



Chapter 09

Biodiversity

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9. Biodiversity

9.1 Introduction

This chapter describes the likely significant effects of the Proposed Development on biodiversity, including flora (plants), fauna (animals) and habitats in both the terrestrial and aquatic environment. Mitigation measures are also described, where applicable or appropriate, that avoid or minimise adverse biodiversity effects.

Chapter 4, *Description of the Proposed Development* provides a full description of the Proposed Development. An Appropriate Assessment (AA) Screening has also been prepared for the Proposed Development, and this will be submitted to An Bord Pleanála as part of the planning application documentation.

The potential effects on biodiversity in this chapter should be considered in conjunction with the other chapters of the EIAR including **Chapter 4**, *Description of the Proposed Development*, **Chapter 11**, *Air Quality*, **Chapter 12**, *Climate*, **Chapter 16**, *Water*, **Chapter 17**, *Land, Soils, Geology and Hydrogeology* and **Chapter 20**, *Cumulative and Interactive Impacts* as well as the Construction Environmental Management Plan (CEMP) included as **Appendix 5.1** in **Volume 4** of this EIAR.

This chapter was prepared by Carl Dixon MSc (ecological monitoring) and Dr. Sorcha Sheehy PhD (ecology / ornithology). Details of Carl and Sorcha's relevant qualifications and experience are included in **Chapter 1**, *Introduction*.

9.2 Assessment Methodology

9.2.1 General

The biodiversity assessment addresses the potential likely significant direct, indirect and cumulative effects of the Proposed Development on terrestrial and aquatic biodiversity, including flora, fauna and habitats in proximity to the Proposed Development site. The assessment has been carried out in three stages:

1. Desktop assessment to determine existing information and records in relation to:
 - Sites, species, and habitats protected under Council Directive 92/43/EEC (Habitats Directive), and sites and species protected under Council Directive 2009/147/EC (Birds Directive), within the zone of influence of the Proposed Development and more distant hydrologically linked sites. The Zone of Influence (ZoI) comprises the area within which the Proposed Development may potentially affect the conservation objectives (or qualifying interests) of a Natura 2000 site; and
 - Biodiversity, habitats, and species present near the Proposed Development.
2. Site visits and field surveys by the specialist ecologists to establish the existing ecological conditions within the footprint of the Proposed Development and within the vicinity of all of the Proposed Development elements.
3. Evaluation of the Proposed Development and determination of the scale and extent of potential likely direct and indirect significant effects on biodiversity (i.e., flora, fauna, and habitats) and the identification of appropriate mitigation and monitoring which may be required.

9.2.2 Relevant legislation

Flora and fauna in Ireland are protected at a national level by the Wildlife Act 1976, as amended, and the European Communities (Birds and Natural Habitats) Regulations 2011. They are also protected at a European level by the EU Habitats Directive (92/43/EEC) and the EU Birds Directive (2009/147/EC).

Under this legislation, sites of nature conservation importance are then designated to legally protect faunal and floral species and important / vulnerable habitats.

The relevant categories of designation are as follows:

- Special Areas of Conservation (SAC) are designated under the European Communities (Birds and Natural Habitats) Regulations 2011 to meet the EU Habitats Directive (92/43/EEC);
- Special Protection Areas (SPAs) are designated under the EU Birds Directive (79/409/EEC) amended in 2009 as the Directive 2009/147/EC; and
- Natural Heritage Areas (NHAs) and Proposed Natural Heritage Areas (pNHA) are listed under the Wildlife (Amendment) Act 2000. A NHA is designated for its wildlife value and receives statutory protection. A list of proposed NHAs (pNHAs) was published on a non-statutory basis in 1995, but these have not since been statutorily proposed or designated.

Relevant European legislation:

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (The Habitats Directive);
- Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds (The Birds Directive);
- Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy (The Water Framework Directive); and
- Directive 2006/44/EC of the European Parliament and of the Council of 6 September 2006 on the quality of fresh waters needing protection or improvement in order to support fish life (The Fish Directive (consolidated)).

Relevant Irish legislation:

- The Wildlife Act 1976, as amended by the Wildlife Act 1976 (Protection of Wild Animals) Regulations, 1980, the Wildlife (Amendment) Act 2000, the Wildlife (Amendment) Act 2010, Wildlife (Amendment) Act 2012, European Communities (Wildlife Act, 1976) (Amendment) Regulations 2017. (The Wildlife Act);
- European Communities (Conservation of Wild Birds) Regulations 1985 (S.I. 291/1985) as amended by S.I. 31/1995;
- European Communities (Natural Habitats) Regulations, S.I. 94/1997 as amended by S.I. 233/1998 & S.I. 378/2005 (The Habitats Regulations);
- Fisheries (Consolidation) Act, 1959 (as amended), hereafter referred to as the Fisheries Act;
- European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477/2011); and
- Flora (Protection) Order, 2022 (S.I. No. 235/2022).

In addition to the above, in assessing the likely significant effects on the prevailing biodiversity arising from the Proposed Development (including during the Decommissioning Phase), due regard, where relevant, has been given to relevant legislation and guidance, including the following:

- EIA Directive (2014/52/EU);
- Planning and Development Acts 2000, as amended and the Planning and Development Regulations 2001, as amended;
- Wildlife Act 1976, as amended;
- Flora (Protection) Order 2015;
- EU Water Framework Directive 2000/60/EC;
- European Communities (Birds and Natural Habitats) Regulations 2011 (as amended);

- National Biodiversity Action Plan 2017 – 2021;
- EU Biodiversity Strategy for 2030 (EU, 2020);
- EU Strategy on Green Infrastructure (EU, 2013);
- National Biodiversity Action Plan for 2017-2021 (Department of Culture, Heritage and the Gaeltacht, 2017); and
- National Parks and Wildlife Service (NPWS) Threat Response Plans (NPWS, Various).

9.2.3 Guidance

This chapter of the EIAR follows the Environmental Protection Agency’s Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022). It also takes account of the Draft Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Environment, Community and Local Government, August 2018), Guidelines on Ecological Impact Assessment in the UK and Ireland, 2nd edition (Chartered Institute of Ecology and Environmental Management (CIEEM), 2016) and Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, Version 1.1 (CIEEM, 2018).

Reference was also made to the following documents where relevant:

- Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU) (European Union (EU), 2017);
- Managing Natura 2000 Sites: The Provision of Article 6 of the Habitats Directive 92/43/EEC (EC Environment Directorate-General, 2018);
- Guidance on integrating climate changes and biodiversity into environmental impact assessment (EU Commission, 2013);
- Assessment of plans & projects in relation to N2K sites – Methodological Guidance (EC, 2021);
- Biodiversity Net Gain Good practice principles for development (CIEEM, 2019);
- Biodiversity Net Gain. A practical guide (CIEEM, 2016);
- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (Inland Fisheries Ireland (IFI), 2016);
- Guidance document on the strict protection of animal species of Community interest under the Habitats Directive (EC, 2021);
- Guidelines for Assessment of Ecological Impacts of National Road Schemes (National Roads Authority (NRA), 2009);
- Best Practice Guidance for Habitat Survey and Mapping (Heritage Council, 2011);
- A Guide to Habitats in Ireland (Fossitt, 2000);
- Guidelines for the treatment of Badgers prior to the construction of National Road Schemes. National Roads Authority, Dublin (NRA, 2005a);
- Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes (NRA, 2005b);
- Guidelines for the treatment of bats during the construction of national road schemes (NRA, 2005c);
- Guidelines for the protection and preservation of trees, hedgerows and scrub prior to, during and post construction of national road schemes (NRA, 2006);
- Guidelines for the treatment of Otters prior to the construction of National Road Schemes (NRA, 2008);

- Bird Census Techniques (Bibby, C.J., Burgess, N.D., Hill, D.A. & Mustoe, S.H., 2000);
- Bird Monitoring Methods - a Manual of Techniques for Key UK Species (Gilbert, G., Gibbons, D.W. & Evans, J., 1998);
- Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd ed) (Collins, 2016); and
- Bat Mitigation Guidelines for Ireland Volume 2 (F. Marnell, C. Kelleher and E. Mullen, 2022).

9.2.4 Desktop study

A desktop study was carried out to collate the available information on the local ecological environment. The purpose of the desktop study was to identify features of ecological value occurring within the Proposed Development site and those occurring near to it which have the potential to be affected by the Proposed Development. A desktop review also allows the key ecological issues to be identified early in the assessment process and facilitates the planning of surveys. Sources of information utilised for this report include the following:

- National Parks and Wildlife Service (NPWS) - www.npws.ie;
- Environmental Protection Agency (EPA) – www.epa.ie;
- National Biodiversity Data Centre (NBDC) – www.biodiversityireland.ie;
- Bat Conservation Ireland - www.batconservationireland.org;
- Birdwatch Ireland - www.birdwatchireland.ie;
- National Biodiversity Action Plan 2017-2021 (NPWS, 2017);
- Cork County Development Plan 2022-2028 (Cork County Council, 2022); and
- Cork Biodiversity Action Plan 2009-2014.

9.2.5 Site surveys

This assessment is based on surveys at the Proposed Development site. Site surveys were carried out from February 2022 to May 2023 on several dates, as outlined in **Table 9.1**.

Table 9.1: Survey types and survey dates

Survey type	Survey dates
Habitat survey	8 th June 2022, 15 th September 2022, 13 th March 2023, 14 th March 2023, 26 th May 2023
Non-volant mammal survey	8 th June 2022, 15 th September 2022, 13 th March 2023, 14 th March 2023
Bat survey	Bat activity surveys: 12 th and 15 th September 2022 Bat / tree survey: 13 th 2023, 14 th March 2023
Breeding bird survey	8 th June 2022, 15 th September 2022, 13 th March 2023, 14 th March 2023, 26 th May 2023
Winter bird survey / vantage point survey	28 th February 2022, 29 th February 2022, 15 th March 2022, 21 st March 2022, 25 th November 2022, 3 rd December 2022, 28 th December 2022, 28 th January 2023, 29 th January 2023.

9.2.5.1 Habitats

Habitats were mapped according to the classification scheme outlined in the Heritage Council publication *A Guide to Habitats in Ireland* (Fossitt, 2000) and following the guidelines contained in *Best Practice Guidance for Habitat Survey and Mapping* (Heritage Council, 2011). Habitats were cross referenced with Habitats Directive Annex I habitats. Dates of the main habitat surveys are included in **Table 9.1**. During these surveys, the site was also surveyed for invasive species and rare floral species (Wyse *et al.*, 2016; Stace 2019).

9.2.5.2 *Non-volant mammals*

Non-volant mammal surveys followed guidelines from the Harris *et al.* (1989), National Roads Authority (NRA) (2005a) and NRA (2008). All habitats within 150m of the Proposed Development site were examined for signs of mammals, with particular focus on Badger *Meles meles* and Otter *Lutra lutra*. Signs of mammals, including spraints, footprints, or feeding remains, were recorded where present.

9.2.5.3 *Bats*

Dusk bat activity / emergence surveys were carried out in the Proposed Development site during suitable weather conditions (sunset temperatures above 10°C, no rain and no strong wind) on several dates outlined in **Table 9.1**. The surveys followed the guidelines set out in ‘Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition)’ (Collins, 2016). Surveyors walked around woodland, treelines and aquatic/wetland habitats which might support bats, and habitats which might be affected by the Proposed Development. The surveys were carried out 15 minutes before sunset. Bat activity surveys used Elekon Batloggers, Magenta Bat 4 Precision, EchoMeter Touch 2 PRO bat detectors. The primary purpose of bat surveys was to assess usage of trees and habitats, located within or in close proximity to the Proposed Development site boundary and to identify foraging and / or commuting routes within the Proposed Development site boundary (i.e., woodland, treelines, hedgerow etc.).

A preliminary roost assessment was also carried at ground level on trees earmarked for removal within the Proposed Development site. The aim of this survey was to identify ‘potential roosting features (PRFs)’ and any evidence indicating the presence of bats i.e., staining, dropping etc. These assessments followed the guidelines set out in ‘Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd ed)’ (Collins, 2016).

9.2.5.4 *Breeding birds*

General bird surveys were carried out in tandem with habitat surveys. Bird surveys were broadly based on the BTO Common Bird Census (CBC) methodology and Breeding Bird Survey (BBS) (Gilbert *et al.*, 1998 and Bibby *et al.*, 2000) which aims to capture a snapshot of breeding bird activity within the survey area. The survey area focused on terrestrial habitats within the planning boundary. All lands within the Proposed Development site were walked so that all habitats within 50m of all potential nesting features were surveyed i.e., woodland, treelines, hedgerows etc. The ornithological surveyor slowly walked through the site, stopping at regular intervals to scan with binoculars and to listen for bird calls or song. Birds were identified by sight and song. All species seen or heard in the survey area and immediate environs were recorded including those in flight. Visits were made during favourable weather conditions.

9.2.5.5 *Wintering birds*

Vantage point surveys for wintering birds overflying the Proposed Development site were carried out between February 2022 and February 2023. These surveys were based on SNH (2017) methodology which is designed to quantify the level of bird flight activity and distribution over the survey area. The vantage point location, on the existing N25 bridge provided excellent visibility of birds overflying the proposed bridge location. Surveys were carried out during good weather conditions, with good visibility and used 8.5×45 binoculars and a Hawke Endurance Ed Spotting Scope 15-45×60 spotting scope. While target species for this survey were wading and wintering birds, all bird species were recorded including passerines, raptors etc. Bird species, flight height and direction were recorded for all species observed.

9.2.6 *Consultation*

The consultation process which informed the scope of this EIAR is described in **Chapter 1, Introduction**. Issues raised during the consultation process relating to biodiversity are addressed where relevant within this chapter.

9.2.7 *Limitations*

Standard survey methods were followed. However, any biases or limitations associated with these methods could potentially affect the results collected. Although every effort was made to provide a full assessment and comprehensive description of the study area, natural fluctuations in populations may not be fully reflected due to the instantaneous nature of the field surveys. However, the field surveys together with the

background knowledge provided by the desk study, provides a robust representation of the baseline for the habitats and species within the zone of influence.

9.3 Baseline Environment

9.3.1 General landscape

The Proposed Development site is located at Little Island, approximately 10km east of Cork City on the N25 Cork to Waterford primary route. The Proposed Development will be located west of the Little Island train station and will cross over the N25 and the railway line, connecting the Little Island train station, the L3004 Glounthaune Road and the Dunkettle to Carrigtwohill pedestrian and cycle route to the Eastgate Business Park in Little Island, Cork. To the north of the Proposed Development lies the L3004 Glounthaune Road and to the south lies the Eastgate Business Park.

The Proposed Development site is located within an area of significant retail, light industrial and residential development. The N25, which bisects the Proposed Development site is a busy road with high levels of traffic and existing lighting. The southern side of the Proposed Development site, which is located within Eastgate Business Park includes areas of car parking associated with the Radisson Blu Hotel, car dealerships and offices to the immediate south, east and west. The northern side of the Proposed Development site is located adjacent to a small public park and recycling centre and railway line. Areas of woodland and treeline are located on the northern and southern boundary of the N25 within the Proposed Development site.

In the wider landscape, wetland and estuarine habitats associated with Cork Harbour are located to the south (Lough Mahon), east (Glounthane Estuary) and west (Dunkettle). Lands to the north of the Proposed Development site are dominated by agricultural grassland and are largely rural in nature.

9.3.2 Designated sites / conservation areas

9.3.2.1 European sites

Special Areas of Conservation (SACs) and candidate SACs (cSACs) are protected under the Habitats Directive 92/43/EEC and the European Communities (Birds and Natural Habitats) Regulations 2011, as amended. Special Protection Areas (SPAs) are protected under the Birds Directive 2009/147/EC and European Communities (Birds and Natural Habitats) Regulations 2011, as amended. Collectively, these sites are referred to as Natura 2000 or European sites.

In accordance with the European Commission Methodological Guidance (EC, 2018), a list of Natura 2000 sites that can be potentially affected by the Proposed Development has been compiled. All SAC, cSAC and SPAs sites which could potentially be impacted by the Proposed Development have been identified. **Table 9.2** lists the relevant Natura 2000 sites, the location of which are shown in **Figure 9.1** and **Figure 9.2** in **Volume 3** of this EIAR.

The Proposed Development does not overlap with any European site. European sites within the potential zone of influence of the Proposed Development site are listed in **Table 9.2**. The Kilcoolishal Stream (also known as the Tibbotstown Stream) runs through the northern side of the Proposed Development site, between the N25 and the railway line. Although the Kilcoolishal Stream is heavily culverted in parts, this ultimately drains into Cork Harbour SPA approximately 2.6km downstream of the Proposed Development site. Surface water run-off during the Construction or Operational Phase of the Proposed Development could potentially flow into Cork Harbour SPA (and Great Island Channel SAC) via the Kilcoolishal Stream. The spread of invasive species during construction could also impact on European sites.

Habitats within or near the Proposed Development site could potentially provide *ex-situ* foraging or roosting grounds for special conservation interest (SCI) species outside the Cork Harbour SPA. SCI species are species for which conservation objectives have been set for this European site. Therefore, construction and operation of the Proposed Development could create disturbance / displacement impacts to SCI birds.

Known bird foraging and roosting habitats for SCI birds are located to the east, west and south of the Proposed Development site. During operation, the bridge could create a collision risk for SCI species for Cork Harbour SPA travelling between foraging / roosting areas.

A potential source-pathway-receptor link has been identified between the source (the Proposed Development) and these receptors (Great Island Channel SAC and Cork Harbour SPA) via a potential pathway (surface water run-off during construction / operation, disturbance / displacement at *ex-situ* foraging habitats, spread of invasive species during construction and collision risk during operation). Further information on these European sites is provided in **Table 9.2**.

Table 9.2: European sites within the zone of influence of the Proposed Development site

European site	Site code	Qualifying interests / special conservation interests	Approximate distance at closest point and potential source-pathway-receptor link
Special Area of Conservation (SAC)			
Great Island Channel SAC	001058	Mudflats and sandflats not covered by seawater at low tide [1140] Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) [1330]	910m east of the Proposed Development site. The Kilcoolishal Stream flows through the Proposed Development site approximately 7.2km upstream of the Great Island Channel SAC. Given the location of the Proposed Development relative to the European site boundary, and the identified downstream hydrological connectivity, a potential source pathway connector link has been identified.
Blackwater River (Cork / Waterford) SAC	002170	Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Perennial vegetation of stony banks [1220] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) [1330] Mediterranean salt meadows (<i>Juncetalia irsute</i>) [1410] Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260] Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>) [91E0] <i>Margaritifera</i> (freshwater pearl mussel) [1029] <i>Austropotamobius pallipes</i> (white-clawed crayfish) [1092] <i>Petromyzon marinus</i> (sea lamprey) [1095] <i>Lampetra planeri</i> (brook lamprey) [1096] <i>Lampetra fluviatilis</i> (river lamprey) [1099]	14.3km north. There is no hydrological connection with this SAC. No potential source pathway connector link has been identified.

European site	Site code	Qualifying interests / special conservation interests	Approximate distance at closest point and potential source-pathway-receptor link
		<p><i>Alosa fallax fallax</i> (twaité shad) [1103]</p> <p><i>Salmo salar</i> (salmon) [1106]</p> <p><i>Lutra lutra</i> (otter) [1355]</p> <p><i>Trichomanes speciosum</i> (Killarney fern) [1421]</p>	
Special Protection Area (SPA)			
Cork Harbour SPA	004030	<p>Little Grebe (<i>Tachybaptus ruficollis</i>) [A004]</p> <p>Great Crested Grebe (<i>Podiceps cristatus</i>) [A005]</p> <p>Cormorant (<i>Phalacrocorax carbo</i>) [A017]</p> <p>Grey Heron (<i>Ardea cinerea</i>) [A028]</p> <p>Shelduck (<i>Tadorna tadorna</i>) [A048]</p> <p>Wigeon (<i>Mareca penelope</i>) [A050]</p> <p>Teal (<i>Anas crecca</i>) [A052]</p> <p>Pintail (<i>Anas acuta</i>) [A054]</p> <p>Shoveler (<i>Anas clypeata</i>) [A056]</p> <p>Red-breasted Merganser (<i>Mergus serrator</i>) [A069]</p> <p>Oystercatcher (<i>Haematopus ostralegus</i>) [A130]</p> <p>Golden Plover (<i>Pluvialis apricaria</i>) [A140]</p> <p>Grey Plover (<i>Pluvialis squatarola</i>) [A141]</p> <p>Lapwing (<i>Vanellus vanellus</i>) [A142]</p> <p>Dunlin (<i>Calidris alpina</i>) [A149]</p> <p>Black-tailed Godwit (<i>Limosa limosa</i>) [A156]</p> <p>Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157]</p>	<p>800m east of the Proposed Development site</p> <p>The Kilcoolishal Stream flows through the Proposed Development site 2.6km upstream of the Cork Harbour SPA.</p> <p>Habitats within or near the Proposed Development site could potentially provide ex-situ foraging grounds for SCI species outside the Cork Harbour SPA. Construction and operation of the Proposed Development could potentially create disturbance / displacement impacts for SCI birds.</p> <p>During operation, the bridge could create a potential collision risk for SCI species overflying this area.</p> <p>Given the location of the Proposed Development relative to the European site boundary and the identified downstream hydrological connectivity as well as the potential for <i>ex situ</i> impacts to foraging / roosting habitat and collision risk for SCI species, a potential source pathway connector link has been identified.</p>

European site	Site code	Qualifying interests / special conservation interests	Approximate distance at closest point and potential source-pathway-receptor link
		<p>Curlew (<i>Numenius arquata</i>) [A160]</p> <p>Redshank (<i>Tringa totanus</i>) [A162]</p> <p>Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179]</p> <p>Common Gull (<i>Larus canus</i>) [A182]</p> <p>Lesser Black-backed Gull (<i>Larus fuscus</i>) [A183]</p> <p>Common Tern (<i>Sterna hirundo</i>) [A193]</p> <p>Wetland and Waterbirds [A999]</p>	

Great Island Channel SAC stretches from Little Island to Middleton, with its southern boundary being formed by Great Island. It is an integral part of Cork Harbour which contains several other sites of conservation interest. Geologically, Cork Harbour consists of two large areas of open water in a limestone basin, separated from each other and the open sea by ridges of Old Red Sandstone. Within this system, Great Island Channel forms the eastern stretch of the river basin and compared to the rest of Cork Harbour, is relatively undisturbed. The site is a Special Area of Conservation (SAC) for two habitats listed on Annex I; [1140] Tidal Mudflats and Sandflats and [1330] Atlantic Salt Meadows. The Blackwater River (Cork / Waterford) SAC is not hydrologically connected to the Proposed Development site.

Cork Harbour SPA is a large, sheltered bay system, with several river estuaries – principally those of the Rivers Lee, Douglas, Owenabue and Owennacurra. The SPA site comprises most of the main intertidal areas of Cork Harbour, including all of the North Channel, the Douglas River Estuary, inner Lough Mahon, Monkstown Creek, Lough Beg, the Owenabue River Estuary, Whitegate Bay, Ringabella Creek and the Rostellan and Poul nabibe inlets. Cork Harbour is of major ornithological significance, being of international importance for the total numbers of wintering birds (i.e., > 20,000). In addition, it supports nationally important wintering populations of 22 species, as well as a nationally important breeding colony of Common Tern. Several of the species which occur regularly are listed on Annex I of the E.U. Birds Directive.

9.3.2.2 Nationally protected sites

Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs) are national designations under the Wildlife Act 1976, as amended. A Natural Heritage Area (NHA) is designated for its wildlife value and receives statutory protection. These areas are considered nationally important for the habitats present or which holds species of plants and animals whose habitats needs protection. Under the Wildlife Amendment Act (2000), NHAs are legally protected from damage from the date they are formally proposed for designation.

Proposed Natural Heritage Areas (pNHA) were published on a non-statutory basis in 1995 and have not since been statutorily proposed or designated. These sites are also of significance for wildlife and habitats. Prior to statutory designation, pNHAs are still subject to limited protection, in the form of:

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

No NHAs are located in the vicinity of the Proposed Development site. The pNHAs located in the vicinity of the Proposed Development site are listed in **Table 9.3** and are shown in **Figure 9.3** in **Volume 3** of this EIAR.

Table 9.3: Proposed Natural Heritage Areas (pNHAs) in the vicinity of the Proposed Development site

pNHA	Site code	Overlapping with Natura 2000 site	Approximate distance at closest point and potential source-pathway-receptor link
Great Island Channel pNHA	001058	Great Island Channel SAC and Cork Harbour SPA	400m east (7.2km downstream). Refer to Great Island Channel SAC for site description. Potential hydrological connection via the Kilcoolishal Stream. However, given the distance from Proposed Development site this is not significant.
Rockfarm Quarry Little Island pNHA	001074	None	1.1km south. Rock Farm Quarry is located c. 9km west of Cork City on Little Island in the River Lee estuary. The area is of considerable interest botanically because of its species diversity and the presence of “rare” for the region, such as the dense-flowered orchid and the Portland Spurge. No pathway identified.
Dunkettle Shore pNHA	001082	Cork Harbour SPA	1.3km west. This site is located at the mouth of Glashaboy River, where it meets the Lee estuary, on the eastern edge of Cork City. It is adjacent to Glanmire Wood pNHA and is an integral part of Cork Harbour. The site is of value because its mudflats provide an important feeding ground for waterfowl, and it acts as a significant roost for birds in the upper harbour. Potential hydrological connection via the Kilcoolishal Stream. A potential source pathway connector link has been identified.
Douglas River Estuary pNHA	001046	Cork Harbour SPA	2.2km southwest. This is a large site situated in the north-west corner of Cork Harbour, stretching from Blackrock to Passage West and is an integral part of Cork Harbour. This site occurs within the upper harbour and consists of extensive mudflats, formed from fine silts, bisected by the Douglas River. Damp grassland occurs on part of the southern side, extending to some low islands which are inundated in extreme tides. This site is of interest because it is an essential part of the Cork Harbour complex and contains much higher densities of waders than would be expected from its relative size. Potential hydrological connection via the Kilcoolishal Stream. A potential source pathway connector link has been identified.
Glanmire Wood pNHA	001054	Cork Harbour SPA	2.7km west. Glanmire Wood occurs on the east bank of the Glashaboy River, immediately south of Glanmire village. The main habitat of interest is mixed broad-leaved woodlands dominated by Oak (<i>Quercus</i> sp.), Beech (<i>Fagus sylvatica</i>) and Sycamore (<i>Acer pseudoplatanus</i>) with a few conifers. This site is of interest because this type of woodland is rare in east Cork. No pathway for impact as designated for terrestrial habitats.
Cork Lough pNHA	001081	No	8.9km southwest. This small lake is situated in the north-west of Cork City, 1km. north of the River Lee. The site is a pNHA of local importance for its bird community. No pathway identified.
Monkstown Creek pNHA	001979	Cork Harbour SPA	9.1km south. Monkstown Creek is situated between Monkstown and the major seaport of Ringskiddy on the western shores of Cork Harbour. The area is of value because its mudflats provide an important feeding area for waterfowl and it is a natural part of Cork Harbour which, as a complete unit, is of international importance for waterfowl.

pNHA	Site code	Overlapping with Natura 2000 site	Approximate distance at closest point and potential source-pathway-receptor link
			Potential hydrological connection via the Kilcoolishal Stream. However, given the distance from Proposed Development site this is not significant.
Leamlara Wood pNHA	001064	No	9.2km northeast. This site is situated 6km north-west of Midleton in the steep sided valley of the Leamlara River. This area is of local importance as there are few areas of semi-natural oak woodland in east Cork, and it is a good example of this community. No pathway identified.
Lee Valley pNHA	000094	No	10.1km west. This site occupies five separate sections of the valley of the River Lee, immediately to the west of Cork City. The diverse range of intact semi-natural habitats in the Lee Valley makes this a site of regional conservation importance. No pathway identified.
Whitegate Bay pNHA	001084	Cork Harbour SPA	10.6km southwest. This site is situated in the south-east corner of Cork Harbour, immediately to the west of Whitegate in County Cork. Most of the Whitegate Bay pNHA comprises open marine water, with extensive mudflats exposed at low tide which hold a wide range of waterfowl, in particular Grebes, Diving Ducks and Waders. Many of these used to roost on Long Point, but this area is now occupied by the Aghada Power Station and so many of the birds spend the night in the vicinity of Corkbeg Island. Whitegate Bay usually holds approximately 10% of the winter waterfowl community of Cork Harbour. Potential hydrological connection via the Kilcoolishal Stream. However, given the distance from Proposed Development site this is not significant.
Ballynaclashy House pNHA	000099	None	11.1km northeast. A maternity roost of Whiskered Bat (<i>Myotis mystacinus</i>) has been recorded at Ballynaclashy House pNHA. The foraging range of Whiskered Bat is normally 3.5km from nursery colonies and therefore the Proposed Development is likely to be outside the foraging range of this bat colony. No pathway identified
Blarney Bog pNHA	001857	No	12.1km west. Blarney Bog is an area of fen situated in the flat valley floor of the River Blarney. The main habitats of the area are lowland wet grassland and freshwater marsh/ fen. The area as a whole is used by a variety of bird species. No pathway identified.
Lough Beg pNHA	001066	Cork Harbour SPA	13.6km south. Lough Beg is a constituent part of Cork Harbour, occurring south of Ringaskiddy in the lower harbour. As part of the Harbour complex, Lough Beg plays a part in supporting internationally important numbers of waders (over 20,000) and of two particular species, the Black-tailed Godwit (peak in 1991/92: 2,077) and Redshank (1,859). There are also nationally important flocks of nineteen others. Wildfowl are relatively numerous as compared to other parts of the Harbour, but the area is perhaps more valuable as a secure roosting site for flocks of all shorebirds when their feeding areas on the mudflats are covered by the tide. Potential hydrological connection via the Kilcoolishal Stream. However, given the distance from Proposed Development site this is not significant.

pNHA	Site code	Overlapping with Natura 2000 site	Approximate distance at closest point and potential source-pathway-receptor link
Carrigshane Hill pNHA	001042	None	<p>13.9km east.</p> <p>This area is important as a representative of the herb rich community grassland community found near the exposed limestone – a habitat under threat from quarrying. The presence of Thick-leaved Stonecrop adds further interest to this site.</p> <p>No pathway identified.</p>
Blarney Castle Woodland pNHA	001515	No	<p>14.3km west</p> <p>This site is situated approximately 1km southwest of Blarney, in the grounds of Blarney Castle. The base rich woodland is an example of a habitat not widely found in Cork where acid uplands predominate.</p> <p>No pathway identified.</p>
Blarney Lake pNHA	001798	No	<p>14.4km west</p> <p>This site is situated approximately 1km southwest of Blarney, close to Blarney Castle. This site contains an interesting wetland community which is one of three closely situated rich and varied sites.</p> <p>No pathway identified.</p>

The Proposed Development site is potentially hydrologically connected to a number of pNHAs within Cork Harbour, including the Great Island Channel pNHA, Dunkettle Shore pNHA and Douglas River pNHA. While there are other pNHAs located within the Cork Harbour area e.g., Monkstown Creek pNHA, Whitegate Bay pNHA, Lough Beg pNHA given the distance from the Proposed Development site, no potential pathway for impact on these other pNHAs have been identified (refer to **Table 9.3** and **Figure 9.3** in **Volume 3** of this EIAR). No other significant pathways to NHA / pNHA sites in the vicinity of the Proposed Development site have been identified.

9.3.2.3 *Ramsar sites*

The Convention on Wetlands, called the Ramsar Convention, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. A key commitment of Ramsar Contracting Parties is to identify and place suitable wetlands onto the List of Wetlands of International Importance. Cork Harbour is listed as a Ramsar site, which is a non-statutory designation.

9.3.2.4 *Important bird areas*

Important Bird and Biodiversity Areas (IBAs) are sites selected as important for bird conservation because they regularly hold significant populations of one or more globally or regionally threatened, endemic or congregator bird species or highly representative bird assemblages. The European IBA programme aims to identify, monitor, and protect key sites for birds all over the continent. It aims to ensure that the conservation value of IBAs in Europe (now numbering more than 5,000 sites or about 40% of all IBAs identified globally to date) is maintained, and where possible enhanced. The programme aims to guide the implementation of national conservation strategies, through the promotion and development of national protected-area programmes.

Through their designation they aim to form a network of sites ensuring that migratory species find suitable breeding, stop-over and wintering places along their respective flyways.

The function of the Important Bird Area (IBA) Programme is to identify, protect and manage a network of sites that are important for the long-term viability of naturally occurring bird populations, across the geographical range of those bird species for which a site-based approach is appropriate. Refer to **Table 9.4**. The Proposed Development site lies approximately 800m west of Cork Harbour IBA (Site Code: IE088).

The Cork Harbour IBA site qualifies for designation under the following IBA Criteria (2000):

- A4iii - The site is known or thought to hold on a regular basis, $\geq 20,000$ waterbirds or $\geq 10,000$ pairs of seabirds of one or more species;
- B1i - The site is known or thought to hold $\geq 1\%$ of a flyway or other distinct population of a waterbird species;
- B2 - The site is one of the most important in the country for a species with an unfavourable conservation status in Europe and for which the site-protection approach is thought to be appropriate;
- C3 - The site is known to regularly hold at least 1% of a flyway population or of the EU population of a species threatened at the EU level (not listed on Annex 1 of The Birds Directive);
- C4 - The site is known to regularly hold at least 20,000 migratory waterbirds and / or 10,000 pairs of migratory species of one or more species; and
- C6 - The site is one of the five most important in the European region in question for a species or subspecies considered threatened in the European Union.

Table 9.4: Summary of Cork Harbour IBA trigger species

Species	Current IUCN red list category	Season	Year(s) of estimate	Population estimates	IBA criteria triggered
Eurasian Curlew (<i>Numenius arquata</i>)	NT	Winter	1995	1,669 individuals	B2
Bar-tailed Godwit (<i>Limosa lapponica</i>)	NT	Winter	1996	456 individuals	B2
Black-tailed Godwit (<i>Limosa limosa</i>)	NT	Winter	1996	1,399 individuals	B1i, C3
Dunlin (<i>Calidris alpina</i>)	LC	Winter	1995	12,050 individuals	B1i, B2, C3
Common Redshank (<i>Tringa tetanus</i>)	LC	Winter	1996	1,344 individuals	B1i, C3
Common Tern (<i>Sterna hirundo</i>)	LC	Breeding	1995	102 breeding pairs	C6
A4iii Species group-- waterbirds	n/a	Winter	-	20,000 individuals	A4iii, C4

9.3.3 Flora

The site of the development lies within Ordnance Survey (OS) National Grid 10km square W77. The National Parks and Wildlife Service (NPWS) rare plant database lists two protected plant species within W77 i.e., Meadow Barley (*Hordeum secalinum*), Chives (*Allium schoenoprasum*). These species are protected by the Flora (Protection) Order 2022 (S.I. No. 235 of 2022). A number of endangered and threatened species have also been recorded in W77 as listed in **Table 9.5**. However, no rare, threatened or legally protected plant species, as listed in the Irish Red Data Book (Wyse Jackson *et al.*, 2016; Stace 2019) were recorded within the Proposed Development site.

Table 9.5: NBDC listed endangered and protected flowering species for W77

Flowering plant species	Latin name	Designations / status (Wyse Jackson <i>et al.</i> , 2016)
Chives	<i>Allium schoenoprasum</i>	Flora Protection Order (S.I. No. 235 of 2022) and Vulnerable
Little-robin	<i>Geranium purpureum</i>	Endangered
Meadow Barley	<i>Hordeum secalinum</i>	Flora Protection Order (S.I. No. 235 of 2022) and Endangered
Common Toadflax	<i>Linaria vulgaris</i>	Near threatened
Corn Marigold	<i>Glebionis segetum</i>	Near threatened
Cornflower	<i>Centaurea cyanus</i>	Near threatened (waiting list)
Milk Thistle	<i>Silybum marianum</i>	Near threatened

Source NBDC 09/03/23

9.3.4 Habitats

Habitat mapping was carried out in line with the methodology outlined in the Heritage Council Publication, Best Practice Guidance for Habitat Survey and Mapping (Heritage Council, 2011). The terrestrial and aquatic habitats within or adjacent to the Proposed Development site were classified using the classification scheme outlined in the Heritage council publication A Guide to Habitats in Ireland (Fossitt, 2000) and cross referenced with Annex I Habitats where required. The survey results are representative of the habitats within the Proposed Development site and include the dominant and characteristic species of flora.

The ecological value of habitats has been defined using the classification scheme outlined in the Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009) which is

included in **Appendix 9.1** in **Volume 4** of this EIAR. It should be noted that the value of a habitat is site specific and will be partially related to the amount of that habitat in the surrounding landscape. Habitats that are considered to be good examples of Annex I and Priority habitats are classed as being of International or National Importance. Semi-natural habitats with high biodiversity in a county context and that are vulnerable, are considered to be of County Importance. Habitats that are semi-natural, or locally important for wildlife, are considered to be of Local Importance (higher value) and sites containing small areas of semi-natural habitat or maintain connectivity between habitats are considered to be of Local Importance (lower value).

An overview of habitats recorded within the site is shown in **Image 9.1**. The habitats recorded onsite as well as their ecological value is detailed in **Table 9.6**. Site photographs are included below. No rare plant species were recorded within the works area during the site survey.

Table 9.6: Habitats recorded within Proposed Development site boundary and their relative values

Habitat	Comments	Ecological value (NRA guidelines)
Buildings and artificial surfaces BL3 / Amenity grassland GA2	<p>The N25 national route, the Cork City to Cobh railway line and parking areas associated with the Radisson Blu Hotel and the train station are classified as artificial surfaces which are of minimal ecological value. The areas of amenity grassland which surround these developments are regularly maintained, with existing palisade fences, streetlighting and other artificial surfaces area.</p> <p>Species noted within area include common grass species as well as Dandelion <i>Taraxacum officinale</i>, Spear thistle <i>Cirsium vulgare</i>, Groundsel <i>Senecio vulgaris</i> Yorkshire fog <i>Holcus lanatus</i> and Cleavers <i>Galium aparine</i>. In proximity to the recycling area in the car park, there is some Buddleia <i>Buddleia davidii</i> and immature Willow <i>Salix</i> sp.</p> <p>This habitat is not a qualifying habitat for European sites and is not an Annex I habitat under the Habitats Directive.</p>	Local importance (lower value)
Mixed broadleaved woodland WD1	<p>On the southern boundary of the N25 there a relatively large block of broadleaved woodland between the road and the Radisson Blu Hotel access road / car park. Woodland cover is dense, creating heavy shade. A drain flows through a section of this woodland east to west.</p> <p>There are several trees mature trees within this woodland including Beech <i>Fagus sylvatica</i>, Ash <i>Fraxinus excelsior</i> and Lime <i>Tilia cordata</i> on the southern edge of this habitat close to the hotel. A review of historical mapping indicates that these trees were part of the landscaping associated with the period dwelling (Castle View) which is evident on the older maps. However, there is no woodland evident to the north of the drainage ditch on the older OS maps with open fields shown on the relevant maps (OS historical map, 25 inch)</p> <p>This southern section of woodland is characterised by older trees which are quite widely spaced with a heavily shaded. The understorey dominated by Ivy <i>Hedera helix</i> with Lord and ladies <i>Arum maculatum</i> and a dense stand of the non-native species Japanese Laurel <i>Aucuba japonica</i>.</p> <p>The northern section of this woodland is of more recent origin and has developed on an area that was historically farmland. The species in this planted woodland is diverse and includes Willow <i>Salix</i> sp., Sitka Spruce <i>Picea sitchensis</i>, Alder <i>Alnus glutinosa</i>, Ash and Poplar <i>Populus</i> sp. The trees are closely spaced with few side branches and the understorey is heavily shaded. Many of these trees are leaning, fallen or in poor condition.</p> <p>Under story species include immature Sycamore, Elder <i>Sambucus nigra</i> with occasional Hawthorn <i>Crataegus monogyna</i> and Holly <i>Ilex aquifolium</i>.</p> <p>Shade levels in the ground layer are high, with Ivy being the dominant species. Understory species include Chilean Myrtle <i>Luma apiculata</i>, Bramble <i>Rubus</i> sp., Hartstongue fern <i>Asplenium scolopendrium</i>, Male fern <i>Dryopteris filix-mas</i>, Lady Fern <i>Athyrium filix-femina</i> and Honeysuckle <i>Lonicera</i> sp. Immature Sycamore are very common and over time are likely to dominate the canopy. There is a wetter area close to the N25 which</p>	Local importance (higher value)

Habitat	Comments	Ecological value (NRA guidelines)
	<p>supports some mature Willow which have been cut back. During wet weather, some ponded surface water was evident.</p> <p>In general, the woodland structure in this area is relatively poor with a high percentage of non-native species. Sycamore is likely to become dominant over time. However, as a mixed woodland which is not highly disturbed by recreational usage, it does provide a refuge for fauna and is a habitat that is not prevalent in the local landscape.</p> <p>This habitat is not a qualifying habitat for European sites and is not an Annex I habitat under the Habitats Directive.</p>	
<p>Drainage Ditches FW4 / Depositing River FW2</p>	<p>Within the block of broadleaved woodland between the N25 and the Radisson Blu Hotel access road, there is a linear, drain running east-west. This drain is heavily shaded with minimal flows during dry weather.</p> <p>The Kilcoolishal Stream also is located along the southern boundary of the railway track. The Kilcoolishal Stream in this area of more characteristic of a drainage ditch. However, as this has been mapped as a stream by the EPA, the classification of FW2 has been used. In general, this watercourse is heavily shaded by woodland within the Proposed Development site. Adjacent to the railway line there are some more open areas of habitat. Flows here are sluggish with dense masses of Duckweed <i>Lemna minor</i> and emerging vegetation such as Reeds <i>Phragmites</i> sp., Water parsnip <i>Sium suave</i>, Sweet grass <i>Hierochloe odorata</i>.</p> <p>A deep drainage ditch also runs along the northern boundary of the railway line and near the Railway line car park. This ditch has minimal flows and with high levels of shade from adjoining trees, many of which actually grow within the channel itself. As indicated by the trees within the channel, the fluctuations in water level vary considerably with high levels during flood events. This drain is hydrologically connected to the adjoining wet willow woodland. Aquatic vegetation is largely absent. Duckweed <i>Lemna</i> sp. forms dense mats in places and some water Starwort <i>Callitriche</i> sp. occurs.</p> <p>Within the southern woodland, there is an open channel with standing water. This drainage ditch is heavily shaded with dense rotting wood and leaf litter.</p> <p>This habitat is not a qualifying habitat for European sites and is not an Annex I habitat under the Habitats Directive.</p>	<p>Local importance (higher value)</p>
<p>Treeline WL2 Mixed broadleaved woodland WD1</p>	<p>Running between the Kilcoolishal Stream and the N25 there is a narrow band of woodland, some of which was planted as part of the landscaping scheme for the N25. Hazel is prominent with Buddleia, also present. Other species recorded include Hawthorn, Chilean myrtle, Privet <i>Ligustrum ovalifolium</i> and Blackthorn <i>Prunus spinosa</i>. The understory has a dense covering of Winter heliotrope <i>Arctostaphylos luciana</i> and Ivy <i>Hedera helix</i> with some Bramble. Stands of immature Japanese Knotweed <i>Reynoutria japonica</i> were recorded within this habitat.</p> <p>It is noted that there are older trees which may pre-date the landscape scheme running along the bank of the Kilcoolishal Stream. These include Hawthorn and Holly. The Hawthorn supports moderate levels of ivy.</p> <p>To the north of the railway track there is a treeline and species recorded in this area include Alder, Grey willow <i>Salix cinerea</i>, Ash, Hazel and Hawthorn.</p> <p>Immature planted Ash with occasional Willow run along the boundary of the eastern side of the railway car park as well as immature Alder along the south of the car park.</p> <p>This habitat is not a qualifying habitat for European sites and is not an Annex I habitat under the Habitats Directive.</p>	<p>Local importance (higher value)</p>
<p>Wet willow woodland WN6</p>	<p>An area of wet woodland is located largely outside the Proposed Development area. This habitat floods during periods of wet weather. The woodland is dominated by Willow with some Alder. Hawthorn is occasional on drier ground and some Ash saplings were also recorded.</p> <p>The understory composition depends on the degree of water logging with Bramble and Hawthorn common on dryer areas. Winter heliotrope is common within dryer areas and</p>	<p>Local importance (higher value)</p>

Habitat	Comments	Ecological value (NRA guidelines)
	<p>along the woodland boundary with amenity grassland. Within waterlogged areas species recorded include Remote sedge <i>Carex remota</i>. Moss coverage on trees is high and some fern such as Hartstongue and Soft shield fern also occur. Other species include Wood dock <i>Rumex sanguineus</i>, Cleavers, Soft rush <i>Juncus effusus</i>, Herb Robert <i>Geranium robertianum</i>, Hard fern. Lords and ladies, Honeysuckle, Ivy and Soft shield fern.</p> <p>This is a relatively uncommon habitat which floods very regularly and is hydrologically connected to the drain which runs along the railway track.</p> <p>Japanese Knotweed was recorded on the eastern periphery of this woodland area.</p> <p>This habitat is not a qualifying habitat for European sites and is not an Annex I habitat under the Habitats Directive.</p>	
<p>Amenity grassland GA2 / Scattered tree and parkland WD5</p>	<p>Low value grassland with a mix of common grass and herbaceous species. The largest area of this habitat is located just north of the railway track. Smaller areas of amenity grassland area associated with car parks to the south of the N25.</p> <p>This habitat supports common herbaceous and grass species including Broadleaved dock <i>Rumex obtusifolius</i>, Red fescue <i>Festuca rubra</i>, Yorkshire Fog, Dandelion, Eyebright <i>Euphrasia rostkoviana</i>, Ribwort Plantain <i>Plantago lanceolata</i>, Oxeye Daisy <i>Leucanthemum vulgare</i>, Common mouse-ear <i>Cerastium fontanum</i> and Creeping buttercup <i>Ranunculus repens</i>. It is regularly maintained, and biodiversity is generally low. Within this habitat there are small number of planted trees, i.e., one semi mature Willow on the periphery of the woodland area and some smaller recently planted Oak. Semi-mature Sycamore, Birch and Beech are also present. In immediate proximity to the railway line, there is a small number of older mature Willow. The main stems are relatively old with younger regrowth and accumulated deadwood material at their base. This habitat is not a qualifying habitat for European sites and is not an Annex I habitat under the Habitats Directive.</p>	<p>Local importance (lower value)</p>
<p>Dry meadow and grassy verge GS1</p>	<p>Linear sections of this habitat type occur along the margins of the N25. This habitat supports a mixture of early successional herbaceous species and common grass species.</p> <p>This habitat is not a qualifying habitat for European sites and is not an Annex I habitat under the Habitats Directive.</p>	<p>Local importance (lower value)</p>
<p>Hedgerow WL1</p>	<p>There is a well-maintained planted hedgerow in the central median of the N5. A planted Beech hedgerow is located on the southwestern boundary of the Radisson Blu Hotel car park. Wild Clematis <i>Clematis virginiana</i> was also recorded in this area.</p> <p>This habitat is not a qualifying habitat for European sites and is not an Annex I habitat under the Habitats Directive.</p>	<p>Local importance (lower value)</p>
<p>Scrub WS1</p>	<p>An area of dense scrub is located along the southern boundary of the Railway line car park. This area is dominated by Nettle, Bramble, Winter heliotrope, Cleavers and Bindweed <i>Convolvulus</i> sp.</p> <p>This habitat is not a qualifying habitat for European sites and is not an Annex I habitat under the Habitats Directive.</p>	<p>Local importance (lower value)</p>



Plate 1. Older widely spaced trees in southern woodland



Plate 2. Woodland area with Japanese Laurel prevalent



Plate 3. Southern woodland



Plate 4. Drainage ditch in southern woodland



Plate 5. Radisson Blu Hotel car park looking from car park towards woodland



Plate 6. Hedgerow within Radisson Blu Hotel car park



Plate 7. Amenity grassland near northern boundary



Plate 8. Amenity grassland on northern boundary with woodland



Plate 9. Willow within amenity grassland

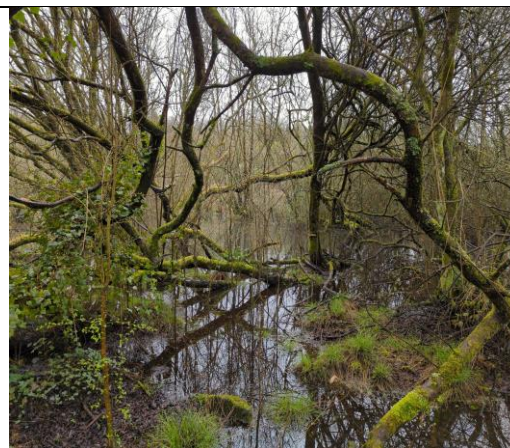


Plate 10. Wet woodland with high water levels



Plate 11. Dense bramble and Winter heliotrope on woodland/amenity grassland boundary



Plate 12. Trees along amenity grassland



Plate 13. Treeline growing along and within drainage ditch near railway line



Plate 14. Kilcoolishal Stream



Plate 15. Woodland between N25 and Kilcoolishal Stream



Plate 16. Hedgerow in N25 median



Plate 17. Bramble scrub and treeline along railway line car park

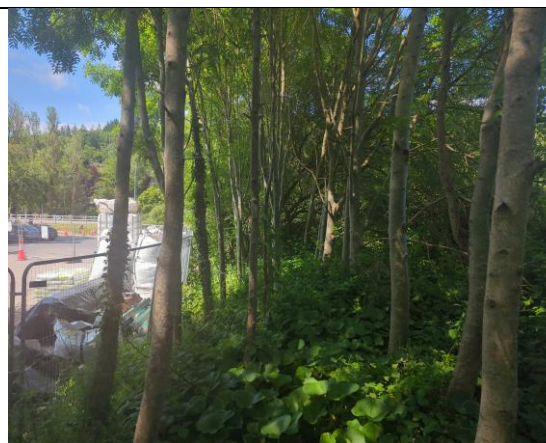


Plate 18. Immature Ash and winter heliotrope near railway line car park

9.3.5 Invasive species

Non-native plants are defined as those plants which have been introduced outside of their native range by humans and their activities, either purposefully or accidentally. Invasive non-native species are so-called as they typically display one or more of the following characteristics or features: (1) prolific reproduction through seed dispersal and / or re-growth from plant fragments; (2) rapid growth patterns; and (3) resistance to standard weed control methods.

Where a non-native species displays invasive qualities and is not managed it can potentially: (1) out compete native vegetation, affecting plant community structure and habitat for wildlife; (2) cause damage to infrastructure including road carriageways, footpaths, walls and foundations; and (3) have an adverse effect on landscape quality. The NBDC lists a number of both aquatic and terrestrial high impact invasive species which have been recorded within grid square W77, the 10km OS grid square which overlaps with the Proposed Development site. Refer to see **Table 9.7**.

Table 9.7: High impact invasive species recorded in W77

Common name	Latin name
Canada Goose	<i>Branta canadensis</i>
Ruddy Duck	<i>Oxyura jamaicensis</i>
Cherry Laurel	<i>Prunus laurocerasus</i>
Common Cord-grass	<i>Spartina anglica</i>
	<i>Fallopia japonica x sachalinensis = F. x bohemica</i>
Giant Hogweed	<i>Heracleum mantegazzianum</i>
Giant Knotweed	<i>Fallopia sachalinensis</i>
Giant-rhubarb	<i>Gunnera tinctoria</i>
Indian Balsam	<i>Impatiens glandulifera</i>
Japanese Knotweed	<i>Fallopia japonica</i>
Parrot's-feather	<i>Myriophyllum aquaticum</i>
	<i>Rhododendron ponticum</i>
Harlequin Ladybird	<i>Harmonia axyridis</i>
American Mink	<i>Mustela vison</i>
Brown Rat	<i>Rattus norvegicus</i>
Fallow Deer	<i>Dama dama</i>
Feral Ferret	<i>Mustela furo</i>
House Mouse	<i>Mus musculus</i>
Sika Deer	<i>Cervus nippon</i>

Source: NBDC database March 2023

The control of invasive species in Ireland comes under the Wildlife (Amendment) Act 2000, where it states that:

‘Any person who— [...] plants or otherwise causes to grow in a wild state in any place in the State any species of flora, or the flowers, roots, seeds or spores of flora, [‘refers only to exotic species thereof’] [...] otherwise than under and in accordance with a licence granted in that behalf by the Minister shall be guilty of an offence.’

The Birds and Natural Habitats Regulations 2011 (SI 477 of 2011), Section 49(2) prohibits the introduction and dispersal of species listed in the Third Schedule, which includes Japanese Knotweed, as

follows: “any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow [...] shall be guilty of an offence.”

The third schedule high-risk invasive species Japanese Knotweed was recorded along the northern side of the N25 and the edge of woodland habitat on the north of the railway line. Refer to **Image 9.2**.

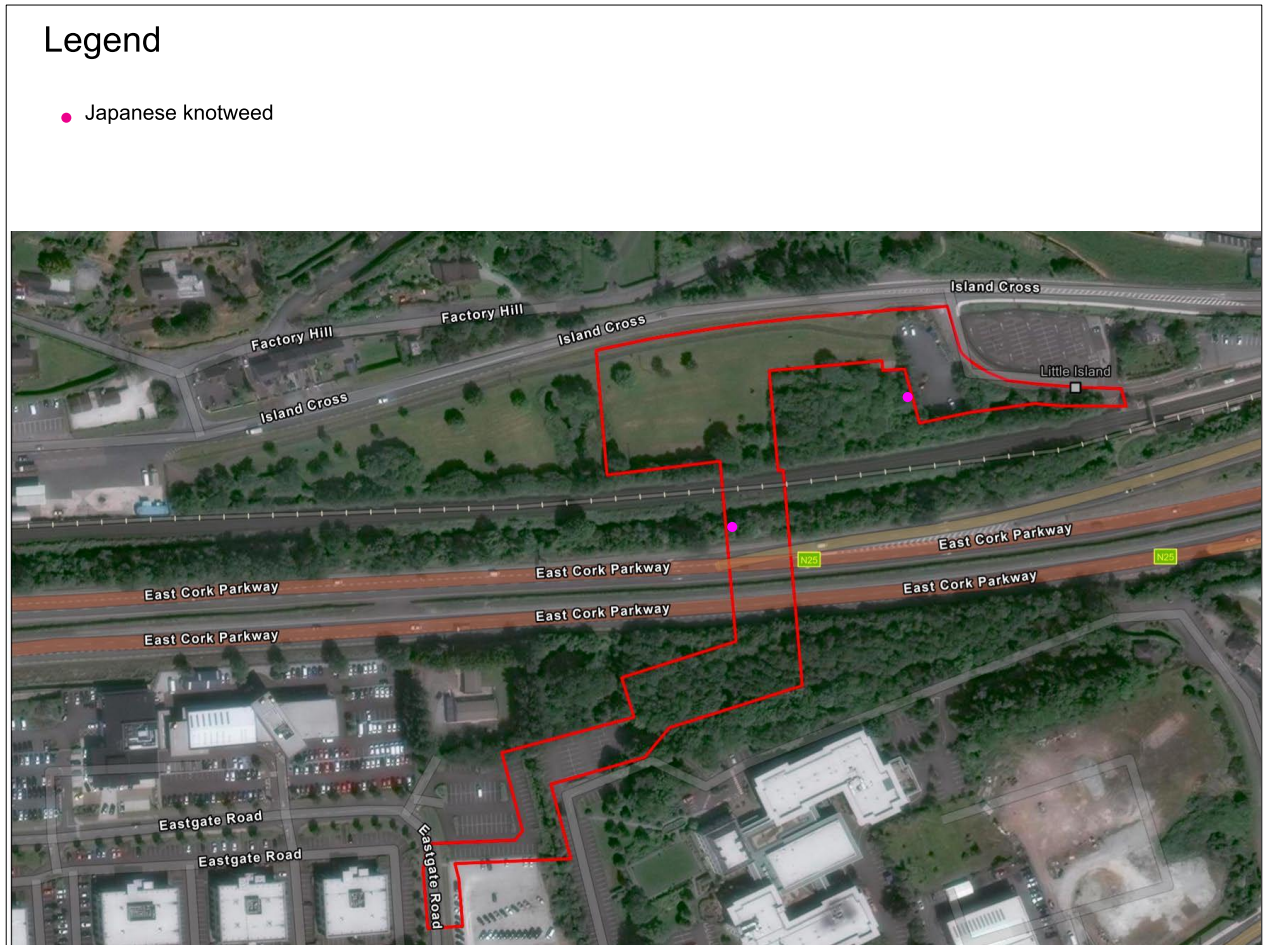


Image 9.2: Location of Japanese Knotweed within the study area

Three other invasive species were recorded within the study area. The medium impact species, *Buddleia davidii* and Wild Clematis (*Clematis virginiana*) were recorded within broadleaved woodland. The low impact species Winter Heliotrope (*Arctostaphylos Luciana*) has as scattered distribution throughout the study area. It is noted that these species are not included in the Third Schedule of the Birds and Natural Habitats Regulations 2011 (SI 477 of 2011). Therefore, their presence at the site does not have the potential to lead to an offence under the Birds and Natural Habitats Regulations 2011 (S.I. 477 of 2011).

9.3.6 Fauna

9.3.6.1 Otter

According to the NBDC, Otter have been recorded on 31 occasions within hectad W77, most recently in September 2018. However, there are no records of Otter in the vicinity of the Proposed Development site.

No signs of Otter were recorded during the site survey, which included all suitable habitats within 150m of the Proposed Development boundary. There is a section of the Kilcoolishal Stream located within the Proposed Development site as well as several small drainage ditches connecting to the stream. The Kilcoolishal Stream and a number of other streams within the Tibbotstown sub catchment i.e., Woodstock Stream and Ann Grove Stream, have not been monitored by the EPA due to their small size and therefore their status to support a diverse aquatic community is unknown. There are no records for Eel (*Anguilla anguilla*), Lamprey (*Lampetra* sp.) or salmonids within the Kilcoolishal Stream (CCC, 2021).

Furthermore, this stream is heavily culverted in the vicinity of the Proposed Development site. The data available suggest that this stream and its drainage ditches have limited potential to support fish species and subsequently are of low value for Otter.

While aquatic and wetland habitats can support Common Frog, which is a prey species for Otter, the drainage ditches, stream and wet woodland areas are heavily shaded throughout the Proposed Development site and are unlikely to support breeding amphibians. The significant levels of disturbance along the road and rail network are likely to further reduce the value of any habitats adjoining these areas. However, the wet willow woodland within the Proposed Development site is a relatively uncommon habitat and this has the potential to provide habitat for Otter. This habitat is largely impenetrable and therefore provides an important refuge on the periphery of an area that is highly disturbed. Overall, the Proposed Development site is of low to negligible value for Otter.

9.3.6.2 Bats

A review of existing bat records within W77 (NBDC) showed that the Irish bat species listed in **Table 9.8** have been recorded. The remaining Irish bat species have not been recorded in the local area to date such as Nathusius's Pipistrelle *Pipistrellus nathusii* and Lesser Horseshoe Bat *Rhinolophus hipposideros* and are unlikely to occur. Lesser Horseshoe Bat is the only species of bat listed on Annex II of the Habitats Directive (Directive 92/43/EEC). The closest record for Lesser Horseshoe Bat is approximately 18km west of the Proposed Development site (NBDC records).

Table 9.8: Presence of Irish bat species within grid squares W77

Common name	Scientific name	Presence
Lesser Noctule	<i>Nyctalus leisleri</i>	Present
Pipistrelle	<i>Pipistrellus pipistrellus sensu lato</i>	Present
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	Present
Daubenton's Bat	<i>Myotis daubentonii</i>	Present
Natterer's Bat	<i>Myotis nattereri</i>	Present
Brown Long-eared Bat	<i>Plecotus auritus</i>	Present
Whiskered Bat	<i>Myotis mystacinus</i>	Present
Lesser Horseshoe	<i>Rhinolophus hipposideros</i>	Absent
Nathusius's Pipistrelle	<i>Pipistrellus nathusii</i>	Absent

NBDC 09/03/23

A preliminary roost assessment of trees earmarked for removal was carried out. 103 no. individual trees, 5 no. part-groups (i.e., sections of a tree group) and 13 no. tree groups have been selected for removal to facilitate the Proposed Development. The estimated total number of trees to be removed on site is 277. The preliminary roost assessment found that trees at the site are largely of negligible to low potential for roosting bats as they lack the significant roost features such holes, cracks, crevices, dethatched bark and detached Ivy, which could provide roosting opportunities. No signs of bats were recorded within the trees such as rub marks, staining or droppings. One tree (T524), a semi-mature lime with a large rotten crevice at the base was determined to have moderate potential for roosting bats. Further detail on the preliminary roost assessment is included in **Appendix 9.2** in **Volume 4** of this EIAR. Although foraging activity was observed in the vicinity of woodland and treelines, no activity indicative of direct emergence of bats was recorded. However, bats can use trees as temporary roosts and therefore the presence of occasional bats cannot be altogether excluded.

There are a number of linear features and areas of semi-natural habitat within the Proposed Development site including woodland, treelines, railway line and the Kilcoolishal Stream. It is noted that existing lighting along the N25 and within other built-up areas may deter foraging by some bat species and will impact on the foraging / roosting value of these areas.

Bat activity surveys focused in particular on the area of woodland to the south of the N25 which was considered the habitat with the highest potential for roosting and foraging bats and along the area of wet woodland to the north of the railway. Although woodland habitat is somewhat isolated in the context of the wider landscape, it is of local value as a block of semi-natural habitat which is dark and undisturbed.

Four bat species were recorded foraging / commuting within and adjacent woodland habitat to the south of the N25 habitat, i.e., Common and Soprano Pipistrelle, Leisler's and Brown Long-eared. It is considered probable that 1-2 individuals of each species were foraging within the woodland and along its boundary. In the car parking area adjacent to the Radisson Blu Hotel, within the Proposed Development site, regular foraging activity of Common and Soprano pipistrelle was also recorded. Some overlap between the pipistrelle bats recorded foraging along the woodland boundary and car park area was noted.

Leisler's Bat were recorded sporadically during the survey, with one signal early in the survey period and four closely spaced signals at a later time. No prolonged foraging behaviour was recorded, and the signals are probably indicative of bats commuting or foraging within the wider landscape.

Bat surveys were also carried out on the northern side of the N25 to assess activity patterns. Soprano Pipistrelle (one individual) was recorded foraging along the drain which runs parallel to the N25. No bat activity was recorded in the planted woodland area along the edge of the N25. It is noted that this area is subject to high levels of light pollution by passing cars and lighting along the N25 route.

There is an existing treeline along the boundary of the railway line and an area of wet willow woodland is also a prominent habitat feature. Three species were recorded in this area, namely Common Pipistrelle, Soprano Pipistrelle and Leisler's Bat. Foraging by both pipistrelle species was sporadic along the linear treeline on the northern boundary of the railway line. The amenity grassland was not utilised during the survey. Sporadic signals for Leisler's Bat were indicative of some generally foraging, with occasional overflying of the site. Some foraging by Soprano and Common Pipistrelle was recorded along the boundary of the wet woodland area, although activity was sporadic.

In general, the area with the highest level of activity was the woodland area to the south of the N25 which provides a local foraging resource for three bat species, namely Brown Long-eared, Common and Soprano Pipistrelle with some overflying Leisler's also recorded. Usage of the habitats to the north of the railway is of lower intensity with some activity recorded along the Kilcoolishal Stream, treeline, railway line and along the boundary of the wet willow woodland. Therefore, the habitats within the Proposed Development site are of local importance, higher to lower value, for bat species.

9.3.6.3 *Other mammals*

18 other species of terrestrial mammal have been recorded within grid square W77. Nine of which are protected under the Irish Wildlife Act; namely Badger (*Meles meles*), Pygmy Shrew (*Sorex minutus*), Red Squirrel (*Sciurus vulgaris*), Hedgehog (*Erinaceus europaeus*), Irish hare (*Lepus timidus hibernicus*), Irish Stoat (*Mustela erminea hibernica*), Pine Marten (*Martes martes*), Fallow Deer (*Dama dama*) and Sika Deer (*Cervus nippon*).

Badger

According to the NBDC, Badger have been recorded on 33 occasions within hectad W77, most recently in May 2015. However, there are no records of Badger in the vicinity of the Proposed Development site.

No signs of Badger were recorded during the site surveys. While Badgers will forage in woodland habitats, the isolated nature of potential foraging areas, particularly on the southern side of the N25, means that they are highly unlikely to fall within Badger foraging territories. Significant levels of disturbance and fencing along the N25 would further restrict Badger access to habitats within the Proposed Development site. Overall, the Proposed Development site is of negligible value for Badger.

Fallow deer

Ireland's second largest deer species and are the most widespread of the deer, found in nearly every county of the island. In Ireland, the Fallow Deer mainly resides in mature deciduous or mixed woodlands which are close to open grassland. Fallow has been recorded on one occasion within W77 but is not likely to occur within or in the vicinity of the Proposed Development site. The Proposed Development site is of negligible value for Fallow Deer.

Hedgehog

Listed on Appendix III of the Berne Convention and can be found throughout Ireland, with male Hedgehogs having an annual range of around 56 hectares. Hedgehog have been recorded on 56 occasions in W77, most recently in May 2021. Given the habitats present within the Proposed Development site, this area has been classified as local importance (lower value) for Hedgehog.

Irish stoat

Irish Stoats occur in most habitats with sufficient cover, including urban areas, for example rat infested rubbish dumps. However, studies have shown that they occur most often in wooded areas, and readily climb trees. Irish Stoat has been recorded on 10 occasions, most recently in July 2016. Given their wide range of habitat usage and the habitats present within the Proposed Development site, this area has been classified as local importance (lower value) for Irish Stoat.

Red squirrel

Red Squirrel is listed on Appendix III of the Berne Convention and can be found throughout Ireland. Red Squirrel is known to occur in the wider area (NBDC records) and have been recorded on 72 occasions within W77. However, while they could potentially use habitats at the site, given the isolated nature of these habitats, the Proposed Development site is of negligible value for Red Squirrel.

Irish hare

Irish Hare is listed on Appendix III of the Berne Convention, Annex V(a) of the EC Habitats Directive (92/43/EEC) and as an internationally important species in the Irish Red Data Book. Irish Hare is adaptable and lives in a wide variety of habitats. It typically reaches its highest densities on farmland, particularly where there is a mix of grassland and arable fields along with hedgerows and other cover. Irish Hare have been recorded on four occasions within W77, most recently in May 2017. However, given the habitats present at the Proposed Development site, this area has been classified as of negligible value for Irish Hare.

Pygmy shrew

Pygmy Shrew is common throughout mainland Ireland and has a preference for habitats such as hedgerows and grasslands; they have also been found utilizing stone walls. Pygmy Shrew has been recorded on five occasions in W77, most recently in January 2016. Given the habitats present within the Proposed Development site, this area has been classified as local importance (lower value) for Pygmy Shrew.

Sika deer

Sika Deer is the smallest of the three deer species now resident in Ireland. They are non-native species with the first Irish population introduced to the Powerscourt estate in county Wicklow in 1860 then to Killarney four years later. They are protected under the Wildlife Act in the republic and under the 1985 Wildlife Order in Ulster although they are listed as a quarry species and can be hunted under license. Sika deer are mainly associated with woodland areas which have open grasslands nearby. The Proposed Development site is of negligible value for Sika Deer.

Pine marten

Pine Marten are listed Annex V of the EU Habitats Directive 1992 and Appendix III of the Bern Convention 1979, are habitat specialists, requiring forest or scrub habitat to exist in an area. They are adept at climbing trees as they have powerful non-retractable claws. The species is primarily active at night and individuals live in territories that can vary in size from 50 hectares to 400 hectares. Males typically have bigger territories than females and there can be partial overlap between adjacent territories. Pine Marten have been recorded in W77 on three occasions, most recently in December 2021. The site is of negligible value for Pine Marten. However, while they could potentially use habitats at the site, given the isolated nature of these habitats the Proposed Development site is of negligible value for Pine Marten.

9.3.6.4 Breeding birds

The NBDC has recorded 16 Annex I bird species within hectad W77 i.e., Bar-tailed Godwit (*Limosa lapponica*), Kingfisher (*Alcedo atthis*), Common Tern (*Sterna hirundo*), Corn Crake (*Crex crex*), Dunlin (*Calidris alpina*), Golden Plover (*Pluvialis apricaria*), Great Northern Diver (*Gavia immer*), Hen Harrier (*Circus cyaneus*), Little Egret (*Egretta garzetta*), Little Gull (*Larus minutus*), Mediterranean Gull (*Larus melanocephalus*), Merlin (*Falco columbarius*), Peregrine Falcon (*Falco peregrinus*), Red-throated Diver (*Gavia stellata*), Short-eared Owl (*Asio flammeus*) and Whooper Swan (*Cygnus cygnus*). There are no breeding habitats for these Annex I species within the Proposed Development site. While some species could potentially overfly and / or forage in the area e.g., Peregrine Falcon and Merlin, there are no valuable foraging habitats for these Annex I species within the Proposed Development site.

Bird surveys were carried out in summer / autumn 2022 and spring 2023. Species recorded within the Proposed Development site are listed in **Table 9.9**.

Table 9.9: Birds recorded at the Proposed Development site

Species		Birds Directive Annex	BOCCI*	
		I	Red List	Amber List
Blackbird	<i>Turdus merula</i>			
Blue Tit	<i>Cyanistes caeruleus</i>			
Chaffinch	<i>Fringilla coelebs</i>			
Chiffchaff	<i>Phylloscopus collybita</i>			
Dunnock	<i>Prunella modularis</i>			
Great Tit	<i>Parus major</i>			
Jackdaw	<i>Corvus monedula</i>			
Magpie	<i>Pica pica</i>			
Mistle Thrush	<i>Turdus viscivorus</i>			
Robin	<i>Erithacus rubecula</i>			
Rook	<i>Corvus frugilegus</i>			
Song thrush	<i>Turdus philomelas</i>			
Starling	<i>Sturnus vulgaris</i>			X
Swallow	<i>Hirundo rustica</i>			X
Woodpigeon	<i>Columba palumbus</i>			
Wren	<i>Troglodytes troglodytes</i>			

* Gilbert G, Stanbury A and Lewis L (2021), "Birds of Conservation Concern in Ireland 2020 –2026". Irish Birds 43: 1-22

Most bird species recorded within the Proposed Development site were common green listed (Gilbert *et al.*, 2021) species such as Chaffinch *Fringilla coelebs*, Chiffchaff *Phylloscopus collybita*, Robin *Erithacus rubecula*, Rook *Corvus frugilegus*, Blackbird *Turdus merula*, Song thrush *Turdus philomelas*, Wren *Troglodytes troglodytes* and Woodpigeon *Columba palumbus*. Two Amber list, birds of conservation concern i.e., Swallow and Starlings, were recorded during site surveys.

The most valuable breeding habitat for birds are the area of woodland to the south of the N25, the wet willow woodland and the treelines to the north of the N25 near the railway line. Woodland areas in particular are largely impenetrable and provide important refuges in what is an otherwise disturbed area. Areas of amenity grassland, provide small areas of foraging habitat for woodland edge species such as Blackbird and Robin. Waterlogged areas could potentially provide habitat for aquatic bird species such as Moorhen and Mallard. Overall, the Proposed Development site is of Local importance (higher value) for breeding birds.

9.3.6.5 Wintering birds
Irish Wetland Bird Survey (I-WeBS)

The Irish Wetland Bird Survey (I-WeBS) was initiated in the Republic of Ireland in the winter of 1994/95. The survey is coordinated by the I-WeBS office based at BirdWatch Ireland, under contract to the NPWS. The primary objective of I-WeBS is to monitor the numbers and distribution of waterbird populations wintering in the Republic of Ireland, and the survey focuses on wintering waterbirds, as opposed to autumn and spring migrants.

The Proposed Development site is located in proximity to Cork Harbour SPA. A review of I-WeBS data shows that the Proposed Development site is located in proximity to a number of I-WeBS survey subsites i.e., Dunkettle, Glounthane Estuary / Slatty Waters, East Lough Mahon and Carrigrenan). I-WeBS data for these sites from 2016-2021 is included in **Appendix 9.3 in Volume 4** of this EIAR. The locations of these I-WeBS subsites in proximity to the Proposed Development site are shown in **Image 9.3**.



Image 9.3: I-WeBS survey subsites in proximity to the Proposed Development site

These results show that nationally important number of wintering Black-tailed Godwit use Dunkettle as well as large numbers of Oystercatcher *Haematopus ostralegus*, Curlew *Numenius arquata*, Redshank *Tringa totanus*, Dunlin, Black-headed Gull *Chroicocephalus ridibundus* and Lesser Black-backed Gull *Larus fuscus*. Nationally important numbers of wintering Shelduck *Tadorna tadorna*, Wigeon *Mareca penelope*, Teal *Anas crecca*, Little Egret, Little Grebe *Tachybaptus ruficollis*, Golden Plover, Lapwing *Vanellus vanellus*, Dunlin, Black-tailed Godwit, Curlew, Redshank as well as large numbers of Oystercatcher and Black-headed Gull use Glounthane / Slatty waters. In Carrigrennan and Lough Mahon, Oystercatcher, Dunlin, Black-headed Gull and Cormorant *Phalacrocorax carbo* occur in the largest numbers.

While the intertidal and coastal habitats within the SPA boundary provide core foraging / roosting habitats for SCI birds, some SCI will forage or roost inland on agricultural fields outside the SPA boundary. According to Gittings (2017), nine SCI species regularly feed on agricultural fields in significant numbers around Cork Harbour: Wigeon, Golden Plover, Lapwing, Oystercatcher, Curlew, Black-tailed Godwit, Black-headed Gull, Common Gull and Lesser Black-backed Gull. There are another six species that can use fields, but these species do not usually occur in significant numbers i.e., Shelduck, Teal, Grey Heron, Little Grebe, Dunlin and Redshank. There are a number of fields within Little Island which have been used historically as foraging and roosting areas for wading birds and waterfowl (Gittings, 2017). The closest of these, known as Little Island West Fields (LIEF in **Image 9.3**), is located approximately 830m east of the Proposed Development site. This area includes two low-lying fields on the northern side of Little Island, adjacent to the western end of the Glounthane Estuary. These fields were previously intensively managed as improved grassland, but recent aerial photography indicates some scrub encroachment has occurred over the last number of years in the absence of continued management. These fields have not been routinely counted since the winter of 2005/06, due to the growth of vegetation along the N25 (which have obscured the fields from the vantage points previously used).

As noted above the habitats within the Proposed Development site are largely woodland, treeline and manmade habitats. There are no large areas of grassland within the site boundary which would provide suitable roosting or foraging areas of wading birds and waterfowl. While small numbers of waders and gulls could potentially occasionally forage on the small area of amenity grassland to the north of the railway line, this is a highly disturbed area which will not provide critical habitats for these species.

Vantage point surveys

Given the proximity of the Proposed Development site to known foraging and roosting areas, the Proposed Development site and bridge could potentially be located within a commuting route for wading birds and waterfowl. Therefore, vantage point surveys were carried out to identify if the location of the proposed bridge creates a potential collision risk for flocks of wading birds and waterfowl. The results of the vantage point surveys, which were carried out in winter 2022 and 2023, are included in **Appendix 9.4** in **Volume 4** of this EIAR.

Generally, small numbers of birds and small flocks of birds (approximately 1-3 individuals) were recorded overflying the Proposed Development site. No wading bird species were recorded, and no large flocks of birds were recorded during any of the surveys. Passerine species such as Hooded Crow *Corvus cornix*, Jackdaw *Corvus monedula* and Rook were the most commonly recorded species. Small numbers of gulls were recorded i.e., Black-headed Gull usually as individuals or pairs of birds. Herring Gull *Larus argentatus* were also recorded in small numbers. Other species recorded included Buzzard *Buteo buteo*, Starling and Woodpigeon. Birds were generally recorded flying at a height of below 50m. Vantage points were carried out from the existing N25 bridge, and it is noted that no birds were recorded flying under the bridge.

9.3.6.6 *Reptiles and amphibians*

According to records held by the NBDC, Common Frog (*Rana temporaria*) and Smooth Newt (*Lissotriton vulgaris*) have been recorded within grid square W77 (NBDC). Common Frog is listed on Annex V of the EU Habitats Directive and is protected under the Wildlife Acts. Common Frogs spend most of their lives on land, living and hunting in damp pastures, open woodlands or other habitats with suitable cover and generally not far from a pond or stream.

Smooth Newt (*Lissotriton vulgaris*) is commonly encountered near waterbodies. Adult newts are actually terrestrial, only returning to waterbodies to breed. They tend to prefer habitats that offer protection from desiccation, such as long grass, woodland and scrubland. Newts will over-winter in refugia such as woodpiles and rotting logs, which offer them some protection from the elements.

No amphibians were recorded during site surveys. While aquatic and wetland habitats can support amphibians, the drainage ditches, wet-willow woodland and Kilcoolishal Stream are heavily shaded throughout the Proposed Development site and are unlikely to support breeding Common Frog. The Proposed Development will not support breeding Smooth Newt. Overall, the Proposed Development site is of low to negligible value for amphibian species.

The reptile species Common Lizard (*Zootoca vivipara*) and Red-eared Terrapin (*Trachemys scripta*) have also been recorded within W77 (Source NBDC). Common Lizard is Ireland's only native terrestrial reptile and is so protected under the Wildlife Act. Ideal habitats for the species are south-facing, damp tussocky grassland, scrub covered hillsides, dunes or banks, and woodland tracks, and it also resides in peat bogs, dry grasslands and heathlands. Red-eared Terrapin is a non-native medium impact invasive species. Temperatures in excess of 20 degrees for 50-100 days are thought to be required for successful incubation of eggs, which are unlikely to occur in Ireland for the foreseeable future. Overall, the heavily shaded semi-natural habitats and manmade habitats which dominate the Proposed Development site is of negligible value for reptile species.

9.3.6.7 Other species

There is a section of the Kilcoolishal Stream located within the Proposed Development site as well as several small drainage ditches connecting to the stream. The Kilcoolishal Stream and a number of other streams within the Tibbotstown sub catchment i.e., Woodstock Stream and Ann Grove Stream, have not been monitored by the EPA due to their small size and therefore their status to support a diverse aquatic community is unknown. There are no records for Eel, Lamprey or salmonids within the Kilcoolishal Stream. Furthermore, this stream is heavily culverted in the vicinity of the Proposed Development site. The data available suggest that this stream and its drainage ditches have limited potential to support fish species.

The NBDC database was consulted for records of rare or threatened invertebrate species in the 2km OS grid square in which the Proposed Development site is located i.e., W77L. There are no records of threatened invertebrate species within W77L. Whilst no site is without invertebrate interest, it is considered unlikely that the Proposed Development site would support protected invertebrate species given the common and manmade habitats which dominate the Proposed Development site.

9.4 Potential Impacts

Annex III of the amended Directive 2014/52/EU requires that the EIAR should assess:

- The magnitude and spatial extent of the impact (for example geographical area and size of the population likely to be affected);
- The nature of the impact;
- The transboundary nature of the impact;
- The intensity and complexity of the impact;
- The probability of the impact;
- The expected onset, duration, frequency and reversibility of the impact;
- The cumulation of the impact with the impacts of other existing and / or approved projects; and
- The possibility of effectively reducing the impact.

Potential effects of the Construction, Operational and Decommissioning Phases of the Proposed Development on terrestrial and aquatic biodiversity include:

- Potential effects on habitats;
- Potential effects on non-volant mammals;
- Potential effects on bats;
- Potential effects on birds (breeding and wintering);
- Potential effects on amphibians and reptiles;
- Potential effects on other species;
- Potential effects as a result of changes in air quality; and
- Potential effects from non-native invasive species.

When describing changes / activities and impacts on ecosystem structure and function, important elements to consider include positive / negative, extent, magnitude, duration, frequency and timing, and reversibility.

Section 3.7 of the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' (EPA, 2022) provides standard definitions which have been used to classify the effects in respect of ecology. This classification scheme is outlined in **Table 1.1** in **Chapter 1, Introduction**.

9.4.1 Do-Nothing Scenario

Most of the habitats to be affected have been significantly modified from their natural state by human activity. In the absence of development, it is expected that the lands within the planning boundary would largely remain under the same management regimes. In pockets of semi-natural habitats within the site boundary, the general pattern of succession from grassland to scrub to woodland would be expected to continue. Overall, no significant changes to the habitats within the boundary are likely to occur, in the “do nothing” scenario.

9.4.2 Construction Phase

9.4.2.1 Designated sites

A Report for Screening for Appropriate Assessment (AA) (which accompanies this planning application) has been prepared. This report investigated the potential for the Proposed Development to have significant effects on European sites (SAC / cSAC / SPA) either alone or in combination with other plans or projects. This report concluded that there would be no significant impact on conservation objectives of Natura 2000 sites from the construction of the Proposed Development (in the absence of mitigation).

Similarly, no significant effects on NHAs / pNHAs have been identified i.e., Dunkettle Shore pNHA, Douglas River Estuary pNHA.

9.4.2.2 Habitats

Direct impacts on habitats as a result of construction works are described in **Table 9.10**. It should be noted that the value of a habitat is site specific and will be partially related to the amount of that habitat in the surrounding landscape. The classification scheme below for the value of habitats and the impacts on them is detailed in the NRA publication Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009) (refer to **Appendix 9.1** in **Volume 4** of this EIAR). No rare or protected floral species were recorded within the Proposed Development site and no impact of rare or protected flora has been identified.

Table 9.10: Potential impacts on habitats within the Proposed Development site

Habitat	Ecological value (NRA Guidelines)	Potential impacts
Buildings and artificial surfaces BL3 / Amenity grassland GA2	Local importance (lower value)	Small areas of these low value habitats will be removed during construction works. Negative, imperceptible, long-term
Mixed broadleaved woodland WD1	Local importance (higher value)	Two areas of this habitat will be removed during construction works on both the north and south of the N25 (as per Site A and Site B tree clearance plans in the Arboricultural Impact Assessment Report – refer to Appendix 8.1 in Volume 4 of this EIAR). This will result in the removal of mature trees, semi-mature trees and tree groups. Further detail on trees within the site are included in Appendix 9.2 in Volume 4 of this EIAR Negative, moderate, long-term
Drainage Ditches FW4 / Depositing River FW2	Local importance (higher value)	Construction works will be carried out along the Kilcoolishal Stream near the northern railway line. In the absence of mitigation, impacts may occur to the profile of stream and drainage ditches. Negative, slight to moderate, short-term
Treeline WL2 / Mixed broadleaved woodland WD1	Local importance (higher value)	An area of this habitat will be removed during construction works (as per Site B tree clearance plans in the Arboricultural Impact Assessment Report – refer to Appendix 8.1 in Volume 4 of this EIAR). This will result in the removal of two tree groups which include mature, semi-mature and juvenile trees. Further detail on this is included in Appendix 9.2 in Volume 4 of this EIAR. Negative, moderate, long-term
Wet willow woodland WN6	Local importance (higher value)	This habitat will be largely avoided. However, a small areas on the boundary of this habitat will be affected by construction works. Negative, slight, long-term
Amenity grassland GA2 / Scattered tree and parkland WD5	Local importance (lower value)	Areas of these low value habitats will be removed during construction works. A small number of mature non-native trees will be removed within this habitat. Negative, slight, long-term
Dry meadow and grassy verge GS1	Local importance (lower value)	Small areas of these low value habitats will be removed during construction works. Negative, not significant, long-term
Hedgerow WL1	Local importance (lower value)	A section of this non-native hedgerow will be removed. Negative, not significant, long-term

9.4.2.3 Invasive Species

The third schedule high impact invasive Japanese Knotweed was recorded at the Proposed Development site.

Japanese Knotweed is a member of the Polygonaceae (docks and rhubarb family), native to Japan and northern China. It has however, become widely distributed throughout Europe, North America, Canada, New Zealand and Australia. Dispersal typically occurs through rhizome fragments being transported in soil by humans or to a lesser extent, through passive mechanical means such as in floodwaters. Dispersal is also achieved through vegetative reproduction from plant fragments. The plant typically occurs along roadsides, riverbanks and waste ground in Ireland where it forms dense, monotypic stands. Japanese Knotweed causes a range of problems due to prolific and dense growth habit including blocking sight-

lines on roads, damage to paving and structures, erosion of riverbanks and flood defence structures, damage to archaeological sites, loss and displacement of native habitats and species.

Buddleia / Wild Clematis and Winter Heliotrope are classified respectively as a medium-risk and low-risk invasive species by the NBDC. Both species are included in the NRA 'Guidelines on the Management of Noxious Weeds and Non-native Species on National Roads' (NRA, 2010) as these species have been shown to have an adverse impact on landscape quality, native biodiversity or infrastructure; and are likely to be encountered during road schemes. Generally Wild Clematis appears to be more vigorous in its introduced range than in native regions. While no impacts have been documented in Ireland, it is considered a serious pest in New Zealand and listed as a weed in North America. No precise studies have been done on the level of impact of Buddleia, likely due to its long history of naturalisation but it is likely to displace native plants where it is present. Winter Heliotrope is a low impact species which is largely recorded on inland unvegetated or sparsely vegetated habitats, artificial habitats and woodland.

In the absence of mitigation, construction works i.e., machinery and personnel, could potentially disturb stands of Japanese Knotweed as well as other invasive species and spread these species to other habitats within and outside the Proposed Development site. The effects of the spread of invasive species to locally valuable nearby habitats near the works area are predicted to be negative, moderate and long-term in the absence of mitigation measures.

9.4.2.4 Otter

No signs of Otter activity were recorded within 150m of the Proposed Development site. The majority of habitats within the Proposed Development are of negligible value for Otter i.e., isolated pockets of woodland, amenity grassland and artificial surfaces. While in theory these habitats would provide areas of cover for Otter, given the absence of foraging habitats along the south of the N25 and the isolated nature of the woodland in this area, the loss of this habitat would be imperceptible to Otter. Construction works in the vicinity of the Kilcoolishal Stream are likely to prevent Otter accessing this area. It is noted that the Kilcoolishal Stream with its sluggish, low flows and considerable culverting has limited potential to support fish and / or provide foraging habitat for Otter.

Construction works could potentially indirectly affect fish stocks within the Kilcoolishal Stream via impacts on water quality. However, as noted above, the Kilcoolishal Stream has limited value for fish and Otter. Potential impacts on surface water and aquatic species are discussed in further detail in Section 9.4.2.10 and in **Chapter 16, Water**.

Increased human presence and / or noise and vibration associated with construction works, has the potential to temporarily displace commuting or foraging Otter. Otters are known to tolerate human disturbance (Bailey and Rochford, 2006; Irish Wildlife Trust, 2012). Any Otters passing through this area are already habituated to considerable disturbance from traffic, lighting and general human activity. Core construction works will be undertaken during normal daylight working hours and given that Otters are generally nocturnal in habit temporary displacement of Otter from the area during construction works is unlikely to impact the local Otter populations.

The impact of construction works on Otter from the loss of low to negligible value habitats and disturbance is predicted to be negative, imperceptible and long-term at a local geographic level.

9.4.2.5 Bats

There are no buildings located within the Proposed Development site boundary. No trees with potential to support significant bat roosts were recorded within the site boundary. However, one tree with moderate potential roosting value will be removed. Whilst no bat roosts were detected, the presence of occasional bats in mature and semi-mature trees earmarked for removal cannot altogether be excluded and in the absence of mitigation and therefore direct impacts on bats cannot be ruled out.

Treelines, woodland and other linear habitat features can provide high value habitat for bats linking roost sites outside the site to foraging areas and facilitating the dispersal of bats into the wider landscape. Treelines, woodland etc are also an important landscape features for commuting bats, as bats prefer to

travel in the shelter of such features to reduce predation. Loss of such habitats affects the ability of bats to travel safely from roosting sites to foraging areas. A gap of as little as 10m may force some species to seek an alternative commuting route and even change roosting sites.

The woodland habitat on the southern side of the N25 has high local value as bat foraging habitat. Three bat species were recorded foraging in this area i.e., Brown Long-eared Bat, Common Pipistrelle, Soprano Pipistrelle as well as commuting Leisler's Bat. However, this is unlikely to provide significant connectivity to the surrounding landscape as this is isolated from surrounding habitats by the N25 and parking / industrial areas to the east, south and west. The treeline and woodland habitat on the northern boundary of the N25 have better connectivity to the surrounding landscape. However, levels of bat foraging activity were lower in this area and only the more common bat species i.e., Common Pipistrelle, Soprano Pipistrelle and Leisler's Bat, were recorded in this area.

103 no. individual trees, 5 no. part-groups (i.e., sections of a tree group) and 13 no. tree groups have been selected for removal to facilitate the Proposed Development. The estimated total number of trees to be removed on site is 277. This will lead to the loss of high to moderate locally valuable bat foraging habitats. Given the isolated nature of the woodland habitat, this is unlikely to affect connectivity to the wider area. While Common and Soprano Pipistrelle forage in a range of habitats and are commonly recorded, Brown Long-eared Bat displays a preference for deciduous woodland and therefore, foraging habitats in the vicinity of the site are more limited. Therefore, impacts on Brown-long Eared Bat may be more significant than other bat species recorded.

Core construction works will be largely carried out during daylight hours and therefore no significant disturbance impacts from lighting during construction works have been identified.

Overall, the loss of semi-natural habitat during construction will reduce the foraging / commuting habitats available for bats. The impact on foraging bats will be negative, moderate and long term at a local geographic level.

9.4.2.6 Other mammals

No other protected mammal species were recorded within the Proposed Development site. While there were no confirmed field signs of Hedgehog, Irish Stoat or Pygmy Shrew, these species are largely nocturnal, and field signs are less frequently observed than for other mammals. Given the habitats onsite they could potentially occur.

The habitats to be affected are common and there is no evidence to indicate that the Proposed Development areas are of particular value for these species in the context of the surrounding countryside. However, construction works could potentially impact on mammal commuting routes around the site. Effects on these species during construction due to loss of habitat, habitat fragmentation and increased noise and disturbance are predicted to be negative, slight and short-term at a local geographic level in the absence of mitigation.

9.4.2.7 Breeding birds

The most significant impacts on breeding birds will be direct impacts during the Construction Phase through habitat loss, fragmentation and modification. As noted above, woodland, treeline, hedgerow and small areas of grassland habitat will be removed during construction works. The proposed works will remove areas of largely undisturbed habitat in an area where this type of habitat is rare. No red list species were recorded during site surveys. The amber list species i.e., Starling and Swallow as well as green list species such as Blackbird, Wren and Robin, are likely to use alternative grassland and hedgerow/treeline habitats in the vicinity during construction works. In the absence of mitigation, potential impacts include disturbance and injury to eggs, young and nests, and long-term loss of potential nesting sites and foraging habitat.

During the Construction Phase, increased noise and disturbance is likely to disturb and / or displace breeding birds from the site. Given the baseline noise levels along the N25, noise levels from construction works will not be significant outside the site boundary. The birds recorded at the Proposed Development

site are common birds which are typical of the urban / suburban habitats onsite. Given the existing levels of noise and disturbance at the site, from traffic, human activity, dog walkers, etc, species which use the site are likely to be largely habituated to human activity and disturbance. Given the mobile nature of birds, the common nature of habitats within the site and the availability of alternative foraging habitat in the immediate vicinity, the impact from disturbance will be slight during the Construction Phase at a local level.

In the absence of mitigation, potential impacts on breeding birds include disturbance and injury to eggs, young and nests, and long-term loss of potential nesting sites and foraging habitat. In the absence of mitigation the impact on breeding birds will be negative, moderate and long-term at a local level.

9.4.2.8 *Wintering birds*

The most significant impacts on wintering birds during construction works would be disturbance impacts. As noted above there are no valuable habitats for wintering birds within the Proposed Development site. Therefore, no impact on wintering wading birds and waterfowl from habitat loss is predicted to occur.

The Proposed Development site is located over 830m from the closest known foraging or roosting habitat for wintering birds. A range of noise levels have been identified as potentially causing disturbance to waterbirds. Cutts *et al.* (2013) identified general threshold noise levels for varying degrees of impacts, which also take into account habituation effects. Cutts *et al.* (2013) state that “noise between 55-72dB in some highly disturbed areas e.g., industrial or urban areas and adjacent to roads, may feature a low level of disturbance provided the noise level is regular as birds will often habituate to a constant noise level”. Cutts *et al.* (2013) also carried out a comprehensive review of visual disturbance to waterbirds during construction work. This study suggests that typical response distances to visual disturbance vary with species i.e., from 110.5m for Oystercatcher to 275m for Curlew. These are distances at which alert responses occur in birds that are not habituated to disturbance, and disturbance response distances are highly variable within species. Flight responses will generally occur at much closer distances, while birds that are habituated to disturbance will also tolerate much closer activity. Therefore, a 300m buffer around the works area provides an indication of the maximum distance over which general disturbance impacts could occur. Laursen *et al.* (2005), Holloway (1997), Liley *et al.* (2011) and Bregnballe *et al.* (2009), which examined a range of species including ducks, geese and diving birds also concluded that disturbance effects will not extend outside 300m.

While the intertidal and coastal habitats within the SPA boundary provide core foraging / roosting habitats for SCI birds, some SCI will forage or roost inland on agricultural fields outside the SPA boundary. Grassland areas within Little Island have been used historically as foraging and roosting habitat for wading birds and waterfowl. However, the Proposed Development site is located over 830m from the closest known foraging or roosting habitat for wintering birds i.e., grassland to the east of the Proposed Development site. Surveys during the breeding season and wintering bird season (2022/2023) found no evidence that the Proposed Development, or lands in the vicinity of the Proposed Development site, are used by significant numbers of SCI birds. While small numbers of Black-headed Gull were occasionally recorded overflying the site, there are no habitats of value for these species in the vicinity of the works area. No flocks of wading birds or waterfowl were recorded overflying or foraging in the area during site surveys. The Proposed Development site is located adjacent to the existing N25, railway line, parking areas, pedestrian areas etc. Any birds which use this area are already habituated to high levels of noise and disturbance.

Given the distance from known foraging / roosting areas, the existing noise environment at the Proposed Development site, the absence of valuable habitats within or in the vicinity of the Proposed Development site, there is no potential for the Proposed Development to create significant disturbance or displacement impacts to wintering birds around Cork Harbour during construction works.

9.4.2.9 *Reptiles and amphibians*

Maintenance works of the drainage ditches within the Proposed Development site could potentially lead to a temporary loss of low value aquatic habitat. However, as noted above, drainage ditches at the site are heavily shaded and largely unsuitable for Common Frog. Although unlikely given the low value of this

habitat, in the absence of mitigation, construction works could lead to direct mortality or injury to this species. The impact on this species during construction will be negative, not significant and temporary at a local geographic level.

Impacts of reptiles will be neutral, imperceptible and short-term.

9.4.2.10 Other species

During construction, there is potential for siltation and pollution of the Kilcoolishal Stream, from runoff during construction works e.g., runoff and erosion from site earthworks and stockpiles, spillage of fuels and lubricant, dewatering of ramp piers / abutments, concrete spillage. There is potential, therefore, for the generation of sediment laden or polluted water runoff associated with the Construction Phase of the works. Given the location of the works, there is potential for runoff to the Kilcoolishal Stream in the absence of mitigation. This could result in impacts on water quality and aquatic ecology.

Temporary disturbance could potentially occur due to noise and vibration during bridge piling operations, including the driving of the support piles for the bridge abutments. As noted above, works required during bridge construction and main structure of the bridge will be precast.

Overall, construction works have the potential to result in a negative, slight and temporary impact to aquatic species / fisheries at a local level in the absence of mitigation measures.

The loss of semi-nature habitats at the site will reduce habitats for terrestrial invertebrates in the short-term. Impacts on terrestrial invertebrates will be neutral, imperceptible and short-term at a local level.

9.4.2.11 Air

Construction activities are likely to generate some dust emissions, particularly during the site clearance and excavation stages. However, no sensitive habitats are located in the vicinity of the site and no significant impacts from dust emissions during construction are predicted to occur.

9.4.3 Operational Phase

9.4.3.1 Designated sites

A Report for Screening for Appropriate Assessment (AA) (which accompanies this planning application) has been prepared. This report investigated the potential for the Proposed Development to have significant effects on European sites (SAC / cSAC / SPA) either alone or in combination with other plans or projects. This report concluded that there would be no significant impact on conservation objectives of Natura 2000 sites from the operation of the Proposed Development (in the absence of mitigation).

Similarly, no significant operational effects on NHAs / pNHAs have been identified i.e., Dunkettle Shore pNHA, Douglas River Estuary pNHA.

9.4.3.2 Habitats

Maintenance works may be required on occasion along boundary habitats. However, no significant operational impacts on terrestrial habitats have been identified.

9.4.3.3 Invasive species

No operational impacts identified.

9.4.3.4 Otter

The proposed bridge structure will be elevated over the N25 and its surrounding habitats and will be supported by concrete piers / piles. There is no potential for the proposed bridge or its associated structures to create a barrier to Otter movement.

During operation, there will be increased noise and disturbance along the new bridge and walkways. While the Proposed Development site is located in a highly disturbed setting adjacent to the N25, parking

areas, railway line and footpaths, there are pockets of undisturbed habitat within this area included the woodland habitat to the south of the N25, as well as the wet woodland and treelines to the north of the N25. Although there is evidence that nocturnal mammals, such as the Otter, can be disturbed by the introduction of artificial light into established breeding and foraging areas (Rich and Longcore, 2005), as discussed above in relation to construction impacts, Otter are relatively tolerant of human and traffic disturbance. Given the existing setting, and the low value of the existing habitats for Otter, disturbance associated with the operation of the Proposed Development will not have significant disturbance / displacement impacts on Otter.

During operation, surface water runoff could potentially indirectly affect fish stocks and aquatic invertebrates via impacts on water quality. Potential impacts on surface water and aquatic species are discussed in further detail in Section 9.4.3.10.

Overall, the impact on Otter during the Operational Phase is predicted to be negative, not significant and long-term at a local geographic level.

9.4.3.5 *Bats*

Habitat fragmentation due to the loss of the foraging and commuting habitat has the potential to continue to impact local bat populations during the Operational Phase of the Proposed Development. Replacement planting (as outlined in the landscape masterplan included as Drawing No. LIPB-BSM-ZZ-XX-DR-L-0001 in **Volume 3** of this EIAR) of areas of native woodland and hedgerows will provide some replacement habitat for foraging bats in areas where habitat has been removed.

Lighting deters some bat species such as Brown Long-eared Bat, from foraging (Azam *et al.*, 2018). Studies have shown that illumination levels as low as 0.06 lux can influence the behaviour of bats. Even a full moon night (0.02 lux) can reduce bat activity within more sheltered, darker wildlife corridors and foraging areas (e.g., woodlands). It is noted that Pipistrelle species appear to be more tolerant of light and disturbance (Speakman, 1991; Stones *et al.*, 2009; Haffner, 1986). Leisler's Bats will also opportunistically feed on such insect gatherings in lit areas (Bat Conservation Ireland, 2010). However, it is noted that more recently research suggests that even in light opportunistic foraging species, foraging activity may be impacted by increased lighting (Hooker *et al.*, 2022).

The lighting scheme for the Proposed Development has considered best practice, as published by the UK Bat Conservation Trust (2018), in respect of mitigation strategies, to minimise the impact of outdoor lighting upon bat populations. However, lighting requirements for the development will mean that light spillage within the retained woodland habitat on the south of the N25 will reduce its habitat value for foraging bats, in particular light-sensitive species such as Brown Long-eared Bat. Light trespass onto the retained woodland habitats could potentially prevent Brown Long-eared Bat from foraging in this area during operation.

The Impact on bats during the Operational Phase is predicted to be negative, moderate and long-term at a local level.

9.4.3.6 *Other mammals*

Increased activity and human presence, noise and additional lighting has the potential to disturb or displace other mammal species such as Hedgehog, Pygmy Shrew and Irish Stoat from foraging habitats during the Operational Phase. The removal of woodland and treeline habitat will reduce areas of cover for mammal species. Replacement planting (as outlined in the landscape masterplan included as Drawing No. LIPB-BSM-ZZ-XX-DR-L-0001 in **Volume 3** of this EIAR) of areas of native woodland and hedgerows will provide some replacement habitat for small mammals in areas where habitat has been removed.

Impacts on other mammals during operation are predicted to be negative, slight and long-term at a local level.

9.4.3.7 *Breeding birds*

As noted above, the Proposed Development site does not provide significant habitat for birds of conservation concern. However, habitat fragmentation due to the loss of the foraging and commuting habitat has the potential to continue to impact local populations of common bird species during the Operational Phase of the Proposed Development.

Replacement planting (as outlined in the landscape masterplan included as Drawing No. LIPB-BSM-ZZ-XX-DR-L-0001 in **Volume 3** of this EIAR) of areas of native woodland and hedgerows will provide some replacement habitat for breeding birds in areas where habitat has been removed.

The impact on birds during operation is predicted to be negative, slight and long-term at a local level.

9.4.3.8 *Wintering birds*

While there is anecdotal evidence that birds collide with bridges, there are limited published studies on the collision of birds with bridges and no published studies which calculate the rate or bird collision with bridges. For the most part, research on collision risk to birds has focused on the manmade structures where a significant risk has been identified either to human or bird welfare e.g., wind turbines, buildings with large areas of glass, powerlines, aircraft, communication towers. There remains a dearth of research and / or data on collision rates with bridges in spite of a significant number of studies on bird collision with a large range of structures particularly in the last number of years with the advent of self-published literature e.g., PlusOne.

Bridges by their nature are often located in areas where high numbers of birds congregate around rivers and / or estuaries. However, information regarding mortality as a result of direct collisions with bridges is sparse. During a review of over 1,500 abstracts or summaries of published reports on bird mortality in relation to man-made structures (from Stanton and Kilcik, 2018) there were no publications documenting bird collisions with, or bird mortality due to, collisions with bridges or bridge cables (Arup, 2002; Parsons Brinckerhoff, 2011). Bird deaths associated with bridges are usually a result of the powerlines strung across bridges (Weston, 1966; Podolsky, 1998; Arup 2002; Parsons Brinckerhoff, 2011) or during periods of inclement weather when birds are affected by the bridge lighting (Nilsson and Green, 2011) or after individuals are downed during strong winds (Owens and James, 1991; Jacobson, 2005).

The Proposed Development site is located in proximity to Cork Harbour and there are known foraging / roosting areas for wintering birds to the east, west and south of the site. However, winter vantage point survey carried out in 2022 and 2023 found no evidence that the Proposed Development site is located within a commuting or flightline for these species. Small numbers of gulls were recorded overflying the site as well as common passerine species such as crows. However, given that these birds are already overflying and not colliding with the existing N25 bridge, these birds are not at a significant collision risk from the proposed bridge.

Operational impacts on wintering birds are predicted to be a neutral, imperceptible and long-term at a local level.

9.4.3.9 *Reptiles and amphibians*

No operational impacts on reptiles and amphibians have been identified. Impacts will be neutral, imperceptible and long-term.

9.4.3.10 *Other species*

There will be no bridge supports located within the Kilcoolishal Stream and therefore no impact on hydraulic flows and / or fish passage during the Operational Phase. SuDS measures as outlined in **Chapter 16, Water** have been designed to ensure that there will be no change in runoff rates to the Kilcoolishal Stream during operation. The proposed bridge is for pedestrian and cycle traffic only and there will be no risk of hydrocarbon runoff associated with operation.

Given the operational design measures, the impacts on fish and aquatic invertebrate species in receptors are predicted to be neutral, imperceptible and long-term at a local level.

No significant impact on terrestrial invertebrates has been identified during operation. However, new habitats created in the landscape design will have a positive, slight and long-term impact at a local level.

9.4.3.11 Air

The Proposed Development is for a pedestrian bridge and cycle path. No significant operation air emissions will occur and there will be no adverse impact on identified ecologically sensitive receptors.

9.4.4 Decommissioning

The design life of the proposed new pedestrian and cyclist bridge is 120 years. During the potential future decommissioning works, it is proposed that the bridge will be removed in a reverse fashion to the proposed construction sequence. Decommissioning will follow construction best practices significant impacts are predicted to occur.

9.5 Mitigation and Monitoring

9.5.1 Construction Phase

The mitigation measures have been drawn up in line with current best practice and include an avoidance of sensitive habitats at the design stage and mitigation measures will function effectively in preventing significant ecological impacts. The following mitigation measures will be implemented.

9.5.1.1 General mitigation measures

Chapter 5, Construction Strategy provides an outline of the general activities associated with the construction of the Proposed Development. A CEMP has been prepared for the Proposed Development and is included as **Appendix 5.1 in Volume 4** to this EIAR. Prior to commencement of works, the Contractor will further develop the CEMP and agree its content with CCC. Once agreed with CCC, the CEMP will be implemented, and site clearance works will be carried out and fencing erected along the Proposed Development boundary.

All construction staff, including all sub-contracted workers, will be notified of the sensitive nature of onsite habitats, the Kilcoolishal Stream and nearby designated sites, and will also be made aware that no construction waste of any kind (rubble, soil, etc.) is to be deposited in these protected areas and that care must be taken with liquids or other materials to avoid spillage.

All personnel involved with the Proposed Development will receive an onsite induction relating to construction and operations and the environmentally sensitive nature of habitats on and adjacent to the Proposed Development site and to re-emphasise the precautions that are required as well as the precautionary measures to be implemented. Site managers, foremen and workforce, including all subcontractors, will be suitably trained in pollution risks and preventative measures.

All staff and subcontractors have the responsibility to:

- Understand the importance of mitigating potential pollution onsite, including noise and dust, and how to respond in the event of an incident to avoid or limit environmental impact;
- Respond in the event of an incident to avoid or limit environmental impact;
- Report all incidents immediately to the project manager;
- Monitor the workplace for potential environmental risks and alert the site manager if any are observed; and
- Co-operate as required, with site inspections.

9.5.1.2 *Water quality*

A Surface Water Management Plan will be incorporated into the CEMP (refer to **Appendix 5.1 in Volume 4** of this EIAR) by the Contractor. Specific controls / mitigation measures will be put in place to manage runoff and minimise pollution to receiving waterbodies during the Construction Phase.

Works in the vicinity of the Kilcoolishal Stream will be carried out in the summer months, when water levels and flows within the stream are minimal. In the eventuality that the stream is not dry, construction works to the section of the Kilcoolishal stream crossing the construction boundary (approximately 28m) will be bunded on either side with earthen bunds and silt screens. Water would be over pumped in the flow direction. Environmental control measures will be implemented during construction in line with standard guidelines (i.e., ‘The Control of Water Pollution from Construction Sites’ (CIRAI, 2001) and ‘The Control of Water Pollution from Linear Construction Projects’ (CIRIA, 2006)) for best practice measures for controlling water pollution. The Report for Screening for AA submitted as part of the planning application concluded that the proposed project, in the absence of mitigation, and either alone or in combination with other plans and / or projects, does not have the potential to significantly affect any European Site, in light of their conservation objectives. The environmental control measures which will be implemented relate to the minimisation of localised potential impacts.

Apart from the area of the Kilcoolishal Stream directly affected by the bridge construction (i.e., Irish Rail portal frame), a buffer strip of 10m will be implemented around the stream with no works taking place in this area. Where this is not possible, in particular for the construction of the Irish Rail portal frame, the streambed and stream banks of the Kilcoolishal Stream in this location will be reprofiled and reinstated following construction and the bunds and silt traps removed.

No plant or tools will be washed in the stream, should it contain water. Spill kits will be permanently on hand and kept close to the works areas. Staff will be trained in how to use the spill kits correctly.

Details of water quality mitigation measures are also included in **Chapter 16, Water**.

9.5.1.3 *Noise and vibration*

The employment of good construction management practice, as described in the CEMP, included as **Appendix 5.1 in Volume 4** of this EIAR, and in **Chapter 10, Noise and Vibration**, will minimise the risk of adverse impacts from the noise and vibration during the Construction Phase.

Mitigation measures will be employed to ensure that potential noise and vibration impacts at nearby sensitive receptors due to construction activities are minimised. The preferred approach for controlling construction noise is to reduce source levels where possible.

The CEMP will be updated by the contractor, prior to construction, to include any specific conditions attached to the approval and other specific construction information, but will at a minimum, include the measures described in **Chapter 10, Noise and Vibration**.

9.5.1.4 *Lighting*

Lighting associated with the site works could cause disturbance / displacement of fauna. If of sufficient intensity and duration, there could be impacts on reproductive success.

During construction, lighting mitigation measures will follow ‘Bats & Lighting Guidance Notes for: Planners, engineers, architects and developers’ (Bat Conservation Ireland, 2010).

Site lighting will typically be provided by tower mounted temporary portable construction floodlights. The floodlights will be cowled and angled downwards to minimise spillage to surrounding properties. The following measures will be applied in relation to site lighting:

- Lighting will be provided with the minimum luminosity sufficient for safety and security purposes. Where practicable, precautions will be taken to avoid shadows cast by the site hoarding on surrounding footpaths, roads and amenity areas;
- Where possible, construction lights will be switched off when not in use; and

- Lighting will be positioned and directed so that it does not to unnecessarily intrude on adjacent ecological receptors and structures used by protected species. The primary area of concern is the potential impact on woodland on the southern and northern boundary of the N25. There will be no directional lighting focused on these sensitive habitats and cowlings and focusing lights downwards will minimise light spillage.

Core construction works will take place during hours of daylight to minimise disturbance to any nocturnal mammal species.

9.5.1.5 Protection of habitats

The Wildlife Act 1976, as amended, provides that it is an offence to cut, grub, burn or destroy any vegetation on uncultivated land or such growing in any hedge or ditch from the 1st March to the 31st August. Exemptions include the clearance of vegetation in the course of road or other construction works or in the development or preparation of sites on which any building or other structure is intended to be provided. Site clearance including vegetation clearance will be undertaken within the Proposed Development boundary and in accordance with the CEMP (refer to **Appendix 5.1 in Volume 4** of this EIAR). Trees and vegetation will not be removed between 1st March and 31st August, to avoid direct impacts on nesting birds. Tree removal will be carried out in accordance with the Arboricultural Impact Assessment (refer to **Appendix 8.1 in Volume 4** of this EIAR). Trees to be retained will be identified and protected to avoid accidental damage during the Construction Phase.

Site drainage will be provided at the construction compounds to collect surface water runoff, which will be directed into the existing local drainage network. Surface water or contaminants within the site compounds will not be released from the site to any waters or the bed and banks of any waters (including ground water). Refer to **Chapter 16, Water** for further details on mitigation measures for water.

To prevent incidental damage by machinery or by the deposition of spoil during site works, woodland, hedgerow, tree and scrub vegetation which are located in close proximity to working areas will be clearly marked and fenced off to avoid accidental damage during excavations and site preparation. Tree protection measures are included in the Arboricultural Impact Assessment Report (refer to **Appendix 8.1 in Volume 4** of this EIAR). The project ecologist will specify appropriate protective fencing where required.

Habitats that are damaged and disturbed will be reinstated and landscaped once construction is complete.

A landscape masterplan is included as Drawing No. LIPB-BSM-ZZ-XX-DR-L-0001 in **Volume 3** of this EIAR.

9.5.1.6 Invasive species

Prior to the commencement of construction works an invasive species survey will be undertaken within the Proposed Development boundary by a competent expert to determine if invasive species listed under Part 1 of the Third Schedule of S.I No. 477 of 2011 have established in the area in the period between pre-planning and post consent. In the event that invasive species are identified within the works area, a site-specific Invasive Species Management Plan (ISMP) will be developed and implemented by a competent specialist on behalf of the contractor.

In addition, in order to comply with Regulations 49 and 50 of the European Communities (Birds and Natural Habitat) Regulations (2011), biosecurity measures will be implemented throughout the Construction Phase to ensure that the introduction and translocation of invasive species is prevented. The appointed project ecologist will carry out a toolbox talk which will identify invasive species and will also implement biosecurity measures such as the visual inspection of vehicles for evidence of attached plant or animal material prior to entering and leaving the works area. Stringent biosecurity measures will be implemented throughout the works. The best practice principles of Check-Clean-Dry guidance of the Non-Native Species Secretariat (NNSS, 2017), IFI biosecurity protocols (IFI, 2010) and Waterways Ireland Marine Notice No. 39/2017 shall be followed during these works to ensure that invasive non-native species are not introduced into the Proposed Development site.

Japanese knotweed

Japanese Knotweed was recorded within the Proposed Development site. The following site hygiene and mitigation measures will be followed during construction to ensure that Japanese Knotweed is effectively removed from the site and is not spread outside of the site during construction works.

Site hygiene at contaminated areas

Construction equipment, vehicles and footwear may provide a vector for the spread of invasive species. Maintaining site hygiene at all times in an area affected by invasive species is essential to prevent further spread.

The following site hygiene measures will be implemented for the contaminated area:

- Understand the potential extent of the rhizome (root) system underground – up to seven metres horizontally and three metres vertically;
- Where possible, the contaminated area will be avoided and fenced off, or the extent of the rhizomes clearly marked;
- If possible, the use of machinery with tracks will avoid contaminated areas. Movement of machinery between contaminated and non-contaminated areas must be controlled and adequate power washing measures implemented;
- Areas where contaminated soil is to be stockpiled on site will be clearly identified and marked out;
- Designated entry and exit points will be identified for personnel on foot and for small mobile equipment. A delineated access track, to be maintained free of Japanese Knotweed, will be established through the site to minimise the spread of Knotweed species by permitted vehicles accessing the site;
- Vehicles, including footwear and tools, leaving the site will be inspected for any plant material and washed down (using a pressure washer) in a dedicated vehicular wheel wash down facility, which will drain into a contained area within the site. Particular care is required with tracked machines;
- Vehicles used in the transport of contaminated material will be visually checked and washed down into a contained area before being used for any other work, either in the same area or on a different site;
- Only vehicles required for essential works, including site investigation works, will be brought on site and the number of visits minimised as much as practicable;
- Material gathered in the dedicated wash down contained areas will be appropriately disposed of off-site;
- For any subsoil or topsoil entering the site, the supplier will be required to provide an assurance that it is free of Japanese Knotweed;
- All site personnel will be made aware of measures to be taken and will be informed of the requirements of the ISMP; and
- Site hygiene signage, in relation to the management of invasive species, will be erected.

Management options

In addition to the possible advance treatment works and pre-construction survey, when the works areas become available to the contractor for enabling works, areas identified as requiring specific invasive species treatment will be demarcated and the designated control measures implemented at the earliest possible stage to reduce the risk of spread within the Proposed Development site or beyond.

There are a number of management options that may be implemented to control and prevent the spread of invasive species. These are presented in the sections below.

Those involved in the application of herbicides / pesticides will be competent to do so and, consequently, will have sufficient training, experience and knowledge in the area of herbicides / pesticides application.

All staff involved in the application of herbicides / pesticides will have received appropriate training, which may include achieving competency certification in the safe use of herbicides / pesticides through a National Proficiency Tests Council registered assessment centre or achieving an appropriate FETAC award in this area. The following management options will be used i.e., chemical control and / or excavation and chemical treatment onsite:

Chemical treatment

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 (Invasive Species Ireland, 2015); and
- Circular Letter NPWS 2/08 Use of Herbicide Spray on Vegetated Road Verges (NPWS, 2008).

These documents include measures to aid the identification of relevant species, with details for the timing, chemicals and methodology for chemical control, and for measures to avoid environmental damage during the use of herbicides.

Chemical treatment involves the application of an herbicide to invasive species plant such as Japanese Knotweed stands without any excavation or removal of the plant material. The preferred types of herbicides to be used in the treatment of Knotweed are Glyphosate and 2,4-D Amine.

If herbicide is applied as the treatment option, it may need to be reapplied for up to five years after the first application to ensure the plant control measures have been effective.

Glyphosate is non-persistent and can be used near water, but it is not selective (i.e., it is a broad spectrum chemical and will impact all plant species) whereas 2,4-D Amine can be persistent for up to one month, and can also be used near water but is more selective on certain plants. The selection of chemical by the contractor and supervising ecologist will depend on seasonal factors, site conditions, proximity to water, surrounding habitats etc.

The most effective time to apply Glyphosate is from July to September (or before cold weather causes leaves to discolour and fall). The majority of herbicides are not effective during the winter dormant stage because they require living foliage to take up the active ingredient.

Reapplication rates will depend on site specific considerations including the extent of the infestation, its location, and the time of year treatment commences. Details of the proposed chemical treatment plan will be included in the updated ISMP based on the proposed work programme.

Foliar treatment (spraying) is usually applied with a sprayer such as a knapsack sprayer or a larger spray system. It is important to use a treatment dye to identify clearly all areas treated. Foliar treatment is an efficient way to treat large monocultures of invasive plants, or to spot-treat individual plants that are difficult to remove mechanically such as Japanese Knotweed.

In the case of Japanese Knotweed, depending on weather and temperatures in the days following the initial treatment, and to ensure optimal uptake of herbicide into the rhizome system, a second similar treatment will be required usually within ten days, before the internal vascular system is no longer capable of translocating the herbicide to the root system.

While the upper surface of the leaves will be easier to treat, it is also important to treat the leaf under surface as Japanese Knotweed possesses many stomata openings on the leaf under surface. Dead stems can be cut, removed and burned on / off site in accordance with the relevant legislation.

The stem injection method is sometimes used for Japanese Knotweed control. This treatment requires a higher concentration of the active ingredient than is used in foliar applications. It involves the use of a specialist herbicide injection tool whereby the injection tool injects the herbicide directly into each of the canes approximately 20-30cms from the base of each cane (between the 1st and 2nd node).

Subsequently, approximately 10ml of herbicide mix is injected into each cane at a ratio of 5:1 through the use of a specialist stem injection tool. The application of glyphosate-based products by injection is most effective when applied in the early Autumn (mid to late Sept). Regrowth will occur in subsequent years, albeit much less vigorously, which will require follow up treatment at the appropriate time of year. Spot treatment will be required each year until no regrowth is observed.

To ensure that the use of herbicides does not contravene legislation, the contractor must comply with Circular Letter NPWS 2/08 *Use of Herbicide Spray on Vegetated Road Verges* (NPWS, 2008) on dealing with the application on to non-target areas.

Excavation and chemical treatment on-site

This option employs both physical and chemical methods of treatment. This method is employed in situations where treatment of invasive species, in particular Japanese Knotweed, is required to be completed in a relatively short timeframe. Generally, digging up the rhizomes and re-cultivating it stimulates plant growth and will result in more successful herbicide application and management.

In summary, this management method requires cutting and killing of the surface plant. The cut material must be left on top of plastic sheeting until dried out and subsequently monitored for any sign of regrowth. Storage of cut material should not take place within flood risk zone of a river. The cut material should not be placed in a green waste recycling bin. Once dried out, the material should be burned on site in accordance with the relevant legislation. The surface of the affected area should be raked with tines to remove crowns and surface material, and in order to break up the rhizomes, bringing them to the surface, which will stimulate leaf production. This will make the plant more vulnerable to herbicide treatment. The more rhizomes that are brought to the surface, the more growth will occur, allowing for a more successful treatment. An excavator can be used to scrape the surface crowns and rhizomes into a pile and then to cultivate the ground to stimulate rhizomes to produce a higher density of stems for treatment. Reapplication of herbicide may be required for up to five years after initially application, subject to the site-specific management plan.

Buddleia, Wild Clematis and Winter Heliotrope

It is noted that the amber list species *Buddleia*, *Wild Clematis* and *Winter Heliotrope* were also recorded at the Proposed Development site. As noted in Section 9.4.2.3, there is no statutory obligation to remove these species. However, should it be concluded that they should be removed, the below treatment methods are recommended. These species are straightforward to control using a mixture of mechanical removal and herbicide treatment.

Buddleia

Buddleia favours disturbed sites, where physical grubbing of plants can provide ideal conditions for the germination of seeds. Therefore, care needs to be taken to ensure re-vegetation of controlled areas is undertaken swiftly. The branches of *Buddleia* are capable of rooting as cuttings, so care should also be taken to ensure material is disposed of in a manner to avoid this risk.

As mature plants occur within the proposed works area, the preferred method of treatment is cutting back to a basal stump or grubbing out followed by chemical treatment. Herbicide applications will consider sensitive receptors such as watercourses and locally important habitats such as woodland and must only be applied in line with manufacturers recommendations.

Recommended practice for the application of herbicides requires cutting back of plants to a basal stump during active growth (late spring to early summer) which is then treated (brushed on) immediately with a systemic weed killer mix (Starr *et al.*, 2003). Foliar application of triclopyr or glyphosate may be adequate for limited infestations of younger plants but should be followed up at 6 monthly intervals until the supervising ecologist can certify that the plant is no longer extant within the works area.

Best practice biosecurity measures should be implemented for works in proximity to the stream and drainage ditches. All wet gear or machinery which has previously come into contact with watercourses should be checked for any silt or mud, plant material or animals. It then should be cleaned and finally dried. Disinfectant or hot water (over 65°C) should be used to clean all equipment followed by a 24 hour drying period. This should be adopted as standard practice in all freshwaters.

Wild Clematis

Wild Clematis is straightforward to control using a mixture of mechanical removal and herbicide treatment. Alternative methods of control are discussed below.

This species can be controlled by both mechanical control and herbicides, though typically its control relies on a combination of both i.e., cut-stump application.

Small seedlings can be readily pulled by hand. Larger stems have to be cut, the roots grubbed out and the material placed off the ground so it cannot take root again.

A number of chemicals have been used effectively against Wild Clematis in New Zealand, including glyphosate, though control invariably takes more than one year (New Zealand Department of Conservation, 2005). Control should be undertaken during active growth. For mature plants, the vines should be cut back to ground level or waist height in winter or spring and the subsequent re-growth can be then foliar sprayed. This method will avoid impacting on the host plant the vine may be covering.

For larger specimens, the plant can be cut at the base with a straight horizontal cut. Herbicide is then applied immediately to the wound with a paint brush, eye dropper or small squeeze bottle. On larger stems it is only necessary to wipe herbicide around the outer rim of the cut. The plants should be left in situ until they are dead. Where plants are not killed in a single application, wait until re-growth before re-spraying.

Triclopyr can also be used as a foliar spray or as a spot treatment. This should be applied in summer during active growth before senescence, when it is not very hot or during drought. Following control, regular monitoring will be required with appropriate follow-up to deal with re-growth or new seedling germination over a period of 2–3 years.

Winter Heliotrope

Physical control

Due to the extensive rhizome network, physical removal of winter heliotrope is really only practical on a limited scale. Where mechanical means can be employed, it should be possible to deal with larger infestations but due to the potential for regeneration from fragments of roots, it may be best to tackle its control using a combination of excavation with follow-up treatment by herbicides. As with other plants with the potential to spread from small root fragments, disposal of material should be undertaken with due caution to prevent accidental spread of the plant. Other means of disposal include burial of material at a depth of at least 2m, incineration or disposal to licensed landfill. There is no evidence that the material would withstand composting though this approach would probably only be suitable for limited infestations.

Chemical control

An application of a glyphosate-based herbicide after flowering in February to March is recommended by Cornwall Nature Reserves (2008), though the Royal Horticultural Society (2008) recommends spraying in mid-summer or later but before the foliage begins to die back.

9.5.1.7 *Bats*

During the site works, general mitigation measures for bats will follow Marnell *et al.* (2022), Kelleher and Marnell (2006) and NRA (2005c). These documents outline the requirements that will be met in the pre-construction (site clearance) stage to minimise negative effects on roosting bats or prevent avoidable effects resulting from significant alterations to the immediate landscape. All mitigation measures including detailed method statements will be agreed with the NPWS prior to commencement of works, which could affect any bat populations on site.

Mature and immature trees will be removed prior to construction. Although mature trees with the potential to be of significant value as bat roosts are absent from the site, the following precautionary measures will be implemented during the removal of semi-mature and mature trees:

- The project ecologist will work with the contractor to ensure that trees earmarked for retention are adequately protected;
- Tree-felling will ideally be undertaken in the period September to late October / early November. During this period, bats are capable of flight and may avoid the risks of tree-felling if proper measures are undertaken;
- Felled trees will not be mulched immediately. Such trees will be left lying several hours and preferably overnight before any further sawing or mulching. This will allow any bats within the tree to emerge and avoid accidental death. The bat specialist will be on-hand during felling operations to inspect felled trees for bats. If bats are seen or heard in a tree that has been felled, work will cease and the local NPWS Conservation Ranger will be contacted;
- Tree will be retained where possible and no ‘tidying up’ of dead wood and spilt limbs on tree specimens will be undertaken unless necessary for health and safety;
- Treelines outside the Proposed Development area but adjacent to it, and thus at risk, will be clearly marked by a bat specialist to avoid any inadvertent damage;
- During construction, directional lighting will be employed to minimise light spill onto adjacent areas. Where practicable during night-time works, there will be no directional lighting focused on watercourses or boundary habitats and focusing lights downwards will be utilised to minimise light spillage; and
- If bats are recorded by the bat specialist within any trees no works will proceed without a relevant derogation licence from the NPWS.

As noted in Section 9.5.1.4, construction lighting mitigation measures will follow recommendations outlined in Bat Conservation Ireland (2010) and Bat Conservation Trust (2018).

9.5.1.8 *Birds*

As noted in Section 9.5.1.5, where practicable, vegetation will be removed outside of the breeding season and in particular, removal during the peak-breeding season (April-June inclusive) will be avoided. This will also minimise the potential disturbance of breeding birds outside of the Proposed Development site boundary. If works are carried out during the breeding season, a pre-construction survey will be carried out by the project ecologist and if birds are detected, appropriate mitigation measures will be implemented.

9.5.1.9 *Common frog*

As a precautionary measure, a visual search of the drainage ditches and the Kilcoolishal Stream will be carried out in the days prior to commencement of construction works and any frogs will be removed to alternative habitats elsewhere within the landholding. This will be carried out under licence from the NPWS and under supervision of the project ecologist.

9.5.2 Operational Phase

9.5.2.1 Lighting during operation

The primary lighting mitigation which will be implemented for this project relates to bats, as these are considered the most sensitive species in relation to night-time lighting. It is noted however that the mitigation proposed will also lessen the impact in relation to other nocturnal species such as Pygmy Shrew and Otter.

The external lighting design concept is to illuminate lighting levels as outlined within BS EN 12464-2:2014 (BSI, 2014). The bridge and walkways will have required lux levels for safe access. The following measures will also be included to minimise impacts on foraging bats where possible:

- LED type lanterns, of the warm white type, have been specified, with a Colour Temperature of 3000 kelvin, as these are considered least disruptive to the emergence of bats from roosts at dusk, and subsequent movement from habitats to foraging locations;
- LED luminaires have been specified due to their sharp cut-off, lower intensity, good colour rendition and dimming capability;
- Lanterns are of the fully cut off type with no light output above the horizontal plane; and
- Screening by existing trees and newly planted trees will limit light spillage onto boundary habitats.

9.5.2.2 Biodiversity enhancement

Disturbed areas will be planted using appropriate native woodland and hedgerow mixes. A landscape masterplan has been included with the application with further detail on tree, woodland and hedgerow planting locations (refer to Drawing No. LIPB-BSM-ZZ-XX-DR-L-0001 in **Volume 3** of this EIAR).

It is proposed that four bat boxes will be installed at the Proposed Development site i.e., bat box pro or similar. These bat boxes will be located along mature woodland at the south of the site and within the wet willow woodland at the north of the site.

It is proposed that six bird nesting boxes (various types including open fronted, entrance hole and kestrel nest boxes) will be installed at the Proposed Development site. These will be located on mature and suitable semi-mature trees within the Proposed Development site boundary.

Log piles are suitable for invertebrates, small mammals and birds, and can be easily installed in wooded areas of parks or open spaces. These stacks of logs are piled up and allowed to rot down. Left undisturbed, they will support a good range of biodiversity. These will be positioned within newly landscaped areas within the Proposed Development site.

It is noted that some planting has been specified in the landscape masterplan (refer to Drawing No. LIPB-BSM-ZZ-XX-DR-L-0001 in **Volume 3** of this EIAR). Natural recolonisation should also be allowed to proceed outside of the planted areas. This will ensure that such areas are colonised by a mixture of native species from the surrounding landscape. These species will be appropriate to the local conditions.

Natural woodland has a complex structure with a mix of different layers at different heights and which are subject to different light regimes. This structure of canopy, sub-canopy and shrub layer can be replicated by including a suitable mix of species which grow at different rates, and which reach different heights at maturity. It is also important to plant sufficient trees to allow dense cover to develop in certain parts of the site. It is noted that areas of cover within which there is little disturbance, even if such areas are small, can be important for open exposed sites and sites with a high degree of human disturbance. For example, they provide areas where mammals can safely hide during the day. Such areas can be developed by ensuring that paths are naturally diverted away from certain identified areas which can then be allowed to develop a denser vegetation.

9.6 Cumulative Impacts

A review of Cork County Council (CCC), An Bord Pleanála (ABP) and Department of Housing, Local Government and Heritage (DHLGH) online planning records has indicated that other projects have been permitted or proposed within the surrounding area that may give rise to cumulative impacts in combination with the impacts of the Proposed Development. The list of projects is included in **Chapter 20, Cumulative and Interactive Impacts**.

The cumulative impacts of the Proposed Development and nearby consented projects on biodiversity are discussed in **Table 9.11**.

Table 9.11: Cumulative impacts of the Proposed Development

Development	Project details	Potential cumulative impacts
<p>224837 Approved - Conditional</p> <p>Decision received 08/06/2022</p>	<p>30 no. bedroom, three-storey extension to the existing Radisson Blu Hotel & Spa, Little Island.</p> <p>iNua Hospitality General Partner Limited t/a Radisson Blu Hotel Cork applied for the construction of 30-bedroom, three storey extension to the existing hotel. The Proposed Development makes provision for internal alterations to the existing hotel to accommodate the proposed extension, including the omission of 2 existing hotel rooms at upper floors, omission of meeting room at ground floor level, and all ancillary works including rooftop plant. The Proposed Development consists of works within the curtilage of a Protected Structure</p>	<p>In the event that the Construction Phase of the Proposed Development was to overlap with this project, potential localised cumulative impacts could arise.</p> <p>Should this situation arise, construction activities will be planned and phased, in consultation with the relevant construction management team. Construction mitigation measures have been outlined in the CEMP which is included as Appendix 5.1 in Volume 4 of this EIAR. These measures will ensure that no significant cumulative noise / disturbance effects or habitat loss for local fauna will occur during construction works. No potential cumulative operational impacts from noise and disturbance have been identified.</p> <p>Following mitigation, no significant adverse impacts from changes in local water quality were identified during the Construction or Operational Phase of the Proposed Development. Therefore, no cumulative impacts for water have been identified.</p> <p>It is noted that tree removal has been minimised in this project, which will remove 7 semi-mature trees. No significant cumulative impacts from habitat loss have been identified.</p> <p>Following the implementation of mitigation measures, no significant cumulative effects have been identified.</p>
<p>225935</p> <p>Approved - Conditional</p> <p>Decision received 05/04/2023</p>	<p>Construction of light industrial building, Euro Business Park, Little Island.</p> <p>South of Ireland Sustainable Energy Federation applied for permission to construct a light industrial building divided into 4 separate units to provide an integrated supply for, Solar Voltaic Panels, Energy Management Systems, Domestic Battery and Heat Pump installations, with additional parking and associated site works</p>	<p>In the event that the Construction Phase of the Proposed Development was to overlap with this project, potential localised cumulative impacts could arise.</p> <p>Should this situation arise, construction activities will be planned and phased, in consultation with the relevant construction management team. Construction mitigation measures have been outlined in the CEMP which is included as Appendix 5.1 in Volume 4 of this EIAR. These measures will ensure that no significant cumulative noise / disturbance effects or habitat loss for local fauna will occur during construction works. No potential cumulative operational impacts from noise and disturbance have been identified.</p> <p>Following mitigation, no significant adverse impacts from changes in local water quality were identified during the Construction or Operational Phase of the Proposed Development. Therefore, no cumulative impacts for water have been identified.</p> <p>While no detail on tree removal / habitat loss was included with this application, the site is located within an existing industrial setting and no significant impacts from cumulative habitat loss have been identified.</p> <p>Following the implementation of mitigation measures, no significant cumulative effects have been identified.</p>

9.7 Residual Impacts

9.7.1 Designated sites

Potential impacts on designated Natura 2000 sites (SAC / cSAC / SPA) are specifically addressed in the Report for Screening for Appropriate Assessment (AA) This report concluded the following:

“The Proposed N25 Pedestrian and Cycle Bridge, Little Island, Cork, either alone or in-combination with other plans and / or projects, does not have the potential to significantly affect any European Site, in light of their conservation objectives.

Therefore, a Stage 2 Appropriate Assessment is deemed not to be required.”

Similarly, no significant effects on NHAs / pNHAs will occur.

9.7.2 Habitats

The removal of areas of mature and semi-mature trees within the mixed-broadleaved woodland and treeline habitats at the Proposed Development site will have a negative, moderate and short to medium-term impact at a local level. Some areas of the site will be replanted with native species and as these trees mature, they will provide high value habitat. Wet willow woodland habitat on the north of the site will be largely avoided by construction works and retained. Temporary impacts will occur within the Kilcoolishal Stream and drainage ditches. However, these areas will be reinstated following construction works – refer to Section 9.5.1.2.

The removal of low value habitats such as low value hedgerow, amenity grassland and small areas of dry meadows and grassy verge will have a negative, not significant and short-term impact. However, these lower value habitats will be largely replaced by landscape planting as outlined in the landscape masterplan, included as Drawing No. LIPB-BSM-ZZ-XX-DR-L-0001 in **Volume 3** of this EIAR.

The residual effects from habitat loss are predicted to be negative, moderate and short to medium-term at a local level.

9.7.3 Invasive species

No residual impacts have been identified.

9.7.4 Otter

The Proposed Development site is of low value for Otter. Given the limited Otter use of this area and the lack of direct impacts on aquatic habitats, following water quality mitigation the impacts during construction are predicted to be negative, imperceptible and short-term.

Otters are generally nocturnal in habit and in many circumstances can tolerate high levels of human presence and disturbance. Otters which use this area are also habituated to comparable levels of disturbance and no significant disturbance impacts are predicted to occur during operation of the Proposed Development.

No significant residual impacts on Otters have been identified.

9.7.5 Bats

Overall, the loss of semi-natural woodland habitats, particularly on the southern boundary of the N25, will reduce the foraging / commuting habitats available for bats. While replanting in this area with native woodland will partially replace the habitat which has been removed, light spillage will continue to impact on this woodland area in the long-term. This is likely to reduce the value of this woodland habitat for foraging bats. Light trespass onto the retained woodland habitats could potentially prevent Brown Long-eared Bat from foraging in this area during operation. Common bat species, which are more tolerant of light spillage i.e., Common and Soprano Pipistrelle and Leisler’s Bat are likely to continue to forage with retained and newly planted habitats.

Newly planted areas along the northern side of the N25 will provide new foraging areas for bats within the Proposed Development site as these habitats mature. However, given the levels of disturbance, lighting and the smaller numbers of bats foraging to the north of the N25, this is likely to provide low value foraging habitat for bats. The provision of bat boxes will provide potential roosting sites for bats within the Proposed Development site.

The residual impacts on bats will be negative, slight to moderate and long term.

9.7.6 Other mammals

The habitats to be affected are common and there is no evidence to indicate that the Proposed Development areas are of particular value for these species in the context of the surrounding countryside. During the Construction Phase, disturbance and site clearance works are predicted to have a negative, slight and short-term impact on other mammal species.

Mammals are generally nocturnal in habit and in many circumstances can tolerate high levels of human presence and disturbance. Mammals which use this area are also habituated to comparable levels of disturbance and no significant disturbance impacts are predicted to occur during operation of the Proposed Development.

Newly landscaped areas within the Proposed Development site will provide alternative foraging and areas of cover for small mammals as the planting matures. Log piles will provide refuges for small mammals in newly landscape areas.

The residual impact on small mammals is predicted to be negative, not significant and long-term.

9.7.7 Breeding birds

In the short to medium term, the loss of common habitats associated with site clearance works and disturbance will have a slight, negative impact on breeding birds. However, as newly planted and enhanced habitats within the Proposed Development site mature, this impact will be reduced. Bird boxes will also provide nesting habitat for a range of common bird species.

The residual impact on birds is predicted to be negative, not significant and long-term at a local level.

9.7.8 Wintering birds

No significant residual impacts on wintering birds have been identified.

9.7.9 Reptiles and amphibians

Although unlikely, given the overgrown nature of the site and low biodiversity value of watercourse / drainage ditches, short-term disturbance of the drainage ditches and Kilcoolishal Stream at the site could potentially have a temporary, negative impact on amphibian species. As a precaution, mitigation measures have been specified to prevent direct impacts on amphibians.

Residual effects on amphibians are predicted to be neutral, imperceptible and long-term.

No residual effects on reptiles have been identified.

9.7.10 Other species

The Kilcoolishal Stream provides limited potential for fish, due to significant culverting and sluggish flows. Mitigation measures will ensure that the stream and drainage ditches at the site are reprofiled following construction. There will be no significant residual effects on this watercourse as a result of the Proposed Development.

Construction mitigation measures and operational design measures will ensure that the residual effect on fish and aquatic invertebrate species in receptors is neutral, imperceptible and long-term at a local level.

The loss of semi-nature habitats at the site will reduce habitats for terrestrial invertebrates in the short-term. However, the landscape plan, included as Drawing No. LIPB-BSM-ZZ-XX-DR-L-0001 in **Volume 3** of this

EIAR, which includes use of native trees and pollinator species, will provide new and enhanced habitats for invertebrate species.

The residual effect on terrestrial invertebrates is predicted to be neutral, imperceptible and long-term.

9.8 References

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