercatcher (*Haematopus ostralegus*), golden plover (*Pluvialis apricaria*), grey plover (*Pluvialis squatarola*), knot (*Calidris canutus*), dunlin (*Calidris alpina*), black-tailed godwit (*Limosa limosa*), bar-tailed godwit (*Limosa lapponica*) redshank (*Tringa totanus*), and wetland and waterbirds. Three QI features of this SPA (i.e., light bellied Brent goose, oystercatcher and golden plover) use large fields, parks and agricultural fields considered supporting habitats for these birds. The Proposed Development will pass through and adjacent to these habitats and are potentially exposed to likely significant effects in the absence of mitigation due to a failure to meet both QI targets:

- Two out of two attributes of the conservation objectives of great crested grebe;
- Two out of two attributes of the conservation objectives of light-bellied Brent goose;
- Two out of two attributes of the conservation objectives of shelduck;
- Two out of two attributes of the conservation objectives of pintail;
- Two out of two attributes of the conservation objectives of goldeneye;
- Two out of two attributes of the conservation objectives of red-breasted merganser;
- Two out of two attributes of the conservation objectives of oystercatcher;
- Two out of two attributes of the conservation objectives of golden plover;
- Two out of two attributes of the conservation objectives of grey plover;
- Two out of two attributes of the conservation objectives of knot;

- Two out of two attributes of the conservation objectives of dunlin;
- Two out of two attributes of the conservation objectives of black-tailed godwit;
- Two out of two attributes of the conservation objectives of bar-tailed godwit; and
- Two out of two attributes of the conservation objectives of redshank.

Therefore, there is the potential for negative impacts at an International Level on the Malahide Estuary SPA from a pollution event, from mortality and from disturbance.

#### 10.4.2.1.4 Baldoyle Bay SPA (Approximately 4km from the Proposed Development)

The Proposed Development will be hydrologically linked to the Baldoyle Bay SPA by the following water body:

- Mayne\_010.

The shortest hydrological distance between the Proposed Development and the SPA will be approximately 5.7km, commencing at WB23. The QI features of this SPA are light-bellied Brent goose (*Branta bernicla hrota*), shelduck (*Tadorna tadorna*), ringed plover (*Charadrius hiaticula*), golden plover (*Pluvialis apricaria*), grey plover (*Pluvialis squatarola*) bar-tailed godwit (*Limosa lapponica*), and wetland and waterbirds.

There is the potential for impacts to occur on the following, in the absence of mitigation:

- Two out of two attributes of the conservation objectives of light-bellied Brent goose;
- Two out of two attributes of the conservation objectives of shelduck;
- Two out of two attributes of the conservation objectives of little ringer plover;
- Two out of two attributes of the conservation objectives of golden plover;
- Two out of two attributes of the conservation objectives of grey plover; and
- Two out of two attributes of the conservation objectives of bar-tailed godwit.

Therefore, there is the potential for negative impacts at an International Level on the Baldoyle Bay SPA from a pollution event, from mortality and from disturbance.

#### 10.4.2.1.5 North-West Irish Sea SPA (Approximately 4.5km from the Proposed Development)

The Proposed Development will be hydrologically linked to the North-West Irish Sea SPA via the following water bodies leading into the Irish Sea:

- Sluice\_010 and the Mayne\_010 (Baldoyle SPA);
- Tolka\_020, Pinkeen\_010 and the Dunboyne (North Bull Island SPA and South Dublin Bay and River Tolka Estuary SPA); and
- Ward\_010, 020 and 030 (Malahide Bay SPA).

The shortest distance between the SPA and the Proposed Development will be approximately 6.2km, commencing from WB19.

The QI features of this SPA are common scoter (*Melanitta nigra*), red-throated diver (*Gavia stellata*), great northern diver (*Gavia immer*), fulmar (*Fulmarus glacialis*), manx Shearwater (*Puffinus puffinus*), shag (*Phalacrocorax aristotelis*), cormorant (*Phalacrocorax carbo*), little gull (*Larus minutus*), kittiwake (*Rissa tridactyla*), black-headed gull (*Chroicocephalus ridibundus*), common gull (*Larus canus*), lesser black-backed gull (*Larus fuscus*), herring gull (*Larus argentatus*), great black-backed gull (*Larus marinus*), little tern (*Sterna albifrons*), roseate tern (*Sterna dougallii*), common tern (*Sterna hirundo*), arctic tern (*Sterna paradisaea*), puffin (*Fratercula arctica*), razorbill (*Alca torda*), guillemot (*Uria aalge*).

When considering all of the attributes of the species together, there is the potential for impacts to occur on the following, in the absence of mitigation

- Three out of five attributes of the conservation objectives of black-headed gull;

- Three out of five attributes of the conservation objectives of common gull;
- Three out of five attributes of the conservation objectives of lesser black-backed gull;
- Three out of five attributes of the conservation objectives of herring gull;
- Three out of five attributes of the conservation objectives of great black-backed gull; and
- Three out of five attributes of the conservation objectives of little gull.

Therefore, there is the potential for negative impacts at an International Level on the North-West Irish Sea SPA from a pollution event from mortality and from disturbance.

#### 10.4.2.1.6 North Bull Island SPA (Approximately 4.6km from the Proposed Development)

The Proposed Development will be hydrologically linked to the North Bull Island SPA by the following water bodies:

- Dunboyne Stream\_010;
- Tolka\_020; and
- Pinkeen\_010.

The shortest hydrological distance between the Proposed Development and SPA will be approximately 23km, commencing at WB07. The QI features of this SPA are light-bellied Brent goose (*Branta bernicla hrota*), shelduck (*Tadorna tadorna*), teal (*Anas crecca*), pintail (*Anas acuta*), shoveler (*Anas clypeata*), oystercatcher (*Haematopus ostralegus*), golden plover (*Pluvialis apricaria*), grey plover (*Pluvialis squatarola*), knot (*Calidris canutus*), sanderling (*Calidris alba*), dunlin (*Calidris alpina*), black-tailed godwit (*Limosa limosa*), bar-tailed godwit (*Limosa lapponica*), curlew (*Numenius arquata*), redshank (*Tringa totanus*), turnstone (*Arenaria interpres*) black-headed gull (*Chroicocephalus ridibundus*) and wetland and waterbirds. There is the potential for impacts to occur on the following, in the absence of mitigation:

- Two out of two attributes of the conservation objectives of light-bellied Brent goose;
- Two out of two attributes of the conservation objectives of oystercatcher;
- Two out of two attributes of the conservation objectives of pintail;
- Two out of two attributes of the conservation objectives of dunlin;
- Two out of two attributes of the conservation objectives of black-tailed godwit;
- Two out of two attributes of the conservation objectives of knot;
- Two out of two attributes of the conservation objectives of redshank;
- Two out of two attributes of the conservation objectives of black-headed gull;
- Two out of two attributes of the conservation objectives of curlew;
- Two out of two attributes of the conservation objectives of shelduck;
- Two out of two attributes of the conservation objectives of little ringed plover;
- Two out of two attributes of the conservation objectives of golden plover;
- Two out of two attributes of the conservation objectives of grey plover; and
- Two out of two attributes of the conservation objectives of bar-tailed godwit.

Therefore, there is the potential for negative impacts at an International Level on the North Bull Island SPA from a pollution event, from mortality and from disturbance.

#### 10.4.2.1.7 South Dublin Bay and River Tolka Estuary SPA (Approximately 5.5km from the Proposed Development)

The Proposed Development will be hydrologically linked to the South Dublin Bay and River Tolka Estuary SPA by the following water bodies:

- Tolka\_020;
- Dunboyne Stream\_010; and

- Pinkeen\_010.

The shortest hydrological distance between the Proposed Development and SPA will be approximately 20.8km, commencing at WB07. The QI features of this SPA are light-bellied Brent goose (*Branta bernicla hrota*), oystercatcher (*Haematopus ostralegus*), ringed plover (*Charadrius hiaticula*), grey plover (*Pluvialis squatarola*), knot (*Calidris canutus*), sanderling (*Calidris alba*), dunlin (*Calidris alpina*), bar-tailed godwit (*Limosa lapponica*), redshank (*Tringa totanus*), black-headed gull (*Chroicocephalus ridibundus*), roseate tern (*Sterna dougallii*), common tern (*Sterna hirundo*) arctic tern (*Sterna paradisaea*) and wetland and waterbirds. There is the potential for impacts to occur on the following, in the absence of mitigation:

- Two out of two attributes of the conservation objectives of light-bellied Brent geese;
- Two out of two attributes of the conservation objectives of oystercatcher;
- Two out of two attributes of the conservation objectives of ringed plover;
- Two out of two attributes of the conservation objectives of grey plover;
- Two out of two attributes of the conservation objectives of knot;
- Two out of two attributes of the conservation objectives of dunlin;
- Two out of two attributes of the conservation objectives of bar-tailed godwit;
- Two out of two attributes of the conservation objectives of redshank; and
- Two out of two attributes of the conservation objectives of black-headed gull.

Therefore, there is the potential for negative impacts at an International Level on the South Dublin Bay and River Tolka Estuary SPA from a pollution event from mortality and from disturbance.

#### 10.4.2.1.8 Rogerstown Estuary SPA (Approximately 7.8km from the Proposed Development)

The Proposed Development will be hydrologically linked to the Rogerstown Estuary SPA via the Irish Sea commencing at:

- Sluice\_010 and the Mayne\_010 (Baldoyle SPA);
- Tolka\_020, Pinkeen\_010 and the Dunboyne (North Bull Island SPA and South Dublin Bay and River Tolka Estuary SPA); and
- Ward\_010, 020 and 030 (Malahide Bay SPA).

The shortest hydrological distance between the Proposed Development and SPA will be approximately 7.8km, commencing from WB19. The QI features of this SPA are greylag goose (*Anser anser*), light-bellied Brent goose (*Branta bernicla hrota*), shelduck (*Tadorna tadorna*), shoveler (*Anas clypeata*), oystercatcher (*Haematopus ostralegus*), ringed plover (*Charadrius hiaticula*), grey plover (*Pluvialis squatarola*), knot (*Calidris canutus*), dunlin (*Calidris alpina*), black-tailed godwit (*Limosa limosa*) redshank (*Tringa totanus*) and wetland and waterbirds. There is the potential for impacts to occur on the following, in the absence of mitigation:

- Two out of two attributes of the conservation objectives of light-bellied Brent goose;
- Two out of two attributes of the conservation objectives of shelduck;
- Two out of two attributes of the conservation objectives of ringed plover;
- Two out of two attributes of the conservation objectives of grey plover;
- Two out of two attributes of the conservation objectives of knot;
- Two out of two attributes of the conservation objectives of dunlin;
- Two out of two attributes of the conservation objectives of redshank;
- Two out of two attributes of the conservation objectives of greylag goose;
- Two out of two attributes of the conservation objectives of shoveler;
- Two out of two attributes of the conservation objectives of black-tailed godwit;
- Two out of two attributes of the conservation objectives of light-bellied Brent goose; and



- Two out of two attributes of the conservation objectives of oystercatcher.

Therefore, there is the potential for negative impacts at an International Level on the Rogerstown Estuary SPA from a pollution event, from mortality and from disturbance.

#### 10.4.2.1.9 Ireland's Eye SPA (Approximately 8.6km from the Proposed Development)

The Proposed Development will be hydrologically linked to the Ireland's Eye SPA via the Irish Sea commencing at:

- Sluice\_010 and the Mayne\_010 (Baldoyle SPA);
- Tolka\_020, Pinkeen\_010 and the Dunboyne (North Bull Island SPA & South Dublin Bay and River Tolka Estuary SPA); and
- Ward\_010, 020 and 030 (Malahide Bay SPA).

The shortest hydrological distance between the Proposed Development and SPA will be approximately 10.5km commencing at WB23. The QI features of this SPA are cormorant (*Phalacrocorax carbo*), herring gull (*Larus argentatus*), kittiwake (*Rissa tridactyla*), guillemot (*Uria aalge*), razorbill (*Alca torda*). There is the potential for impacts on the following, in the absence of mitigation:

- Two out of three attributes of the conservation objectives of herring gull.

Therefore, there is the potential for negative impacts at an International Level on the Ireland's Eye SPA from a pollution event.

#### 10.4.2.1.10 Lambay Island SPA (Approximately 13.4km from the Proposed Development)

The Proposed Development will be hydrologically linked to the Lambay Island SPA via the Irish Sea commencing at the following water bodies:

- Sluice\_010 and the Mayne\_010 (Baldoyle SPA);
- Tolka\_020, Pinkeen\_010 and the Dunboyne (North Bull Island SPA & South Dublin Bay and River Tolka Estuary SPA); and
- Ward\_010, 020 and 030 (Malahide Bay SPA).

The shortest hydrological distance between the Proposed Development and SPA will be approximately 22.1km, commencing at WB19. The QI features of this SPA are fulmar (*Fulmarus glacialis*), cormorant (*Phalacrocorax carbo*), shag (*Phalacrocorax aristotelis*), greylag goose (*Anser anser*), lesser black-backed gull (*Larus fuscus*), herring gull (*Larus argentatus*), kittiwake (*Rissa tridactyla*), guillemot (*Uria aalge*), razorbill (*Alca torda*), and puffin (*Fratercula arctica*). There is the potential for impacts to occur on the following, in the absence of mitigation:

- Two out of three attributes of the conservation objectives of greylag goose;
- Two out of three attributes of the conservation objectives of lesser black-backed gull; and
- Two out of three attributes of the conservation objectives of herring gull.

Therefore, there is the potential for negative impacts at an International Level on the Lambay Island SPA from a pollution event, from mortality and from disturbance.

#### 10.4.2.1.11 Skerries Islands SPA (Approximately 18.5km from the Proposed Development)

The Proposed Development will be weakly hydrologically linked to the Skerries Island SPA via the Irish Sea commencing at the below watercourses. However, there are multiple hydrological links to supporting habitat via other SPAs for which there are overlapping QI:

- Sluice\_010 and the Mayne\_010 (Baldoyle SPA);
- Tolka\_020, Pinkeen\_010 and the Dunboyne (North Bull Island SPA & South Dublin Bay and River Tolka Estuary SPA); and



- Ward\_010, 020 and 030 (Malahide Bay SPA).

The shortest hydrological distance between the Proposed Development and SPA will be approximately 29km, commencing at WB19. However, Baldoyle SPA and Malahide SPA have supporting habitat for overlapping QI for which there will be an approximate 4.8km and 8.7km hydrological link, respectively. The QI features of this SPA are cormorant (*Phalacrocorax carbo*), shag (*Phalacrocorax aristotelis*), light-bellied Brent goose (*Branta bernicla hrota*), purple sandpiper (*Calidris maritima*), turnstone (*Arenaria interpres*), and herring gull (*Larus argentatus*). There is the potential for impacts to occur on the following, in the absence of mitigation:

- Two out of three attributes of the conservation objectives of light bellied Brent goose; and
- Two out of three attributes of the conservation objectives of herring gull.

Therefore, there is the potential for negative impacts at an International Level on the Skerries Islands SPA from a pollution event from mortality and from disturbance.

#### 10.4.2.1.12 River Nanny and Shore SPA (Approximately 26km from the Proposed Development)

The Proposed Development will be weakly hydrologically linked to the River Nanny and Shore SPA due to the large hydrological distance. However, there are multiple hydrological links to supporting habitat via other SPAs for which the QI require the same habitat types:

- Sluice\_010 and the Mayne\_010 (Baldoyle SPA);
- Tolka\_020, Pinkeen\_010 and the Dunboyne (North Bull Island SPA and South Dublin Bay and River Tolka Estuary SPA); and
- Ward\_010, 020 and 030 (Malahide Bay SPA).

The shortest hydrological distance between the Proposed Development and SPA will be approximately 43km, commencing at WB19. However, Baldoyle SPA and Malahide SPA have supporting habitat for which there will be an approximate 4.8km and 8.7km hydrological link, respectively. The QI features of this SPA are oystercatcher (*Haematopus ostralegus*), ringed plover (*Charadrius hiaticula*), golden plover (*Pluvialis apricaria*), knot (*Calidris canutus*), sanderling (*Calidris alba*), herring gull (*Larus argentatus*), and wetland and waterbirds.

There is the potential for impacts to occur on the following, in the absence of mitigation:

- Two out of two attributes of the conservation objectives of oystercatcher;
- Two out of two attributes of the conservation objectives of ringed plover;
- Two out of two attributes of the conservation objectives of golden plover;
- Two out of two attributes of the conservation objectives of knot; and
- Two out of two attributes of the conservation objectives of herring gull.

Therefore, there is the potential for negative impacts at an International Level on the River Nanny and Shore SPA from a pollution event, from mortality and from disturbance.

#### 10.4.2.1.13 Boyne Estuary SPA (Approximately 33km from the Proposed Development)

The Proposed Development will be weakly hydrologically linked to the Boyne Estuary SPA due to the large hydrological distance. However, there are multiple hydrological links to supporting habitat via other SPAs for which the QI require the same habitat types. The commencing watercourses for this hydrological link are detailed below:

- Sluice\_010 and the Mayne\_010 (Baldoyle SPA);
- Tolka\_020, Pinkeen\_010 and the Dunboyne (North Bull Island SPA & South Dublin Bay and River Tolka Estuary SPA); and
- Ward\_010, 020 and 030 (Malahide Bay SPA).

The shortest hydrological distance between the Proposed Development and SPA will be approximately 52km, commencing at WB19. However, Baldoyle SPA and Malahide SPA have supporting habitat for which there will be an approximate 4.8km and 8.7km hydrological link, respectively. The QI features of this SPA are shelduck (*Tadorna tadorna*), oystercatcher (*Haematopus ostralegus*), golden plover (*Pluvialis apricaria*), grey plover (*Pluvialis squatarola*), lapwing (*Vanellus vanellus*), knot (*Calidris canutus*), sanderling (*Calidris alba*), black-tailed godwit (*Limosa limosa*) redshank (*Tringa totanus*), turnstone (*Arenaria interpres*), little tern (*Sterna albifrons*), and wetland and waterbirds.

There is the potential for impacts to occur on the following, in the absence of mitigation::

- Two out of two attributes of the conservation objectives of shelduck;
- Two out of two attributes of the conservation objectives of oystercatcher;
- Two out of two attributes of the conservation objectives of golden plover;
- Two out of two attributes of the conservation objectives of grey plover;
- Two out of two attributes of the conservation objectives of lapwing;
- Two out of two attributes of the conservation objectives of knot;
- Two out of two attributes of the conservation objectives of black-tailed godwit; and
- Two out of two attributes of the conservation objectives of redshank.

Therefore, there is the potential for negative impacts at an International Level on the Boyne Estuary SPA from a pollution event and disturbance.

#### 10.4.2.1.14 Dundalk Bay SPA (Approximately 50km from the Proposed Development)

The Proposed Development will be weakly hydrologically linked to the Dundalk Bay SPA due to the large hydrological distance. However, there are multiple hydrological links to supporting habitat via other SPAs for which the QI require the same habitat types. The watercourses commencing these links are:

- Sluice\_010 and the Mayne\_010 (Baldoyle SPA);
- Tolka\_020, Pinkeen\_010 and the Dunboyne (North Bull Island SPA & South Dublin Bay and River Tolka Estuary SPA); and
- Ward\_010, 020 and 030 (Malahide Bay SPA).

The shortest hydrological distance between the Proposed Development and SPA will be approximately 78km, commencing at WB1. However, Baldoyle SPA and Malahide SPA have supporting habitat for which there will be an approximate 4.8km and 8.7km hydrological link, respectively. The QI features of this SPA are great crested grebe (*Podiceps cristatus*), greylag goose (*Anser anser*), light-bellied Brent goose (*Branta bernicla hrota*), shelduck (*Tadorna tadorna*), teal (*Anas crecca*), mallard (*Anas platyrhynchos*), pintail (*Anas acuta*), common scoter (*Melanitta nigra*), red-breasted merganser (*Mergus serrator*), oystercatcher (*Haematopus ostralegus*), ringed plover (*Charadrius hiaticula*), golden plover (*Pluvialis apricaria*), grey plover (*Pluvialis squatarola*), lapwing (*Vanellus vanellus*), knot (*Calidris canutus*), dunlin (*Calidris alpina*), black-tailed godwit (*Limosa limosa*), bar-tailed godwit (*Limosa lapponica*), curlew (*Numenius arquata*), redshank (*Tringa totanus*), black-headed gull (*Chroicocephalus ridibundus*), common gull (*Larus canus*), herring gull (*Larus argentatus*), and wetland and waterbirds. There is the potential for impacts to occur on the following, in the absence of mitigation:

- Two out of two attributes of the conservation objectives of great crested grebe;
- Two out of two attributes of the conservation objectives of light-bellied Brent goose;
- Two out of two attributes of the conservation objectives of shelduck;
- Two out of two attributes of the conservation objectives of teal;
- Two out of two attributes of the conservation objectives of mallard;
- Two out of two attributes of the conservation objectives of pintail;
- Two out of two attributes of the conservation objectives of common scoter;

- Two out of two attributes of the conservation objectives of red-breasted merganser;
- Two out of two attributes of the conservation objectives of oystercatcher;
- Two out of two attributes of the conservation objectives of ringed plover;
- Three out of six attributes of the conservation objectives of lapwing;
- Two out of two attributes of the conservation objectives of knot;
- Two out of two attributes of the conservation objectives of dunlin;
- Two out of two attributes of the conservation objectives of black-tailed godwit;
- Two out of two attributes of the conservation objectives of bar-tailed godwit;
- Two out of two attributes of the conservation objectives of curlew;
- Two out of two attributes of the conservation objectives of redshank;
- Two out of two attributes of the conservation objectives of common gull; and
- Two out of two attributes of the conservation objectives of herring gull.

Therefore, there is the potential for negative impacts at an International Level on the Dundalk Bay SPA from a pollution event, from mortality and from disturbance.

An NIS has been prepared that addresses the potential for adverse effects on the integrity of the 14 European designated sites, as listed above, and is included as a standalone document in the planning application pack.

#### 10.4.2.2 Water Bodies

As outlined in the baseline conditions, of the 58 water bodies identified within the study area, three WFD water bodies are considered to be of local (lower value) ecological sensitivity: WB09, WB14 and WB21 and 16 drainage ditches are considered to be of local (higher value) ecological sensitivity: DD02, DD05, DD07, DD11, DD13, DD14, DD15, DD16, DD18, DD19, DD20, DD21, DD22, DD23, DD30, DD31 and three water bodies were considered to be of local (higher value) ecological sensitivity: WB09, WB14, WB21. The remaining 19 water bodies were recorded as dry during the survey period and are therefore not considered to be sensitive aquatic receptors.

Details of the proposed Water Framework Directive (WFD) designated water body crossings, and any unnamed non-designated water body crossings are provided in Chapter 12 (Hydrology) in this EIAR.

In summary:

- No watercourse crossings (WFD designated or non-designated) are proposed to be undertaken by HDD;
- Ten watercourse crossings of WFD designated water bodies, are proposed to be undertaken by open cut trench crossing;
- Nine watercourse crossings of WFD designated water bodies, are proposed to be crossed within the road structure;
- Seven crossings of unnamed non-designated water bodies are proposed via open cut trenching;
- 21 in-road crossings of unnamed non-designated water bodies are proposed;
- There are five water bodies for which it is currently unclear if they will be crossed. However, if the water body extends upstream, then the crossing will be in-road;
- There is one water body for which it is currently unclear if it will be crossed, but if the water body extends upstream, it will be crossed off-road;
- One watercourse (WFD designated water body) is predicted to be affected by a Passing Bay; and
- A permanent crossing of one watercourse will be required to maintain access to Joint Bay 1 during the Operational Phase.

In the absence of mitigation, the in-stream trenching and construction works near sensitive water bodies have the potential to result in sedimentation (increased sedimentation concentrations within the water column, and sediment deposition on the riverbed and downstream water bodies), bank erosion, chemical contamination, changes in hydrology and riparian habitat degradation.

Pollution may result in habitat degradation, loss and fragmentation and there is the potential for changes to hydrology, all of which have the potential for negative effects on water bodies at a local level.

### 10.4.2.3 Nationally Designated Sites

There were no NHAs in the ZoI of the Proposed Development. Four pNHAs are considered to be within the ZoI (Malahide Estuary pNHA, Sluice River Marsh pNHA, Baldoyle Bay pNHA, and Howth Head pNHA) due to hydrological connectivity in-between these designated sites and the Proposed Development (a pollution event arising from the Proposed Development during the Construction Phase has the potential to lead to habitat degradation at a National Level within the designated sites). Conversely, North Dublin Bay pNHA and Ireland's Eye pNHA are considered to be outside of the ZoI as there is no pathway to effects on these designated sites.

### 10.4.2.4 Habitats

No further Annex I habitats other than those associated with European sites and nationally designated sites were identified within the ZoI from the desk-based study and field surveys.

An assessment of Annex I habitats found within European sites and nationally designated sites is provided in Section 10.4.2.1

The habitats within 150m of the PAB are described in Section 10.3.2.1 and their locations are shown in Figure 10.2 in Volume 4 of this EIAR. Table 10.26 includes data on the area and percentage of habitat lost within the PAB along with the likely significance of the habitat loss (negative impacts) in the absence of mitigation (note that habitats recorded within the study area but outside of the PAB are not included within the table as there are no direct impacts upon these). Temporary and permanent habitat loss for each of the Fossitt habitat types within the PAB (as of 20 March 2023) are also presented on Figure 10.12 and Figure 10.13 in Volume 4 of this EIAR, respectively.

The Proposed Development has the potential to lead to habitat degradation beyond the PAB (i.e. habitats outside of the PAB but within the study area and ZoI) in the event of a pollution event during the Construction Phase. However, this will only result in likely significant effects where a pathway such as hydrological connectivity exists in-between the Proposed Development and the habitat, and the geographical value of the habitat is equal or greater than Local Level. On this basis, habitat degradation has the potential to occur within the following habitats: other artificial lakes and ponds (FL8), depositing lowland rivers (FW2), drainage ditches (FW4), wet grassland (GS4), marsh (note that GM1 is not included within Table 10.27 as the habitat is located within the ZoI but outside of the PAB), and riparian woodland (WN5) (note in the event of a pollution event, habitat degradation could potentially occur within other habitats not included within this list, although the effects are likely to be highly localised and not significant).

**Table 10.26: Habitat Areas (with Fossitt Habitat Codes, Fossitt 2000) Within the PAB Showing Areas of Temporary and Permanent Loss and Percentage Habitat Loss in the Absence of Mitigation**

Fossitt Habitat Code	Fossitt Habitat	Baseline Habitat Area / Length within PAB		Temporary Habitat Loss			Permanent Habitat Loss			Likely Significant Effect (Yes/No) and Geographic Scale of Impact
		Area (ha)	Length (km)	Area (ha)	Length (km)	Percentage of Habitat Loss within PAB	Area (ha)	Length (km)	Percentage of Habitat Loss within PAB	
BC1	Arable crops	20.45	-	12.21	-	60%	7.89	-	39%	No - Less than local
BC3	Tilled land	2.40	-	2.20	-	92%	0.20	-	8%	No - Less than local
BL3	Buildings and artificial surfaces	46.37	-	32.47	-	70%	11.99	-	26%	No - Less than local
ED3	Recolonising bare ground	1.35	-	1.33	-	98%	0.02	-	2%	Yes – Local Level
FL8	Other artificial lakes and ponds	0.02	-	0.02	-	100%	0.00	-	0%	Yes – Local Level
FW2	Depositing lowland river	-	0.53	-	0.45	86%	-	-	0%	Yes – Local Level
FW4	Drainage ditches	-	10.22	-	5.15	50%	-	0.49	5%	Yes – Local Level
GA1	Improved agricultural grassland	23.62	-	18.11	-	77%	5.30	-	22%	No - Less than local
GA2	Amenity grassland	1.39	-	1.33	-	96%	0.00	-	0%	No - Less than local
GS1	Dry calcareous and neutral grassland	21.34	-	18.48	-	87%	2.85	-	13%	Yes – Local Level
GS2	Dry meadows and grassy verges	5.47	-	5.09	-	93%	0.35	-	6%	Yes – Local Level
GS4	Wet grassland	1.95	-	1.02	-	52%	0.93	-	48%	Yes – Local Level
WD1	(Mixed) broadleaved woodland	8.00	-	7.55	-	94%	0.06	-	1%	Yes – Local Level
WD2	Mixed broadleaved / conifer woodland	0.24	-	0.24	-	100%	0.00	-	0%	Yes – Local Level

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Fossitt Habitat Code	Fossitt Habitat	Baseline Habitat Area / Length within PAB		Temporary Habitat Loss			Permanent Habitat Loss			Likely Significant Effect (Yes/No) and Geographic Scale of Impact
		Area (ha)	Length (km)	Area (ha)	Length (km)	Percentage of Habitat Loss within PAB	Area (ha)	Length (km)	Percentage of Habitat Loss within PAB	
WD5	Scattered trees and parkland <sup>NOTE 1</sup>	0.13	-	0.13	-	100%	0.00	-	0%	Yes – Local Level
WL1	Hedgerows	0.00	15.76	-	1.32	8%	-	0.67	4%	Yes – Local-County Level
WL2	Treelines	0.00	8.21	-	0.84	10%	-	0.04	<1%	Yes – Local-County Level
WN5	Riparian woodland	0.01	-	0.01	-	100%	0.00	-	0%	Yes – Local Level
WS1	Scrub	3.21	-	2.80	-	87%	0.13	-	4%	Yes – Local Level
WS2	Immature woodland	5.56	-	4.97	-	89%	0.59	-	11%	Yes – Local Level
WS3	Ornamental / non-native shrub	0.16	-	0.15	-	88%	0.02	-	12%	No - Less than local
TOTAL		141.70	34.72	108.12	7.83	76%	30.33	1.72	21%	
NOTE 1 – Scattered parkland and trees mapped as a polygon feature, excludes scattered trees mapped as individual points										

Appendix A18.2 in Volume 3 of this EIAR presents an Arboricultural Assessment. Out of a total of 9,103 trees within the study area for the Arboricultural Assessment (the PAB plus a 30m buffer), 512 will be required to be removed (5% of all the trees). A further 662 trees are at risk in the study area (7% of all trees). Adopting a precautionary principle, where all at risk trees will be required to be removed (i.e., 1,174 trees would be felled), the likely potential impact would represent 12% of the total trees within the study area.

#### 10.4.2.5 Ground Water Dependent Terrestrial Ecosystems (GWDTE)

As outlined in the baseline conditions, marsh (GM1), wet grassland (GS4), and riparian woodland (WN5) were identified as potential GWDTE within the study area. There is a risk of excavation during trenching interfering with groundwater yield, quality or flow direction, where groundwater is required to be abstracted.

The Scottish Environmental Protection Agency (SEPA) Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Ecosystems (SEPA 2017), which has been used in this assessment in the absence of similar Irish guidance, but is considered appropriate and applicable, states that excavations greater than 1m pose a risk to GWDTE up to 250m away, and excavations less than 1m depth pose a risk to GWDTE up to 100m away. There is also a risk where such excavation would also require the abstraction of water. The depth of the proposed excavation for the proposed cable route will be approximately 1.3m to 1.8m, and as such, a potential risk to GWDTE sites is assessed. Further information is presented in Chapter 11 (Soils, Geology and Hydrogeology) in Volume 2 of this EIAR which notes that negative impacts to groundwater quality at secondary receptors such as GWDTE are predicted, especially where the receptor is in proximity / adjacent to the proposed cable route. Chapter 11 (Soils, Geology and Hydrogeology) notes that there is a risk of intercepting shallow and / or perched groundwater at approximately 1.3m due to the shallow depths of the trenching (up to 1.8m). There is the potential for small scale, localised dewatering. There is also the potential for a localised impact on the groundwater quality supporting these potential GWDTEs.

There is therefore the potential for negative effects on GWDTE habitats resulting in potential habitat loss or degradation at a Local Level.

#### 10.4.2.6 Wintering Birds

During the winter bird surveys, 10 bird species listed as wintering SCIs for SPAs in the vicinity were recorded in the study area, as shown in Table 10.27. The nearest SPAs designated for these SCI species are as follows:

- Black-headed Gull (North-West Irish Sea SPA, approximately 5.4km east of the Proposed Development; average max flight distance between roost and feeding site is 18.5km (Woodward *et al.* 2019));
- Black-tailed Godwit (Malahide Estuary SPA, approximately 3.6km north-east of the Proposed Development; average max flight distance between roost and feeding site is not available for this species);
- Brent Goose (Malahide Estuary SPA, approximately 3.6km north-east of the Proposed Development; average max flight distance between roost and feeding site is 53km (Clausen *et al.* 2013));
- Common Gull (North-West Irish Sea SPA, approximately 5.4km east of the Proposed Development; average max flight distance between roost and feeding site is 50km (Woodward *et al.* 2019));
- Golden Plover (Malahide Estuary SPA, approximately 3.6km north-east of the Proposed Development; average max flight distance between roost and feeding site is not available for this species);
- Great Black-backed Gull (North-West Irish Sea SPA, approximately 5.4km east of the Proposed Development; average max flight distance between roost and feeding site is 73km (Woodward *et al.* 2019));



- Herring Gull (North-West Irish Sea SPA, approximately 5.4km east of the Proposed Development; average max flight distance between roost and feeding site is 58.8±26.8km (Woodward *et al.* 2019));
- Lesser Black-backed Gull (North-West Irish Sea SPA, approximately 5.4km east of the Proposed Development average max flight distance between roost and feeding site is 127±109km (Woodward *et al.* 2019));
- Oystercatcher (Malahide Estuary SPA, approximately 3.6km north-east of the Proposed Development; average max flight distance between roost and feeding site is not available for this species); and
- Teal (North Bull Island SPA, approximately 4.6km south-east of the Proposed Development; average flight distance between roost and feeding site during winter is between 0.8 and 8.4km (Legagneux *et al.* 2009).

**Table 10.27: SCI Birds Recorded During Surveys Within the Vicinity of the Proposed Development and Corresponding SPAs.**

Species name	October	November	December	January	February	March	SPA (Approximate Distance)
Black-headed gull	197	394	172	52	114	3	North-West Irish Sea SPA (5.4km)
Black-tailed godwit	23	0	0	0	0	1	Malahide Estuary SPA (3.6km)
Brent Goose	0	240	231	200	0	0	Malahide Estuary SPA (3.6km)
Common gull	2	33	7	5	3	0	North-West Irish Sea SPA (5.4km)
Golden Plover	0	0	137	0	2	0	Malahide Estuary SPA (3.6km)
Great black-backed gull	0	2	2	0	0	0	North-West Irish Sea SPA (5.4km)
Herring gull	113	192	74	96	91	154	North-West Irish Sea SPA (5.4km)
Lesser black-back gull	0	0	7	21	7	7	North-West Irish Sea SPA (5.4km)
Oystercatcher	37	18	3	0	0	0	Malahide Estuary SPA (3.6km)
Teal	0	4	0	0	0	0	North Bull Island SPA (4.6km)

Black-tailed godwit, Brent goose, coot, little grebe, mute swan and oyster catcher were observed exclusively at Darndale Park which is located approximately 850m south-east of the existing Belcamp Substation.

#### 10.4.2.6.1 Disturbance

The works will involve the excavation and laying of a proposed underground cable circuit, and as a result, habitats immediately under the PAB and either side of the proposed cable circuit excavation will be the predominant habitats affected. There will also be temporary disturbance during the Construction Phase. Treelines, hedgerows and scrub, and to lesser extent arable and grassland field margins, will be impacted, particularly at Joint Bay locations. It is predicted that these linear habitats do not support wintering birds.

There is therefore the potential for negative effects on wintering birds from disturbance at both National and International Levels.

#### 10.4.2.6.2 Habitat Degradation

In the absence of mitigation, potential sedimentation and potentially polluting materials from pollution incidents have the potential to enter watercourses that are hydrologically linked to supporting habitat, causing habitat degradation and impacting QI species and their prey. The proximity of the European site to the Proposed Development means that works may be taking place within supporting habitat for QI bird species which are known to travel inland to use agricultural land to forage and roost, namely Brent goose, oystercatcher, golden plover, curlew, black-headed gull, greylag goose, herring gull and lesser black-backed gull.

There is therefore the potential for negative effects on wintering birds from pollution and habitat degradation at both National and International Levels.

#### 10.4.2.6.3 Mortality

The Proposed Development has the potential to result in mortality of QI species associated with indirect impacts to a SPA from pollution leading to a reduction in water quality and a reduction of prey availability.

There is therefore the potential for negative effects on wintering birds at both National and International Level from mortality associated with a reduction in water quality and reduction of prey availability.

### 10.4.2.7 Breeding Birds

#### 10.4.2.7.1 Habitat Loss

The Proposed Development will result in the loss of nesting and foraging habitat and displacement of breeding birds, particularly due to the temporary and permanent loss of trees and hedgerows (as summarised in Table 10.26).

There is therefore the potential for negative effects on breeding birds at a Local Level due to habitat loss.

#### 10.4.2.7.2 Disturbance

No water body or wetland of ecological importance will be impacted by the Proposed Development. The majority of water bodies are not expected to be significantly impacted by disturbance during the Proposed Development as a result of existing screening through vegetation, infrastructure and topography. Although a temporary decline in overall breeding bird abundance has the potential to occur at a very local level (i.e., within the PAB, this is unlikely to affect the local range of the breeding bird species present in these habitats, nor is it likely to affect the ability of these breeding bird populations to maintain their local populations in the long-term.

Increased levels of noise, vibration, lighting (i.e. temporary lighting installed at Joint Bays, Temporary Construction Compounds and HDD Compounds), construction traffic and human presence during the Construction Phase will likely disturb breeding bird species during the breeding season (March to August, inclusive), resulting in the displacement of breeding birds from habitats within and adjacent to the Proposed Development PAB. Increased noise levels during the Construction Phase have the potential to disturb bird species affecting bird abundance and occurrence in the locality. Although it is not possible to quantify the magnitude of this potential impact, it could potentially extend for several hundreds of metres from the PAB. As the works will be temporary to short-term, disturbance or displacement effects will be temporary to short-term during the Construction Phase, and are therefore not likely to affect the conservation status of red or amber breeding bird species in the long-term.

There is therefore the potential for negative effects to breeding birds at a Local Level in the short-term, but not in the long-term.

#### 10.4.2.7.3 Pollution

A pollution event during the Construction Phase has the potential to change the water quality and reduce the prey availability of waterbird species downstream of the pollution event. The breeding birds survey recorded the waterbirds of grey heron, mallard, great black-backed gull, herring gull and lesser black-backed gull, whose food source has the potential to be negatively affected by water pollution.

There is therefore the potential for negative effects from a pollution event at a Local to National / to International Level.

#### 10.4.2.7.4 Mortality

The Proposed Development poses a mortality risk to breeding birds associated with the potential destruction of nests during vegetation clearance. If site clearance works were to be undertaken during the breeding bird season (i.e., March to August, inclusive), it is likely that nest sites holding eggs or chicks will be destroyed and birds killed.

Five breeding bird SCIs were recorded within the PAB (cormorant, curlew, great black-backed gull, herring gull, lesser black-backed gull). Birds recorded during the 2023 survey are shown in Table 10.13, and in Figure 10.5 in Volume 4 of this EIAR. Mortality of birds during site clearance works is not predicted to affect the conservation status of any of the breeding bird species present within the study area at any geographic scale.

There is therefore the potential for negative effects on breeding birds from vegetation clearance resulting in mortality at a Local to National / International Level.

#### 10.4.2.8 Bats

##### 10.4.2.8.1 Mortality

No bat roosts were recorded within the study area during the course of surveys, and therefore, no direct impacts on known roosts are anticipated. The felling of trees approximately along every 100m of the proposed cable route will potentially be required (see Appendix A18.2 in Volume 3 of this EIAR for the full Arboricultural Assessment). All potential tree roosts identified as moderate or high along the proposed cable route were surveyed and no roosts were found at the time of survey. As bats switch tree roosts regularly, there is a risk that bats might colonise trees within which none were recorded previously in the 2023 survey season. Therefore, without mitigation (i.e., pre-Construction Phase surveys), there is a risk that roosts could be lost and bats killed, injured or disturbed. The precise character of the potential impact would depend on the species, type and conservation status of a roost.

There is therefore the potential for negative effects from vegetation clearance resulting in mortality to bats at a Local Level.

##### 10.4.2.8.2 Habitat Loss / Fragmentation

The overall effect on bats from losses of foraging habitat differs according to species. Generally, larger impacts would be expected for habitat specialists and / or those species with smaller feeding ranges, such as brown long-eared bats (woodland specialists) and *Myotis* bats (bats of woodland and water bodies), or where lost habitat is located near a roost. The felling of trees within the Proposed Development PAB may lead to the loss of foraging opportunities for bats. The removal of trees has the potential to reduce insect availability in the area, which subsequently has the potential to affect the feeding habits and nutritional resources for local bat populations.

The Proposed Development works will result in habitat loss and fragmentation, although the majority of the Proposed Development will be 'in-road' (70%) (i.e., the habitat under the construction works footprint is predominantly road surface). For the off-road sections, the land is largely characterised by farmland (arable and pastoral fields delimited by hedgerows and treelines). The loss of habitat within the fields is not considered significant as these habitats are common and widespread at all geographic scales. Conversely, the hedgerows and treelines afford flight paths and foraging opportunities which may be important to the viability of local bat populations. However, linear habitat loss has been minimised through design to limit potential fragmentation effects.

As bats have large foraging ranges (with core sustenance zones around roost sites ranging between 2km to 3km for the bats recorded within the study area), the loss of these habitats is unlikely to lead to significant negative effects. Core sustenance zones for the bats recorded during static surveys and the emergence surveys are as follows (Collins, J. (ed.) 2023):

- Common pipistrelle: 2km;
- Soprano pipistrelle: 3km;
- Brown long eared bat: 3km;
- Natterer's bat: 4km; and
- Leisler's bat: 3km.

However, the loss of hedgerow and treelines (both temporary and permanent) has the potential to lead to severance effects, as bats commonly use linear features such as hedgerows, treelines and roads to commute to their foraging area and roost. This has the potential to also cause severance from roosts in buildings which were not surveyed due to a lack of direct impacts. Further, there is the potential for fragmentation of habitat caused by temporary lighting at Temporary Construction Compounds and HDD Compounds.

Bats are known to avoid gaps of open spaces within linear features, the smallest size suggested which bats are known to avoid is 5m (BCI 2022). The range of permanent minimum break width for the loss of hedgerows / treelines along the proposed cable route is 4m, which is not anticipated to cause any fragmentation or alter bat foraging range in the long-term. The range of permanent maximum break width for an easement off-road is 6m, which may alter or sever bat foraging ranges by removing linear features but is not likely to have an impact where no linear features are altered. The range of permanent maximum break for the easement on the approach to Belcamp Substation is approximately 30m, which has the potential to impact bat foraging ranges and potentially sever a commuting / foraging route when removing hedges and other linear features to accommodate the proposed cable route. However, the approach to Belcamp Substation has multiple alternative linear features within the vicinity which are not going to be affected by the proposed cable route, and so, while the removal will likely have a negative effect, it is unlikely to be significant. Impacts from compound lighting will be temporary.

There is therefore the potential for negative effects from habitat loss / fragmentation resulting in severed bat habitats at a Local Level. This includes all bat species recorded within the study area, as all are known to use linear features to commute to foraging areas and roosts. However, the linear features being altered are only susceptible to the local population as the core sustenance zone for all species is 4km or under.

#### **10.4.2.9 Otter**

##### **10.4.2.9.1 Mortality, Disturbance and Pollution**

Otters are likely to be present within the study area of the Proposed Development, with one suspected holt with slide located approximately 145m from the proposed cable route, one otter slide located approximately 173m from the proposed cable route and one otter spraint located approximately 33m from the proposed cable route identified during the field surveys. There is optimal commuting, foraging and resting habitat for otter throughout the study area. However, the majority of habitat to be impacted by the Construction Phase is considered sub-optimal for otter as it comprises hedgerows, treelines and agricultural land away from watercourses. There is the potential for disturbance or direct mortality to arise to this species from the Construction Phase. Additionally, a pollution event from the works has the potential to impact on water quality and reduce otter prey availability.

There is therefore the potential for significant negative effects from mortality, disturbance and pollution for otter at County Level.

#### **10.4.2.10 Badger**

##### **10.4.2.10.1 Mortality, Habitat Loss and Disturbance**

Badgers are known to be present within both the study area and within the PAB, as field signs and 10 setts were recorded during field surveys (refer to Table 10.20).

Negative impacts, namely disturbance and mortality are considered likely upon two active setts located within 50m of the PAB (Sett 2 and Sett 10). Sett 2 is a main sett located approximately 32m west of the PAB, and Sett 10 is an outlier in the locality of Belcamp Substation. Therefore, mitigation is required for Sett 2 due to the status and proximity of the sett to the Proposed Development. Mitigation may also be required for Sett 10 depending on whether works are scheduled within 50m of this sett during the badger breeding season (December to June, inclusive).

No impacts are foreseen upon the remaining three inactive setts within 50m of the PAB (Sett 1, Sett 3 and Sett 4), providing that these remain inactive for the duration of the Construction Phase. No impacts are also predicted on the remaining five setts, as they are located more than 50m from the PAB. However, there is the potential for disturbance and direct mortality to still arise on badgers associated with these setts (and further unrecorded setts outside of the study area), as the Construction Phase has the potential to result in disruption to dispersal routes between foraging grounds by creating obstacles and hazards. However, no impact is predicted upon the carrying capacity of the local area in the context of the duration of the Construction Phase and the widespread availability of suitable habitats.

There is therefore the potential for negative effects from mortality and disturbance for badger at a Local Level.

#### **10.4.2.11 Other Protected Mammals**

##### **10.4.2.11.1 Mortality**

Habitat with the potential to support a variety of small mammal species was recorded or likely to be present within the study area.

The Construction Phase is unlikely to result in any significant level of mortality to the larger and more mobile species such as red squirrel, as they can migrate away from the works. Squirrels breed in winter (young born February to April), which is when trees are scheduled to be felled, so breeding squirrels have the potential to be affected by the works. It is also probable that vegetation clearance may result in mortality to the smaller mammals such as pygmy shrew, if present, since small mammals have less ability to disperse. The potential impact would be expected to be greater during the breeding season when juveniles would be present in burrows (April to October), or in the case of hedgehog, impacts may be greater during their hibernation period (November to March). Potential impacts will be in the short-term and will only occur during the Construction Phase.

There is therefore the potential for negative effects from mortality for small mammals at a Local Level.

#### **10.4.2.12 Reptiles and Amphibians**

##### **10.4.2.12.1 Mortality and Disturbance**

No amphibian or reptile species were recorded within the study area during field surveys and there were no breeding ponds with habitat connectivity within 500m of the PAB. However, terrestrial habitat with the potential to support both amphibians and reptiles has the potential to be lost as part of construction works, which will require the removal of habitats within the PAB. Given the habitat character of the off-road sections (which is predominantly arable and pasture farmland under regular management) and the width of the construction easement (which is reduced for linear habitats in order to minimise habitat loss and potential fragmentation effects), it is unlikely that the site clearance works will have a significant impact on the locally available suitable habitat for these species, particularly given how common and widespread suitable habitats for these species is. Nevertheless, the Construction Phase has the potential to lead to disturbance and direct mortalities of these species, particularly during hibernation (November to February) or the breeding season (January to July).

There is therefore the potential for negative effects from mortality and disturbance to amphibians and reptiles at a Local Level.

### 10.4.2.13 Fish and Aquatic Invertebrates

#### 10.4.2.13.1 Mortality, Habitat Loss and Degradation

The water body surveys carried out across the length of the Proposed Development found that the water bodies are largely characterised by low-energy river typologies with a silt substrate. This indicates that these water bodies are largely unsuitable for Atlantic salmon, brown trout, and lampreys, all of which are SCIs. The majority of watercourses are not likely to have active habitats for these species, and as a result, little to no effect will occur to these species.

The presence of trout and lamprey was confirmed in six water bodies, despite suboptimal spawning conditions due to limited gravels and stones on the water body beds. Therefore, these species have the potential to be affected through either direct disturbance or mortality during the Construction Phase. Indirect effects have the potential to occur from pollution of the water bodies causing a detrimental effect to the water quality and fish populations.

As outlined in the baseline conditions (Section 10.3.2.12), 16 waterbodies may offer suitable habitat for eels. The confirmed presence of eels in one watercourse (WB22) through eDNA survey further underscores this potential. Therefore, the species also has the potential to be affected through either direct disturbance or pollution causing a detrimental effect to the water quality, and in turn the population of eels, in the same manner as trout and lamprey.

White-clawed crayfish were confirmed to be likely absent in 14 of the eDNA tested watercourses. However, a negative eDNA result is not entirely proof of absence, and three watercourses could not be surveyed due to access issues. As a result, on a precautionary basis, it can be considered that white-clawed crayfish have the potential to be affected by the Proposed Development through watercourse pollution or direct disturbance.

There is therefore the potential for negative effects from mortality, habitat loss and disturbance for fish and aquatic invertebrates at a Local to County Level (European eel – County Level, white-clawed crayfish – County Level, Atlantic salmon – Local-County Level, and lamprey spp. – Local-County Level).

### 10.4.2.14 Invasive Species

#### 10.4.2.14.1 Habitat Loss / Degradation

Regulation 50 of the Birds and Habitats Regulations prohibits the distribution, introduction or lease of any plant listed on the Third Schedule. The following Third Schedule invasive species were recorded in the 2023 surveys (refer to Figure 10.9 in Volume 4 of this EIAR):

- Three-cornered leek (*Allium triquetrum*) spreads by ants transporting seeds (NatureSpot 2024) and was present alongside the Proposed Development PAB (coordinate reference N 95657 44458). One stand was present within proximity of Joint Bay 6, and there is therefore the potential for a significant effect from its disturbance or degradation of habitat;
- Spanish bluebell (*Hyacinthoides hispanica*) spreads by seeds. It is a poor disperser, but there is an ongoing supply to the wild of new material through planting and dumping of garden waste. It is most likely to spread along lines of human habitation (NNSS 2024). One stand was present within the PAB, and there is therefore the potential for a significant effect from its disturbance or degradation of habitat;
- Giant hogweed (*Heracleum mantegazzianum*) spreads entirely by seeds, which are dispersed by wind, water and humans (NNSS 2024). One stand was present within the PAB, and there is therefore the potential for a significant effect from its disturbance or degradation of habitat;



- Japanese knotweed (*Reynoutria japonica*) spreads vegetatively when small root pieces of the plant break off the main plant, but no seeds are produced (INNS 2023). As all the stands recorded were outside of the PAB, there is unlikely to be a significant effect from its disturbance or degradation of habitat; and
- Rhododendron (*Rhododendron ponticum*). The small seeds are dispersed up to 100m by wind and water under favourable conditions (INNS 2023). Rhododendron was present in one location within the Proposed Development PAB. The stand was located approximately 6m from the proposed cable route (coordinate reference O 05654 45437). This stand therefore has the potential for significant effects from its disturbance and habitat loss and degradation.

As outlined in the baseline conditions (Section 10.3.2.14), a further four non-native invasive species not listed on the Third Schedule (winter heliotrope, buddleia, snowberry, and sycamore) were also recorded within the study area. Populations of these species are not known to pose risk of impact to protected, notable and rare species of conservation concern.

There is therefore the potential for negative effects from the spread of invasive plant species at a Local Level.

#### 10.4.2.15 Summary of Potential Construction Phase Impacts

A summary of the potential impacts during the Construction Phase, in the absence of mitigation, is provided in Table 10.28.

**Table 10.28: Summary of Potential Construction Phase Impacts in the Absence of Mitigation**

Ecological Receptor	Ecological Valuation	Potential Impacts	Likely Significant Effect (Yes / No) and Level
<b>Designated Sites</b>			
Malahide Estuary SAC Malahide Estuary pNHA	International Importance National Importance	Habitat degradation (hydrology- pollution)	Yes, International Level Yes, National Level
Baldoyle Bay SAC Baldoyle Bay pNHA	International Importance National Importance	Habitat degradation (hydrology – pollution)	Yes, International Level Yes, National Level
Rockabill to Dalkey Island SAC	International Importance	None	No
Lambay Island SAC	International Importance	None	No
Malahide Estuary SPA	International Importance	Habitat degradation (hydrology – pollution) mortality, disturbance / displacement	Yes, International Level
Baldoyle Bay SPA	International Importance	Habitat degradation (hydrology-pollution), mortality, disturbance / displacement	Yes, International Level
North-West Irish Sea SPA	International Importance	Habitat degradation (hydrology-pollution), mortality, disturbance / displacement	Yes, International Level
North Bull Island SPA	International Importance	Habitat degradation (hydrology-pollution), mortality, disturbance / displacement	Yes, International Level
South Dublin Bay and River Tolka Estuary SPA	International Importance	Habitat degradation (hydrology-pollution), mortality, disturbance / displacement	Yes, International Level
Rogerstown Estuary SPA	International Importance	Habitat degradation (hydrology-pollution), mortality, disturbance / displacement	Yes, International Level
Ireland's Eye SPA	International Importance	Habitat degradation (hydrology-pollution), mortality, disturbance / displacement	Yes, International Level
Howth Head Coast SPA	International Importance	None	No
Lambay Island SPA	International Importance	Habitat degradation (hydrology-pollution), mortality, disturbance / displacement	Yes, International Level



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Ecological Receptor	Ecological Valuation	Potential Impacts	Likely Significant Effect (Yes / No) and Level
Dalkey Islands SPA	International Importance	None	No
Skerries Islands SPA	International Importance	Habitat degradation (hydrology-pollution), mortality, disturbance / displacement	Yes, International Level
Rockabill SPA	International Importance	None	No
River Nanny Estuary and Shore SPA	International Importance	Habitat degradation (hydrology-pollution), mortality, disturbance / displacement	Yes, International Level
Boyne Estuary SPA	International Importance	Habitat degradation (hydrology-pollution) disturbance/ displacement	Yes, International Level
Dundalk Bay SPA	International Importance	Habitat degradation (hydrology-pollution), mortality, disturbance / displacement	Yes, International Level
Sluice River Marsh pNHA	National Importance	Habitat degradation (hydrology- pollution)	Yes, National Level
North Dublin Bay pNHA	National Importance	None	No
Howth Head pNHA	National Importance	Habitat degradation (hydrology- pollution)	Yes, National Level
Ireland's Eye pNHA	National Importance	None	No
<b>Habitats (including Fossitt Codes, Outside Designated Sites)</b>			
Arable crops (BC1)	Less than local Importance	Habitat loss (temporary and permanent)	No
Horticultural land (BC2)	Less than local Importance	None	No
Tilled land (BC3)	Less than local Importance	Habitat loss (temporary and permanent)	No
Flower beds and borders (BC4)	Less than local Importance	None	No
Earth banks (BL2)	Less than local Importance	None	No
Building or Artificial (BL3)	Less than local Importance	Habitat loss (temporary and permanent)	No
Spoil and bare ground (ED2)	Local Importance (Lower Value)	None	No
Recolonising bare ground (ED3)	Local Importance (Higher Value)	Habitat loss (temporary and permanent) and fragmentation	No
Other artificial lakes and ponds (FL8)	Local Importance (Higher Value)	Habitat loss (temporary) and degradation (surface water quality)	Yes, Local Level
Depositing lowland rivers (FW2)	Local Importance (Higher Value)	Habitat degradation – surface water quality	Yes, Local Level
Drainage ditches (FW4)	Local Importance (Higher Value)	Habitat degradation – surface water quality	Yes, Local Level
Improved agricultural grassland (GA1)	Less than local Importance	Habitat loss (temporary and permanent)	No
Amenity grassland (GA2)	Less than local Importance	Habitat loss (temporary)	No
Marsh (GM1) – potential GWDTE	Local Importance (Higher Value)	Habitat degradation	Yes, Local Level
Dry calcareous grassland (GS1)	Local Importance (Higher Value)	Habitat loss (temporary and permanent) and fragmentation	Yes, Local Level
Dry meadows and grassy verges (GS2)	Local Importance (Higher Value)	Habitat loss (temporary and permanent) and fragmentation	Yes, Local Level
Wet grassland (GS4) – potential GWDTE	Local Importance (Higher Value)	Habitat loss (temporary and permanent), fragmentation and degradation	Yes, Local Level

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Ecological Receptor	Ecological Valuation	Potential Impacts	Likely Significant Effect (Yes / No) and Level
(Mixed) broadleaved woodland (WD1)	Local Importance (Higher Value)	Habitat loss (temporary and permanent) and fragmentation	Yes, Local Level
Mixed broadleaved / conifer woodland (WD2)	Local Importance (Higher Value)	Habitat loss (temporary) and fragmentation	No
Conifer plantation (WD4)	Local Importance (Lower Value)	None	No
Scattered trees and parkland (WD5)	Local Importance (Lower Value)	Habitat loss (temporary) and fragmentation	Yes, Local Level
Hedgerows (WL1) species rich	County Importance	Habitat loss (temporary and permanent) and fragmentation	Yes, County Level
Hedgerows (WL1) species poor	Local Importance (Higher Value)	Habitat loss (temporary and permanent) and fragmentation	Yes, Local Level
Treeline (WL2)	Local Importance (Higher Value)	Habitat loss (temporary and permanent) and fragmentation	Yes, Local to County Level
Riparian woodland (WN5) – potential GWDE	Local Importance (Higher Value)	Habitat loss (temporary) and degradation (surface water quality)	Yes, Local Level
Scrub (WS1)	Local Importance (Higher Value)	Habitat loss (temporary and permanent) and fragmentation	Yes, Local Level
Immature woodland (WS2)	Local Importance (Lower Value)	Habitat loss (temporary and permanent) and fragmentation	Yes, Local Level
Ornamental / non-native shrub (WS3)	Less than local Importance	Habitat loss (permanent)	No
Recently-felled woodland (WS5)	Local Importance (Lower Value)	None	No
<b>Protected, Notable and Invasive Species and Taxa</b>			
SCI bird species	International Importance	Habitat degradation (hydrology-pollution) disturbance / displacement / mortality (reduction in water quality and prey availability)	Yes, National - International Level
European eel	National Importance	Habitat degradation (hydrology – pollution); disturbance / displacement	Yes, County Level
White-clawed crayfish	County Importance	Habitat degradation (hydrology – pollution); disturbance / displacement	Yes, County Level
Otter	County Importance	Habitat degradation (hydrology – pollution); disturbance / displacement	Yes, County Level
Atlantic salmon	County Importance	Habitat degradation (hydrology – pollution); disturbance / displacement	Yes, Local to County Level
Lamprey spp.	County Importance	Habitat degradation (hydrology – pollution); disturbance / displacement	Yes, Local to County Level
All other Red, Amber or Green listed bird species (non-SCI breeding populations)	Local Importance (Higher Value)	Habitat degradation (hydrology – pollution); disturbance / displacement (including temporary lighting)	Yes, Local Level
Bats	Local Importance (Higher Value)	Habitat loss; mortality; disturbance from temporary lighting	Yes, Local Level
Badger	Local Importance (Higher Value)	Disturbance likely of two active setts	Yes, Local Level
Other small mammal species protected under the Wildlife Act	Local Importance (Higher Value)	Habitat loss; disturbance / displacement	Yes, Local Level
Smooth newt	Local Importance (Higher Value)	Habitat loss; disturbance / displacement	Yes, Local Level
Common frog	Local Importance (Higher Value)	Habitat loss; disturbance / displacement	Yes, Local Level

Ecological Receptor	Ecological Valuation	Potential Impacts	Likely Significant Effect (Yes / No) and Level
Common lizard	Local Importance (Higher Value)	Habitat loss; disturbance / displacement	Yes, Local Level
Other fish species (including trout)	Local Importance (Lower Value)	Habitat degradation (hydrology – pollution); disturbance / displacement	Yes, Local Level
Non-native invasive plant species	N/A	Spread of invasive plants	Yes, Local Level

### 10.4.3 Operational Phase

The impact of the Operational Phase of the Proposed Development upon IERs is expected to be not significant, as most impacts will occur during the Construction Phase due to the nature of the Proposed Development. Along most of the proposed cable route, the road will be reinstated for public use, and vegetation removed will be re-instated, except along the permanent easement, at Joint Bays, along permanent access tracks, and where over-cable planting is not technically viable, for example due to asset risk.

#### 10.4.3.1 Habitat Loss

The width of the Joint Bays and the nature of the road network in the area means that road closures and diversions will be required in some areas along the proposed cable route during maintenance activities in the Operational Phase.

It will be necessary to provide permanent access tracks (4m wide unbound tracks for a total approximate length of 4km in private land) for infrequent use to all off-road Joint Bays during the Operational Phase. There will be 12 separate permanent access tracks which will be provided for 15 Joint Bays, as follows:

- JB 1, JB 2, JB 3 and JB 4 (access track to be shared with the Kildare Meath Grid Upgrade - planning application reference number 316372);
- JB 17;
- JB 21, JB 28 and JB 29;
- JB 30, JB 31 and JB 38; and
- JB 46, JB 47, JB48 and JB 49.

Refer to Figure 4.1 (Sheet 1 to Sheet 48) in Volume 4 of the EIAR for their locations. There is the potential for negative effects from habitat loss at these locations. However, these have been assessed under permanent loss during the Construction Phase, and as such, are not described or assessed further here.

#### 10.4.3.2 Mortality, Pollution, Habitat Degradation and / or Fragmentation

Should unexpected and / or emergency maintenance of the proposed underground cable be required during the Operational Phase, excavation will be required, and this could occur on (in-road) and / or off-road. As per the Construction Phase, there will be the potential for the same negative effects to occur to IERs, as noted in Section 10.4.2.15.

There is therefore the potential for negative effects at a Local level from mortality and disturbance and loss or fragmentation of habitat for IERs.

## 10.5 Mitigation and Monitoring Measures

### 10.5.1 Ecological Clerk of Works

An on-site Ecological Clerk of Works (ECoW) will be appointed by the appointed contractor to carry out pre-construction surveys to ensure that the ecological baseline remains current (Section 10.5.2) and, where required, will implement appropriate mitigation measures as needed (Section 10.5.3.1 and Section 10.5.3.2). Mitigation measures are listed below and include measures to be adopted during the Construction Phase of the Proposed Development, with the aim of reducing the potential negative impact that the Proposed Development might have on protected species and habitats. These include measures adopted to prevent and control pollution, to control and reduce silt-laden runoff, to prevent the spill and the leaks of contaminating materials including oil and fuel, and to prevent the spread of invasive species. However, no mitigation measures will be required during the Operational Phase, as the impacts are expected to be minimal. Where sensitive habitats or species have the potential to be impacted, the ECoW will be on-site to implement all mitigation measures, as described below. The ECoW will have sufficient experience to carry out the task(s) at hand and will be a member of a professional body, such as CIEEM, or similar.

### 10.5.2 Pre-Construction Surveys

In advance of enabling works, the appointed contractor's EcoW will complete pre-construction confirmatory surveys of selected ecological features whose distribution is dynamic over time, and which are known to have the potential to occur within the ZoI of the PAB. At this time, maximum effort will be adopted to survey those small number of areas that could not be surveyed during baseline data collection, due to site access limitations. As noted above, an assessment of these non-accessed areas has been made in this Chapter, based on the available data (e.g. aerial photograph, desktop data, access from adjacent area, etc). This is in-line with the CIEEM Guidance (CIEEM 2018). These surveys will update the findings of the surveys completed between December 2021 and October 2023 (survey dates are detailed in Table 10.3), and will include the following:

- Bat trees previously identified as having roosting potential and within the ZoI will be subject to pre-construction surveys. Bat surveys will be carried out in accordance with guidance from Bat Mitigation Guidelines for Ireland – 2 (Marnell *et al.* 2022), Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes (National Roads Authority 2006a) and Bat Surveys for Professional Ecologists: Good Practice Guidelines 4<sup>th</sup> edition (Collins 2023). Surveys will be carried out by a licensed bat worker, who will determine the locations where they are required, using best practice techniques;
- Otter breeding / resting sites within the ZoI of the PAB (minimum 50m from watercourse crossings, up to 150m at HDD Compound sites, will be subject to pre-construction surveys, where access allows (noting that guidance recommends 20m for non-breeding sites);
- Badger setts within the ZoI of the PAB (minimum 50m, up to 150m at HDD Compound locations, will be subject to pre-construction surveys, where access allows). Further information relating to determining sett activity and mitigation measures is provided in Section 10.5.3.2.5;
- Squirrel (grey and red), where dreys are identified within trees to be felled within the PAB will be subject to pre-construction surveys.;
- Amphibians and reptiles: a pre-construction survey will be undertaken by the ECoW of previously identified areas that are suitable to host these species including reptile habitat (dry calcareous grassland, dry meadows and grassy verges and recolonising bare ground) and of amphibian habitat (drainage ditches and wet grassland) within the PAB. A suitable safe receptor site will be pre-identified, and if amphibians or reptiles are found within the PAB, the ECoW will translocate animals if necessary to the suitable receptor habitat;
- Watercourses within the PAB will be subject to pre-construction surveys, particularly for the presence of sensitive aquatic fish and invertebrate species (e.g. white-clawed crayfish, eel, lamprey species, salmon, trout);
- Invasive species within the PAB will be subject to pre-construction surveys; and

- Hedgerows and treelines to be removed will be resurveyed before construction commences (collecting information on canopy, understorey and field layer species, and associated features such as ditches, earth banks, and walls) to inform reinstatement.

All surveys will be undertaken by the ECoW and supported by a suitably qualified ecologist where needed with demonstrable experience in the survey and assessment of the feature.

### **10.5.2.1 Reporting**

The results of the pre-construction confirmatory surveys will inform the refinement of mitigation and monitoring measures (if required) in the appointed contractor's method statements (in accordance with the commitments set out in this EIAR and any conditions attached to any grant of planning), and all results will be incorporated into the appointed contractor's constraint mapping.

Survey reporting and mapping will be provided to the Developer's Ecologist (ESB), EirGrid's Planning and Environmental Unit (PEU) within the Chief Infrastructure Office, and to any prescribed bodies as additionally required by any planning conditions.

## **10.5.3 Construction Phase**

### **10.5.3.1 Site - Wide Mitigation**

A number of site-wide mitigation measures have been identified which will be applied across the Proposed Development to avoid the impacts associated with pollution of watercourses and impacts to small mammal species, amphibians and breeding bird species. In addition to this, there are mitigation measures specific to the various Proposed Development elements which are detailed in Section 10.5.3.2.

#### **10.5.3.1.1 Ecological Clerk of Works (ECoW)**

The appointed contractor's EcoW will be on-site during the Construction Phase for any works deemed to be of sensitive nature due to the number of sensitive ecological receptors and the works taking place within watercourses connected to European sites.

Where sensitive habitats or species have the potential to be impacted, the ECoW will be on-site to oversee the implementation all mitigation measures as described below. The EcoW will be at sensitive locations, for example, where there will be in-stream works and where a watercourse is hydrologically connected to European site, at locations where there is the potential for disturbance to SCI birds, where hoarding will be erected, and in areas of vegetation reinstatement, including tree planting.

Table 10.29 outlines the location of proposed silt fencing, that will be installed to prevent any silt-laden runoff from impermeable surfaces, with the aim of preserving protected areas and areas of conservation and their associated habitats and species (further detail is provided in Section 10.5.3.1.3). To note, some of these locations are not yet determined. The final locations will be determined by the EcoW on-site to ensure that the locations are suitable and are in-line with the requirements of this EIAR, and any conditions attached to any grant of planning. The EcoW will be a member of a professional body, such as CIEEM, or similar, and will be suitably experienced for the task at hand.

**Table 10.29: Indicative Silt Fencing Locations Requiring ECoW Supervision**

Water Body Name	European Sites with Hydrological Connection	Indicative Locations of Silt Fencing (NGR)
Tolka_020	<ul style="list-style-type: none"> <li>North-West Irish Sea SPA</li> <li>North Bull Island SPA</li> <li>South Dublin Bay and River Tolka Estuary SPA</li> </ul>	2 Locations: <ul style="list-style-type: none"> <li>O 01119 43261</li> <li>O 01655 43968</li> </ul>
Dunboyne Stream_010	<ul style="list-style-type: none"> <li>North-West Irish Sea SPA</li> <li>North Bull Island SPA</li> <li>South Dublin Bay and River Tolka Estuary SPA</li> </ul>	3 Locations: <ul style="list-style-type: none"> <li>N 94483 46404</li> <li>N 94423 46442</li> <li>O 00537 42674</li> </ul>
Pinkeen_010	<ul style="list-style-type: none"> <li>North-West Irish Sea SPA</li> <li>North Bull Island SPA</li> <li>South Dublin Bay and River Tolka Estuary SPA</li> </ul>	3 Locations: <ul style="list-style-type: none"> <li>O 03952 45039</li> <li>O 04095 44965</li> <li>O 04090 45021</li> </ul>
Ward_020	<ul style="list-style-type: none"> <li>Malahide Estuary SAC</li> <li>Rockabill to Dalkey Island SAC</li> <li>Lambay Island SAC</li> <li>Malahide Estuary SPA</li> <li>Lambay Island SPA</li> </ul>	4 Locations: <ul style="list-style-type: none"> <li>O 05260 45264</li> <li>O 07317 44650</li> <li>O 07378 44541</li> <li>O 07489 44351</li> </ul>
Ward_010	<ul style="list-style-type: none"> <li>Malahide Estuary SAC</li> <li>Rockabill to Dalkey Island SAC</li> <li>Lambay Island SAC</li> <li>Malahide Estuary SPA</li> <li>Lambay Island SPA</li> </ul>	4 Locations: <ul style="list-style-type: none"> <li>O 05634 45422</li> <li>O 05654 45444</li> <li>O 06599 45597</li> <li>O 06694 45616</li> </ul>
Ward_030	<ul style="list-style-type: none"> <li>Malahide Estuary SAC</li> <li>Rockabill to Dalkey Island SAC</li> <li>Lambay Island SAC</li> <li>Malahide Estuary SPA</li> <li>Lambay Island SPA</li> </ul>	11 Locations: <ul style="list-style-type: none"> <li>O 09506 44418</li> <li>O 10245 45153</li> <li>O 10370 45217</li> <li>O 10840 45522</li> <li>O 11650 45815</li> <li>O 13017 44843</li> <li>O 13148 44703</li> <li>O 13218 44681</li> <li>O 14066 44606</li> <li>O 14173 44613</li> <li>O 14662 44583</li> </ul>
Sluice_010	<ul style="list-style-type: none"> <li>Baldoyle Bay SAC</li> <li>Rockabill to Dalkey Island SAC</li> <li>Baldoyle Bay SPA</li> <li>North-West Irish Sea SPA</li> <li>Ireland's Eye SPA</li> <li>Howth Head Coast SPA</li> </ul>	1 Location: <ul style="list-style-type: none"> <li>O 16415 44423</li> </ul>
Mayne_010	<ul style="list-style-type: none"> <li>Baldoyle Bay SAC</li> <li>Rockabill to Dalkey Island SAC</li> <li>Baldoyle Bay SPA</li> <li>North-West Irish Sea SPA</li> <li>Ireland's Eye SPA</li> <li>Howth Head Coast SPA</li> </ul>	1 Location: <ul style="list-style-type: none"> <li>O 19109 42085</li> </ul>

The ECoW will give toolbox talk to all site personnel to highlight any environmental sensitivities and the boundaries of sensitive habitats. Toolbox talks will include findings of pre-construction surveys on baseline changes and any adaptive mitigation measures required. The ECoW will propose adaptive mitigation measures in response to, for instance, extreme weather events (amber and red Met Éireann weather warnings which can be checked on the Met Éireann website (Met Éireann 2024), or new mitigation requirements arising from pre-construction surveys. Method statements in relation to trenched crossings will be agreed with Inland Fisheries Ireland (IFI) prior to the start of works. No sensitive works will be permitted without the prior approval of the ECoW. The ECoW will be able to demonstrate previous experience and will be a member of a profession body, such as CIEEM, or similar.

### 10.5.3.1.2 Pollution Control

The measures set out below will be implemented to ensure that there will be no pollution of surface water during the Construction Phase of the Proposed Development. The measures are included in the Construction Environmental Management Plan (CEMP) and Appendix D to the CEMP (Surface Water Management Plan) which are included as standalone documents in this planning application pack, and will also be incorporated into the appointed contractor's final CEMP, which is a key contract document that will be implemented in full by the appointed contractor. The CEMP will be updated to include any mitigation measures prescribed by An Bord Pleanála as a condition to any grant of planning permission. The CEMP has been developed in accordance with legislation and the following guidance documents and legislation:

- Construction Industry Research and Information Association (CIRIA) C532 Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (Masters-Williams *et al.* 2001);
- CIRIA C648 Control of Water Pollution from Linear Construction Projects: Technical Guide (Murnane *et al.* 2006a);
- CIRIA C649 Control of Water Pollution from Linear Construction Projects: Site Guide (Murnane *et al.* 2006b);
- CIRIA C741 Environmental Good Practice on Site (Charles and Edwards 2015);
- Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (NRA 2005); and
- S.I. No. 113/2022 - (European Union (Good Agricultural Practice for Protection of Waters) (Amended Regulations).

Mitigation measures with respect to accidental pollution are focused on prevention, safeguarding the approach to the storage and handling of materials, and managing vehicles and plant during the Construction Phase.

### 10.5.3.1.3 Control of Silt-Laden Runoff

Specific measures to control silt, as shown in Figure 10.11 in Volume 4 of this EIAR, will be implemented to prevent surface water flowing into surface water receptors:

- The appointed contractor will ensure no deleterious discharges are released from construction sites to the nearby water bodies during construction. If a discharge to a watercourse is necessary, the water will pass through a suitable drainage system such as a swale and / or silt buster prior to discharge. Levels of suspended solids in any discharge will be no greater than 25mg/l (milligrams per litre) as per the Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (IFI 2016), and flows will be controlled to levels appropriate to the receiving water. It is possible that such a discharge may require a licence under the Water Pollution Acts 1977 and 1990 (as amended), and the Arterial Drainage Act 1945 and 1995 (as amended). The appointed contractor will liaise with the regulatory authorities at an early stage to determine the need for licences and include the appropriate application time required in any construction programme;
- Silt fences will be erected along the boundary of water bodies to prevent any silt-laden runoff from impermeable surfaces, temporary or permanent, as well as spoil heaps within the construction swathe:
  - Silt fencing will also be applied to areas that are within 30m of a watercourse and hydrologically linked to a European site, where concrete pouring is to be undertaken and where there is a risk to European designated sites. Where required, this will be double silt fencing;
  - Silt fences will be installed downgradient of the potential source of the silt / sediment;
  - The silt curtain will contain the area where silted waters are being generated and will terminate on high ground;



- They will be constructed using permeable filter fabric (Hy-Tex Terrastop silt fence or similar) rather than a mesh material and its base will be embedded at least 15cm into the ground and staked at 2m intervals;
- Vegetation will be retained as far as practicable. However, where targeted vegetation removal is required, additional measures will be put in place including additional silt fencing in these areas;
- The vegetated turves will be peeled back and not detached from the ground, the materials inserted and the turves replaced to hold the base in place;
- The silt fence will be inspected regularly by the ECoW and appointed contractor, and in particular following heavy rainfall;
- Silt fences will remain in-situ until the vegetation on the disturbed ground is re-established as determined by the ECoW;
- The fence will not be pulled from the ground, but cut at ground level and the stakes / posts removed;
- Should water build up behind the fences, the sediment will settle to the bottom. Water can be released, but sediments will remain;
- Two lines of silt fencing will be installed in sensitive areas, based on the ECoW's professional judgement;
- A record of its installation, inspection and removal will be maintained by the ECoW; and
- Reinstatement of any banks affected by silt-laden runoff during construction will be reinstated back to pre-development conditions.

#### 10.5.3.1.4 Stockpiling of Materials

The following mitigation measures will be implemented for the stockpiling of materials. Mobilisation sites will either be cleared in stages during the Construction Phase to prevent bare earth being exposed to ambient conditions for prolonged periods, or the bare earth will be immediately covered in a gravel / plastic covering to reduce the likelihood of sediment laden runoff following rainfall events. Stripped soil will be stockpiled more than 10m away from the surface interceptor drain. Stockpiles will be in a dry zone that is not subject to flooding (i.e., outside the 1:100 flood extent (1% Annual Exceedance Probability (AEP))). The following measures will be put in place by the appointed contractor for the stockpiling of materials:

- Temporary stockpiles will be located away from drains and watercourses. Stockpiles will not be located within 10m of a watercourse;
- For watercourse crossings, stockpiles will not be located anywhere within the crossing working area;
- Stockpiles will be managed to prevent siltation of watercourse systems through runoff during rainstorms with the measures to be implemented by the appointed contractor. These will include the following:
  - No use of commercial seed to stabilise exposed soils;
  - Coir matting to be used, where required (e.g. along all bank surfaces), to enable vegetation to establish on the exposed soil;
  - Providing silt fences or straw barriers at the toe of the stockpile to mitigate runoff during rainfall events;
  - Surrounding stockpiles with cut-off ditches to contain runoff;
  - Directing any runoff to the site drainage system or filter drains along the construction working width and to the settlement pond (or other) treatment systems; and
  - Providing bunds or another form of diversion to keep runoff from entering the stockpile area.

#### 10.5.3.1.5 Storage of Materials

The following mitigation measures will be implemented for the storage of materials:

- All oil and diesel storage facilities will be at least 30m from any watercourse, including surface water drains, and outside the 1:100 flood extent (1% AEP), unless prior approval is confirmed by the ECOW to reduce this distance;
- Spill kits and drip trays will be provided for all equipment and at locations where any liquids are stored and dispensed (all teams will also carry spill kits and spill kits will be suitably sized to address the amount of pollutant substances being used);
- Storage areas for solid materials, including waste soils, will be designed and managed to prevent deterioration of the materials and their escape (via surface runoff or wind blow);
- Storage areas will be kept secure to prevent acts of vandalism that could result in leaks or spills; and
- All containers of any size will be correctly labelled, indicating their contents and any hazard warning signs.

#### 10.5.3.1.6 Spills

The following mitigation measures will be implemented across the Proposed Development to prevent spills:

- Fuel tanks, drums and mobile bowsers (and any other equipment that contains oil and other fuels) will have a secondary containment, for example double-skinned tanks;
- All tanks, drums and mobile bowsers will be located in a sealed impervious bund with sufficient capacity to contain at least 25% of the total volume of the containers or 110% of the largest container, whichever is the greatest;
- Storage areas will be covered, wherever possible, to prevent rainwater filling the bunded areas;
- Fuel fill pipes will not extend beyond the bund wall and will have a lockable cap secured with a chain;
- Where fuel is delivered through a pipe permanently attached to a tank or bowser:
  - The pipe will be fitted with a manually operated pump or a valve at the delivery end which closes automatically when not in use;
  - The pump or valve will be fitted with a lock;
  - The pipe will be fitted with a lockable valve at the end where it leaves the tank or bowser;
  - The pipework will pass over and not through bund walls;
  - Tanks and bunds will be protected from vehicle impact damage;
  - Tanks will be labelled with contents, capacity information and hazard warnings; and
  - All valves, pumps and trigger guns will be turned off and locked when not in use. All caps on fill pipes will be locked when not in use.
- Suitable precautions will be taken to prevent spillages from equipment containing small quantities of hazardous substances (for example, chainsaws and jerry cans) including:
  - Each container or piece of equipment will be stored in its own drip tray made of a material suitable for the substance being handled; and
  - Containers and equipment will be stored on a firm, level surface.
- For deliveries and dispensing activities, the appointed contractor will ensure that:
  - Site-specific procedures are in place for bulk deliveries; and
  - Delivery points and vehicle routes are clearly marked.
- Emergency procedures will be displayed, and suitably sized spill kits will be available at all delivery points, and staff will be trained in these procedures and the use of spill kits.

#### 10.5.3.1.7 Fuel and Oil Leaks from Vehicles and Plant

The use of vehicles and plant poses similar risks to those posed by storage of liquids. Fuel and oil may leak from such equipment which may enter drains and / or watercourses, as well as contaminating the ground itself. The following mitigation measures will be implemented to reduce this risk:

- Vehicles and plant provided for use on-site will be regularly inspected to ensure they are free from leaks and promptly repaired when not in good working order;
- Sufficient spill kits will be carried on all vehicles;
- Vehicles and plant will not park near or over drains;
- Refuelling of vehicles and plant will be carried out on hardstanding, using drip trays to ensure no fuel can contaminate the ground outside of the bunded areas; and
- Vehicles and plant will be in good working order to ensure optimum fuel efficiency.

#### 10.5.3.1.8 Concrete

Where concrete is required on-site, the following mitigation measures will be implemented to reduce risks associated with concrete pouring:

- Prior to the concrete pour taking place, all mitigation for turbidity and erosion control will be checked to ensure it is fit for purpose;
- Established concrete washout management areas will be designated to control the discharge of concrete washout;
- An emergency response plan will be developed and communicated to site staff prior to the concrete pouring;
- The ECoW and on-site personnel will monitor the concrete pour continuously, ensuring that any spills are promptly addressed and mitigated;
- The ECoW will conduct a thorough inspection of the site after the concrete pour to identify any environmental impacts and implement clean-up measures if necessary;
- When working in or near surface water and the use of introduced materials (e.g. oil) cannot be avoided, alternative materials such as biodegradable oils will be used;
- Placing of concrete in or near watercourses will be only carried out under the supervision of the ECoW;
- Wet concrete operations adjacent to water bodies will be avoided, where possible, with a minimum separation distance of 20m, with exception to in-stream pours which will be undertaken within a sealed dry working area. The appointed contractor will ensure that all concrete truck washing / cleaning is undertaken offsite, as far as practicable, and remote from water bodies or potential pathways to water bodies;
- There will be no hosing of concrete, cement, grout or similar material spills into surface water drains. Such spills shall be contained immediately, and run-off prevented from entering the watercourse;
- Concrete waste and wash-down water will be contained and managed on-site to prevent pollution of all surface watercourses; and
- Washout from concrete lorries will not be permitted on-site and will only take place at the batching plant (or other appropriate facility designated by the manufacturer).

#### 10.5.3.1.9 Breeding Birds

Unless suitable mitigation is adopted (see next paragraph), hedgerows, trees and scrub will not be removed within the breeding bird season (1 March to 31 August, inclusive) to avoid impacts on nesting birds.

Where this seasonal restriction cannot be adhered to, habitats that need to be removed will be inspected by a ECoW suitably experienced in the identification of nests for the presence of breeding birds prior to clearance.

When nesting birds are present, the ecologist will demarcate a suitable buffer around an active nest and clearance within this area will be postponed until the chicks have fledged. A suitable exclusion zone will be established by the ECoW. To reduce the potential of birds to nest, bird deterrents (e.g. flicker tape / compact discs) will be tied to habitat confirmed to be without nests and the habitat will be cleared within three days of the inspection. Otherwise, repeat inspections will be required to confirm the continued absence of nesting birds. If vegetation is to be cleared in the breeding season (under supervision of a suitably qualified ecologist), it will be chipped, removed or covered on the same day to prevent birds from nesting. Reinstated habitat including trees, hedgerows and grassland, will provide suitable habitat for breeding birds recorded in the study area, once established. The locations of trees that will be lost and retained are shown on Figure 18.2 to Figure 18.5 in Volume 4 in this EIAR (with discussion included in Appendix A18.2 in Volume 3 in this EIAR). It may be necessary for temporary lighting to be provided at the proposed Temporary Construction Compounds and HDD Compounds for security purposes. However, temporary lighting will be controlled and directed in order to mitigate any potential impacts to birds as advised by the appointed EcoW.

#### 10.5.3.1.10 Bats

Any roosts recorded during the pre-construction surveys, as outlined in Section 10.5.2, will be felled under a derogation licence. As part of the licence, mitigation measures such as the provision of bat boxes as alternative roosts will be required. The type and number of bat boxes (if required) will be relative to the species and conservation status of the roost to be impacted. In all instances, bat boxes will be sited in suitable, undisturbed locations, away from works during the Construction Phase, either on third party lands (subject to agreement with landowners) or in the instance of no landowner agreement on ESB-owned lands at Woodland and / or Belcamp Substations.

The loss of trees with high potential for roosting bats will be mitigated on a 3-to-1 ratio with bat boxes, and moderate potential trees will be mitigated on a 2-to-1 ratio with bat boxes. A range of models determined by the appointed EcoW will be used, suited to the species recorded within the study area, and for different seasons. The boxes will be erected in a suitable location. It may be necessary for temporary lighting to be provided at the proposed Temporary Construction Compounds and HDD Compounds for security purposes. However, temporary lighting will be controlled and directed in order to mitigate any potential impacts to bats as advised by the appointed EcoW.

#### 10.5.3.1.11 Otter

The following general mitigation measures for otter will be implemented during the Construction Phase, after otter pre-construction surveys have been carried out (refer to Section 10.5.2):

- Any excavations will be covered at night to prevent otter from falling in or becoming trapped;
- Should any otter be observed within the PAB or should any evidence of otter activity be found during the Construction Phase, works will cease immediately and the ECoW will be contacted for advice;
- Although there are not predicted to be any impacts on otters, if confirmatory surveys identify likely disturbance of otters, further mitigation following the Guidelines for the Treatment of Otters (NRA 2008b) will be implemented by the ECoW to ensure no significant effects on otters arise. Should a non-breeding otter holt or rest site be identified, a buffer zone of 30m will be implemented around the feature. Where a resting place is confirmed to be a natal site, this will increase to 150m. Should works occur in the vicinity of otter holts with breeding females or cubs, screening will occur and working hours will be restricted. When holts are present, no wheeled or tracked vehicles will be used within 20m, and no light work will occur within 15m. Exceptions may be adopted under licence. Appropriate fencing will be set around areas associated with otters, before works commence, to mark the areas that cannot be accessed. Disused and inactive holts will be destroyed, after verified as inactive and after blocking and monitoring the entrances for a five-day period.

#### 10.5.3.1.12 Badger

The following general mitigation measures for badger will be implemented during the Construction Phase to avoid / minimise impacts in accordance with the mitigation hierarchy, following the completion of the badger pre-construction surveys (refer to Section 10.5.2):

- Ground excavations will be covered at night to prevent badger from falling in or becoming trapped;
- Any works within 30m of an active sett will be supervised on-site for the full duration of those works by an ECoW (extended to 50m during the breeding season for a main sett where there is breeding activity);
- Breeding setts will not be interfered with or disturbed during the badger breeding season (December to June, inclusive);
- Only the use of hand tools will be permitted within 20m of an active sett;
- No heavy machinery will be used within 30m of a sett;
- During the breeding season, none of the construction works including ground excavation, and use of tools and heavy machines, will be undertaken within 50m of active setts, and blasting (if required) will not be undertaken within 150m of active setts. Should this not be possible, the ECoW will provide advice on how best to proceed. Mitigation measures will include sett screening and restricted working hours. The ECoW will be able to advise on any mitigation options such as sett screening and restricted working hours that may be available relative to the predicted scale and duration of impact (which is informed by the proposed works and sett specifics (i.e., sett type, level of sett activity, tunnel direction, type of substrate, vegetative cover, and topography)). It should be noted that for the HDD platforms, none of the badger signs were within these distances. The nearest badger signs (prints) to the proposed HDD works under the M1 Motorway were approximately 1.15km away. The nearest badger signs (prints) to the proposed HDD works under the M2 Motorway were approximately 0.52km away. The nearest badger signs to the proposed HDD works under the M3 Motorway (a disused sett) was approximately 1.95km away;
- Night-time working will be restricted as far as possible within 100m of a sett;
- The use of noisy plant and machinery near badger setts will cease before sunset; and
- Any spoil heaps will be sited at a minimum distance of 30m from setts.

#### 10.5.3.1.13 Red Squirrel

Where pre-construction surveys identify potential dreys at risk from felling, vantage point watches (for individual trees) or transects (for hedgerows / groups of trees) will be conducted to visualise squirrels and identify if the squirrel is grey (invasive) or red (protected). Surveys will be conducted in the early morning, during the summer months. Where visualisations are inconclusive, hair tube surveys may be required, following the best practice guidance (i.e., Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA 2009)). As grey squirrels are a scheduled invasive species, confirmed grey squirrel dreys can be felled without mitigation. In the event that confirmed or suspected red squirrel dreys require felling, felling will only be carried out from October to January, in consultation with the NPWS, from which a licence may be required, subject to survey findings.

#### 10.5.3.1.14 Other Protected Mammals

Removal and clearance of vegetation may affect small mammal species if present in these habitats. The following mitigation measures will be adhered to in order to minimise impacts to small mammal species:

- Any excavations will be covered at night to prevent small mammals from falling in and / or becoming trapped;
- Working at night will be prohibited where specific tasks such as vegetation removal and clearance are to be carried out;

- Any lights will be turned off after working hours;
- Noise levels will not exceed permissible levels for construction works (70 decibels (dB(A)), based on Guidelines for the Treatment of Noise and Vibration in National Road Schemes (NRA 2004); and
- With the exception of permanent areas of hardstanding, the site will be re-vegetated at the end of the Construction Phase.

#### 10.5.3.1.15 Reptiles and Amphibians

Removal and clearance of vegetation has the potential to affect amphibians or reptiles if present in these habitats. The following mitigation measures will be adhered to, to minimise impacts on amphibians or reptiles:

- A toolbox talk will be carried out to ensure all site personnel are aware of these protected species and their mitigation requirements;
- Vegetation will be cleared in the following two stages, during the reptile and amphibian active season, following the completion of the toolbox talk:
  - A hand-search will be undertaken by a licensed ECoW for any animals present within vegetation to be cleared, followed by a first cut of vegetation down to 210mm above ground-level using hand tools; and
  - A second hand-search will be undertaken of vegetation to be cleared by an ECoW for any animals present, followed by the second cut of vegetation to ground-level (or as close as practicable).
- If any reptiles are found during the pre-construction surveys or during the construction works, they will be captured and translocated by a suitably qualified and experienced ecologist under licence to a previously identified receptor site;
- Where practicable, in the context of the Construction Phase, water levels will be maintained in any ponds or ditches potentially used by amphibians; and
- Habitat reinstatement will recreate the former habitats within the PAB (excluding woody vegetation that cannot be planted within the permanent cable easement and other permanent habitat losses).

#### 10.5.3.1.16 Invasive Species

A management plan for those Third Schedule invasive plant species recorded during the survey (refer to Table 10.23) which have the potential to be impacted by the works will be included in the final CEMP for the Proposed Development (this will be adapted from Appendix E of the CEMP included as a standalone document in this planning application pack). The mitigation measures described below follow the recommendations set out in the Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (NRA 2010) and will be implemented during the Construction Phase:

- All staff will be informed of the proximity and identification of Giant hogweed and rhododendron and any other invasive species identified through toolbox talks;
- Giant hogweed will be controlled chemically or physically;
- The most effective chemical control for Giant hogweed is glyphosate. Foliar sprays of glyphosate are suitable for large infestations, and injection into the stem of the plant approximately 30cm above the ground with 5ml of a 5% v/v solution can be used where spot treatment is required. Chemical applications will be adopted before stem-elongation (mid-spring);
- Giant hogweed physical control will include eradication of the plant, during the springtime, as follows:
  - Young plants can be readily pulled out the soil using hand tools;



- Where plants are larger than 1.5m, the upper part can be cut back and the lower part used to lever the roots out;
- Seed heads on old stems will be removed by individually bagging seed heads and cutting to prevent accidental spread of seeds;
- Mowers, strimmers or weed-whackers will not be used;
- Periodic removal will be required to control continuous germination of seedlings;
- Seed might remain viable up to 15 years, thus control will require continued input over time (at least 5 years), and monitoring will occur between spring and autumn;
- Seed can be present in soil within 4m of established plants and it will not be transferred to other parts of a site;
- The top 5 cm of soil contains the majority of the seed, and will not be stockpiled within 10m of watercourse to prevent plant spread; and
- Giant hogweed material and infected soil will be stored on top of a membrane of fabric in a designated area for appropriate disposal; by a suitably qualified and licensed expert.
- Tracked machinery will be limited in the area and will be cleaned when leaving the site;
- Rhododendron will be controlled chemically or physically;
- Chemical control will be adopted during the active growth of the plant in late spring or summer (June to September). A variety of herbicides have proven effective for chemical control, including 2,4\_glyphosate, dicamba and triclopyr. Chemical applications can include foliar spray, wiper applicator or spot treatment, stem-injection or cut-stump. Triclopyr will not be used during drought when temperatures are high;
- A range of physical control measures have been developed for rhododendron in response to the sensitivity of the site. These include:
  - Uprooting by hand: roots are relatively shallow and can be toppled using a hand operated turfer or mechanical winch. Younger plants can be hand-pulled;
  - Chainsaw cutting of root-ball: more effective on larger plants but restricted to soft soil areas. It can be used in combination with winching methods to reduce soil disturbance; and
  - Experimental methods include mulch matting to prevent regrowth following initial clearance and bud rubbing on cut stumps.
- Exclusion zones will be established where necessary to prevent the spread of invasive species;
- No machinery will be allowed within exclusion zones other than where necessary to undertake treatment measures;
- Any plant material and soil-containing plant material will be disposed of by a suitably qualified and licensed expert in accordance with the Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads;
- Care will be taken near watercourses to ensure that material that contains flower heads, seeds or cuttings of any invasive species will be disposed of correctly and not enter watercourses;
- Three-cornered leek and Spanish bluebell will be controlled chemically or physically;
- Chemical treatment for three-cornered leek and Spanish bluebell will be made in the spring (when above ground vegetation visible) but before flowering. Multiple applications may be required due to persistence of bulbs and soil seed bank; and
- Physical control of small populations of three-cornered leek and Spanish bluebell (as recorded within the PAB) will include hand digging, ensuring that all biomass including bulbs collected. Longer term eradication will also require a number of years of mechanical cutting to exhaust seed / bulb bank in wider subsurface environment.



### 10.5.3.2 Specific Mitigation Measures

#### 10.5.3.2.1 European Designated Sites

The AA Screening Report determined that likely significant effects in the absence of mitigation on the following 14 European sites could not be excluded: Malahide Estuary SAC, Baldoyle Bay SAC, Malahide Estuary SPA, Baldoyle Bay SPA, North Bull Island SPA, South Dublin Bay and River Tolka Estuary SPA, North-West Irish Sea SPA, Rogerstown Estuary SPA, Ireland's Eye SPA, Lambay Island SPA, Skerries Islands SPA, River Nanny Estuary and Shore SPA, Boyne Estuary SPA, and Dundalk Bay SPA. Mitigation measures to protect these sites from pollution, mortality and disturbance are described in the NIS (included as a standalone document in the planning application pack) and in the site-wide measures in Section 10.5.3.1.

#### 10.5.3.2.2 Nationally Designated Sites

No NHAs were identified within the ZOI of the Proposed Development. Four pNHAs were identified within the potential ZOI of the Proposed Development with hydrological connectivity, lying between approximately 3.5km and 8.4km away. Site-specific mitigation is not considered necessary for these pNHAs as the pollution prevention measures that are outlined in Section 10.5.3.1 are considered suitable and will be implemented to protect pNHAs.

#### 10.5.3.2.3 Wintering Birds

##### 10.5.3.2.3.1 Disturbance

Black-tailed godwit, Brent goose, coot, little grebe, mute swan and oyster catcher were observed exclusively at Darndale Park which is located approximately 850m to the south-east of Belcamp Substation. This is more than double the distance of the 300m distance for noise and visual disturbance suggested by the Waterbird disturbance mitigation toolkit (Cutts *et al.* 2013), and therefore, these species are unlikely to be disturbed by the Proposed Development.

However, there is the potential for disturbance impacts upon other wintering bird species, recorded during wintering bird surveys across other parts of the Proposed Development. Therefore, the following mitigation measures will be implemented to ensure that there will be no disturbance to QI species within functionally linked habitat during the Construction Phase of the Proposed Development:

- A 2m to 3 m high non-transparent visual and noise screening barrier will be erected along the perimeter of the site to block the construction works and the movement of machinery / workforce to minimise disturbance to protected birds in functionally linked habitats. This height will be achieved at the typical working level of plant and personnel and will be raised accordingly, if necessary, to ensure that the screening is of adequate height (i.e., no visual disturbance). Locations of the proposed screening are outlined in Table 10.30 and shown on Figure 10.11 in Volume 4 of this EIAR:
- This screening barrier will have a mass per unit area exceeding 7 kg/m<sup>2</sup> (kilogrammes per metre squared) in accordance with the recommendations of Part B.4 of British Standard (BS) 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites - Noise (hereafter referred to as BS 5228-1) (BSI 2014a). The fencing will be of adequate height to screen the works area (3m to 4m) or as advised by an experienced ecologist. The appointed ECoW will supervise the erection of the screening (where natural screening cannot be retained) and will provide guidance through a toolbox talk ensuring that these measures are effective. The ECoW will regularly check the screening throughout the works to ensure that it is maintained in good condition and working order;
- Screening will be installed prior to site clearance, and installation will be monitored by the EcoW. There will be no restrictions on the timing of this installation as the works area will not be directly adjacent to a SPA; and

- This screening will remain in place for the duration of the works and will be moved regularly as work advances.
- All plant used during the Construction Phase will be the quietest of its type that is practical for achieving the works, as demonstrated in writing by the appointed contractor to the local authority, with reference to other noisier models;
- Noise levels will not exceed permissible levels for construction works (70 decibels (dB(A)), based on Guidelines for the Treatment of Noise and Vibration in National Road Schemes (NRA 2004);
- A Noise and Vibration Management Plan will be developed by the appointed contractor;
- All plant will be operated in accordance with the manufacturer’s recommendations including the use and maintenance of specific noise reduction measures to reduce the impact further:
  - The use of mufflers on pneumatic tools;
  - Effective exhaust silencers;
  - Sound reducing enclosures;
  - Machines in intermittent use will not be left idling and will be switched off during periods where they are not required; and
  - Post construction, semi-natural habitats will be left to re-vegetate naturally from the seed bank within re-instated soils. Commercial seed mixes will only be used to reinstate vegetation on agricultural lands (EirGrid 2023).

**Table 10.30: Proposed Locations of Screens For Birds**

Screen Number	Point / Line	Co-ordinates (Point) (NGR)	Co-ordinates (From) (NGR)	Co-ordinates (To) (NGR)	Location Information
1	Line	N/A	N 95155 47993	N 94113 45167	Off-road, approximate Chainage 0-3,650, including construction platforms and Temporary Construction Compound (TCC0)
2	Point	N 94328 45100	N/A	N/A	Passing Bay
3	Point	N 97745 44012	N/A	N/A	Passing Bay
4	Point	N 99748 43076	N/A	N/A	Construction platform
5	Point	O 00322 42842	N/A	N/A	Temporary Construction Compound (TCC2)
6	Point	O 00457 42684	N/A	N/A	Construction platform
7	Point	O 01038 43192	N/A	N/A	Construction platform
8	Point	O 01501 43884	N/A	N/A	Construction platform
9	Line	N/A	O 01616 44016	O 01698 44179	Off-road, from approximate Chainage 12,600-12,900, including HDD Compound (HDD 1a)
10	Line	N/A	O 03703 44963	O 04091 45036	Off-road section, from approximate Chainage 15,850-16,450, including Temporary Construction Compound (TCC3)
11	Point	O 05770 45427	N/A	N/A	Passing Bay
12	Point	O 06448 45612	N/A	N/A	Passing Bay
13	Line	N/A	O 06558 45676	O 06701 45607	Off-road, from approximate Chainage 19,200-19,400
14	Point	O 06904 45338	N/A	N/A	Construction platform
15	Line	N/A	O 07295 44683	O 07367 44567	Off-road section, from approximate chainage 20,500-20650, including Passing Bay

Screen Number	Point / Line	Co-ordinates (Point) (NGR)	Co-ordinates (From) (NGR)	Co-ordinates (To) (NGR)	Location Information
16	Line	N/A	O 07688 44026	O 08931 43700	Off-road section, from approximate chainage 21,300-22,650, including Temporary Construction Compound (TCC4)
17	Point	O 08123 43840	N/A	N/A	Eastern side of Temporary Construction Compound TCC4
18	Point	O 09354 44293	N/A	N/A	Construction platform and HDD Compound (HDD 2a)
19	Line	N/A	O 09491 44460	O 09634 44661	Along HDD Compound (HDD 2b) Object ID 446, approximate Chainage 23,600-23,850
20	Point	O 10633 45379	N/A	N/A	Passing Bay
21	Point	O 11318 45696	N/A	N/A	Passing Bay
22	Point	O 11853 45799	N/A	N/A	Passing Bay
23	Point	O 12275 45751	N/A	N/A	Western, southern and eastern sides of Temporary Construction Compound (TCC5)
24	Point	O 12858 45057	N/A	N/A	Construction platform
25	Line	N/A	O 13404 44680	O 13869 44628	Off-road section, from approximate Chainage 28,650-29,150, including construction platform
26	Point	O 18246 43900	N/A	N/A	Passing Bay
27	Line	N/A	O 18511 43902	O 19273 41479	Off-road section, from approximate Chainage 34,100-37,766, including HDD Compounds (HDD 3a and HDD3b), construction platforms, and Temporary Construction Compound (TCC6)

#### 10.5.3.2.3.2 Habitat Degradation and Mortality

Provided that the site -wide mitigation measures outlined in Section 10.5.3.1 are implemented during the Construction Phase, there is low potential for negative indirect effects from pollution to cause potential habitat degradation and reduction in food availability, and therefore, no site-specific mitigation is proposed.

#### 10.5.3.2.4 Otter

In line with the mitigation measures set out in the Guidelines for the Treatment of Otters during the Construction of National Road Schemes (NRA 2008b), namely, when holts are present, no wheeled or tracked vehicles will be used within 20m, and no light work will occur within 15m of any holts present. When a non-breeding otter holt or rest site is identified, a buffer zone of 30m will be implemented around the feature. When a breeding otter holt or resting site is identified, the buffer zone will be extended to 150m. Buffer zones will be fenced prior to works commencing. Moreover, should works occur in the vicinity of otter holts with breeding females or cubs, screening will occur and working hours will be restricted.

Disused and inactive holts can be destroyed, after being identified as inactive holts and after their entrances have been blocked and monitored for a five-day period. Exceptions can be adopted under licence. The Guidelines for the Treatment of Otters Prior to Construction of National Road Schemes (NRA 2008b) state that a licence will be required for any works likely to cause disturbance (e.g., piling and blasting) to active breeding holts when present with 150m of a development.

During the field surveys one potential otter holt with a slide was identified approximately 145m from the proposed cable route, one otter slide was identified approximately 173m from the proposed cable route and one otter spraint was identified approximately 26m from the proposed cable route (see Figure 10.7 in Volume 4 of this EIAR). Since the holt showed signs of otter use (a slide was recorded next to it), and due to its location near to a river, there is high potential for use. However, the nearest potential holt was 145m away, close to the 150m threshold, and did not have evidence of breeding otters. Therefore, there is no requirement for monitoring and works will be able to proceed under the supervision of an EcoW.

#### 10.5.3.2.5 Badger

During the baseline surveys, it was identified that 10 badger setts / potential badger setts have the potential to be impacted by the Proposed Development, including two within 50m of the PAB and four between 51m and 150m. Exact locations of setts, are not provided due to persecution of this species. Sensitive information relating to the location of badger setts is provided in a confidential appendix (Appendix A10.1 and Figure 10.10), which are provided to An Bord Pleanála and the NPWS separately.

The following pre-construction surveys and mitigation measures that follow the recommendations set out in the Guidelines for the Treatment of Badgers during the Construction of National Road Schemes (NRA 2006b) will be implemented:

- Affected badger setts will be marked and the extent of bounds prohibited for vehicles will be clearly marked by fencing and signage. When there is the need to proceed with works close to active setts during the breeding season, mitigation measures, such as sett screening and restricted working hours will be adopted, prior expert consultation;
- To determine whether a sett is active or inactive, camera traps will be set up prior to the commencement of construction to monitor the entrance to the holes for a minimum of five days. If, after five days, there is no evidence that badgers are using the sett, it is presumed inactive, and no further actions will be required. However, this will only apply if the camera trap monitoring is carried out directly prior to the start of works, meaning that there was no change to the baseline. The use of the sett may change over time, so if there is a delay of more than 12 months prior to the commencement of the works from the date of the final camera monitoring, then a further badger survey will be undertaken to determine the status of the hole;
- Disused and inactive sett entrances will be blocked to prevent reoccupation, and the disused or inactive sett will be destroyed using a mechanical digger after five days of monitoring, under the supervision of a suitably experienced and qualified EcoW; and
- No heavy machinery will be used within 30m of active badger setts. Lighter machinery (generally wheeled vehicles) will not be used within 20m of a sett entrance. Light work, such as digging by hand or scrub clearance will not take place within 10m of sett entrances. During the breeding season (December to June, inclusive), none of the above works will be undertaken within 50m of active setts, nor blasting or pile driving within 150m of active setts.

Where an active sett is required to be closed, the following mitigation measures presented in the Guidelines for the Treatment of Badgers during the Construction of National Road Schemes will be implemented:

- Active entrances will have one-way gates installed (plus proofing around sides of gates) to allow badgers to exit but not to return (inactive entrances will not require gates and may be soft and then hard-blocked as per inactive setts);
- The gates will be tied open for three days prior to the sett exclusion and sticks placed in the entrance to monitor sett activity;
- Gates will be left installed, with regular inspections, over a minimum period of 21 days (including period with gates tied open) before the sett is deemed inactive. Any activity at all will require the procedures to be repeated or additional measures taken;

- Setts destruction will commence immediately following the 21 day exclusion period, provided that all badgers have been excluded and will be conducted under the supervision of a suitably experienced and qualified ECoW;
- Setts destruction is usually undertaken with a tracked 12 to 25 tonne 360 excavator, commencing at approximately 25m from the outer sett entrances and working towards the centre of the sett, excavating approximately 0.5m slices in a trench to a depth of 2m;
- Exposed tunnels will be checked for recent badger activity, with full attention paid to safety requirements in so doing;
- The sett will be destroyed from several directions, in the same manner, until only the central core of the sett remains. Once it is ensured that no badgers remain, the core will then also be destroyed and the entire area back-filled and made safe; and
- Setts excavation will, preferably, be concluded within one working day, as badgers may re-enter exposed tunnels and entrances.

The NPWS Wildlife Licensing was consulted regarding licensing requirements for works in and around badgers and their setts. Section 23(7)(iv) of the Wildlife Act outlines that if a licence or permission has been received from another public authority whose actions are directed by a statute or statutory instrument, further permission is not required from the NPWS for works affecting badgers (i.e., a licence will be issued by the relevant local authority if required rather than the NPWS).

#### 10.5.3.2.6 Fish and Aquatic Invertebrates

Mitigation measures regarding pollution control of surface water have been detailed in the site-wide mitigation measures in Section 10.5.3.1. These measures have been developed to protect water bodies, drainage ditches and ponds / lakes and the habitats and species that they support, and will avoid a reduction in water quality during construction. Although white-clawed crayfish were confirmed to be likely absent in 14 of the watercourses, on a precautionary basis, it can be considered that white-clawed crayfish have the potential to be affected by the Proposed Development through watercourse pollution or direct disturbance.

The following control measures will be implemented during the Construction Phase in or adjacent to a watercourse:

- In-stream works will not be carried out in watercourses frequented by salmon or trout during the Annual Close Season. The duration of the season varies regionally within the period from the beginning of October to the end of February, inclusive (IFI 2016). River and brook lamprey spawn during the period March to April / May. Therefore, translocation (fish rescue) and in-stream works will be undertaken outside of the spawning season. As the spawning season can vary regionally, work will be carried out in watercourses in the period June to September to minimise the impact on fish. This mitigation will also protect white-clawed crayfish. The timing of works will be considered on a site-specific basis by the ECoW and in agreement with IFI;
- Operation of machinery in-stream will be kept to an absolute minimum. All construction machinery operating in-stream will be mechanically sound to avoid leaks of oils, hydraulic fluid, etc. Machinery will be cleaned and checked prior to commencement of in-stream works;
- The design of temporary settlement ponds, the outfalls from these temporary ponds and the construction method statements for their installation will be agreed with IFI prior to construction;
- The area of disturbance of the watercourse bed and bank will be the absolute minimum required for the installation of outfalls / culverts;
- Any de-watering flows will be directed to the construction drainage system and to the settlement pond (or other) treatment system;
- Sediment mats / silt traps or similar will be located immediately downstream of the works within and adjacent to the watercourses. These will be inspected daily, maintained and cleaned regularly by the ECoW during the course of site works. Diversion of water to and from a

- temporary diversion channel will only take place during the period March to September (IFI 2016) or as agreed with IFI;
- Small check dams will be constructed in the cut-off watercourse to trap any sediment, and a sediment trap will be provided immediately downstream of the diversion to the existing watercourse; and
- Where in-stream bed material is to be removed, coarse aggregates, if present, will be stockpiled at least 10m away from the watercourse for replacement following reinstatement of a watercourse channel.

Watercourse banks affected during construction in / near a watercourse will be reinstated back to pre-construction conditions.

Where open trenching is proposed, site restoration works will be carried out following completion of the crossing, in agreement with IFI (see Table 10.29 for a list of these watercourses). These works may include riverbank and gravel replacements. In all cases, the site will be restored post-installation. An adverse weather stop work plan will be developed to ensure that activities with the potential to cause pollution are stopped under certain weather conditions (Met Éireann red, amber, yellow warnings will be monitored daily by the ECoW by accessing the Met Éireann website (Met Éireann 2024)). Works will be stopped where a red weather warning is issued. Where an amber warning is issued, works will be monitored by the ECoW and stopped where deemed appropriate based on the site conditions.

Additional mitigation measures that will be undertaken to protect fish species are as follows:

- Where in-stream trenching is to be carried out, the area will be dewatered to provide a dry works area;
- The impermeable barrier will be tailored to the watercourse in question, as per consultation with IFI to-date, and where technically feasible, fluming will be preferred to over pumping techniques to provide the dry working area (refer to Chapter 4 (Proposed Development Description) for details);
- Netting, sandbags and / or dumpy-bags filled with rock will be installed upstream to prevent fish travelling downstream into the working area;
- Fish will be removed from the working area through electrofishing and moved upstream of the dammed area; and
- Once construction is completed, the watercourse will be re-wetted under the direction of the ECoW. Water will be released slowly and silt mats, sediment traps and haybales will be used to avoid a sudden influx of sediment to the system. A silt buster will be used where required.

### 10.5.3.2.7 Reinstatement

#### 10.5.3.2.7.1 General Requirements (All Hedgerows)

All planting will be native (only) and of local provenance, taking account of the vegetation that has been removed and typical species of the local landscape.

A post-consent / pre-construction baseline survey of all hedges to be removed will be carried out to characterise its canopy, understorey and field layer species, and associated features (ditches, earth banks, walls etc.) to inform reinstatement.

Unless otherwise agreed with the Developer (ESB) and the local authority, the appointed contractor will reinstate hedgerows and treelines to a species-rich condition (i.e., five native woody species per 30m (excluding brambles), with no use of commercial seed), comprising only native species. All other sites will be returned as close as possible to their pre-existing condition, using the same woody species removed, under the supervision and direction of the appointed contractor's ECoW.



Hedging / hedgerow plants will be planted as a staggered double row, six plants per metre with 330mm between rows. Suitable individual protection from browsing animals will be provided by tube, spiral or similar held in place with a short cane. Group protection of new planting will be provided by suitable fencing, but individual plant protection of spirals will be provided to protect against browsing animals. Mulch mats or similar weed suppression materials (restricted to a biodegradable specification) will be used to promote successful establishment.

The appointed contractor will make orders by the scientific name to ensure native plants are delivered and not a cultivated variety.

Nurseries prefer to grow trees to order, so the appointed contractor will make the order as soon as possible (up to a year in advance) to ensure that the required species and stock specification can be secured.

Consideration will be given to the procurement of planting so that there are suitable lead-in times to ensure that plants are of the right age / height required for when they are planted.

The appointed contractor will manage the establishment phase of planting (one to two years) in accordance with the Teagasc guidance, How to plant a hedge (Teagasc 2020), to include watering in, weed suppression (using biodegradable mulches), and (where required) protection from browsing animals.

Thereafter, the Developer (ESB) will manage plantings from years three to five in agreement with the landowner.

#### *10.5.3.2.7.2 Specific Requirements (Hedgerows and Trees Within the Cable Easement)*

At the time of writing, the latest EirGrid Functional Specification for Underground Cables (EirGrid 2021) stated:

*"The easement area shall be cleared, and kept clear, of trees and other vegetation with deep root systems as these may damage the cable".*

Since publishing this specification, EirGrid has identified precedence from Germany and the Netherlands for safely planting certain shrubs over High Voltage (HV) underground cables. EirGrid has engaged closely with the ESB, and relevant Dutch and German Transmission System Operators across Europe, to understand feasibility of planting over HV underground cables in Ireland. A Draft Over Cable Planting Strategy is in advance development in consultation with ESB, for which the Design Risk Assessment (DRA) was ongoing at time of writing (including calculations to assess a possible cable de-rating). The draft strategy combines the requirement for a minimum cable burial depth of 1m (to top of Cement Bound Granular Mixture in the cable trench), use of a high performing Root Barrier Membrane, and a strictly defined shrub species list with known maximum root depths of less than 1m. It is possible that the DRA may conclude that over cable planting cannot be delivered while guaranteeing cable performance and security. There are also risks that the strictly defined shrub species list is not compatible with landowner farm boundary requirements and / or agricultural farm payments. As such, applying a precautionary principle, offsite compensatory planting is assumed for all permanent losses within the permanent easement (permanent loss is outlined in Table 10.26).

Subject to consent, the planting will commence in advance of, or in parallel with, the Construction Phase of the Proposed Development. EirGrid has identified candidate sites in County Meath and County Dublin in consultation with a charity partner, who provides compensatory planting options on third-party lands. Whether these candidate sites or other sites are used for compensatory planting, there will be no planting in semi-natural habitats of significant ecological value, which will be verified by the suitably qualified ecologist employed the compensation supplier. Offsite compensatory planting will deliver 130% of trees permanently lost within the PAB.



#### 10.5.3.2.7.3 Specific Requirements (Semi-Natural Grasslands)

The appointed contractor's ECoW will develop site-specific reinstatement plans for all semi-natural habitats (including dry calcareous grassland, and dry meadows and grassy verges). These plans will be provided to the Developer's Ecologist (ESB), and the Planning and Environmental Unit in EirGrid's Chief Infrastructure Office. In accordance with the All-Ireland Pollinator Plan 2021-2025 (NBDC 2021), commercial seed mixes will not be sown with the objective of restoring biodiversity. Seeds of certain plant species, such as wildflowers and certain species included in multi-species mixtures, are not subject to the seed certification schemes as implemented by the EU Member States and The Organisation for Economic Co-operation and Development OECD-designated authorities in respect of third countries, so there is no guarantee of the species mix or its provenance. Furthermore, even where harmful weed species are not present, seeds of non-local origin (even if the species are native) introduce new genetic strains which may displace or compromise the local, naturally-occurring flora (Dublin Naturalists Field Club 2021).

As such, in the site-specific habitat reinstatement plans for semi-natural habitats, the appointed contractor's ECoW will adopt the following approach, subject to consultation with the NPWS:

- Where it is deemed appropriate to allow habitats to re-vegetate naturally (e.g. roadside verges, where similar habitat is contiguous either side of the construction area), there will be no active seeding of re-instated topsoil;
- In all other areas, the preferred approach to reinstatement will be the use of locally collected seed from similar habitats;
- Use of commercial seed in semi-natural habitats will only be permitted where local seed is not available, or where local seed establishment has failed, and if both:
  - Certified native by the Department of Agriculture, Food, and the Marine; and
  - With the written agreement of the NPWS.

#### 10.5.3.2.7.4 General Requirements (Roadside Verges and Agricultural Areas)

The requirements that will be followed for use of seed in grassland reinstatement are:

- Commercial seed mixes will only be used on agricultural lands. All other areas will be left to naturally revegetate from the seed bank within reinstated soils;
- All seed mixes will be certified native by the Department of Agriculture, Food, and the Marine; and
- In agricultural areas, the rate of seeding, time and method of sowing, including the application of fertiliser, will be agreed with an experienced agronomist and will follow the guidance on reseedling – Pocket Manual for Reseeding (Teagasc 2020).

#### 10.5.3.2.7.5 Reporting

All reinstated or indirectly impacted semi-natural vegetation will be inspected at the completion of the Construction Phase, at which time the appointed contractor's ECoW will provide written reports on habitat condition to the Developer's Ecologist (ESB), and EirGrid's Planning and Environmental Unit. At that time, the Developer's Ecologist (ESB) will determine what additional steps are required to assist vegetation growth and establishment. Additional steps will include any of the following; replacement tree planting, additional hedge mulch, protection from browsing animals, or sowing of locally harvested seed for semi-natural grassland, using a green hay approach.

### 10.5.4 Operational Phase

No mitigation is proposed during the Operational Phase due to the nature of the Proposed Development. The effects of the Operational Phase of the Proposed Development are expected to be minimal on the IERs, with most of the impacts to them occurring during the Construction Phase. Along most of the proposed cable route, the road will be reinstated for public use, and vegetation removed will be reinstated, except along the

permanent easement, at Joint Bays, along permanent access tracks, and where over-cable planting is not technically viable due to asset risk.

### **10.5.5 Summary of Mitigation Measures**

Table 10.31 summarises the potential impacts on receptors, the proposed mitigation measures, and any predicted residual impacts, after mitigation.

**Table 10.31: Summary of Potential Construction Phase Impacts, Proposed Mitigation Measures and Predicted Residual Impacts if Present**

Ecological Receptor	Ecological Valuation	Potential Impacts	Proposed Mitigation	Significant Residual Impact (Yes/No) and Level
<b>Designated sites</b>				
Malahide Estuary SAC Malahide Estuary pNHA	International Importance National Importance	Habitat degradation (hydrology – pollution) at an International (SAC) / National (pNHA) Level	Pollution control measures	No
Baldoyle Bay SAC Baldoyle Bay pNHA	International Importance National Importance	Habitat degradation (hydrology – pollution) at an International (SAC) / National (pNHA) Level	Pollution control measures	No
Rockabill to Dalkey Island SAC	International Importance	None	None	No
Lambay Island SAC	International Importance	None	None	No
Malahide Estuary SPA	International Importance	Habitat degradation (hydrology – pollution), mortality, disturbance / displacement at an International Level	Pollution control measures Non-transparent visual and noise barrier (temporary installation)	No
Baldoyle Bay SPA	International Importance	Habitat degradation (hydrology-pollution), mortality, disturbance / displacement at an International Level	Pollution control measures	No
North-West Irish Sea SPA	International Importance	Habitat degradation (hydrology-pollution,) mortality, disturbance / displacement	Non-transparent visual and noise barrier (temporary installation)	No
North Bull Island SPA	International Importance	Habitat degradation (hydrology-pollution), mortality, disturbance / displacement at an International Level	Pollution control measures	No
South Dublin Bay and River Tolka Estuary SPA	International Importance	Habitat degradation (hydrology-pollution), mortality, disturbance / displacement at an International Level	Non-transparent visual and noise barrier (temporary installation)	No
Rogerstown Estuary SPA	International Importance	Habitat degradation (hydrology-pollution), mortality, disturbance / displacement at an International Level	Pollution control measures	No
Ireland's Eye SPA	International Importance	Habitat degradation (hydrology-pollution), mortality, disturbance / displacement at an International Level	Non-transparent visual and noise barrier (temporary installation)	No
Howth Head Coast SPA	International Importance	None	None	No

Ecological Receptor	Ecological Valuation	Potential Impacts	Proposed Mitigation	Significant Residual Impact (Yes/No) and Level
Lambay Island SPA	International Importance	Habitat degradation (hydrology-pollution), mortality, disturbance / displacement at an International Level	Pollution control measures Non-transparent visual and noise barrier (temporary installation)	No
Dalkey Islands SPA	International Importance	None	None	No
Skerries Islands SPA	International Importance	Habitat degradation (hydrology-pollution), mortality, disturbance / displacement at an International Level	Pollution control measures Non-transparent visual and noise barrier (temporary installation)	No
Rockabill SPA	International Importance	None	None	No
River Nanny Estuary and Shore SPA	International Importance	Habitat degradation (hydrology-pollution), mortality, disturbance / displacement at an International Level	Pollution control measures Non-transparent visual and noise barrier (temporary installation)	No
Boyne Estuary SPA	International Importance	Habitat degradation (hydrology-pollution), disturbance / displacement at an International Level	Pollution control measures Non-transparent visual and noise barrier (temporary installation)	No
Dundalk Bay SPA	International Importance	Habitat degradation (hydrology-pollution), mortality, disturbance / displacement at an International Level	Pollution control measures Noise barrier erection	No
Sluice River Marsh pNHA	National Importance	Habitat degradation (hydrology-pollution) at a National Level	Pollution control measures	No
North Dublin Bay pNHA	National Importance	None	None	No
Howth Head pNHA	National Importance	Habitat degradation (hydrology-pollution) at a National Level	Pollution control measures	No
Ireland's Eye pNHA	National Importance	None	None	No
<b>Habitats (including Fossitt codes, outside designated sites)</b>				
Arable crops (BC1)	Less than local Importance	Habitat loss (temporary and permanent) at Less than Local Level	None	No
Horticultural land (BC2)	Less than local Importance	None	None	No

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Ecological Receptor	Ecological Valuation	Potential Impacts	Proposed Mitigation	Significant Residual Impact (Yes/No) and Level
Tilled land (BC3)	Less than local Importance	Habitat loss (temporary and permanent) at Less than Local Level	None	No
Flower beds and borders (BC4)	Less than local Importance	None	None	No
Earth banks (BL2)	Less than local Importance	None	None	No
Building or Artificial (BL3)	Less than local Importance	Habitat loss (temporary and permanent) at Less than Local Level	None	No
Spoil and bare ground (ED2)	Local Importance (Lower Value)	None	None	No
Recolonising bare ground (ED3)	Local Importance (Higher Value)	Habitat loss (temporary and permanent) and fragmentation at a Local Level	Habitat reinstatement	No – permanent habitat loss will occur, but based on size and distribution the effect is not significant
Other artificial lakes and ponds (FL8)	Local Importance (Higher Value)	Habitat loss (temporary) at a Local Level	Habitat reinstatement	No
Depositing lowland rivers (FW2)	Local Importance (Higher Value)	Habitat degradation – surface water quality at a Local Level	Pollution control measures	No
Drainage ditches (FW4)	Local Importance (Higher Value)	Habitat loss (temporary and permanent) and habitat degradation – surface water quality at a Local Level	Habitat reinstatement Pollution control measures	Yes, Local Level
Improved agricultural grassland (GA1)	Less than local Importance	Habitat loss (temporary and permanent) at Less than Local Level	None	No
Amenity grassland (GA2)	Less than local Importance	Habitat loss (temporary) at Less than Local Level	None	No
Marsh (GM1)	Local Importance (Higher Value)	Habitat degradation at a Local Level	Pollution control measures	No
Dry calcareous grassland (GS1)	Local Importance (Higher Value)	Habitat loss (temporary and permanent) and fragmentation at a Local Level	Habitat reinstatement	Yes, Local Level
Dry meadows and grassy verges (GS2)	Local Importance (Higher Value)	Habitat loss (temporary and permanent) and fragmentation at a Local Level	Habitat reinstatement	Yes, Local Level
Wet grassland (GS4)	Local Importance (Higher Value)	Habitat loss (temporary and permanent) fragmentation and degradation at a Local Level	Habitat reinstatement Pollution control measures	Yes, Local Level

Ecological Receptor	Ecological Valuation	Potential Impacts	Proposed Mitigation	Significant Residual Impact (Yes/No) and Level
(Mixed) broadleaved woodland (WD1)	Local Importance (Higher Value)	Habitat loss (temporary and permanent) and fragmentation at a Local Level	Habitat reinstatement outside of the cable easement	Yes, Local Level
Mixed broadleaved / conifer woodland (WD2)	Local Importance (Higher Value)	Habitat loss (temporary) and fragmentation at a Local Level	Habitat reinstatement	No
Conifer plantation (WD4)	Local Importance (Lower Value)	None	None	No
Scattered trees and parkland (WD5)	Local Importance (Lower Value)	Habitat loss (temporary) and fragmentation at a Local Level	Habitat reinstatement	No
Hedgerows (WL1) species rich	County Importance	Habitat loss (temporary and permanent) and fragmentation at a County Level	Habitat reinstatement outside of the cable easement	Yes, Local to County Level
Hedgerows (WL1) species poor	Local Importance (Higher Value)	Habitat loss (temporary and permanent) and fragmentation at a County Level	Habitat reinstatement outside of the cable easement	Yes, Local Level
Treeline (WL2)	Local Importance (Higher Value)	Habitat loss (temporary and permanent) and fragmentation at a County Level	Habitat reinstatement outside of the cable easement	Yes, Local to County Level
Riparian woodland (WN5)	Local Importance (Higher Value)	Habitat loss (temporary) and degradation (surface water quality) at a Local Level	Habitat reinstatement outside of the cable easement Pollution control measures	No
Scrub (WS1)	Local Importance (Higher Value)	Habitat loss (temporary and permanent) and fragmentation at a Local Level	Habitat reinstatement outside of the cable easement	Yes, Local Level
Immature woodland (WS2)	Local Importance (Lower Value)	Habitat loss (temporary and permanent) and fragmentation at a Local Level	Habitat reinstatement outside of the cable easement	Yes, Local Level
Ornamental / non-native shrub (WS3)	Less than local Importance	Habitat loss (temporary and permanent) at Less than Local Level	Habitat reinstatement	No
Recently-felled woodland (WS5)	Local Importance (Lower Value)	None	None	No
<b>Protected, notable and invasive species and taxa</b>				
SCI bird species	International Importance	Habitat degradation (hydrology-pollution), disturbance / displacement/mortality, and mortality at an National-International Level	Pollution control measures Noise barrier erections Non-transparent visual screening barrier erection Control measures to reduce machineries noise	No

Ecological Receptor	Ecological Valuation	Potential Impacts	Proposed Mitigation	Significant Residual Impact (Yes/No) and Level
			Habitat reinstatement	
European eel	National Importance	Habitat degradation (hydrology – pollution) and disturbance / displacement at a County Level	Pollution control measures Control measures for works within and adjacent to watercourses Habitat reinstatement	No
White-clawed crayfish	County Importance	Habitat degradation (hydrology – pollution) and disturbance / displacement at a County Level	Pollution control measures Control measures for works within and adjacent to watercourses Habitat reinstatement	No
Otter	County Importance	Habitat degradation (hydrology – pollution) and disturbance / displacement at a County Level	Pollution control measures Control measures to reduce machinery noise and vibration and to work within holts Temporary lighting will be controlled and directed Seasonal limitations Working distance from holts measures Habitat reinstatement Derogation licence	No
Atlantic salmon	County Importance	Habitat degradation (hydrology – pollution) and disturbance / displacement at a Local-County Level	Pollution control measures Control measures for works within and adjacent to watercourses Habitat reinstatement	No
Lamprey spp.	County Importance	Habitat degradation (hydrology – pollution) and disturbance / displacement at a Local-County Level	Pollution control measures Control measures for works within and adjacent to watercourses Habitat reinstatement	No
All other Red, Amber or Green listed bird species (non-SCI breeding populations)	Local Importance (Higher Value)	Habitat degradation (hydrology – pollution) and disturbance / displacement (including temporary lighting) at a Local Level	Pollution control measures Noise barrier erections Temporary lighting will be controlled and directed	No



Ecological Receptor	Ecological Valuation	Potential Impacts	Proposed Mitigation	Significant Residual Impact (Yes/No) and Level
			Non-transparent visual screening barrier erection Control measures to reduce machineries noise Habitat reinstatement	
Bats	Local Importance (Higher Value)	Habitat loss and disturbance from temporary lighting at a Local Level	Alternative roost provision Night-time working limited Temporary lighting will be controlled and directed Derogation licence	No
Badger	Local Importance (Higher Value)	Disturbance at a Local Level (likely of two active setts)	Seasonal work limitation Temporary lighting will be controlled and directed Control measures to reduce machineries impact within setts Working distance from setts measures	No
Other small mammal species protected under the Wildlife Acts	Local Importance (Higher Value)	Habitat loss and disturbance / displacement at a Local Level	Seasonal work limitation Derogation licence Noise and light limitation Night-time working limited Habitat reinstatement	No
Smooth newt	Local Importance (Higher Value)	Habitat loss and disturbance / displacement at a Local Level	Seasonal working limitation Individual translocation Habitat reinstatement Water levels maintained in water features potentially used	No
Common frog	Local Importance (Higher Value)	Habitat loss and disturbance / displacement at a Local Level	Seasonal working limitation Individual translocation Habitat reinstatement Water levels maintained in water features potentially used	No

Ecological Receptor	Ecological Valuation	Potential Impacts	Proposed Mitigation	Significant Residual Impact (Yes/No) and Level
Common lizard	Local Importance (Higher Value)	Habitat loss and disturbance / displacement at a Local Level	Seasonal working limitation Individual translocation Habitat reinstatement	No
Other fish species (including trout)	Local Importance (Lower Value)	Habitat degradation (hydrology – pollution) and disturbance / displacement at a Local Level	Pollution control measures Control measures for works within and adjacent to watercourses Habitat reinstatement	No
Non-native invasive plant species	N/A	Spread of invasive plants at a Local Level	Chemical and physical control and eradication Exclusion zone established to avoid spread	No

## 10.6 Residual Impacts and Compensation (Unrelated to European Sites)

Residual significance is defined as the level of significance of a potential impact or effect following the implementation of mitigation. For the purpose of this assessment, significant residual impacts are only considered for permanent habitat losses (as outlined in Table 10.32). Temporary habitat losses (for GS2 dry meadow and grassy verges and FL8 other artificial lakes and ponds) are not considered as there are no significant residual impacts following the implementation of mitigation (i.e. habitat reinstatement).

There will be a Negative, Significant and Medium to Long -Term residual impacts at Local to County Level from the loss of hedgerows and treelines until new species rich hedgerows and treelines are established. There will be a Negative, Significant and Permanent residual impact estimated at County Level from the loss of mature trees as this cannot be compensated with replacement planting due to the time taken for trees to reach maturation. There is no scope for wet grassland at Belcamp Substation, where the grasslands are dry, or compensation options for dry calcareous and neutral grassland (the offsite compensation strategy does not include grassland as seeding is not permitted as outlined in Section 10.5.3.2.7.3). As such, the grassland losses are assessed as Negative, Significant and Permanent residual impacts, estimated at a Local (High) geographic scale.

Table 10.32 identifies the net habitat loss after mitigation (note dry meadows and grassy verges (GS2) is not included within this table as the predicted habitat losses are temporary with no residual impacts predicted following reinstatement), and after compensation via offsite compensatory planting being proposed to deliver 130% of trees permanently lost, which would equate to between 705 and 1,528 new trees planted. An offsite hedgerow compensation strategy has been developed, in light of the urgent biodiversity action required at European and national level, and the hedgerow / tree policy objectives outlined in the Meath County Development Plan (particularly HER POL 37, HER POL 38, HER POL 40) (MCC 2021) and the Fingal Development Plan (particularly GINHP21, GINHP22, GINHO44) (FCC 2023).

A Draft Over Cable Planting Strategy is in advance development in consultation with the ESB, for which the DRA was ongoing at the time of writing. However, applying a precautionary principle, it is assumed that the DRA will conclude planting cannot be carried out while maintaining technical and safety standards. As such, offsite compensatory planting is assumed to be the only action available to replace hedgerows / treelines removed from off-road underground cable route sections. The offsite compensatory planting will be entirely outside the PAB. A minimum of 130% compensatory offsite planting will be delivered by the Developer (ESB), in consultation with EirGrid. The surplus will help contribute towards an overall biodiversity net gain.

Subject to consent, the planting will commence in advance of, or in parallel with, the Construction Phase of the Proposed Development. EirGrid has identified candidate sites in County Meath and County Dublin in consultation with a charity partner, who provides compensatory planting options on third-party lands. Whether these candidate sites or other sites are used for compensatory planting, there will be no planting in semi-natural habitats of significant ecological value, which will be verified by the suitably qualified ecologist employed the compensation supplier.

**Table 10.32: Net Habitat Loss and Gain of IERs After Mitigation and After Compensation Planting**

Fossitt Habitat Code	Fossitt Habitat	Permanent Net Habitat Loss After Mitigation	Significant Residual Impact	Compensation Proposed	Net Habitat Loss or Gain After Compensation Planting <sup>NOTE 2</sup>
ED3	Recolonising bare ground	0.02 ha	No	N/A	-0.02 ha (habitat loss)
FW4	Drainage ditches	0.01 km	No	N/A	-0.01 km (habitat loss)
GS1	Dry calcareous and neutral grassland	2.85 ha	Yes	No – no compensation options available	-2.85 ha (habitat loss)
GS2	Dry meadows and grassy verges	0.35 ha	Yes	No – no compensation options available	-0.35 ha (habitat loss)
GS4	Wet grassland	0.93 ha	Yes	No – no compensation options available	-0.93ha (habitat loss)
WD1	(Mixed) broadleaved woodland	0.06 ha	Yes	0.08 ha (130% compensation)	+0.02 ha (habitat gain)
WL1	Hedgerow	0.67 km	Yes	0.87 km (130% compensation)	+0.20 km (habitat gain)
WL2	Treeline	0.04 km	Yes	0.05 km (130% compensation)	+0.01 km (habitat gain)
WS1	Scrub	0.13 ha	Yes	0.17 ha (130% compensation)	+0.04 ha (habitat gain)
WS2	Immature woodland	0.59 ha	Yes	0.77 ha (130% compensation)	+0.18 ha (habitat gain)
N/A	Individual trees within study area, including mature trees <sup>NOTE 1</sup>	512 – 1,174	Yes	666 to 1,526 trees planted offsite (130% compensation)	+154 to 352 trees (habitat gain)

NOTE 1: Study area as defined in the Arboricultural Assessment (Appendix A18.2 in Volume 3 of this EIAR), as the PAB plus a 30m buffer. Note due to the data collection methodology for the arboricultural survey, the individual tree data includes treelines, hedgerows, and woodland. The respective permanent loss and compensation figures are therefore indicative only as double counting of these habitat types is unavoidable. Trees also take many years to reach maturity so there will be residual impact from trees felled before they reach maturity.

NOTE 2: The conclusion that compensation delivers a net gain relies upon a simplistic measurement of habitat length only. The significant residual effects arising from net habitat loss have been clearly stated. The offsite compensation will take place outside the PAB in Dublin and Meath, and so does not offset the permanent habitat fragmentation effects. The offsite compensation will involve planting of young trees, and so will also not offset losses of mature trees and hedges.

## 10.7 Conclusion

Significant residual impacts are predicted for dry calcareous and neutral grassland, wet grassland, scrub, mixed broadleaved woodland, immature woodland, hedgerows, treelines and individual trees. There are no compensation options available at present to offset the significant residual impacts upon grassland. Compensatory measures are proposed for hedgerows, treelines and individual trees, although there will be an inevitable loss of biodiversity until these habitats have established (approximately 5 to 10 years for hedgerows and 20 to 30 years for treelines and individual trees). The loss of mature trees is considered a permanent residual impact of County Level significance due to the time taken for replacement trees to reach maturation.

Following offsite compensation, there will be a net gain in trees numbers and with EirGrid's commitment to monitoring mitigation success and embedding Nature Inclusive Design, the Proposed Development will ultimately align with the County Meath Development Plan (particularly HER POL 37, HER POL 38, HER POL 40) (MCC 2021) and the Fingal Development Plan (particularly GINHP21, GINHP22, GINHO44) (FCC 2023) policies and objectives.

## 10.8 References

- Andrews, H., and Gardener, M. (2016). Bat Tree Habitat Key – Database Report 2016. AEcol, Bridgwater
- Aughney, T., Roche, N. and Langton, S (2018). The Irish Bat Monitoring Programme 2015-2017. Irish Wildlife Manuals, No. 103. National Parks and Wildlife Service, Department of Culture Heritage and the Gaeltacht, Ireland.
- Bat Conservation Ireland, BCI. (2022) Managing Hedgerows for Bats, Available at: <https://www.batconservationireland.org/wp-content/uploads/2022/07/Managing-Hedgerows-for-Bats.pdf> (Accessed: 23 January 2024).
- Bibby, C.J., Burgess, N.D., Hill, D.A. and Mustoe, S.H. (2000). Bird Census Techniques. 2nd Edition. Academic Press: London.
- BING maps (2023), available at: <https://www.bing.com/maps?cp=51.501477%7E-0.074844&lvl=11.0>
- Birdwatch Ireland (2019). Irish Wetland Bird Survey: Site Summaries. Available from: <https://birdwatchireland.ie/our-work/surveys-research/research-surveys/irish-wetland-bird-survey/> (Accessed February 2023).
- Boland, H. and Crowe, O. (2008). An Assessment of the Distribution and Range of Greylag (Icelandic-Breeding and Feral Populations) in Ireland. Report to the National Parks and Wildlife Service and the Northern Ireland Environment Agency. BirdWatch Ireland, Newtown Mountkenedy.
- Bord na Mona (2021). Prosperous Bog. Cutaway Bog Decommissioning and Rehabilitation Plan. Available from: <https://www.bnmpcas.ie/wp-content/uploads/sites/18/2022/01/Prosperous-Draft-Rehab-Plan-V6.pdf> (Accessed February 2023).
- Botanical Society of Britain and Ireland (BSBI). (2020). Lowland Hay Meadows (EU Habitats Directive Code 6510) BSBI Ireland Annex I Grassland Resources. Available from: <https://bsbi.org/irish-grasslands-project> (Accessed February 2023).
- Box, J and Stanhope, K. (2010). Translocating wildlife habitats: a guide for civil engineers. Civil Engineering, Volume 163, Issue 3.
- Catry, T., Alves, J.A., Andrade, J., Costa, H., Dias, M.P., Fernandes, P., Leal, A., Lourenco, P.M., Martins, R.C., Muniz, F., Pardal, S., Rocha, A., Santos, C.D., Encarnacao, V. and Granadeiro, J.P. (2011). Long-term declines of wader populations at the Tagus estuary, Portugal: a response to global or local factors? Bird Conservation International, 21, 438–453.
- Charles, P. and Edwards, P. (2015). Environmental good practice on site guide, 4<sup>th</sup> edition. Construction Industry Research and Information Association.
- CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester.
- Clausen, Kevin & Clausen, Preben & Hounisen, J. & Vissing, Marie & Fox, A. (2013). Foraging range, habitat use and minimum flight distances of East Atlantic Light-bellied Brent Geese Branta bernicla hrota in their spring staging areas. Wildfowl. Special Issue 3. 26-39.
- Collins, J. (ed). (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3<sup>rd</sup> edition). The Bat Conservation Trust, London.

Collins, J. (ed). (2023). *Bat Surveys for Professional Ecologists: Good Practice Guidelines (4<sup>th</sup> edition)*. The Bat Conservation Trust, London.

Curtis, T.G.F. and McGough, H.N. (1988, updated 2005). *The Irish Red Data Book: 1 Vascular Plants*. Wildlife Service Ireland, Stationery Office, Dublin.

Cutts, N. and Allen, J. (1999). *Avifaunal Disturbance Assessment, Flood Defence Work, Saltend*. Report to the Environment Agency.

Cutts, N., Hemingway, K. and Spencer, J. (2013). *Waterbird disturbance mitigation toolkit*. Institute of Estuarine and Coastal Studies, University of Hull.

Cutts, N., Phelps, A. and Burdon, D. (2009). *Construction and Waterfowl: Defining Sensitivity, Response, Impacts and Guidance*. Report to Humber INCA. Institute of Estuarine and Coastal Studies, University of Hull.

Department for Environment, Food and Rural Affairs (2006). *Hedgerow Survey Handbook*. A standard procedure for local surveys in the UK.

Department for Housing, Local Government and Heritage (2017) *Margaritifera Sensitive Areas Map* [online] Available from *Margaritifera Sensitive Areas Map - Dataset* - [data.gov.uk](https://data.gov.uk/dataset/margaritifera-sensitive-areas-map)

Environmental Protection Agency (2022). *Guidelines on the Information to be contained in Environmental Assessment Reports*.

EirGrid (2020). *110kV, 220kV and 400kV Underground Cable Functional Specification General Requirements*. Document Reference CDS-GFS-00-001-R0

EirGrid (2023). *Environmental Requirements – Technical Note 1*.

Gilbert, G., Stanbury, A. and Lewis L. (2021). *Birds of Conservation Concern in Ireland 2020-2026*. *Irish Birds* 9, 523-544. Delanty, K., Feeney, R. and Shephard, S. (2022). *Fish Stock Survey of the River Liffey 2021*. Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin 24, Ireland. Department of Housing, Local Government and Heritage (2022). *Ireland's 4<sup>th</sup> National Biodiversity Action Plan*. Draft for Public Consultation.

Dias, M., Granadeiro, J., Lecoq, M., Santos, C. and Palmeirim, J. (2006). *Distance to high-tide roosts constrains the use of foraging areas by dunlins: Implications for the management of estuarine wetlands*. *Biological Conservation*. 131, 446-452.

Dublin City Council (2022). *Dublin City Development Plan 2022-2028*.

Dublin Naturalists' Field Club (2021). *The case against 'wildflower' seed mixtures*. Position Paper No.1. Available online at <https://dnfc.net/wp-content/uploads/2021/07/Wildflower-Mixtures-LR.pdf>

EirGrid (2020). *Ecological Guidelines for Electricity Transmission Projects. A Standard Approach to Ecological Impact Assessment of High Voltage Transmission Projects*. Available online at <https://www.eirgridgroup.com/site-files/library/EirGrid/Ecology-Guidelines-for-Electricity-Transmission-Projects.pdf>

EirGrid (2021). *110kV/220kV/400kV Underground Cable Functional Specifications (CDS-GFS-00-001-R1)*. Available online at <https://www.eirgridgroup.com/site-files/library/EirGrid/110kV-Underground-Cable-Functional-Specification-General-Requirements.pdf>

EirGrid (2023). Grid Implementation Plan 2023-2028 DRAFT. Available from:

<https://consult.eirgrid.ie/en/consultation/draft-grid-implementation-plan-2023-2028>

Environmental Protection Agency (2023). Online environmental information/data held by the Environmental Protection Agency Unified GIS Application. Available from: [gis.epa.ie/EPAMaps](https://gis.epa.ie/EPAMaps) [Accessed February 2023].

Environmental Protection Agency (2022). Guidelines on the information to be contained in Environmental Impact Assessment Reports.

EPA (2023). EPA Maps. [Online] Available from [gis.epa.ie/EPAMaps/](https://gis.epa.ie/EPAMaps/)

ESRI (2023). Mapping software. Available from: <https://www.esri.com/en-us/home>

European Communities (Birds and Natural Habitats) Regulations (2011)

European Commission (2017). Environmental Impact Assessment of Projects, Guidance on the preparation of the Environmental Impact Assessment Report.

Fingal County Council (2023). Fingal Development Plan 2023-2029.

Fossitt, J. (2000). Guide to Habitats in Ireland. The Heritage Council.

Foulkes, N., Fuller, J., Little, D., McCourt, S. and Murphy, P. (2013). Hedgerow Appraisal System – Best Practise Guidance on Hedgerow Survey, Data Collation and Appraisal. Woodlands of Ireland, Dublin. Unpublished Report.

Froglife (1999). Advice Sheet 10. Reptile Survey. An introduction to planning, conducting and interpreting survey for snake and lizard conservation.

Gallagher, M.B., Dick, J.T.A. and Elwood, R.W. (2006). Riverine habitat requirements of the white-clawed crayfish, *Austropotamobius pallipes*. Biology and Environment: Proceedings of the Royal Irish Academy. 106B, 1-8.

Gilbert G., Gibbons D.W. and Evans J. (1998). Bird Monitoring Methods: A Manual of Techniques for Key UK Species. RSPB, Sandy.

Gilbert, G., Stanbury, A. and Lewis L. (2021). Birds of Conservation Concern in Ireland 2020-2026. Irish Birds 9, 523-544.

Glover, H. K., Weston, M. A., Maguire, G. S., Miller, K. K. and Christie, B.A. (2011). Towards ecologically meaningful and socially acceptable buffers: response distances of shorebirds in Victoria, Australia, to human disturbance. Landscape and Urban Planning. 103, 326-34.

Google Earth (2023) available from <https://earth.google.com/web/@0,-21.4667689,0a,22251752.77375655d,35y,0h,0t,0r/data=OgMKATA>

Government of Ireland (2018). Project Ireland 2040 – National Planning Framework.

Government of Ireland (2021). Project Ireland 2040 – Development Plan 2021-2030.

Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. and Thompson, D. (2013). Raptors: a field guide to survey and monitoring. 3<sup>rd</sup> ed. The Stationery Office, Edinburgh.



Hendry, K. and Cragg-Hine, D. (2003). Ecology of the Atlantic Salmon. Conserving Natura 2000 Rivers Ecology Series No. 7. English Nature, Peterborough

Holdich, D. (2003). Ecology of the White-clawed Crayfish. Conserving Natura 2000 Rivers Ecology Series No. 1. English Nature, Peterborough.

Inland Fisheries Ireland (2016). Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters.

Invasive Non-Native Species (INNS) (2023) Department for Environment, Food & Rural Affairs, The Scottish Government, and Welsh Government

Jacobs (2022). Arboricultural Technical Note: Planting over High Voltage Underground Cables.

Jacobs (2023a). CP1021 Grid Upgrade. Appropriate Assessment Screening Report.

Jacobs (2023b). CP1021 Grid Upgrade. Natura Impact Statement.

Jacobs (2023c). CP1021 Grid Upgrade Design Framework

Jacobs (2023d). East Meath – North Dublin Upgrade. Ecology Watercourse Crossings – Technical Note.

Johnston, A., Ausden, M., Dodd, A. M., Bradbury, R. B., Chamberlain, D. E., Jiguet, F. and Pearce-Higgins, J. W. (2013). Observed and predicted effects of climate change on species abundance in protected areas. *Nature Climate Change*, 3, 1055– 1061.

Kelleher, C. and Marnell, F. (2006). Bat Mitigation Guidelines for Ireland. Irish Wildlife Manuals. No. 25. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

Kelly, F.L., Matson, R., Connor, L., Feeney, R., Morrissey, E., Wogerbauer, C. and Rocks, K. (2012) Water Framework Directive Fish Stock Survey of Rivers in the Eastern River Basin District. Inland Fisheries Ireland, Swords Business Campus, Swords, Co. Dublin, Ireland

Kennedy, G.J.A. (1984) Evaluation of techniques for classifying habitats for juvenile salmon (*Salmo salar* L.) Proceedings of the Atlantic Salmon trust workshop on stock enhancement, 23.

King, J.L., Marnell, F., Kingston, N., Rosell, R., Boylan, P., Caffrey, J.M., FitzPatrick, Ú., Gargan, P.G., Kelly, F.L., O'Grady, M.F., Poole, R., Roche, W.K. and Cassidy, D. (2011). Ireland Red List No. 5: Amphibians, Reptiles & Freshwater Fish. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

Legagneux, P., C. Blaize, F. Latraube, J. Gautier, and V. Bretagnolle. 2009. Variation in home-range size and movements of wintering dabbling ducks. *Journal of Ornithology* 150 (1):183-193.  
<http://dx.doi.org/10.1007/s10336-008-0333-7>

Linszen, H., van de Pol, M., Allen, A.M., Jans, M., Ens, B.J., Krijgsveld, K. L., Frauendorf, M. And van der Kolk, H. (2019). Disturbance increases high tide travel distance of a roosting shorebird but only marginally affects daily energy expenditure. *Avian Research* 10, 31.

- Lyons, M.D. and Kelly, D.L. (2016). Monitoring guidelines for the assessment of petrifying springs in Ireland. Irish Wildlife Manuals, No. 94. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.
- King, J.L., Marnell, F., Kingston, N., Rosell, R., Boylan, P., Caffrey, J.M., FitzPatrick, Ú., Gargan, P.G., Kelly, F.L., O'Grady, M.F., Poole, R., Roche, W.K. and Cassidy, D. (2011). Ireland Red List No. 5: Amphibians, Reptiles & Freshwater Fish. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.
- Madsen, J. (1985). Relations between spring habitat selection and daily energetics of Pink-footed Geese *Anser brachyrhynchus*. Scandinavian Journal of Ornithology. 16, 222–228.
- Maitland, P.S. (2003). Ecology of the River, Brook and Sea Lamprey. Conserving Natura 2000 Rivers Ecology Series No. 5. English Nature, Peterborough.
- Martin, J. R., O'Neill, F. H. and Daly, O. H. (2018) The monitoring and assessment of three EU Habitats Directive Annex I grassland habitats. Irish Wildlife Manuals, No. 102. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland.
- Marnell, F., Kingston, N. and Looney, D. (2009). Ireland Red List No. 3: Terrestrial Mammals, National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.
- Marnell, F., Kelleher, C., and Mullen, E (2022). Bat Mitigation Guidelines for Ireland – version 2. Irish Wildlife Manuals, Number 134. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland.
- Martin, J. R., O'Neill, F. H. and Daly, O. H. (2018) The monitoring and assessment of three EU Habitats Directive Annex I grassland habitats. Irish Wildlife Manuals, No. 102. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland.
- Masters-Williams, H., Heap, A., Kitts, H., Greenshaw, L., Davis, S., Fisher, P., Hendrie, M. and Owens, D. (2001). Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors. Construction Industry Research and Information Association.
- Matson, R., Delanty, K., Gordon, P., O'Briain, R., Garland, D., Cierpal, D., Connor, L., Corcoran, W., Coyne, J., McLoone, P., Morrissey-McCaffrey, E., Brett, T., Ní Dhonnabhain, L. and Kelly, F.L., (2018a). Sampling Fish in Rivers 2017 – Tolka, Factsheet No. 8. National Research Survey Programme. Inland Fisheries Ireland.
- Matson, R., Delanty, K., Gordon, P., O'Briain, R., Garland, D., Cierpal, D., Connor, L., Corcoran, W., Coyne, J., McLoone, P., Morrissey-McCaffrey, E., Brett, T., Ní Dhonnabhain, L. and Kelly, F.L., (2018b) Sampling Fish in Rivers 2017 – Broadmeadow & Ward, Factsheet No. 2. National Research Survey Programme. Inland Fisheries Ireland.
- Matson, R., Delanty, K., Gordon, P., O'Briain, R., McCarthy, E., Cierpal, D., Connor, L., Corcoran, W., Coyne, J., McLoone, P., Morrissey-McCaffrey, E., Brett, T., Gavin, A and Kelly, F.L., (2019) Sampling Fish in Rivers 2018 – Ryewater, Factsheet No. 5. National Research Survey Programme. Inland Fisheries Ireland.
- Meath County Council. Community Biodiversity Action Plans (2016). Available at <https://www.meath.ie/council/council-services/heritage-architectural-conservation/heritage/heritage-plans-policies-and-guidelines/biodiversity-plans/community-biodiversity-action-plans>
- Meath County Council (2021). Meath County Development Plan 2021-2027.

Met Éireann (2023). The Irish Meteorological Service

Mitchell-Jones, A.J, and McLeish, A.P. (eds). (2004). Bat Workers' Manual, 3<sup>rd</sup> ed. JNCC, Peterborough.

Murnane, E., Heap, A., and Swain, A. (2006a). Control of water pollution from linear construction projects: Technical Guide. Construction Industry Research and Information Association.

Murnane, E., Heap, A., and Swain, A. (2006b). Control of water pollution from linear construction projects: Site guide. Construction Industry Research and Information Association.

National Biodiversity Data Centre (2023). Online data records as held by the National Biodiversity Data Centre. Available from [maps.biodiversityireland.ie](https://maps.biodiversityireland.ie) [Accessed January 2023]

National Parks and Wildlife Service (2019a). The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill.  
National Parks and Wildlife Service (2019b). The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments. Unpublished NPWS report. Department of Culture, Heritage and the Gaeltacht.

National Parks and Wildlife Service (2020). NPWS Maps. [Online] Available from NPWS Biodiversity Maps – Biodiversity Maps ([biodiversityireland.ie](https://maps.biodiversityireland.ie))

National Parks and Wildlife Service (2019c). The Status of EU Protected Habitats and Species in Ireland. Volume 3: Species Assessments. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill.

National Roads Authority (NRA) (2004). Guidelines for the Treatment of Noise and Vibration in National Road Schemes.

National Roads Authority (NRA) (2005). Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes.

National Roads Authority (NRA) (2006a). Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes. National Roads Authority.

National Roads Authority (NRA) (2006b). Guidelines for the Treatment of Badgers during the Construction of National Road Schemes. National Roads Authority.

National Roads Authority (NRA) (2008a). Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes. National Roads Authority. National Roads Authority.

National Roads Authority (NRA) (2008b). Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes.

National Roads Authority (NRA) (2009). Guidelines for Assessment of Ecological Impacts of National Road Schemes. National Roads Authority, Dublin.

National Roads Authority (NRA) (2010). Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads.

National Tree Map (Bluesky, 2023). Available at: <https://bluesky-world.com/ntm/>

NatureSpot (2024). Available at: <https://www.naturespot.org.uk/>

Niven, A.J. and McCauley, M. (2013). Lamprey Baseline Survey No2: River Faughan and Tributaries SAC. Loughs Agency, 22, Victoria Road, Derry.

Non-Native Species Secretariat (2024). Web site: <https://www.nonnativespecies.org/>

NPWS (2017). NPWS Margaritifera Sensitive Area Map. Available from: <https://data.gov.ie/dataset/margaritifera-sensitive-areas-map> (Accessed November 2022).

NPWS (2019a). Online data available on European Site network and on Natural Heritage Areas (NHAs) or proposed Natural Heritage Areas (pNHAs) held by the National Parks and Wildlife Service. Available from: <https://www.npws.ie/protected-sites> (Accessed January 2023).

NPWS (2021). Guidance on the Strict Protection of Certain Animal and Plant Species under the Habitats Directive in Ireland. Department of Housing, Local Government and Heritage.

NPWS (2011) Conservation Objectives: Dundalk Bay SAC 000455 and Dundalk Bay SPA 004026. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2012a) Conservation Objectives: Baldoyle Bay SAC 000199. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2012b) Conservation Objectives: River Nanny Estuary and Shore SPA 004158. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2013a) Conservation Objectives: Malahide Estuary SAC 000205. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2013b) Conservation Objectives: Malahide Estuary SPA 004025. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2013c) Conservation Objectives: Baldoyle Bay SPA 004016. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2013d) Conservation Objectives: Rogerstown Estuary SPA 004015. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2013e) Site synopsis: Rye Water Valley/Carton SAC 001398. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2013f) Conservation Objectives: Boyne Estuary SPA 004080. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2015a) Conservation Objectives: North Bull Island SPA 004006. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2015b) Conservation Objectives: South Dublin Bay and River Tolka Estuary SPA 004024. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2022a) Conservation objectives for Ireland's Eye SPA [004117]. First Order Site-specific Conservation Objectives Version 1.0. Department of Housing, Local Government and Heritage.

NPWS (2022b) Conservation objectives for Lambay Island SPA [004069]. First Order Site-specific Conservation Objectives Version 1.0. Department of Housing, Local Government and Heritage.

NPWS (2022c) Conservation objectives for Skerries Islands SPA [004122]. First Order Site-specific Conservation Objectives Version 1.0. Department of Housing, Local Government and Heritage.

NPWS (2023a).Ireland's 4<sup>th</sup> National Biodiversity Action Plan 2023-2030

NPWS (2023) Conservation Objectives: North-West Irish Sea SPA 004236. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

O'Connor, W., Hayes G., O'Keeffe, C. and Lynn, D. (2009) Monitoring of white-clawed crayfish *Austropotamobius pallipes* in Irish lakes. Irish Wildlife Manuals, No 37. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin.

O'Neill, F.H., Martin, J.R., Devaney, F.M. and Perrin, P.M. (2013). The Irish semi-natural grasslands survey 2007-2012. Irish Wildlife Manuals, No. 78. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Ireland.

Perrin, P., Lynn, D. and FitzPatrick, U. (2018). 'The Irish Vegetation Classification – An Overview of Concepts, Structure and Tools. In Practice, CIEEM, 15-19.

Potter, I. C., and Osborne, T.S. (1975). The systematics of British larval lampreys. *Journal of Zoology*, 176(3), 311-329.

Rees, E. C., Bruce, J. H., and White, G. T. (2005). Factors affecting the behavioural responses of whooper swans (*Cygnus c. cygnus*) to various human activities. *Biological conservation*, 121(3), 369-382.

Reynolds, J.D., O'Connor, W., O'Keefe, C. and Lynn, D. (2010) A technical manual for monitoring white-clawed crayfish *Austropotamobius pallipes* in Irish lakes. Irish Wildlife Manuals, No. 45, National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin.

Rodwell, J.R. (2006). National Vegetation Classification: Users' handbook.

Russ, J. (2012). British Bat Calls: A Guide to Species Identification. Pelagic Publishing, Exeter.

Scottish Environment Protection Act (2017). Guidance on Assessing the Impacts of Development on Abstractions and Groundwater Dependent Terrestrial Ecosystems.

Scottish Natural Heritage (2016). Assessing Connectivity with Special Protection Areas (SPAs). Guidance. Version 3.

Scottish Environmental Protection Agency (2017). Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Ecosystems. Guidance Note 31.

Smit, C.J. and Visser, G.J.M. (1993). Effects of disturbance on shorebirds: a summary of existing knowledge from the Dutch Wadden Sea and Delta area. *Wader Study Group Bull.* 68, 6-19.

Stace, C.A. (2010). *New flora of the British Isles*, 3rd ed. Cambridge: Cambridge University Press.

Svensson, L., Mullarney, K. and Grant, P. (2009). *Collins Bird Guide*. Harper Collins, London.

Teagasc (2014). Pocket Manual for Reseeding. Moorepark Animal and Grassland Research and Innovation Centre. Series 22.

Teagasc (2020). How to plant a hedge. Available online at <https://www.teagasc.ie/news--events/daily/environment/how-to-plant-a-hedge.php>

Toner, P., Bowman, J., Clabby, K., Lucey, J., McGarrigle, M., Concannon, C., Clenaghan, C., Cunningham, P., Delaney, J., O'Boyle, S., McCarthaigh, M., Craig, M. and Quinn, R. (2005). Water Quality in Ireland, 2001–2003. Environmental Protection Agency, Co. Wexford, Ireland.

Transport Infrastructure Ireland (TII) (2010). Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads.

Western Power (2021) Standard Technique CA6A/7. Available online at <https://www.nationalgrid.co.uk/downloads-view-reciteme/362962>

Whitfield, D.P., Ruddock, M. and Bullman, R. (2008). Expert opinion as a tool for quantifying bird tolerance to human disturbance. *Biological Conservation*, 141, 2708-2717.

Woodward, I., Thaxter, C. B., Owen, E., & Cook, A. S. C. P. (2019). Desk-based revision of seabird foraging ranges used for HRA screening. BTO research report, (724), 2019-2020.