Moyvannan Electricity Substation

Environmental Impact Assessment Report

Chapter 5: Biodiversity

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Contents

5.1 Introduction

5.1.1 Background & Objectives

This chapter presents an assessment of the likely significant effects of the project on the receiving environment.

This chapter provides:-

- A baseline study of the receiving ecological environment, including survey methodology and results;
- An assessment of the likely significant effects of the project during construction, operation and decommissioning phases;
- An assessment of likely significant cumulative effects;
- Mitigation measures to avoid or reduce the likely significant effects anticipated;
- Residual impacts; and,
- Enhancement measures.

5.1.2 Description of the Project

The project site is located in rural Co. Roscommon, approximately 8 kilometres (km) northwest of Athlone, c. 6km south of Lecarrow and immediately north/northeast of Brideswell. In summary, the project comprises the following main components as described in full at **Chapter 3**:-

- A 110kV 'loop-in/loop-out' electricity substation;
- Approximately 270m of 110kV underground electricity line between the electricity substation and the Athlone-Lanesborough overhead transmission line and the provision of 2 no. interface masts;
- Approximately 7.5km of underground electricity line between the electricity substation and the permitted Seven Hills Wind Farm grid connection infrastructure; and,
- All associated and ancillary site development, access, excavation, construction, landscaping and reinstatement works, including provision of site drainage infrastructure.

5.1.3 Statement of Authority

The chapter has been prepared by Dr. Jonathon Dunn. Jonathon undertook scoping surveys, extended habitat surveys, and Annex I turlough surveys. He also coordinated the winter bird surveys. Jonathon has worked in the environmental sector since 2014 and joined SLR in 2021. Prior to working in environmental consultancy, he undertook research at Newcastle University on avian ecology and conservation. He holds a PhD in avian ecology from Newcastle University, a MSc in Ecology, Evolution and Conservation from Imperial College London and a MA (Cantab.) in Natural Sciences from the University of Cambridge. Jonathon has prepared a wide variety of ecological reports, including Environmental Impact Assessment Report (EIAR) chapters, Ecological Impact Assessment (EcIA) reports, Natura Impact Statements (NIS), reports to inform Appropriate Assessment (AA) screenings, bird and bat reports, and collision risk modelling reports. Jonathon has worked on a wide variety of projects with a focus on renewable energy projects.

Ross Macklin PhD (in preparation) B.Sc. (Hons) MCIEEM., MIFM, HDip GIS, PDip IPM (Principal ecologist with Triturus Environmental Ltd.) is an ecologist with over 16-years' professional experience in Ireland and undertook aquatic ecology surveys to support

this chapter. He specialises in freshwater fisheries ecology, biology and water quality. He has considerable experience in a wide range of ecological and environmental projects including the preparation of EIAR, EcIA, AA/NIS, CEMP as well as biodiversity, water quality monitoring, invasive species and fisheries management. He also has expert identification skills in macrophytes, freshwater invertebrates, protected aquatic habitats and protected aquatic species including freshwater pearl mussel. His diverse project list includes work on renewable energy developments, flood relief schemes, road schemes, blueways/greenways, biodiversity projects, fisheries management projects and catchment wide water quality management. He is currently completing his PhD on the ecology and impact of common carp (*Cyprinus carpio*) in Irish waters.

Triturus Environmental Ltd. have completed assessments on over 100 no. renewable energy projects. As a company, Triturus specialise in aquatic ecology and fisheries and provide in-depth catchment wide knowledge on the key aquatic and fisheries constraints associated with each renewable energy project completed. Their skills in aquatic ecology include invertebrates, fish, macrophytes, Annex I aquatic habitats and aquatic invasive species. They also have expert knowledge in project design, planning and the merging of interdisciplinary chapters as part of EIAR preparation.

This chapter has been reviewed by Andrew Torsney BSc, MRes, PhD, ACIEEM. Andrew has undertaken EcIA and prepared EIARs for projects of various sizes including large scale wind energy developments and linear infrastructure projects such as the Nenagh Greenway. Andrew is a technical specialist in ecological assessments and contributed to the Environmental Protection Agency's *Guidelines on the information to be contained in Environmental Impact Assessment Reports* (2022). Additionally, Andrew has undertaken review processes for competent authorities such as the Department of Public Expenditure and Reform and several local authorities such as Dun Laoghaire-Rathdown County Council and Kilkenny City & County Council. Andrew has undertaken a number of technical assessments; for projects such as a large-scale pharmaceutical development in Raheen, Co. Limerick; where there was a requirement for technical derogation licence applications for floral protection order species and other protected species such as badgers.

5.1.4 Relevant Guidance

Guidance documents consulted included the following[1]:-

- *Appropriate Assessment of Plans and Projects in Ireland – Guidance for Local Authorities (DoEHLG, 2010);*
- *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal (CIEEM, 2018);*
- *Bat Surveys for Professional Ecologists: Good Practice Guidelines 4th edition (Collins (ed.), 2024);*
- *Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022);*
- *Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species (Goodship and Furness, 2022);*
- *Assessing Connectivity with Special Protection Areas (SPAs)(SNH, 2016);*
- *Guidance on the preparation of the EIA Report (Directive 2011/92/EU as amended by 2014/52/EU) (EC, 2017);*

[1] A complete list of references is included at the end of this chapter.

- *Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2014);*
- *A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (IAQM, 2019);*
- *Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (IFI, 2016);*
- *Guidance on 'Control of Water Pollution from Linear Construction Projects' CIRIA Report No. C648. (CIRIA, 2006);*
- *Control of Water Pollution from Construction Sites - Guidance for Consultants and Contractors. CIRIA C532 (CIRIA, 2006); and,*
- *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (DoHPLG, 2018).*

5.1.5 Legislation & Policy

This chapter has been prepared having regard to the following legislation and policy, with details of relevant local policy as pertains to biodiversity provided at **Annex 5.5**.

5.1.5.1 International Legislation

- *The UN Convention on Biological Diversity (CBD);*
- *The Berne Convention on the Conservation of European Wildlife and Natural Habitats;*
- *The Bonn Convention on the Conservation of Migratory Species of Wild Animals;*
- *The Ramsar Convention on Wetlands of International Importance;*
- *The Berne Convention on the Conservation of European Wildlife and Natural Habitats;*
- *The Bonn Convention on the Conservation of Migratory Species of Wild Animals;* and,
- *The Ramsar Convention on Wetlands of International Importance.*

5.1.5.2 European Legislation

- *European Communities (Environmental Liability) Regulations, 2008;*
- *EIA Directive (2014/52/EU);*
- *European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018, as amended;*
- *EU Habitats Directive (92/43/EEC);*
- *EU Birds Directive (2009/147/EC);*
- *EU Water Framework Directive 2000/60/EC;*
- *Regulation (EU) No 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species, as amended, together with Commission Implementing Regulation (EU) 2016/1141 and Implementing Regulation (EU) 2019/1262;*
- S.I. No. 293/1988 - European Communities (Quality of Salmonid Waters) Regulations, 1988; and,
- S.I. No. 477/ 2011 - Regulation 49 and 50 of European Communities (Birds and Natural Habitats) Regulations 2011.

5.1.5.3 National Legislation

- *The Wildlife Act (1976, as amended);* and,
- *The Flora (Protection) Order 2022.*

5.1.5.4 National Policy

- *National Heritage Plan 2030;*
- *National Biodiversity Action Plan 2023;*
- *Project Ireland 2040 - National Planning Framework;* and,
- *Regional and Spatial Economic Strategy (RSES) – Northern and Western Regional Assembly.*

5.1.5.5 Local Policy

- *Roscommon County Development Plan 2022-2028.*

5.1.6 Limitations

The survey and assessment are subject to a number of limitations as set out below.

5.1.6.1 Bats, Terrestrial Mammals and Habitats

No access was possible to third party lands near the route of the underground electricity line. Therefore, the assessment of bat roosting potential could only be undertaken for trees and structures that intersected the route that could be viewed from public roads. This is not considered to be a significant limitation, as desktop data from Bat Conservation Ireland (BCI) were examined to locate previously identified roosts. For other terrestrial mammals and habitats, only areas that were immediately adjacent to the route could be surveyed. Desktop data and satellite images were used to supplement the field survey results and given the small scale of the proposed works at any particular location along the route, the lack of access is not considered to be a significant limitation.

5.1.6.2 Birds and Aquatic Ecology

Winter bird surveys were conducted at the electricity substation site and an alternative electricity line route option that is no longer part of the project. While there was some overlap with the chosen electricity line option, particularly nearer the substation, the southern section nearer the village of Brideswell was not surveyed for winter birds (see **Annex 5.2** for details). This is not considered to be a significant limitation as the areas surveyed were the most suitable for wildfowl and waders due to the presence of nearby turlough and other wetland habitats. Therefore, it is unlikely any key habitats for winter birds were not surveyed.

Aquatic surveys were conducted c. 2.8km downstream of the watercourse crossing for the chosen option at the Cross [Roscommon] River. However, an appraisal of the riparian habitats and searches for otter were made in the environs of the proposed watercourse crossing also. The lack of instream survey at the proposed watercourse crossing is unlikely to be a significant limitation as representative baseline information on the Cross [Roscommon] watercourse is available, no instream works are proposed and no direct impacts to riparian ecological features are likely.

None of the limitations outlined above are considered to significantly affect the validity of the data on which the assessment is based.

5.1.7 Consultations

Consultation requests were issued to a number of consultees. **Table 5.1** details the response received to-date that are relevant to Biodiversity. The responses are included at **Annex 1.5**.

Consultee	Date of Consultation	Response	How and Where Response Has Been Addressed
Developments Application Unit (DAU)	26 March 2024	This Department notes the preliminary EIA scoping report that has been produced by Galetech Energy Services. We recommend that the potential cumulative impacts of the proposed development along with those of the permitted Seven Hills Wind Farm (An Bord Pleanála Ref. ABP-313750-22) and the proposed EirGrid Athlone to Lanesborough 110 kV line upgrade should be evaluated. We further note that the proposed development is in fact part of the infrastructure of the permitted Seven Hills Wind Farm (An Bord Pleanála Ref. ABP-313750-22), that the proposed electricity substation and cables should have formed part of the planning application for the permitted Seven Hills Wind Farm and that the failure to have done so constitutes a lacuna in the planning process for the permitted Seven Hills Wind Farm (as in O'Grianna & Ors. V. An Bord Pleanála ([2016] IEHC 632)).	The permitted Seven Hills Wind Farm and proposed EirGrid Athlone to Lanesborough line upgrade have been assessed as part of cumulative impact assessment (**Section 5.5.5**).
Department of Agriculture, Forestry and the Marine (DAFM)	26 March 2024	If the proposed development will involve the felling or removal of any trees, the developer must obtain a Felling Licence from this Department before trees are felled or removed. The developer should take note of the contents of the Felling and Reforestation Policy document which provide a consolidated source of information on the legal and regulatory framework relating to tree felling; gov.ie-Tree Felling Licences (www.gov.ie). As this development is within forest lands, particular attention should be paid to deforestation, turbulence felling and the requirement to afforest alternative lands. It is important to note that when applying to a Local Authority, or An Bord Pleanàla, for planning permission where developments are:	No trees or hedgerows will be felled or removed as part of the project. Hedgerows will be trimmed along the L7551 outside the breeding bird season to accommodate access to the electricity substation site.

		a) subject to an EIA procedure (including screening in the case of a sub-threshold development) and any resulting requirement to produce an EIAR; and/or b) subject to an Appropriate Assessment procedure (including screening) and any resulting requirement to a Natura Impact Statement (NIS); and c) the proposed development in its construction or operational phases, or any works ancillary thereto, would directly or indirectly involve the felling and replanting of trees, deforestation for the purposes of conversion to another type of land use, or replacement of broadleaf high forest by conifer species, 1.that there is a requirement inter alia under the EIA Directive for an overall assessment of the effects of the project or the alteration thereof on the environment to be undertaken, including the direct and indirect environmental impact of the project; and 2.pursuant to Article 2(3) of the EIA Directive, the Department of Agriculture, Food and the Marine strongly recommends that, notwithstanding the fact that a parallel consent in the form of felling licence may also have to be applied for, any EIAR and/or NIS produced in connection with the application for planning permission to the Local Planning Authority or An Bord Pleanàla, should include an assessment of the impact of and measures, as appropriate, to prevent, mitigate or compensate for any significant adverse effects direct or indirect identified on the environment arising from such felling and replanting of trees, deforestation for the purposes of conversion to another type of land use, or replacement of broadleaf high forest by conifer species. 3.Please note that there must be absolute spatial	

		consistency between the felling licence areas submitted to DAFM (second authority) and all related planning documents submitted to the first authority in respect of the felling area(s).	
Irish Wildlife Trust (IWT)	27 February 2023	We do not have the staff capacity to be respond to this consultation at the moment but we will endeavour to respond if possible.	None required.

Table 5.1: Consultations

5.2 Methodology

5.2.1 Study Area

The various study areas applied in this assessment are detailed at **Annexes 5.1, 5.2** and **5.3**.

5.2.1.1 Habitats, Flora, Terrestrial Mammals (including Bats) & Other Protected Fauna

The survey area for habitats, flora, terrestrial mammals (including bats) and other protected fauna included lands within the electricity substation site boundary plus lands adjacent to the electricity line, except for the areas that could not be accessed (see **Section 5.1.6** for details).

5.2.1.2 Birds

The survey areas used for the ornithological impact assessment differ according to receptor as recommended by relevant good practice survey guidance (e.g. Bird Survey & Assessment Steering Group, 2024). These are summarised in **Section 5.2.3.4** below and are described in more detail within the baseline survey reports (**Annex 5.2**).

For the assessment of effects on bird species, a variety of buffer distances have been applied to infrastructure, where appropriate. These buffers are in accordance with current guidance and evidence-based research.

5.2.1.3 Fisheries & Aquatic Ecology

The survey area used for the fisheries and aquatic ecology impact assessment was 150m either side of the watercourse crossing where the underground electricity line route spans the Cross [Roscommon] River. As outlined at **Section 5.1.6.2**, this survey location is c. 2.8km downstream of the chosen watercourse crossing assessed in this EIAR.

The watercourse crossing was surveyed, for otter, 150m either side and surveyed from the bankside but was not subject to additional, instream aquatic assessment.

The aquatic surveys undertaken are summarised below and are described in more detail within the baseline survey report (**Annex 5.3**).

5.2.2 Desk Study

A desk study was carried out to inform the biodiversity input to the scoping report for the project. The desk study involved using online resources to collate information on areas designated for nature conservation and previous ecological studies undertaken

for other projects in the wider local area.

The following online and other resources were accessed as part of the desk study, searching for all relevant records up to 20km radius of the project boundary:-

- Satellite imagery[2];
- Environmental Protection Agency (EPA) maps[3];
- National Biodiversity Data Centre (NBDC) database[4];
- Environmental Sensitivity Mapper[5];
- National Parks and Wildlife Services (NPWS)[6];
- NPWS data request (request made on 29/05/2024 but no response received to date);
- BCI data request (results accurate as of 04/06/2024);
- The Irish Wetland Bird Survey (I-WeBS)[7]; and,
- Birds of Conservation Concern in Ireland 4 (BoCCI4): 2020-2026 (Gilbert at al., 2021).

For NBDC data, a 1km grid square resolution was used for the electricity substation site (M9748) and where the underground electricity line intersects with the Cross [Roscommon] watercourse (M9445). The rest of the underground electricity line will be located within existing public roads.

For some species, population estimates are absent. Where NPWS have geographical range size, this has been used as a proxy for population size, with the number of individuals substituted for the number of occupied 1km grid squares.

5.2.2.1 Nature Conservation Sites

The following websites were accessed for information on nature conservation sites in the vicinity of the project:-

- NPWS; and,
- NBDC.

As a starting point, all European and national sites within 15km surrounding the project were identified, with the search distance extended to 20km for SPAs and potentially further for nature conservation sites with downstream hydrological connectivity. International sites considered included Special Areas of Conservation (SACs), candidate SACs, Special Protection Areas (SPAs), proposed SPAs, Important Bird Areas (IBAs) and Ramsar sites. National sites considered included Natural Heritage Areas (NHAs), proposed Natural Heritage Areas (pNHAs) and nature reserves. The rationale for the search distances is described at **Section 5.2.4**.

5.2.3 Field Surveys

Ecological surveys were carried out to yield sufficient data to support this assessment. A brief description of the surveys undertaken, and survey dates, is presented at **Table**

[2] www.google.ie/maps (Last accessed 06/11/2024)

[3] https://gis.epa.ie Last accessed 06/11/2024

[4] https://maps.biodiversityireland.ie/ Last accessed 06/11/2024

[5] https://airomaps.geohive.ie/ESM/ Last accessed 06/11/2024

[6] www.npws.ie/ Last accessed 06/11/2024

[7] www.birdwatchireland.ie/our-work/surveys-research/research-surveys/irish-wetland-bird-survey/ Last accessed 06/11/2024. Data were supplied by the Irish Wetland Bird Survey (I-WeBS), a scheme coordinated by BirdWatch Ireland under contract to the National Parks and Wildlife Service of the Department of Housing, Local Government and Heritage

5.2 below.

Survey	Brief Description	Timing
Scoping survey	An initial survey to identify any major constraints.	19 October 2023
Bird surveys	Winter feeding distribution surveys within the substation site, along the electricity line route, plus 500m surrounding the route. Full details of the survey methodology are described at **Annex 5.2.**	Non-breeding season 2023/24: Fortnightly from 19 October 2023 to 11 March 2024
	Breeding bird surveys within the substation site prior to extended habitat survey using BTO breeding bird criteria to assess breeding status (BTO, 2024).	25 April 2024, 06:00–08:00 23 May 2024, 05:30–07:30
Aquatic surveys	A survey for aquatic habitats, fisheries potential (including salmonid and lamprey habitat), macro-invertebrates (biological water quality), macrophytes and aquatic bryophytes, aquatic invasive species, and species of conservation value, which may use the watercourses in vicinity of the project. Otter were searched for within 150m either side of the watercourse crossing (300m in total). Full details of the survey methodology are described at **Annex 5.3**.	7 February 2024
Extended habitat survey	A survey to map the habitats present within the electricity substation site and along the electricity line route, along with other ecological features such as terrestrial mammals (including bats), invertebrates, amphibians, reptiles and plants (including invasive and non-native or 'INNS' species).	22 and 23 May 2024
Annex I Habitats	A survey to investigate turlough habitats (Fossitt code FL6) previously mapped as Annex I priority habitat 3180.	23 May 2024

Table 5.2: Survey Dates

5.2.3.1 Habitats & Flora

Terrestrial habitats and flora (including invasive plant species) were mapped according to Fossitt (2000) and the good practice measures outlined in Heritage Council guidance (Smith et al., 2011). The locations of any rare or invasive plant species were recorded using a hand-held GPS.

Plant species nomenclature follows Rose's *The Wildflower Key: How to identify wildflowers, trees and shrubs in Britain and Ireland* (Rose et al., 2006). A list of the dominant and notable plant species was prepared for each habitat type.

Habitat surveys were conducted during an optimal time of year.

Annex I Habitats

A more detailed habitat survey was carried out for areas identified as turloughs (Fossitt code FL6) to search for evidence of vegetation communities that correspond with priority Annex I turlough habitat 3180*. One of these areas was just outside of the project site but, given their potential ecological importance, were included within the scope of surveys.

Methodology was broadly in line with O'Neill and Martin (2015). Given the small size of the accessible turlough and the general lack of access to the larger turlough system, relevés were not used. Instead, botanical composition was recorded for all accessible turlough areas using the DAFOR system.

5.2.3.2 Fisheries & Aquatic Ecology

Baseline surveys were carried out in February 2024. Full data are presented at **Annex 5.3** with a summary provided below. Surveys focused on the detection of freshwater habitats and species of high conservation value. A strict biosecurity protocol was used following guidance and the 'Check-Clean-Dry' approach with further details at **Annex 5.3**.

Physical Surveys

The survey site was assessed in terms of physical watercourse characteristics, substrate and flow.

Fisheries Assessment

A fisheries habitat appraisal was undertaken to establish the importance of the survey sites for fish species.

Environmental DNA (eDNA) Analysis

To support the fish stock assessment and to detect potentially cryptically low populations of sensitive aquatic receptors within the study area, 2 no. composite water samples were collected and analysed for freshwater pearl mussel, white-clawed crayfish, European eel, crayfish plague, and smooth newt eDNA.

Otter Survey

Searches were made for otter signs and sightings within 150m of the aquatic survey site and mapped using a hand-held GPS. Notes were made on the quantity and visible constituents of spraint.

Biological Water Quality (Q-sampling)

Biological water quality was assessed via Q-sampling at the riverine survey site. Methodology followed Feeley et al. (2020) and samples were converted into Q-ratings per Toner et al. (2005). Any rare invertebrate species were identified.

Macrophytes & Aquatic Bryophytes

Botanical surveys were conducted via instream wading. Specimens were collected for on-site identification. Any rare macrophyte or bryophyte species were recorded, and the aquatic vegetation community assessed for correspondence with Annex I habitat types.

5.2.3.3 Other Protected Fauna

Invertebrate species were recorded on an ad hoc basis during all surveys.

No specific surveys for reptiles were conducted and were searched for on an ad hoc basis during other surveys, as NRA (2009) guidance states that direct observation is an effective survey technique.

Amphibians were surveyed for during aquatic ecology surveys and on an ad hoc basis

during other surveys.

5.2.3.4 Bird Surveys

Baseline ornithology surveys were conducted during the period October 2023 to March 2024 (non-breeding season) and during April and May 2024 (breeding season).

Baseline Survey Methodologies

Surveys were carried out following Bird Survey & Assessment Steering Group (2024) guidance. Further details of the non-breeding season surveys are provided at **Annex 5.2** with a summary provided below.

Wildfowl and Wader Feeding Distribution Surveys

Feeding distribution surveys were carried out every fortnight between October to March inclusive for the 2023/24 non-breeding season to survey for wildfowl and waders which may utilise fields within the project site and within a 500m buffer. These surveys were undertaken by driven transect, stopping on a regular basis to check all fields for wildfowl and wader feeding activity.

Full details are provided at **Annex 5.2**.

Breeding Bird Surveys

The survey methodology for breeding birds comprised a walked survey to identify potential nesting birds within the substation site. This level of survey effort was judged as proportionate given the site comprises heavily grazed improved agricultural grassland with high levels of disturbance by cattle and the existing access track consists of vegetated stone walls, with small amounts of vegetation offering limited nesting opportunities for birds.

2 no. survey visits were undertaken in April and May 2024 starting at dawn and continuing for 2-hours thereafter.

In addition, the remainder of the electricity line route was searched for evidence of breeding birds as part of the extended habitat survey in May 2024.

5.2.3.5 Terrestrial Mammals (including bats)

Searches for mammals were carried out as part of extended habitat surveys in May 2024. The focus of these surveys was to search for mammal resting/breeding places, which are most vulnerable to disturbance and habitat loss. In addition, any other signs/sightings were recorded and mapped using a hand-held GPS. Survey methodology followed that outlined Cresswell et al. (2012), with a particular focus on badger *Meles meles*.

Otters *Lutra lutra* were searched for during the aquatic surveys (see **Section 5.2.3.2**). Signs were recorded during other surveys, if observed.

A desk study was used to compile information on potential bat roosts and foraging habitats within and nearby the project site. The survey area was walked in May 2024 to search for potential bat roost features, plus to undertake an initial site risk assessment for bats.

5.2.4 Evaluation Criteria for Ecological Assessment

5.2.4.1 Assessing Impact Significance

CIEEM guidelines state that ecological receptors which are important (i.e., Important Ecological Features or 'IEFs') and potentially affected by the project should be subject to detailed assessment. It is not necessary to carry out detailed assessment of receptors that are sufficiently widespread, unthreatened and resilient to project effects and would remain viable and sustainable. However, the EU *Biodiversity Strategy 2020* and Irish *National Biodiversity Action Plan 2023-2030* emphasise the need to achieve no net loss and an enhancement of biodiversity.

5.2.4.2 Determining the Zone of Influence

Determining whether an IEF has the potential to be affected by the project relates to the concept of the Zone of Influence (ZoI). The ZoI relates to the nature of the project, its likely effects and the presence of connections or pathways between ecological receptors and the project. Thus, ecological receptors that lack a connection to the project are considered outside the ZoI, even if they are directly within the project site. Conversely, receptors that are considerably removed from the project can still be considered within the ZoI if a pathway for effects exists.

All connections (ecological, hydrological and hydrogeological) which provide pathways for effects between the project and ecological receptors in the surrounding area are identified and described in **Section 5.3.1**.

For all receptors that are not designated nature conservation sites, the initial ZoI for the construction and decommissioning phases is as follows:-

- Direct effects: up to a 50m area surrounding permanent and temporary site infrastructure for the electricity substation and up to a 5m area along the electricity line; and,
- Indirect effects: dependent on the type of works and the published sensitivities of the ecological receptor.

For all receptors that are not designated nature conservation sites, the ZoI for the operational phase is dependent on the published sensitivities of the ecological receptor.

Regarding designated nature conservation sites, DoEHLG (2010) guidelines suggest that a 15km study area is adopted as a starting point when assessing the potential for source-receptor connectivity between a project and European sites. However, this is an arbitrary distance and, in some cases, could be much smaller or larger depending on whether there is hydrological, hydrogeological or ecological connectivity present. A 20km study area has been used initially for SPAs, which is slightly larger than the 15km recommended, in recognition that 20km is the maximum distance SPA Qualifying Interests (QI) bird species typically travel (NatureScot (formerly SNH), 2016). These 15km and 20km initial search areas were then reappraised during impact assessment where all hydrologically connected sites were considered.

5.2.4.3 Determining Importance

Ecological features can be important for a variety of reasons. The importance of ecological receptors should be considered within a defined geographical context and, for this project, the following geographic frame of reference is used:-

- International (i.e. Europe);

- national (i.e. Ireland);
- regional/county (i.e. County Roscommon);
- local higher value(i.e. the townlands containing the project); and,
- local lower value (i.e. the project site).

Habitat importance is determined through an assessment of the species composition, diversity, complexity and condition of a site. This is assessed in accordance with the relative abundance – or rarity – of a species or habitat at the geographic scales indicated above. The presence of Floral Protection Order species and/or Annex I habitats would increase the overall value. Similarly, habitat connectivity corridors such as complex treelines or riparian zone increase the habitat importance of value. These same considerations are placed on suitable habitats for species such as bats, otter, amphibians etc.

Where appropriate, the value of resident or regularly occurring species populations has been determined using the standard '1% criterion' method (Percival, 2003; Holt, et al., 2012). Using this, the presence of >1% of the international population of a species is considered internationally important and >1% of the national population is considered nationally important.

For non-breeding wildfowl, IWeBS data were used to assess regional/county populations (data from all IWeBS sites in County Roscommon and County Westmeath were collated); however, this is only available for wintering wildfowl and is not available for all birds or for the breeding season. Where detailed regional or county-level species population data was absent, we have estimated regional-level and county-level populations for County Roscommon and County Westmeath (regional) and County Roscommon (county) by multiplying the ROI population totals by 0.05 and 0.03, respectively. These correction factors reflect the land area taken up by the region (Roscommon plus Westmeath) or county (Roscommon) as a proportion of the ROI total land area. This assumes that species populations are evenly distributed, which may not be realistic; however, in the absence of detailed spatial data this is considered a reasonable approximation. Where this approach has been undertaken, it is termed 'inferred'.

Data collected from the surveys for the project are at the local scales.

This information, combined with baseline survey results, was utilised to evaluate each ecological receptor recorded within the ZoI in terms of its importance. The exception is for habitats where the approach is to provide a balance sheet of losses and gains for the project as a whole. This is because evaluating individual habitat types can exclude consideration of assemblages.

Key ecological receptors (for assessment) are those deemed to be above the 'Local – Lower Value' importance evaluation. Evaluation criteria are outlined below at **Table 5.3.**

Resource Evaluation	Defining Criteria (adapted from NRA, 2009)
International Importance	'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA), candidate Special Area of Conservation (cSAC) or proposed Special Protection Area (pSPA). Sites that fulfil the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended). Features essential to maintaining the coherence of the Natura 2000 Network. Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive.

	Resident or regularly occurring populations (assessed to be important at the national level) of the following: Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or Species of animal and plants listed in Annex II and/or IV of the Habitats Directive. Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971). World Heritage Site (Convention for the Protection of World Cultural and Natural Heritage, 1972). Biosphere Reserve (UNESCO Man and The Biosphere Programme). Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979). Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979). Biogenetic Reserve under the Council of Europe. European Diploma Site under the Council of Europe. Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).
National Importance	Site designated or proposed as a Natural Heritage Area (NHA). Statutory Nature Reserve. Refuge for Fauna and Flora protected under the Wildlife Acts. National Park. Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA). Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park. Resident or regularly occurring populations (assessed to be important at the national level) of the following: Species protected under the Wildlife Acts; and/or Species listed on the relevant Red Data list. Site containing 'viable areas' of the habitat types listed in Annex I of the Habitats Directive.
County Importance	Area of Special Amenity. Area subject to a Tree Preservation Order. Area of High Amenity, or equivalent, designated under the County Development Plan. Resident or regularly occurring populations (assessed to be important at the County level) of the following: Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; Species protected under the Wildlife Acts; and/or Species listed on the relevant Red Data list. Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance. County important populations of species, or viable areas of semi-natural habitats or natural heritage features identified in the national or local Biodiversity Action Plan (BAP), if this has been prepared. Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county. Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.
Local Importance (higher value)	Locally important populations of priority species or habitats or natural heritage features identified in the local BAP, if this has been prepared. Resident or regularly occurring populations (assessed to be important at the Local level) of the following: Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; Species protected under the Wildlife Acts; and/or Species listed on the relevant Red Data list. Sites containing semi natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are

	uncommon in the locality. Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.
Local Importance (lower value)	Sites containing small areas of semi natural habitat that are of some local importance for wildlife. Sites or features containing non-native species that are of some importance in maintaining habitat links.

Table 5.3: Evaluation Criteria

5.2.4.4 Impact Assessment

The main purpose of an EIAR is to identify, describe and present an assessment of the likely significant effects of a project on the environment.

The CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2018, updated 2022) (hereafter referred to as 'the CIEEM guidelines') form the basis of the impact assessment presented in this chapter. Reference has also been made to other relevant guidance, as appropriate.

The impact assessment process involves the following steps:-

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

The description of the likely significant impacts on the receiving environment should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the project. This description takes into account the environmental protection objectives established at EU or Member State level which are relevant to the project.

When describing effects, reference has been made to specific characteristics, as appropriate. Using CIEEM (2018) guidelines, impacts and effects have been described in terms of:-

- quality e.g. positive/neutral/negative;
- extent e.g. spatial area;
- context e.g. conform/contrast with baseline conditions;
- magnitude e.g. size/amount/intensity/volume;
- probability e.g. likely/unlikely;
- duration e.g. temporary/short-term/medium-term/long-term/permanent;
- frequency e.g. once/rarely/occasionally/frequently/constantly;
- timing e.g. critical life-stage or season; and,
- reversibility e.g. reversible/irreversible.

The assessment will describe those characteristics that are relevant to understanding the ecological effect and determining the significance, and as such does not need to incorporate all stated effects.

5.2.4.5 Significant Effects

The concept of ecological significance is addressed in paragraphs 5.24 through to

5.28 of the CIEEM guidelines. Significance is a concept related to the weight that should be attached to effects when decisions are made. For the purpose of Ecological Impact Assessment (EcIA), a 'significant effect' is an effect or impact that is sufficiently important to require assessment and reporting so that the competent authority is adequately informed of the environmental consequences of permitting a project. Effects can be considered significant at a wide range of scales from international to local, and the scale of significance of an effect may or may not be the same as the geographic context in which the feature is considered important.

The nature of the identified effects on each assessed feature is characterised in accordance with the process at **Section** Error! Reference source not found.. This is considered alongside available research and professional judgement about the sensitivity of the feature affected; and professional judgement about how the impact is likely to affect the site, habitat, or population's structure and continued function. Where it is concluded that an effect would be likely to reduce or increase the importance of an assessed feature, it is described as significant.

5.2.4.6 Cumulative Effects

Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. Cumulative effects can occur where a project results in individually insignificant effects that, when considered in-combination with effects of other proposed or permitted plans and projects, can result in significant effects.

Other plans and projects (refer to **Chapter 1**) that should be considered when establishing cumulative effects include:-

- Proposals for which consent has been applied but which are awaiting determination;
- Projects which have been granted consent, but which have not yet been started or which have been started but are not yet completed (i.e. under construction);
- Proposals which have been refused permission, but which are subject to appeal, and the appeal is undetermined.
- Constructed developments whose full environmental effects are not yet felt and therefore cannot be accounted for in the baseline; or,
- Developments specifically referenced in a national policy, a national plan or a local plan.

5.2.4.7 Avoidance, Mitigation, Compensation & Enhancement

Where likely significant effects have been identified, the mitigation hierarchy has been applied, as recommended in the CIEEM guidelines. The mitigation hierarchy sets out a sequential approach beginning with the avoidance of effects where possible, the application of mitigation measures to minimise unavoidable effects and then compensation for any remaining effects. Once avoidance and mitigation measures have been applied, residual effects are then identified along with any necessary compensation measures, and incorporation of opportunities for enhancement.

It is important to clearly differentiate between avoidance mitigation, compensation and enhancement and these terms are defined here, as follows:-

- Avoidance is used where an impact has been avoided, e.g. through changes in scheme design;

- Mitigation is used to refer to measures to reduce or remedy a specific negative impact in situ;
- Compensation describes measures taken to offset residual effects, i.e. where mitigation in situ is not possible; and
- Enhancement is the provision of new benefits for biodiversity that are additional to those provided as part of mitigation or compensation measures, although they can be complementary.

5.2.4.8 Residual Effects

Where likely significant effects have been identified, the mitigation hierarchy has been applied, as recommended in the CIEEM guidelines. The mitigation hierarchy sets out a sequential approach beginning with the avoidance of effects where possible and followed by the application of mitigation measures to minimise unavoidable effects. The remaining effects are termed 'residual effects'. If significant residual effects remain, then compensation for any remaining effects may be undertaken.

5.3 Description of Existing Environment

This section presents a description of the general context of the receiving (baseline) environment associated with the project.

For all receptors, other than nature conservation sites, the results of both the desktop studies and field surveys are presented together. Full details of the sources for desktop data (including when the data searches were made) are presented at **Annex 5.4**. Full details of the field surveys (including when the surveys were made) are described at **Section 5.2.3**.

5.3.1 Nature Conservation Sites

European sites are assessed in the Appropriate Assessment (AA) Screening and Natura Impact Statement (NIS) which accompanies the planning application for the project. Nationally designated sites are discussed in the following sections.

Site synopses are provided at **Annex 5.6.**

5.3.1.1 International Sites

The project is not situated within any internationally designated site.

There are 12 no. SACs, and 6 no. SPAs (including one SPA that overlaps with a Ramsar site) within 15km and 20km of the project, respectively. There were also an additional 2 no. SACs and 2 no. SPAs with a remote, downstream hydrological connection.

These international sites are illustrated at **Annex 5.1** (**Figure 2a** to **2d**).

Table 5.4 provides a list of the designated sites and identifies any source-receptor pathways. These can be considered within the ZoI of the project. Qualifying interests with connectivity to the project are highlighted in bold. The NIS concludes:-

> "*With the identified mitigation measures in place, it can be concluded, beyond all reasonable scientific doubt that the project, either alone or in combination with other plans or projects will not undermine the conservation objectives of any European sites. It can therefore be concluded that the Project would not have an adverse effect on the integrity of any European site*".

Site Name	Code	Qualifying Interests	Value	Distance (km) from Project	Source – Pathway – Receptor as identified in the NIS
SACs and cSACs					
Ballynamona Bog and Corkip Lough SAC 002339	002339	Turloughs [3180] Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] Depressions on peat substrates of the *Rhynchosporion* [7150] Bog woodland [91D0]	International	0.9	Hydrological & Hydrogeological No downstream hydrological connectivity. Upstream hydrological connectivity via Cross [Roscommon] and Barr's Drain watercourses (instream distance 6.6km). Potential remote, indirect hydrogeological connection to groundwater dependent terrestrial ecosystem (GWDTE) QI turlough habitats via shared Funshinagh groundwater body. The other QI habitats are typically rainwater fed, and so are not usually dependent on surface water or groundwater from elsewhere. **Chapter 7** identifies that there is no groundwater connection between the substation location and SAC, but there could be for the electricity line. Air There is no strong connection for airborne emissions and dust due to distance and screening by natural features such as hedgerow and treelines. Ecological No ecological connectivity as the designated features are habitats which do not occur on the project site, therefore, no pathway. Invasive species There are no hydro- or hydrogeological, airborne or ecological pathways for the spread of invasive species.
Lough Ree SAC	000440	Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* - type vegetation [3150] Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important	International	1.9	Hydrological and hydrogeological No downstream hydrological connectivity. Upstream hydrological connectivity via Cross [Roscommon] and Shannon [Upper] watercourses (instream distance 17.2km). Potential remote, indirect hydrogeological connection to groundwater dependent terrestrial ecosystem GWDTE alkaline fen and alluvial forest QI habitats via shared Funshinagh groundwater body.

		orchid sites) [6210] Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] Alkaline fens [7230] Limestone pavements [8240] Bog woodland [91D0] Alluvial forests with *Alnus glutinosa* and Fraxinus excelsior (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] Otter *Lutra lutra* [1355]			The other QI habitats are either terrestrial, or are typically rainwater fed, and so are not usually dependent on surface or groundwater from elsewhere. **Chapter 7** identifies that there is an indirect groundwater connection between the substation location and electricity line to the SAC via infiltration/ groundwater flow. Air There is no strong connection for airborne emissions and dust due to distance and screening by natural features such as hedgerow and treelines. Ecological Otter were recorded 2.8km downstream. Maximum otter territories in Ireland are 13.2km length (Reid, et al., 2013). As this distance is smaller than the instream distance between the project site and SAC, it is unlikely that there is ecological connectivity between the project and the SAC via mobile ex situ otter. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.
Lough Funshinagh SAC 000611	000611	Turloughs [3180] Rivers with muddy banks with *Chenopodion rubri* p.p. and *Bidention* p.p. vegetation [3270]	International	2	Hydrological and hydrogeological No hydrological connectivity. Potential remote, indirect hydrogeological connection to GWDTE QI turlough habitats via shared Funshinagh groundwater body. The other QI habitat is fed by surface water. **Chapter 7** identifies that there is no groundwater connection between the project and SAC, as traced underground connections show that the project is located downgradient of the SAC. Air There is no strong connection for airborne emissions and dust due to distance and screening by natural features such as hedgerow and treelines. Ecological No ecological connectivity as the QIs are habitats,

					which are located outside of the project site. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.
Castlesampson Esker SAC	001625	Turloughs [3180] Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) [6210]	International	3.8	Hydrological and hydrogeological No hydrological connectivity. **Chapter 7** confirms that there is a possible hydrogeological connection to GWDTE QI turlough habitats via the shared Funshinagh groundwater body. The other QI habitat is terrestrial and cannot be affected by groundwater. Air There is no strong connection for airborne emissions and dust due to distance. Ecological No ecological connectivity as the QIs are habitats, which are located outside of the project site. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.
Lough Croan Turlough SAC	000610	Turloughs [3180]	International	5.3	Hydrological and hydrogeological No hydrological connectivity. No hydrogeological connectivity as SAC is in a different groundwater body (Suck South) to the project (Funshinagh). Air There is no strong connection for airborne emissions and dust due to distance. Ecological No ecological connectivity as the QI is a habitat, which is located outside of the project site. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.
Killeglan Grassland SAC	002214	Semi-natural dry grasslands and scrubland	International	7.2	Hydrological and hydrogeological

		facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) [6210]			No hydrological connectivity. No hydrogeological connectivity as SAC is in a different groundwater body (Suck South) to the project (Funshinagh). <u>Air</u> There is no strong connection for airborne emissions and dust due to distance. <u>Ecological</u> No ecological connectivity as the QI is a habitat, which is located outside of the project site. <u>Invasive species</u> There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.
River Shannon Callows SAC	000216	*Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410] Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*) [6510] Alkaline fens [7230] Limestone pavements [8240] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] Otter *Lutra lutra* [1355]	International	8.8	<u>Hydrological and hydrogeological</u> Downstream hydrological connectivity via Cross [Roscommon] and Shannon [Lower] (10.1km instream distance). No hydrogeological connectivity as SAC is in a different groundwater body (Athlone West, Inny, Clara, Tynagh, Aughrim, Banagher) to the project (Funshinagh). <u>Air</u> There is no strong connection for airborne emissions and dust due to distance. <u>Ecological</u> Otter were recorded 2.8km downstream. Maximum otter territories in Ireland are 13.2km length (Reid, et al., 2013). This distance is greater than the instream distance between the project site and SAC. Therefore, there is potential ecological connectivity via mobile ex situ otter. Taking a precautionary approach, which assumes that the otter signs recorded during the surveys could represent SAC individuals, the possibility of disturbance /displacement or water-quality related effects to otter during the construction phases, cannot be ruled out at this stage and requires further consideration. <u>Invasive species</u>

					Downstream hydrological connectivity provides a potential pathway for the spread of invasive species, such as Japanese knotweed, which was recorded alongside the route of the underground electricity line.
Four Roads Turlough SAC	001637	Turloughs [3080]	International	10.6	Hydrological and hydrogeological No hydrological connectivity. No hydrogeological connectivity as SAC is in a different groundwater body (Suck South) to the project (Funshinagh). Air There is no strong connection for airborne emissions and dust due to distance. Ecological No ecological connectivity as the QI is a habitat, which is located outside of the project site. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.
Crosswood Bog SAC	002337	Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120]	International	12.4	Hydrological and hydrogeological No downstream hydrological connectivity. Upstream hydrological connectivity via Cross [Roscommon] and Shannon [Upper] watercourses (instream distance 17.2km). No hydrogeological connectivity as SAC is in a different groundwater body (Inny) to the project (Funshinagh). Air There is no strong connection for airborne emissions and dust due to distance. Ecological No ecological connectivity as the QIs are habitats, which are located outside of the project site. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.
Lisduff Turlough SAC	000609	Turloughs [3080]	International	12.4	Hydrological and hydrogeological No hydrological connectivity.

					No hydrogeological connectivity as SAC is in a different groundwater body (Suck South) to the project (Funshinagh). Air There is no strong connection for airborne emissions and dust due to distance. Ecological No ecological connectivity as the QI is a habitat, which is located outside of the project site. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.
Carn Park Bog SAC	002336	Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120]	International	14.1	Hydrological and hydrogeological No downstream hydrological connectivity. Upstream hydrological connectivity via Cross [Roscommon] and Shannon [Upper], Breensford and Tullycross watercourses (instream distance 32.5km). No hydrogeological connectivity as SAC is in a different groundwater body (Inny) to the project (Funshinagh). Air There is no strong connection for airborne emissions and dust due to distance. Ecological No ecological connectivity as the QIs are habitats, which are located outside of the project site. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.
Fortwilliam Turlough SAC	000448	Turloughs [3180]	International	14.9	Hydrological and hydrogeological No hydrological connectivity. No hydrogeological connectivity due to distance and Lough Ree acting as natural barrier. Air There is no strong connection for airborne emissions and dust due to distance. Ecological

					No ecological connectivity as the QI is a habitat, which is located outside of the project site. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.
Lough Derg, North-east Shore SAC	002241	*Juniperus communis* formations on heaths or calcareous grasslands [5130] Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* [7210] Alkaline fens [7230] Limestone pavements [8240] Alluvial forests with *Alnus glutinosa* and *Fraxinus* excelsior (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] *Taxus baccata* woods of the British Isles [91J0]	International	42	Hydrological and hydrogeological Very remote, downstream hydrological connectivity (67km instream distance). The distance is such that there is no strong connection due to dilution effects. No hydrogeological connectivity due to distance, and project is in different groundwater body to SAC (Funshinagh vs. Nenagh). Air There is no strong connection for airborne emissions and dust due to distance. Ecological No ecological connectivity as the QIs are habitats, which are located outside of the project site. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.
Lower River Shannon SAC	002165	Sandbanks which are slightly covered by sea water all the time [1110] Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Coastal lagoons [1150] Large shallow inlets and bays [1160] Reefs [1170] Perennial vegetation of stony banks [1220] Vegetated sea cliffs of the	International	75	Hydrological and hydrogeological Very remote, downstream hydrological connectivity (104km instream distance). The distance is such that there is no strong connection due to dilution effects. No hydrogeological connectivity due to distance, and project is in different groundwater body to SAC (Funshinagh vs. large number of other groundwater bodies). Air There is no strong connection for airborne emissions and dust due to distance. Ecological Freshwater pearl mussel are not mobile and were not recorded near the project site. The catchment is also not

		Atlantic and Baltic coasts [1230]			a known pearl mussel catchment (NPWS, 2019). While salmonids can act as hosts for pearl mussel glochidia (NPWS, 2019), the extremely large instream distance makes it unlikely that any salmonids present near the project site act as hosts for pearl mussel in this SAC. Common dolphin are exclusively marine. Sea, river lamprey and Atlantic salmon were not recorded during surveys. Therefore, there will be no disturbance/displacement or water-mediated effects for freshwater pearl mussel, common dolphin, sea lamprey, river lamprey and Atlantic salmon. Brook lamprey and otter were recorded 1.5 and 2.8 km downstream respectively. Book lamprey are a non-migratory species and only travel short distances upstream prior to spawning (NPWS, 2019). Thus, the populations near the project site are highly unlikely to be part of the SAC population due to the extremely large instream distance. Maximum otter territories in Ireland are 13.2km length (Reid, et al., 2013). As this distance is much smaller than the instream distance between the SAC and project site, there is no ecological connectivity via mobile ex situ otters. <u>Invasive species</u> There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.
SPAs (no proposed SPAs were present) and Ramsar Sites					
Lough Ree SPA	004064	Little Grebe (*Tachybaptus ruficollis*) [A004] w Whooper Swan (*Cygnus cygnus*) [A038] w Wigeon (*Mareca penelope*) [A050] w Teal (*Anas crecca*) [A052]	International	1.9	<u>Hydrological and hydrogeological</u> Upstream hydrological connectivity via Cross [Roscommon] and Shannon [Lower]. Potential remote hydrogeological connection to groundwater dependent terrestrial ecosystem GWDTE wetland QI habitats via shared Funshinagh groundwater body. **Chapter 7** indicates that there is an indirect groundwater

		w Mallard (*Anas platyrhynchos*) [A053] w Shoveler (*Anas clypeata*) [A056] w Tufted Duck (*Aythya fuligula*) [A061] r, w Common Scoter (*Melanitta nigra*) [A065] r Goldeneye (*Bucephala clangula*) [A067] w Coot (*Fulica atra*) [A125] w Golden Plover (*Pluvialis apricaria*) [A140] w Lapwing (*Vanellus vanellus*) [A142] w Common Tern (*Sterna hirundo*) [A193] r Wetland and Waterbirds [A999]			connection between the substation site and electricity line to the SPA via infiltration/groundwater flow. <u>Air</u> There is no strong connection for airborne emissions and dust due to distance and screening by natural features such as hedgerow and treelines. <u>Ecological</u> The following SCI species were not recorded during surveys and so cannot be significantly affected by disturbance/displacement:- • Shoveler; • Common scoter; • Golden plover; and, • Common tern. The following SCI species were recorded during surveys:- • Little grebe; • Whooper swan; • Wigeon; • Teal; • Mallard; • Tufted duck; • Coot; and, • Lapwing. The core foraging distances for little grebe, wintering whooper swan, wigeon, teal, mallard, tufted duck, coot and lapwing are up to 20km (SNH, 2016), 5km (SNH, 2016), 8km (Myrfyn & Williams, 1976), 0.8km (Legagneux, et al., 2009), 3.3km (Bengtsson, et al., 2014), 20km (SNH, 2016), 20km (SNH, 2016) and 12km (Gillings, et al., 2007), respectively. As these distances are greater than the distance between the project site and the SPA, there is therefore ecological connectivity between the two. Taking a precautionary approach, which assumes that the birds recorded during the surveys could represent SPA birds, the possibility of disturbance/displacement and collision-related mortality to little grebe, whooper

					swan, wigeon, teal, mallard, tufted duck, coot and lapwing during the construction and operational phases, cannot be ruled out. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.
Lough Croan Turlough SPA	004139	Shoveler (*Anas clypeata*) [A056] r, w Golden Plover (*Pluvialis apricaria*) [A140] w Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395] w Wetland and Waterbirds [A999]	International	5.4	Hydrological and hydrogeological No hydrological connectivity. No hydrogeological connectivity as SPA is in a different groundwater body (Suck South) to the project (Funshinagh). Air There is no strong connection for airborne emissions and dust due to distance. Ecological The following SCI species were not recorded during surveys and so cannot be significantly affected by disturbance/displacement:- • Shoveler; • Golden plover; and, • Greenland white-fronted goose. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.
River Suck Callows SPA	004097	Whooper Swan (*Cygnus cygnus*) [A038] w Wigeon (*Mareca penelope*) [A050] w Golden Plover (*Pluvialis apricaria*) [A140] w Lapwing (*Vanellus vanellus*) [A142] w Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395] w Wetland and Waterbirds	International	8.8	Hydrological and hydrogeological No hydrological connectivity. No hydrogeological connectivity as SPA is in different groundwater bodies (Mount Mary, Suck South, Aughrim) to the project (Funshinagh). Air There is no strong connection for airborne emissions and dust due to distance. Ecological The following SCI species were not recorded during surveys and so cannot be significantly affected by disturbance/displacement:-

		[A999]			• Golden plover; and, • Greenland white-fronted goose. The following SCI species were recorded during surveys:- • Whooper swan; • Wigeon; and, • Northern lapwing. The core foraging distances for wintering whooper swan, Eurasian wigeon and northern lapwing are up to 5km (SNH, 2016), 8km (Myrfyn & Williams, 1976) and 12km (Gillings, et al., 2007), respectively. As the latter 2 no. distances are both greater than the distance between the project site and the SPA, there is therefore ecological connectivity between the two for Eurasian wigeon and northern lapwing. As the project site is beyond the core foraging range for whooper swan, any whooper swan forming part of the SPA population cannot be significantly affected by disturbance/displacement effects. Taking a precautionary approach, which assumes that the birds recorded during the surveys could represent SPA birds, the possibility of disturbance/displacement and collision-related mortality to Eurasian wigeon and northern lapwing, cannot be ruled out at this stage and requires further consideration. <u>Invasive species</u> There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.
Middle Shannon Callows SPA	004096	Whooper Swan (*Cygnus cygnus*) [A038] w Wigeon (*Anas penelope*) [A050] w Corncrake (*Crex crex*) [A122] r Golden Plover (*Pluvialis apricaria*) [A140] w Lapwing (*Vanellus vanellus*) [A142] r,w	International	8.8	<u>Hydrological and hydrogeological</u> Downstream hydrological connectivity via Cross [Roscommon] and Shannon [Lower] (10.1km instream distance). No hydrogeological connectivity as SPA is in a different groundwater body (Athlone West, Inny, Clara, Tynagh, Banagher) to the project (Funshinagh). <u>Air</u> There is no strong connection for airborne emissions and dust due to distance.

		Black-tailed Godwit (*Limosa limosa*) [A156] c, w Black-headed Gull (*Chroicocephalus ridibundus*) [A179] w Wetland and Waterbirds [A999]			<u>Ecological</u> The following SCI species were not recorded during surveys and so cannot be significantly affected by disturbance/ displacement:- • Corncrake; • Golden plover; and, • Black-tailed godwit. The following SCI species were recorded during surveys: • Whooper swan; • Wigeon; • Northern lapwing; and, • Black-headed gull. The core foraging distances for wintering whooper swan, wigeon, northern lapwing and black-headed gull are up to 5km (SNH, 2016), 8km (Myrfyn & Williams, 1976), 12km (Gillings, et al., 2007) and 20km (SNH, 2016), respectively. As these latter 2 no. distances are both greater than the distance between the project site and the SPA, there is therefore ecological connectivity between the sites for northern lapwing and black-headed gull. As the project site is beyond the core foraging range for whooper swan and wigeon, any whooper swan or wigeon forming part of the SPA population cannot be significantly affected by disturbance/displacement effects. Taking a precautionary approach, which assumes that the birds recorded during the surveys could represent SPA birds, the possibility of disturbance/displacement and collision-related mortality to northern lapwing and black-headed gull, cannot be ruled out at this stage and requires further consideration. <u>Invasive species</u> Downstream hydrological connectivity provides a potential pathway for the spread of invasive species, such as Japanese knotweed, which was recorded alongside the electricity line route.
Four Roads Turlough SPA	004140	Golden Plover (*Pluvialis*	International	10.6	<u>Hydrological and hydrogeological</u>

		apricaria) [A140] w Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395] w Wetland and Waterbirds [A999]			No hydrological connectivity. No hydrogeological connectivity as SAC is in a different groundwater body (Suck South) to the project (Funshinagh). Air There is no strong connection for airborne emissions and dust due to distance. Ecological The following SCI species were not recorded during surveys and so cannot be significantly affected by disturbance/ displacement:- • Golden plover; and, • Greenland white-fronted goose. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.
Mongan Bog SPA/Mongan Bog Ramsar Site 416	004017	Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395] w	International	16.7	Hydrological and hydrogeological No hydrological connectivity. No hydrogeological connectivity as SAC is in a different groundwater body (Inny) to the project (Funshinagh). Air There is no strong connection for airborne emissions and dust due to distance. Ecological The following SCI species were not recorded during surveys and so cannot be significantly affected by disturbance/ displacement:- • Greenland white-fronted goose. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.
Lough Derg (Shannon) SPA	004058	Cormorant (*Phalacrocorax carbo*) [A017] r, w Tufted Duck (*Aythya fuligula*) [A061] r, w	International	42	Hydrological and hydrogeological Very remote, downstream hydrological connectivity (67km instream distance). The distance is such that there is no strong connection due to dilution effects. No hydrogeological connectivity due to distance.

		Goldeneye (*Bucephala clangula*) [A067] w Common Tern (*Sterna hirundo*) [A193] r Wetland and Waterbirds [A999]			Air There is no strong connection for airborne emissions and dust due to distance. Ecological The following SCI species were not recorded during surveys and so cannot be significantly affected by disturbance/ displacement:- • Goldeneye; and, • Common tern. The following SCI species were recorded during surveys:- • Cormorant; and, • Tufted duck. The core foraging distances for cormorant and tufted duck are up to 5.2km (breeding season) (Thaxter, et al., 2012) to 20km (non-breeding season), and 20km (SNH, 2016), respectively. As these distances are both less than the distance between the project site and the SPA, there is therefore no ecological connectivity between the two. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.
River Shannon and River Fergus Estuaries SPA	004077	Cormorant (*Phalacrocorax carbo*) [A017] w Whooper Swan (*Cygnus cygnus*) [A038] w Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] w Shelduck (*Tadorna tadorna*) [A048] w Wigeon (*Mareca penelope*) [A050] w Teal (*Anas crecca*) [A052] w Pintail (*Anas acuta*) [A054]	International	95	Hydrological and hydrogeological Very remote, downstream hydrological connectivity (126km instream distance). The distance is such that there is no strong connection due to dilution effects. No hydrogeological connectivity due to distance. Air There is no strong connection for airborne emissions and dust due to distance. Ecological The following SCI species were not recorded during surveys and so cannot be significantly affected by disturbance/displacement:- • Light-bellied brent goose; • Shelduck;

		w Shoveler (*Anas clypeata*) [A056] w Scaup (*Aythya marila*) [A062] w Ringed Plover (*Charadrius hiaticula*) [A137] w Golden Plover (*Pluvialis apricaria*) [A140] w Grey Plover (*Pluvialis squatarola*) [A141] w Lapwing (*Vanellus vanellus*) [A142] w Knot (*Calidris canutus*) [A143] w Dunlin (*Calidris alpina*) [A149] w Black-tailed Godwit (*Limosa limosa*) [A156] w Bar-tailed Godwit (*Limosa lapponica*) [A157] w Curlew (*Numenius arquata*) [A160] w Redshank (*Tringa totanus*) [A162] w Greenshank (*Tringa nebularia*) [A164] w Black-headed Gull (*Chroicocephalus ridibundus*) [A179] w Wetland and Waterbirds [A999]			• Pintail; • Shoveler; • Scaup; • Ringed plover; • Golden plover; • Grey plover; • Knot; • Dunlin; • Black-tailed godwit; • Bar-tailed godwit; • Redshank; and, • Greenshank. The following SCI species were recorded during surveys:- • Cormorant; • Whooper swan; • Wigeon; • Teal; • Lapwing; • Curlew; and, • Black-headed gull. The core foraging distances for cormorant, whooper swan, wigeon, teal, lapwing, curlew and black-headed gull are up to 20km (SNH, 2016), 5km (SNH, 2016), 8km (Myrfyn & Williams, 1976), 0.8km (Legagneux, et al., 2009), 12km (Gillings, et al., 2007), 20km (SNH, 2016) and 20km (SNH, 2016), respectively. As these distances are all less than the distance between the project site and the SPA, there is therefore no ecological connectivity between the two. <u>Invasive species</u> There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.

Table 5.4: International Sites

5.3.1.2 National Sites

There are 19 no. national nature conservation sites within 15km of the project (i.e. 5 no. NHAs, and 14 no. pNHAs). These are presented at **Annex 5.1** (**Figure 3a** to **3d**).

There are 10 no. pNHAs within 15km of the project that overlap with European sites and for which no site synopsis is available. There are also 3 no. pNHAs that overlap with European sites located beyond 15km that have remote, downstream hydrological connectivity.

The European site designation supersedes that of the pNHA, and effects on these have been assessed in the NIS and are not considered further in this chapter.

A summary of these pNHAs and the European site with which they overlap is presented in **Table 5.5** below.

National Site	Distance (km) of pNHA from Project	Overlapping European Site
Lough Ree pNHA (000440)	1.9	Lough Ree SAC (000440)
		Lough Ree SPA (004064)
Lough Funshinagh pNHA (000611)	2	Lough Funshinagh SAC (000611)
Castlesampson Esker pNHA (001625)	3.8	Castlesampson Esker SAC (001625)
Lough Croan Turlough pNHA (000610)	5.3	Lough Croan Turlough SAC (000610)
		Lough Croan Turlough SPA (004139)
River Shannon Callows pNHA (000216)	8.8	River Shannon Callows SAC (000216)
		Middle Shannon Callows SPA (004096)
Four Roads Turlough pNHA (001637)	10.6	Four Roads Turlough SAC (001637)
		Four Roads Turlough SPA (004140)
Crosswood Bog pNHA (000678)	12.4	Crosswood Bog SAC (000678)
Lisduff Turlough pNHA (000609)	12.4	Lisduff Turlough SAC (000609)
Carn Park Bog pNHA (000676)	14.1	Carn Park Bog pNHA (000676)
Fortwilliam Turlough pNHA (000448)	14.9	Fortwilliam Turlough pNHA (000448)
Lough Derg pNHA (002241)	42	Lough Derg, North-east Shore SAC (002241)
		Lough Derg (Shannon) SPA (004058)
Inner Shannon Estuary – South Shore pNHA (000435)	78	Lower River Shannon SAC (002165)
		River Shannon and River Fergus Estuaries SPA (004077)
Fergus Estuary and Inner Shannon, North Shore pNHA (002048)	78	Lower River Shannon SAC (002165)
		River Shannon and River Fergus Estuaries SPA (004077)

Table 5.5: Nationally Designated Sites which overlap with European Sites

For each of the sites presented at **Table 5.5** the NIS concluded "*with the identified mitigation measures in place, it can be concluded, beyond all reasonable scientific doubt that the Project, either alone or in combination with other plans or projects will*

not undermine the conservation objectives of any European sites. It can therefore be concluded that the Project would not have an adverse effect on the integrity of any European site".

As such, the same conclusion applies for these pNHAs.

Table 5.6 provides a list of the designated sites and identifies any source-receptor pathways. These can be considered within the ZoI. None of the NHAs or pNHAs described in **Table 5.6** are nature reserves.

Site Name	Code	Qualifying Interests	Value	Distance (km) from Project	Connectivity
NHAs					
Suck River Callows NHA	000222	Peatlands Birds	National	8.8	Hydrological and hydrogeological No hydrological connectivity. No hydrogeological connectivity as NHA is in different groundwater bodies (Mount Mary, Suck South, Aughrim) to the project (Funshinagh). Air There is no strong connection for airborne emissions and dust due to distance. Ecological As the NHA overlaps almost entirely with the SPA of the same name, the Birds QI is assumed to be equivalent as the SCI species for the SPA, with the same connectivity as described in **Table 5.5**. i.e. potential ecological connectivity for lapwing and wigeon. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.
Carrickynaghtan Bog NHA	001623	Peatlands	National	10.5	Hydrological and hydrogeological There is no downstream hydrological connection between this NHA and the project site. No hydrogeological connectivity as NHA is in different groundwater body (Athlone West) to the project (Funshinagh). Air There is no strong connection for airborne emissions and dust due to distance. Ecological No ecological connectivity as the QIs are habitats, which are located outside of the project site. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.

Forthill Bog NHA	001448	Peatlands	National	13.1	Hydrological and hydrogeological No hydrological connection. Possible hydrogeological connectivity as NHA is in same Funshinagh groundwater body as the project. However, the raised bog habitats present are not groundwater-fed and there is no pathway for effects. Air There is no strong connection for airborne emissions and dust due to distance. Ecological No ecological connectivity as the QIs are habitats, which are located outside of the project site. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.
Annaghbeg Bog NHA	002344	Peatlands	National	13.1	Hydrological and hydrogeological No hydrological connection. No hydrogeological connectivity as NHA is in different groundwater body (Suck South) to the project (Funshinagh). Air There is no strong connection for airborne emissions and dust due to distance. Ecological No ecological connectivity as the QIs are habitats, which are located outside of the project site. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.
Castle Ffrench East Bog NHA	001244	Peatlands	National	15.0	Hydrological and hydrogeological No hydrological connection. No hydrogeological connectivity as NHA is in different groundwater body (Suck South) to the project (Funshinagh). Air There is no strong connection for airborne emissions and dust due to distance.

					Ecological No ecological connectivity as the QIs are habitats, which are located outside of the project site. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.
pNHAs					
Feacle Turlough pNHA	001634	Turloughs	National	2.9	Hydrological and hydrogeological No hydrological connection. No hydrogeological connectivity as pNHA is in different groundwater body (Suck South) to the project (Funshinagh). Air There is no strong connection for airborne emissions and dust due to distance. Ecological No ecological connectivity as the QIs are habitats, which are located outside of the project site. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.
Lough Slawn pNHA	001443	Habitat diversity	National	10.7	Hydrological and hydrogeological No hydrological connection. **Chapter 7** identifies that there is no hydrogeological connection between the project and the pNHA. Air There is no strong connection for airborne emissions and dust due to distance. Ecological No ecological connectivity as the QIs are habitats, which are located outside of the project site. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.
Cranberry Lough pNHA	001630	Lake habitats Sedge warbler	National	11.1	Hydrological and hydrogeological There is no downstream hydrological connection between

		Acrocephalus schoenobaenus Reed bunting *Emberiza schoeniclus* Common snipe *Gallinago gallinago* Eurasian curlew *Numenius arquata* Little grebe *Tachybaptus rufficolis* Moorhen *Gallinula chloropus* Whooper swan *Cygnus cygnus*			this pNHA and the project site. No hydrogeological connectivity as pNHA is in different groundwater body (Athlone West) to the project (Funshinagh). <u>Air</u> There is no strong connection for airborne emissions and dust due to distance. <u>Ecological</u> The following SCI species were not recorded during surveys and so cannot be significantly affected by disturbance/displacement:- • Sedge warbler; • Reed bunting; • Common snipe; and, • Moorhen. The following SCI species were recorded during surveys:- • Little grebe; • Eurasian curlew; and, • Whooper swan. The core foraging distances for wintering little grebe, Eurasian curlew and whooper swan are up to 20km (SNH, 2016), 20km (SNH, 2016), and 5km (SNH, 2016), respectively. As these distances are greater than the distance between the project site and the pNHA for little grebe and Eurasian curlew, there is therefore ecological connectivity between the sites. As the project site is beyond the core foraging range for whooper swan, any whooper swan forming part of the pNHA population cannot be significantly affected by disturbance/displacement effects. Taking a precautionary approach, which assumes that the birds recorded during the surveys could represent SPA birds, the possibility of disturbance/displacement and collision-related mortality to little grebe and Eurasian curlew during the construction and operational phases, cannot be ruled out. <u>Invasive species</u> There are no hydro-, hydrogeological, airborne or ecological

					pathways for the spread of invasive species.
Waterstown Lake pNHA	001732	Fen and peat habitats	National	12.2	Hydrological and hydrogeological No hydrological connection. No hydrogeological connectivity as pNHA is in different groundwater body (Inny) to the project (Funshinagh). Air There is no strong connection for airborne emissions and dust due to distance. Ecological No ecological connectivity as the QIs are habitats, which are located outside of the project site. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.

Table 5.6: Nationally Designated Sites

5.3.2 Habitats & Flora

5.3.2.1 Desktop Study

There are no previously mapped Annex I habitats present within the project site (NPWS, 2019). However, previously mapped priority Annex I turlough habitats [3180*] are present to the south and southwest of the project, outside the project site. Similarly, there are no records of Floral Protection Order species, protected bryophytes or important habitats such as semi-natural grasslands or ancient woodlands (AW) within the NPWS data sources.

Habitat contribution to ecological networks has been assessed *sensu* Parker et al. (2016). Those areas that contribute most to ecological networks (i.e. those that contribute to 3 no. ecological networks) are considered to have the highest biodiversity value. Most of the project contributes to no ecological networks *sensu* Parker et al. (2016). Some of the northern and southern sections of the underground electricity line contribute to 1 no. ecological network. Thus, most of the land at the project site (excluding electricity line) has low biodiversity value in this regard.

No records of threatened, protected or non-native flora were yielded from the data search.

5.3.2.2 Field Survey

No threatened or protected flora were recorded within the study area during surveys.

A small stand of invasive Japanese knotweed *Fallopia japonica* was recorded within the verge along local road L2019 adjacent to the underground electricity line. This species is listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011-2021 (S.I. 477/2011).

Non-native box honeysuckle *Lonicera pileata* was located adjacent to the Cross [Roscommon] watercourse crossing and montbretia *Crocosmia x crocosmiiflora* was located adjacent to the underground electricity line. Non-native snowberry *Symphoricarpos albus* was also located in hedges alongside the underground electricity line. The invasiveness of these three species classified as 'not-assessed', 'low' and 'low', respectively (Kelly et al., 2013).

The following describes the habitats recorded within the project site (includingthe route of the electricity line). The locations of these habitats, along with non-native species locations, are illustrated at **Annex 5.1** (**Figures 4a–4f**, **5b**) and **Table 5.7**.

Flower Beds and Borders (BC4)

Flower beds and borders were present as part of gardens adjacent to the underground electricity line. A variety of non-native and native plant species were recorded including marigold *Tagetes* spp., New Zealand flax *Phormium* spp., peony *Paeonia* spp., ox-eye daisy *Leucanthemum vulgare*, rose *Rosa* spp. and borage *Borago officinalis*.

Photo 1: Flower Beds and Borders BC4

Stone Walls and Other Stoneworks (BL1)

Stone walls and other stoneworks were largely present as field or property boundaries adjacent to the underground electricity line, or within fields that will contain the substation and associated infrastructure. Lichens were mostly present on the stone walls, along with occasional ivy-leaved toadflax *Cymbalaria muralis* and maidenhair spleenwort *Asplenium trichomanes*. Ivy *Helix hedera*, herb robert *Geranium robertanium*, bramble *Rubus fruticosus* agg., occasional alder *Alnus glutinosa*, hawthorn *Crataega monogyna*, nettles *Urtica dioica* and white clover *Trifolium repens*. Dandelion *Taraxacum vulgaria* and cocksfoot *Dactylis glomerata* were rarely seen on the edge of this habitat.

Photo 2: Stone Walls and Oher Stoneworks BL1

Buildings and Artificial Surfaces (BL3)

Buildings and artificial surfaces were present as roads along the route of the underground electricity line, at buildings adjacent to same and in the environs of the

electricity substation site.

Photo 3: Buildings and Artificial Surfaces BL3

Recolonising Bare Ground (ED3)

Recolonising bare ground was found adjacent to areas of scrub adjacent to the route of the underground electricity line and in a building site in Brideswell. Species recorded included perforate St John's wort *Hypericum perforatum*, sweet rocket *Hespersis matronalis*, barren strawberry *Potentilla sterilis*, ribwort plantain *Plantago lanceolata*, dandelion, Yorkshire fog *Holcus lanatus*, bramble, European gorse *Ulex europeus*, bracken *Pteridium aquilinum*, sycamore *Acer pseudoplatanus* saplings, black medick *Medicago lupulina*, foxglove *Digitalis purpurea*, herb robert, hedge mustard *Sisymbrium officinale*, sowthistle *Sonchus oleraceus* and broad-leaved dock *Rumex obtusifolius*.

Photo 4: Recolonising Bare Ground ED3

Turloughs (FL6)

A small turlough was present within the survey area but a much larger example of this habitat was present immediately south of the substation site. All turloughs present

were subject to additional botanical analysis.

The turloughs to the south of the substation appeared to have flooded GA1 improved agricultural grassland fields, with evidence of submerged WL1 hedgerow and BL1 stone walls and other stoneworks present.

There were very few plants present within the large turlough itself. Hemlock water-dropwort *Oenanthe crocata* was occasionally present within the turlough and frequently present on the margins. Also, occasionally present on the margins included watercress *Nasturtium oficinale* and drowned broad-leaved dock.

No bryophytes (or any other notable species) associated with priority Annex I habitat [3180] turloughs* (O)'Neill and Martin, 2015) were recorded including *Cinclidotus fontinaloides* and *Fontinalis antipyretica*. However, access to the turloughs was restricted to the northern shore and it is possible that these bryophytes were present elsewhere. Given that the area has previously been mapped as Annex I turlough habitat, they have been assumed to be here also, in accordance with the precautionary approach.

Photo 5: Turloughs FL6

Depositing/Lowland Rivers (FW2)

Depositing/Lowland Rivers were present in the form of the Cross [Roscommon] River which intersects the route of the underground electricity line. Species recorded along the bank edges included flag iris *Iris pseudacorus*, great willowherb *Epilobium hirsutum*, common reed *Phragmites australis* and marsh marigold *Caltha palustris*. Abundant brambles and nettles were also seen, suggesting nutrient enrichment. Non-native box honeysuckle was present also.

A fuller description of the instream habitats present at the Cross [Roscommon] River is provided at **Annex 5.3**.

Photo 6: Depositing/Lowland Rivers FW2

Drainage Ditches (FW4)

Drainage ditches were found within the verge along the underground electricity line, particularly near the Derryglad Folk Museum and south of the Cross [Roscommon] River. Plant species recorded included locally abundant flag iris, meadowsweet *Filipendula ulmaria* and great willowherb. Small goat willow *Salix caprea* saplings were occasionally present, along with common reed. Common duckweed *Lemna minor* was also present.

Photo 7: Drainage Ditches FW4

Improved Agricultural Grassland (GA1)

Improved agricultural grassland was found near much of the underground electricity line and at the substation location. These areas were used for grazing by sheep and, at the substation, cattle. Perennial rye grass *Lolium* species dominated this habitat type, with frequent creeping buttercup *Ranunculus repens*, broad-leaved dock and occasional creeping thistle *Cirsium arvense* and spear thistle *Cirsium vulgare* present. Wetter areas had frequent soft rush *Juncus effusus* present also. Pineappleweed *Matricaria discoidea*, germander speedwell *Veronica chamaedrys*, cleavers *Galium aparine* and hogweed *Heracleum sphondylium* were present in field margins.

Photo 8: Improved Agricultural Grassland GA1

Amenity Grassland (Improved) (GA2)

Amenity grassland (improved) comprised of lawns and mown verges near to the underground electricity line. This habitat was dominated by a mixture of grass species and daisy *Bellis perennis*.

Photo 9: Amenity Grassland (Improved) GA2

Dry Meadows and Grassy Verges (GS2)

Dry meadows and grassy verges were found adjacent to much of the underground electricity line. Species recorded included cocksfoot, cleavers, creeping buttercup and sow thistle. Occasionally cow parsley *Anthriscus sylvestris*, bush vetch *Vicia sepium*, nettles and yarrow *Achillea millefolium* were also present.

Invasive Japanese knotweed was present in 1 no. verge adjacent to the underground electricity line and non-native montbretia along another.

Photo 10: Dry Meadows and Grassy Verges GS2

(Mixed) Broadleaved Woodland (WD1)

(Mixed) broadleaved woodland was found in a small section to the east of the substation location and along the underground electricity line. Species included beech *Fagus sylvatica*, elder *Sambucus nigra*, hazel *Corylus avellana*, ash *Fraxinus excelsior*, cedar *Cedrus* sp., yew *Taxus baccata* and hawthorn.

Photo 11: (Mixed) Broadleaved Woodland WD1

Scattered Trees and Parklands (WD5)

Scattered trees and parkland habitat consisted of a large garden adjacent to the underground electricity line where trees were a prominent visual feature but comprised less than 30% of the total area under consideration. Trees included small beech, rowan *Sorbus aucuparia*, staghorn sumac *Rhus typhina*, ornamental cherry *Prunus* sp., mahonia *Mahonia* sp., Portuguese laurel *Prunus lusitanica* and ornamental conifers.

Photo not shown due to its presence within a private garden.

Hedgerows (WL1)

Hedgerows were present along most of the underground electricity line route and some at the electricity substation site acting as boundaries to fields and properties. Species recorded included blackthorn, bramble, hawthorn, elder, hazel and cow parsley. Non-native hedges comprised of box honeysuckle, laurel *Prunus* spp., red robin *Photinia* spp., snowberry *Symphoricarpos albus* and Leyland cypress *Cupressus x leylandii*.

Photo 12: Hedgerows WL1

Treelines (WL2)

Treelines were present adjacent to the underground electricity line route and comprised a wide variety of tree species including ash, willows, sycamore and copper beech *Fagus sylvatica f. purpurea*. Ash trees dominated. Ivy was occasionally observed. Trees were mainly small and/or immature.

Photo 13: Treelines WL2

Scrub (WS1), and Dense Bracken x Scrub (HD1 x WS1) Mosaic

Scrub was found nearby to parts of the underground electricity line comprising of European gorse along with occasional bracken, foxglove, herb robert, small hawthorn and blackthorn saplings, nettles, bramble and creeping buttercup.

This habitat type also formed mosaics with HD1 dense bracken in areas (photo not shown due to lack of access).

Photo 14: Scrub WS1

WS3 Ornamental/Non-native Shrub

This category included a large stand of laurel within a garden adjacent to the underground electricity line.

Photo not shown due to its presence within a private garden.

Fossitt Code	Fossitt Name	EU Annex I Affiliation?	Area (ha)/Length (m)	Occurrence within Project
BC4	Flower beds and borders	No	54m	Adjacent to the underground electricity line.
BL1	Stone walls and other stonework	No	135.46m	Adjacent to the underground electricity line and forms field boundaries at the substation.
BL3	Buildings and artificial surfaces	No	11.9ha/101m	Roads and buildings adjacent to the underground electricity line.
ED3	Recolonising bare ground	No	1.4ha	Adjacent to the underground electricity line.
FL6	Turloughs	Yes – with 3180* turloughs	0.5ha	South of the substation.
FW2	Depositing/lowland rivers	No	263m	Crossed by underground electricity line.
FW4	Drainage ditches	No	619m	Adjacent to the underground electricity line.
GA1	Improved agricultural grassland	No	97.7ha	Adjacent to the underground electricity line and at substation location.
GA2	Amenity grassland (improved)	No	3.8ha	Adjacent to the underground electricity line.
GS2	Dry meadows and grassy verges	No	0.2ha/549m	Adjacent to the underground electricity line.
WD1	(Mixed) broadleaved woodland	No	0.2ha	East of the substation location.
WD5	Scattered trees and parklands	No	0.1ha	Adjacent to the electricity line.
WL1	Hedgerows	No	6,032m	Adjacent to the underground electricity line.
WL2	Treelines	No	3,279m	Adjacent to the underground electricity line.
WS1	Scrub	No	1.5ha	Adjacent to the underground electricity line.
HD1 x WS1	Dense bracken x scrub mosaic	No	0.1ha	Adjacent to the underground electricity line.
WS3	Ornamental/non-native shrub	No	0.02ha	Adjacent to the underground electricity line.

Table 5.7: Habitat Types Within Project site

5.3.3 Birds

5.3.3.1 Desktop Study

The data search yielded no records of threatened or protected birds at the project site (see **Annex 5.4** for details of data sources). This included opportunistic data and data collected for other purposes.

5.3.3.2 Field Survey

The following sections present seasonal summaries of the non-breeding and breeding bird surveys undertaken. Full details of the non-breeding bird survey results (including figures) are provided in **Annex 5.2** and a figure of the breeding birds recorded is provided at **Annex 5.1** (**Figure 5b**).

28 no. species were recorded during bird surveys.

Table 5.8 summarises the peak numbers of birds recorded during baseline surveys undertaken during October 2023 to March 2024 inclusive (non-breeding season), and April and May 2024 (breeding season).

In general, the surveys during the non-breeding period recorded more species and a greater overall abundance of birds. The turloughs south and southwest of the electricity substation site were the most important habitats during this season. Species consistently recorded in this area during surveys included black-headed gull, lapwing, teal, mallard and mute swan.

In the breeding season, confirmed breeding was identified for coot *Fulica atra* present in the southern turlough and probable breeding for starlings *Sturnus vulgaris* at a housing development in Brideswell. A coot sitting on a nest was also seen late in the non-breeding season; however, this was in a separate location to the breeding coot seen during breeding season surveys.

Species Name	Period of Analysis (Season)	Peak Count	Locations	Behaviour
Black-headed gull *Chroicocephalus ridibundus*	Non-breeding 2023/24	108	Most frequently on southwestern turlough	Foraging on turlough
	Breeding 2024	10	Fields NE of substation and west of Cross [Roscommon] River, within southern turlough	Foraging in fields and within turlough
Common gull *Larus canus*	Non-breeding 2023/24	1	Fields near underground electricity line; two observations of single birds	Foraging
Coot	Non-breeding 2023/24	6	Within southern and southwestern turloughs, in wetland areas adjacent to underground electricity line	Confirmed Breeding – seen on nest
	Breeding 2024	7	Southern turlough	Confirmed Breeding – swimming with young
Cormorant *Phalacrocorax carbo*	Non-breeding 2023/24	1	Along underground electricity line	Flying over
	Breeding 2024	1	Southern turlough	Flying over turlough

Curlew *Numenius Arquata*	Non-breeding 2024/24	1	Heard during surveys at turloughs on one occasion only	Calling
Great crested grebe *Podiceps cristatus*	Non-breeding 2023/24	1	Single bird recorded on two occasions in southwestern turlough	Foraging
Grey heron *Ardea cinerea*	Non-breeding 2023/24	1	Single bird recorded on two occasions in southern and southwestern turloughs	Foraging
Herring gull *Larus argentatus*	Breeding 2024	2	Fields NE of substation	Foraging in fields
Hooded crow *Corvus cornix*	Breeding 2024	3	Fields NE of substation and east of Cross [Roscommon] River, over southwest turlough, farmyard near substation	Foraging in fields, flying over turlough, flying over farmyard
House martin *Delichon urbicum*	Breeding 2024	5	Fields east of farmyard at substation	Foraging in fields
House sparrow *Passer domesticus*	Breeding 2024	4	Farmyard near substation	Foraging in farmyard
Jackdaw *Coloeus monedula*	Breeding 2024	2	Farmyard near substation	Flying over farmyard
Kestrel *Falco tinnunculus*	Non-breeding 2023/24	1	Along underground electricity line	Foraging
Lapwing *Vanellus vanellus*	Non-breeding 2023/24	120	Mainly in southern and southwestern turloughs	Foraging adjacent to turloughs
Lesser black-backed gull *Larus fuscus*	Non-breeding 2023/24	3	Southern and southwestern turloughs	Foraging
	Breeding 2024	1	Fields NE of substation and east of Cross [Roscommon] River	Foraging in fields
Little egret *Egretta garzetta*	Breeding 2024	1	Southwest turlough	Foraging in turlough
Little grebe *Tachybaptus rufficolis*	Non-breeding 2023/24	2	Southern and southwestern turloughs, pond in field near underground electricity line	Foraging
Mallard *Anas platyrhynchos*	Non-breeding 2023/24	6	Southern and southwestern turloughs	Foraging
	Breeding 2024	2	Derryglad Folk and Heritage Museum, southwestern turlough	Flying over, foraging in turlough
Moorhen *Gallinula chloropus*	Non-breeding 2023/24	2	Southern and southwestern turloughs	Foraging
	Breeding 2024	1	Southwest turlough	Foraging in turlough
Mute swan *Cygnus olor*	Non-breeding 2023/24	5	Mainly in southern and southwestern turloughs	Foraging
	Breeding 2024	2	Southwest and southern turloughs	Foraging in turloughs
Oystercatcher *Haematopus ostralegus*	Non-breeding 2023/24	1	Single bird recorded once in fields north of substation	Foraging
Rook *Corvus*	Breeding 2024	2	Fields NE of substation	Foraging in fields

frugilegus				
Starling	Breeding 2024	10	Housing development in Brideswell, and farmyard near substation	**Probable Breeding** – within abandoned pile of breeze blocks in housing development, foraging in farmyard
Swallow *Hirundo rustica*	Breeding 2024	5	Over Cross [Roscommon] River and southwest turlough, south of farmyard near substation	Foraging over watercourses and waterbody, and south of farmyard
Teal *Anas crecca*	Non-breeding 2023/24	33	Mainly in southwestern turlough	Foraging
Tufted duck *Aythya fuligula*	Non-breeding 2023/24	8	Southern and southwestern turlough	Foraging
Whooper swan *Cygnus cygnus*	Non-breeding 2023/24	14	Recorded on three occasions in southern and southwestern turloughs	Foraging
Wigeon	Non-breeding 2023/24	84	Mainly in southwestern turlough	Foraging

Table 5.8: Summary of Bird Species Recorded by Season

5.3.4 Terrestrial Mammals (Excluding Bats)

5.3.4.1 Desktop Study

The data search yielded records of 1 no. species of threatened and/or protected mammal (see **Annex 5.4**) namely Eurasian badger *Meles meles*. There is limited likelihood of this species being present within the project site.

There were no records of invasive or non-native mammals.

5.3.4.2 Field Survey

No non-volant mammals (i.e. either live sightings or other evidence) were recorded during the field surveys. Note that Eurasian otter results are discussed in **Section 5.3.7.2** under aquatic ecology.

The heavily grazed improved agricultural grassland fields and stone walls at the substation site do not afford suitable breeding, resting or foraging habitats for mammals. It is possible that mammals could use some habitats adjacent to the underground electricity line but these were not accessible for survey.

5.3.5 Bats

5.3.5.1 Desktop Study

Potential Roost Feature Assessment

Online satellite images, and the Environmental Sensitivity Mapper, identified very few structures or trees that could be used by roosting bats within or adjacent to the footprint of the project during the desk study.

Bat Landscapes

The mean bat landscapes suitability index across all bat species differs across the project site, with most of the underground electricity line less suitable for bats than the substation. For the substation, the score is 34.56 (out of a maximum score of 100). For most of the underground electricity line the score is 25.22 (out of a maximum score of 100). An explanation is provided below.

The substation site has a high bat landscapes suitability index for soprano pipistrelle *Pipistrellus pygmaeus*. There is moderate suitability for brown long-eared bat *Plecotus auritus*, common pipistrelle *Pipistrellus pipistrellus*, Daubenton's bat *Myotis daubentonii*, Nathusius' pipistrelle *Pipistrellus nathusii*, Natterers' bat *Myotis nattereri*, Leisler's bat *Nyctalus leisleri* and whiskered bat *Myotis mystacinus*. The bat landscapes suitability index is classified as low for lesser horseshoe bat *Rhinolophus hipposideros*.

The route of the underground electricity line has a moderate bat landscapes suitability index for brown long-eared bat, common pipistrelle, Daubenton's bat, Leisler's bat, Natterers' bat and soprano pipistrelle. The bat landscapes suitability index is classified as low for lesser horseshoe bat, Nathuisus' pipistrelle and whiskered bat.

NBDC Data

There are no records of bats within the 1km grid squares overlapping the electricity substation site and watercourse crossing.

Bat Conservation Ireland Data

Bat Conservation Ireland (BCI) data show that 2 no. recorded bat roosts are located within the 10km hectads overlapping the project site (**Annex 5.1 Figure 5a**). The roosts are c. 4km north and c. 7.9km northwest of the substation, respectively. The former is a roost for soprano pipistrelle and the latter is a mixed-species roost for common pipistrelle, soprano pipistrelle, and brown long-eared bat.

Neither of these roosts are likely to have ecological connectivity to the project site i.e., the core sustenance zones (CSZ), as measured from the roost, do not overlap with the project site.

BCI had desktop records on all Irish bat species exception for lesser horseshoe and Nathusius' pipistrelle in the wider search area.

5.3.5.2 Field Survey

No evidence of roosting bats was observed in any of the trees or structures surveyed.

All trees along the route of the underground electricity line were classified as having low or negligible suitability.

5.3.6 Other Protected Flora

5.3.6.1 Desktop Study

No records of amphibian, reptile or other invertebrates were yielded from the data search.

5.3.6.2 Field Survey

Amphibians

Neither common frog nor smooth newt were recorded during surveys. However, suitable habitat for both species is present in the form of turlough habitats, damp patches in fields and drainage ditches, particularly in the wider environs of the substation location and near the Cross [Roscommon] River crossing.

Reptiles

No reptiles were recorded during surveys. Common lizard *Zootoca vivipara* can utilise a variety of habitats. As such, south-facing habitats including sunny stone walls near hedgerows within the project site could support common lizard.

Other Invertebrates

No threatened and/or protected species were recorded during surveys. The highly modified, intensely farmed agricultural landscape at the substation affords low suitability for invertebrates. Some of the habitats (grassy verges, hedgerows, flower beds and scrub) adjacent to the underground electricity line offer foraging and breeding habitats, particularly for pollinators. Note, aquatic invertebrates recorded during Q sampling are detailed at **Annex 5.3.**

5.3.7 Fisheries and Aquatic Ecology

5.3.7.1 Desktop Study

The desktop data available for fisheries and aquatic ecology is described in full at **Annex 5.3**. A summary is provided below.

The Cross [Roscommon] River is known to support brown trout *Salmo trutta*, perch *Perca fluviatilis*, pike *Esox Lucius*, gudgeon *Gobio gobio*, roach *Rutilis rutilis*, roach x bream hybrids *R. rutilis* x *Abramis brama*, lamprey *Lampetra* sp., stone roach *Barbatula barbatula* and three-spined stickleback *Gasterosteus aculeatus*.

No Atlantic salmon *Salmo salar* have been recorded by Inland Fisheries Ireland in the river during historical surveys.

A low number of records for white-clawed crayfish *Austropotamobius pallipes* are present within the wider area; downstream of, but not overlapping, the crossing of the Cross [Roscommon] River.

There are historical records of otter present within the wider area but not at the watercourse crossing.

5.3.7.2 Field Survey

The full set of fisheries and aquatic ecology survey results can be found at **Annex 5.3**. A summary is provided below.

The locations of surface water features are illustrated at **Annex 5.1** (**Figures 1** and **4a-4f**.

Habitats

The watercourse and aquatic survey site in the vicinity of project site was a semi-natural, lowland depositing watercourse (FW2) with evidence of historical drainage

modifications.

Q-sampling

No rare or protected macro-invertebrate species (according to national red lists) were recorded in the biological water quality sample taken.

The survey site achieved target good status (Q4 and EQR of 0.8) requirements of the EU Environmental Objectives (Surface Waters) (Amendment) Regulations 2019 and the Water Framework Directive (2000/60/EC).

This was a consequence of the number of group A species including the mayfly species *Ephermera Danica* and *Heptagenia sulphurea*, presence of group B species such as cased caddis species, numerous group C species such as caseless caddis *Hydropsyche instabilis* and the riffle beetle species *Elmis aenea* and *Limnius volkmari*.

Macrophytes & Aquatic Bryophytes

No rare or protected macrophytes or aquatic bryophytes were recorded at the survey site. Similarly, no examples of the Annex I habitat 'Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation or aquatic mosses [3260]' was recorded during the surveys.

Salmonids

Good quality spawning and nursery habitat for brown trout was also present both upstream and downstream of the survey site, with valuable holding areas for migratory adults present downstream in deeper glide and pool habitat. Mixed cohorts of brown trout were recorded. No Atlantic salmon were recorded in eDNA samples, and while salmon can enter parts of the middle Shannon including the River Suck, the species densities are either very low or the species does not occur in the Cross [Roscommon] River.

Lamprey

Brook lamprey *Lampetra planeri* were detected via eDNA sampling and with good spawning and moderate quality nursery habitat for the species present at the survey site. While nursery habitat was 'patchy' (limited to more localised superficial sand and silt), spawning habitat was more extensive given mixed medium and fine gravels between coarser bed substrata. However, in pools and depositional areas >100m downstream of the survey site, more significant lamprey habitat exists.

European Eel

The survey area (especially deep glide) downstream of the survey site was of moderate suitability for European eel *Anguilla anguilla*, but the species was not recorded in eDNA sampling. Downstream barriers including Meelick Weir and Ardnacrusha Dam restrict the passage of eel into the middle River Shannon catchment and likely explains the very low density or absence of eels in the study area.

White-clawed crayfish

Although some good habitat suitability was present in terms of instream refugia for white-clawed crayfish (i.e. boulders and cobble), none were recorded during the survey in eDNA samples. Furthermore, no crayfish remains were detected in otter

spraint.

Otter

Two otter spraint sites were recorded under the bridge crossing at the survey site and on marginal boulders downstream. The survey area was considered to provide good foraging and commuting habitat although no breeding and or resting areas were recorded within 150m of the survey site, likely due to more limited riparian cover (much of the banks downstream of the crossing were sparse and open). A search of the riparian boulder revetments and dry arch of the bridge adjoining the survey site did not identify any potential holt sites. Furthermore, the very hard ground of the modified banks, compacted during historical drainage works also limits the potential for holt excavation on the riverbanks.

Invasive aquatic species

No non-native or invasive aquatic species were recorded.

5.4 Evaluation of Ecological Features

An evaluation of ecological features within the ZoI is provided at **Table 5.9**.

Only those evaluated as an Important Ecological Feature (IEF) are brought forward for impact assessment. These include those protected by law or policy. It should be noted that all recorded habitats have been brought forward for assessment to facilitate a fuller assessment of any net changes to biodiversity as a consequence of the project.

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Y/N
International Nature Conservation Sites	Ballynamona Bog and Corkip Lough SAC 002339, Lough Ree SAC 000440/SPA 004064, Castlesampson Esker SAC 001625, River Shannon Callows SAC 000216, River Suck Callows SPA 004097, and Middle Shannon Callows SPA 004096	Protected under the Habitats and Birds Directive, derived domestic legislation, and national, regional and local planning policy. NIS determined potential hydrological/hydrogeological/ecological connectivity.	International	Part of European Natura 2000 network.	Y
National Nature Conservation Sites	Suck River Callows NHA 000222	Protected under local planning policy. There is a potential ecological connection between the project site and this pNHA for lapwing and wigeon.	National	Statutory designated Irish conservation site.	Y
	Cranberry Lough pNHA 001630	Protected under local planning policy. There is a potential ecological connection between the project site and this pNHA for little grebe and curlew.	National	Non-statutory designated Irish conservation site.	Y

Birds	Black-headed gull	BoCCI 4: Amber list (qualifying criteria: moderate decline in breeding range of 58% and 55% over short and longer time periods, respectively; localized breeder with >50% breeding population in 10 or fewer sites). ROI non-breeding and breeding population: 20,197 individuals (2016/17: (Fitzgerald et al, 2021)) and 9,318 breeding pairs (2010-2012: (NPWS, 2022)). Regional (Co. Roscommon and Co. Westmeath) non-breeding and breeding population: 20,197 (IWeBS) and 18,636 individuals (inferred). County Roscommon population non-breeding and breeding population: 787 (IWeBS) and 410 individuals (inferred). Baseline surveys: peak count 108 individuals (non-breeding season) and 10 individuals (breeding season).	Regional (non-breeding and breeding)	Non-breeding and breeding peak counts are 0.5% and 0.05% of the ROI population, respectively, so are not significant within this context. These peak counts are 9.7% and 1.1% of the regional populations, respectively. On this basis, both non-breeding and breeding populations are of regional importance.	Y
	Common gull	BoCCI 4: Amber list (qualifying criteria: moderate decline in breeding population of 25% over the longer time period). ROI non-breeding population: 8,032 individuals (2016/17: (Fitzgerald et al., 2021)). Regional (Co. Roscommon and Co. Westmeath) non-breeding population: 64 individuals (IWeBS). County Roscommon population non-breeding population: 64 individuals (IWeBS). Baseline surveys: peak count one individual (non-breeding season only).	Regional (non-breeding only)	Non-breeding peak counts are 0.01% of the ROI population, so are not significant within this context. The peak count is 1.6% of the regional population. On this basis, the non-breeding population is of regional importance, acknowledging that IWeBS counts likely underestimate the true population as counts of gulls are optional (BirdWatch Ireland and NPWS, 2024).	Y
	Common kestrel	BoCCI 4: Red list (qualifying criteria: severe decline in breeding population of 53% over short time period). ROI population: 36 territorial pairs (Wilson-Parr & O'Brien, 2019) but this is likely to represent a massive underestimate as the Countryside Bird Survey 2011-2016 (Lewis, et al., 2019) estimates	Local Higher (non-breeding only)	Non-breeding peak counts are 0.07% of the ROI population, so are not significant within this context. The peak count is 0.15% and 0.34% of the regional and county populations. On this basis, the non-breeding	Y

		an ROI population of 13,500 individuals, so this is the more likely estimate for the non-breeding population. Regional (Co. Roscommon and Co. Westmeath) non-breeding population: 651 individuals (inferred). County Roscommon population non-breeding population: 297 individuals (inferred). Baseline surveys: peak count one individual (non-breeding season only).		population is of local - higher importance, acknowledging the poor conservation status of the species.	
	Eurasian coot	BoCCI 4: Amber list (qualifying criteria: unfavourable conservation status in Europe but global population concentrated outside Europe; 35% decline in winter population over short time period; 36% decline in breeding range over long time period; localised non-breeding population). ROI non-breeding and breeding population: 9,368 individuals (2016/17: (Fitzgerald et al., 2021) for both (in absence of estimates, the breeding population has been assumed to be the same as the non-breeding population). Regional (Co. Roscommon and Co. Westmeath) non-breeding and breeding population: 3,838 (IWeBS) and 452 (inferred) individuals. County Roscommon population non-breeding and breeding population: 203 (IWeBS)and 206 (inferred) individuals. Baseline surveys: peak count six and seven individuals (non-breeding and breeding season). Confirmed breeding at the southern turlough and in lake near underground electricity line.	County (non-breeding)/Regional (breeding)	Non-breeding and breeding peak counts are 0.06 and 0.07% of the ROI population, so are not significant within this context. The peak count is 0.16% and 1.5% of the regional non-breeding and breeding populations, so is significant in the context of the latter. The peak count is 3% of the county non-breeding population, so is significant in this context. On this basis, the non-breeding population is of county importance and the breeding population is of regional importance.	Y
	Eurasian curlew	BoCCI 4: Red list (qualifying criteria: global conservation concern; severe decline in breeding population of 86% and 98% over shorter and longer time periods, respectively;	Local Higher (non-breeding only)	Non-breeding peak counts are 0.007% of the ROI population, so are not significant within this context. The peak count is 0.26% and 0.35%	Y

		severe decline in non-breeding population of 65% over longer time period; severe decline in breeding range of 73% and 78% over longer and shorter time periods, respectively). ROI non-breeding population: 14,994 individuals (2016/17: (Fitzgerald et al., 2021)). Regional (Co. Roscommon and Co. Westmeath) non-breeding population: 379 individuals (IWeBS). County Roscommon population non-breeding population: 288 individuals (IWeBS). Cranberry Lough pNHA: no information in site synopsis and not an IWeBS site, so no population data available. Baseline surveys: peak count one individual (non-breeding season only).		of the regional and county populations. On this basis, the non-breeding population is of local - higher importance, acknowledging the poor conservation status of the species. It is impossible to contextualise the non-breeding peak counts for the Cranberry Lough pNHA curlew population, as no data are available.	
	Eurasian teal	BoCCI 4: Amber list (qualifying criteria: moderate decline in breeding range of 46% over longer time period). ROI non-breeding population: 23,671 individuals (2016/17: (Fitzgerald et al., 2021)). Regional (Co. Roscommon and Co. Westmeath) non-breeding population: 2,368 individuals (IWeBS). County Roscommon population non-breeding population: 2,027 individuals (IWeBS). Baseline surveys: peak count 33 individuals (non-breeding season only).	Regional (non-breeding only)	Non-breeding peak counts are 0.14% of the ROI population, so are not significant within this context. The peak count is 1.39% of the regional population. On this basis, the non-breeding population is of regional importance.	Y
	Eurasian wigeon	BoCCI 4: Amber list (qualifying criteria: moderate decline in non-breeding population of 38% and 44% over shorter and longer time periods, respectively; rare breeder; localized non-breeding populations). ROI non-breeding population: 41,504 wintering individuals (2016/17: (Fitzgerald et al., 2021)). Regional (Co. Roscommon and Co. Westmeath) non-breeding population: 3,524	Regional (non-breeding only)	Non-breeding peak counts are 0.2% of the ROI population, so are not significant within this context. The peak count is 2.38% of the regional population. On this basis, the non-breeding population is of regional importance. Similarly, the non-breeding peak counts are 6.2% of the Suck Callows	Y

		individuals (IWeBS). County Roscommon population non-breeding population: 3,383 individuals (IWeBS). Suck River Callows NHA winter population: 1,355 (IWeBS 5-year mean peak count 2016/17 – 2020/21). Baseline surveys: peak count 84 individuals (non-breeding season only).		NHA population, and so are significant in this context.	
	Great cormorant	BoCCI 4: Amber list (qualifying criteria: localised breeder with >50% breeding population in 10 or fewer sites). ROI non-breeding and breeding population: 2,987 individuals (2016/16: (Fitzgerald et al., 2021)) and 4,366 breeding pairs (2012: (NPWS, 2022)). Regional (Co. Roscommon and Co. Westmeath) non-breeding and breeding population: 137 (IWeBS) and 421 individuals (inferred). County Roscommon population non-breeding and breeding population: 77 (IWeBS) and 192 individuals (inferred). Baseline surveys: peak count one individual (in both non-breeding and breeding seasons).	County (non-breeding)/Local Higher (breeding)	Non-breeding and breeding peak counts are 0.03% and 0.01%of the ROI population, respectively, so are not significant within this context. The peak counts are 0.73% and 0.24% of the non-breeding and breeding regional population, respectively, so are not significant within this context. The peak counts are 1.3% and 0.52% of the non-breeding and breeding county populations, respectively. On this basis, the non-breeding population is of county importance and the breeding population is of local higher importance.	Y
	Great crested grebe	BoCCI 4: Amber list (qualifying criteria: 43% decline in winter population over short time period; localised non-breeding population). ROI non-breeding population: 879 wintering individuals (2016/17: (Fitzgerald et al., 2021)). Regional (Co. Roscommon and Co. Westmeath) non-breeding population: 104 individuals (IWeBS). County Roscommon population non-breeding population: 37 individuals (IWeBS). Baseline surveys: peak count one individual (non-breeding season only).	County (non-breeding only)	Non-breeding peak counts are 0.1%, 0.96% and 2.7% of the ROI, regional and county populations, respectively. On this basis, the non-breeding population is of county importance.	Y

	Herring gull	BoCCI4: Amber list (qualifying criteria: unfavourable conservation status in Europe with global population concentrated in Europe; moderate decline of 29% and 50% in breeding population over short and longer time periods). ROI breeding population: 2,319 pairs (NPWS, 2021). Regional (Co. Roscommon and Co. Westmeath) breeding population: 224 individuals (inferred). County Roscommon breeding population: 102 individuals (inferred). Baseline surveys: peak count one individual (breeding season only).	County (breeding only)	Breeding peak counts are 0.04% of the ROI population, so are not significant within this context. The peak count is 0.9% and 2% of the regional and county populations, respectively. On this basis, the breeding population is of county importance.	Y
	House martin	BoCCI 4: Amber list (qualifying criteria: unfavourable conservation status in Europe and global population concentrated in Europe). ROI breeding population: 606,043 individuals (Lewis et al., 2019). Regional (Co. Roscommon and Co. Westmeath) breeding population: 29,219 individuals (inferred). County Roscommon breeding population: 13,350 individuals (inferred). Baseline surveys: peak count five individuals (breeding season only).	Local Higher (breeding only)	Breeding season peak counts are 0.0008%, 0.017% and 0.037% of the ROI, regional and county populations, respectively. Therefore, they are not significant in this context. On this basis, the breeding population is of local - higher importance, acknowledging the conservation status of the species.	Y
	House sparrow	BoCCI 4: Amber list (qualifying criteria: unfavourable conservation status in Europe and global population concentrated in Europe). ROI breeding population: 2,266,646 individuals (Lewis et al., 2019). Regional (Co. Roscommon and Co. Westmeath) breeding population: 109,280 individuals (inferred).	Local Higher (breeding only)	Breeding season peak counts are 0.0002%, 0.0037% and 0.008% of the ROI, regional and county populations, respectively. Therefore, they are not significant in this context. On this basis, the breeding population is of local - higher importance, acknowledging the conservation status of the species.	Y

		County Roscommon breeding population: 49,931 individuals (inferred). Baseline surveys: peak count four individuals (breeding season only).			
	Lesser black-backed gull	BoCCI 4: Amber list (qualifying criteria: localised breeder with >50% breeding population in 10 or fewer sites). ROI non-breeding and breeding population: 3,644 individuals (2016/17: (Fitzgerald et al., 2021)) and 4,239 breeding pairs (2012: (NPWS, 2022)). Regional (Co. Roscommon and Co. Westmeath) non-breeding and breeding population: 20 (IWeBS) and 409 individuals (inferred). County Roscommon non-breeding and breeding population: 14 (IWeBS) and 187 individuals (inferred). Baseline surveys: peak count of three and one individuals (non-breeding and breeding season).	Regional (non-breeding/Higher Local (breeding)	Non-breeding and breeding peak counts are 0.08% and 0.01%of the ROI population, respectively, so are not significant within this context. The peak counts are 15% and 0.24% of the non-breeding and breeding regional population, respectively, so are significant within this context for the non-breeding population only, acknowledging that IWeBS counts likely underestimate the true population as counts of gulls are optional (BirdWatch Ireland and NPWS, 2024). The peak counts are 0.5% of the breeding county populations. On this basis, the non-breeding population is of regional importance and the breeding population is of local higher importance.	Y

	Little egret	Annex I Birds Directive; BoCCI4: Green list. ROI non-breeding population: 1,274 individuals (2016/17: (Fitzgerald), which is assumed to be the same as for the resident population). Regional (Co. Roscommon and Co. Westmeath) breeding population: 61 individuals (inferred). County Roscommon breeding population: 28 individuals (inferred). Baseline surveys: peak count one individual (breeding season only).	Regional (breeding only)	Breeding peak counts are 0.08% of the ROI population, so are not significant within this context. The peak count is 1.6% of the regional populations. On this basis, the breeding population is of regional importance, acknowledging ROI breeding population estimates are lacking.	Y
	Mallard	BoCCI 4: Amber list (qualifying criteria: moderate decline of winter population of 41% over short time period). ROI non-breeding and breeding population: 8,098 individuals (2016/17: (Fitzgerald et al., 2021)) and 15,400 breeding pairs (2008-2011; (NPWS, 2022)). Regional (Co. Roscommon and Co. Westmeath) non-breeding and breeding population: 693 (IWeBS) and 1,485 individuals (inferred). County Roscommon non-breeding and breeding population: 467 (IWeBS) and 678 individuals (inferred). Baseline surveys: peak count of six and two individuals (non-breeding and breeding season).	County (non-breeding)/Local Higher (breeding)	Non-breeding and breeding peak counts are 0.07% and 0.006%of the ROI population, respectively, so are not significant within this context. The peak counts are 0.87% and 0.13% of the non-breeding and breeding regional population, respectively, so are not significant within this context. The peak counts are 1.28% and 0.29% of the non-breeding and breeding county populations, respectively. On this basis, the non-breeding population is of county importance and the breeding population is of local higher importance.	Y
	Mute swan	BoCCI 4: Amber list (qualifying criteria: Irish population represents more than 20% of	County (non-breeding and	Non-breeding and breeding peak counts are 0.1% and 0.02% of the ROI population, respectively, so are	Y

		European population in non-breeding season). ROI non-breeding and breeding population: 3,839 individuals (2016/17: (Fitzgerald et al., 2021)) and 7,120 breeding individuals (2008-2011; (NPWS, 2022)). Regional (Co. Roscommon and Co. Westmeath) non-breeding and breeding population: 593 (IWeBS) and 342 individuals (inferred). County Roscommon non-breeding and breeding population: 246 (IWeBS) and 157 individuals (inferred). Baseline surveys: peak count of five and two individuals (non-breeding and breeding season).	breeding)	not significant within this context. The peak counts are 0.8% and 0.6% of the non-breeding and breeding regional population, respectively, so are not significant within this context. The peak counts are 2% and 1.3% of the non-breeding and breeding county populations, respectively. On this basis, the non-breeding and breeding population are of county importance.	
	Northern lapwing	BoCCI 4: Red list (qualifying criteria: of global conservation concern; severe decline in breeding population of 74% over short time period and 95% over longer time period; severe decline in winter population of 67% over short time period and 58% over longer time period). ROI non-breeding population: 42,514 individuals (2016/17: (Fitzgerald et al., 2021)). Regional (Co. Roscommon and Co. Westmeath) non-breeding population: 4,257 individuals (IWeBS). County Roscommon non-breeding and breeding population: 3,732 individuals (IWeBS). Suck River Callows NHA non-breeding population: 1,778 individuals (IWeBS 5-year mean peak count 2016/17 – 2020/21)). Baseline surveys: Peak count of 120 individuals (non-breeding season).	Regional (non-breeding only)	Non-breeding peak counts are 0.3% of the ROI population, so are not significant within this context. The peak count is 2.8% of the regional population. On this basis, the non-breeding population is of regional importance. Similarly, the non-breeding peak counts are 6.7% of the Suck Callows NHA population, and so are significant in this context.	Y

	Oystercatcher	BoCCI 4: Red list (qualifying criteria: global conservation concern). ROI non-breeding population: 29,797 individuals (2016/17: (Fitzgerald et al., 2021)). Regional (Co. Roscommon and Co. Westmeath) non-breeding population: 1,437 individuals (inferred). County Roscommon non-breeding and breeding population: 656 individuals (inferred). Baseline surveys: Peak count of one individual (non-breeding season).	Local Higher (non-breeding only)	Non-breeding peak counts are 0.003%, 0.07% and 0.6% of the ROI, regional and county populations, respectively. On this basis, the non-breeding population is of local higher value, acknowledging the poor conservation status of the species.	Y
	Starling	BoCCI 4: Amber list (qualifying criteria: unfavourable conservation status in Europe and global population concentrated outside Europe). ROI breeding population: 2,066,904 individuals (Lewis et al., 2019). Regional (Co. Roscommon and Co. Westmeath) breeding population: 99,650 individuals (inferred). County Roscommon breeding population: 45,531 individuals (inferred). Baseline surveys: peak count 10 individuals (breeding season only).	Local Higher (breeding only)	Breeding peak counts are 0.0005%, 0.01% and 0.02% of the ROI, regional and county populations, respectively. On this basis, the non-breeding population is of local higher value, acknowledging the poor conservation status of the species.	Y
	Swallow	BoCCI 4: Amber list (qualifying criteria: unfavourable conservation status in Europe and global population concentrated outside Europe). ROI breeding population: 4,936,488 individuals (Lewis et al., 2019). Regional (Co. Roscommon and Co. Westmeath) breeding population: 237,998 individuals (inferred). County Roscommon breeding population: 108,743 individuals (inferred). Baseline surveys: peak count five individuals (breeding season only).	Local Higher (breeding only)	Breeding peak counts are 0.0001%, 0.002% and 0.005% of the ROI, regional and county populations, respectively. On this basis, the non-breeding population is of local higher value, acknowledging the poor conservation status of the species.	Y

	Tufted duck	BoCCI 4: Amber list (qualifying criteria: 34% decline in non-breeding population over short time period; localised non-breeding population). ROI non-breeding population: 9,709 individuals (2016/17: (Fitzgerald et al., 2021)). Regional (Co. Roscommon and Co. Westmeath) non-breeding population: 950 individuals (IWeBS). County Roscommon non-breeding and breeding population: 547 individuals (IWeBS). Baseline surveys: Peak count of eight individuals (non-breeding season).	County (non-breeding only)	Non-breeding peak counts are 0.08%, 0.8% and 1.46% of the ROI, regional and county populations, respectively. On this basis, the non-breeding population is of county importance.	Y
	Whooper swan	Annex I Birds Directive; BoCCI 4: Amber list (qualifying criteria: rare breeder; localized non-breeding population; Irish population represents 45% of European non-breeding population). ROI non-breeding population: 14,467 wintering individuals (Burke et al., 2021). Regional (Co. Roscommon and Co. Westmeath) non-breeding population: 2,304 individuals (Burke et al., 2021). County Roscommon non-breeding and breeding population: 1,322 individuals (Burke et al., 2021). Baseline surveys: Peak count of 14 individuals (non-breeding)	County (non-breeding)	Non-breeding peak counts are 0.2% of the ROI population, so are not significant within this context. The peak count is 0.6% and 1.1% of the regional and county population, respectively. On this basis, the non-breeding population is of county importance.	Y
	Grey heron, hooded crow, jackdaw, little grebe, moorhen, rook	BoCCI 4: Green-listed, so detailed population data not presented.	Local Lower	Green-listed and/or not listed under Nelson et al. (2019), so do not require further assessment.	N
Terrestrial Mammals	Eurasian otter	Annex II and IV Habitats Directive; Wildlife Act (1976, as amended). Red list: Least Concern; ROI population: 16,000-22,000 individuals	Local Higher importance (population downstream of	If the number of aquatic survey sites with otter signs represents a likely estimate of the downstream otter population (N=1), then this	Y

		(Marnell et al., 2019). Regional (County Westmeath and County Roscommon) population: 771–1,061 individuals (inferred). County Roscommon population: 352 – 485 individuals (inferred). Baseline surveys: Otter spraint was recorded at N=1 site on the Cross [Roscommon] River, downstream of the watercourse crossing. No breeding (holts) areas were identified in the 150 m vicinity of any of the survey sites. No otter holts, couches or latrines were recorded within 150 m of the watercourse crossing or any proposed infrastructure.	project only)	population is not significant in the context of the ROI population (0.005-0.006%), regional population (0.09-0.1%), or the County Roscommon population (0.28-0.21%). On this basis, the downstream otter population is of local higher importance, acknowledging the strict legal protected afforded this species.	
	Bat Assemblage (all Irish bats but lesser horseshoe bat could be present)	All Irish bats listed under Annex IV Habitats Directive; Wildlife Act (1976, as amended) and are Red list: Least Concern (Marnell et al., 2019). Baseline surveys: No moderate to high potential roosts were recorded for this species within the survey area.	Local Higher	No potential or known bat roosts are within the works footprint or search area. Hedgerows, tree lines, watercourses, turloughs and drainage ditches are all likely to afford commuting and foraging opportunities. Based on the above, the bat assemblage within the study area is of local higher importance, acknowledging the strict legal protection afforded bats.	Y
Other protected fauna	Common lizard	Annex V Habitats Directive; Wildlife Act (1976, as amended); Red list: Least Concern (King et al, 2011). ROI population: No estimates available. Regional (County Westmeath and County Roscommon) and County Roscommon populations: No estimates available. Baseline surveys: not recorded during surveys; however, there was some suitability along south-facing stone walls that are near hedgerow habitats.	Local Higher	While no common lizard were recorded during surveys, they could be present in some habitats. This species has the best possible conservation status. Based on the above, the population within the study area is of local higher importance, acknowledging the lack of population estimates.	Y

	Common frog	Annex V Habitats Directive; Wildlife Act (1976, as amended); Red list: Least Concern (King et al, 2011). ROI population: 150,000,000 (King, et al., 2011). Regional (County Westmeath and County Roscommon) population: 7,231,796 individuals (inferred). County Roscommon population: 330,425 individuals (inferred). Baseline surveys: not recorded during surveys; however, there was some suitability for frogs at drainage ditches, watercourses, turlough and wetter grassland habitats.	Local Higher	While no frogs were recorded during surveys, it is likely damp habitats afford breeding and foraging opportunities for this species throughout the project. Based on the above, the population within the study area is of local higher importance.	Y
	Smooth newt	Wildlife Act (1976, as amended); Red list: Least Concern (King et al., 2011). ROI population: no estimates available but thought to be stable (King, et al., 2011). Regional (County Westmeath and County Roscommon) and County Roscommon populations: No estimates available. Baseline surveys: not recorded during surveys, but wetter habitats could provide suitability.	Local Higher	Not recorded during surveys. However, it is likely suitable foraging and breeding habitat is available within the study area. Based on the above, the population within the study area is of local higher importance.	Y
Fisheries and Aquatic Ecology	Brown trout	Red list status: Least Concern (King et al., 2011). ROI population: no estimates available (King, et al., 2011). Regional (County Westmeath and County Roscommon) and County Roscommon populations: No estimates available. Baseline surveys: recorded at the survey site, downstream of the project.	Local Lower (downstream population)	This species has the best possible conservation status. Brown trout also act as host species for pearl mussel species. However, there are no pearl mussels recorded in the catchment. Based on the above, the population within the study area is of local lower importance only.	N
	Brook lamprey	Annex II of Habitats Directive; Red list status: Least Concern (King et al., 2011). ROI population: no estimates available (King, et al., 2011).	County (downstream population)	Considering their legal and conservation status, the species is of county importance.	Y

		Regional (County Westmeath and County Roscommon) and County Roscommon populations: No estimates available. Baseline surveys: eDNA recorded at survey site downstream of the project.			

Table 5.9: Evaluation of Ecological Features within ZoI

5.5 Description of Likely Effects

5.5.1 Do-Nothing Scenario

The project site encompasses existing public roads and agricultural lands that are currently subject to intensely managed agricultural practices. If the project does not proceed, the area is likely to continue to be used for similar activities.

Taking the above into account, the likely significant effects are described in the following sections.

5.5.2 Construction Phase

The construction phase will mainly result in habitat loss/disturbance to facilitate construction of the substation and associated infrastructure, including excavation of trenches during the installation of the underground electricity line. No felling of trees or hedgerows will be undertaken but some trimming of roadside hedgerows will be required.

Timing of construction works affects the level and type of impact, especially if undertaken during a critical life stage or season for an ecological feature.

The duration of any construction effects for non-habitat features is likely to be no greater than short-term as the construction phase is anticipated to take 15-18 months.

Likely sources of direct and indirect effects during construction phase are as follows.

Likely sources of direct effects during the construction phase are as follows:-

- Clearance of vegetation and soil for access tracks, substation and ancillary infrastructure;
- Trimming of hedgerows to facilitate site entrance;
- Creation of temporary infrastructure e.g. site compound;
- Excavation of trenches for electricity line ducting; and,
- Placement of materials required for infrastructure works.

Likely sources of indirect effects during the construction phase are as follows:-

- Stockpiling of materials on-site;
- Dust and changes in air quality;
- Collection/drainage of surface water runoff;
- Pollution and changes in hydrology;
- Spreading non-native/invasive plants; and,
- Construction activity (including noise, light and the presence of construction workers) disturbing birds and mammals.

5.5.2.1 Nature Conservation Sites

European sites are assessed fully in the NIS. The NIS concludes that, with mitigation measures, the project, either alone or in combination with the other projects assessed as part of the NIS process, would not undermine the conservation objectives or have an adverse effect on the integrity of any European site. It follows that there is no significant effect in EIA terms on European sites identified which require additional mitigation measures not contained within the NIS.

The NHAs or pNHAs that overlap with SACs or SPAs are either located within the boundaries of European sites and/or there are no additional qualifying features. Therefore, the pNHAs have been indirectly, but fully, assessed within the NIS with the

conclusions of same also being applicable (see **Section 5.3.1.2**).

The assessment of likely effects is therefore restricted to NHAs or pNHAs that do not overlap with SACs or SPAs. Those with connectivity to the project, and which therefore require consideration, are:-

- Suck River Callows NHA 000222; and
- Cranberry Lough pNHA 001630.

Direct Effects

The project is not located within any national nature conservation site (NHA or pNHA). Therefore, construction works will not directly impact on any of these sites.

Indirect Effects

Suck River Callows NHA 000222 has an ecological connection via wigeon and lapwing. As there could be significant disturbance/displacement effects on these species populations in the absence of mitigation (see **Section 5.5.2.3** below), there are short-term, significant, negative effects predicted for Suck River Callows NHA at the national scale.

Cranberry Lough pNHA 001630 has an ecological connection via little grebe and curlew. As there could be disturbance/displacement effects on curlew in the absence of mitigation (see **Section 5.5.2.3** below), there are short-term, significant, negative effects predicted for Cranberry Lough pNHA at the national scale.

5.5.2.2 Habitats & Flora

Direct Effects

The construction of project infrastructure will result in direct habitat loss that is assessed as being permanent. Some habitats will also be temporarily lost due to the construction of infrastructure e.g., site compound. For details of habitat loss, see **Table 5.10**.

There will be no direct loss of Annex I turlough habitats. There are no rare or threatened plant species within the study area and none are predicted to be lost.

There will be permanent loss of improved agricultural grassland GA1 and stone walls and other stonework BL1. Temporary loss will also occur for areas of improved agricultural grassland GA1, although this habitat type will be reinstated once construction has ceased.

These habitats are of low biodiversity value as they are either highly modified/artificial or do not provide important habitat for animals.

In the absence of mitigation, enhancement or compensation, the permanent loss of improved agricultural GA1, and stone wall and other stonework BL1 habitats will have a significant negative permanent effect at the local lower value scale.

No riparian (FW2 or FW4) habitats will be lost. Likely effects on ecology relating to water quality within watercourses are detailed below (**Section 5.5.2.7**).

The overwhelming majority of habitats within the project site occur as large, contiguous areas that are also part of the wider landscape. Therefore, the project is not likely to significantly affect any habitats which could be acting as ecological stepping-stones or corridors for mobile species given their widespread abundance

both inside and outside the project footprint. The exceptions are linear hedgerows WL1, treelines WL2 and watercourses FW2, all of which act as ecological corridors. There will be no loss of these habitats and, accordingly, there will be no effect on their ability to act as ecological corridors.

Fossitt Code	Fossitt Name	Potential EU Annex I or PAW Affiliation?	Area (ha)/Length (m)			Where Loss Will Occur
			Total (baseline)	Permanent Loss	Temporary Loss	
BC4	Flower beds and borders	No	54m	-	-	No loss
BL1	Stone walls and other stonework	No	135.46m	15m	-	There will be a permanent loss of a section of stone wall near the substation to accommodate access tracks
BL3	Buildings and artificial surfaces	No	11.9ha/101m	-	-	No loss, as affected areas will be reinstated immediately after installation of electricity line
ED3	Recolonising bare ground	No	1.4ha	-	-	No loss
FL6	Turloughs	Yes – with 3180* turloughs	0.5ha	-	-	No loss
FW2	Depositing/lowland rivers	No	263m	-	-	No loss
FW4	Drainage ditches	No	619m	-	-	No loss
GA1	Improved agricultural grassland	No	97.7ha	1.137ha	0.315ha	There will be permanent loss to accommodate the substation, interface masts and access tracks. There will be temporary loss to accommodate the construction compound and due to storage of materials
GA2	Amenity grassland (improved)	No	3.8ha	-	-	No loss
GS2	Dry meadows and grassy verges	No	0.2ha/549m	-	-	No loss
WD1	(Mixed) broadleaved woodland	No	0.2ha	-	-	No loss

Fossitt Code	Fossitt Name	Potential EU Annex I or PAW Affiliation?	Area (ha)/Length (m)			Where Loss Will Occur
			Total (baseline)	Permanent Loss	Temporary Loss	
WD5	Scattered trees and parklands	No	0.1ha	-	-	No loss
WL1	Hedgerows	No	6,032m	-	-	No loss – some trimming required only
WL2	Treelines	No	3,279m	-	-	No loss
WS1	Scrub	No	1.5ha	-	-	No loss
HD1 x WS1	Dense bracken x scrub mosaic	No	0.1ha	-	-	No loss
WS3	Ornamental/non-native shrub	No	0.02ha	-	-	No loss

Table 5.10: Habitat Loss

Indirect Effects

Likely indirect effects on habitats include smothering of habitats due to sediment wash-out from cleared areas, deposition areas or dewatering of excavations. The effects of this on water quality of aquatic habitats (including turloughs) is assessed below under 'Fisheries and Aquatic Ecology' at **Section 5.5.2.7**.

Compaction and excavation of soil adjacent to hedgerows WL1/treelines WL2 habitats may cause damage to and disease of plants. Dust can also smother photosynthetic activity, although it is unlikely that dust production will reach levels that will have a discernible effect on plant growth. No compaction and excavation of soil near hedgerow WL1 and treeline WL2 habitats will occur and no effects are predicted as likely.

In the absence of biosecurity measures, invasive or non-native plants (Japanese knotweed, snowberry, montbretia and box honeysuckle) could spread to the project site via plant machinery and vehicles which could have a negative effect on sensitive habitats.

In absence of mitigation, there is a likelihood of Japanese knotweed being spread, as the species is located <2m from the works area (rhizomes can extended horizontally underground 7m (Pridham et al., 1966) and may be present within the soil under the road).

Other non-native species such as snowberry, montbretia and box honeysuckle are also at risk of being spread by construction activity. While these are not subject to the same legal restrictions as Japanese knotweed, it is good practice to avoid their spread.

Snowberry and montbretia are classed as having a low risk of impact (Kelly et al., 2013) and are mainly found within hedgerows and verges adjacent to the underground electricity line, respectively. Box honeysuckle was found adjacent to the crossing of the Cross (Roscommon) River and its invasiveness impact has not been assessed. Snowberry can form dense thickets, outcompeting native plants. It is spread predominantly through vegetative growth in its roots. Montbretia can spread into grasslands, roadsides, forests and riparian areas where it can compete with native understory or ground vegetation. It mainly spreads vegetatively by corms and rhizomes.

In the absence of mitigation, accidental spread of Japanese knotweed, snowberry, montbretia and box honeysuckle could have significant negative permanent effects at the local higher scale for habitats that are in the same general area as them e.g. hedgerows WL1, dry meadows and grassy verges GS2, treelines WL2 and riverbanks of depositing/lowland rivers FW2.

5.5.2.3 Birds

Direct Effects

Likely direct construction effects include nest damage or destruction, habitat loss and disturbance/displacement.

Nest Damage or Destruction

IEF coot and starling were recorded as breeding during the surveys undertaken. No nests were recorded within the project footprint and, as a result, no direct nest damage/destruction can occur.

However, it is possible that these and other bird species could begin nesting within the project footprint prior to construction especially hedgerows or treelines adjacent to the underground electricity line. Damage or destruction to active bird nests of any species could contravene Section 22 of the Wildlife Acts (1976, as amended). However, good practice measures will avoid the likelihood of damage, destruction or disturbance to occupied bird nests during the construction phase, if breeding is confirmed during pre-construction surveys.

On this basis, significant direct effects related to nest damage or destruction are not assessed as likely for birds; however, mitigation measures are presented as a measure of good practice.

Habitat Loss of suitable habitats for birds

Habitat loss will occur due to the development as described in **Section 5.5.2.2**. The non-breeding and breeding bird surveys results illustrate that there was evidence of confirmed or probable breeding for the following sensitive IEF bird species:-

- Coot have been recorded breeding c. 100m southwest of local road L2018 (adult sitting on nest) and a mother and 5 no. chicks were recorded in a turlough c. 400m south of the substation; and,
- Starlings were recorded bringing food to an abandoned pile of breeze blocks within a housing development in Brideswell, c. 20m from the underground electricity line.

None of these IEF species were confirmed close enough to the project footprint to suffer direct habitat loss.

The loss of improved agricultural grassland is unlikely to result in the loss of any bird territories as other areas were preferentially used for foraging.

No significant habitat loss effects during construction are assessed as likely for the other sensitive receptors identified in **Section 5.3.3**; namely IEFs black-headed gull, common gull, common kestrel, Eurasian coot, Eurasian curlew, Eurasian teal, Eurasian wigeon, great cormorant, great crested grebe, herring gull, house martin, house sparrow, lesser black-backed gull, little egret, mallard, mute swan, northern lapwing, oystercatcher, starling, swallow, tufted duck and whooper swan.

On this basis, no significant direct effects related to suitable habitat loss are assessed as likely for birds.

Disturbance/Displacement

The likely effects of noise and visual disturbance could lead to temporary displacement or disruption of foraging/roosting/breeding birds. The significance of the effect depends on the timing of potentially disturbing activities, the extent of spatial/temporal displacement and the availability of suitable displacement habitats in the surrounding area. Behavioural sensitivity to disturbance also varies between species.

Significant disturbance/displacement effects are unlikely to occur along the route of the electricity line, with the electricity line being buried within or immediately adjacent

to existing public roads or heavily modified cultivated habitats (e.g. agricultural grasslands). Any disturbance/displacement from construction activities while the electricity line is being installed is unlikely to be significantly greater than that from typical traffic levels. Also, the electricity line does not pass through any nature conservation sites designated for their ornithological interest; and any wetter areas likely to be of more importance for wildfowl and waders along the electricity line route are, at least, partially screened by hedgerows, treelines and houses.

Disturbance/displacement effects due to the project are likely to be greatest at the electricity substation site during the construction phase in the non-breeding season. This is because the turloughs south and southwest of the project were regularly used by wintering wildfowl and waders. Also, during construction, there will be an increased presence of personnel and vehicles, which provide visual and aural disturbance stimuli.

Goodship and Furness (2022) provide guidance on buffer distances required to avoid human disturbance to a range of bird species during breeding and non-breeding seasons. This guidance states that these distances provide a precautionary approach, recognising that the significance of disturbance activities may vary depending on species, habitat requirements of the species, time of year, time of day and topography. Thus, in certain circumstances, smaller buffers may be appropriate depending on the type of disturbing activity, duration, topography (or presence of screening features) and known levels of habituation.

These buffer distances, along with the recorded proximity to the electricity substation site is provided below at **Table 5.12** for each IEF bird species recorded during the non-breeding season within proximity of the substation site. Where no buffer distance information is available, buffers for other species with a similar niche are used.

Species	Buffer to avoid Disturbance	Recorded Distance to Substation (m)	Disturbance Possible?
Black-headed gull	No information (100m given that this species frequently forages at active landfills with high levels of disturbance; Cook et al, 2008)	170	No
Coot	No information (100m–200m is typical for ducks with similar niche)	260	No
Curlew	200m-650m	175	Yes
Great crested grebe	No information (100m–350m for great northern diver *Gavia immer* used as proxy)	400	No
Lapwing	No information (200m–500m for other plovers)	240	Yes
Lesser black-backed gull	No information (100mgiven that this species frequently forages at active landfills with high levels of disturbance; Cook et al, 2008)	320	No
Mallard	≥100m	275	No
Mute swan	No information (200m–600m for whooper swan used as proxy)	400	Yes
Oystercatcher	150m-300m	>500 (heard only)	No
Teal	No information (100m–200m is typical for other ducks)	270	No
Tufted duck	No information (100m–200m is typical for other ducks)	220	No
Whooper swan	200m-600m	450	Yes

Species	Buffer to avoid Disturbance	Recorded Distance to Substation (m)	Disturbance Possible?
Wigeon	200m-500m	300	Yes

Table 5.11: Disturbance Buffers for Non-Breeding Waders and Wildfowl

On this basis, disturbance to IEF curlew, lapwing, mute swan, whooper swan and wigeon at turloughs south and southwest of the substation is assessed as likely during the construction phase if it overlaps with the non-breeding season.

The construction phase and associated effects will be of a short-term duration. The risk of local extinction due to disturbance is low as none of the non-breeding species recorded are rare and alternative foraging areas are available nearby. Without mitigation, significant short-term negative effects may occur at a regional scale for lapwing and wigeon, at a county scale for mute and whooper swans, and at a local scale for curlew. No significant effects are expected for other non-breeding species or for any breeding species as they were either too distant from the project or not breeding in the area.

There are no significant disturbance/displacement effects likely for any other IEF species recorded in the non-breeding season as they were either located sufficiently distant from the project or were recorded nearby to the underground electricity line. These species include black-headed gull, common gull, common kestrel, Eurasian coot, Eurasian teal, great cormorant, great crested grebe, herring gull, mallard, oystercatcher and tufted duck.

There are also no significant disturbance effects likely for any IEF bird species during the breeding season (predominantly between March and August, depending on the species under consideration). This is because they were either not recorded breeding within the relevant ZoI or were located sufficiently distant from the project that any disturbance is highly unlikely. These species include black-headed gull, Eurasian coot, great cormorant, herring gull, house martin, house sparrow, lesser black-backed gull, little egret, mallard, mute swan, starling and swallow.

Even though significant effects are not assessed as likely, the risk of construction disturbance will be further mitigated by avoiding sensitive areas through the implementation of visual and acoustic screening, appropriately defined buffer zones and by timing construction activities to avoid periods where sensitive species are present (if and where possible). A range of good practice measures have therefore been proposed to mitigate for likely construction phase disturbance effects (see **Section 5.7.1.5**).

On this basis, and in the absence of mitigation, significant direct effects related to disturbance/displacement are likely to arise for birds.

Indirect Effects

If the construction of the project gave rise to the pollution of wetland habitats and/or dewatering of groundwater-dependent habitats within nearby designated sites for birds, it could result in indirect habitat loss for qualifying bird species. The same is true for wetland sites that could be used by bird species from nearby designated sites, even if those wetland sites are not designated themselves. Similar effects could also occur for bird species using turloughs south and southwest of the substation site.

No such effects are predicted owing to a lack of hydro- or hydrogeological connections to the River Suck Callows NHA and Cranberry Lough pNHA.

Short-term, negative indirect effects could occur in the absence of mitigation that are significant at the regional scale for black-headed gull (breeding and non-breeding), common gull (non-breeding), coot (breeding), teal (non-breeding), wigeon (non-breeding), lesser black-backed gull (non-breeding), little egret (breeding) and lapwing (non-breeding).

Similar effects could occur at the county scale for coot (non-breeding), cormorant (non-breeding), great crested grebe (non-breeding), herring gull (breeding), mallard (non-breeding), mute swan (breeding and non-breeding), tufted duck (non-breeding) and whooper swan (non-breeding).

The same is true at the local high value scale for curlew (non-breeding), cormorant (breeding), lesser black-backed gull (breeding), mallard (breeding) and oystercatcher (non-breeding).

On this basis, and in the absence of mitigation, significant indirect effects are likely to arise for birds.

5.5.2.4 Terrestrial Mammals (Excluding Bats)

Direct Effects

No direct effects to mammals are assessed as likely as there were no dwelling places for mammals identified during the field surveys.

On this basis, no significant direct effects on mammals are likely.

Indirect Effects

Indirect effects on mammals during construction could result in the loss of potential foraging, commuting and sheltering habitat. Disturbance from noise, vibration, machinery movement and increased human presence could also displace foraging individuals or cause breeding mammals to abandon natal sites.

As above, the only habitats likely to be lost are either highly artificial or intensely modified and there was no evidence of mammals using them for foraging, commuting or sheltering. No natal sites were recorded.

On this basis, no significant indirect effects are assessed as likely for mammals.

5.5.2.5 Bats

Direct Effects

Direct effects on bats during construction of the project include vegetation removal or removal/modification of existing structures which could result in a loss of potential roost sites.

No potential or confirmed bat roosts were recorded within or nearby the works footprint. This includes hedgerows requiring trimming and the watercourse crossing. Horizontal Directional Drilling (HDD) will be used at the watercourse crossing, which will avoid any direct effects on the existing bridging structure.

On this basis, no significant direct effects on bats are assessed as likely.

Indirect Effects

Indirect effects could include the loss of foraging/commuting habitats or features. If lighting is used for night-time working, this could also disturb roosting and foraging

bats. However, no night-time working is proposed as part of embedded mitigation measures and no disturbance is likely (see **Section 5.7.1.7**).

The only habitats that will be permanently lost are either artificial or highly modified and intensely farmed with low value to foraging or commuting bats. No linear features such as hedgerows, treelines and watercourses will be removed by the project and so no disruptions to connectivity will occur.

On this basis, no significant indirect effects on bats are assessed as likely.

5.5.2.6 Other Protected Fauna

Direct Effects

Direct effects on amphibians such as common frog and smooth newt, and reptiles such as common lizard, could include destruction of breeding sites and mortality from construction activities.

There are no wet areas within the project footprint and, therefore, there is no likelihood of direct effects on breeding amphibians. It is unlikely that common lizards are present in improved agricultural grassland habitats and the only other habitat that will be lost is a small section of a stone wall, with other more suitable breeding habitats present outside the project footprint.

On this basis, no significant direct effects are assessed as likely for common frog, smooth newt and common lizard.

Indirect Effects

Indirect effects on amphibians and reptiles could include loss of foraging habitats. For amphibians, habitats that could be used for foraging include drainage ditches, turloughs and wetter parts of improved agricultural grassland. There will be no loss of any of these habitats and the grasslands present are gently sloping with no suitable wet areas.

However, the Annex I turloughs south and southwest of the substation are downslope and, in the absence of mitigation, any accidental pollution that drains to the turloughs is likely to have significant short-term negative effects on amphibians at the local higher value scale.

None of the habitats within the project footprint are likely to be of importance for foraging common lizard.

Therefore, it is unlikely that any significant indirect effects will occur for common lizard.

5.5.2.7 Fisheries and Aquatic Ecology

Direct Effects

Direct effects could include the loss of natural watercourses due to the watercourse crossing and the placement of culverts, water quality degradation, the diversion of natural watercourses, increased suspended solids/hydrocarbons/cement leachate within watercourses inside the project site and the loss of freshwater habitats due to removal or blockage of watercourses.

HDD will be used to cross the Cross [Roscommon] River, which will avoid any instream works. As a result, direct effects on aquatic habitats such as FW2 depositing/eroding rivers, FW4 drainage ditches and brook lamprey are assessed as unlikely.

There are no otter holts within 150m of the watercourse crossing or the aquatic survey site. Therefore, no significant direct effects of disturbance to breeding/resting otters are assessed as likely.

Indirect Effects

Indirect effects include the release of suspended solids, hydrocarbons or cement leachate which could reach downstream receptors such as brown trout and brook lamprey via hydrological connections. This could reduce the water quality, which could have negative effects on aquatic receptors.

In the absence of mitigation, if any pollutants from the project are accidentally spread into the Annex I turloughs south and southwest of the project site, significant negative short-term effects on the regional scale are predicted for this habitat type.

Salmonids require very high levels of water quality to complete their life cycles. High levels of suspended solids can increase turbidity (inhibits respiration) and siltation (affects riverbed substrate composition, reducing spawning and fry survival). Suspended solids typically contain phosphorous or hydrocarbons that can lead to eutrophication and reduced oxygen levels (a cause of death for all salmonid and lamprey life stages). The release of even small amounts of hydrocarbons (e.g. fuel spills) can reduce oxygen levels, affecting salmonid and lamprey populations.

Habitat availability and quality are linked with survival rates of salmon fry and parr (Kalleberg, 1958), with small amounts of debris entering a watercourse important for vulnerable life stages of salmonids and lamprey potentially leading to negative effects on juvenile survival and habitat use.

Accidental fuel spills, which could occur during construction, can release hydrocarbons, which can bioaccumulate in salmonids (McCain, et al., 1990), leading to a loss of condition. As salmonids are known to avoid areas containing hydrocarbons (Maynard & Weber, 1981), fuel spills can lead to the effective loss of habitat and/or migration routes. Fuel spills are unlikely to occur at all, and even if one did occur, it is unlikely to be a scale which would have an appreciable effect on salmonid habitats. However, this risk cannot be completely discounted and requires the implementation of mitigation measures.

A decrease in fish stocks can also lead to reduced prey availability to otter.

Unmitigated, indirect effects are therefore likely to be significant negative at the county scale for brook lamprey, and local higher scale for otter.

5.5.3 Operational Phase

Direct effects are unlikely to occur at the underground electricity line during the operational phase. The electricity line will be buried underground and avoids sensitive IEFs. Once installed, there are no likely significant operational effects from the electricity line.

While the primary function of the project is to facilitate the connection of the Seven Hills Wind Farm to the national electricity grid; the project will, once operational, be operated and maintained by EirGrid as part of the national electricity network. On this basis, operational effects are assessed to be permanent.

Possible effects resulting from the operational phase are as follows:-

- Direct effects:-
    - Collision with interface masts for birds and bats.

- Indirect effects:-
  - Collection/drainage of surface water runoff;
  - Operational activities and servicing (a few visits per week with a light commercial vehicle); and,
  - Displacement effects of substation lighting.

5.5.3.1 Nature Conservation Sites

European sites are assessed fully in the NIS. No adverse effects on the integrity of any other European site were identified and therefore, in an EIA sense, there are no likely significant effects on these designated sites identified which require additional mitigation measures not contained within the NIS (**Section 5.3.1.1**).

National sites (not included as part of an SAC or SPA) that are within the ZoI with connectivity to the project site are Suck River Callows NHA and Cranberry Lough pNHA.

Direct Effects

The project is not located within any NHAs or pNHAs and no significant direct effects are assessed as likely.

The Suck River Callows NHA and Cranberry Lough pNHA are designated for *inter alia* birds and there could be significant effects due to collision with the substation and interface masts. There could also be disturbance/displacement/barrier effects. The relevant bird species are wigeon and lapwing for Suck River Callows NHA and little grebe and curlew for Cranberry Lough pNHA.

No significant effects are assessed as likely for IEF birds (see **Section 5.5.3.3** on Birds below) and, therefore, no significant effects on Suck River Callows NHA, and Cranberry Lough pNHA are likely to occur.

Indirect Effects

As the Suck River Callows NHA and Cranberry Lough pNHA are not hydrologically or hydrogeologically connected to the project, significant indirect effects are not assessed as likely.

5.5.3.2 Habitats and Flora

Direct Effects

There will be no significant, direct, operational effects on any habitats during the operational phase.

Indirect Effects

There will be no significant, indirect, operational effects on any habitats during the operational phase.

5.5.3.3 Birds

Direct Effects

Possible direct effects include:-

- Disturbance/displacement and barrier effects; and,
- Collision with the substation and interface masts.

Collision

No statistical model exists to assess bird collisions with static objects or interface masts. The buried electricity line, located near the road network, poses no operational effects. The control building, at 8.5m tall, presents negligible collision risk. The interface masts (15-18m) will be placed along the route of an existing overhead line with no new overhead lines being added. Therefore, the project is not assessed as likely to significantly increase bird collision risk.

Disturbance/Displacement & Barrier Effects

Once construction has been completed, any disturbance stimuli will reduce considerably in magnitude as considerably fewer personnel and vehicles will be present. Birds will also become habituated to the static substation infrastructure which will be screened via newly planted hedgerows and infilling of existing hedgerows, while the electricity line will be buried underground. Therefore, disturbance and displacement during the operational phase is very unlikely and can be excluded from further assessment.

Also, due to the small scale of the project, no barrier effects to birds will occur, as there will be no appreciable increase in the energy expended to fly around the project, and so no significant effects from barrier effects are likely.

Indirect Effects

If hydrocarbon spills during the operation of the project led to pollution of wetland habitats and/or dewatering of groundwater-dependent habitats within nearby designated sites for birds, it could result in indirect habitat loss for qualifying bird species. The same is true for wetland sites that could be used by bird species from nearby designated sites, even if those wetland sites are not designated themselves.

As detailed at **Chapter 7**, the embedded mitigation proposed including an extensive drainage system will prevent any such effects occurring for birds using the turloughs south and southwest of the substation.

5.5.3.4 Terrestrial Mammals (excluding bats)

Direct Effects

As described at **Section 5.3.4**, there were no mammal breeding or resting sites recorded during the surveys within or in any proximity to the project footprint. Therefore, no destruction of such site or accidental killing of mammals is likely.

Therefore, no significant direct effects are assessed as likely for terrestrial mammals.

Indirect Effects

As there will be low numbers of personnel visiting the substation relatively infrequently during the day, thereby avoiding the period when most mammals are most active, it is highly unlikely there will be any indirect loss of foraging or commuting habitats due to the presence of personnel. Therefore, no significant indirect effects are assessed as likely for mammals.

5.5.3.5 Bats

Direct Effects

Possible direct effects include:-

- Collision with substation and interface masts.

Collision with substations, power lines and other electrical infrastructure is a very low risk for Irish bat species (EirGrid, 2015). Therefore, even without mitigation, operational phase effects are unlikely to have significant effects on the local bat assemblage.

Indirect Effects

Indirect effects due to operational lighting at the substation could disturb or displace roosting or foraging bats (BCT, 2023). No roosts are located nearby the project and the general lack of linear features such as treelines, hedgerows or watercourses nearby suggests that flight corridors and foraging areas are limited, largely precluding negative indirect lighting effects on bats. However, the turloughs south and southwest of the substation could be more important for foraging bats and in the absence of mitigation, indirect effects on the assemblage of bats could be significant negative permanent at the local higher scale.

5.5.3.6 Other Protected Fauna

Direct Effects

No direct effects on common frog, smooth newt or common lizard are assessed as likely during the operational phase.

Indirect Effects

No indirect effects on common lizard are assessed as likely during the operational phase.

Indirect effects include release of suspended solids or hydrocarbons (from vehicles) into watercourses as described at **Section 5.5.2.7**, which could travel to Annex I turlough habitats near the substation site. As described at **Chapter 7**, the embedded mitigation proposed including an extensive drainage control system will prevent any such effects occurring for amphibians using the turloughs south and southwest of the substation. Therefore, no indirect effects on amphibians are likely to occur.

5.5.3.7 Fisheries and Aquatic Ecology

Direct Effects

No IEF aquatic habitats or species are located within the project site therefore it is unlikely there will be any significant direct effects during the operational phase.

Indirect Effects

Indirect effects include release of suspended solids or hydrocarbons (from vehicles) into watercourses as described at **Section 5.5.2.7**, which could travel downstream to IEFs including brook lamprey and otter. The same is true for Annex I turlough habitats nearby the substation.

As described at **Chapter 7**, the embedded mitigation proposed including an extensive drainage control system will prevent any such effects occurring for Annex I turloughs south and southwest of the substation

Similarly, once the underground electricity line is buried, there will be no mechanism through which pollutants can be released into any downstream watercourses.

Therefore, no indirect effects on brook lamprey and otter are assessed as likely.

5.5.4 Decommissioning Phase

As set out at **Chapter 3** (**Sections 3.2** and **3.7**), the project will form part of the national electricity network and decommissioning of the project is not proposed. Therefore, decommissioning phase effects will not occur.

5.5.5 Cumulative Impact

Other projects considered for cumulative impact assessment are detailed at **Table 5.13** below and **Chapter 1**.

Development Type	Name (Planning Reference)	Distance (km) /Direction	Details	Hydro – or Hydrogeological Connection between project site and other development?
Wind Farm	Seven Hills Wind Farm (An Bord Pleanála Reference ABP-313750-22)	0	Permitted development of a 17 no turbine wind farm and associated ancillary infrastructure	Hydrological – N Hydrogeological – Y, partly in same Funshinagh groundwater body as the project
Electricity Line	Athlone to Lanesborough 110kV line upgrade (N/A)	0	Existing overhead Electricity Transmission Line between the 110kV electricity substations at Athlone and Lanesborough	Hydrological – N Hydrogeological – Y, in same Funshinagh groundwater body as the project
Quarry	Mannion Quarries (Roscommon County Council Planning Register References 01/113 and 05/811)	4.4 southwest	Existing quarry activities at a 4.8 ha site	Hydrological – N Hydrogeological – N, in separate groundwater body (Suck South vs. Funshinagh)
	Cam Quarry (Roscommon County Council Planning Register References 04/1479 and 08/393)	3.8 northwest	Existing quarry at a c. 68 ha site with associated operations	Hydrological – N Hydrogeological – N, in separate groundwater body (Suck South vs. Funshinagh)
	Ward Bros. Quarries (Roscommon County Council Planning Register References 08/998 and 09/143)	10.8 northwest	Existing quarry on a c. 16 hectare site and associated operations	Hydrological – N Hydrogeological – N, in separate groundwater body (Suck South vs. Funshinagh)
	Lecarrow Quarries (Roscommon County Council Planning Register References 02/36, 03/979 and 18/118)	7.2 north	Existing quarry and ancillary operations	Hydrological – N Hydrogeological – Y, in same Funshinagh groundwater body

Development Type	Name (Planning Reference)	Distance (km) /Direction	Details	Hydro – or Hydrogeological Connection between project site and other development?
	Roadstone Ltd (Roscommon County Council Planning Register Reference 23/60269)	1.3 southeast	Proposed infilling and restoration of a previous sand and gravel extraction site	Hydrological – N Hydrogeological – Y, in same Funshinagh groundwater body
	Kildea Concrete (Roscommon County Council Planning Register Reference 22/526 (An Bord Pleanála Reference ABP-317704-23))	4.7 southeast	Proposed development consisting of the extraction of sand, stone and gravel over a site area of 6.9 ha	Hydrological – N Hydrogeological – Y, in same Funshinagh groundwater body
Other	Alexion Pharma International (Roscommon County Council Planning Register Reference 22/2)	7.0 southeast	Existing development consisting of the provision of a new warehouse with ancillary accommodation and a loading bay	Hydrological – N Hydrogeological – N, in separate groundwater body (Industrial Facility (P0110-01 vs. Funshinagh)

Table 5.12: Other Developments within 15km of the Project

Cumulative impacts during construction are mainly limited to water quality changes in nearby watercourses. The site currently meets good biological water quality standards (≥Q4), but other projects could impact water quality if built simultaneously without mitigation. There are no Section 4 discharges linked to the Cross [Roscommon] River, though an industrial emissions site is 9km downstream has Industrial Emissions (IE) licence (Licence number P0987-01). Existing plans, such as the *Roscommon County Development Plan 2022-2028* provide a framework for land use developments which include a series of policies with embedded environmental considerations from the existing SEA and AA processes – these policies are considered to lower any likely risk of cumulative impacts.

Without mitigation, short-term negative cumulative effects on freshwater ecology, particularly brook lamprey and otter, may occur at county and local scales. Potential groundwater impacts from nearby quarry developments, including Roadstone and Kildea Concrete, could affect turlough habitats and associated species at a regional scale.

There are no operational, consented or proposed projects with hydrological connections to the project (see **Table 5.13**).

While several quarry projects are within the same groundwater body as the project, most are operational and subject to strict licencing procedures to avoid the pollution of groundwater. The proposed infilling of a Roadstone sand and gravel extraction site and the proposed development of a new extraction site for Kildea Concrete have the most potential to negatively impact groundwater.

Assuming there is a groundwater connection between these 2 no. developments and the project, and in the absence of mitigation, there could be significant short-term negative effects on IEF turlough habitats near the substation at the regional scale.

Significant short-term negative indirect effects are likely to affect IEFs using turloughs without mitigation. At the regional scale, species such as black-headed gull, common gull, coot, teal, wigeon, lesser black-backed gull, little egret, and lapwing may be affected. At the county scale, impacts could extend to non-breeding coot, cormorant, great crested grebe, herring gull, mallard, mute swan, tufted duck, and whooper swan. Locally, curlew, breeding cormorant, lesser black-backed gull, mallard, and oystercatcher could also face negative effects. There could also be significant short-term negative effects on amphibians at the local higher value scale.

European sites are assessed fully in the NIS. The conclusion of the NIS is that, with mitigation, there would not be an adverse effect on the integrity of any European sites because of the project, in combination with all other projects and plans (**Section 5.3.1.1**). In EIA terms, this means there are no likely significant cumulative effects on European sites.

There are no national nature conservation sites with a hydro- or hydrogeological connection to the project precluding any cumulative effects on these sites.

Operational effects could occur because of the substation and ancillary infrastructure. As the electricity line will be located underground, there will be no operational effects due to underground cabling/ducting.

In the absence of mitigation, possible cumulative effects include deterioration of water quality within the catchment with potential for downstream effects on IEF brook lamprey, otter, Annex I turloughs and wetland IEF birds and amphibians that could use them. However, as an extensive drainage control system is proposed as part of the embedded mitigation, no significant cumulative effects on these receptors are predicted.

No decommissioning is predicted and no decommissioning effects (individually or cumulative) are assessed as likely.

5.6 Mitigation Measures

The Developer will be responsible for implementing proposed mitigation and compensation during construction and the operator will be responsible for the same during operation and decommissioning.

5.7.1 Construction Phase

5.7.1.1 Nature Conservation Sites, Fisheries and Aquatic Ecology

Mitigation measures to prevent adverse effects on downstream European sites during construction are provided in full in the NIS. These will ensure no deterioration in the quality of water entering the River Shannon Callows SAC and Middle Shannon Callows SPA; and will ensure there will be no effects on any QI habitats and species. The same is true for IEF non-QI aquatic habitats and species.

These measures are taken from **Chapter 7** and the CEMP (**Annex 3.4**).

In order to mitigate likely effects during the construction phase, best practice construction methods will be implemented in order to prevent water (surface water and groundwater) pollution. Good practice measures will be applied in relation to pollution risk, sediment management and management of surface runoff rates and volumes.

A CEMP (**Annex 3.4**) has been prepared for the project to ensure adequate protection of the water environment. All personnel working on the project will be

responsible for the environmental control of their work and will perform their duties in accordance with the requirements and procedures of the CEMP.

During the construction phase, all works associated with the construction of the project will be undertaken in accordance with the guidance contained within CIRIA Document C741 'Environmental Good Practice on Site' (CIRIA, 2015). Any groundwater encountered will be managed and treated in accordance with CIRIA C750, 'Groundwater control: design and practice' (CIRIA, 2016).

Earthworks (Removal of Vegetation Cover, Excavations and Stock Piling) Resulting in Suspended Solids Entrainment in Surface Water

Mitigation by Avoidance

A key mitigation adopted during the design phase is the avoidance of infrastructure close to turloughs and surface water features at the electricity substation site. All areas of the electricity substation site are located significantly away from surface watercourses. The closest surface water feature is a turlough located to the south of the site. This is a temporary surface water feature which is only likely to be present during certain months of the year, and may not exist between ~May–November, thus construction proposed between May-November is not likely to affect the turlough.

Meanwhile, there is only 1 no. watercourse crossing along the underground electricity line.

The large setback distances between sensitive hydrological features and any element of the project means that adequate room is maintained for the proposed drainage design/mitigation measures (discussed below) to be properly installed and operate effectively. No works will be undertaken within any surface water feature which will:-

- Avoid physical damage to turloughs and watercourses and associated release of sediment;
- Avoid excavations within close proximity to turloughs and surface watercourses (again, absent at the electricity substation site);
- Avoid the entry of suspended sediment from earthworks into turloughs and watercourses; and,
- Avoid the entry of suspended sediment from the construction phase drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation via infiltration areas.

Mitigation through earthworks management and site drainage

The overall approach to the management of surface water runoff during the construction phase will be to collect and treat on-site and then divert to ground locally within the project site.

Management of surface water runoff and subsequent treatment prior to release off-site will be undertaken during construction work as follows:-

- Prior to the commencement of earthworks, silt fencing will be placed down-gradient of the construction areas, as required, until the full range of construction phase measures are installed;
- These will be embedded into the local soils to ensure all site water is captured and filtered;
- Clean water drains will include check dams to control flow rates and avoid erosion or scouring of the drain;

- Water from the clean drains will be discharged by a buffered outfall or level spreader at greenfield runoff rates;
- Water will be discharge from the clean drains over natural grassland which will provide filtration;
- All surface water runoff from works areas, excavations, stockpiles at the electricity substation site will be intercepted by downslope drains which will also include check dams;
- These dirty water drains will direct water to settlement ponds for treatment and attenuation;
- The treated water will then be discharged via a buffered outfall or level spreader, at greenfield rates, over natural grassland which will provide additional filtration and treatment;
- The precise design, sizing and sitting of the drainage infrastructure will be confirmed as part of the post-consent detailed design process, however the design will be reflective of predicted rainfall levels with an appropriate allowance for climate change;
- Daily monitoring of the excavation/earthworks, the water treatment and pumping system and the discharge areas will be completed by a suitably qualified person during the construction phase. All necessary preventative measures will be implemented to ensure no entrained sediment, or deleterious matter will enter the main drainage channel;
- If high levels of silt or other contamination is noted in the pumped water or the treatment systems, all construction works will be stopped. No works will recommence until the issue is resolved and the cause of the elevated source is remedied;
- Earthworks will take place during periods of low rainfall to reduce run-off and potential siltation of watercourses; and,
- The fluvial glacial deposits (i.e. sand and gravels) located under the glacial tills in part of the site will act as a natural filter.

Silt Fences

Silt fences will be placed downgradient of the work areas at the electricity substation site. This will act to prevent entry to any active turloughs or surface water features, of sand and gravel sized sediment, released from excavation of mineral subsoils of glacial and glacio-fluvial origin, and entrained in drainage water runoff. Inspection and maintenance of these structures during construction phase is critical to their functioning to stated purpose. Inspection of the silt fencing will be carried out weekly or daily during periods of heavy rainfall (>15mm in 24 hours). This monitoring will be a requirement of the contract for the contractor carrying out the works on site. The silt fences will remain in place throughout the entire construction phase.

Silt Bags

Silt bags will be used where small to medium volumes of water need to be pumped from excavations. As water is pumped through the bag, most of the sediment is retained by the geotextile fabric allowing filtered water to pass through. The discharge from the silt bags will be directed to the settlement ponds.

Management of Drainage from Spoil Deposition Areas

Excavated subsoil will be used for fill throughout the site and any excess will be stored at 2 no. spoil deposition areas.

The deposition areas will be sealed with a digger bucket and vegetated as soon

possible to reduce sediment entrainment in drainage water. Once re-vegetated and stabilised, the deposition areas will no longer be a likely source of silt laden water.

Timing of Site Construction Works

Construction of the site drainage system will only be carried out during periods of low or no rainfall. This will minimise the risk of entrainment of suspended sediment in drainage water. Construction of the drainage system during this period will also ensure that attenuation features associated with the drainage system will be in place and operational for all subsequent construction works.

Monitoring

An inspection and maintenance plan for the on-site drainage system will be prepared in advance of the commencement of any works. Regular inspections of all installed drainage systems will be undertaken, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water in parts of the systems where it is not intended.

Any excess build-up of silt levels at check dams, the settlement ponds, or any other drainage features that may decrease the effectiveness of the drainage feature, will be removed.

Surface Watercourses

The primary mitigating factor in relation to downgradient surface water bodies is the distinct lack of surface watercourses which drain the electricity substation site and the surrounding area. The rainfall falling on the site recharges to the underlying groundwater aquifer. There are no small streams (10-50l/s) which would typically be seen on upland slopes.

To ensure the continuation of the existing hydrological regime, whereby rainfall percolates to ground and does not discharge as surface water runoff, the drainage design has incorporated natural attenuation of flows and allows for collected rainwater to be recharged back into the underlying aquifer rather than leaving the site through man-made drains. The drainage design also includes mitigation measures to ensure that any collected surface water is treated prior to discharge/recharge back into the ground, and therefore will not contain suspended sediment. Further details are provided at **Chapter 7**.

Accidental Release of Hydrocarbons

Mitigation measures to avoid the release of hydrocarbons at the project site are as follows:-

- No refuelling or maintenance of construction vehicles or plant at the electricity substation site will take place outside of the dedicated bunded refuelling area. Any off-site refuelling (i.e. along the route of the underground electricity line) will occur at a controlled fuelling station located on an area of impermeable hardstanding;
- Each vehicle will carry fuel absorbent material and pads in the event of any accidental spillages;
- Onsite refuelling will be carried out by trained personnel only;
- Fuels stored on site will be minimised. Fuel storage areas within the temporary construction compound will be bunded appropriately for the fuel storage

volume for the time period of the construction and fitted with a storm drainage system and an appropriate oil interceptor;
- Drainage water from temporary construction compounds will be collected and drained via silt traps and hydrocarbon interceptors prior to recharge to ground;
- The plant used during construction will be regularly inspected for leaks and fitness for purpose; and,
- An emergency plan for the construction phase to deal with accidental spillages is contained within Construction and Environmental Management Plan (see **Annex 3.4**). Spill kits will be available to deal with and accidental spillage in and outside the re-fuelling area.

Wastewater Disposal

Measures to avoid contamination of surface and ground waters by wastewaters will comprise:-

- Self-contained chemical toilets with an integrated waste holding tank will be installed at the temporary construction compound, maintained by the providing contractor, and removed from site on completion of the construction works;
- Water supply, for use in site offices and for other sanitation purposes, will be brought to site and removed after use and disposed of at a suitable off-site treatment location; and,
- No water will be sourced on the site, nor will any wastewater be discharged to the site.

Release of Cement-Based Products

Mitigation by Avoidance

The following mitigation measures are proposed:-

- No batching of wet-cement products will occur on site. Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place;
- Where possible pre-cast elements for concrete works will be used;
- Where concrete is delivered on site, only the chute will be cleaned, using the smallest volume of water practicable. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed. Chute cleaning water will be undertaken at lined cement washout ponds located within the temporary construction compound;
- Weather forecasting will be used to plan dry days for pouring concrete; and,
- The pour site will be kept free of standing water and plastic covers will be ready in case of sudden rainfall event.

Mitigation by Design

The following mitigation measures are proposed:-

- No in-stream excavation works are proposed and therefore there will be no impact on the Cross (Roscommon) River at the proposed crossing along the underground electricity line;
- Any guidance/mitigation measures required by the OPW or Inland Fisheries Ireland will be incorporated into the detailed project design proposals;
- As a further precaution, near stream construction work, will only be carried out during the period permitted by Inland Fisheries Ireland for in-stream works

according to the Eastern Regional Fisheries Board (2004) guidance document *Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites* i.e., May to September inclusive. This time period coincides with the period of lowest expected rainfall, and therefore minimum surface water flows (note within the electricity substation site there are no watercourses, and all rainwater will percolate to ground). This will minimise the risk of entrainment of suspended sediment in drainage water, and transport via this pathway to surface watercourses (any deviation from this will be completed in consultation with the IFI);

- During the near stream construction work (along the underground electricity line) double row silt fences will be emplaced immediately down-gradient of the construction area for the duration of the construction phase. There will be no batching or storage of cement allowed in the vicinity of the crossing construction areas; and,
- No new stream crossings or culverts will be required. No Section 50 Applications are required for this project.

Directional Drilling Works

The following mitigation measures are proposed:-

- Although no in-stream works are proposed, the drilling works will only be done over a dry period between July and September (as required by IFI for in-stream works) to avoid the salmon spawning season and to have more favourable (dryer) ground conditions;
- The crossing works area will be clearly marked out with fencing or flagging tape to avoid unnecessary disturbance;
- There will be no storage of material/equipment or overnight parking of machinery inside a 15m buffer zone which will be imposed around the Cross (Roscommon) River;
- Before any ground works are undertaken, double silt fencing will be placed upslope of the watercourse channel along the 15m buffer zone boundary;
- Additional silt fencing or straw bales (pinned down firmly with stakes) will be placed across any natural surface depressions/channels that slope towards the watercourse;
- Silt fencing will be embedded into the local soils to ensure all site water is captured and filtered;
- The area around the bentonite batching, pumping and recycling plant will be bunded using terram (as it will clog) and sandbags in order to contain any spillages;
- Drilling fluid returns will be contained within a sealed tank/sump to prevent migration from the works area;
- Spills of drilling fluid will be clean up immediately and stored in an adequately sized skip before been taken off-site;
- If rainfall events occur during the works, there will be a requirement to collect and treat small volumes of surface water from areas of disturbed ground (i.e. soil and subsoil exposures created during site preparation works);
- This will be completed using a shallow swale and sump down slope of the disturbed ground; and water will be pumped to a proposed percolation area at least 50m from the watercourse;
- The discharge of water onto vegetated ground at the percolation area will be via a silt bag which will filter any remaining sediment from the pumped water.

The entire percolation area will be enclosed by a perimeter of double silt fencing;
- Any sediment laden water from the works area will not be discharged directly to a watercourse or drain;
- Works shall not take place during periods of heavy rainfall and will be scaled back or suspended if heavy rain is forecasted;
- Daily monitoring of the compound works area, the water treatment and pumping system and the percolation area will be completed by a suitably qualified person during the construction phase. All necessary preventative measures will be implemented to ensure no entrained sediment, or deleterious matter is discharged to the watercourse;
- If high levels of silt or other contamination is noted in the pumped water or the treatment systems, all construction works will be stopped. No works will recommence until the issue is resolved and the cause of the elevated source is remedied;
- On completion of the works, the ground surface disturbed during the site preparation works and at the entry and exit pits will be carefully reinstated;
- The silt fencing upslope of the river will be left in place and maintained until the works area has been fully reinstated;
- There will be no batching or storage of cement allowed at the watercourse crossing;
- There will be no refuelling allowed within 100m of the watercourse crossing; and,
- All plant will be checked for purpose of use prior to mobilisation at the watercourse crossing.

A Fracture Blow-out (Frac-out) Prevention and Contingency Plan will be prepared by the drilling contractor prior to construction and will include the following measures:-

- The drilling fluid/bentonite will be non-toxic and naturally biodegradable (i.e., Clear Bore Drilling Fluid or similar will be used);
- The area around the drilling fluid batching, pumping and recycling plants will be bunded using terram and/or sandbags to contain any potential spillage;
- A double row of silt fencing will be placed between the works area and the adjacent river;
- Spills of drilling fluid will be cleaned up immediately and transported off-site for disposal at a licensed facility;
- Adequately sized skips will be used where temporary storage of arisings are required;
- The drilling process/pressure will be constantly monitored to detect any possible leaks or breakouts into the surrounding geology or local watercourse;
- This will be gauged by observation and by monitoring the pumping rates and pressures. If any signs of breakout occur then drilling will be immediately stopped;
- Any frac-out material will be contained and removed off-site;
- The drilling location will be reviewed, before re-commencing with a higher viscosity drilling fluid mix; and,
- If the risk of further frac-out is high, a new drilling alignment will be sought at the crossing location.

Karst Features

The following mitigation measures are proposed:-

- Site drainage management will be put in place in order to prevent any poor quality drainage water reaching the turlough during the construction phase. This

includes 3 no. layers of silt fencing downgradient of works areas, as well as the general separation of clean and dirty water, while maintaining the overall hydrological regime of rainfall recharge to ground; and,
- Mitigation measures relating to hydrocarbons, wastewater and cementitious materials, as detailed at **Chapter 7**, will provide a high level of protection to groundwater and surface water quality and ensure that groundwater quality and karst features will not be significantly affected, thus protecting the groundwater quality of the Karstic Bedrock Aquifer.

5.7.1.2 Habitats

The project footprint does not overlap with any high-value terrestrial habitats and will be located almost entirely within existing roads and improved agricultural grassland. No treelines or hedgerows will be removed.

To avoid widespread disturbance to habitats, access within the project will be restricted to the footprint of the proposed works corridor and no access between different parts of the project will be permitted, except via the proposed works corridor. An Ecological Clerk of Works (ECoW) will be employed throughout the construction phase to ensure that construction activities do not encroach, unnecessarily, into any important habitats.

5.7.1.3 Rare Flora

No rare flora were recorded during surveys and no mitigation measures are required.

5.7.1.4 Invasive Plants

The following will be implemented to avoid the accidental spread of any invasive or non-native species:-

- An invasive species management plan will be developed and implemented. This will include the following general prevention and containment measures and species-specific treatment measures below; and,
- An Ecological Clerk of Works will be employed for the duration of the construction period to make contractors aware of any invasive and non-native species sensitivities of the project and to undertake pre-construction surveys, enforcing any exclusion zones and mitigation measures as required.

General Prevention Measures

- Use of toolbox talks as part of site introduction to workers, including what to look out for and what procedures to follow if invasive species are observed;
- Signs will be used to warn workers of invasive species contamination;
- Only planting and sowing of native species if any reinstatement works are required or where invasive plant species are physically removed;
- Unwanted material contaminated with invasive species will be transported off-site by an appropriate licenced waste contractor and disposed of at a suitably licenced facility (NRA, 2010); and,
- Good hygiene practices will be adhered to including the removal of build-up of soil on equipment; keeping equipment clean; washing vehicles exiting the site using a pressure washer to prevent the transport of seeds; storing wastewater from washing facilities securely and treating to prevent spread of invasive species; checking footwear and clothing of workers for seeds, fruits or other viable material before leaving the site; any plant material arising from cleaning

equipment, footwear and clothing will be carefully disposed of following (NRA, 2010) guidelines in such a manner not to cause the spread of invasive species.

General Containment Measures

- A pre-construction walkover survey of the project will be undertaken during the growing season (April to August). This will search for invasive and non-native species, which could change over time. The extent of invasive plant species will be physically marked out; and,
- If any are identified, then appropriate exclusion zone(s) will be implemented. A 1m buffer (except for the named species below) will be used to cordon off invasive species outside the works footprint.

Japanese Knotweed

Japanese knotweed code of practice

To assist the Developer and contractors to select the most appropriate treatment option, some excerpts from the Knotweed Code of Practice (Environment Agency, 2013) are reproduced below. The code of practice has been developed by experts in the control of Japanese knotweed and is based on the successes and failures of several Japanese knotweed management plans in the United Kingdom, which is also relevant for Ireland. Therefore, it represents the best available guidance on the different treatment options.

- "Unless an area of Japanese knotweed is likely to have a direct impact on the development, control it in its original location with herbicide over a suitable period of time, usually two to five years;
- Only consider excavating Japanese knotweed as a last resort, and if so, keep the amount of knotweed excavated to a minimum;
- Soil containing Japanese knotweed material may be buried on the site where it is produced to ensure that you completely kill it. Bury material at least 5 m deep;
- Where local conditions mean you cannot use burial as an option, it may be possible to create a Japanese knotweed bund. The purpose of the bund is to move the Japanese knotweed to an area of the site that is not used. This 'buys time' for treatment that would not be possible where the Japanese knotweed was originally located;
- Due to timing, location, landfill is the only reliable option, but it should be treated as a last resort. Landfill can be expensive and would require haulage, which would increase the risk of Japanese knotweed spreading; and,
- When transporting soil infested with Japanese knotweed to landfill, it is essential to carry out strict hygiene measures. If these standards are not followed, this may result in the spread of this invasive species. Japanese knotweed is a particular problem along transport routes/corridors, where it can interfere with the line of vision and can potentially result in traffic accidents."

Information is also provided by Invasive Species Ireland (ISI) (ISI, 2015) in relation to identification, control and eradication of Japanese knotweed.

Exclusion zone

Prior to the construction phase/excavations at the site, the following bio-security measures will be in place:-

- A 7m exclusion zone, measured horizontally from the nearest visible Japanese knotweed plant, will be established around all areas infested by Japanese knotweed;
- Where part of the exclusion zone encroaches onto an active public access, or beyond a site boundary, this section of the exclusion zone will be positioned as close as possible to the boundary;
- The exclusion zone will be delineated with a secure temporary construction fence, such as herras panels or timber post and netting, and be fitted with appropriate warning/advisory signage;
- Fencing will remain in place for the duration of construction works; and,
- Signs will be placed on the fence to advise site personnel that the area contains Japanese knotweed material, and that bio-security measures are actively in force.

Chemical control

The use of physical methods on their own are extremely unlikely to control Japanese knotweed and chemical treatment is recommended.

The desired option to treat Japanese knotweed generally is to control the infestation in-situ with a combination of physical and herbicide control over a period (typically 3-5 years or until no new growth is observed). The control of Japanese knotweed will require the use of herbicides, which can pose a risk to human health, to non-target plants or to wildlife. To ensure the safety of herbicide applicators and of other public users of the site, it is essential that a competent and qualified person carries out the herbicide treatment. A qualified and experienced contractor will be employed to carry out all treatment work. The contractor will follow the detailed recommendations of the following documents for the control of invasive species and noxious weeds:-

- Chapter 7 and Appendix 3 of the TII Publication: The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (NRA, 2010);
- Best Practice Management Guidelines for Japanese Knotweed (ISI, 2015); and,
- Circular Letter NPWS 2/08 Use of Herbicide Spray on Vegetated Road Verges (NPWS, 2008).

A systemic herbicide (e.g. Picloram) and/or a bioactive formulation (i.e. glyphosate) may be sprayed on foliage during dry weather or injected directly into the stems of Japanese knotweed plants identified within the site. Strong systemic herbicides are most effective at targeting the persistent roots of Japanese knotweed; however, they may also persist in the soil and/or kill surrounding vegetation.

Chemical control using a bioactive formulation of glyphosate is the most appropriate herbicide for use in or near water (Environment Agency, 2003) and this is the recommended treatment if knotweed is found within 20m of the Cross [Roscommon] River.

The length of treatment may vary depending on the type of herbicide used, i.e. highly persistent herbicides may eradicate a plant within 1-2 years whereas non-persistent herbicides (such as glyphosate) may take over a period of at least 3-years to ensure the successful eradication of the plants.

Annual spot-checks will be conducted in May-June to identify and retreat any re-growth.

Such treatment can take up to 5-years to completely eradicate growth; therefore, further treatment may be required beyond the 3-years. This will be determined by the results of the monitoring. Japanese knotweed does not produce viable seed in

Ireland, and therefore seed germination in subsequent years will not be an issue. The optimal period for treatment is May-June and September-October.

Montbretia

The following treatment options are recommended by NRA (2010) guidance.

Chemical control

Montbretia can be treated with herbicide during the active growing season. Due to the potential for re-infestation from seeds, corms and/or rhizome fragments, regular monitoring and follow-up treatment, as dictated by the monitoring, will be required over several years. If found near a watercourse crossing, similar bioactive-formulation glyphosate based herbicide treatment is recommended as for Japanese knotweed (see above).

Physical control

Physical control of montbretia is difficult as individual corms easily break from their chains and can result in ready re-infestation or further spread. Where infestations are limited in extent, the entire stand can be excavated and buried or disposed of to a licensed landfill or incineration facility under licence. The most effective time to remove montbretia is before the flowering/seeding season. The corms are very hardy and are not suitable for composting. Due to the potential for re-infestation from corms, regular follow-up will be required over several years to deal with any re-growth.

Snowberry

As snowberry is present within hedgerows in third-party lands, the primary means of preventing spread will be avoidance.

In the event of interaction of works with snowberry, excavation of the entire root system is recommended, in addition to the general prevent and containment measures outlined earlier.

This must be done before the plants' seeds ripen in autumn and plant matter from this process can be disposed of at a licenced landfill site or may be buried on-site up to a depth of >2m.

5.7.1.5 Birds

To avoid widespread disturbance to birds, access will be restricted to the footprint of the proposed works corridor. Measures proposed in **Section 5.7.1.1** will prevent deterioration of water quality and adverse effects on birds relying on wetland habitats, such as turloughs.

Disturbance is predicted to have the greatest effect on wintering IEF wildfowl and waders that use the turloughs south and southwest of the substation.

The following will be implemented to reduce the possibility of damage and destruction (and disturbance to sensitive species) to occupied bird nests:-

- if site clearance and construction activities are required to take place during the main breeding bird season, pre-commencement survey work will be undertaken to ensure that nest destruction and disturbance is avoided;
- once vegetation has been removed from the works corridor, these areas will be retained in a condition that limits suitability for nesting birds for the remainder of the construction phase e.g. cover for ground nesting species will be made unsuitable for cutting vegetation or tracking over with an excavator; and,

- a suitably experienced Ecological Clerk of Works will be employed for the duration of the construction period to make contractors aware of the ornithological sensitivities of the project and to undertake surveys for nesting birds throughout the construction period, and enforcing exclusion areas, as required.

Mitigation measures to avoid disturbance to wintering waders and wildfowl have been developed using the TIDE toolbox (TIDE, 2024), which is a best-practice toolkit that has been developed to avoid disturbance to waders and wildfowl at foraging and roosting locations. The following will be implemented to avoid disturbance to birds during the non-breeding season at the substation location:-

- Most construction activities (or the most disturbing aspects) at the electricity substation site will be undertaken during the breeding season months (April to August inclusive) insofar as possible to minimise disturbance to non-breeding IEF wildfowl and waders;
- However, as the construction phase is predicted to last 15-18 months, works will be required to be undertaken during the non-breeding season. Prior to the commencement of the non-breeding season, temporary barriers will be erected to provide acoustic and visual screening of the substation and access track which will remain in place until construction works cease or the end of the non-breeding season (whichever is sooner). The barrier will consist of wooden boarding approximately 5m tall and will face the turloughs to the south and southwest of the substation location. This will reduce the magnitude of high disturbance stimuli (e.g. sudden loud noises, continuous loud noises, workers operating outside of plant and, workers vacating plant), which could otherwise cause disturbance and displacement to birds. The barrier will be erected in such a way that no destruction of existing stonewalls, hedgerows or treelines will occur;
- Where screening cannot be implemented along the access road to the substation site, construction personnel must stay within their vehicles and ensure that vehicles travel slowly and quietly, without coming to a halt; and,
- Bird monitoring will be undertaken throughout the construction phase during the non-breeding season by a suitability experienced Ecologist. This will be used to check that actions/measures to avoid disturbance are being undertaken correctly and that remedial actions can be implemented if required. The bird monitoring during the non-breeding season will be focused at the turlough locations south and southwest of the substation and will involve conducting fortnightly wader and wildfowl feeding distribution surveys between October to March inclusive. The locations of IEF birds including black-headed gull, common gull, coot, curlew, teal, wigeon, cormorant, great-crested grebe, lesser black-backed gull, mallard, mute swan, lapwing, oystercatcher, tufted duck and whooper swan within 500m of the turloughs will be recorded, as well as any responses to disturbance stimuli.

5.7.1.6 Terrestrial Mammals (excluding bats)

Measures proposed in **Section 5.7.1.1** will prevent deterioration of water quality and adverse effects on mammals relying on downstream habitats, such as otter. Habitat features important for mammals will be retained a (e.g. hedgerows and treelines).

A pre-construction walkover survey of the project will be undertaken. This will search for mammal resting/breeding places which could change over time. If any are identified, then appropriate exclusion zone(s) will be implemented and construction

activities timed to avoid sensitive periods, such as the breeding season or hibernation, as relevant.

The following will be implemented to reduce the possibility of direct and indirect effects on mammals:-

- limiting constructions works to daylight hours;
- providing exit points for any excavations (e.g. escape planks or spoil runs) so mammals do not become trapped; and,
- if any threatened or legally protected mammals are recorded during the pre-construction walkover survey, the Ecological Clerk of Works make contractors aware of the mammalian sensitivities of the project and to undertake surveys for breeding or resting mammals throughout the construction period, enforcing exclusion areas as required. These are 50m for red squirrel, 100m for pine marten, 150m for otter and 50m for badger. If in the unlikely event that exclusion zones cannot be implemented, advice will be sought from NPWS, and appropriate mitigation and compensation measures will be put in place and an application will be made to NPWS for a derogation licence if required.

5.7.1.7 Bats

As no hedgerows and treelines will be lost due to construction, there is no net loss of commuting and foraging routes for bats.

As there are no structures/trees with moderate to high bat roosting potential within or nearby the project footprint, it will not be necessary for an ecologist to undertake a comprehensive survey of structures/trees with moderate to high bat roosting potential in advance of construction works.

No night-time lighting will be required during construction.

5.7.1.8 Other Protected Fauna

Pre-construction checks will be undertaken for spawning frogs in drainage ditches adjacent to the underground electricity line if construction works are undertaken in February. If found, adults and spawn will be translocated under NPWS licence to suitable alternative locations if present. Pitfall traps and drift fences will be used to capture adult frogs.

Amphibian-proof fencing close to any ponds/pools will be used to prevent frogs or smooth newts from accessing any parts of the project most hazardous to amphibians during the construction phase.

5.7.2 Operational Phase

5.7.2.1 Nature Conservation Sites, Fisheries and Aquatic Ecology

Mitigation measures to protect water quality are shown in **Chapter 7** and in **Annex 3.4** of this EIAR. Maintenance of the drainage system will ensure the system is operating effectively and will be undertaken following the CIRIA C697 SuDS and Maintenance Manual. A review of the ecological mitigation measures will be required during the operational phase and project specific mitigation will be provided as appropriate where further measures are required to ensure no significant environmental effects on aquatic receptors and nature conservation sites. The following mitigation measures will be implemented and can be added to:-

- Onsite re-fuelling of machinery will not be carried out during the operational phase of the development. All plant/machinery will be refuelled offsite;

- Fuels stored on site will be minimised and any diesel or fuel oils/hydrocarbons stored on-site will be bunded within the control building. The bund capacity will be sufficient to contain 110% of the storage tank's maximum capacity;
- The electrical control building will be bunded appropriately to the volume of oils likely to be stored, and to prevent leakage of any associated chemicals and to groundwater or surface water. A storm drainage system and an appropriate oil interceptor will be installed at the compound of the electricity substation to avoid any discharges from the site of hydrocarbons;
- Any plant used during the operational phase will be regularly inspected for leaks and fitness for purpose;
- Spill kits will be available to deal with accidental spillages; and,
- Wastewater arising from the control building will be stored in a sealed sub-surface tank and will be removed from the site as required by a local licenced waste collector.

This will prevent any negative effects on downstream aquatic receptors and designated sites.

5.7.2.2 Birds

No mitigation measures for birds are required as no direct effects are predicted; measures to prevent pollution of wetland habitats, such as turloughs, will also prevent indirect negative effects on IEF birds using such habitats.

5.7.2.3 Bats

To avoid any effects on bats from lighting at the substation, cowled lighting will be used, directing light inwards to minimise disturbance of any commuting or foraging bats.

Appropriate luminaire specifications will also be used for lighting at the substation as outlined in BCT (2023). These include:-

- All luminaires should lack UV elements when manufactured. Metal halide, compact fluorescent sources should not be used;
- LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability;
- A warm white light source (2700Kelvin or lower) should be adopted to reduce blue light component;
- Light sources should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats (Stone, 2012);
- Column heights should be carefully considered to minimise light spill and glare visibility. This should be balanced with the potential for increased numbers of columns and upward light reflectance as with bollards;
- Only luminaires with a negligible or zero Upward Light Ratio, and with good optical control, should be considered;
- Luminaires should always be mounted horizontally, with no light output above 90° and/or no upward tilt; and,
- Where appropriate, external security lighting should be set on motion sensors and set to as short a possible a timer as the risk assessment will allow.

In addition, new hedgerows will be planted and existing hedgerows bolstered around the substation (see **Section 5.9** below), which will help screen any bats foraging at turloughs from negative lighting effects.

5.7.3 Decommissioning Phase

As set out at **Chapter 3** (**Sections 3.2** and **3.7**), the project will form part of the national electricity network and decommissioning of the substation is not proposed. Therefore, no decommissioning phase mitigation measures are required.

5.8 Compensation Measures

No compensation measures are proposed.

5.9 Enhancement Measures

The following enhancement measures are proposed, which also support Roscommon County Council's policy objectives NH10.6 (protect/enhance ecological features) and NH10.14 (plant new hedgerows) and are illustrated at **Annex 5.1** (**Figure 6**).

5.9.1 Habitats

Objective 1: Establishment of new hedgerows/trees and 'bolstering' existing hedgerows:-

- Plant c. 810m of new hedgerow habitat using species around the substation for screening as specified in **Annex 9.3** (e.g. trees including hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, pedunculate oak *Quercus robur*, and grey willow *Salix cinerea;* and, shrubs including dog rose *Rosa canina*, guelder rose *Viburnum opulus*, and honeysuckle *Lonicera pericycleum*);
- Existing boundary hedgerows (c. 250m) to the west of the project will be bolstered using a native planting whip mix (from species described above) to fill any existing gaps;
- Plants must be of Irish Origin or Irish Provenance and purchased from Department of Agriculture, Fishing and the Marine (DAFM) registered professional operators;
- New planting will be undertaken in the appropriate season, with bareroot stock planted October to December (avoiding periods when the ground is waterlogged or frozen) unless on clay, when planting should be delayed until March due to risk of heave during heavy frost;
- Planting will not be undertaken until the first appropriate season post-construction to avoid damage to whips;
- Cultivate the ground prior to planting and add organic matter if required;
- To ensure new hedgerows are beneficial for biodiversity, there must be six plants per metre in a double-staggered row at a spacing of 600mm. Overall, no one species will make up more than 70% of the total number of plants;
- Any mix of native hedgerow species can be chosen, with one tree species planted at every 1.5m to 3m, and shrubs to be planted at 900mm to 1,500mm spacings;
- Water during first year to assist with establishment. Frequency of watering to adapt to weather conditions;
- New hedgerows will be protected from livestock with an appropriate permanent fence, which can be moved out further as the hedgerow matures and expands;
- Cut hedgerows annually during establishment phase to encourage sideways growth and canopy closure. Hedgerows will be maintained at 4m height;
- Competing vegetation will be controlled, preferably via mulching with organic matter, and avoiding the of use of chemical herbicides;
- Failed or dead plants (identified during condition assessments) should be replaced the following planting season; and,

- Should any newly planted hedgerows require temporary removal to allow for maintenance works to the project, they will be reinstated following the criteria mentioned above.

The success of this objective will be measured through:-

- Success will be assessed by monitoring the condition of hedgerows/trees throughout the establishment phase, and, at less frequent intervals, throughout the maintenance phases;
- Newly created hedgerows will be subject to condition assessment following the Hedgerow Appraisal System each year after planting for the first 5 years (the establishment phase), and then every 5-years. This will help identify ongoing management actions, such as weed control, gapping up and where fence maintenance is required;
- By Year 5 after planting, hedgerows should meet the criteria for 'Favourable' under the Hedgerow Appraisal System; and,
- In addition to the condition assessment, the diversity of the tree/shrub/climber component (otherwise described in the Hedgerow Appraisal System as 'canopy' forming species) should be the same, or greater than, that at planting.

5.9.2 Species

5.9.2.1 Bats

Objective 2: Provision of bat roosts:-

- 1 no. bat box will be erected in an existing tree within the electricity substation site;
- The box will be installed at least 4m above ground level (AGL), facing a direction to provide shelter from strong, prevailing winds;
- The box will be positioned such that there is a clear flight path to and from the box entrance (i.e. the box entrance is not obscured by vegetation);
- A box suitable for either maternity or hibernation roosting will be used;
- The location and access arrangements to the box will be agreed with the relevant landowner;
- The bat box will be subject to inspections for bats and maintenance checks once a year during Years 1-5 (post-construction), and then every five years;
- Detritus (not including bat droppings) to be cleared from the bat box during inspections and vegetation trimmed to ensure entrances do not become obstructed; and,
- Where the bat box has become damaged or are missing, it will be replaced immediately. If there is evidence of human vandalism, an alternative tree in a less prominent position will be identified (and permissions obtained) and a replacement box will be reinstalled in the new tree.

The success of this objective will be measured through:-

- Bat box inspections undertaken in every year post-construction Years 1-5, and every 5-years thereafter;
- Evidence of occupation by bats within the first five years following construction; and,
- All bat roosts records to be submitted to Bat Conservation Ireland online at https://www.batconservationireland.org/in-your-area/sightings.

5.9.2.2 Birds

Objective 3: Provision of bird nesting habitat:-

- Installation of 1 no. bird box within the electricity substation site; and,
- Position nest boxes such that they are not exposed to sun and are sheltered from the rain and are at least 7m from the ground.

The success of this objective will be measured through:-

- Checks every year during Years 1-5 post-construction to ensure that the bird box is in good condition.

This will help to determine whether repairs/replacement of the bird box are required.

5.9.2.3 Reptiles and amphibians

Objective 4: Provision of amphibian hibernaculum:-

- 1 no. hibernaculum will be constructed within the site for amphibians;
- The hibernaculum will be located in a sunny position, orientated such that a long side faces south and near to watercourses/drainage ditches, within rough grassland or scrub and avoiding areas of intensively managed/grazed land; and,
- The locations of the hibernaculum will be agreed in conjunction with landowners and the Planning Authority prior to the completion of construction of the project.

The success of this objective will be measured through:-

- Amphibian species richness and abundance will be measured via physical checks to ensure hibernacula are still present and functional in Years 1-5 post-construction.

5.9.2.4 Invertebrates

Objective 5: Provision of invertebrate foraging habitat and hibernacula:-

- Existing area of grassland to be managed as meadows;
- Where soil has been disturbed from construction stage activity at infrastructure margins, residual areas of the substation site and atop the western spoil deposition area, natural recolonisation will be allowed to occur;
- Locally sourced yellow rattle *Rhianthus minor* seed to be planted in these areas;
- No fertiliser or herbicides to be used for management of these invertebrate foraging habitats;
- Erect 1 no. insect hotel in the first year of operation. Insect hotels or bee boxes can be created by drilling holes into fence posts or pieces of wood and positioning appropriately. This site can be created along dry hedgerows, access tracks and other field boundaries;
- Ensure insect hotel is maintained or replaced over the lifespan of the project as required;
- Locate insect hotels in sunny, sheltered areas, ideally no more than 300m from areas of food plants; and,
- The locations of the insect hotels will be agreed in conjunction with landowners and the Planning Authority prior to the completion of construction of the project.

The success of this objective will be measured through:-

- Maintenance checks to ensure wildflower/grassland buffer habitats, and, insect hotel still present and functional, to be carried out annually in Years 1-5 post-construction.

5.9.3 Implementation

5.9.3.1 Roles and Responsibilities

The implementation of enhancement measures will be overseen by an ecologist with the required experience and expertise, appointed by the Developer. All management tasks will either be undertaken by the developer, operator or by suitably experienced contractors acting on their behalf and all ecological monitoring will be undertaken by suitably qualified and experienced ecologists.

5.9.3.2 Reporting and Reviewing

This enhancement measures have been developed using best-practice guidance and following the recommendations of this guidance monitoring is proposed to measure success of the management measures and to identify whether remedial measures are required if objectives are not being met.

Monitoring results will be reported on an annual basis (during years in which monitoring takes place) and if necessary (e.g. if stated objectives were not being met), recommendations made for reasonable changes to management prescriptions, as appropriate. Monitoring reports will be submitted to Planning Authority and any changes proposed to management prescriptions would be discussed with them in the first instance.

5.10 Monitoring

5.10.1 General Pre-Construction Confirmation Surveys

To prevent accidental disturbance to resting/breeding/hibernating places of mammals (badgers, red squirrel, pine marten, otter and hedgehog), an ecological walkover survey will be undertaken prior to any construction activities within the project footprint. If any sensitive locations for mammals are newly recorded, ongoing monitoring and appropriate exclusion zones will be implemented to determine when and where works can proceed. If exclusion zones cannot be implemented, NPWS will be contacted and based on their advice, additional mitigation and compensation will be implemented, with relevant licences applied for, if required.

Similarly, trees and structures within the works corridor will be re-assessed for bat roosting potential, with any inspections or emergence surveys carried out as required under licence.

Checks for nesting birds will be required for construction undertaken during the bird breeding season. If nests are newly recorded, ongoing monitoring and appropriate exclusion zones will be implemented to determine when and where works can proceed. If exclusion zones cannot be implemented, NPWS will be contacted and based on their advice, additional mitigation and compensation will be implemented, with relevant licences applied for, if required.

5.10.2 Water Quality (During and Post-Construction)

Water quality monitoring will be undertaken as outlined at **Chapter 7** to confirm the efficacy of mitigation measures.

5.10.3 Birds (Construction)

Bird monitoring will be undertaken throughout the construction phase during the non-breeding season by a suitability experienced ecologist. This will be used to check that actions/measures to avoid disturbance are being implemented correctly and that remedial actions can be implemented if required. The bird monitoring during the non-breeding season will be focused at the turlough locations south and southwest of the substation and will involve conducting fortnightly wader and wildfowl feeding distribution surveys between October to March inclusive. The locations of all wildfowl and waders within 500 m of the turloughs will be recorded as well as any responses to disturbance stimuli.

Proposed monitoring measures will be agreed with the Planning Authority prior to the commencement of development.

5.11 Residual Effects

A summary of the effects, mitigation and residual effects, considering cumulative effects, is set out in **Table 5.15.**

A 'balance-sheet' of habitat losses and gains is also presented in **Table 5.14**.

Fossitt Code	Fossitt Name	Potential EU Annex I or PAW Affiliation?	Area (ha)/Length (m)					Where and How Compensation/Enhancement Will Occur
			Total (baseline)	Permanent Loss	Temporary Loss	Compensation/ Enhancement Gain	Net Change	
BC4	Flower beds and borders	No	54m	-	-	-	0m	Not required
BL1	Stone walls and other stonework	No	135.46m	15m	-	-	-15m	There will be a permanent loss of a section of stone wall near the substation to accommodate access tracks
BL3	Buildings and artificial surfaces	No	11.9ha/101m	-	-	11.9ha/101m	0ha/0m	Will be reinstated immediately after installation of electricity line
ED3	Recolonising bare ground	No	1.4ha	-	-	-	0m	Not required
FL6	Turloughs	Yes – with 3180* turloughs	0.5ha	-	-	-	0m	Not required
FW2	Depositing/lowland rivers	No	263m	-	-	-	0m	No loss
FW4	Drainage ditches	No	619m	-	-	-	0m	No loss
GA1	Improved agricultural grassland	No	97.7ha	1.137ha	0.315ha	-	-1.137ha	Temporary loss will be compensated for by natural recolonisation/wildflower planting. No compensation of permanent loss is required given the highly modified status of habitat.
GA2	Amenity grassland (improved)	No	3.8ha	-	-	-	0ha	Not required
GS2	Dry meadows and grassy verges	No	0.2ha/549m	-	-	-	0ha/0m	Not required

WD1	(Mixed) broadleaved woodland	No	0.2ha	-	-	-	0ha	Not required
WD5	Scattered trees and parklands	No	0.1ha	-	-	-	0ha	Not required
WL1	Hedgerows	No	6,032m	-	-	808m	+808m	New hedgerow will be planted to screen substation and ancillary infrastructure. In addition, 247m existing hedgerow will be bolstered.
WL2	Treelines	No	3,27 m	-	-	-	0m	Not required
WS1	Scrub	No	1.5ha	-	-	-	0ha	Not required
HD1 x WS1	Dense bracken x scrub mosaic	No	0.1ha	-	-	-	0ha	Not required
WS3	Ornamental/non-native shrub	No	0.02ha	-	-	-	0ha	Not required

Table 5.13: Habitat Loss

Ecological Feature	Phase	Likely Effect	Likely Cumulative Effect	Significance Pre-Mitigation	Proposed Mitigation/Compensation/Enhancement	Significance of Residual Effect
Fisheries and Aquatic Ecology						
Brook lamprey, otter, Annex I turloughs FL6, depositing/lowland rivers FW2, drainage ditches FW4, common frog, smooth newt	Construction	Direct: None Indirect: short-term deterioration in surface and groundwater water quality due to pollution or suspended solids	Risk slightly increased due to other projects and plans	Significant short-term negative at regional scale for Annex I FL6 turlough habitats, at county scale for brook lamprey, and lower higher value for otter, common frog and smooth newt. Not significant for depositing/lowland	See **Section 5.7.1** based on **Chapter 7** and CEMP in **Annex 3.4** found in Volume II of this EIAR	Not significant

				rivers FW2 or drainage ditches FW4.		
	Operation	No direct or indirect effects	No elevated risk	Not significant	See **Section 5.7.1** based on **Chapter 7** and CEMP in **Annex 3.4** found in Volume II of this EIAR	Not significant
Designated Sites						
European Sites	Assessed in NIS and assessed above in **Sections 5.3.1.1**, and **5.5.3.1**. The NIS confirms that, with mitigation measures, the project, either alone or in combination with any other plan or project, would not undermine the conservation objectives or have an adverse effect on the integrity of any European site					
Suck River Callows NHA	Construction	Direct: none. Indirect: short-term disturbance/displacement to wigeon and lapwing from the NHA that use the turloughs south and southwest of the project	No elevated risk	Significant short-term negative at national scale.	See **Section 5.7.1.5** and CEMP in **Annex 3.4** found in Volume II of this EIAR.	Not significant
	Operation	No direct or indirect effects.	No elevated risk	Not significant	Not significant	Not significant
Cranberry Lough pNHA	Construction	Direct: none. Indirect: short-term disturbance/displacement to little grebe and curlew from the pNHA that use the turloughs south and southwest of the project	No elevated risk	Significant short-term negative at national scale.	See **Section 5.7.1.5** and CEMP in **Annex 3.4** found in Volume II of this EIAR.	Not significant
	Operation	No direct or indirect effects	No elevated risk	Not significant	Not significant	Not significant
Habitats						
BC4 flower beds and borders, ED3 recolonising bare ground, GA2	Construction and operation	No direct or indirect effects	No elevated risk	Not significant	None	Not significant

amenity grassland (improved), WD1 (mixed) broadleaved woodland, WD5 scattered trees and parkland, WS1 scrub, HD1 x WS1 dense bracken x scrub mosaic, WS3 ornamental/non-native shrub						
GA1 improved agricultural grassland	Construction	Direct habitat loss	No elevated risk	Significant permanent negative at local lower value scale.	Temporary loss will be compensated for and enhancement measures will increase biodiversity value of remainder (see **Section 5.9**).	Not significant
	Operation	No direct or indirect effects	No elevated risk	Not significant	None	Not significant
BL1 stone walls and other stoneworks	Construction	Direct habitat loss	No elevated risk	Significant permanent negative at local lower value scale.	None	Significant, negative effect at local lower value.
	Operation	No direct or indirect effects	No elevated risk	Not significant	None	Not significant
GS2 dry meadows and grassy verges, WL2 treelines, FW2 depositing/lowland watercourses, FW4 drainage ditches	Construction	Direct: none Indirect effects: accidental spread of invasive and non-native plant species.	No elevated risk	Significant permanent negative at local higher value scale	Invasive species management plan will be used to avoid accidental spread of invasive and non-native plants.	Not significant
	Operation	Operation	No direct or indirect effects	No elevated risk	Not significant	None
WL1 hedgerows	Construction	Direct: none Indirect effects: accidental	No elevated	Significant permanent	Invasive species management plan will be used to avoid accidental spread of	Significant, positive

		spread of invasive and non-native plant species.	risk	negative at lower higher value scale.	invasive and non-native plants. Planting of 808 m of new hedgerow and bolstering of 247 m of existing hedgerow (see **Section 5.9**)	effect at the local higher scale
	Operation	Operation	No direct or indirect effects	No elevated risk	Not significant	None
IEF Birds						
IEF birds recorded during breeding season near substation (black-headed gull, coot, cormorant, herring gull, house martin, house sparrow, lesser black-backed gull, little egret, mallard, mute swan, starling and swallow)	Construction	Direct nest damage or destruction	No elevated risk	Not significant due to embedded mitigation	As detailed in **Section 5.7.1.5** a series of embedded mitigation measures are included to avoid destruction of active nests.	Not significant
		Disturbance/displacement at nearby turlough habitats	No elevated risk	Significant short-term negative: Regional scale = coot, little egret County scale = herring gull, mute swan Local higher value scale = cormorant, lesser black-backed gull, mallard Not significant for	See **Section 5.7.1.5.**	Not significant

				house martin, house sparrow, little egret, starling and swallow		
IEF birds recorded during non-breeding season near proposed substation (black-headed gull, common gull, coot, cormorant, great-crested grebe, herring gull, mallard, mute swan, tufted duck, whooper swan, teal, wigeon, lesser black-backed gull, lapwing, curlew, oystercatcher)	Construction	Disturbance/displacement at nearby turlough habitats	No elevated risk	Significant short-term negative: Regional scale = black-headed gull, common gull, teal, wigeon, lesser black-backed gull, lapwing County scale = coot, cormorant, great-crested grebe, mallard, mute swan, tufted duck, whooper swan Local higher value scale = curlew, oystercatcher	See **Section 5.7.1.5.**	Not significant
Common kestrel	Construction	No direct or indirect effects	No elevated risk	Not significant	None	Not significant
All IEF birds	Operation	No direct or indirect effects	No elevated risk	Not significant	None	Not significant
IEF Bats						
Bat assemblage	Construction	Direct destruction/disturbance of roost sites, or foraging and commuting habitats	No risk	No confirmed or potential roosts were recorded in works footprint of project and no loss of foraging or commuting habitat is	See **Section 5.7.1.7**.	Not significant

				predicted		
	Operation	Indirect disturbance/displacement due to lighting	No risk	Significant permanent negative at local higher value scale.	See **Section 5.5.3.5.**	Not significant
IEF Other Fauna						
Amphibians (common frog and smooth newt)	Construction	Direct effects via accidental destruction of spawn.	No risk	Significant short-term negative at local higher scale	See **Section 5.7.1.8**.	Not significant
		Indirect loss of foraging habitats	No risk	Significant short-term negative at local higher scale	See **Section 5.7.2.1**.	Not significant
	Operation	Operation	No direct or indirect effects	No elevated risk	Not significant	None

Table 5.14: Summary of Effects

5.12 Conclusion

This chapter assesses the project which is described throughout.

A proposed mitigation scheme for the construction, operational and decommissioning phases is described in this chapter and these mitigation measures will be implemented in full for the project.

With the implementation of the mitigation measures in this chapter, there are not likely to be any residual significant effects on important ecological features and the proposed enhancement measures, including the planting of new hedgerows and bolstering of existing hedgerows, will likely have a significant positive effect on biodiversity.

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