Chapter 12
Biodiversity

Contents

12. Biodiversity

12.1 Introduction

This Chapter of the Environmental Impact Assessment Report (EIAR) presents the output of the biodiversity assessment and contains information regarding, *inter alia*, the biodiversity baseline scenario, the potential impacts on biodiversity, the mitigation measures and the predicted residual effects of the Clongriffin to City Centre Core Bus Corridor Scheme (hereafter referred to as the Proposed Scheme).

The likely significant effects of the Proposed Scheme on biodiversity during both the Construction Phase, including impacts on air and water quality, on habitats, and on flora and fauna from construction activities such as utility diversions, road resurfacing, and road realignments in addition to impacts associated with the operation of the Proposed Scheme and routine maintenance. The assessment undertaken for the Proposed Scheme identified numerous key ecological receptors (KERs) within the study area that could potentially be impacted by the Proposed Scheme. These KERs are examined in detail in this Chapter.

The methodologies used to collate information on the baseline biodiversity environment and assess the likely significant impacts of the Proposed Scheme are detailed in the following sections.

The aim of the Proposed Scheme, when in operation, is to provide enhanced walking, cycling and bus infrastructure on this key access corridor in the Dublin region, which will enable and deliver efficient, safe, and integrated sustainable transport movement along the corridor. The objectives of the Proposed Scheme are described in Chapter 1 (Introduction). The Proposed Scheme, which is described in Chapter 4 (Proposed Scheme Description) has been designed to meet these objectives.

The design of the Proposed Scheme has evolved through comprehensive design iteration, with particular emphasis on minimising the potential for environmental impacts, where practicable, whilst ensuring the objectives of the Proposed Scheme are attained. In addition, feedback received from the comprehensive consultation programme undertaken throughout the option selection and design development process have been incorporated, where appropriate.

12.2 Methodology

In accordance with the requirements of Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (referred to as “the EIA Directive”), this Chapter of the EIAR identifies, describes and assesses the likely direct and indirect significant effects of the Proposed Scheme on biodiversity, with particular attention to species and habitats protected under both EU and Irish law.

The EIA Directive does not provide a definition of biodiversity. However, as noted in the European Commission, “Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment” (2013), Article 2 of the Convention on Biological Diversity, gives the following formal definition of biodiversity:

‘*biological diversity means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems* (CBD 2006)

Alongside the term ‘*biodiversity*’ the terms ‘*ecology*’ and ‘*ecological*’ are also used throughout this Chapter as broader terms to consider the relationships of biodiversity receptors with one another and with the wider environment.

This Chapter also refers to the Appropriate Assessment Screening Report (hereafter referred to as the AA Screening Report) and the Natura Impact Statement (hereafter referred to as the NIS) which have also been prepared on behalf of the NTA and submitted with the application for approval, so as to enable the Board, ac competent authority, to carry out the assessments required pursuant to Article 6(3) of Council Directive 92/43/EEC

of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (hereafter referred to as "the Habitats Directive" documents).

Chapter 4 (Proposed Scheme Description) provides a detailed description of the Proposed Scheme and Chapter 5 (Construction) outlines the manner in which it is proposed to construct the Proposed Scheme. A review of the Proposed scheme was undertaken which identified numerous KERs within the study area that could potentially be impacted by the Proposed Scheme. These KERs are examined in detail in this Chapter.

The methodologies used to collate information on the baseline biodiversity environment and assess the likely significant effects of the Proposed Scheme are detailed in the following sections.

12.2.1 Ecological Survey Study Area

The Proposed Scheme extents are illustrated in the General Arrangement Drawings (BCIDA-ACM-GEO_GA-0001_XX_00-DR-CR-9001) in Volume 3 of this EIAR. Ecological surveys were carried out for each of the biodiversity receptors listed in Table 12.1, within a specific study area (as described in Table 12.1), and focused on assessing potential impacts within the Zone of Influence (ZoI) of the Proposed Scheme. The Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland (hereafter referred to as the CIEEM Guidelines) (CIEEM 2018) define the Zone of Influence (ZoI) for a development as the area over which ecological features may be subject to significant impacts as a result of the Proposed Scheme and associated activities (see Section 12.3.1 for more detail on the ZoI as it relates to the Proposed Scheme and the various ecological receptors).

The ecological surveys were designed based upon the characteristics of the Proposed Scheme and its likely significant impacts on the baseline environment during construction and / or operation. The study areas are described in Table 12.1.

Table 12.1: Ecological Survey Study Areas for Each Ecological Receptor

Ecological Receptor	Study Area Description
Habitats	The area within or immediately adjacent to the Proposed Scheme footprint where habitats could be directly or indirectly affected during construction/operation. The extent of the study area for habitats is illustrated in Figure 12.5 in Volume 3 of this EIAR.
Rare and / or Protected Flora	The area within or immediately adjacent to the Proposed Scheme footprint where rare and/or protected flora could be directly or indirectly affected during construction/operation. The extent of the study area for rare and/or protected flora is illustrated in Figure 12.5 in Volume 3 of this EIAR.
Fauna species other than those listed below (includes badger, otter, other protected mammal species, amphibians, and reptiles)	The area within or immediately adjacent to the Proposed Scheme footprint where fauna species could be directly or indirectly affected during construction/operation. The extent of the study area for fauna species (other than bats and breeding birds) is illustrated in Figure 12.5 in Volume 3 of this EIAR.
Bats	The area suitable for roosting, foraging and/or commuting bats (e.g. bridges, hedgerows, treelines, woodland and watercourses) within or immediately adjacent to the Proposed Scheme footprint where bats could be directly or indirectly affected during construction/operation. The extent of the study area for bat activity is illustrated in Figure 12.1.1 in Volume 3 of this EIAR.
Wintering Birds	The area suitable for wintering birds within or immediately adjacent to the Proposed Scheme footprint where wintering birds could be directly affected during construction/operation. The extent of the study area for wintering birds is illustrated in Figure 12.1.2 in Volume 3 of this EIAR.

12.2.2 Relevant Guidelines, Policy and Legislation

- Environmental Impact Assessment of Projects - Guidance on the preparation of the Environmental Impact Assessment Report (European Commission 2017);
- Environmental Protection Agency (EPA) Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the EPA Guidelines) (EPA 2017);
- Draft Advice Notes for Preparing Environmental Impact Statements (hereafter referred to as the EPA Advice Notes) (EPA 2015);

- Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Commission 2013);
- Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (hereafter referred to as the CIEEM Guidelines) (CIEEM 2018);
- National Roads Authority (NRA) Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (NRA, 2005);
- Guidelines for the Treatment of Badgers during the Construction of National Road Schemes. National Roads Authority (NRA, 2006a);
- Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes. National Roads Authority (NRA, 2006b);
- Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes (NRA, 2008c);
- The Management of Invasive Alien Plant Species on National Roads - Technical Guidance (TII, 2020a);
- The Management of Invasive Alien Plant Species on National Roads – Standard (TII, 2020b)
- Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA 2009);
- Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (NRA 2008a);
- Environmental Impact Assessment of National Road Schemes – A Practical Guide (NRA 2008b);
- Bat Surveys for Professional Ecologists: Good Practice Guidelines 3rd edition (Collins, J (ed.) 2016);
- The Bat Workers' Manual (Mitchell-Jones and McLeish 1999);
- Bat Mitigation Guidelines for Ireland. Irish Wildlife Manuals No. 25 (Kelleher and Marnell 2006);
- The Irish Bat Monitoring Programme 2015 - 2017. Irish Wildlife Manuals 103. (Aughney et al. 2018);
- United Kingdom Highways Agency (UKHA) Design Manual for Roads and Bridges (DMRB) (UKHA 2001a; UKHA 2001b; UKHA 2005);
- National Parks and Wildlife Service (NPWS) Circular NPW 1/10 & PSSP 2/10 Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities (NPWS 2010);
- Circular Letter NPWS 2/07 Guidance on compliance with Regulation 23 of the Habitats Regulations 1997 – strict protection of certain species / applications for derogation licences (NPWS 2007a); and
- Circular Letter PD 2/07 and NPWS 1/07 Compliance Conditions in respect of Developments requiring (1) Environmental Impact Assessment (EIA); or (2) having potential impacts on Natura 2000 sites (NPWS 2007b).

Policy and Planning Documents:

- Department of Culture, Heritage and the Gaeltacht (DCHG) National Biodiversity Plan 2017 - 2021 (DCHG 2017);
- Dublin City Council (DCC) Dublin City Development Plan 2016 - 2022 (DCC 2016);
- Dublin City Biodiversity Action Plan 2015 - 2020 (DCC 2015);
- Fingal Biodiversity Action Plan 2010-2015 (FCC 2010); and
- Fingal Development Plan 2017-2023 (FCC 2017).

Legislation:

- The Habitats Directive;
- 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 (hereafter referred to as the Water Framework Directive (WFD));

- S.I. No. 477/2011 - European Communities (Birds and Natural Habitats) Regulations 2011, as amended (hereafter referred to as the Birds and Habitats Regulations);
- The EIA Directive;
- Planning and Development Acts 2000 to 2021;
- Wildlife Acts 1976 to 2021;
- S.I. No. 356/2015 - Flora (Protection) Order, 2015 (hereafter referred to as the Flora Protection Order); and
- Fisheries Acts 1959 to 2017.

12.2.3 Data Collection and Collation

12.2.3.1 **Desk Study**

A desk study involved collection and review of relevant published and unpublished sources of data, collation of existing information on the ecological environment and consultation with relevant statutory bodies.

The following sources were consulted during the desk study to inform the scope of the ecological surveys:

- Online data available on European sites and on Natural Heritage Areas (NHAs) or proposed Natural Heritage Areas (pNHAs) as held by the NPWS (NPWS Online Database 2021a);
- Online data records available on the National Biodiversity Data Centre Database (NBDC Online Database 2021b);
- Ordnance Survey Ireland (OSI) orthophotography (from 1995 to 2012) for the Proposed Scheme study area;
- Bus Connects Drone Imagery, surveyed 2020 (NTA 2020);
- Records of rare and / or protected species for the 10km (kilometre) grid squares O03, O13 and O23, held by the NPWS;
- Habitat and species GIS datasets provided by the NPWS, including Article 12 and Article 17 data;
- Bat records from Bat Conservation Ireland's (BCI) database;
- Records from the Botanical Society of Britain and Ireland (BSBI);
- Information contained within the Flora of County Dublin (Doogue *et al.* 1998);
- Environmental information/data for the area available from the EPA website (EPA 2020);
- Information on the status of European Union (EU) protected habitats and species in Ireland (NPWS 2019a, NPWS 2019b and NPWS 2019c); and
- Information on light-bellied brent goose inland feeding sites (Scott Cawley Ltd. 2017).

A desk study was carried out to identify suitable bat foraging and / or commuting habitat (e.g. woodland and mature treelines) that may be affected by the Proposed Scheme (e.g. areas where vegetation will, or is likely to be, directly affected by works associated with the Proposed Scheme). Following this, transect routes for bat activity surveys were designed within these areas to encompass a representative sample of the habitats present with the selected area.

A desk study was carried out to identify any potential suitable inland feeding and / or roosting sites for wintering birds located within or directly adjacent to the Proposed Scheme. This included a review of recent aerial photography and known inland feeding sites for the Special Conservation Interest (SCI) bird species light-bellied brent goose *Branta bernicla hrota* (Scott Cawley Ltd. 2017). The desk study identified sites in which significant suitable foraging and/or roosting habitat which directly lost as a consequence of the Proposed Scheme, for further wintering bird surveys.

A desk study was carried out to identify all hydrological crossing points within the footprint of the Proposed Scheme. No in-stream works are proposed and the desk study identified no sites where water bodies may be subject to significant disturbance as a consequence of the Proposed Scheme. As such, instream aquatic habitat surveys were not deemed necessary.

12.2.3.2 **Ecological Surveys**

This Section describes the various ecological survey methodologies used to collate baseline ecological information in the preparation of this Chapter. The ecological surveys carried out are summarised in Table 12.2

Table 12.2: Ecological Surveys and Survey Dates Between 2018 and 2021

Survey	Survey Date(s)	Surveyor Reference
Habitat survey	June to August 2018 August 2020 March 2021	Scott Cawley Ltd.
Mammal surveys (excluding bats)	June to August 2018 August 2020 October 2020 March 2021	Scott Cawley Ltd.
Bat surveys:	Walked transect activity surveys June to August 2018 September and October 2019 May 2020 July 2020 Identification of potential roost features (PRFs) June to August 2018 August 2020 March 2021	Scott Cawley Ltd.
Wintering bird survey	February 2020 October 2020 to March 2021	Scott Cawley Ltd.
Amphibian habitat suitability assessment	June to August 2018 August 2020 March 2021	Scott Cawley Ltd.
Reptile habitat suitability assessment	June to August 2018 August 2020 March 2021	Scott Cawley Ltd.

12.2.3.3 **Habitat Survey**

Habitat surveys were carried out by Scott Cawley Ltd. between June and August 2018, August 2020, and March 2021 at Priorswood Road to capture design changes to the Proposed Scheme. All habitats located within or immediately adjacent to the Proposed Scheme footprint were surveyed and mapped to level three of the Heritage Council's A Guide to Habitats in Ireland habitat codes, after Fossitt (Fossitt 2000) and in accordance with Best Practice Guidance for Habitat Survey and Mapping (Smith et al. 2011). The level of field data quality (as per Smith et al. 2011) was also recorded. Plant species present that were either representative of a habitat or considered to be of conservation interest (i.e. those listed on the Flora Protection Order or listed in the 'threatened' category or higher on the Ireland Red List No. 10 Vascular Plants (NPWS 2016) and the Ireland Red List No. 8 Bryophytes (NPWS 2012)) were recorded, along with their relative abundances. Non-native invasive plant species listed on the Third Schedule of the Birds and Habitats Regulations were also recorded. The habitat's extent was mapped onto an aerial photograph, with Global Positioning System (GPS) points taken where a habitat's extent could not be clearly identified from the aerial photograph. Vascular plant nomenclature follows that of the New Flora of the British Isles Fourth Edition (Stace 2019).

12.2.3.4 **Mammals (Excluding Bats)**

The footprint of the Proposed Scheme and suitable lands e.g. greenfield sites immediately adjacent were surveyed for badger *Meles meles* and otter *Lutra lutra* activity as part of the multidisciplinary walkover survey, undertaken between June and August 2018, and in August 2020. Additional surveys were carried out in March 2021 at Priorswood Road to capture design changes to the Proposed Scheme. The presence / absence of these species was surveyed through the detection of field signs such as tracks, markings, feeding signs, and droppings

as well as by direct observation. In addition, the study area was surveyed for the presence of badger sett and otter holts. Where present, any evidence of use was recorded.

No species-specific surveys were considered necessary for other protected mammal species for which field signs are less frequent and / or less reliable than other larger mammals, such as pine marten *Martes martes*, Irish stoat *Mustela erminea hibernica* and Irish hare *Lepus timidus*. Nevertheless, during all surveys, attention was paid to activity signs such as searching soft muds for tracks, and to look for droppings. Potential presence of these species in suitable habitat was determined based on the habitat preferences described in Exploring Irish Mammals (Hayden and Harrington 2000).

12.2.3.5 **Bats**

The following sections describe the methodologies employed to carry out the various bat surveys undertaken in 2019, 2020 and 2021 to inform the EIAR. The bat surveys were carried out under the following licences, issued by the NPWS:

- Licence DER / BAT 2019-02 (amended) – Derogation licence to disturb bat roosts throughout the State.
- DER / BAT 2020-67 - Derogation licence to disturb bat roosts throughout the State

12.2.3.5.1 Bats - Walked Transect Surveys

Walked bat activity transect surveys were conducted along preselected transect routes at four locations along the Proposed Scheme. Previous iterations of the Proposed Scheme design extended to Father Collin's Park adjacent to Main Street, and Transect routes were located along Main Street Clongriffin at Father Collin's Park, referred to as CBC0001BT001, R139 Belmayne to Northern Cross referred to as CBC0001BT002, along R107 Malahide Road at Maypark (Donnycarney Park) referred to as CBC0001BT003 and along R107 Malahide Road at Clontarf Golf Club referred to as CBC0001BT004. CBC0001BT001 transect route has since been removed from the Proposed Scheme design, however the results from surveys will inform the receiving environment and impact assessment. The walked transect routes are shown on Figure 12.1.1 in Volume 3 of this EIAR.

Walked transect surveys comprised four visits to each transect route across three seasons; autumn, spring and summer as guided by Bat Surveys for Professional Ecologists: Good Practice Guidelines (Bat Conservation Trust 2016) (see Table 12.2 for specific dates). Surveys were conducted in June to August 2018, September and October 2019, May 2020, and July 2020. Surveys commenced approximately 30 minutes after sunset to ensure that bats had emerged from their roosts. Transect route CBC0001BT001 adjacent to Father Collins Park was subject to two survey seasons in 2020 to accommodate changes to the Proposed Scheme design. Surveys in this location were conducted in May 2020 and July 2020.. Surveys involved the surveyor walking each transect route at a slow pace using with a handheld ultrasound bat detector (Elekon Batlogger M) to record any bat species present.

All bat calls were analysed using Elekon BatExplorer software. Calls were manually identified against species descriptions provided within British Bat Calls - A Guide to Species Identification (Russ 2012).

12.2.3.5.2 Bats - Tree Surveys

Trees located within the footprint of the Proposed Scheme were assessed for their potential to support roosting bats (i.e. Potential Roost Features (PRFs)) as part of the multidisciplinary walkover surveys carried out between June and August 2018 and August 2020. Additional surveys were carried out in March 2021 at Priorswood Road to capture design changes to the Proposed Scheme.

A number of trees located across the Proposed Scheme were examined from ground level for the potential to support roosting bats. They were assessed based on the presence of features commonly used by bats. Examples of such features include:

- Natural holes;
- Cracks / splits in major limbs;

- Loose bark; and
- Hollows / cavities.

12.2.3.6 **Wintering Birds**

A desk study was carried out to identify any potential suitable inland feeding and / or roosting sites for winter birds located within or directly adjacent to the Proposed Scheme. This included a review of recent aerial photography and known inland feeding sites for the SCI bird species light-bellied brent goose (Scott Cawley Ltd. 2017).

The desk study identified three sites along or adjacent to the Proposed Scheme with potential for wintering birds that would be subject to direct habitat loss. This was located at lands opposite the Hilton Hotel at the junction of R107 Malahide Road / R135 referred to as CBC0001WB001, an area of amenity grassland adjacent to Buttercup Park referred to as CBC0001WB002 and proposed for use as a Construction Compound CL1, and Maypark referred to as CBC0001WB003.

A field survey was carried out to confirm the suitability or presence of wintering birds at CBC0001WB001. The survey deemed the lands to be unsuitable feeding and / or roosting sites for wintering birds, due to habitat conditions being dominated by scrub with mosaics of recolonising bare ground and subject to high levels of disturbance and dumping of household and construction waste. As such, it was not deemed necessary to carry out further wintering bird surveys. The results of the desk-based study have informed the assessment of potential impacts on wintering bird species arising from the Proposed Scheme.

CBC0001WB002 and CBC0001WB003 were deemed suitable for wintering birds and were surveyed twice a month, between the months November 2020 and February 2021. The results of the desk study and field surveys have informed the assessment of potential impacts on wintering bird species arising from the Proposed Scheme.

The approach for wintering bird surveys was a ‘look-see’ methodology (based on Gilbert et al. 1998). All birds present within a site were identified with reference to Collins Bird Guide (Svensson, 2010) to confirm identification (where necessary), and were recorded using the British Trust for Ornithology (BTO) species codes. The total flock size of birds present, their general location within the site and any activity exhibited were also recorded. Bird droppings were recorded along walked transect lines.

12.2.3.7 **Reptiles**

The suitability of habitats, located within and immediately adjacent to the Proposed Scheme, were assessed for breeding and / or hibernating reptile species common lizard *Zootocavivipara*, as part of the multi-disciplinary walkover surveys undertaken between June and August 2018 and in August 2020. Additional surveys were carried out in March 2021 at Priorswood Road to capture design changes to the Proposed Scheme.

12.2.3.8 **Amphibians**

An assessment of the suitability of surface water features, such as watercourses, drainage ditches and ponds for amphibian species (common frog *Rana temporaria* and smooth newt *Lissotriton vulgaris*) along the footprint of the Proposed Scheme, and suitable lands immediately adjacent, was carried out as part of the multi-disciplinary walkover surveys undertaken between June and August 2018 and in August 2020. Additional surveys were carried out in March 2021 at Priorswood Road to capture design changes to the Proposed Scheme.

12.2.4 Appraisal Method for the Assessment of Impacts

The biodiversity and ecological impacts of the Proposed Scheme have been assessed using the following guidelines:

- Environmental Impact Assessment of Projects - Guidance on the preparation of the Environmental Impact Assessment Report (European Commission 2017);
- EPA Guidelines (EPA 2017);

- EPA Advice Notes (EPA 2015);
- Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Commission 2013);
- CIEEM Guidelines (CIEEM 2018); and
- Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA 2009).

12.2.4.1 **Valuing the Ecological Receptors**

Biodiversity receptors (including identified sites of biodiversity importance) have been valued with regard to the ecological valuation examples set out in the Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA 2009). These include International Importance, National Importance, County Importance, and Local Importance.

Habitat areas within Special Areas of Conservation (SACs) and Special Areas of Conservation (SPAs) are considered in the context of assessing impacts on the conservation objectives and site integrity of a given European site with regard to the Appropriate Assessment (AA) tests set out in Article 6(3) of the Habitats Directive. An AA Screening Report and Natura Impact Statements have been submitted with the application for approval as to enable the Board to carry out the requisite assessments for the purposes of Article 6(3) of the Habitats Directive. For the purposes of the appraisal of likely significant effects on biodiversity arising from the Proposed Scheme, as part of this chapter of the EIAR, all European sites are valued as internationally important.

In accordance with the Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA 2009), biodiversity features within the ZoI of the Proposed Scheme which are '*both of sufficient value to be material in decision making and likely to be affected significantly'* are deemed to be KERs. These are the biodiversity receptors which may be subject to likely significant impacts from the Proposed Scheme, either directly or indirectly. KERs are those biodiversity receptors with an ecological value of Local Importance (Higher Value) or greater.

12.2.4.2 **Characterising and Describing the Impacts**

The parameters considered in characterising and describing the magnitude or scale of the likely significant effects of the Proposed Scheme are outlined in Table 12.3.

Table 12.3: Parameters used to Characterise and Describe the Magnitude or Scale of Potential Impacts

Parameter	Categories
Type of impact	Positive / Neutral / Negative May also include Cumulative Effects, 'Do Nothing Effects', 'Do Minimum Effects', Indeterminable Effects, Irreversible Effects, Residual Effects, Synergistic Effects, Indirect Effects and / or Secondary Effects
Extent	The size of the affected area / habitat and / or the proportion of a population affected by the effect
Duration	The period of time over which the effect will occur*.
Frequency and Timing	How often the effect will occur; particularly in the context of relevant life-stages or seasons
Reversibility	Permanent / Temporary Will and impact reverse; either spontaneously or as a result of a specific action

*Note: The above terms / definitions for describing the duration of impacts are provided in the EPA Guidelines (EPA 2017): Momentary Effects - effects lasting from seconds to minutes; Brief Effects - effects lasting less than a day; Temporary Effects - effects lasting less than a year; Short-term Effects - effects lasting one to seven years; Medium-term Effects - effects lasting seven to 15 years; Long-term Effects - effects lasting 15 to 60 years; Permanent Effects - effects lasting over 60 years.

The likelihood of an impact occurring, and the predicted effects, are also an important consideration in characterising impacts. The likelihood of an impact occurring is assessed as being certain, likely or unlikely and; in some cases, it may be possible to definitively conclude that an impact will not occur.

Professional judgement is used in considering the contribution of all relevant criteria in determining the overall magnitude of an impact.

12.2.4.3 **Impact Significance**

In determining impact significance, the Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA 2009) and the CIEEM Guidelines (CIEEM 2019) were followed, which requires examination of the following two key elements:

- Impact on the integrity of the ecological feature; and
- Impact on its conservation status within a given geographical area.

12.2.4.3.1 Integrity

The term 'integrity' should be regarded as the coherence of ecological structure and function, across the entirety of a site that enables it to sustain all of the biodiversity or ecological resources for which it has been valued (NRA 2009).

The term 'integrity' is most often used when determining impact significance in relation to designated areas for nature conservation (e.g. SACs, Special Protection Areas (SPAs) or pNHAs / NHAs) but can often be the most appropriate method to use for non-designated areas of biodiversity value where the component habitats and / or species exist with a defined ecosystem at a given geographic scale.

An impact on the integrity of an ecological site or ecosystem is considered to be significant if it moves the condition of the ecosystem away from a favourable condition: removing or changing the processes that support the sites' habitats and / or species; affect the nature, extent, structure and functioning of component habitats; and / or, affect the population size and viability of component species.

12.2.4.3.2 Conservation Status

The definitions for conservation status given in the Habitats Directive, in relation to habitats and species, are also used in the CIEEM Guidelines (CIEEM 2018) and the Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA 2009):

- For natural habitats, conservation status means the sum of the influences acting on the natural habitat and its typical species, that may affect its long-term distribution, structure and functions as well as the long-term survival of its typical species, at the appropriate geographical scale; and
- For species, conservation status means the sum of influences acting on the species concerned that may affect the long-term distribution and abundance of its populations, at the appropriate geographical scale.

An impact on the conservation status of a habitat or species is considered to be significant if it will result in a change in conservation status.

After the definitions provided in the Habitats Directive, the conservation status of a habitat is favourable when:

- Its natural range and areas it covers within that range are stable or increasing;
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future; and
- The conservation status of its typical species is favourable as defined below under species.

Moreover, the conservation status of a species is favourable when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

According to the CIEEM Guidelines and the Guidelines for Assessment of Ecological Impacts of National Road Schemes methodology, if it is determined that the integrity and / or conservation status of an ecological feature will be impacted on, then the level of significance of that impact is related to the geographical scale at which the impact will occur (i.e. local, county, national, international). In some cases, an impact may not be significant at the geographic scale at which the ecological feature has been valued but may be significant at a lower geographical level. For example, a particular impact may not be considered likely to have a negative effect on the overall conservation status of a species which is considered to be internationally important. However, an impact may occur at a local level on this internationally important species. In this case, the impact on an internationally important species is considered to be significant at only a local, rather than international level.

12.3 Baseline Environment

The Proposed Scheme has an overall length of approximately 5.7km, and is routed along the R107 Malahide Road from Mayne River Avenue – R107 Malahide Road Junction to the junction with Marino Mart - Fairview and also routed for cyclists via the junction with Malahide Road-Brian Road along Carleton Road, St Aidan's Park, Haverty Road and Marglann Marino, all in the County of Dublin and within the Dublin City Council (DCC) administrative area. From here the scheme ties into a separate project, Clontarf to City Centre Cycle & Bus Priority Project, currently being developed by DCC. The Clontarf to City Centre Cycle & Bus Priority Project will provide segregated cycling facilities and bus priority infrastructure along a 2.7km route that extends from Clontarf Road at the junction with Alfie Byrne Road, to Amiens Street at the junction with Talbot Street in the City Centre. The start of the scheme ties into a separate project being developed by DCC namely, The Belmayne Main Street and Belmayne Avenue Scheme, which provides bus and cycle linkages to Clongriffin Dart Station.

Where the Proposed Scheme commences at Mayne River Avenue – R107 Malahide Road Junction southwards along R107 Malahide Road from the R139 Junction, habitats include an area of undeveloped bare and recolonising ground with mosaics of scrub and unmanaged grassland north-east of the junction. The Proposed Scheme is bordered by areas of amenity grassland and dry meadows and grassy verges to the west, and buildings and artificial surfaces associated with Clarehall Retail Centre to the east. Existing residential developments dominate as the Proposed Scheme extends southwards along R107 Malahide Road and crosses the River Santry. Residential areas and buildings and artificial surfaces are found in association with mosaics of landscaped habitats including hedgerows, treelines and amenity grassland. Amongst the urban-dominated habitats throughout Donnycarney, the Proposed Scheme is bordered by Maypark (Donnycarney Park), Clontarf Golf Club and Fairview Park where the scheme terminates. Habitats associated with the golf club and parks in the vicinity of the Proposed Scheme include hedgerows, treelines, scattered trees and parkland, and amenity grassland.

12.3.1 ZoI

The ZoI, or distance over which a likely significant effect may occur, will differ across the KERs, depending on the predicted impacts and the potential impact pathway(s). The results of both the desk study and the suite of ecological field surveys undertaken has established the habitats and species present along the alignment of the Proposed Scheme. The ZoI is then informed and defined by the sensitivities of each of the ecological receptors present, in conjunction with the nature and potential impacts associated with the Proposed Scheme. In some instances, the ZoI extends beyond the study area as described in Table 12.1 (e.g. surface water quality effects of a sufficient magnitude can extend, and affect, receptors at significant distances downstream).

The ZoI of the Proposed Scheme in relation to terrestrial habitats is generally limited to the footprint of the Proposed Scheme, and the immediate environs (to take account of shading or other indirect impacts, such as air quality). Hydrogeological / hydrological linkages (e.g. rivers or groundwater flows) between impact sources and wetland / aquatic habitats can often result in impacts occurring at significant distances.

The underlying aquifers are either Locally Important Bedrock Aquifer, Moderately Productive only in Local Zones or Poor Bedrock Aquifer, Moderately Productive only in Local Zones. These types of aquifers are associated with low permeability which decreases with depth. An upper shallow zone of higher permeability may exist in the top few meters and is associated with relatively short flow paths. Therefore any influence on the groundwater as a result of the proposed works will be localised a will not extend to any groundwater dependant habitats which are

all located over 400m from any proposed work. This ZoI follows is determined by the professional judgement of the hydrogeology specialists. This is further discussed with reference to specific construction activities in Chapter 14 (Land, Soils, Geology & Hydrogeology).

The unmitigated ZoI of air quality effects is generally local to the Proposed Scheme and not greater than a distance of 50m from the Proposed Scheme boundary, and 500m from Construction Compound during the Construction Phase, and up to 200m the Proposed Scheme boundary or local road networks experiencing a change in AADT (Annual Average Daily Traffic) flows greater than 1,000 during the Operational Phase (refer to Chapter 7 (Air Quality) for more detail).

With regards to hydrological impacts, the distances over which water-borne pollutants are likely to remain in sufficient concentrations to have a likely significant effect on receiving waters and associated wetland / terrestrial habitat is highly site-specific and related to the predicted magnitude of any potential pollution event. Evidently, it will depend on volumes of discharged waters, concentrations and types of pollutants (in this case sediment, hydrocarbons, and heavy metals), volumes of receiving waters, and the ecological sensitivity of the receiving waters. In the case of the Proposed Scheme, this includes: all estuarine habitats downstream of where the Proposed Scheme will drain to or cross water bodies listed in Table 12.4, and the marine environment of Dublin Bay and the Mayne Estuary (See Figure 12.2).

As such, the potential ZoI for aquatic plant and animal species includes all estuarine habitats located downstream of where the Proposed Scheme will drain to the proposed crossing points listed in Table 12.4, and the marine environment of Dublin Bay. The ZoI for impacts to aquatic fauna species, such as Atlantic salmon *Salmo salmar* and lamprey species *Lampetra* spp., is limited to those water courses that will be crossed by the Proposed Scheme or water bodies to which runoff from the Proposed Scheme could drain to during construction.

Table 12.4 Water bodies Hydrologically Connected to the Proposed Scheme and Within its ZoI

Waterbody Name	Connectivity to the Proposed Scheme
River Santry (Santry_020)	Crosses the Proposed Scheme
Wad River	Crosses the Proposed Scheme
River Mayne (Mayne_010)	c. 300m north of the Proposed Scheme
Liffey Estuary Lower	*c.* 3km downstream of Santry_020 crossing
Tolka Estuary	*c.* 3km downstream of Santry_020 crossing
North Bull Island	*c.* 3km downstream of Santry_020 crossing
Mayne Estuary	*c.* 3km downstream of Mayne_010
Dublin Bay	Connectivity via existing surface water infrastructure discharging to North Bull Island and Tolka Estuary

The ZoI for small mammal species, such as the pygmy shrew, would be expected to be limited to no more than approximately 100m from the Proposed Scheme boundary due to their small territory sizes and sedentary lifecycle. The ZoI for otters, badgers, stoat, and hedgehogs may extend over greater distances than small mammal and bird species due to their ability to disperse many kilometres from their natal / resting sites. The ZoI of impacts for significant disturbance impacts to badger and otter breeding / resting places may extend as far as approximately 150m from the Proposed Scheme boundary. This ZoI (i.e. approximately 150m from Proposed Scheme boundary) for badgers and otters has been defined in accordance with the Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (NRA 2005) and the Guidelines for the Treatment of Badgers Prior to the Construction of National Road Schemes (NRA 2006a) and is considered to be of a precautionary distance. During construction-related disturbance, the screening effect provided by surrounding vegetation and buildings would likely reduce the actual distance of the ZoI for badgers and otters.

The ZoI of potential effects to bat roosts would not be expected to exceed approximately 200m in most cases but as effects are dependent on many factors (such as species, roost type, surrounding habitat, commuting routes *etc.*), this is assessed on a case by case basis and the ZoI may increase / decrease from this distance accordingly. Given the large foraging ranges for some species, the ZoI of potential landscape scale impacts, such as habitat loss and severance, could extend for several kilometres from the Proposed Scheme but the most significant effects are likely to occur within 1km of important roost sites (e.g. maternity roosts). Leisler's bats have been recorded foraging up to 13km from maternity roost sites (Shiel et al. 1999).

The ZoI of the Proposed Scheme in relation to likely significant effects on most breeding bird species is generally limited to habitat loss within the footprint of the Proposed Scheme, and disturbance / displacement during construction and disruption in territorial singing due to noise during operation. Disturbance effects may extend for several hundred metres from the Proposed Scheme.

The ZoI in relation to disturbance impacts to wintering birds could extend up to approximately 300m from the Proposed Scheme for general construction activities, as many species (such as waterbirds) are highly susceptible to disturbance from loud and unpredictable noise during construction. However, as many estuarine bird species use inland habitat areas at distances from the coast, the ZoI for ex-situ impacts could extend a considerable distance from the Proposed Scheme. In the case of the Proposed Scheme, impacts to wintering birds within this 300m band could affect the use of potential ex-situ sites for bird species listed as SCIs of European sites.

Current understanding of construction related noise disturbance to wintering waterbirds is based on the research presented in Cutts et al. (2009) (Cutts et al. 2009) and Wright et al. (2010) (Wright et al. 2010). In terms of construction noise, levels below 50dB (decibels) are not expected to result in any response from foraging or roosting birds. Noise levels between 50dB and 70dB would provoke a moderate effect / level of response from birds (i.e. birds becoming alert and some behavioural changes (e.g. reduced feeding activity)), but birds are expected to habituate to noise levels within this range. Noise levels above 70dB are likely result in birds moving out of the affected zone or leaving the site altogether. At approximately 300m, typical noise levels associated with construction activity (British Standard Institute (BSI) British Standard (BS) 5228-1:2009 +A1:2014 Code of Practice for noise and vibration control of construction and open sites - Part 1: Noise (hereafter referred to as BS 5228–1) (BSI 2008)) are generally below 60dB or, in most cases, are approaching the 50dB threshold.

The ZoI in relation to amphibian species is likely to be limited to direct habitat loss and severance within the Proposed Scheme boundary and / or indirect impacts to water quality in wetland habitats hydrologically connected to the Proposed Scheme.

The ZoI in relation to the common lizard is likely to be limited to direct habitat loss and severance within and across the Proposed Scheme boundary and disturbance / displacement effects in the immediate vicinity during construction.

12.3.2 Desk Study

The results of the desk study review are provided in Appendix A12.1 in Volume 4 of this EIAR and are incorporated into the sections below under the various headings, as relevant.

12.3.3 Biodiversity Areas

The Dublin City Biodiversity Action Plan 2015 – 2020 (DCC 2015) highlights a number of areas considered to be of biodiversity value present within the DCC administrative boundary. These areas that are located within the ZoI of the Proposed Scheme are provided below:

- Dublin City's Green Infrastructure Network. Habitats within the Proposed Scheme which are considered to contribute to the Green Infrastructure Network include grassland, hedgerows, treelines and woodlands, which support a range of species and act as ecological links/corridors across the wider landscape;
- Network of parks and public green spaces, such as Maypark, Fairview Park, Clontarf Golf Club and private gardens, which support a variety of species and is considered to be a valuable biodiversity resource; and
- Dublin City's network of rivers, streams and riparian zones. The Proposed Scheme is hydrologically connected to the Santry_020 and Mayne_010, which supports a range of riverine bird species, such as kingfisher, and fish species. It also supports an active otter *Lutra lutra* population.

Local biodiversity areas listed above are considered under the relevant flora and / or fauna KERs that rely on these areas in the overall EIAR biodiversity assessment.

12.3.4 Designated Areas for Nature Conservation

12.3.4.1 **European sites**

The Proposed Scheme does not overlap with any European site. The nearest European site is South Dublin Bay and River Tolka Estuary SPA which is located *c.* 0.5km east of the Proposed Scheme.

There are eight European sites located in Dublin Bay that are downstream of the Proposed Scheme. These European sites are North Dublin Bay SAC, South Dublin Bay SAC, Howth Head SAC, Rockabill to Dalkey Island SAC, North Bull Island SPA, South Dublin Bay and River Tolka SPA, Howth Head Coast SPA, and Dalkey Island SPA. European sites will be hydrologically connected to the Proposed Scheme via the River Santry, Wad River, and existing drainage pipes which discharge directly to the bay.

The Proposed Scheme terminates at Mayne River Avenue, *c.* 300m south of the Mayne_010. The Proposed Scheme will be connected to the Mayne_010 via the existing surface water drainage network. There are two European sites located in the Mayne Estuary transitional waterbody that are downstream of the Proposed Scheme. These European sites are Baldoyle Bay SAC and Baldoyle Bay SPA and have been included in the ZoI.

There are twelve SPAs designated for SCI species that are known to forage and / or roost at inland sites across Dublin City and / or utilise Dublin Bay: Malahide Estuary SPA, Baldoyle Bay SPA, Rogerstown Estuary SPA, Skerries Islands SPA, North Bull Island SPA, South Dublin Bay and River Tolka SPA, Ireland's Eye SPA, Lambay Island SPA, Howth Head Coast SPA, Dalkey Islands SPA, Rockabill SPA, and The Murrough SPA.

In addition, Lambay Island SAC and Rockabill to Dalkey Island SAC are designated for mobile Qualifying Interest (QI) species known to utilise Dublin Bay and the Mayne Estuary.

There are 24 no. European sites (SACs or SPAs) located in the wider area of the Proposed Scheme. These are listed in Table 12.5 and illustrated in Figure 12.3 in Volume 3 of this EIAR. Table 12.5 lists these sites, their distance (i.e. as the crow flies) from the Proposed Scheme, and the sites' designations (QIs/SCIs). There are 18 sites located within the ZoI of the Proposed Scheme (see Table 12.5).

It is confirmed that, for the purposes of the EIAR, these European sites are all valued as being of International Importance.

Table 12.5: European sites (SACs and SPAs) Located with the ZoI (highlighted in light blue), and those in the Wider Area, of the Proposed Scheme Boundary.

Site Name	Distance	Designation – QIs or SCIs
SAC		
Baldoyle Bay SAC [000199]	*c.* 2.4km east of the Proposed Scheme	Annex I Habitats: • Mudflats and sandflats not covered by seawater at low tide [1140]; • *Salicornia* and other annuals colonising mud and sand [1310]; • Atlantic salt meadows (*Glauco - Puccinellietalia maritimae*) [1330]; and • Mediterranean salt meadows (*Juncetalia maritimi*) [1410]. *S.I. No. 472/2021 - European Union Habitats (Baldoyle Bay Special Area of Conservation 000199) Regulations 2021*Source: Conservation Objectives: Baldoyle Bay SAC 000199. Version 1. (NPWS 2012a)
North Dublin Bay SAC [000206]	*c.* 2.7km south-east of the Proposed Scheme	Annex I Habitats: • Mudflats and sandflats not covered by seawater at low tide [1140]; • Annual vegetation of drift lines [1210]; • *Salicornia* and other annuals colonising mud and sand [1310]; • Atlantic salt meadows (*Glauco - Puccinellietalia maritimae*) [1330]; • Mediterranean salt meadows (*Juncetalia maritimi*) [1410]; • Embryonic shifting dunes [2110]; • Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes') [2120];

Site Name	Distance	Designation – QIs or SCIs
		• * Fixed coastal dunes with herbaceous vegetation ('grey dunes') [2130]; and • Humid dune slacks [2190]. Annex II Species: • Petalwort *Petalophyllum ralfsii* [1395]. *S.I. No. 524/2019 – European Union Habitats (North Dublin Bay Special Area of Conservation 000206) Regulations 2019* Source: Conservation Objectives: North Dublin Bay SAC 000206. Version 1. (NPWS 2013a)
South Dublin Bay SAC [000210]	*c.* 3.3km south-east of Proposed Scheme	Annex I Habitats: • Mudflats and sandflats not covered by seawater at low tide [1140] • Annual vegetation of drift lines [1210] • *Salicornia* and other annuals colonizing mud and sand [1310] • Embryonic shifting dunes [2110] *S.I. No. 525/2019 - European Union Habitats (South Dublin Bay Special Area of Conservation 000210) Regulations 2019* Source: Conservation Objectives: South Dublin Bay SAC 000210. Version 1. (NPWS 2013b)
Malahide Estuary SAC [000205]	*c.* 4.9km north of Proposed Scheme	Annex I Habitats: • Mudflats and sandflats not covered by seawater at low tide [1140]; • *Salicornia* and other annuals colonising mud and sand [1310]; • Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]; • Mediterranean salt meadows (*Juncetalia maritimi*) [1410]; • Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120]; and • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]. *S.I. No. 525/2019 – European Union Habitats (South Dublin Bay Special Area of Conservation 000210) Regulations 2019* Source: Conservation Objectives: Malahide Estuary SAC 000205. Version 1. (NPWS 2013c)
Howth Head SAC [000202]	*c.* 6.4km east of the Proposed Scheme	Annex I Habitats: • Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]; and • European dry heaths [4030]. *S.I. No. 524/2021 - European Union Habitats (Howth Head Special Area of Conservation 000202) Regulations 2021* Source: Conservation Objectives: Howth Head SAC 000202. Version 1. (NPWS 2016)
Ireland's Eye SAC [002193]	*c.* 7.2km east of the Proposed Scheme	Annex I Habitats: • Perennial vegetation of stony banks [1220]; and • Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]. *S.I. No. 501/2017 – European Union Habitats (Ireland's Eye Special Area of Conservation 002193) Regulations 2017* Source: Conservation Objectives: Ireland's Eye SAC 002193. Version 1. (NPWS 2017a)
Rockabill to Dalkey Island SAC [003000]	*c.* 7.2km east of the Proposed Scheme	Annex I Habitats: • Reefs [1170]. Annex II Species: • Harbour porpoise *Phocoena phocoena* [1351]. *S.I. No. 94/2019 – European Union Habitats (Rockabill To Dalkey Island Special Area Of Conservation 003000) Regulations 2019* Source: Conservation Objectives: Rockabill to Dalkey Island SAC 003000. Version 1. (NPWS 2013d)

Site Name	Distance	Designation – QIs or SCIs
Rogerstown Estuary SAC [000208]	*c.* 10.2km north of the Proposed Scheme	Annex I Habitats: • Estuaries [1130]; • Mudflats and sandflats not covered by seawater at low tide [1140]; • Salicornia and other annuals colonising mud and sand [1310]; • Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]; • Mediterranean salt meadows (*Juncetalia maritimi*) [1410]; • Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]; and, • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]. *S.I. No. 286/2018 – European Union Habitats (Rogerstown Estuary Special Area of Conservation 000208) Regulations 2018* Source: Conservation Objectives: Rogerstown Estuary SAC 000208. Version 1. (NPWS, 2013e)
Lambay Island SAC [000204]	*c.* 13.4km north east of Proposed Scheme	Annex I Habitats: • Reefs [1170]; and, • Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Annex II Species: • Grey seal *Halichoerus grypus* [1364]; and, • Harbour seal *Phoca vitulina* [1365]. *S.I. No. 294/2019 - European Union Habitats (Lambay Island Special Area Of Conservation 000204) Regulations 2019* Source: Conservation objectives for Lambay Island SPA [000204]. Version 1.0. (NPWS 2013f)
Wicklow Mountains SAC [002122]	*c.* 14.4km south of Proposed Scheme	Annex I Habitats: • Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110]; • Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or *Isoeto-Nanojuncetea* [3130]; • Natural dystrophic lakes and ponds [3160]; • Northern Atlantic wet heaths with *Erica tetralix* [4010]; • European dry heaths [4030]; • Alpine and Boreal heaths [4060]; • Calaminarian grasslands of the *Violetalia calaminariae* [6130]; • Species-rich *Nardus* grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) [6230]; • Blanket bogs (* if active bog) [7130]; • Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*) [8110]; • Calcareous rocky slopes with chasmophytic vegetation [8210]; • Siliceous rocky slopes with chasmophytic vegetation [8220]; and • Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]. Annex II Species: • Otter *Lutra lutra* [1355]. Source: Conservation Objectives: Wicklow Mountains SAC 002122. Version 1. (NPWS 2017b)
Glenasmole Valley SAC [001209]	*c.* 14.8km south of Proposed Scheme	Annex I Habitats: • Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) [6210]; • *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410]; and • Petrifying springs with tufa formation (*Cratoneurion*) [7220].

Site Name	Distance	Designation – QIs or SCIs
		S.I. No. 345/2021 - European Union Habitats (Glenasmole Valley Special Area of Conservation 001209) Regulations 2021 Conservation objectives for Glenasmole Valley SAC [001209]. Generic Version 8.0. DCHG (NPWS 2021a)
SPA		
South Dublin Bay and River Tolka Estuary SPA [004024]	*c.* 0.5km south of the Proposed Scheme	• Light-bellied Brent Goose *Branta bernicla hrota* [A046]; • Oystercatcher *Haematopus ostralegus* [A130]; • Ringed Plover *Charadrius hiaticula* [A137]; • Grey Plover *Pluvialis squatarola* [A140]; • Knot *Calidris canutus* [A143]; • Sanderling *Calidris alba* [A144]; • Dunlin *Calidris alpina* [A149]; • Bar-tailed Godwit *Limosa lapponica* [A157]; • Redshank *Tringa totanus* [A162]; • Black-headed Gull *Chroicocephalus ridibundus* [A179]; • Roseate Tern *Sterna dougallii* [A192]; • Common Tern *Sterna hirundo* [A193]; • Arctic Tern *Sterna paradisaea* [A194]; and • Wetlands and Waterbirds [A999]. *S.I. No. 212/2010 – European Communities (Conservation of Wild Birds (South Dublin Bay and River Tolka Estuary Special Protection Area 004024) Regulations 2010.* Source: Conservation Objectives: South Dublin Bay and River Tolka Estuary SPA 004024. Version 1. (NPWS 2015a) and Natura 2000 – Standard Data Form (NPWS 2020a)
Baldoyle Bay SPA [004016]	*c.* 2.8km east of Proposed Scheme	• Light-bellied Brent Goose *Branta bernicla hrota* [A046]; • Shelduck *Tadorna tadorna* [A048]; • Ringed Plover *Charadrius hiaticula* [A137]; • Golden Plover *Pluvialis apricaria* [A140]; • Grey Plover *Pluvialis squatarola* [A141]; • Bar-tailed Godwit *Limosa lapponica* [A157]; and • Wetlands and Waterbirds [A999]. *S.I. No. 275/2010 – European Communities (Conservation of Wild Birds (Baldoyle Bay Special Protection Area 004016) Regulations 2010.* Sources: Conservation Objectives: Baldoyle Bay SPA 004016. Version 1. (NPWS 2013g) and Natura 2000 – Standard Data Form (NPWS 2020b)
North Bull Island SPA [004006]	*c.* 2.7km east of the Proposed Scheme	• Light-bellied Brent Goose *Branta bernicla hrota* [A046]; • Shelduck *Tadorna tadorna* [A048]; • Teal *Anas crecca* [A052]; • Pintail *Anas acuta* [A054]; • Shoveler *Anas clypeata* [A056]; • Oystercatcher *Haematopus ostralegus* [A130]; • Golden Plover *Pluvialis apricaria* [A140]; • Grey Plover *Pluvialis squatarola* [A141]; • Knot *Calidris canutus* [A143]; • Sanderling *Calidris alba* [A144]; • Dunlin *Calidris alpina* [A149]; • Black-tailed Godwit *Limosa limosa* [A156]; • Bar-tailed Godwit *Limosa lapponica* [A157]; • Curlew *Numenius arquata* [A160]; • Redshank *Tringa tetanus* [A162]; • Turnstone *Arenaria interpres* [A169]; • Black-headed Gull *Chroicocephalus ridibundus* [A179]; and • Wetlands and Waterbirds [A199].

Site Name	Distance	Designation – QIs or SCIs
		S.I. No. 211/2010 – European Communities (Conservation of Wild Birds (North Bull Island Special Protection Area 004006) Regulations 2010. Source: Conservation Objectives: North Bull Island SPA 004006. Version 1. (NPWS 2015b) and Natura 2000 – Standard Data Form (NPWS 2020c)
Malahide Estuary SPA [004025]	*c.* 5.5km north of Proposed Scheme	• Great Crested Grebe *Podiceps cristatus* [A005]; • Light-bellied Brent Goose *Branta bernicla hrota* [A046]; • Shelduck *Tadorna tadorna* [A048]; • Pintail *Anas acuta* [A054]; • Goldeneye *Bucephala clangula* [A067]; • Red-breasted *Merganser Mergus serrator* [A069]; • Oystercatcher *Haematopus ostralegus* [A130]; • Golden Plover *Pluvialis apricaria* [A140]; • Grey Plover *Pluvialis squatarola* [A141]; • Knot *Calidris canutus* [A143]; • Dunlin *Calidris alpina* [A149]; • Black-tailed Godwit *Limosa limosa* [A156]; • Bar-tailed Godwit *Limosa lapponica* [A157]; • Redshank *Tringa totanus* [A162]; and, • Wetland and Waterbirds [A999]. *S.I. No. 285/2011 – European Communities (Conservation of Wild Birds (Malahide Estuary Special Protection Area 004025) Regulations 2011* Sources: Conservation Objectives: Malahide Estuary SPA 004025. Version 1. (NPWS 2013h) and Natura 2000 – Standard Data Form (NPWS 2020d)
Ireland's Eye SPA [004117]	*c.* 7km east of Proposed Scheme	• Cormorant *Phalacrocorax carbo* [A017]; • Herring Gull *Larus argentatus* [A184]; • Kittiwake *Rissa tridactyla* [A188]; • Guillemot *Uria aalge* [A199]; and • Razorbill *Alca torda* [A200]. *S.I. No. 240/2010 – European Communities (Conservation of Wild Birds (Ireland's Eye Special Protection Area 004117) Regulations 2010.* Source: Conservation objectives for Ireland's Eye SPA [004117]. Generic Version 8.0. (NPWS 2021b) and Natura 2000 – Standard Data Form (NPWS 2020e)
Howth Head Coast SPA [004113]	*c.* 8.3km east of the Proposed Scheme	• Kittiwake *Rissa tridactyla* [A188]. *S.I. No. 185/2012 – European Communities (Conservation of Wild Birds (Howth Head Coast Special Protection Area 004113)) Regulations 2012.* Source: Conservation objectives for Howth Head Coast SPA [004113]. Generic Version 8.0. (NPWS 2021c) and Natura 2000 – Standard Data Form (NPWS 2020f)
Rogerstown Estuary SPA [004015]	*c.* 10.4km north of Proposed Scheme	• Greylag Goose *Anser anser* [A043]; • Light-bellied Brent Goose *Branta bernicla hrota* [A046]; • Shelduck *Tadorna tadorna* [A048]; • Shoveler *Anas clypeata* [A056]; • Oystercatcher *Haematopus ostralegus* [A130]; • Ringed Plover *Charadrius hiaticula* [A137]; • Grey Plover *Pluvialis squatarola* [A141]; • Knot *Calidris canutus* [A143]; • Dunlin *Calidris alpina* [A149]; • Black-tailed Godwit *Limosa limosa* [A156]; • Redshank *Tringa totanus* [A162]; and, • Wetland and Waterbirds [A999]. *S.I. No. 271/2010 – European Communities (Conservation of Wild Birds (Rogerstown Estuary Special Protection Area 004015) Regulations 2010.*

Site Name	Distance	Designation – QIs or SCIs
		Source: Conservation Objectives: Rogerstown Estuary SPA 004015. Version 1. (NPWS, 2013i) and Natura 2000 – Standard Data Form (NPWS, 2020g)
Lambay Island SPA [004069]	*c.* 13.3km north east of Proposed Scheme	• Fulmar *Fulmarus glacialis* [A009]; • Cormorant *Phalacrocorax carbo* [A017]; • Shag *Phalacrocorax aristotelis* [A018]; • Greylag Goose *Anser anser* [A043]; • Lesser Black-backed Gull *Larus fuscus* [A183]; • Herring Gull *Larus argentatus* [A184]; • Kittiwake *Rissa tridactyla* [A188]; • Guillemot *Uria aalge* [A199]; • Razorbill *Alca torda* [A200]; and • Puffin *Fratercula arctica* [A204]. *S.I. No. 242/2010 – European Communities (Conservation of Wild Birds (Lambay Island Special Protection Area 004069)) Regulations 2010.* Source: Conservation Objectives: Lambay SPA [004069]. Generic Version 8.0. (NPWS 2021d) and Natura 2000 – Standard Data Form (NPWS 2020h)
Dalkey Island SPA [004172]	*c.* 13.1km east of Proposed Scheme	• Roseate Tern *Sterna dougallii* [A192]; • Common Tern *Sterna hirundo* [A193]; and • Arctic Tern *Sterna paradisaea* [A194]. *S.I. No. 238/2010 – European Communities (Conservation of Wild Birds (Dalkey Islands Special Protection Area 004172)) Regulations 2010.* Source: Conservation Objectives for Dalkey Islands SPA [004172]. Generic Version 8.0. (NPWS 2021e) and Natura 2000 – Standard Data Form (NPWS 2020i)
Rockabill SPA [004014]	*c.* 19.7km north east of the Proposed Scheme	• Purple Sandpiper *Calidris maritima* [A148; • Roseate Tern *Sterna dougallii* [A192]; • Common Tern *Sterna hirundo* [A193]; and, • Arctic Tern *Sterna paradisaea* [A194]. *S.I. No. 94/2012 – European Communities (Conservation of Wild Birds (Rockabill Special Protection Area 004014) Regulations 2012.* Source: Conservation Objectives: Rockabill SPA [004014]. Version 1. (NPWS, 2013X) and Natura 2000 – Standard Data Form (NPWS, 2018X)
Wicklow Mountains SPA [004040]	*c.* 14.7km south of the Proposed Scheme	• Merlin *Falco columbarius* [A098]; and • Peregrine *Falco peregrinus* [A103]. *S.I. No. 586/2012 – European Communities (Conservation of Wild Birds (Wicklow Mountains Special Protection Area 004040) Regulations 2012.* Source: Conservation Objectives: Wicklow Mountain SPA 004040. Generic Version 8.0. (NPWS 2021f) and Natura 2000 – Standard Data Form (NPWS 2020j)
Skerries Islands SPA [004122]	*c.* 19.2km north of the Proposed Scheme	• Cormorant *Phalacrocorax carbo* [A017]; • Shag *Phalacrocorax aristotelis* [A018]; • Brent Goose *Branta bernicla hrota [*A046]; • Purple Sandpiper *Calidris maritima [*A148]; • Turnstone *Arenaria interpres* [A169]; • Herring Gull *Larus argentatus* [A184]. *S.I. No. 245/2010 – European Communities (Conservation of Wild Birds (Skerries Islands Special Protection Area 004122)) Regulations 2010.* Source: Conservation Objectives: Skerries Islands SPA 004122. Generic Version 8.0. (NPWS, 2021g) and Natura 2000 – Standard Data Form (NPWS 2020k)
The Murrough SPA [004186]	c. 31.4km south of the Proposed Scheme	• Red-throated Diver *Gavia stellata* [A001]; • Greylag Goose *Anser anser* [A043]; • Light-bellied Brent Goose *Branta bernicla hrota* [A046]; • Wigeon *Anas penelope* [A050]; • Teal *Anas crecca* [A052]; • Black-headed Gull *Chroicocephalus ridibundus* [A179]; • Herring Gull *Larus argentatus* [A184]; and,

Site Name	Distance	Designation – QIs or SCIs
		• Little Tern *Sterna albifrons* [A195]. *S.I. No. 298/2011 – European Communities (Conservation of Wild Birds (The Murrough Special Protection Area 004186)) Regulations 2011.* Source: Conservation Objectives: The Murrough SPA 004186. Generic Version 6.0. (NPWS, 2021h) and Natura 2000 – Standard Data Form (NPWS 2020l)

12.3.4.2 Natural Heritage Areas (NHAs) and Proposed Natural Heritage Areas (pNHAs)

NHAs are designations under Section 18 of the Wildlife (Amendment) Act 2000 to protect habitats, species or geology of national importance.

In addition to NHAs, pNHAs are sites of significance for wildlife and habitats and were published on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. pNHAs are offered protection in the interim period under the county or city development plans which requires that planning authorities give due regard to their protection in planning policies and decisions. The Proposed Scheme lies within the administrative boundary of Dublin City County Development Plan 2016-2022 (DCC 2016) and within close proximity to the administrative boundary of Fingal County Development Plan 2017-2023 (FCC 2017).

Many of the pNHA sites, and some of the NHAs in Ireland overlap with the boundaries of European sites.

The closest nationally designated site to the Proposed Scheme is North Dublin Bay pNHA, which is located *c.* 0.4km east of the Proposed Scheme. This is followed the Royal Canal pNHA, which is located *c.* 1.1km south of the Proposed Scheme. North Dublin Bay pNHA and the Royal Canal pNHA both lie within the administrative boundaries of the Dublin City County Development Plan 2016-2022.

There are seven pNHAs that are located downstream of the Proposed Scheme in Dublin Bay and the Mayne Estuary. These include Baldoyle Bay pNHA, North Dublin Bay pNHA, Dolphins, Dublin Docks pNHA, Booterstown Marsh pNHA, Howth Head pNHA, Dalkey Coastal Zone and Killiney Hill pNHA, and South Dublin Bay pNHA. These sites will be hydrologically connected to the Proposed Scheme via the Santry_020, Mayne_010, and the Wad River. These pNHAs lie within the administrative boundaries of the Dublin City County Development Plan 2016-2022 and / or Fingal County Development Plan 2017-2023 (FCC 2017).

There is one NHA and eleven pNHAs containing wintering bird species that are known to forage and/or roost at inland sites across Dublin and Dublin Bay. These include Skerries Islands NHA, Malahide Estuary pNHA, Baldoyle Bay pNHA, Rogerstown pNHA, Portraine Shore pNHA, North Dublin Bay pNHA, Dolphins, Dublin Docks pNHA, Booterstown Marsh pNHA, Dalkey Coastal Zone and Killiney Hill pNHA, Ireland's Eye pNHA, Lambay Island pNHA and The Murrough pNHA.

There is one NHA and 24 pNHAs located in the wider area of the Proposed Scheme. These are listed in Table 12.6 and illustrated in Figure 12.4 in Volume 3 of this EIAR.

Table 12.6 lists these sites, their distance from the Proposed Scheme, and the ecological features for which the sites are designated/proposed. 15 of these are located within the ZoI of the Proposed Scheme (see Table 12.6).

These pNHAs are valued as being of National Importance.

Table 12.6: NHAs and pNHAs located within the ZoI of the Proposed Scheme Boundary (highlighted in light blue), and those in the Wider Area of the Proposed Scheme Boundary

Site Name	Distance	Description
Natural Heritage Areas		
Skerries Islands NHA [000204]	*c.* 19.2km north of the	See Table 12.5 under Skerries Islands SPA

Site Name	Distance	Description
	Proposed Scheme	
Proposed Natural Heritage Areas		
North Dublin Bay pNHA [000206]	*c.* 0.5km east of Proposed Scheme	See Table 12.5 under North Dublin Bay SAC, North Bull Island SPA and South Dublin Bay and River Tolka Estuary SPA
Baldoyle Bay pNHA [000199]	*c.* 2.4km east of Proposed Scheme	See Table 12.5 under Baldoyle Bay SAC and Baldoyle Bay SPA
Royal Canal pNHA [002103]	*c.* 1.1km south of the Proposed Scheme	Diversity of species canal supports and presence of legally protected plant species, opposite-leaved pondweed *Groenlandia densa*
Grand Canal pNHA [002104]	*c.* 2.3km south of the Proposed Scheme	Diversity of species canal supports and presence of legally protected plant species, opposite-leaved pondweed *Groenlandia densa*
Sluice River Marsh pNHA [001763]	*c.* 2.7km north of the Proposed Scheme	Freshwater marsh
Santry Demesne pNHA [000178]	*c.* 3.1km west of Proposed Scheme	Presence of legally protected plant species, hairy St. John's-wort *Hypericum hirsutum*, and woodland
Feltrim Hill pNHA [001208]	*c.* 3.2km north of the Proposed Scheme	Good example of knoll-reef phenomenon. Previously known to contain two rare plant species, namely spring squill *Scilla verna* and long-stalked crane's-bill *Geranium columbinum*
Dolphins, Dublin Docks pNHA [000201]	*c.* 3.3km south of the Proposed Scheme	See Table 12.5 under South Dublin Bay and River Tolka Estuary SPA
South Dublin Bay pNHA [000210]	*c.* 3.3km south of the Proposed Scheme	See Table 12.5 under South Dublin Bay SAC and South Dublin Bay and River Tolka Estuary SPA
Malahide Estuary pNHA [000205]	*c.* 4.9km north-east of the Proposed Scheme	See Table 12.5 under Malahide Estuary SAC and Malahide Estuary SPA
Howth Head pNHA [000202]	*c.* 5.8km east of the Proposed Scheme	See Table 12.5 under Howth Head SAC and Howth Head Coast SPA
Booterstown Marsh pNHA [001205]	*c.* 6.2km south of the Proposed Scheme	See Table 12.5 under South Dublin Bay and River Tolka Estuary SPA
Ireland's Eye pNHA [000203]	*c.* 7.2km east of the Proposed Scheme	See Table 12.5 under Ireland's Eye SAC and Ireland's Eye SPA
Liffey Valley pNHA [000128]	*c.* 7.9km south-west of the Proposed Scheme	Presence of legally protected plant species, hairy St. John's-wort *Hypericum hirsutum*, rare Red List plant species green figwort *Scrophularia umbrosa* and yellow archangel *Lamiastrum galeobdolon* and the diversity of habitat present.
Portraine Shore pNHA [001215]	*c.* 9.2km north of the Proposed Scheme	See Table 12.5 under Rogerstown Estuary SAC and Rogerstown Estuary SPA
Rogerstown pNHA [000208]	*c.* 10.2km north of the Proposed Scheme	See Table 12.5 under Rogerstown Estuary SAC and Rogerstown Estuary SPA

Site Name	Distance	Description
Dalkey Coastal Zone and Killiney Hill pNHA [001206]	*c.* 10.4km south-east of Proposed Scheme	Good example of a coastal system with habitats ranging from sub-littoral to coastal heath. Flora is well developed and includes some scare species. The islands are important bird sites. See Rockabill to Dalkey Island SAC and Dalkey Islands SPA
Fitzsimon's Wood pNHA [001753]	*c.* 10.5km south of the Proposed Scheme	Birch woodland, which is very rare in Co. Dublin.
Dodder Valley pNHA [000991]	*c.* 10.6km south-west of Proposed Scheme	The last remaining stretch of natural river bank vegetation on the River Dodder in the built-up Greater Dublin Area.
Lambay Island pNHA [000204]	*c.* 13.3km north-east of the Proposed Scheme	See Table 12.5 under Lambay Island SAC and Lambay Island SPA
Dingle Glen pNHA [001207]	*c.* 14km south of the Proposed Scheme	Variety of habitat present, including woodland
Loughlinstown Woods pNHA [001211]	*c.* 14.6km south of the Proposed Scheme	Demesne-type mixed woodland
Glenasmole Valley pNHA [001209]	*c.* 14.8km south-west of Proposed Scheme	See Table 12.5 under Glenasmole Valley SAC
The Murrough pNHA [004186]	*c.* 31.5km south of the Proposed Scheme	See Table 12.5 under The Murrough SPA

12.3.4.3 **Other Designated Sites**

Other designations recognised in the wider Greater Dublin area including RAMSAR wetlands sites and Dublin Bay Biosphere cover are considered in terms of the overall with European and National sites, whilst the 3 Special Area Amenity Order are local to specific Bus Connects corridors but are nonetheless captured in the overall EIAR biodiversity assessment and Natura Impact Statement by virtue of overlapping nature designations, namely European and Nationally designated sites.

RAMSAR Sites

The Convention on Wetlands is an intergovernmental treaty adopted on 2 February 1971 in the Iranian city of Ramsar. The official name of the treaty The Convention on Wetlands of International Importance especially as Waterfowl Habitats reflects the emphasis on the protection of wetlands primarily as habitat for waterbirds.

There are a number of RAMSAR sites within the vicinity of the Proposed Scheme, namely:

- Rogerstown Estuary Roger (site Code 412);
- Broadmeadow Estuary (Site code 833);
- Baldoyle Bay (Site code 413);
- North Bull Island (site code 406); and,
- Sandymount Strand / Tolka Estuary (Site code 832).

As these RAMSAR sites overlap with European sites and / or NHAs / pNHAs for which this EIAR assessment is considering, no further discussion is provided.

Dublin Bay Biosphere

Dublin Bay was initially recognised by UNESCO for its rare and internationally important habitats and species of wildlife. The North Bull Island supports a variety of plants and wildlife including an internationally significant population of Brent geese that overwinters in the bay. UNESCO's concept of a Biosphere has evolved to include not just areas of ecological value but also the areas around them and the communities that live and work within these areas. Dublin Bay Biosphere Reserve now extends to over 300 km2 of marine and terrestrial habitat encompassing North Bull Island and ecologically significant habitats such as the Tolka and Baldoyle Estuaries, Howth Head, Dalkey Island, Killiney Hill and Booterstown Marsh. Over 300,000 people live within the newly enlarged Biosphere.

While the Biosphere designation does not strictly add any specific new legal protection, it greatly enhances the many legal protections that already exist by improving the coordination and management of the three functions in a holistic and integrated way. In this respect the biodiversity assessment for the EIAR and the AA for the Proposed Scheme collectively addresses the key biodiversity elements of the Biosphere designation, and no further discussion is provided in this regard.

Special Amenity Area Order

The objective of the Special Amenity Area Order is primarily to protect outstanding landscapes, nature and amenities and were originally placed on a statutory footing under the Local Government (Planning and Development) Act 1963, as amended, and re-enacted under section 202 of the Planning and Development Act 2000.

Three such special amenity area orders have been recognised in Ireland, all of them in the Greater Dublin Area. They include:

- North Bull Island;
- Howth Head.

The designations re-enforces protection for green belts via land plans and objectives contained therein. As such these areas, have been considered in the overall EIAR biodiversity assessment and Appropriate Assessment respectively, by virtue of overlapping nature designations.

12.3.5 Habitats

12.3.5.1 **Overview**

The results of the habitat surveys along the alignment of the Proposed Scheme are described below by habitat type, after Fossitt (Fossitt 2000). The habitats described below relate to habitat areas within or adjacent to the Proposed Scheme, as shown on Figure 12.5 in Volume 3 of this EIAR along with the full habitat survey results. The results and summary of the findings of the aquatic habitat surveys have been incorporated into the relevant habitat descriptions.

The habitat types recorded along the footprint of the Proposed Scheme, as discussed in this Section, are as follows:

- Flower beds and borders (BC4);
- Stone walls and other stonework (BL1);
- Buildings and artificial surfaces (BL3);
- Spoil and bare ground (ED2);
- Recolonising bare ground (ED3);
- Depositing / lowland rivers (FW2);
- Amenity Grassland (Improved) (GA2);
- Dry calcareous and neutral grassland (GS1);
- Residential;
- Scattered trees and parkland (WD5);

- Hedgerows (WL1);
- Treelines (WL2);
- Scrub (WS1); and
- Ornamental / non-native shrub (WS3).

12.3.5.2 **Flower beds and borders (BC4)**

This habitat includes ornamental planting associated with commercial developments or industrial complexes, and planting at roundabouts and along roadsides in suburban areas. This habitat type was identified at various locations across the Proposed Scheme. The largest area of this habitat type consists of planted beds on R107 Malahide Road at Clarehall shopping centre. Other locations where this habitat occurs include Clongriffin park and ride and along centre road medians at the Priory and at Mayne River Avenue.

Ornamental species present at this habitat include butterfly bush *Buddleja davidii*, fuchsia *Fuchsia magellanica*, lavender species *Lavandula sp*., and shrubs.

This habitat type was also found in mosaics with the following habitats; amenity grassland (improved) (GA2) and buildings and artificial surfaces (BL3).

This habitat type is of Local Ecological Importance (Lower Value) due to the presence and dominance of non-native species.

12.3.5.3 **Stone walls and other stonework (BL1)**

Stone walls were present in one location across the Proposed Scheme, comprising either property boundaries or roadside boundaries. This habitat was located along at the junction of R107 Malahide Road / Kilmore Road around a housing estate.

Stone walls recorded along the proposed scheme were well maintained and free from vegetation. This habitat category was also used to describe stone bridges, steps and stone buildings.

This habitat type is of Local Ecological Importance (Lower Value) due to being devoid of vegetation.

12.3.5.4 **Buildings and artificial surfaces (BL3)**

This habitat type includes all buildings (i.e. domestic, commercial and industrial), roads, car parks, artificial recreation surfaces and other concrete/hard standing areas. This habitat type was the most commonly encountered habitat and was present across the entire length of the Proposed Scheme, owing to the largely urban and suburban nature of the study area.

This habitat type was also found in association with the following habitats; flower beds and borders (BC4), amenity grassland (GA2), recolonising bare ground (ED3), hedgerows (WL1), treelines (WL2) and scrub (WS1).

This habitat type is of Negligible Ecological Value due to being a built / artificial surface and devoid of vegetation.

12.3.5.5 **Spoil and bare ground (ED2)**

This habitat type was present in five locations across the Proposed Scheme, in small areas of bare ground, often associated with access ways, such as gravel driveways. Areas of bare ground, which have recently been sown with grass but are not yet adequately vegetated were also classified as being spoil and bare ground habitat.

The largest areas of this habitat were identified bordering R107 Malahide Road opposite the Hilton Hotel.

This habitat type was also found in mosaics with the following habitats: buildings and artificial surfaces (BL3); recolonising bare ground (ED3), scrub (WS1) This habitat type is of local ecological importance (lower value).This habitat type is of Local Ecological Importance (Lower Value) due to its low species diversity and disturbed nature.

12.3.5.6 **Recolonising bare ground (ED3)**

This habitat type was assigned to areas of disturbed ground and/or artificial surfaces which have been recolonised by plants, and vegetation cover is now greater than 50%. This habitat type was identified sporadically across the Proposed Scheme in few locations.

Most of the vegetation recorded were ruderal species commonly found in this habitat type. Typical species recorded included ribwort plantain *Plantago lanceolata*, greater plantain *P. major*, common poppy *Papaver rhoeas*, Yorkshire-fog *Holcus lanatus*, barren brome-grass *Bromus sterilis*, hawkweed *Hieracium agg*., red clover *Trifolium pratense*, butterfly bush, hoary willowherb *Epilobium parviflorum* and common ragwort *Jacobaea vulgaris*.

This habitat type also occurred in mosaics with the following habitat types; flower beds and borders (BC4), treelines (WL2) and scrub (WS1).

This habitat type is of Local Ecological Importance (Lower Value) due to the disturbed nature of this habitat.

12.3.5.7 **Depositing / lowland rivers (FW2)**

This habitat type refers to the Santry_020 and Wad River, and Mayne_010 which are classified as depositing / lowland rivers. These habitats are present at two locations across the Proposed Scheme., with additional hydrological connectivity to the Mayne_010, and are discussed individually below.

The Santry_020 is located at the R107 Malahide Road and Greencastle Road junction and is culverted beneath R107 Malahide Road (illustrated in Figure 12.5 in Volume 3 of this EIAR). The Santry_020 is classified as 'Poor Ecological Status' for the period of 2013-2018 and is deemed to be 'At Risk' of failing to meet its requirements under the Water Framework Directive. The Santry_020 is narrow (<1m on average) at the proposed crossing point with highly channalised banks. Riparian vegetation identified along the Santry_020 banks include: improved amenity grassland GA2 and treelines of sycamore *Acer pseudoplatanus*, small-leaved lime *Tilia cordata*, ash *Fraxinus excelsior*, birch species *Betula sp.*, and cypress species *Cupressus sp.*

The Wad River is located at R107 Malahide Road and Collins Road Junction, and is culverted in its entire length. It drains the area to the south of Dublin Airport and flows south and east before outfalling to the Tolka Estuary at Clontarf. The Wad River is not a WFD assigned river, therefore has no risk status.

The River Mayne will not be crossed by the Proposed Scheme, however, it is hydrologically connected via existing and proposed drainage networks. It is located c.300m north of the Proposed Scheme. The Mayne_010 has a Poor Ecological Status' for the period of 2013-2018 and is deemed to be 'At Risk' of failing to meet its requirements under the Water Framework Directive.

This habitat type is of Local Ecological Importance (Higher Value) as it is not common in the surrounding area.

12.3.5.8 **Amenity grassland (Improved) (GA2)**

Amenity grassland was a commonly recorded habitat across the study area. It is present in small areas located across the entirety of the Proposed Scheme (illustrated in Figure 12.5 in Volume 3 of this EIAR). The largest area of this habitat type was identified along the western side of the R107 Malahide Road from Belcamp Lane to Priorswood Road. Other areas of this habitat type included: the grounds of Ardscoil Ris; along the banks of the Santry_020; a green area at Ayrfield Drive. Smaller areas of this habitat type were observed across the Proposed Scheme as part of road landscaping of verges and medians.

This habitat is comprised of a range of common grass species including perennial ryegrass *Lolium perenne*, annual meadow grass *Poa annua*, red fescue *Festuca rubra*, wall-barley *Hordeum murinum* and common knotgrass *Polygonum aviculare agg*. Forb species were very low in abundance and comprised of yarrow *Achillea millefolium*, daisy *Bellis perennis*, butterfly bush, cordyline species *Cordyline sp*., willowherb species *Epilobium sp*., crane's-bill *Geranium sp*., oxeye daisy *Leucanthemum vulgare*, yellow oxeye daisy *Buphthalmum salicifolium*, common poppy, ribwort plantain, greater plantain, bramble *Rubus fructicosus agg*., broad-leaved dock *Rumex obtusifolius*, common ragwort, common groundsel *Senecio vulgaris*, charlock mustard *Sinapis arvensis*, common

dandelion *Taraxacum officinale agg*., red clover, white clover *Trifolium repens*, creeping thistle *Cirsium arvense*, pineappleweed *Matricaria discoidea* and shepherds purse *Capsella bursa-pastoris*.

This habitat type often occurred in mosaics with buildings and artificial surfaces (BL3), flower beds and borders (BC4) and treelines (WL2).

This habitat type is of Local Ecological Importance (Lower Value) due to low species diversity.

12.3.5.9 **Dry calcareous and neutral grassland (GS1)**

This habitat type was identified at one location across the Proposed Scheme on the western side of R107 Malahide Road from R139 to Belcamp Lane.

Grass species recorded include false oatgrass *Arrhenatherum elatius*, perennial ryegrass, cock's-foot *Dactylis glomerata* and annual meadow grass. Forb species present include creeping cinquefoil *Potentilla reptans*, hawkweed, ribwort plantain, greater plantain, common dandelion, white clover, creeping buttercup *Ranunculus repens*, horsetail species *Equisetum sp*., field bindweed *Convolvulus arvensis*, creeping thistle, bramble, cleavers *Galium aparine*, common nettle *Urtica dioica*, common hogweed *Heracleum sphondylium*, winter heliotrope *Petasites pyrenaicus*, butterfly bush and ragweed species *Ambrosia sp*.

This habitat type also occurred in mosaics with amenity grassland (GA2), hedgerows (WL1) and treelines (WL2).

This habitat type is of Local Ecological Importance (Higher Value) as it is not common in the surrounding area and is relatively species-rich in the context of surrounding habitats.

12.3.5.10 **Residential**

This non-Fossitt classification is used to represent residential properties along the Proposed Scheme corridor and generally consists of a mosaic of buildings and artificial surfaces (BL3), amenity grassland (GA2), flower beds and borders (BC4), ornamental shrubs (WS3) and hedgerows (WL1).

This habitat type was commonly encountered across the entirety of the Proposed Scheme corridor (illustrated in Figure 12.5 in Volume 3 of this EIAR).

This habitat type is of Local Ecological Importance (Lower Value).

12.3.5.11 **Scattered trees and parkland (WD5)**

This habitat classification describes areas of scattered trees, standing alone or in small clusters, which are a prominent structural or visual feature of the habitat. This habitat type was identified at 28 locations across the Proposed Scheme associated with parks and playing pitches (illustrated in Figure 12.5 in Volume 3 of this EIAR). The most significant areas of this habitat type were present at Thorndale Park, St. David's Park, Marino Crescent Park, Donnycarney Church, Ardscoil Ris, Mount Temple Comprehensive, Cadbury's, and along the banks of Santry_020. This habitat was also frequently identified along road medians, including at Northern Cross, Griffith Avenue, Newtown Road and Belcamp Avenue. Tree species at these locations include birch species ,cypress species, beech *Fagus sylvatica*, ash, sycamore, poplar species *Populus sp*., small-leaved lime and rowan *Sorbus aucuparia.*

This habitat type also occurred in mosaics with flower beds and borders (BC4), amenity grassland (GA2), treelines (WL2) and immature woodland (WS2).

This habitat type is of Local Ecological Importance (Higher Value) as it is not common in the surrounding area and is relatively species-rich in the context of surrounding habitats.

12.3.5.12 **Hedgerows (WL1)**

Hedgerows were identified in three locations across the Proposed Scheme (illustrated in Figure 12.5 in Volume 3 of this EIAR). These consisted of linear strips of shrubby vegetation, often containing trees. Most of the hedgerows

which were recorded along the Proposed Scheme was along roadsides and within the vegetated median of larger roads. This habitat was identified along road medians on R107 Malahide Road and the perimeter of UCI complex.

The species composition varied greatly within this habitat type. Tree and shrub species consist of leyland cypress *Cupressus × leylandii*, beech, copper beech *Fagus sylvatica f. purpurea*, New Zealand broadleaf *Griselinia littoralis*, oleander *Nerium oleander*, sycamore, poplar species, cherry laurel *Prunus laurocerasus*, willow species *Salix sp*., dogwood species *Cornus sp*., garden privet *Ligustrum Ovalifolium* and common ivy *Hedera helix*.

This habitat type also occurred in mosaics with buildings and artificial surfaces (BL3).

This habitat type is of Local Ecological Importance (Higher Value) as it is not common in the surrounding area.

12.3.5.13 **Treelines (WL2)**

This habitat is comprised of narrow rows or single lines of trees which are greater than 5m in height. This habitat type was recorded widely across the study area of the Proposed Scheme (illustrated in Figure 12.5 in Volume 3 of this EIAR). In the context of the Proposed Scheme, treeline habitat is typically bordering adjacent parkland and areas with urban street planting along footpaths/ strips of amenity grassland and road edges. Substantial areas of this habitat were observed at Maypark, Clontarf Golf club, Ardscoil Ris, and along Santry_020 at Greencastle Road. Smaller areas of this habitat type were observed at Casino Park, Maypark and at Brookville Park. Urban street planting was observed frequently along R107 Malahide Road.

Species frequently recorded include birch species, hornbeam *Carpinus Fastigiata Lucas*, hazel *Corylus avellana*, hawthorn *Crataegus monogyna*, cypress species, beech, sycamore, sweet cherry *Prunus avium*, cherry *Prunus Kanzan*, Norway maple *Acer platanoides*, goat willow *Salix caprea*, crab apple *Malus domestica*, field maple *Acer campestre*, maple *Acer sp*., alder *Alnus glutinosa*, holm oak *Quercus ilex*, oak species *Quercus sp*., elder *Sambucus nigra*, whitebeam *Sorbus aria*, rowan, common lime *Tilia × europaea*, small-leaved lime, ash, horse chestnut *Aesculus hippocastanum*, Leyland cypress, aspen *Populus tremula* and cedar species *Cedrus sp*.

The understory consists of a variety of species including bramble Rubus, butterfly bush, cotoneaster species Cotoneaster sp., dogwood species, and common ivy.

This habitat type also occurred in mosaics with amenity grassland (GA2).

This habitat type is of Local Ecological Importance (Higher Value) as it is not common in the surrounding area and is relatively species-rich in the context of surrounding habitats.

12.3.5.14 **Scrub (WS1)**

Scrub was identified in four locations across the Proposed Scheme (illustrated in Figure 12.5 in Volume 3 of this EIAR). Significant areas of this habitat were located at Northern Cross opposite the Hilton Hotel and at a commercial property on Greencastle Road / R107 Malahide Road junction. Small fragment patches were recorded adjacent to the R107 Malahide Road / Priorswood Road roundabout, and a small section of road median at UCI.

Species observed at these locations consisted of ruderal species including yarrow, common thistle *Cirsium vulgare*, common dandelion, broad-leaved dock and common ragwort. Grass species comprise of Yorkshire-fog and cocks-foot.

This habitat type also occurred in mosaics with buildings and artificial surfaces (BL3), treelines (WL2) and ornamental/ non-native shrub (WS3).

This habitat type is of Local Ecological Importance (Lower Value) due to its low species diversity.

12.3.5.15 **Ornamental/ non-native shrub (WS3)**

Areas of ornamental / non-native shrub were generally associated with amenity and landscape planting at commercial properties. This habitat type was identified at eight locations across the Proposed Scheme (illustrated

in Figure 12.5 in Volume 3 of this EIAR). Substantial areas of this habitat type bordered areas of buildings and artificial surfaces (BL3) at Clarehall Shopping Centre, Coolock Retail Park, and Chanel College.

Species identified in these areas included dogwood species *Cornus sp*., and various other planted shrubs and trees.

This habitat type is of Local Ecological Importance (Lower Value) due to its low species diversity.

12.3.6 Rare and Protected Plant Species

There were no protected plant species listed on the Flora Protection Order, identified within the footprint of the Proposed Scheme during field surveys.

The desk study returned records of a total of sixteen species listed on the Flora Protection Order across the wider study area (i.e. Grid Squares O13, O23 and O24) and are listed in Appendix A12.1 in Volume 4 of this EIAR. This includes petalwort *Petalophyllum ralfsii* recorded at North Bull Island in 2009, a species which is also listed on Annex II under the EU Habitats Directive (NBDC online database, 2021b).

There were no records returned within close proximity to the Proposed Scheme.

12.3.7 Non-Native Invasive Plant Species

There were no non-native invasive plant species listed on the Third Schedule of the Birds and Habitats Regulations identified along the Proposed Scheme during the habitat surveys.

The desk study returned records of a total of twenty-one species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 across the wider study area (i.e. Grid Squares O13, O23 and O24) and are listed in Appendix A12.1 in Volume 4 of this EIAR. Records within 1km of the Proposed Scheme include records from 2009 of giant hogweed *Heracleum mantegazzianum* along the Santry_020 at Edenmore and Canadian waterweed *Elodea canadensis* in the Santry_020 at Cadburys. Records of Japanese knotweed *Reynoutria japonica* at Philipsburgh Avenue in Marino in 2018 and three-cornered leek *Allium triquetrum* at Mount Temple in 2016 (NBDC 2020). These species were not present within the footprint of the Proposed Scheme.

12.3.8 Mammals

12.3.8.1 **Bats**

Bats, and their breeding and resting places, are protected under the Wildlife Acts. All bat species are also listed on Annex IV of the Habitats Directive, with the lesser horseshoe bat also listed on Annex II. Bats are also afforded strict protection under the Habitats Directive and the Birds and Habitats Regulations.

Bat surveys were carried out across four seasons between 2018 and 2020 in the preparation of this EIAR. Four transects were surveyed within the footprint of the Proposed Scheme; including along Main Street Clongriffin at Father Collin's Park, referred to as CBC0001BT001; along the R139 Belmayne to Northern Cross referred to as CBC0001BT002; along R107 Malahide Road at Maypark / Donnycarney Park referred to as CBC0001BT003 and along R107 Malahide Road at Clontarf Golf Club referred to as CBC0001BT004. The results of these surveys are described in Section 12.3.8.1.1 to Section 12.3.8.1.8 and are also presented in Figure 12.6.1 in Volume 3 of this EIAR. The section is structured is such that each bat species is described in turn. The results of the various surveys are presented to allow an understanding of each species' distribution across the Proposed Scheme.

All bat species populations in County Dublin are valued as being of Local Importance (Higher Value) given the legal protection afforded to them, and due to their common presence throughout the Greater Dublin Area (GDA). In an Irish context, the conservation status of these species in Ireland is designated as 'Least Concern' (Marnell et al. 2019).

12.3.8.1.1 Leisler's bat *Nyctalus leisleri*

Leisler's bat was recorded along all four transects surveyed between 2018 and 2020, including CBC0001BT001(Father Collins Park), CBC0001BT002 (Belmayne to Northern Cross), CBC0001BT003 (Maypark / Donnycarney Park) and CBC0001BT004 (Clontarf Golf Club).

A total of 39 recordings of Leisler's bat were identified in these locations between 2018 and 2020. Leislers bat activity was low in 2018 with two recordings made along CBC0001BT002 only (Belmayne to Northern Cross). Leisler's bat activity was highest during 2019, with 22 recordings of this species recorded along CBC0001BT002 (Belmayne to Northern Cross). There were 8 recordings along CBC0001BT003 (Maypark / Donnycarney Park) and 3 recordings along CBC0001BT004 (Clontarf Golf Club).

There were only two recordings of this species at this location in Spring 2020 and in Summer 2020.

The results of the bat surveys as they relate to the Leisler's bat are shown on Figure 12.6.1 in Volume 3 of this EIAR.

No roost sites for Leisler's bat were recorded during any of the surveys for the Proposed Scheme.

The desk study found that Leisler's bat are known to occur in the wider study area and utilise foraging habitat within the greater Dublin area (see Appendix A12.1 in Volume 4 of this EIAR for further details). There were no records returned of live sightings within 1km of the proposed scheme (NBDC database, 2020).

12.3.8.1.2 Common pipistrelle bat *Pipistrellus pipistrellis*

Common pipistrelle bat was recorded along three of the four transects surveyed between 2018 and 2020; including CBC0001BT001(Father Collins Park), CBC0001BT002 (Belmayne to Northern Cross) and CBC0001BT003 (Maypark / Donnycarney Park). A total of fourteen recordings of common pipistrelle bat were identified in these locations between 2018 and 2020. Activity was highest at in Summer 2020 with 4 recordings along CBC0001BT001 (Father Collins Park), and 3 along CBC0001BT002 (Belmayne to Northern Cross). In 2018 and 2019 there was low bat activity with 2 and 3 recordings respectively along CBC0001BT003 (Maypark / Donnycarney Park) only. There were two recordings during Spring 2020 both of these occurred along CBC0001BT002 (Belmayne to Northern Cross).

The results of the bat surveys as they relate to the common pipistrelle bats are shown on Figure 12.6.1 in Volume 3 of this EIAR.

No roost sites for common pipistrelle bat were recorded during any of the surveys for the Proposed Scheme.

The desk study found that pipistrelle bat is known to occur in the wider study area and utilise foraging habitat within the greater Dublin area (see Appendix A12.1 in Volume 4 of this EIAR for further details). There were no records returned of live sightings within *c.* 1km of the proposed scheme (NBDC online database, 2021b)

12.3.8.1.3 Nathusius' pipistrelle bat *Pipistrellus nathusii*

Nathusius' pipistrelle bat was not recorded across the study area of the Proposed Scheme during the walked transect surveys.

No roost sites for Nathusius' pipistrelle bat were recorded during any of the surveys for the Proposed Scheme.

The desk study found that Nathusius' pipistrelle bat is known to occur in the wider study area and utilise foraging habitat within the greater Dublin area (see Appendix A12.1 in Volume 4 of this EIAR for further details). There were no records returned of live sightings within 1km of the proposed scheme (NBDC online database, 2021b)

12.3.8.1.4 Soprano pipistrelle bat *Pipistrellus pygmaeus*

Soprano pipistrelle bat was recorded along two of the four transects surveyed between 2018 and 2020; including CBC0001BT001 (Father Collins Park), and CBC0001BT002 (Belmayne to Northern Cross). A total of 22

recordings of soprano pipistrelle bat were identified at these locations between 2018 and 2020. Soprano pipistrelle was only recorded during the Summer 2020 surveys and bat activity was highest at CBC0001BT001(Father Collins Park), with 21 recordings of this species this location. All recordings were made during surveys carried out in July 2020. The results of the bat surveys as they relate to the soprano pipistrelle bats are shown on Figure 12.6.1 in Volume 3 of this EIAR.

No roost sites for soprano pipistrelle bat were recorded during the surveys for the Proposed Scheme.

The desk study found that soprano pipistrelle bat is known to occur across the Proposed Scheme (see Appendix A12.1 in Volume 4 of this EIAR for further details). This includes one record from 2005 located within 1km of the proposed scheme, at Belcamp College, and a record from 2012 of a reported roost in a building on Drumnigh Road, north of Father Collins Park (see Appendix A12.1 in Volume 4 of this EIAR for further details) (NBDC online database, 2021b).

12.3.8.1.5 Unidentified pipistrelle species

Pipistrelle species bat calls that could not be classified as either characteristic of common or soprano pipistrelle are referred to as ‘unidentified’ pipistrelle species. Common pipistrelle bats have their peak echolocation call strength at 45kHz (kilohertz) and soprano pipistrelle bats at 55kHz. As such, pipistrelle bat species that echolocate between 48kHz and 52kHz cannot be accurately identified by their calls and are described as ‘unidentified’ pipistrelle bat species.

Pipistrelle species bat calls that could not be classified as either characteristic of common or soprano pipistrelle were identified at two locations surveyed between 2018 and 2020; which was at CBC0001BT003 (Maypark (Donnycarney Park)) and CBC0001BT004 (Clontarf Golf Club). A total of two recordings of unidentified pipistrelle species were identified at these locations between 2018 and 2020. Both recordings were from surveys carried out in 2019. The results of the bat surveys as they relate to the unidentified pipistrelle bats are shown on Figure 12.6.1 in Volume 3 of this EIAR.

12.3.8.1.6 Brown long-eared bat *Plecotus auratus*

Brown long-eared bat was not recorded across the study area of the Proposed Scheme during the walked transect surveys.

No roost sites for brown long-eared bat were recorded during the surveys for the Proposed Scheme.

The desk study found that brown long-eared bat are known to occur in the wider study area and utilise foraging habitat within the greater Dublin area (see Appendix A12.1 in Volume 4 of this EIAR for further details). The desk study found that brown long-eared bat did not occur within 1km of the Proposed Scheme (NBDC database, 2020).

12.3.8.1.7 *Myotis* bat species

Myotis bat species were not recorded across the study area of the Proposed Scheme during the walked transect surveys. The desk study found that *Myotis* bat species are known to occur in the wider study area and utilise foraging habitat within the greater Dublin area (see Appendix A12.1 in Volume 4 of this EIAR for further details). The desk study returned no records of *Myotis* bat species including Daubenton’s bat *Myotis daubentonii,* Natterer's bat *M. nattereri,* and Whiskered bat *M. mystacinus* within 1km of the Proposed Scheme (NBDC online database, 2021b).

12.3.8.1.8 Potential Roost Features (PRFs)

The trees identified as having potential to support roosting bats (known as Potential Roost Features (PRFs)) are listed in Table 12.7 below and shown on Figure 12.6.2 in Volume 3 of this EIAR. Each tree, or grouping of homogenous trees, was classified with regard to their potential to support roosting bats (Collins 2016). Trees with negligible suitability for roosting bats are not described or mapped as they are assessed as not having potential to support roosting bats.

Table 12.7 Summary of (PRFs) recorded within the footprint of the Proposed Scheme

Reference	Species	Description
CBC0001PRF002	Cedar species *Cedrus sp.*	Knotholes / cavities
CBC0001PRF003	Cedar species *Cedrus sp.*	Knotholes / cavities
CBC0001PRF004 (Group PRF)	Horse chestnut *Aesculus hippocastanum* Lime species *Tilia sp.* Sycamore *Acer pseudoplatanus*	Mature trees with dense ivy cover
CBC0001PRF005 (Group PRF)	Horse chestnut *Aesculus hippocastanum* Lime species *Tilia sp.* Sycamore *Acer pseudoplatanus*	Mature trees with dense ivy cover

Note: A description of each different type of PRF, is provided in Andrews (2018).

12.3.8.2 **Badger**

Badger, and their breeding and resting places, are legally protected under the Wildlife Acts.

No evidence of badger (*e.g.* setts or evidence of badger activity) were recorded during the multi-disciplinary surveys carried out along the Proposed Scheme.

Despite this, badger are widely distributed throughout the GDA, often utilising public parks and residential gardens. The desk study returned two records of badger located within 1km of the Proposed Scheme (see Appendix A12.1 in Volume 4 of this EIAR for further details). This includes one record of a live sighting in St. Anne's Park and a road-kill record on Howth Road in Raheny (NBDC 2020). As such, it has been assumed that badger may occur in vegetated areas adjacent to the Proposed Scheme.

The local badger population is deemed to be of Local Ecological Importance (Higher Value) due to the known presence of resident populations within the wider environment of the Proposed Scheme, which are valued as being of Local Importance (Higher Value) as they are a Wildlife Act protected species.

12.3.8.3 **Otter**

Otter, and their breeding and resting places, are legally protected under the Wildlife Acts. Otter are also listed on Annex II and Annex IV of the Habitats Directive.

No evidence of otter activity (e.g. sprainting posts), holts or couch sites were recorded during the multi-disciplinary surveys carried out along the Proposed Scheme.

The desk study found that otter is known to occur within 1km of the Proposed Scheme and across the wider study area (see Appendix A12.1 in Volume 4 of this EIAR for further details). Records include otter signs at the Mayne Bridge in 2011 and 2012 c. 1km downstream of the Proposed Scheme, and at Baldoyle in 2017 c. 2km downstream of the Proposed Scheme (NBDC online database, 2021b). The River Mayne flows within 300m of the proposed scheme, low otter activity was observed, with records of an unoccupied holt at Belcamp House c.1km upstream of the Proposed Scheme. Further otter signs were observed in the lower reaches near Baldoyle Racecourse c.1km downstream of the Proposed Scheme (Macklin, *et al.* 2019).

The Santry River system is known to support a local otter population. Six otter signs including a possible holt site and several spraints were identified along the upper reaches of the Santry_010 to the rear of Woodlawn Estate, Coolock c.2.7km upstream of the Proposed Scheme. Along the lower reaches of the Santry_010, otter signs were observed in Raheny *c.* 2km downstream of the Proposed Scheme (Macklin, *et al.*, 2019).

In an Irish context, the conservation concern of otter is 'Least Concern' (Marnell *et al*. 2019) due to population recoveries since 2009, however remains 'Near Threatened' at a European and Global context (IUNC Red List) (Roos *et al.* 2015).

Wicklow mountains SAC is the closest European site designated for otter, located 14.4km south of the Proposed Scheme, as the crow flies. Otter territories are within the range of c. 7.5km for females and can reach up to 21km for males via hydrological pathways (O' Neill *et a*l. 2009). The River Dodder and Liffey Estuary provide the key pathway to Wicklow Mountains SAC, whereas the Proposed Scheme will discharge into the Tolka Estuary. Wicklow Mountains SAC is located within a different sub-catchment (Dodder_SC_010) to the Proposed Scheme (Santry 10 Mayne_SC_010). As such, populations of otter within the footprint of the Proposed Scheme are deemed not to be connected to the SAC population.

The local otter population is therefore valued as being of County Importance as it is listed on Annex II of the Habitats Directive and is designated under the Dublin City Biodiversity Action Plan considered to be a species of high conservation concern.

12.3.8.4 **Marine Mammals**

The Proposed Scheme is hydrologically connected to Dublin Bay via the Santry_020, Wad River, Tolka Estuary and North Bull Island transitional water body, and the Mayne Estuary via the Mayne_010. There were no dedicated marine mammal surveys carried out as part of the assessment.

Harbour seal, grey seal, and Harbour porpoise are known from Dublin Bay and the Mayne Estuary and these species are all protected under the Wildlife Acts – both seal species are also listed on Annex II of the habitats directive and all cetacean species are listed on Annex IV of the Habitats Directive. Harbour porpoise is a QI species designated as part of Rockabill to Dalkey Island SAC which is located *c.* 5.5km east of the Proposed Scheme. Harbour seal and grey seal are also listed on Annex II of the Habitats Directive and are listed QI species designated as part of Lambay Island SAC which is located 12.2km north of the Proposed Scheme.

Harbour porpoise, harbour seal, and grey seal are valued as being of International Importance as they listed on Annex II of the Habitats Directive and are QI species designated as part of Rockabill to Dalkey Island SAC, and Lambay Island SAC. As such, are considered to be a species of high conservation concern.

A number of protected marine mammals are known to occur within Dublin Bay, the Mayne Estuary, and off the Dublin coast downstream of the Proposed Scheme, including:

- Common Dolphin *Delphinus delphis;*
- Common Porpoise *Phocoena phocoena*
- Minke Whale *Balaenoptera acutorostrata;*
- White-beaked Dolphin *Lagenorhynchus albirostris;*
- Pygmy Sperm whale *Kogia breviceps;*
- Bottle-nosed Dolphin *Tursiops truncates;*
- Humpback Whale *Megaptera novaeangliae;*
- Sperm Whale *Physeter macrocephalus;*
- Striped Dolphin *Stenella coeruleoalba;*
- Risso's Dolphin *Grampus griseus;* and,
- Northern Bottle-nosed Whale *Hyperoodon ampullatu.*

Common dolphin and common porpoise are common to Irish coastlines throughout the year, these are protected under Annex II; Annex IV of the Habitats Directive, the local population are therefore valued as County Importance.

Bottle-nosed dolphin and Risso's dolphin, are found both inland and offshore coastal waters, occasionally sighted in Dublin Bay. Minke whales, and humpback whale species are migratory and frequent Irish coastlines each year. White-beaked dolphin, sperm whale, striped dolphin, and northern bottle-nosed whale are rarely sighted in Dublin Bay, favouring the offshore waters of the continental shelf. Pygmy Sperm whales are rare to the Irish coastline, with only one record identified in Dublin Bay. These are protected under Annex IV of the Habitats Directive and are therefore valued as County Importance.

12.3.8.5 **Other Mammal Species**

No other protected mammal species were recorded during the multi-disciplinary surveys carried out along the Proposed Scheme. The desk study returned records for the following terrestrial mammal species protected under the Wildlife Acts are known, within *c.*1km of the Proposed Scheme (see Appendix A12.1 in Volume 4 of this EIAR for further details):

- Red Squirrel *Sciurus vulgaris;*
- Hedgehog *Erinaceus europaeus;* and,
- Pygmy Shrew *Sorex minutus.*

The local population of these species are deemed to be of Local Ecological Importance (Higher Value) due to the known presence of resident populations within the wider environment of the Proposed Scheme, which are valued as being of local importance as they are a Wildlife Act protected species.

Evidence of fox *Vulpes vulpes* and rabbit *Orytolagus cuniculus* were also recorded across the study area within areas of suitable habitat. Although these species are not afforded legal protection under the Wildlife Acts, they form part of the local biodiversity resource and are noted here in that context.

12.3.9 Birds

12.3.9.1 **Breeding Birds**

All wild birds, and their nests and eggs, are protected under the Wildlife Acts. Some bird species are also listed on Annex I of the Birds Directive, and / or as SCIs within designated European sites.

The full results of the desk study, including records of breeding bird species considered to be of conservation concern, are presented in Appendix A12.1 in Volume 4 of this EIAR. These species are considered to be KERs of the Proposed Scheme and include the following:

- SCIs, for a breeding population, of SPAs;
- Species listed under Annex I of the Birds Directive; and
- Red and Amber Birds of Conservation Concern in Ireland (BoCCI) (Gilbert et al. 2021) species listed for their breeding populations.

The results of the breeding bird desk review carried out to inform this assessment are summarised below.

The desk study returned records of a total of 79 breeding bird species across the study area (i.e. Grid Squares O13, O23 and O24). Records included 39 SCI species, 10 species listed under Annex I of the Birds Directive, and an additional nine Red Listed and 20 Amber Listed species. This includes 24 species with breeding and wintering populations. These species are grouped into habitat preferences and are discussed below in relation to their presence within the footprint of the Proposed Scheme.

Several bird species for which records were returned in the desk study are those typically found in coastal, estuarine and intertidal habitats, such as Dublin Bay and the Mayne Estuary. Many gull, auk, shearwater and tern species breed in steep inaccessible cliffs *i.e.* Howth Head, offshore islands, and Dublin Port. Seabirds such as terns, guillemots and kittiwakes nest on the cliffs and crevices of Rockabill Island in Dublin Bay SPA (Birdwatch Ireland, 2020). Fulmar, shag razorbill and gannet nest in the cliffs of Irelands Eye SPA, which also has numbers of large *larus* gulls, cormorant and puffin (Merne & Madden 2000). Gulls favour nesting along coasts on shingle and cliffs but may utilise inland public areas for scavenging and buildings for roof nesting (Birdwatch Ireland, 2020). As such, some may utilise buildings within the footprint for nesting although the majority of these species are not deemed to breed within the footprint of the Proposed Scheme.

The majority of records along the Proposed Scheme comprise bird species common to suburban habitats (including residential and parkland areas), such as gull and garden bird species. Residential habitats, green space and parkland habitats were observed in several locations across the Proposed Scheme, Maypark / Donnycarney Park, Thorndale Park, St. David's Park, Marino Crescent Park, Donnycarney Church, Ardscoil Ris, Mount Temple

Comprehensive and Cadbury's. These species therefore are likely to use lands surrounding the footprint of the Proposed Scheme for breeding and foraging.

Breeding species which are associated with buildings were returned from the desk study including swallows and martins (Birdwatch Ireland, 2020). Swallows and house martins occurred across the larger study area (*i.e.* Grid Squares O13, O23 and O24) and may therefore utilise buildings adjacent to the Proposed Scheme. Buzzards and sparrowhawks occurred across the larger study area (*i.e.* Grid Squares O13, O23 and O24) and may therefore utilise open green spaces and trees adjacent to the Proposed Scheme. No suitable habitat was identified for merlin and desk study records were confined to coastal areas (i.e. Grid Squares O23 and O24) and are therefore not deemed to breed within the footprint of the Proposed Scheme.

Several species of warblers and raptors which favour woodlands, agricultural lands and upland heathland areas were identified during the desk study (Appendix A12.1. in Volume 4 of this EIAR), due to the urban locality of the Proposed Scheme, these habitat types are not present or are highly fragmented. Suitable agricultural habitat is located *c*.1.5km to the north of the Proposed Scheme As such, these species are not deemed to be present across the Proposed Scheme in significant numbers, however small numbers may be present in larger parks and greenspaces in the lands surrounding the Proposed Scheme i.e. O' Toole's GAA, Maypark / Donnycarney Park, Clontarf Golf Club, Ardscoil Ris, Marino Crescent Park and Fairview Park which all border the Proposed Scheme.

Species that are known to utilize freshwater lakes, ponds, canals, and rivers in urban habitats include coots, moorhen, swans, ducks, herons, kingfisher and cormorants (Appendix A12.1. in Volume 4 of this EIAR). Suitable habitats within close proximity to the Proposed Scheme include, Father Collins Park containing populations of mute swans and Santry_020 with moorhen (Birds of North Bull Island, 2020) kingfisher and wagtails (O' Connor, *et al.* 2016). Rivers are important nesting and foraging sites for species such as kingfisher within the Proposed Scheme. The Proposed Scheme will cross the Santry_020at R107 Malahide Road / Greencastle Road junction, as such these species may utilise these areas adjacent to the Proposed Scheme. The desk study returned records of these riverine species at the Santry_020 outflow which is *c*.3km downstream of the Proposed Scheme. Records of breeding birds relevant to the Proposed Scheme are listed in Table 12.8.

Table 12.8 Desk Study Records of Breeding Birds of Conservation Concern Adjacent to the Proposed Scheme

Common Name / Scientific Name / BTO Code	Distribution in the Study Area	Conservation Importance		
		BoCCI (B – Breeding / W - Wintering)	Annex I	Nearest SPA Designated for SCI Species
Great Black-backed Gull *Larus marinus* (GB)	Mayne Estuary 2001	Green (B/W)	-	-
Herring Gull *Larus argentatus* (HG)	Mayne Estuary 2001 Within the 2km grid O24F at Clongriffin 2011	Amber (B/W)	-	Ireland's Eye SPA (c.5.2km)
Black-headed Gull *Chroicocephalus ridibundus* (BH)	Mayne Estuary 2001 Within the 2km grid O24F at Clongriffin 2011	Amber (B/W	-	The Murrough SPA (c. 31.5km)
Lesser Black-backed Gull *Larus fuscus* (LB)	Mayne Estuary2001	Amber (B/W)	-	Lambay Island SPA (c.12.2km)
Mediterranean Gull *Larus melanocephalus* (MU)	Within the 2km grid O24K at Mayne Estuary2011	Amber (B)	✓	-
Mute Swan *Cygnus olor*	Across the Proposed Scheme Population in Father Collins Park	Amber (B/W)	-	-
Common Kingfisher *Alcedo atthis*	Throughout Grids O13 O23 and O24 and at the River Santry outflow	Amber (B)	✓	River Boyne and Blackwater SPA (c.50km)
Grey Wagtail *Motacilla cinerea*	Throughout Grids O13 O23 and O24 and at Springdale Road and Belcamp	Red (B)	-	-

12.3.9.2 **Wintering Birds**

All wild birds, and their nests and eggs, are protected under the Wildlife Acts. Some bird species are also listed on Annex I of the EU Birds Directive, and / or as SCIs within designated European sites.

A total of nine wintering bird surveys were carried out for the Proposed Scheme at sites CBC0001WB002 and CBC0001WB003 between November 2020 and March 2021 on a fortnightly basis. Species identified included Black headed gull, herring gull, common gull, and light bellied brent geese. Wintering bird activity was low across all visits, with the exception of black-headed gull at Maypark (CBC0001WB003). Table 12.9 provides a summary of the findings of the winter bird surveys with respect to those species which are of highest conservation concern, and were recorded within winter bird survey sites, and shown on Figure 12.7 in Volume 3 of this EIAR.

Table 12.9: Wintering Birds of Conservation Concern Recorded at Sites CBC0001WB002 and CBC0001WB003 during the Wintering Bird Surveys

Common Name / Scientific Name / BTO Code	Activity and Distribution in the Study Area	Conservation Importance			Surveyor Observations outside of transect
		BoCCI (B – Breeding / W - Wintering)	Annex I	SCI	
Black-headed gull *Chroicocephalus ridibundus* (BH)	CBC0001WB002: three birds feeding on grassland along transect (28/01/2021) CBC0001WB003: 73 birds loafing on grassland next to transect (23/02/2021)	Amber (B/W)	-	✓	
Common gull *Larus canus* (CM)	CBC0001WB003: Six birds loafing on grassland of Maypark (23/02/2021)	Amber (B/W)	-	Not in ZoI	
Herring gull *Larus argentatus* (HG)	CBC0001WB002: 23 birds feeding on grass along transect (28/01/2021) CBC0001WB003: 13 birds feeding on grasslands within transect (01/12/20)	Amber (B/W)	-	✓	
Light-bellied brent goose *Branta bernicla* (BG)	Not recorded CBC0001WB002: Droppings noted (23/03/2021)	Amber (W)	-	✓	CBC0001WB002: +100 birds flying over grassland and transect (28/01/2021 & 23/02/21).

Site conditions at Buttercup Park (CBC0001WB002) and Maypark (CBC0001WB003) were characterised by well-maintained ground conditions managed through regular cutting, and high disturbance with regular vehicle and human presence. Light-bellied brent geese were not observed utilising CBC0001WB002, however were frequently observed flying over, to and from Dublin Bay.

Site conditions at Maypark (CBC0001WB003) were characterised by well-maintained ground conditions managed through regular cutting, and high disturbance with regular human presence. Light-bellied brent geese were not observed utilising CBC0001WB003, however two droppings were noted on one occasion. Light-bellied brent goose activity was observed on this site during the 2020/2021 survey period, two droppings were observed in the middle of the Gaelic football pitch.

Table 12.10 compares peak counts identified across surveys to their national and international populations.

Table 12.10 Wintering Bird Species Recorded during Winter Bird Surveys in Comparison to the 1% of its International and National Populations

Common Name / Scientific Name / BTO Code	Associated European Sites within the ZoI	1% of International Population	1% of National Population
Black-headed gull *Chroicocephalus ridibundus* (BH)	South Dublin Bay and River Tolka Estuary SPA; North Bull Island SPA; The Murrough SPA	31,000	n/a
Common gull *Larus canus* (CM)	-	16,400	n/a
Herring gull *Larus argentatus* (HG)	Ireland's Eye SPA; Lambay Island SPA; Skerries Islands SPA; The Murrough SPA	14,400	n/a
Light-bellied brent goose *Branta bernicla* (BG)	South Dublin Bay and River Tolka Estuary SPA; North Bull Island SPA; Baldoyle Bay SPA; Malahide Estuary SPA; Rogerstown Estuary SPA ; Skerries Islands SPA; The Murrough SPA	400	350

The full results of the desk study, including records of wintering bird species considered to be of conservation concern, are presented in Appendix A12.1. in Volume 4 of this EIAR These species are considered to be KERs of the Proposed Scheme and include the following:

- SCIs, for a wintering population, of SPAs;
- Species listed under Annex I of the Birds Directive; and
- Red and Amber BoCCI species listed for their wintering populations.

The desk study returned records of a total of 52 wintering bird species across the study area (i.e. Grid Squares O13, O23 and O24). Records included 37 SCI species, four species listed under Annex I of the Birds Directive, and an additional five Red Listed and five Amber Listed species. This includes 24 species with breeding and wintering populations. These species are grouped into habitat preferences and are discussed below in relation to their presence within the footprint of the Proposed Scheme.

Downstream of the Proposed Scheme, Dublin Bay also supports Internationally Important numbers of black-tailed godwit and bar-tailed godwit between June and September (Dublin Bay Birds Project, 2016). An additional 20 species occurred in nationally important numbers across the Bay in 2013 and 2016. These included shelduck, wigeon, teal, pintail and shoveler which favoured Dollymount Strand and North Bull Island, while great crested grebe and ringed plover favoured Sandymount Strand. Red-breasted merganser, red-throated diver, little egret, grey heron, oystercatcher, grey plover, knot, sanderling, dunlin, curlew, greenshank, redshank, and turnstone were recorded across all areas of Dublin Bay. Records for wintering bird species returned in the desk study are those typically found in coastal, estuarine and intertidal habitats, such as the Tolka Estuary. Mayne Estuary and Dublin Bay. These largely include seabirds, waders, waterfowl, ducks, geese, and gulls. With the exception of geese, gulls and waders utilising inland feeding sites throughout the winter months, these species are unlikely to utilise lands adjacent to the Proposed Scheme in large numbers.

The wider study area of Dublin Bay, located *c*. 3.3km east of the Proposed Scheme, is considered of significant ornithological importance as it supports an Internationally Important population of light-bellied brent goose, the SCI species may use open parkland and grassland adjacent to the study area for foraging purposes. A review of a study into light-bellied brent goose inland feeding sites (Scott Cawley Ltd. 2017) has identified known inland wintering bird feeding sites within *c.* 300m of the Proposed Scheme. The importance of a feeding site has been categorised as follows:

- A site is considered to be of major importance if a peak count of over 400 geese has been previously recorded at that site;

- A site is considered to be of high importance site if a peak count of between 51 to 400 geese has been previously recorded at that site; and,
- A site is considered to be of moderate importance if a peak count of between 1 to 50 geese has been previously recorded at that site (Benson, 2009).

Known inland wintering bird feeding sites within *c.* 300m of the Proposed Scheme and are listed below (Scott Cawley Ltd. 2017):

- O'Toole's GAA pitch, immediately adjacent on R107 Malahide Road at Blunden Drive (major importance);
- Chanel College Coolock, immediately adjacent at Coolock Village (major importance);
- St David's College Artane, *c.* 100m west of R107 Malahide Road (major importance);
- Ardscoil Rís, immediately adjacent at R107 Malahide Road (major importance);
- St Vincent's GAA pitch, *c.* 300m west of R107 Malahide Road (major importance);
- Fairview Park, *c.*100m south of Marino (major importance)
- Rathvale Park, *c.*125m east of R107 Malahide Road (high importance);
- Ayrfield, *c.* 90m east of R107 Malahide Road (high importance); and,
- Clontarf Golf Club, immediately adjacent at R107 Malahide Road (high importance).

Desk study records of wintering bird species utilising lands adjacent to the Proposed Scheme are provided in Table 12.11.

Table 12.11 Desk Study Records of Wintering Birds of Conservation Concern Adjacent to the Proposed Scheme

Common Name / Scientific Name / BTO Code	Activity and Distribution in the Study Area	Conservation Importance		
		BoCCI (B – Breeding / W - Wintering)	Annex I	Nearest SPA designated for SCI species
Black-tailed Godwit *Limosa limosa* (BW)	Mayne Estuary2001 Within the 2km grid O24F at Clongriffin 2011	Red (W)	-	North Bull Island SPA (c.2km)
Bar-tailed Godwit *Limosa lapponica* (BA)	Mayne Estuary2001	Red (W)	✓	Baldoyle Bay SPA (c.1.2km)
Eurasian Curlew *Numenius arquata* (CU)	Mayne Estuary2001 Within the 2km grid O24F at Clongriffin 2011	Red (B/W)	✓	North Bull Island SPA (c.2km)
European Golden Plover *Pluvialis apricaria* (GP)	Mayne Estuary2001	Red (B/W)	✓	Baldoyle Bay SPA (c.1.2km)
Northern Lapwing *Vanellus vanellus* (L.)	Within the 2km grid O24F at Clongriffin 2011	Red (B/W)	✓	Boyne Estuary SPA (c.36km)
Light-bellied brent goose *Branta bernicla* (BG)	Observed utilising all of the above feeding sites and at Kilbarrack/Swan's Nest Road Park	Amber (W)	-	South Dublin Bay and River Tolka Estuary SPA (c.2.8km)
Eurasian Oystercatcher *Haematopus ostralegus* (OC)	Ardscoil Ris at Griffith Avenue Coolock / Cadbury's Pitch & Putt	Red (B/W)	-	Malahide Estuary SPA (c7.5km)
Little Grebe *Tachybaptus ruficollis* (LG)	Howth Head	Green (B/W)	-	Lough Ree SPA (c.110km)

12.3.10 Reptiles

Common Lizard are legally protected under the Wildlife Acts. Common lizard were not recorded during the multi-disciplinary surveys and no suitable habitat confirmed within the footprint of the Proposed Scheme.

The desk study did not return records of common lizard within the wider study area. This species is strongly associated with heathland and coastal dune habitats; neither habitat types were identified within the Proposed Scheme boundary (Marnell, 2002; Farren et al., 2010). However, it cannot be ruled out that these species are not in the wider study area.

Common lizard are deemed to be of Local Ecological Importance (Higher Value).

12.3.11 Amphibians

The common frog and the smooth newt are legally protected under the Wildlife Acts. The common frog is also listed under Annex V of the Habitats Directive. No evidence of common frogs or smooth newt were identified along the Proposed Scheme during the multi-disciplinary surveys.

Suitable amphibian habitat (*i.e.* vegetated river banks, surface water / drainage features with stagnant, relatively unpolluted water) was not identified within the footprint of the Proposed Scheme.

The desk study returned records for common frog within 1km of the Proposed Scheme at Marino in 2003 (NBDC 2020). This includes records of common frog across the length of the Proposed Scheme and records of smooth newt at Portmarnock and Howth (NPWS, 2019d).

Amphibians are deemed to be of Local Ecological Importance (Higher Value).

12.3.12 Fish

Fish species are protected under the Fisheries Acts and by fishing by-laws. Atlantic salmon, river lamprey and the brook lamprey are listed on Annex II of the EU Habitats Directive. Fish surveys were not carried out as part of the field surveys.

The Santry River catchment was surveyed by Inland Fisheries Ireland in 2019 and was assigned an Ecological Fish Status of Poor (EPA, 2019). The monitoring station is located at Clonshaugh Rd Bridge located c.1.8km upstream of the Proposed Development. It has no assigned Q Value since 1998. Under Water Framework Directive classification, the river has ‘Poor’ status in the upper reach, and ‘Unassigned’ status in the lower reach (Stack, 2019).

12.3.12.1 **Salmonid Species**

The Mayne River is considered a non-salmonid system (IFI Consultation, 2020). A survey carried out in 2016 found no salmonid species present in the Mayne River, the river was surveyed at three sites; Limekiln Lane, Wellfield Bridge and Snugborough. (Kelly *et a*l., 2017).

The Santry_020 is considered a non-salmonid system due to the presence of an impassable feature to fish movement at the lower reaches of the system (IFI Consultation, 2020). At its outflow there is a large box culvert which is described as fish accessible during larger high tides, upstream of this the lower reaches of the Santry_20 are associated with culverts or small weirs., (Macklin et al., 2019). However, it should be highlighted that Dublin City Council is currently conducting an ambitious river restoration and greenway project along a 4,500m stretch of the River. In a recent fish stock survey, brown trout were recorded in the lower reaches (IFI Consultation, 2020).

Brown trout are deemed to be of Local Ecological Importance (Higher Value).

12.3.12.2 **Lamprey Species**

The Santry_020 is not considered to contain suitable lamprey habitat due to the presence of an impassable feature to fish movement at the lower reaches of the system (IFI Consultation, 2020). The desk study did not return records for lamprey species within waterbodies hydrologically connected to the Proposed Scheme (NBDC2020). As such, lamprey are not considered further in the assessment.

12.3.12.3 European Eel

The desk study returned records for European eel *Anguilla Anguilla* within the on the River Mayne. WFD Fish survey reported European eel presence in 2011 (Kelly *et al* 2011). No records of European eel were returned for Santry RiveSantry_020 (NBDC online database, 2021b). The Santry_020 is not considered to contain suitable European eel habitat due to the presence of impassable features to fish movement at the lower reaches of the system (IFI Consultation, 2020).

This species is the most threatened fish in Irish freshwaters (King *et al.*, 2011) and the alarming decline of the species in recent decades has resulted in a classification of "*critically endangered*" (Jacoby & Gollock 2014).

European eel populations are valued as being of County Importance.

12.3.12.4 All Other Fish Species

During WFD surveillance monitoring programme in rivers 2011. -Three spined stickleback was recorded in abundance (Kelly *et al* 2011).

The desk study did not return records for fish species on the Santry_020. The Santry_020 is not considered to contain suitable habitat due to the presence of impassable features to fish movement at the lower reaches of the system (IFI Consultation, 2020). As such, other fish species are not considered further in the assessment.

These other species are valued as being of Local Importance (Higher Value).

12.3.13 Invertebrates

12.3.13.1 White Clawed Crayfish

White-clawed crayfish are legally protected under the Wildlife Acts and are also listed on Annex II of the Habitats Directive. Ireland remains the only part of the EU with no introduced species of crayfish, as such is of key conservation concern.

The desk study (see Appendix A12.1 in Volume 4 of this EIAR) did not return records for white-clawed crayfish in the Santry_020. As such, white-clawed crayfish are not considered further in this assessment.

12.3.13.2 Freshwater Molluscs

Surveys for freshwater molluscs were not carried out as part of this assessment. The desk study (see Appendix A12.1 in Volume 4 of this EIAR) did not return records for freshwater molluscs within close proximity of the Proposed Scheme. As such, freshwater molluscs are not considered further in the assessment.

12.3.13.3 Marsh Fritillary Butterfly

Marsh fritillary (*Euphydryas aurinia*) are legally protected under Annex II of the Habitats Directive. Surveys for marsh fritillary were not carried out as part of this assessment. In an Irish context, the conservation status of these species in Ireland is designated as 'Vulnerable' (Regan et al. 2010).

The desk study (see Appendix A12.1 in Volume 4 of this EIAR) did not return records for marsh fritillary within the footprint of the Proposed Scheme. Desk study records in the wider area were largely historical (pre-1980s). Recent records for marsh fritillary were identified 3km east of the Proposed Scheme at Bull Island in 2019.

Marsh fritillary are restricted to habitats containing a low, open sward with abundant devil's-bit scabious (*Succisa pratensis*) including sand dunes, calcareous grassland, fens, raised and blanket bogs, upland heaths and grasslands. Neither devil's-bit scabious nor these habitats were recorded within the footprint of the Proposed Scheme. As such, marsh fritillary are not considered further in the assessment.

12.3.13.4 **Other Invertebrates**

The desk study (see Appendix A12.1 in Volume 4 of this EIAR) returned records for several invertebrates red listed on Ireland Red List No. 4: Butterflies (Regan*, et al* 2010), Ireland Red List No. 6: Damselflies and Dragonflies (Odonata) (Nelson, *et al* 2011), Ireland Red and Regional Red List of Irish Bees 2006 (Fitzpatrick, *et al*., 2006) (NBDC 2020).

Butterfly are known to favour nectar-rich flowers which provide larval foodplants, preferred species include cock's-foot grass *Dactylis glomerata*, bird's-foot trefoil *Lotus corniculatus*, common nettle *Urtica dioica*, cuckoo flower *Cardamine pratensis*, garden nasturtium *Tropaeleum majus*, Common holly *Ilex aquifolium* and common ivy *Hedera helix* (Butterfly Conservation Ireland, 2020). Corresponding habitats along the Proposed Scheme are located in parkland with scattered trees (WD5) and amenity grasslands (GA2); present within Thorndale Park, St. David's Park, Marino Crescent Park, Donnycarney Church, Ardscoil Ris, Mount Temple Comprehensive, Cadbury's and along the banks of Santry_020. These habitats were identified along the route of the Proposed Scheme in fragmented pockets of small and medium size. Species diversity was low in terms of foodplants in these habitats. Butterfly communities that are known to survive in highly fragmented landscapes are mobile species that can feed off a range of plants (Öckinger, *et al.* 2010).

Bees favour sites with abundant flowers in unimproved grasslands and hay meadows. This grassland habitat type (GS1) was identified at one location across the Proposed Scheme on the western side of R107 Malahide Road from R139 to Belcamp Lane. The preferred foodplants for bees are native species with white, blue or yellow flowers (Fitzpatrick, 2006). Additional small, fragmented sites where suitable floral species were recorded along the Proposed Scheme include ornamental flower beds and borders (BC4) within residential gardens, parkland with scattered trees (WD5), and amenity grasslands (GA2); in parks and along the Santry_020.

Bumblebees may have large ranges and require large areas with varied habitats providing long flowering periods to support viable populations. Bees do not cope well with habitat fragmentation which can isolate species, ultimately reducing gene flow and genetic diversity, increasing their vulnerability to other stressors such as disease and internal parasites. Species with specialist foodplants or limited dispersal abilities can be particularly vulnerable to habitat loss and degradation (Biesmeijer *et al*. 2006) leading to increasing dominance by a smaller number of generalist species.

Loss of natural and semi-natural habitats has been a key driver in pollinators who require a balanced diet from a range of plant species throughout their active foraging season which lasts from early spring until late autumn (TCD 2017). There are small, isolated and fragmented sites along the route of the Proposed Scheme including; Clongriffin Village, adjacent to the Proposed Scheme, which is recorded as an urban pollinator area, with designated areas set aside where grass cutting has ceased and is actively managed for wildflowers (NBDC 2021).

These invertebrate species favour species rich semi-natural grasslands and meadows, upland heathland and sand dunes. Habitats within proximity of the Proposed Scheme which correspond to species requirements include species poor dry meadows and grassy verges, and areas of ornamental planting along roadsides, parkland, and gardens. Such habitats are fragmented and highly disturbed and are therefore deemed unsuitable for significant populations of red-listed invertebrates (Biesmeijer et al. 2006; Öckinger, et al. 2010). As such, other invertebrates are not considered further in the assessment.

12.3.14 Summary Ecological Valuation and Identification of Key Ecological Receptors

Table 12.12 summarises the ecological evaluation of all receptors taking into consideration legal protection, conservation status and local abundance. KERs are highlighted in blue in Table 12.12. Species, habitats and features not qualifying as KERs are not subjected to impact assessment in line with current best practice of assessing the impacts on what are determined to be important ecological or biodiversity features, as per the CIEEM Guidelines (CIEEM 2018) and the Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA 2009).

All designated areas for nature conservation that lie within the ZoI of the Proposed Scheme are considered to be KERs given that they are sites selected specifically for biodiversity conservation and are potentially at risk of

impacts from the Proposed Scheme. Those designated areas for nature conservation that lie beyond the ZoI of the Proposed Scheme are not considered to be at risk of impact and are therefore, not considered to be KERs.

In all cases, habitat and species valued as being of Local Importance (Higher Value), or higher, are considered to be KERs as they are important contributors to the local biodiversity resource and are of conservation concern, at least locally.

Habitats valued as being of a local importance (lower value) are not considered to be KERs in this assessment. This is not to say that they are of no biodiversity value, but that impacts on these habitat types in their local context are not likely to result in a significant effect on biodiversity. It should be noted that this relates to the impact on the habitat itself as distinct from considering the role these habitat types play in supporting KER fauna species. The impacts of the Proposed Scheme in that sense are captured and assessed under the relevant species' headings in Section 12.4.

These lower biodiversity value habitats include built or artificially created habitats, transient habitats as a result of disturbance, or those that have been highly anthropogenically modified (e.g. BL1, BL2, BL3, GA2 and WS3). These habitat types tend to be associated with residential, commercial or industrial development, roads and highly managed amenity areas. It also includes grassland habitats that are relatively species poor and improved.

In some cases, local importance (lower value) habitat can be associated with, or develop into, higher value habitats and where this is the case it is captured in valuing and considering whether a particular habitat type is a KER for this assessment.

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

Table 12.12 Summary of Ecological Valuation and Identification of KERs

Ecological Receptor	Ecological Valuation	KER?
Designated Sites		
Baldoyle Bay SAC [004016]	International	Yes
North Dublin Bay SAC [000206]	International	Yes
South Dublin Bay SAC [000210]	International	Yes
Howth Head SAC [000202]	International	Yes
Rockabill to Dalkey Island SAC [003000]	International	Yes
Lambay Island SAC [000204]	International	Yes
South Dublin Bay and River Tolka Estuary SPA [004024]	International	Yes
Baldoyle Bay SPA [004016]	International	Yes
North Bull Island SPA [004006]	International	Yes
Malahide Estuary SPA [004025]	International	Yes
Ireland's Eye SPA [004117]	International	Yes
Howth Head Coast SPA [004113]	International	Yes
Rogerstown Estuary SPA [004015]	International	Yes
Lambay Island SPA [004069]	International	Yes
Dalkey Islands SPA [004172]	International	Yes
Skerries Islands SPA [004122]	International	Yes
Rockabill SPA [004014]	International	Yes
The Murrough SPA [004186]	International	Yes
All other SAC or SPA sites	International	No – beyond ZoI
Skerries Islands NHA [001218]	National	Yes
North Dublin Bay pNHA [000206]	National	Yes

Ecological Receptor	Ecological Valuation	KER?
Baldoyle Bay pNHA [000199]	National	Yes
Dolphins, Dublin Docks pNHA [000201]	National	Yes
South Dublin Bay pNHA [000210]	National	Yes
Malahide Estuary pNHA [000205]	National	Yes
Howth Head pNHA [000202]	National	Yes
Ireland's Eye pNHA [000203]	National	Yes
Booterstown Marsh pNHA [001205]	National	Yes
Rogerstown pNHA [000208]	National	Yes
Portraine Shore pNHA [001215]	National	Yes
Dalkey Coastal Zone and Killiney Hill pNHA [001206]	National	Yes
Lambay Island pNHA [000204]	National	Yes
The Murrough pNHA [004186]	National	Yes
All other NHA or pNHA sites	National	No – beyond ZoI
Habitats		
Flower beds and borders (BC4)	Local Importance (Lower Value)	No
Stone walls and other stonework (BL1)	Local Importance (Lower Value)	No
Buildings and artificial surfaces (BL3)	Local Importance (Lower Value)	No
Spoil and bare ground (ED2);	Local Importance (Lower Value)	No
Recolonising bare ground (ED3);	Local Importance (Lower Value)	No
Depositing/lowland rivers (FW2)	Local Importance (Higher Value)	Yes
Amenity grassland (improved) (GA2)	Local Importance (Lower Value)	No
Dry calcareous and neutral grassland (GS1);	Local Importance (Higher Value)	Yes
Dry meadows and grassy verges (GS2)	Local Importance (Lower Value)	No
Residential	Local Importance (Lower Value)	No
(Mixed) broadleaved woodland (WD1)	Local Importance (Higher Value)	Yes
Scattered trees and parkland (WD5)	Local Importance (Higher Value)	Yes
Hedgerows (WL1)	Local Importance (Higher Value)	Yes
Treelines (WL2)	Local Importance (Higher Value)	Yes
Scrub (WS1)	Local Importance (Lower Value)	No
Ornamental/non-native shrub (WS3)	Local Importance (Lower Value)	No
Flora Species		
Flora Species listed on the Flora Protection Order	National	Yes
Flora Species on Irelands Red Lists (Vulnerable or of higher conservation concern)	Local Importance (Higher Value)	Yes
All other non-Red listed flora species	Local Importance (Lower Value)	No
Non-native invasive plant species	N/A	No
Fauna Species		
Otter	County Importance	Yes
Bats	Local Importance (Higher Value)	Yes
Badger	Local Importance (Higher Value)	Yes
Marine Mammals	Local Importance (Higher Value) – County Importance	Yes
Other terrestrial mammal species protected under the Wildlife Acts	Local Importance (Higher Value)	Yes

Ecological Receptor	Ecological Valuation	KER?
SCI and/or Annex I bird species	International Importance	Yes
All other Red listed bird species (non-SCI or Annex I breeding populations)	Local Importance (Higher Value)	Yes
All other Amber listed bird species (non-SCI or Annex I breeding populations)	Local Importance (Higher Value)	Yes
Any other Green listed bird species (non-SCI or Annex I breeding populations)	Local Importance (Higher Value)	Yes
All other wintering bird species (non-SCI or Annex I)	Local Importance (Higher Value)	Yes
European Eel	County Importance	Yes
All other fish species	Local Importance (Higher Value)	Yes
Amphibians	Local Importance (Higher Value)	Yes
Reptiles	Local Importance (Higher Value)	Yes
Non-native invasive fauna species	N/A	No

12.4 Potential Impacts

The following section presents the assessment of potential impacts on biodiversity within the ZoI of the Proposed Scheme. As outlined in Section 12.2.4, this is focused on the KERs identified in Section 12.3.14. This includes consideration of the "*Do-Nothing impact*" scenario – *i.e.* the existing trends with the potential to affect biodiversity in the absence of the Proposed Scheme.

12.4.1 Characteristics of the Proposed Scheme

A detailed description of the proposed road development and construction activities are provided in Chapter 4 (Proposed Scheme Description), and Chapter 5 (Construction). The main characteristics of the Proposed Scheme of relevance to the ecological assessment are outlined under Construction and Operational Phases in sections 12.4.1.1 and 12.4.1.5.

12.4.1.1 **Construction Phase**

The main characteristics of the Construction Phase of the Proposed Scheme that have potential for ecological impact are:

- Site preparation and clearance;
- Removal of existing boundaries, pavements, lighting columns, bus stops, and signage;
- Removal of trees and vegetation;
- Protection and / or diversion of buried services;
- Road widening, pavement reconstruction, and kerb improvements;
- Reconfiguration of traffic lanes throughout;
- Installation of new bus stops and junction / roundabout modification;
- Property boundary reinstatement, signage replacement; installation of lighting columns; and,
- Landscaping and tree planting, and reinstatement of temporary land acquisitions.

12.4.1.2 **Drainage Infrastructure**

The drainage system for the Proposed Scheme will discharge to four surface water receptors, the Santry_020, Mayne_010, North Bull Island transitional water body and the Tolka Estuary, before ultimately draining to Dublin Bay and the Mayne Estuary. All drainage outfall discharges to surface waters represent point discharges. For the Proposed Scheme, there will be a net increase of 1,440m^2 in the impermeable area ultimately discharging to Dublin Bay and a net increase of 273m^2 in the impermeable area ultimately discharging to Baldoyle Bay. The drainage design principles ensure that all runoff from increases in impermeable areas will be attenuated and there will be no net increase in the surface water flow discharged to these receptors.

Full details of proposed drainage infrastructure are provided in Chapter 13 (Water) and the Proposed Surface Water Drainage Works Drawings (BCIDA-ACM-DNG_RD-0001_XX_00-DR-CD-9001) in Volume 3 of this EIAR.

12.4.1.3 **Construction Compounds**

The Construction Compound CL1 will be located at Buttercup Park adjacent to R107 Malahide Road for the duration of the Proposed Scheme's Construction Phase. This site is composed of GA2 habitat. The Construction Compound will be located on at wintering birds survey site CBC0001WB002.

Construction Compound CL1 will be the main Construction Compound servicing the Proposed Scheme. This Construction Compound will be used to store materials, plant and equipment, to manage the activities from and to provide welfare facilities for construction personnel. It is anticipated that the appointed contractor may seek to crush and re-use certain materials, primarily concrete and excavated rock, during the Construction Phase of the Proposed Scheme.

The Construction Compound will be in place for the duration of the Construction Phase of the Proposed Scheme, estimated as approximately 24 months.

12.4.1.4 **Estimated Project Duration**

The duration of the Construction Phase is estimated to be approximately 24 months.

12.4.1.5 **Operational Phase**

The main characteristics of the Operational Phase of the Proposed Scheme that have potential for ecological impact are:

- The presence and operation (traffic) of the road;
- The presence of additional lighting; and
- Routine maintenance.

12.4.2 'Do Nothing' Scenario

In the Do Nothing scenario, the Proposed Scheme would not be implemented (discussed further in Chapter 6 (Traffic & Transport)). Thus, the existing corridors would remain with no immediate significant changes in the terrestrial, aquatic and marine biodiversity (flora and fauna) of the area, as there would be no significant Construction Phase impacts from the Proposed Scheme beyond roadside management of existing habitats. The impact of no construction is neutral upon biodiversity along and adjacent to the Proposed Scheme.

The Baseline Environment (see Section 12.3) describes the existing land use surrounding the Proposed Scheme. The Greater Dublin Area is highly urbanised with existing trends resulting in added pressure to water resources and habitat losses to ongoing development. As the full extent of the Proposed Scheme passes through lands zoned under the Dublin City County Development Plan 2016-2022 (DCC 2016) the current land use zonings provide the best indication of what the future short to medium-term biodiversity trends might be, as they will influence and direct development in the surrounding area. Lands surrounding the Proposed Scheme are largely zoned for residential, commercial or industrial purposes. Current biodiversity trends are likely to continue in areas zoned for development, adding to pressures on water bodies and habitat fragmentation. It is also likely that traffic numbers will continue to remain high on a road network with variable drainage control or pollution control measures, which may have effects on biodiversity receptors in the receiving environment.

However, any effects on biodiversity are likely to be moderated by the environmental protective policies in the Dublin City County Development Plan 2016-2022 and overarching pollution control objectives in the River Basin Management Plan (RBMP) (DHPLG 2018).

The interaction between the existing trends, future trends, and other plans or projects with the Proposed Scheme are considered and assessed further in Chapter 21 (Cumulative Impacts & Environmental Interactions).

12.4.3 Construction Phase

This section describes and assesses the potential for the Proposed Scheme to result in likely significant effects on designated areas for nature conservation at SACs, SPAs, NHAs or pNHAs. In the context of European sites this is focused on the habitats and species for which the sites are selected (i.e. QIs for SACs and SCI species for SPAs, and the conservation objectives supporting their conservation status in each site. This assessment is directly related to the assessment methodology for European sites required under the Habitats Directive, which is presented in the NIS prepared for the Proposed Scheme (and submitted with the application for approval).

In the case of NHAs and pNHAs, the assessment considers whether the integrity of any such site would be affected by the Proposed Scheme with reference to the ecological features for which the site is designated or is proposed.

12.4.3.1.1 European sites

In the context of assessing whether the Proposed Scheme is likely to result in an impact on the integrity of any European sites, the NIS considers whether the Proposed Scheme will affect the conservation objectives supporting the favourable conservation condition of any European sites' QIs / SCIs and as a result presents an

assessment of whether the integrity of any European sites would be affected. For the avoidance of doubt, it should be noted that, if the Proposed Scheme would adversely affect the integrity of a European site, then this would constitute a likely significant effect in the context of the EIA Directive.

The nature and scale of the Proposed Scheme, the identified potential impacts and their relationship to European sites were considered in order to determine which European sites were located within the ZoI of the Proposed Scheme, in view of best scientific knowledge and in view of conservation objectives, and therefore potentially at risk of the Proposed Scheme affecting their conservation objectives. The potential impacts associated with the Proposed Scheme are discussed below in relation to those European sites within its ZoI (further information can also be found in Section 6 and Section 7 of the NIS).

The ZoI is a distance within which the Proposed Scheme could potentially affect the conservation condition of QI habitats or QI / SCI species of a European site.

The mechanism to define the ZoI is summarised as follows:

- Consider the nature, size and location of the Proposed Scheme;
- Consider the sensitivities of the ecological receptors;
- Identify impact sources and pathways; and
- Determine the ZoI based on the extent of the impact

Considering the ZoI, in the absence of mitigation measures, the Proposed Scheme was assessed as having the potential to adversely affect the integrity of the following European sites:

- Baldoyle Bay SAC [000199];
- North Dublin Bay SAC [000206];
- South Dublin Bay SAC [000210];
- Howth Head SAC [000202];
- Rockabill to Dalkey Island SAC [003000];
- Lambay Island SAC [000204];
- South Dublin Bay and River Tolka Estuary SPA [004024];
- Baldoyle Bay SPA [004016];
- North Bull Island SPA [004006];
- Malahide Estuary SPA [004025];
- Ireland's Eye SPA [004117];
- Howth Head Coast SPA [004113];
- Rogerstown Estuary SPA [004015];
- Lambay Island SPA [004069];
- Dalkey Island SPA [004172];
- Skerries Islands SPA [004122];
- Rockabill SPA [004014] and,
- The Murrough SPA [0041186].

The locations of these European sites relative to the Proposed Scheme are shown on Figure 12.3 in Volume 3 of this EIAR .

The following potential effects on European sites have been identified based on the existing ecological environment and the extent and characteristics of the Proposed Scheme (see information provided below for detailed description of each potential impact):

- Habitat loss and fragmentation;
- Habitat degradation / effects on QI / SCI species as a result of hydrological impacts;
- Habitat degradation as a result of introducing / spreading non-native invasive species;

- Habitat degradation as a result of air quality impacts; and,
- Disturbance and displacement impacts.

Habitat Loss and Fragmentation

The Proposed Scheme does not overlap with any European sites. The nearest European site with a direct hydrological connection to the Proposed Scheme are North Dublin Bay SAC and North Bull Island SPA which are both located *c.* 3km downstream of the proposed crossing point of the Santry_020.

Special Conservation Interest (SCI) species for which SPAs in the vicinity of the Proposed Scheme have been designated are known to utilise *ex situ* feeding sites in the Dublin area (i.e., Malahide Estuary SPA, Baldoyle Bay SPA, North Bull Island SPA, South Dublin Bay and River Tolka SPA and Rogerstown Estuary SPA, Skerries Islands SPA, Ireland's Eye SPA, Lambay Island SPA and The Murrough SPA). A number of potential inland feeding sites within the footprint of the Proposed Scheme were surveyed to inform this assessment; these were located at lands opposite the Hilton Hotel at the junction of Malahide Road / R135 referred to as CBC0001WB001, Buttercup Park, referred to as CBC0001WB002, and Maypark, referred to as CBC0001WB003. Of these, Buttercup Park and Maypark were found to support SCI species. The Proposed Scheme will result in the temporary loss of 0.81ha GA2 habitat suitable to support breeding gull and wintering bird species at the Proposed Buttercup Park compound (referred to as CBC0001WB002), a permanent loss of 0.02ha of suitable GA2 habitat at the proposed Maypark footpath, and a temporary loss of 0.7ha of suitable GA2 habitat at Maypark to facilitate boundary works.

In summary, there is potential for impacts on SCI species associated with SPAs to occur as a result of habitat loss / fragmentation.

Habitat Degradation / Effects on QI / SCI Species as a result of Hydrological Impacts

The Proposed Scheme is hydrologically connected to Dublin Bay and the Mayne Estuary via the Santry_020, Mayne_010, Wad River and existing pipes which drain directly to Dublin Bay and the Mayne Estuary. The potential release of contaminated surface water runoff and / or an accidental spillage or pollution event into any surface water features during construction has the potential to affect water quality in the receiving aquatic environment. Such a potential pollution event may include: the release of sediment into receiving waters and the subsequent increase in mobilised suspended solids; and, the accidental spillage and / or leaks of containments into receiving waters. The associated effects of a reduction of surface water quality could potentially extend for a considerable distance downstream of the location of the accidental pollution event or the discharge point and therefore impact the downstream environment, i.e. Dublin Bay and the Mayne Estuary including the following European sites: Baldoyle Bay SAC, North Dublin Bay SAC, South Dublin Bay SAC, Howth Head SAC, Rockabill to Dalkey Island SAC, Baldoyle Bay SPA, North Bull Island SPA, South Dublin Bay and River Tolka Estuary SPA and Dalkey Islands SPA. This reduction in water quality (either alone or in combination with other pressures on water quality) could potentially result in the degradation of sensitive habitats present within these European sites, which in turn would negatively affect the SCI bird species that rely upon these habitats as foraging and / or roosting habitat. It could also potentially negatively affect the quantity and quality of prey available to SCI bird species. These potential impacts could occur to such a degree that the conservation objectives of Baldoyle Bay SAC, North Dublin Bay SAC, South Dublin Bay SAC, Howth Head SAC, Rockabill to Dalkey Island SAC, Baldoyle Bay SPA, North Bull Island SPA, South Dublin Bay and River Tolka Estuary SPA and Dalkey Islands SPA are undermined.

In a worst case scenario, in the absence of mitigation measures, the release of contaminated surface water runoff and / or an accidental spillage or pollution event into any surface water features during construction, also has the potential to affect mobile SCI bird species and QI mammal species that commute, forage and loaf in Dublin Bay *i.e.* birds associated with Skerries Islands SPA, Rockabill SPA and Lambay Island SPA, Ireland's Eye SPA, North Dublin Bay SPA, South Dublin Bay and River Tolka Estuary SPA, Malahide Estuary SPA, Rogerstown Estuary SPA, Dalkey Islands SPA, The Murrough SPA and, marine mammals associated with Rockabill to Dalkey Island SAC and Lambay Island SAC. This reduction in water quality could result in the degradation of sensitive habitats present within downstream European sites, which in turn would negatively affect the SCI bird species that rely upon these habitats as foraging and / or roosting habitat. It could also negatively affect the quantity and quality of prey available to SCI and QI populations.

Habitat Degradation as a result of Introducing / Spreading Non-Native Invasive Species

No non-native invasive plant species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 were recorded within, or in close proximity to, the Proposed Scheme. However, there were records of invasive species in the vicinity of the Proposed Scheme returned from the desk study. Therefore, there is potential for invasive species to spread or be introduced, during construction to terrestrial habitat areas in European sites downstream in Dublin Bay via the Santry _020 and / or Wad River (i.e. North Dublin Bay SAC, South Dublin Bay SAC, North Bull Island SPA and South Dublin Bay and River Tolka Estuary SPA). The introduction and/or spread of these invasive species to downstream European sites could potentially result in the degradation of existing habitats present, in particular coastal habitats not permanently or regularly inundated by seawater. These species may outcompete other native species present, negatively impacting the species composition, diversity and abundance and the physical structural integrity of the habitat. This in turn could potentially undermine the conservation objectives of these European sites.

It is not considered possible that invasive species could spread to European sites which are located a significant distance from the outfall locations of the Santry_020 and Wad River, or the potential outfall locations of the pipes that drain directly to Dublin Bay (i.e. Howth Head SAC, Howth Head Coast SPA, Rockabill to Dalkey Island SAC, Dalkey Islands SPA).

Disturbance and Displacement Impacts

There are no European sites within the disturbance ZoI of the Proposed Scheme, however, several QI species are known to occur within the vicinity of the Proposed Scheme. Refer to Section 12.4.3.4 and Section 12.4.3.5 for more details with regards to potential construction impacts on QI mammals and SCI birds, respectively.

There are a number of SPAs located in relatively close proximity to the Proposed Scheme which are designated for SCI species that are known to forage and/or roost at inland sites, such as amenity grassland playing pitches (i.e. Malahide Estuary SPA, Baldoyle Bay SPA, North Bull Island SPA, South Dublin Bay and River Tolka SPA, Rogerstown Estuary SPA, Skerries Islands SPA, Ireland's Eye SPA, Lambay Island SPA, and the Murrough SPA). These species include light-bellied brent goose, curlew, oystercatcher, black-tailed godwit, blacked-headed gull, herring gull and lesser black-backed gull. Suitable inland foraging / roosting sites, which these bird species utilise, are located within the potential ZoI of the Proposed Scheme.

Refer to Section 12.4.3.5.2 for more details with regards to potential impacts on wintering bird species, which encompass all relevant SCI bird species.

12.4.3.1.2 Natural Heritage Areas and Proposed Natural Heritage Areas

In the case of NHAs and pNHAs the assessment considers whether the integrity of any such site would be affected by the proposed development with reference to the ecological features for which the site is designated, or is proposed.

Considering the ZoI of the Proposed Scheme, in the absence of mitigation measures the Proposed Scheme has the potential to have a likely significant effect upon the following one NHAs and pNHAs:

- Skerries Islands NHA [000204];
- North Dublin Bay pNHA [000206];
- Baldoyle Bay pNHA [000199];
- Howth Head pNHA [000202];
- South Dublin Bay pNHA [000210];
- Dolphins, Dublin Docks pNHA [000201];
- Booterstown Marsh pNHA [001205];
- Malahide Estuary pNHA [000205];
- Dalkey Coastal Zone and Killiney Hill pNHA [001206];
- Rogerstown pNHA [000208];
- Portraine Shore pNHA [001215];

- Ireland's Eye pNHA [000203] and,
- Lambay Island pNHA [000204].

The locations of these designated areas for nature conservation relative to the Proposed Scheme are shown on Figure 12.4 in Volume 3 of the EIAR.

The potential effects on European sites arising from the Proposed Scheme, described above in Section 12.4.3.1.1, may also negatively affect the pNHA sites located within the boundaries of these European sites. These pNHA are primarily designated for similar reasons. The Proposed Scheme also has the potential to affect biodiversity in a broader sense than just the Qis / SCIs of those European sites. Where biodiversity receptors in these pNHAs do not form part of the Qis / SCIs in the NIS assessment, they are considered under the other individual impact assessment headings for each KER below. Potential impacts arising from the Proposed Scheme on these pNHA sites would result in a likely significant negative effect at a national geographic scale.

12.4.3.2 **Habitats**

This section assesses the potential effects of the Proposed Scheme on habitats. In terms of quantifying the magnitude of effects on habitats, the estimated percentage of the local habitat resource being affected is based upon the total area of a given habitat type that was recorded within the study area of the Proposed Scheme. This provides some local context as to the magnitude of the habitat loss and whether the impact is significant or not, and at what geographic scale.

Habitat Loss & Fragmentation

The construction of the Proposed Scheme will result in habitat loss across its length. This occurs in the form of permanent land take of edge habitats adjacent to the existing road network, or as temporary land take to facilitate construction activities.

The habitat type depositing / lowland rivers (FW2) may be affected by the Proposed Scheme and is considered of Local Importance (Higher Value). This habitat type comprises the Santry_020 and Wad River, which will cross the Proposed Scheme, flowing under the R107 Malahide Road, at its junction with Greencastle Road in Coolock. The Proposed Scheme will not result in any permanent loss of this habitat type and, therefore, there is no potential for significant effects at any geographic scale.

Habitat types considered to be of Local Importance (Higher Value) will be lost as a result of the Proposed Scheme. These include relatively small areas of scattered trees and parkland (WD5), hedgerow (WL1) and treeline (WL2) habitats, as well as a small linear area of dry calcareous and neutral grassland (GS1), which is located opposite the Clarehall Shopping Centre and will be temporarily lost by the Proposed Scheme. These habitats are located next to existing urban development, and as such are highly disturbed. The overall total area of the habitat types which overlap with the Proposed Scheme boundary and will be directly lost as a result of the construction of the Proposed Scheme is provided in Table 12.13. It should be noted that the extent of tree loss is calculated across the length of the Proposed Scheme and is captured under treelines (WL2) as the majority of habitat loss affects this habitat type. However small numbers of these trees may be lost from the habitat classification scattered trees and parkland (WD5). This distinction is considered in the habitat loss impact assessment. The permanent loss of habitat types considered to be of Local Importance (Higher Value) has the potential to affect the conservation status of each of these habitat types and, therefore, result in a significant negative effect at the local geographic scale.

The remaining areas within the footprint of the Proposed Scheme comprise of habitats considered to be of a Local Importance (Lower Value). These include: improved amenity grassland (GA2), planted flowers beds (BC4) and ornamental/non-native shrub (WS3), areas of disturbed ground (ED2 and ED3) and scrub (WS1) and hard standing (BL3). These habitats are located next to existing urban development, and as such are highly disturbed. With the exception of the temporary loss of 0.81ha of GA2 habitat for the Construction Compound, habitat loss will consist of small, isolated sections adjacent to the existing Malahide Road. The overall total area of these habitat types which overlaps with the Proposed Scheme boundary and will potentially be lost as a direct impact during construction of the Proposed Scheme is not considered to be significant at any geographical scale.

The various KER habitat types affected and corresponding total areas which overlap with the Proposed Scheme boundary are summarised below in Table 12.13. These calculations include all KER habitat areas within the Proposed Scheme boundary, as the possibility of areas within the Proposed Scheme boundary however outside of the footprint of the Proposed Scheme itself being affected by construction activities cannot be ruled out. KERs highlighted in blue will be subject to direct habitat loss as a result of the Proposed Scheme.

Habitat loss may also lead to habitat fragmentation, *i.e.* creating new divisions of existing habitat blocks and / or contributing to an existing trend of fragmenting semi-natural habitat blocks; however, considering the habitat types to be lost, their extents and the surrounding habitats beyond the Proposed Scheme boundary, this potential impact will not result in a significant effect at any local geographic scale.

The mitigation measures that have been designed to avoid or reduce the effects of direct impacts to habitats are in Section 12.5.

Table 12.13 Extent of habitat loss within the Proposed Scheme

Habitat Type	Extent of permanent habitat loss	Extent of temporary habitat loss
Local Importance (Higher Value)		
Depositing/lowland rivers (FW2)	*c.* 0m	*c.* 0m
Scattered trees and parkland (WD5)*	*c.* 1.05ha	*c.* 0.03ha
Mixed broadleaf woodland (WD1)	*c.* 0ha	*c.* 0ha
Dry calcareous and neutral grassland (GS1)	*c.* 0.03ha	*c.* 0.03ha
Hedgerow (WL1)	*c.* 0.1ha	N / A
Treelines (WL2)	221 trees removed	N / A

KERs highlighted in blue will be subject to direct habitat loss as a result of the Proposed Scheme.

*Extent of habitat removal refers to parkland only, tree loss is captured under Treeline (WL2) habitat code

Habitat Degradation – Surface Water Quality

During construction, contaminated surface water runoff and / or an accidental spillage or pollution event into any surface water feature has the potential to have significant negative effects on water quality and consequently affect aquatic and wetland habitats in the receiving environment. The effects of frequent and / or prolonged pollution events have the potential to be extensive and far-reaching and could potentially have significant long-term effects. In a worst-case scenario, the downstream habitats of the Tolka Estuary, North Bull Island, and Mayne Estuary transitional water bodies, and Dublin Bay could also be affected.

It is unlikely that a pollution event of such a magnitude would occur during construction or, in the unlikely event it did occur, it would be temporary in nature. Nevertheless, a precautionary approach has been adopted in the assessment of potential risk of impacts on water quality. Consequently, detailed mitigation measures are required to further minimise the risk contaminated surface water runoff and / or an accidental spillage or pollution event of the Proposed Scheme having any perceptible effect on water quality during construction.

Construction works in close proximity to the Santry_020 or existing surface water drainage infrastructure hydrologically connected to the River Wad, and / or the Mayne_010, could result in generated silt / sediment being released into these surface water features and in a worst case scenario, potentially being transferred downstream including, potentially, into downstream transitional and coastal water bodies. Cement based products used in the Construction Phase of the Proposed Scheme (*e.g.* concrete and / or bentonite which are highly corrosive and alkaline materials), if released into the surface water network may cause surface water degradation and damage to aquatic fauna. This has the potential to result in significant negative effects on water quality at a local geographical scale and consequently affect aquatic and wetland habitats in the receiving environment. In a worst-case scenario, transitional and coastal habitats downstream, in the Tolka Estuary, North Bull Island, Mayne Estuary, and Dublin Bay, could also be affected.

Habitat degradation as a consequence of construction effects on surface water quality has the potential to affect the conservation status of Annex I habitats contained in European sites in and around Dublin Bay and therefore,

has the potential to result in a significant negative impact at a national scale in the case of the aquatic / wetland Annex I habitats located within the ZoI of the Proposed Scheme.

The mitigation measures that have been designed to avoid or reduce the potential impacts of the Proposed Scheme on surface water quality are presented in Section 12.5.

Habitat Degradation – Hydrological Regime

During the Construction Phase, the potential for temporary disruption to local drainage systems and hydrological regimes have been assessed in relation to the Proposed Scheme. These are not predicted to result in a likely significant negative effect on any aquatic habitats or species through effects on the hydrological regime (for more detail refer to Section 13.4 of Chapter 13 (Water)).

Habitat Degradation – Groundwater

Any effects on the existing hydrogeological baseline supporting wetland habitats has the potential to negatively affect habitat extent and distribution, and vegetation structure and composition. The potential effects upon the existing hydrogeological regime are not necessarily limited to habitats within the proposed development boundary but can be far-reaching, with significant negative long-term effects. As discussed in Chapter 14 (Land, Soils, Geology & Hydrogeology), the Proposed Scheme may involve the excavation of potentially contaminated ground, resulting in damage to the aquifer, or change the existing groundwater regime.

Groundwater dependent habitats were not identified in close proximity to the Proposed Scheme, therefore, any potential impacts as a result of the Proposed Scheme arise with the interaction between groundwater and surface water.

However, while there may be no direct impact on the groundwater regime, there is potential indirect impacts associated with the Proposed Scheme through surface water interaction. However, since any pumping (if any) is expected to be limited and localised and temporary, the magnitude of this impact is considered negligible.

As detailed in the Construction and Environmental Management Plan (CEMP) for the Proposed Scheme (Appendix A5.1 in Volume 4 of this EIAR), specific controls / mitigation measures have been identified for implementation to manage runoff and minimise pollution to receiving waterbodies during the Construction Phase.

Habitat Degradation – Air Quality

As discussed in Chapter 7 (Air Quality), the Proposed Scheme has the potential to generate dust during construction works which could affect vegetation in habitat areas adjacent to the Proposed Scheme. Mitigation measures have been designed to contain dust emissions during construction (see Section 12.5.1).

Habitat Degradation – Non-native Invasive Plant Species

The accidental spread of non-native invasive plant species as a result of construction works has the potential to impact on terrestrial habitats; potentially affecting plant species composition, diversity and abundance over the long-term. This is not only confined to habitats within and immediately adjacent to the footprint of the Proposed Scheme but also includes habitat areas located along the network of proposed haul routes associated with the Proposed Scheme.

The effects of introducing such non-native invasive plant species to highly sensitive and ecologically important habitat areas (*e.g.* designated area for nature conservation or areas of Annex I habitat) have the potential to result in a significant negative effect, at geographic scales ranging from local to international. No non-native invasive plant species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 were identified along the Proposed Scheme, during field surveys undertaken. However, the desktop study revealed records for several non-native invasive species within 1km of the Proposed Scheme. Giant hogweed was previously recorded along the Santry_020. Records for Japanese knotweed at Philipsburgh Avenue Marino and three-cornered garlic at Mount Temple also exist.

During the interim between the original invasive species surveys and commencement of construction, it is possible that newly established Third Schedule non-native invasive species may become established within the footprint of the Proposed Scheme. Mitigation measures have been designed to avoid this potential impact (see Section 12.5.1 and Appendix A5.1 (CEMP) in Volume 4 of the EIAR).

12.4.3.3 **Rare and Protected Plant Species**

Habitat Loss

No protected plant species listed on the Flora (Protection) Order, 2015 were recorded within or in close proximity to the Proposed Scheme. The desktop study did not reveal any records for rare and/or protected species in close proximity to the Proposed Scheme. Therefore, there is no potential for impacts on rare / protected species, as a result of the construction of the Proposed Scheme.

12.4.3.4 **Mammals**

12.4.3.4.1 Bats

Roost Loss

There are no confirmed bat roosts within the footprint of the Proposed Scheme, however, there were two trees with PRFs identified during the multi-disciplinary surveys. The Proposed Scheme will not result in the loss of trees with PRFs. Therefore, there is no potential for impacts on bat roosts as a result of the construction of the Proposed Scheme.

Habitat Loss as a result of fragmentation of foraging / commuting habitat and commuting routes

Bats rely on suitable semi-natural habitats which support the insect prey upon which they feed. The Proposed Scheme will result in the loss of such habitats used for feeding by all bat species recorded in the study area. Suitable habitat for foraging and / commuting bats within the footprint of the Proposed Scheme includes hedgerows, treelines, Santry_020, areas of parkland, and open grassland. The area of the habitats which will be lost as a result of the Proposed Scheme is provided in Table 12.13 and the Landscaping General Arrangement Drawings (BCIDA-ACM-ENV_LA-0001_XX_00-DR-LL-9001) in Volume 3 of this EIAR. This is not deemed significant, considering the extent of habitat loss (See Table 12.13), their location (adjacent to existing artificially lit roads in a generally highly disturbed urban environment) and the presence and relative abundance of other similar habitats in the wider locality, which will not be impacted by the Proposed Scheme. The Proposed Scheme will not result in any loss of the Santry_020.

In assessing the impacts of habitat loss as a result of fragmentation of foraging / commuting habitat on bat populations, consideration was given to a species Core Sustenance Zone. A Core Sustenance Zone (CSZ) refers to the area surrounding a communal bat roost within which habitat availability and quality will have a significant influence on the “resilience and conservation status” of the colony using the roost. Bat Conservation Trust Guidance (Bat Conservation Trust 2016) states that: “With reference to planning and development the core sustenance zone is: The area surrounding the roost within which development work can be assumed to impact the commuting and foraging habitat of bats using the roost, in the absence of information on local foraging behaviour. This will highlight the need for species-specific survey techniques where necessary; and; The area within which mitigation measures should ensure no net reduction in the quality and availability of foraging habitat for the colony, in addition to mitigation measures shown to be necessary following ecological survey work.”

Notwithstanding the fact that there is evidence of bats foraging and commuting within the study area of the Proposed Scheme, particularly near Maypark (CBC0001BT003), Clarehall Avenue (R139) (CBC0001BT002) and Father Collins Park (CBC0001BT001), and that all parts of the Proposed Scheme which contain suitable habitat are likely to be within the core sustenance zone (CSZ) of at least one bat roost, considering the type of works proposed (*e.g.* upgrading of existing infrastructure for the most part), there is limited potential for the Proposed Scheme to act as a barrier to flight paths for bat species.

The provision of the proposed footpath in Maypark will not result in the felling of the existing boundary treeline and therefore will not reduce foraging/ commuting habitat for local bat populations in this location. Felling of six

trees is proposed to accommodate a cycle way at St David's Wood, this is not deemed to significantly disrupt connectivity to commuting / foraging routes in the surrounding area i.e. St. David's Sports Grounds and Rockfield Park. Likewise, works along Clarehall Avenue (R139) will not result in the removal of any substantial vegetation, which could constitute habitat fragmentation.

Fragmentation of feeding habitat has the potential to disturb normal bat behavioural patterns, and thus adversely affect the ability of local bat populations to persist and reproduce, impacting on their local distribution and/or abundance. The barrier effect can manifest itself as soon as the site clearance phase commences and the barrier itself is in the form of the cleared lands.

Removal of suitable habitat for foraging and / commuting bats within the footprint of the Proposed Scheme is calculated as 228m of hedgerow (WL1) and 0.34ha of vegetation. The majority of trees and / or hedgerows to be removed consist of landscaping vegetation at road medians of the R107 Malahide Road, which are highly urbanised with extensive areas of existing lighting. Habitat removal is within a highly disturbed urban environment with low numbers of bat species records, and, as such is not deemed to provide significant contributions to core sustenance zones of roosts outside of the footprint of the Proposed Scheme. The effect of habitat fragmentation and barrier effect associated with the construction of the Proposed Scheme is therefore considered to be significant at the local level only.

Installation of temporary working and site compound lighting which may cause indirect disturbance of flight patterns

One Construction Compound is required for the Proposed Scheme, at the following location: adjacent to Buttercup Park. Security lighting will be installed in this compound and will be in operation for the duration of construction (*i.e.* 24 months), thereby temporarily increasing the level of artificial lighting in this area. Artificial lighting within suitable habitat may result in avoidance behaviour by bats, and could prevent bats from accessing foraging areas or roosts and/or result in bats taking more circuitous routes to get to foraging areas and hence potentially depleting energy reserves and abandonment of nearby roosts. Given the urban setting of this proposed site compound, and limited foraging resources in the existing environment, bats in the area are not deemed to be present in high numbers and would be habituated to some level of artificial lighting. Provided security lighting at this Construction Compound is considered to be significant at the local level only.

Construction Phase works will typically be undertaken during normal daylight working hours and therefore the requirement for lighting to accommodate construction works during night-time, in areas where existing light levels are low, will be limited. The effect of temporary lighting effects associated with the Construction Phase of the Proposed Scheme is therefore considered to be significant at the local level only.

12.4.3.4.2 Badger

Multi-disciplinary surveys did not confirm any badger setts or evidence of badger within the footprint of the Proposed Scheme.

Although it cannot be predicted if badger will establish new setts within the ZoI of the Proposed Scheme before construction works commence, it is a possibility and this scenario has been taken into account in the mitigation strategy (refer to Section 12.5.1).

Loss of Foraging Habitat and Breeding / Rest Sites

There are no badger setts located within the ZoI of the Proposed Scheme; therefore, there is no potential for the permanent loss of any badger sett to occur.

Construction may result in the permanent loss of minor and disturbed sections of suitable foraging / commuting habitat for badgers (e.g. amenity grassland, scattered trees and parkland, dry calcareous and neutral grassland and treelines/ hedgerows). In addition, the provision of a Construction Compound adjacent to Buttercup Park for the duration of the Construction Phase will result in the temporary loss of 0.81ha of GA2 habitat, which could be used by commuting / foraging badgers.

Permanent habitat removal is proposed at lands located largely adjacent to pre-existing roads/paths and is limited to *c.* 2m wide linear sections of amenity grassland, existing hard surfaces, scattered trees and parkland and roadside treelines/ hedgerows, within a highly disturbed urban environment. These areas of habitat removal are not likely to provide significant foraging habitat for the local badger population. The loss of suitable habitat at Buttercup Park during construction will result in a temporary impact to commuting/ foraging badgers, although given the relative abundance of suitable habitat in the wider vicinity (e.g. Darndale Park and agricultural lands to the north of the R139), the temporary loss of this habitat is not considered significant at any geographic scale. Therefore, the Proposed Scheme is unlikely to affect the conservation status of the local badger population and will not result in a likely significant negative effect, at any geographic scale.

Disturbance / Displacement

In conjunction with any displacement effects associated with habitat loss, increased human presence and / or noise and vibration associated with construction works, the Proposed Scheme has the potential to displace badgers from both breeding/resting places and from foraging habitat located beyond the footprint of the Proposed Scheme.

As construction works in areas of suitable foraging habitat will typically be undertaken during normal daylight working hours and badgers are nocturnal in habit, displacement of badgers from foraging areas (outside of areas where foraging habitat will be lost as a result of the Proposed Scheme) is extremely unlikely to affect the local badger population and will not result in a likely significant negative effect, at any geographic scale. In addition, badgers residing within the wider study area are likely to be habituated to disturbance within the urban environment and therefore would be less sensitive to very localised, temporary increases in disturbance.

Disturbance and displacement effects on badger may also be the result of increased artificial lighting during construction. Nocturnal mammals, such as badger, are likely to be disturbed by the introduction of artificial light into established breeding and foraging areas (Rich & Longcore 2005). Although the majority of the Proposed Scheme corridor is already lit artificially, the proposal may result in the introduction of artificial lighting to previously unlit areas, if the proposed Construction Compound at Buttercup Park requires security lighting for the duration of construction. Buttercup Park holds suitable foraging habitat for badger (*i.e.* amenity grassland and scattered trees and parkland). If high-intensity, non-directional security lighting (e.g. floodlighting) is installed in this proposed compound, light spill into adjacent areas could render these areas unsuitable for foraging badger. Therefore, lighting associated with the Construction Phase of the Proposed Scheme could result in a negative effect on badgers, albeit temporary in nature and significant at the local level.

12.4.3.4.3 Otter

It is possible that otter will establish new holt or couch sites within the ZoI of the Proposed Scheme before construction works commence, and this scenario has been taken into account in the mitigation strategy (refer to Section 12.5.1).

Loss of Breeding / Resting Sites

No otter breeding or resting places, holt or couch sites, were identified within the boundary of the Proposed Scheme, during the field surveys; therefore, there will not be any loss of holt or couch sites as a result of construction works. No instream / bankside works are proposed along the Santry_020. Therefore, the Proposed Scheme will not have a likely significant effect on the conservation status of otter, as there will be no loss of breeding/resting sites, and will not have a likely significant negative effect, at any geographic scale.

Loss / Fragmentation of Foraging / Commuting Habitat

Evidence of otter was not recorded within or in close proximity to the Proposed Scheme during the field surveys. However, based on the results of the desktop study, otter are known to occur within 1km of the Proposed Scheme, particularly in the Mayne Bridge and Baldoyle areas. In addition, the Santry_020, which is crossed by the Proposed Scheme, is also known to support otters (Macklin, et al. 2019).

There are no works proposed within the Santry_020 and therefore there is no potential for the Proposed Scheme to result in the loss/ fragmentation of foraging / commuting habitat. Minor works are proposed adjacent to the

Santry_020 including resurfacing and upgrade works, which will result in the loss of a small area of amenity grassland (*c.* 40m^2 in total temporary GA2 habitat loss and 15m^2 in total temporary WD5 habitat loss) *c.* <15m north of the Santry_020. This habitat is not considered suitable otter habitat, given its distance from the river, and therefore its loss will not constitute a significant decline in the extent of available otter habitat and will not affect the local otter population's ability to maintain itself, even in the short-term.

Habitat loss associated with the construction of the Proposed Scheme will not have a likely significant effect on the conservation status of otter and will not have a likely significant negative effect, at any geographic scale.

Habitat Severance / Barrier effect

There are no works proposed over the Santry_020 and whilst there are minor works proposed in the vicinity of the river, which will result in the removal of a small area of amenity grassland and scattered trees and parkland habitat, there is no potential for severance/ barrier effects, as a result of construction works, to significantly affect the local otter population at any geographical scale.

Habitat and Food Source Degradation – Water Quality

As discussed in Section 12.4.3.2 under Habitat Degradation – Surface Water Quality, the Construction Phase of the Proposed Scheme could result in contamination of receiving water bodies. This could result in significant negative impacts on otter either directly (e.g. acute or sub-lethal toxicity from pollutants) or indirectly (e.g. affecting their food supply or supporting habitats).

Habitat degradation as a result of effects on surface water quality during construction has the potential to affect the conservation status of otter and result in a likely significant negative effect, at a local geographic scale. This is in consideration of the temporary nature and scale of the proposed impact, the availability of suitable habitat for otter in the wider vicinity and the relative abundance of otter across the wider environment, as demonstrated in the results of the desk study.

Mitigation measures have been designed to protect water quality during construction (see Section 12.5.1).

Disturbance / Displacement

The results of the desktop study show that otter are active throughout the Santry River (Santry_020 and Santry_010). Increased human presence and/or noise and vibration associated with construction works within the footprint of the Proposed Scheme is unlikely to affect these holts, given the distance between them and the Proposed Scheme. However, construction works associated with the Proposed Scheme have the potential to (at least temporarily) displace commuting or foraging otter.

Construction activities in proximity to the Santry_020 will include carriageway and pavement resurfacing / reconstruction as required, readjustment of kerbs and boundary wall adjustment . Noise and vibrations associated with these works will have the potential to create disturbance and displacement within the vicinity of the works. Noise and disturbance levels associated with these works are quantified 80dB at 10m from the Proposed Scheme boundary and return to background levels at 250m.

Otter are known to tolerate human disturbance under certain circumstances (Bailey & Rochford, 2006, The Environment Agency, 2010, Irish Wildlife Trust, 2012). There are numerous records of otter within the urban Dublin area, which suggests a relatively high level of habituation to human disturbance and noise by otter (Macklin *et al*., 2019). As construction works will typically be undertaken during normal daylight working hours and otter are generally nocturnal in habit, and that otter can (in many circumstances) tolerate high levels of human presence and disturbance, displacement of otter from their habitat is extremely unlikely to affect the local otter population. Works at the Santry_020 will not involve high disturbance works such as piling / rock breaking. Therefore, disturbance during construction, as a result of increased human presence, is not likely to have a significant effect on the species' conservation status and will not result in a likely significant negative effect, above the local scale.

Disturbance and displacement effects on otter may also be the result of increased artificial lighting during construction. Nocturnal mammals, such as otter, are likely to be disturbed by the introduction of artificial light into established breeding and foraging areas (Rich & Longcore 2005). The majority of the Proposed Scheme corridor

is already lit artificially and therefore it is reasonable to assume that otter in the vicinity are habituated to some degree of artificial lighting. The proposal may result in the introduction of artificial lighting to previously unlit areas, if the proposed Construction Compound adjacent to Buttercup Park road requires security lighting for the duration of construction. Given the location of Buttercup Park, which is removed from any watercourses or other suitable otter habitat, the installation of artificial lighting during construction will not have any significant effect on commuting / foraging otter in the locality.

12.4.3.4.4 Marine Mammals

Habitat and Food Resource Degradation – Water Quality

As discussed in Section 12.4.3.2 under Habitat Degradation – Surface Water Quality, the Construction Phase of the Proposed Scheme could result in contamination of receiving water bodies. This could result in significant negative impacts on marine mammals either directly (e.g. acute or sub-lethal toxicity from pollutants) or indirectly (e.g. affecting their food supply or supporting habitats).

Habitat degradation as a result of effects on surface water quality during construction has the potential to affect the species' conservation status and result in a likely significant negative effect, at a local geographic scale. This is in consideration of the temporary nature and scale of the proposed effect and the availability of suitable habitat in Dublin Bay.

Mitigation measures have been designed to protect water quality during construction (see Section 12.5.1).

12.4.3.4.5 Other Mammals

No other protected mammal species were recorded during the multi-disciplinary surveys carried out along the Proposed Scheme. However, based on the results of desk study several mammal species, protected under the Wildlife Acts, are known to occur in the wider environment, including red squirrel, hedgehog and pygmy shrew.

Habitat Loss

The construction of the Proposed Scheme will result in the permanent loss of suitable habitat for small mammals located within the boundary of the Proposed Scheme. Given the relatively low numbers of individuals of each species that are likely to be affected (*i.e.* pine marten, red squirrel, hedgehog, pygmy shrew), and the abundance of alternative suitable habitat available locally, the effects of habitat loss associated with construction works are unlikely to affect the long-term viability of their local populations. Therefore, habitat loss is unlikely to affect the species' conservation status or result in a significant negative effect, at any geographic scale.

Mortality Risk

Site clearance works have the potential to result in the mortality of small mammal species. The potential for this impact to occur would be expected to be greater during the breeding season when juveniles would be present in nests, or in the case of hedgehog impacts may be greater during their hibernation period. Furthermore, the potential for direct mortality to small mammals would be greater in more vegetated areas, as opposed to disturbed ground/ urban habitats, as these areas would offer more in terms of breeding/ resting habitat for small mammal species. Given the relatively low numbers of individuals of each species that are likely to be affected, and that these species are highly mobile, site clearance is unlikely to result in a level of mortality that would affect the species' conservation status, and result in a significant negative effect, even at a local geographic scale.

Disturbance / Displacement

In conjunction with any displacement effects associated with habitat loss, increased human presence and/or noise and vibration associated with construction works, has the potential to displace mammals from both breeding/resting places and from foraging habitat. Mammals residing within the wider study area are likely to be habituated to disturbance within the urban environment.

As construction works in areas of suitable foraging habitat will typically be undertaken during normal daylight working hours and the relevant small mammal species are nocturnal in habit, displacement of mammal species from foraging areas (outside of areas where foraging habitat will be lost as a result of the Proposed Scheme) is extremely unlikely to affect the local mammal population and will not result in a likely significant negative effect, at any geographic scale.

12.4.3.5 **Birds**

12.4.3.5.1 Breeding Birds

The assessment carried out in the NIS for the Proposed Scheme considered the potential for the Proposed Scheme to affect the bird species listed as SCIs of European sites. The assessment is set out in the NIS and for the reasons detailed therein, it is concluded that the Proposed Scheme would not affect their breeding colonies or have any long-term effects on the local breeding populations. Therefore, for these species, the Proposed Scheme will not affect the conservation status of the breeding populations and will not result in any adverse effects on the integrity of European sites.

Habitat Loss and Loss of Breeding / Resting Sites

The Proposed Scheme will result in the loss of breeding bird nesting and foraging habitat within the footprint of the Proposed Scheme. The areas of habitat loss within the Proposed Scheme boundary are provided in Section 12.4.3.2 and tabulated in Table 12.13 for all KER habitat types. These areas include hedgerows, treelines, scattered trees and parkland habitats and dry calcareous and neutral grassland habitats. In addition, there are areas of scrub and amenity grassland within the footprint of the Proposed Scheme, which are not KERs in their own right due to their limited botanical value, however, may provide nesting and / or foraging habitat for birds. These areas will be removed during construction of the Proposed Scheme resulting in an additional loss of breeding bird nesting and/or foraging habitat. In summary, the habitats that may be lost comprise:

- Treeline habitat, both central median vegetation and streetscape vegetation on road verges, at various locations the R107 Malahide Road;
- Scattered trees and parkland habitat and amenity grassland adjacent Buttercup Park to accommodate the proposed temporary Construction Compound;
- Small number of trees along Blunden Drive; and,
- Small number of trees at Mayfield Park to accommodate the proposed new footpath for the park.

The primary consequence of habitat loss will be increased competition for resources (*e.g.* nesting habitat and / or prey / food source) both between and amongst breeding bird species. The magnitude of this effect will be largely defined by whether the local habitat resource has currently reached its carrying capacity or not in terms of breeding bird species. For species with larger home ranges during the breeding season, habitat loss at the scale of the Proposed Scheme is not likely to have any perceptible effects on breeding success or population dynamics. As the Proposed Scheme will be constructed within an already busy transport corridor, habitats suitable to support breeding birds are limited. Treelines and hedgerows are highly disturbed, and largely within the road median, therefore do not offer significant shelter for breeding bird species.

The habitat areas that will be lost as a result of the Proposed Scheme form a small part of larger expanses of similar habitat types and mosaics in the wider locality. Parks and greenspaces form a vital resource for breeding birds within an urban setting. These areas of suitable breeding bird nesting and/or foraging habitat available in the wider locality of the Proposed Scheme (*i.e.* from *c.* 0.3-2km from these existing sites located within the footprint of the Proposed Scheme) include:

- Parks and greenspaces with hedgerow, treeline and/or scrub boundaries such as Father Collins Park, Baldoyle Racecourse Park, Darndale Park, O'Tooles GAA pitches, Edenmore Park, Fairview Park, St. Anne's Park and Clontarf Golf Club;
- Wildfowl and Waterbird habitat within the Tolka Estuary and wider Dublin Bay area such as, Bull Island, and
- Sections of the Santry River and River Mayne both upstream and downstream of the Proposed Scheme.

None of the habitat areas to be lost are unique to the locality and, either individually or collectively, are not likely to support a significant proportion, or the only population, of any given breeding bird species locally. Although a temporary decline in overall breeding bird abundance could potentially occur at a very local level (*i.e.* the footprint of the Proposed Scheme), this is unlikely to affect the local range of the breeding bird species present nor is it likely to affect the ability of these breeding bird populations to maintain their local populations in the long-term. Mitigation measures will be implemented to reduce the effects of habitat loss on breeding bird species locally (see Section 12.5.1).

Mortality Risk

In the absence of mitigation, if vegetation clearance works were to be undertaken during the bird breeding season (*i.e.* March to August, inclusive) it is possible that nest sites holding eggs or chicks will be destroyed and birds killed.

Mortality of birds at the scale of the Proposed Scheme, over what is likely to be a single breeding bird season in terms of completing site clearance works, will likely have a short-term effect on local breeding bird population abundance.

However, in the longer-term, this would be unlikely to affect the ranges of the breeding bird species recorded in the study area nor would it be likely to affect the long-term viability of the local populations. Mortality of birds during site clearance works is not predicted to significantly affect the conservation status of any of the breeding bird species present within the study area at any geographic scale.

Disturbance / Displacement

The noise, vibration, increased human presence and the visual deterrent of construction traffic associated with site clearance and construction will disturb breeding bird species and is likely to displace breeding birds from habitat areas adjacent to the footprint of the Proposed Scheme i.e. Maypark, Clontarf Golf Club, and areas of unmanaged grounds at the northern terminus of the Proposed Scheme. Construction activities will largely involve carriageway and pavement resurfacing / reconstruction as required, readjustment of kerbs and new road layouts with no piling / blasting methodologies proposed. There is an existing relatively high level of human disturbance within the immediate environment of the Proposed Scheme (i.e. R107 Malahide Road, Clarehall, Marino) and as such it is likely that breeding species present are habituated to a certain degree of disturbance. The magnitude of the impact will be dependent on the type of construction works and their duration; general construction activities will have a less pronounced affect than blasting, in terms of its ZoI, but will be on-going from periods of up to 24 months and multiple breeding seasons across the entirety of the Construction Phase. However, phasing of the construction works in scheme sections will reduce the temporary nature of this impact to approximately two to nine month disturbances in each section of the Proposed Scheme.

Although it is not possible to quantify the magnitude of this potential impact (or the potential effect zone) with precision, it could potentially extend for several hundred metres from the Proposed Scheme. The results of noise modelling carried out for the Proposed Scheme confirmed that, at 150m, noise levels for all construction activities will be below 60dB (see Chapter 9 (Noise & Vibration)). Given the temporary to short-term nature of the construction works, coupled with the existing levels of disturbance within these urban areas, disturbance or displacement effects associated with the construction phase of the Proposed Scheme will also be over the short-term. Therefore, these impacts will not affect the conservation status of breeding bird species and will not result in a negative effect, above the local geographic scale.

Habitat Degradation – Surface Water Quality

As discussed in Section 12.4.3.2 under Habitat Degradation – Surface Water Quality, the Construction Phase of the Proposed Scheme could potentially result in contamination of receiving water bodies, with a consequent effect on breeding birds either directly (e.g. acute or sub-lethal toxicity from pollutants) or indirectly (e.g. affecting their food supply or supporting habitats).

Habitat degradation as a consequence of construction effects on surface water, if those impacts occur is, therefore, likely to be significant at the local level. However, as set out below, such impacts are not predicted to occur in circumstances of effective implementation of appropriate mitigation measures.

12.4.3.5.2 Wintering Birds

This section of the impact assessment deals with wintering bird species, *i.e.* those bird species which are SCIs of SPAs for their wintering populations or are listed on either the BoCCI Red or Amber lists for their wintering populations. The assessment carried out in the NIS for the Proposed Scheme considered the potential for the Proposed Scheme to affect the bird species listed as SCIs of European sites for their wintering populations. As set out in the NIS, that assessment concluded that Proposed Scheme would not affect the wintering bird colonies or have any long-term effects on the local wintering populations. Therefore, for these species, the Proposed Scheme will not affect the conservation status of the wintering bird populations and will not result in an adverse effect on the integrity of any European sites.

Habitat Loss

The Proposed Scheme will result in the temporary loss of 0.81ha of GA2 habitat suitable to support breeding gull and wintering bird species at the Proposed Buttercup Park compound (referred to as CBC0001WB002), a permanent loss of 0.02ha of suitable GA2 habitat at the proposed Maypark footpath, and a temporary loss of 0.7ha of suitable GA2 habitat at Maypark to facilitate boundary works (referred to as CBC0001WB003).

The loss of suitable GA2 habitat at the proposed Maypark footpath is not deemed to have a significant impact on the wintering bird population at any geographical scale due to the following reasons:

- Relatively low frequency of occurrence of these bird species on lands located within the footprint of the Proposed Scheme, signifying that these species do not regularly use or rely upon these lands as foraging and/or roosting habitat, and are likely to use other suitable sites available in the wider area on a similar or more regular basis (See Table 12.9);
- Relatively low peak flocks recorded on lands located within the footprint of the Proposed Scheme, especially when compared to 1% of both their international flyway and national populations (See Table 12.10), signifying that these sites are not significantly important to the overall population of each respective bird species, and are likely to use other suitable sites available in the wider area on a similar or more regular basis;
- The availability of large areas of suitable foraging and/or roosting habitat for these SCI bird species in the wider locality of the Proposed Scheme, including those in closer proximity to nearby SPAs. These include other similar public amenity grassland parks and sports pitches such as those discussed in Disturbance / Displacement Impacts below. It is very likely that bird species currently utilise these and other suitability lands in the wider area to a similar and/or greater intensity during the 24 months in which the Buttercup Park compound will be in use; and
- The existing pedestrian footpath at Maypark will be extended to facilitate the proposed cycleway resulting in permanent habitat loss. This habitat loss is not deemed to be significant as it is removing a minor section at the edge of the site.

Although the temporary removal of amenity grassland habitat to facilitate Construction Compounds will not have a long-term effect on SCI populations, mitigation measures are proposed to ensure that this habitat is restored post-construction at Buttercup Park (CBC0001WB002).

Disturbance / Displacement

Temporary increases in noise, vibration and / or human activity levels during the construction of the Proposed Scheme could result in the disturbance to and / or displacement of wintering bird species present within footprint and/or the vicinity of the Proposed Scheme.

Assessment of construction-related noise disturbance to wintering waterbirds is based on research (Cutts *et al.* 2009) and (Wright *et al*. 2010). In terms of construction noise, levels below 50dB would not be expected to result in any response from foraging or roosting birds. Noise levels between 50dB and 70dB would provoke a moderate effect/level of response from birds, *i.e.* birds becoming alert and some behavioural changes (*e.g.* reduced feeding activity), but birds would be expected to habituate to noise levels within this range. Noise levels above 70dB would likely result in birds moving out of the affected zone, or leaving the site altogether. At *c.* 300m, typical noise levels associated with construction activity as per BS 5228 (BSI 2008) are generally below 60dB or, in most cases, are approaching the 50dB threshold. The results of noise modelling carried out for the Proposed Scheme confirmed

that at 150m, noise levels for all construction activities will be below 60dB (See Chapter 9 (Noise & Vibration)). As such, disturbance effects for general construction activities across the majority of the Proposed Scheme would not be expected to extend beyond a distance of approx. 300m, as noise levels associated with general construction activities would attenuate to close to background levels at that distance and beyond.

None of the construction activities would be expected to result in any more than a moderate level of disturbance effect on wintering birds at distances beyond 150m. At 150m, noise levels are below 60dB or, in most cases, are approaching the 50dB threshold. Imperceptible, or no, effects would be expected for those noise levels. Any landscape features, vegetation cover or buildings between the Proposed Scheme boundary and identified winter bird sites would contribute to further reducing the ambient noise at any given distance. Therefore, 300m is considered to be a precautionary buffer in defining the ZoI of disturbance effects.

As the majority of works will be carried out during normal working daylight hours, the potential for construction to disturb wintering birds at night, will not arise. Impacts associated with increased levels of disturbance will likely result in the temporary displacement of these wintering bird species other suitable available lands in the locality. These impacts will be associated with general construction activities (*e.g.* visual impact of construction workers and machinery and the associated vibration and more constant/continuous noise levels). Following the completion of construction, disturbance levels will likely return to baseline conditions and as a result these lands will become available again as foraging and/or roosting habitat for these wintering bird species.

The majority of wintering birds identified in the desk study are typically found in coastal, estuarine and intertidal habitats including the Tolka Estuary, Bull Island transitional water body, Mayne Estuary, and Dublin Bay, and therefore will not be impacted directly during construction. Certain species, such as light-bellied Brent geese, often forage on inland sites in the Greater Dublin Bay Area. Suitable sites are usually composed of open parkland / playing pitches. The following known inland wintering bird feeding sites are known to occur within 300m of the Proposed Scheme, and birds here could be displaced during construction works:

- Coolock/ O'Toole's GAA Club (major importance);
- Ayrfield (high importance);
- Coolock/ Rathvale Drive (high importance);
- Coolock/ Chanel College (major importance);
- Clontarf Golf Club (high importance);
- Artane/ St. David's College (major importance);
- Marino/ Ardscoil Rís (major importance);
- Marino/ Mount Temple School (unknown importance); and
- Dublin Harbour/ Fairview Park (major importance);

There are large areas of suitable foraging habitat available for wintering bird species within the wider locality of the Proposed Scheme. The following 25 known inland wintering bird feeding sites are known to occur within 300m-1km of the Proposed Scheme (i.e beyond the ZoI), and it is likely that birds displaced from the sites listed above, would be displaced to the following known sites:

- Donaghmede/ Donaghmede Park (major importance);
- Donaghmede/ Grangemore Park (major importance);
- Baldoyle/ Red Arches North (major importance);
- North Bull/ Marian Court (major importance);
- Donahies Pitch (unknown importance);
- Darndale/ Darndale Park (major importance);
- Darndale/ Ferricarrig Drive (high importance);
- Donaghmede/ Donahies Community School (major importance);
- Grange Woodbine Pitch (unknown importance);
- Edenmore Park (major importance);
- Edenmore/ Tonlegee Drive (high importance);

- Coolock/ Cadbury's Pitch & Putt (high importance);
- Coolock/ Kilmore Drive (high importance);
- Coolock/ McCauley Park (major importance);
- River Santry / Springdale Road (major importance);
- River Santry / Lein Park (Upper) (major importance);
- Coolock / Ribh Road Park (major importance);
- Edenmore / Colaiste Dhulaigh (high importance);
- Clontarf / Castle Avenue- Alfie Byrne Road (high importance);
- Alfie Byrne / Clontarf Road- East Point (high importance);
- Dublin Harbour / East Point Park (major importance);
- Donnycarney / St. Vincent's GAA (major importance);
- Donnycarney / Pobalscoil Rosmini (major importance);
- Marino Institute of Education (major importance); and
- Marino / Maryfield College (major importance).

Wintering birds which are disturbed during construction will likely be displaced to suitable sites in the surrounding environment, such as those listed above and, therefore, impacts are not considered to be significant beyond the local level. Therefore, in consideration of these factors, the loss of suitable foraging and/or roosting habitat within the Proposed Scheme boundary that is utilised by wintering birds and an increase in short-term disturbance or displacement effects will not affect the conservation status of any wintering bird species and will not result in a likely significant negative effect, above the local level.

Habitat Degradation – Surface Water Quality

As discussed in Section 12.4.3.2 under Habitat Degradation – Surface Water Quality, the Construction Phase of the Proposed Scheme could result in contamination of receiving water bodies. This could result in potentially significant negative impacts on otter either directly (e.g. acute or sub-lethal toxicity from pollutants) or indirectly (e.g. affecting their food supply or supporting habitats).

Habitat degradation as a result of effects on surface water quality during construction has the potential to result in a likely significant negative effect, at a local geographic scale. Mitigation measures have been designed to protect water quality during construction (see Chapter 13 (Water), and the CEMP (Appendix A5.1 in Volume 3 of this EIAR).

12.4.3.6 **Reptiles**

There were no reptile species recorded during the multi-disciplinary surveys and no suitable habitat confirmed within the footprint of the Proposed Scheme. The desk study did not return records for reptile species protected under the Wildlife Acts within the footprint of the Proposed Scheme or wider surrounding area. However, it cannot be ruled out that these species are not in the wider area due to the presence of suitable habitat.

Disturbance & Mortality Risk

Site clearance works have the potential to result in disturbance to, and the direct mortality of, common lizard. Given relatively low area of potentially suitable habitat for common lizard in the wider study area, the number of individuals that would potentially be at risk is low and would be unlikely to affect the local populations in the long-term. Therefore, disturbance or mortality risk are not likely to affect the species' conservation status or result in a likely significant negative effect, at any geographic scale.

Habitat Severance / Barrier Effect

There is no potential for habitat severance/ barrier effect as a result of the Proposed Scheme as there is no suitable habitat for reptile species within the footprint of the Proposed Scheme.

12.4.3.7 **Amphibians**

No amphibian species were recorded during the multi-disciplinary surveys carried out along the Proposed Scheme. The desk study returned records for common frog within *c.* 1km of the Proposed Scheme, and therefore it cannot be ruled out that these species occur in the vicinity of the Proposed Scheme.

Disturbance & Mortality Risk

Site clearance and / or constructions works in areas adjacent to the Santry_020 and / or wet grassland have the potential to result in disturbance to, and the direct mortality of amphibians during the breeding season. Given the relatively small area of potentially suitable habitat for amphibians in the study area and its immediate locality, the number of individuals that would potentially be at risk is considered to be low. Therefore, potential impacts arising from increased disturbance or mortality risk are not likely to affect the local populations of any amphibian species' in the long-term nor their conservation status and as such there is no potential for a likely significant negative effect, above the local geographic scale.

Habitat Severance / Barrier Effect

The temporary to short-term physical disruption of the existing landscape during site clearance and construction will fragment habitat used by amphibians. As a temporary to short-term impact, this is unlikely to present a significant barrier to the movement of the species such that it would affect the local amphibian populations in the long-term. Therefore, habitat severance during construction and any associated barrier effect are not likely to affect the species' conservation status and are not predicted to result in a likely significant negative effect to amphibians, at any geographic scale.

12.4.3.8 **Fish**

Habitat Degradation – Surface Water Quality

As discussed in Section 12.4.3.2 under Habitat Degradation – Surface Water Quality, the Construction Phase of the Proposed Scheme could result in contamination of receiving water bodies. This could result in significant negative impacts on European eel and other fish species either directly (e.g. acute or sub-lethal toxicity from pollutants) or indirectly (e.g. affecting their food supply or supporting habitats).

Habitat degradation as a result of effects on surface water quality during construction has the potential to affect the conservation status of affected fish species and result in a likely significant negative effect, at a local to national geographic scale.

Table 12.14 Summary of Potential Construction Phase Impacts (pre-mitigation)

Ecological Receptor	Ecological Valuation	Potential Impacts	Potential Significance
Designated Areas for Nature Conservation			
Baldoyle Bay SPA Baldoyle Bay pNHA	International Importance National Importance	Habitat Degradation (hydrology); Disturbance and Displacement	Likely significant effect at the international geographic scale
North Dublin Bay SAC; North Dublin Bay pNHA	International Importance National Importance	Habitat Degradation (hydrology; non-native invasive plant species)	Likely significant effect at the international geographic scale
South Dublin Bay SAC South Dublin Bay pNHA	International Importance National Importance	Habitat Degradation (hydrology; non-native invasive plant species)	Likely significant effect at the international geographic scale
Howth Head SAC Howth Head pNHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale
Rockabill to Dalkey Island SAC Dalkey Coastal Zone and Killiney Hill pNHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale
Lambay Island SAC Lambay Island pNHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale

Ecological Receptor	Ecological Valuation	Potential Impacts	Potential Significance
South Dublin Bay and River Tolka Estuary SPA Dolphins, Dublin Docks pNHA South Dublin Bay pNHA Booterstown Marsh pNHA	International Importance National Importance National Importance National Importance	Habitat Degradation (hydrology; non-native invasive plant species); Disturbance and Displacement	Likely significant effect at the international geographic scale
North Bull Island SPA North Dublin Bay pNHA	International Importance National Importance	Habitat Degradation (hydrology; non-native invasive plant species); Disturbance and Displacement)	Likely significant effect at the international geographic scale
Malahide Estuary SPA Malahide Estuary pNHA	International Importance National Importance	Habitat Degradation (hydrology; non-native invasive plant species); Disturbance and Displacement)	Likely significant effect at the international geographic scale
Ireland's Eye SPA Ireland's Eye pNHA	International Importance National Importance	Habitat Degradation (hydrology); Disturbance and Displacement)	Likely significant effect at the international geographic scale
Howth Head Coast SPA Howth Head pNHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale
Rogerstown Estuary SPA Portraine Shore pNHA Rogerstown pNHA	International Importance National Importance National Importance	Habitat Degradation (hydrology; non-native invasive plant species); Disturbance and Displacement)	Likely significant effect at the international geographic scale
Lambay Island SPA Lambay Island pNHA	International Importance National Importance	Habitat Degradation (hydrology); Disturbance and Displacement)	Likely significant effect at the international geographic scale
Dalkey Island SPA Dalkey Coastal Zone and Killiney Hill pNHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale
Skerries Islands SPA Skerries Islands NHA	International Importance National Importance	Habitat Degradation (hydrology) ; Disturbance and Displacement)	Likely significant effect at the international geographic scale
The Murrough SPA The Murrough pNHA	International Importance National Importance	Habitat Degradation (hydrology) ; Disturbance and Displacement)	Likely significant effect at the international geographic scale
Habitats (outside of designated areas for nature conservation)			
Depositing / lowland rivers (FW2)	Local Importance (Higher Value)	Habitat Degradation (hydrology; non-native invasive plant species)	Likely significant effect at the local geographic scale
Dry calcareous and neutral grassland (GS1)	Local Importance (Higher Value)	Habitat Degradation (non-native invasive plant species)	Likely significant effect at the local geographic scale
Scattered trees and parkland (WD5)	Local Importance (Higher Value)	Habitat Degradation (non-native invasive plant species)	Likely significant effect at the local geographic scale
Hedgerows (WL1)	Local Importance (Higher Value)	Habitat Loss, Habitat Degradation (non-native invasive plant species)	Likely significant effect at the local geographic scale
Treelines (WL2)	Local Importance (Higher Value)	Habitat Loss, Habitat Degradation (non-native invasive plant species)	Likely significant effect at the local geographic scale
Fauna Species			
Bats	Local Importance (Higher Value)	Habitat loss / fragmentation; Disturbance / displacement	Likely significant effect at the local geographic scale
Badger	Local Importance (Higher Value)	Disturbance / displacement	Likely significant effect at the local geographic scale
Otter	National Importance	Habitat degradation (hydrology; disturbance / displacement)	Likely significant effect at the local geographic scale
Marine mammals	Local Importance (Higher Value) – National Importance	Habitat degradation (hydrology)	Likely significant effect at the local to national geographic scale
SCI bird species	International Importance	*See SPAs above*	*See SPAs above*

Ecological Receptor	Ecological Valuation	Potential Impacts	Potential Significance
All other breeding bird species (non-SCI)	Local Importance (Higher Value)	Habitat Loss; Mortality risk; Disturbance / Displacement; Habitat Degradation (hydrology)	Likely significant effect at the local geographic scale
All other wintering bird species (non-SCI)	Local Importance (Higher Value)	Habitat Loss; Mortality risk; Disturbance / Displacement; Habitat Degradation (hydrology)	Likely significant effect at the local geographic scale
Amphibians	Local Importance (Higher Value)	Habitat Degradation (hydrology); Mortality risk	Likely significant effect at the local geographic scale
Fish	Local Importance (Higher Value) – County Importance	Habitat degradation (hydrology)	Likely significant effect at the local to national geographic scale

12.4.4 Operational Phase

12.4.4.1 **Designated Areas for Natura Conservation**

12.4.4.1.1 European sites

Habitat Loss and Fragmentation

The potential for impacts on SCI bird populations for which SPAs are designated has been provided in the NIS.

Refer to Section 12.4.3.5 with regards to potential Operational Phase impacts on wintering bird species, which encompass all relevant SCI bird species.

Habitat Degradation / Effects on QI / SCI Species as a result of Hydrological Impacts

The Proposed Scheme is hydrologically connected to Dublin Bay and the Mayne Estuary via the Santry_020, Mayne_010, Wad River and existing pipes which drain directly to Dublin Bay and the Mayne Estuary. The release of contaminated surface water runoff and/or an accidental spillage or pollution event into any surface water features during the Operation Phase, has the potential to affect water quality in the receiving aquatic environment. Such a pollution event may include: the release of sediment into receiving waters and the subsequent increase in mobilised suspended solids; and the accidental spillage and / or leaks of containments into receiving waters. The associated effects of a reduction of surface water quality could potentially extend for a considerable distance downstream of the location of the accidental pollution event or the discharge point and therefore impact the downstream, i.e. Dublin Bay and the Mayne Estuary including the following European sites: Baldoyle Bay SAC, North Dublin Bay SAC, South Dublin Bay SAC, Howth Head SAC, Rockabill to Dalkey Island SAC, Baldoyle Bay SPA, North Bull Island SPA, South Dublin Bay, River Tolka Estuary SPA and Dalkey Islands SPA. This reduction in water quality (either alone or in combination with other pressures on water quality) could result in the degradation of sensitive habitats present within these European sites which, in turn, would negatively affect the SCI bird species that rely upon these habitats as foraging and / or roosting habitat. It could also negatively affect the quantity and quality of prey available to SCI bird species. These potential impacts could occur to such a degree that the conservation objectives of the North Dublin Bay SAC, South Dublin Bay SAC, Howth Head SAC, Rockabill to Dalkey Island SAC, North Bull Island SPA, South Dublin Bay and River Tolka Estuary SPA and Dalkey Islands SPA may be undermined.

In a worst case scenario, the release of contaminated surface water runoff and/or an accidental spillage or pollution event into any surface water features during operation, also has the potential to affect mobile SCI bird species and QI mammal species that commute, forage and loaf in Dublin Bay i.e., birds associated with Skerries Islands SPA, Rockabill SPA and Lambay Island SPA, Ireland's Eye SPA, North Dublin Bay SPA, South Dublin Bay and River Tolka Estuary SPA, Malahide Estuary SPA, Rogerstown Estuary SPA, Dalkey Islands SPA, The Murrough SPA and, marine mammals associated with Rockabill to Dalkey Island SAC and Lambay Island SAC. This potential reduction in water quality could result in the degradation of sensitive habitats present within

downstream European sites, which in turn would negatively affect the SCI bird species that rely upon these habitats as foraging and/or roosting habitat. It could also negatively affect the quantity and quality of prey available to SCI and QI populations.

Habitat degradation as a result of air quality impacts

A reduction in air quality within the immediate vicinity of the road, involving emissions from car exhausts, and the deposition of particulate matter and heavy metals produced by engine, brake and tyre wear during the Operational Phase, can contribute to increased deposition of pollutants such as oxides of nitrogen (NOx, NOs), volatile organic compounds (VOCs), particulate matter (PM), heavy metals (HM) and ammonia (NH4) in the vicinity of a road carriageway. This can affect the ecosystems and vegetation present, influencing plant growth rates and species composition, diversity, and abundance.

The unmitigated ZoI for air quality effects arising from the Proposed Scheme has the potential to extend up to 200m the Proposed Scheme boundary during the Operational Phase. There are no European sites present within these distances.

A change in AADT (Annual Average Daily Traffic) flows greater than 1,000 is predicted to occur on Clontarf Road where cars may be redirected onto the local road network once the Proposed Scheme is in operation. This lies adjacent to South Dublin Bay and River Tolka Estuary SPA. As such the Proposed Scheme has the potential to result in habitat degradation of the qualifying / special conservation interest species / habitats of South Dublin Bay and River Tolka Estuary SPA during the Operational Phase of the Proposed Scheme. South Dublin Bay SAC is outside of the air quality impact zone of influence.

Disturbance and Displacement impacts

There are no European sites within the disturbance ZoI of the Proposed Scheme, however, several QI species are known to occur within the vicinity of the Proposed Scheme. Refer to Section 12.4.4.4 and Section 12.4.4.5 for more details with regards to potential construction impacts on QI mammals and fish, respectively.

The potential for impacts on SCI bird populations for which SPAs are designated has been provided in the NIS. Refer to Section 12.4.4.5 with regards to potential impacts on wintering bird species, which encompass all relevant SCI bird species.

12.4.4.1.2 Natural Heritage Areas and Proposed Natural Heritage Areas

The potential impacts on European sites arising from the Proposed Scheme, outlined above in Section 12.4.4.1, may also negatively affect the pNHA sites, which are located within the boundaries of European sites and designated for similar reasons. The respective European sites are provided in Table 12.6. The Proposed Scheme also has the potential to affect biodiversity in a broader sense than only the QIs/SCIs of those European sites. Where biodiversity receptors in these pNHAs do not form part of the QIs/SCIs in the NIS assessment, they are considered under the other individual impact assessment headings for each KER below with the exception of Air Quality impacts to North Dublin Bay pNHA and the Royal Canal pNHA.

Habitat Degradation – Air Quality

During the Operational Phase of the Proposed Scheme, North Dublin Bay pNHA and the Royal Canal pNHA will be adjacent to roads where changes in AADT flows (AADT flows greater than 1,000) are predicted. As such, during the Operational Phase of the Proposed Scheme, emissions from car exhausts, and the deposition of particulate matter and heavy metals produced by engine, brake and tyre wear of construction vehicles, can contribute to increased deposition of pollutants such as oxides of nitrogen (NOx, NO_2) and particulate matter (PM) in the vicinity of a road carriageway. This can affect the ecosystems and vegetation present, influencing plant growth rates and species composition, diversity, and abundance.

The assessment methodology for air quality impacts from roads and their interaction / effects on ecology are set out in the TII guidance document Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes (National Roads Authority 2011) and three UK reports: The Ecological Effects of Diffuse Air Pollution from Road Transport (Bignal et al. 2004), The Ecological Effects of Air Pollution from Road Transport: An Updated Review (Natural England, 2016), and Advice on Ecological Assessment of Air Quality

Impacts (CIEEM 2021). Further guidance can also be found in the IAQM document A Guide To The Assessment Of Air Quality Impacts On Designated Nature Conservation Sites (IAQM 2020) and in the DMRB guidance LA105 Air Quality (UKHA 2019), both of which describe NO_X emissions as the most likely source of significant impacts from road traffic. Pollutants such as PM, CO_2, CO, SO_2, ammonia and volatile organic compounds are not considered in this guidance and have been scoped out of detailed assessment (refer to Section 7.4.3.2.4 of Chapter 7 (Air Quality) for full methodology).

An assessment of the impact of the Proposed Scheme has been undertaken using the approach outlined in the IAQM guidance document A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (Version 1.1) (IAQM 2020). Vehicle-derived air emissions were modelled during the Operational Phase of the Proposed Scheme at Clontarf Road (North Dublin Bay pNHA) and Newcomen Bridge (Royal Canal pNHA) (refer to Section 7.4.3.2.4 of Chapter 7 (Air Quality) for details). The worst-case predicted annual average NOx concentrations at various distances from the Proposed Scheme exceed the 30µg/m^3 limit value. In all cases where exceedances occur, the modelled future baseline environment is already in excess of this value. In the case of Clontarf Road (North Dublin Bay pNHA) only, the modelled future baseline environment is already in excess of this value and reduces below this critical level at 150m from Clontarf Road. During the Operational Phase of the Proposed Scheme (the Do Something Scenario), NOx is modelled to reduce below the critical level at 160m from Clontarf Road, therefore resulting in an additional 10m within the pNHA being subject to NOx above the 30µg/m3 limit value as a result of the Proposed Scheme. Given the existing baseline environment, the additional air quality effects associated with the Proposed Scheme do not add a significantly greater level of impact than already exists on the pNHA. The Proposed scheme results in a slight decrease in NOx concentrations and nitrogen deposition at Newcomen Bridge, however as Newcomen Bridge (Royal Canal pNHA) is already surrounded by existing urban development, NOx exceeds the 30µg/m^3 limit value in the modelled future baseline and during the Operational Phase of the Proposed Scheme (the Do Something Scenario).

The contribution of the Operational Phase of the Proposed Scheme to the NO_2 dry deposition rate was modelled at North Dublin Bay pNHA and the Royal Canal pNHA. Nitrogen deposition levels have been compared to the lower and higher critical loads for habitats associated with the Royal Canal pNHA, including Canals (FW3), Dry Meadow / Grassy Verges (GS2), Reed and Large Sedge Swamps (FS1) and Tall-herb Swamps (FS2), and wetland habitats associated with North Dublin Bay pNHA. All sites are below the lower critical load of inland and surface water habitats of 5-10 Kg(N)/ha/yr (National Road Authority, 2011) and therefore, significant harmful effects on vegetation within North Dublin Bay pNHA and the Royal Canal pNHA from NO_2 are not considered likely, nor will there be any reduction in habitat area of the pNHA habitats.

While harmful air quality effects on the North Dublin Bay pNHA as a result of the Proposed Scheme are considered to be unlikely, in a worst case scenario, this is could result in a likely significant negative effect at a local geographic scale. The prediction is based on conservative assumptions regarding background pollutant concentrations and the improvement in vehicle emission rates. 2019 background pollutant concentrations have been used to represent the 2028 baseline, although those concentrations and are likely be lower by the opening year than in 2019. Older fleet projections were used in the absence of a future fleet that incorporates the effects of 2021 Climate Action Plan measures – a larger proportion of electric vehicles is planned by the opening year than has been modelled. In reality, total concentrations (and magnitude of change) are likely to be lower than those reported here. (refer to Section 7.4.5 of Chapter 7 (Air Quality) for further details).

12.4.4.2 **Habitats**

Habitat Degradation - Surface Water Quality

Mitigation for the Operational Phase has been built into the design of the Proposed Scheme. During the Operational Phase, there will be a net increase of 1,440m^2 in the impermeable area ultimately discharging to Dublin Bay and a net increase of 273m^2 in the impermeable area ultimately discharging to the Mayne Estuary. This increase in impermeable area will be being managed for the Proposed Scheme through a combination of bioretention areas and filtration drains. Where no new paved areas are proposed, the existing drainage network will be retained and utilised (See Chapter 4 (Proposed Scheme Description) for more detail on drainage design).

The inclusion of these SuDS systems will reduce the volume of surface water runoff discharging to the existing drainage network. The functioning and effectiveness of both elements of the road drainage network are discussed in more detail in Chapter 13 (Water). The Proposed Scheme will not exacerbate the existing surface water quality conditions in the Santry_020, Wad River, North Bull Island, or Tolka Estuary. It will, in fact, result in a beneficial, albeit imperceptible, impact on the local surface water quality due to the implementation of SuDS, where appropriate.

Without the incorporation of the above design mitigation, then during operation, contaminated surface water runoff and / or an accidental spillage or pollution event into any surface water feature has the potential to have significant negative effects on water quality and consequently affect aquatic and wetland habitats in the receiving environment. The effects of frequent and / or prolonged pollution events have the potential to be extensive and far-reaching and could potentially have significant long-term effects. In a worst-case scenario, the downstream habitats of the Tolka Estuary and North Bull Island transitional water bodies, and Dublin Bay coastal water body could also be affected. This is deemed to be significant at a local scale.

Mitigation measures to maintain SuDS are provided in Section 12.5.2.

Habitat Degradation – Hydrological Regime

Changes in the flow regime due to increased surface water runoff or discharges, in new locations, could result in changes to sedimentation processes and the structure of riverbanks. None of these are predicted to have any long-term effects that would give rise to a likely significant negative impact on any aquatic habitats or species through effects on the hydrological regime as the drainage design principles ensure that there will be no net increase in the surface water flow discharged to these receptors (for more detail refer to Chapter 13 (Water).

Habitat Degradation- Non-native Invasive Plant Species

No non-native invasive plant species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 were identified along the Proposed Scheme, during field surveys undertaken. However, the desktop study revealed records for several non-native invasive species within 1km of the Proposed Scheme. Given the presence of non-native invasive plant species in the vicinity of the Proposed Scheme, there is the potential that these species will recolonize vegetated areas within the proposed development boundary post-construction. As such, there is a risk that routine maintenance works may inadvertently spread contaminated vegetation cuttings. The effects of introducing such non-native invasive plant species to highly sensitive and ecologically important habitat areas (e.g. designated areas for nature conservation or areas of Annex I habitat) have the potential to result in a significant negative effect, at geographic scales ranging from local to international.

Mitigation measures have been designed to avoid this potential impact (see Section 12.5).

Habitat Degradation- Air Quality

As discussed above in Section 12.4.4.1.2, Air quality modelling of NOx concentrations, deposition rates, and particulate matter (PM_{10} and $PM_{2.5}$) were modelled for the Operational Phase of the Proposed Scheme at distances up to 200m from the proposed road development (refer to Chapter 7 (Air Quality) for details). The results from the Air Quality modelling deem the Proposed Scheme overall neutral or slightly beneficial in terms of the annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations at all modelled receptors. As such harmful effects on vegetation from these emissions are not likely.

12.4.4.3 **Rare and Protected Plant Species**

No protected plant species listed on the Flora (Protection) Order, 2015 were recorded within or in close proximity to the Proposed Scheme. The desktop study did not reveal any records for rare and / or protected species in close proximity to the Proposed Scheme. Therefore, there is no potential for impacts on rare / protected species, as a result of the operation of the Proposed Scheme.

12.4.4.4 **Mammals**

12.4.4.4.1 Bats

Indirect Disturbance of Flight Patterns Due to Operational Lighting

Bat activity was recorded at all locations surveyed. Additional permanent lighting features within suitable habitat may result in avoidance behaviour by bats. Such displacement (which would be a matter of metres) could prevent bats from accessing foraging areas or roosts and / or result in bats taking more circuitous routes to get to foraging areas and hence potentially depleting energy reserves and abandonment of nearby roosts. Given the urban environment of the Proposed Scheme, and the fact that artificial lighting is already present along the footprint of the Proposed Scheme, the effects of displacement as a result of increased artificial lighting along existing road networks are not considered to be significant at any geographic scale. This is because the lighting strategy involves the use and upgrade of existing lighting infrastructure and given that artificial lighting is already in place along the Proposed Scheme, bat species who utilise the area would already be habituated to some level of artificial lighting.

In areas where new lighting is proposed in previously dark / low lighting areas, e.g., new cycle / pedestrian footpaths at Maypark and St. David's Wood, there may be disruption to potential commuting foraging routes to St David's Sports Grounds and Rockfield Park. Examination of light spill modelling has identified potential light spill impacts on bats. However, considering that the R107 Malahide Road is already artificially lit, it is expected that bats utilising the area around St. David's Wood would be habituated to some degree of artificial lighting. Therefore, the overall effect of artificial lighting on bats during operation is considered to be significant at the local level only.

Mitigation to avoid light spill are detailed in Section 12.5.2.3.1.

Disturbance / Displacement – Increased Human Activity

The provision of the proposed cycleway at the boundary of Maypark is likely to result in increased human presence in this area of the Proposed Scheme. However, populations of bats associated with the Proposed Scheme are likely to be habituated to a certain degree of human disturbance. Therefore, it is considered that there may be temporary significant effect on bats at a local scale, until such a time that they have habituated to the increased levels of human disturbance.

12.4.4.4.2 Badger

No evidence of badger was recorded along the Proposed Scheme during surveys undertaken. However, based on the results of the desktop study, badger are known to occur within the wider vicinity and therefore impacts on this species cannot be excluded.

Habitat Severance / Barrier Effect

Barriers such as road infrastructure may affect foraging behaviour and dispersal corridors, *e.g.* the movement of species between breeding, foraging and hibernation sites, meaning that local populations can become isolated, having long-term effects on genetic diversity and gene flow, at a local geographic scale.

As the Proposed Scheme, for the most part, consists of upgrading existing infrastructure, the effect of habitat severance / barrier effect on badger is not considered to be significant at any geographic scale. The existing infrastructure itself acts as a barrier to badger movement across the landscape and the Proposed Scheme will neither exacerbate nor improve the barrier effect already in existence.

Mortality Risk

The Proposed Scheme will not result in any increase in terms of mortality risk to badger during operation. This is because the Proposed Scheme is largely focused on upgrading existing infrastructure, the mortality risk of which already exists. The Proposed Scheme will neither exacerbate nor improve the level of mortality risk associated with this infrastructure. Therefore, the impact of mortality risk to badger, as a result of the Proposed Scheme is not regarded to be significant at any geographic scale.

Light Spill

Nocturnal mammals, such as badger, are likely to be disturbed by the introduction of artificial light into established breeding and foraging areas (Rich & Longcore 2005). Although the majority of the Proposed Scheme corridor is already lit artificially, the proposal will result in the introduction of artificial lighting to previously unlit areas at an area of amenity grassland area of Maypark.

The lighting design of the Proposed Scheme controls light emissions such that along the majority of the alignment light spill does not extend beyond the Proposed Scheme boundary and where it does, this is at tie-ins with the existing road / footpath networks or at residential properties. There are no badger setts, or areas of high badger activity, within or in beyond the Proposed Scheme boundary that are located within the modelled light spill zone for the Proposed Scheme.

Therefore, lighting associated with the Proposed Scheme will not disturb or displace badgers from habitat areas located beyond the Proposed Scheme boundary, will not affect the species conservation status in that regard and will not result in a likely significant negative effect, at any geographic scale.

12.4.4.4.3 Otter

No evidence of otter was recorded along the Proposed Scheme during surveys undertaken. However, based on the results of the desktop study, otter are known to occur within the wider vicinity, particularly along the Santry_020. Therefore, impacts on this species cannot be excluded.

Habitat Severance / Barrier Effect

Barriers such as road infrastructure may affect foraging behaviour and dispersal corridors, e.g. the movement of species between breeding, foraging and resting sites, meaning that local populations can become isolated, having long-term effects on genetic diversity and gene flow, at a local geographic scale.

As the Proposed Scheme, for the most part, consists of upgrading existing infrastructure, the effect of habitat severance / barrier effect on otter is not considered to be significant at any geographic scale. The existing infrastructure itself acts as a barrier to otter movement across the landscape and the Proposed Scheme will neither exacerbate nor improve the barrier effect already in existence. Therefore, the impact of habitat severance/ barrier effect on otter, as a result of the Proposed Scheme, is not considered to be significant at any geographic scale.

Disturbance / Displacement

Nocturnal mammals, such as the otter, would be likely to be disturbed by the introduction of artificial light into established breeding and foraging areas (Rich & Longcore 2005). Permanent lighting is proposed along all of the Proposed Scheme footprint however, it should be noted that the majority of the Proposed Scheme corridor is already lit artificially, and so otter in the area would be habituated to some degree of artificial lighting. Therefore, the effect of artificial lighting on otter, as a result of the Proposed Scheme, is not considered to be significant at any geographic scale.

Disturbance or displacement associated with the operation of the Proposed Scheme is not likely to affect the conservation status of otter and therefore, will not result in a likely long-term significant negative effect, at any geographic scale.

Habitat and Food Source Degradation- Surface Water Quality

As discussed in Section 12.4.3.2 under Habitat Degradation – Surface Water Quality, without the design mitigation incorporated into the design of the Proposed Scheme, the Operational Phase of the Proposed Scheme could potentially result in contamination of receiving water bodies. This could result in significant negative impacts on otter either directly (e.g. acute or sub-lethal toxicity from pollutants) or indirectly (e.g. affecting their food supply or supporting habitats).

Habitat degradation as a result of effects on surface water quality during operation has the potential to affect the conservation status of otter and result in a likely significant negative effect, at a local geographic scale. This is in consideration of the temporary nature and scale of the proposed impact, the availability of suitable habitat for otter

in the wider vicinity and the relative abundance of otter across the wider environment, as demonstrated in the results of the desk study.

Mortality Risk

The Proposed Scheme will not result in any increase in terms of mortality risk to otter during operation. This is because the Proposed Scheme is largely focused on upgrading existing infrastructure, the mortality risk of which already exists. The Proposed Scheme will neither exacerbate nor improve the level of mortality risk associated with this infrastructure. Therefore, the impact of mortality risk to otter, as a result of the Proposed Scheme is not considered to be significant at any geographic scale.

12.4.4.4.4 Marine Mammals

Surface Water Quality Impacts & Prey Abundance

As discussed in Section 12.4.3.2 under Habitat Degradation – Surface Water Quality, without the design mitigation incorporated into the design of the Proposed Scheme, the Operational Phase of the Proposed Scheme could result in contamination of receiving water bodies. This could result in significant negative impacts on otter either directly (e.g. acute or sub-lethal toxicity from pollutants) or indirectly (e.g. affecting their food supply or supporting habitats).

Habitat degradation as a result of effects on surface water quality during operation has the potential to affect the conservation status of otter and result in a likely significant negative effect, at a local geographic scale. This is in consideration of the temporary nature and scale of the proposed impact, the availability of suitable habitat for otter in the wider vicinity and the relative abundance of otter across the wider environment, as demonstrated in the results of the desk study.

12.4.4.4.5 Other Mammals

No evidence of other protected terrestrial mammals were recorded along the Proposed Scheme during surveys undertaken. However, based on the results of the desktop study, other protected terrestrial mammals (See Section 12.3.8.5) are known to occur within the wider vicinity and therefore impacts on this species cannot be excluded.

Habitat Severance/ Barrier Effect

Barriers such as road infrastructure may affect foraging behaviour and dispersal corridors, e.g. the movement of species between breeding, foraging and hibernation sites, meaning that local populations can become isolated, having long-term effects on genetic diversity and gene flow, at a local geographic scale.

As the Proposed Scheme, for the most part, consists of upgrading existing infrastructure, the effect of habitat severance / barrier effect on mammals is not considered to be significant at any geographic scale. The existing infrastructure itself acts as a barrier to mammal movement across the landscape and the Proposed Scheme will neither exacerbate nor improve the barrier effect already in existence.

Mortality Risk

The Proposed Scheme will not result in any increase in terms of mortality risk to mammals during operation. This is because the Proposed Scheme is largely focused on upgrading existing infrastructure, the mortality risk of which already exists. The Proposed Scheme will neither exacerbate nor improve the level of mortality risk associated with this infrastructure. Therefore, the impact of mortality risk to mammals, as a result of the Proposed Scheme is not regarded to be significant at any geographic scale.

Light Spill

Nocturnal mammals are likely to be disturbed by the introduction of artificial light into established breeding and foraging areas (Rich & Longcore 2005). Permanent lighting is proposed along all of the Proposed Scheme Corridor however, it should be noted that the majority of the Proposed Scheme corridor is already lit artificially, and so mammals in the area would be habituated to some degree of artificial lighting. Therefore, the effect of

artificial lighting on other mammals, as a result of the Proposed Scheme, is not considered to be significant at any geographic scale.

12.4.4.5 **Birds**

12.4.4.5.1 Breeding Birds

Disturbance / Displacement

Increases in noise levels, associated with the increased frequency of bus traffic, as well as increased human presence, owing to the provision of the proposed cycle tracks, and may also have a negative effect on bird abundance and occurrence in the locality where noise levels increase. Increased noise levels, as well as causing disturbance to birds in the locality, may also affect the breeding success of local bird populations as bird calls would become drowned out by traffic noise. Predictions from the noise and vibration modelling (See Chapter 9 (Noise & Vibration) for full assessment) highlight that several areas may also experience reductions in noise during the Operational Phase.

It is also important to note that the majority of the Proposed Scheme is located within a highly urbanised environment, and therefore, traffic noise is an existing source of disturbance for breeding birds in the vicinity. Owing to this, the population of breeding birds which occur here is likely to already be habituated to some level of noise disturbance and the effect of increased noise is not likely to be significant at any geographic scale.

The displacement of breeding birds from the Proposed Scheme boundary is likely to result in an increase in competition for resources (e.g. nesting habitat or prey / food sources) both between and amongst breeding bird species, which in turn would have negative impacts on local breeding bird populations in the long-term.

Although the Proposed Scheme is predicted to have a long-term effect on local breeding bird populations, even at a local level this is not predicted to affect the ability of local breeding bird species to persist within their current ranges or to maintain their populations long-term. Therefore, the Proposed Scheme is not likely to affect the conservation status of breeding bird species and will not result in a likely significant negative effect, at any geographic scale.

Habitat Degradation - Surface Water

As discussed in Section 12.4.3.2 under Habitat Degradation – Surface Water Quality, without the design mitigation incorporated into the design of the Proposed Scheme, the Operational Phase of the Proposed Scheme could result in contamination of receiving water bodies. In the absence of mitigation, this could potentially result in significant negative impacts on breeding birds either directly (e.g. acute or sub-lethal toxicity from pollutants) or indirectly (e.g. affecting their food supply or supporting habitats).

Habitat degradation as a result of effects on surface water quality during operation has the potential to affect the conservation status of otter and result in a likely significant negative effect, at a local geographic scale. This is in consideration of the temporary nature and scale of the proposed impact, the availability of suitable habitat for breeding birds in the wider vicinity and the relative abundance of otter across the wider environment, as demonstrated in the results of the desk study.

12.4.4.5.2 Wintering Birds

This section of the impact assessment deals with wintering bird species, i.e. those bird species which are SCIs of SPAs for their wintering populations or are listed on either the BoCCI Red or Amber lists for their wintering populations.

Disturbance / Displacement

During operation, the Proposed Scheme has the potential to disturb and displace wintering bird species from habitat near the Proposed Scheme boundary due to an increase in noise, human activity and visual disturbance associated with increased human presence and increased bus flow. Although the operational disturbance / displacement effect cannot be quantified with precision, it is expected to be much less than the 300m ZoI associated with construction works because operational disturbance will be limited to vehicular traffic and periodic

maintenance works, which is also present within the existing environment. Most species of wintering birds are likely to habituate to the increased traffic flows and human presence along cycle tracks. Any operational noise increases are not likely to alter the existing baseline effect on wintering birds using the habitats locally.

Although there is still likely to be some level of displacement effect, a perceptible effect would be expected to be limited to inland feeding sites habitats immediately adjacent to the Proposed Scheme. Although it is likely to add to the effect of habitat loss, in terms of additional habitat area unavailable or unlikely to be used by wintering birds, it is not predicted to have a detrimental population level effect—particularly given the relatively infrequent and/or low numbers of wintering birds generally recorded at affected winter bird sites.

Therefore, any displacement of birds from habitat areas during operation of the Proposed Scheme is not likely to affect the conservation status of wintering bird species and will not result in a likely significant negative effect, at any geographic scale.

Habitat Degradation – Surface Water Quality

As discussed in Section 12.4.3.2 under Habitat Degradation – Surface Water Quality, without the design mitigation incorporated into the design of the Proposed Scheme, the Operational Phase of the Proposed Scheme could result in contamination of receiving water bodies. This could result in significant negative impacts on wintering birds either directly (e.g. acute or sub-lethal toxicity from pollutants) or indirectly (e.g. affecting their food supply or supporting habitats).

Habitat degradation as a result of effects on surface water quality during operation has the potential to affect the conservation status of otter and result in a likely significant negative effect, at a local geographic scale. This is in consideration of the temporary nature and scale of the proposed impact, the availability of suitable habitat for wintering birds in the wider vicinity and the relative abundance of otter across the wider environment, as demonstrated in the results of the desk study.

12.4.4.6 **Reptiles**

No evidence of any protected reptile species, such as common lizard, was identified along the Proposed Scheme during surveys undertaken. No suitable habitat for common lizard was recorded during the surveys undertaken either. The desktop review did not reveal any recent records for common lizard . Nonetheless a precautionary approach has been adopted which has not excluded the possibility of common lizard being present in the vicinity of the Proposed Scheme.

Habitat Severance / Barrier Effect

Barriers such as road infrastructure may affect foraging behaviour and dispersal corridors, e.g. the movement of species between breeding and hibernation sites, meaning that local populations can become isolated, having long-term effects on genetic diversity and gene flow, at a local geographic scale.

As the Proposed Scheme, for the most part, consists of upgrading existing infrastructure, the effect of habitat severance/ barrier effect on common lizard is not considered to be significant at any geographic scale. The existing infrastructure itself acts as a barrier to amphibian movement across the landscape and the Proposed Scheme will neither exacerbate nor improve the barrier effect already in existence.

Mortality Risk

The Proposed Scheme will not result in any increase in terms of mortality risk to common lizard during operation. This is because the Proposed Scheme is largely focused on upgrading existing infrastructure, the mortality risk of which already exists. The Proposed Scheme will neither exacerbate nor improve the level of mortality risk associated with this infrastructure. Therefore, the impact of mortality risk to Common Lizard, as a result of the Proposed Scheme is not considered to be significant at any geographic scale.

12.4.4.7 **Amphibians**

No evidence of any protected amphibian species, such as common frog or smooth newt, were identified along the Proposed Schemed during surveys undertaken. However, suitable amphibian habitat such as vegetated

riverbanks were recorded within the Proposed Scheme. The desktop study returned records of amphibians in the vicinity of the Proposed Scheme and, therefore, impacts on these species cannot be excluded.

Habitat Severance / Barrier Effect

Barriers such as road infrastructure may affect foraging behaviour and dispersal corridors, e.g. the movement of species between breeding and hibernation sites, meaning that local populations can become isolated, having long-term effects on genetic diversity and gene flow, at a local geographic scale.

As the Proposed Scheme, for the most part, consists of upgrading existing infrastructure, the effect of habitat severance/ barrier effect on amphibian species is not considered to be significant at any geographic scale. The existing infrastructure itself acts as a barrier to amphibian movement across the landscape and the Proposed Scheme will neither exacerbate nor improve the barrier effect already in existence.

Mortality Risk

The Proposed Scheme will not result in any increase in terms of mortality risk to amphibians during operation. This is because the Proposed Scheme is largely focused on upgrading existing infrastructure, the mortality risk of which already exists. The Proposed Scheme will neither exacerbate nor improve the level of mortality risk associated with this infrastructure. Therefore, the impact of mortality risk to amphibians, as a result of the Proposed Scheme is not considered to be significant at any geographic scale.

12.4.4.8 **Fish**

Habitat Degradation- Surface Water

As discussed in Section 12.4.3.2 under Habitat Degradation – Surface Water Quality, without the design mitigation incorporated into the design of the Proposed Scheme, the Operational Phase of the Proposed Scheme could potentially result in contamination of receiving water bodies. This could result in significant negative impacts on European eel and other fish species either directly (e.g. acute or sub-lethal toxicity from pollutants) or indirectly (e.g. affecting their food supply or supporting habitats).

Habitat degradation as a result of effects on surface water quality during operation has the potential to affect the conservation status of otter and result in a likely significant negative effect, at a local geographic scale. This is in consideration of the temporary nature and scale of the potential impact.

Table 12.15 Summary of Potential Operational Phase Impacts (pre-mitigation)

Ecological Receptor	Ecological Valuation	Potential Impacts	Potential Significance
Designated Areas for Nature Conservation			
Baldoyle Bay SAC Baldoyle Bay SPA Baldoyle Bay pNHA	International Importance International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale
North Dublin Bay SAC; North Dublin Bay pNHA	International Importance National Importance	Habitat Degradation (hydrology; non-native invasive plant species)	Likely significant effect at the international geographic scale
South Dublin Bay SAC South Dublin Bay pNHA	International Importance National Importance	Habitat Degradation (hydrology; non-native invasive plant species)	Likely significant effect at the international geographic scale
Howth Head SAC Howth Head pNHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale
Rockabill to Dalkey Island SAC Dalkey Coastal Zone and Killiney Hill pNHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale
South Dublin Bay and River Tolka Estuary SPA Dolphins, Dublin Docks pNHA South Dublin Bay pNHA Booterstown Marsh pNHA	International Importance National Importance National Importance	Habitat Degradation (hydrology; non-native invasive plant species)	Likely significant effect at the international geographic scale

Ecological Receptor	Ecological Valuation	Potential Impacts	Potential Significance
	National Importance		
South Dublin Bay and River Tolka Estuary SPA	International Importance	Habitat Degradation (air quality)	Likely significant effect at the local geographic scale
North Bull Island SPA North Dublin Bay pNHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale
Dalkey Island SPA Dalkey Coastal Zone and Killiney Hill pNHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale
Malahide Estuary SPA Malahide Estuary pNHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale
Ireland's Eye SPA Ireland's Eye pNHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale
Rockabill SPA Rockabill Island pNHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale
Rogerstown Estuary SPA Portraine Shore pNHA Rogerstown pNHA	International Importance National Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale
Lambay Island SPA Lambay Island pNHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale
Dalkey Island SPA Dalkey Coastal Zone and Killiney Hill pNHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale
Skerries Islands SPA Skerries Islands NHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale
The Murrough SPA The Murrough pNHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale
North Dublin Bay pNHA	National Importance National Importance	Habitat Degradation (air quality)	Likely significant effect at the local geographic scale
Habitats (outside of designated areas for nature conservation)			
Depositing/lowland rivers (FW2)	Local Importance (Higher Value)	Habitat degradation (hydrology; non-native invasive plant species)	Likely significant effect at the local geographic scale
Fauna Species			
Bats	Local Importance (Higher Value)	Disturbance / displacement	Likely significant effect at the local geographic scale
Otter	National Importance	Habitat Degradation (hydrology)	Likely significant effect at the local geographic scale
Marine mammals	Local Importance (Higher Value) – National Importance	Habitat Degradation (hydrology)	Likely significant effect at the local geographic scale
SCI bird species	International Importance	*See SPAs above*	*See SPAs above*
All other breeding bird species (non-SCI)	Local Importance (Higher Value)	Habitat Degradation (hydrology)	Likely significant effect at the local geographic scale
All other wintering bird species (non-SCI)	Local Importance (Higher Value)	Habitat Degradation (hydrology)	Likely significant effect at the local geographic scale
Amphibians	Local Importance (Higher Value)	Habitat Degradation (hydrology)	Likely significant effect at the local geographic scale
Fish	Local Importance (Higher Value) – County Importance	Habitat Degradation (hydrology)	Likely significant effect at the local geographic scale

12.5 Mitigation and Monitoring Measures

12.5.1 Construction Phase

12.5.1.1 **Designated Areas for Natura Conservation**

12.5.1.1.1 European sites

The mitigation measures that are required to ensure that the Proposed Scheme will not adversely affect the integrity of the European sites within the ZoI are presented in the NIS. Following a consideration and assessment of the Proposed Scheme on the identified relevant European sites, the following mitigation measures were developed to address potential impacts that were identified:

- Measures to protect surface water quality during construction; and
- Measures to prevent the spread of invasive species to downstream European sites.

12.5.1.1.2 National sites

The mitigation strategy in relation to potential impacts arising from the Proposed Scheme on pNHAs within the ZoI are as per those for European sites as the boundaries of the pNHAs follow those of the SACs and SPAs. Therefore, the mitigation measures outlined above in Section 12.5.1.1, and as detailed in the NIS, will prevent the Proposed Scheme resulting in a significant negative effect on these pNHAs at the national geographic scale.

It should be noted that the full suite of mitigation measures proposed to protect surface water during construction and to prevent the spread of invasive species to downstream European and national sites are set out in full in Appendix A5.1 CEMP in Volume 4 of this EIAR.

12.5.1.2 **Habitats**

Habitat Loss / Fragmentation

Where practicable, areas of vegetation, including habitats of Local Importance (Higher Value), (i.e. scattered trees and parkland, treeline and hedgerow habitat types), which lie within the footprint, or along the boundary of the Proposed Scheme, will be retained. The areas of vegetation to be retained are shown on the Landscaping General Arrangement Drawings (BCIDA-ACM-ENV_LA-0001_XX_00-DR-LL-9001) in Volume 3 of this EIAR. These areas will be protected for the duration of construction works and fenced off at an appropriate distance.

To minimise the loss of habitat associated with the Proposed Scheme, there are also areas within the Proposed Scheme footprint which are included for mitigation planting where general construction works will not be undertaken. Proposed planting incorporated into the Proposed Scheme will be implemented, shown as design mitigation is listed below and within Appendix A5.1 CEMP in Volume 4 of this EIAR, and displayed on the Landscaping General Arrangement Drawings (BCIDA-ACM-ENV_LA-0001_XX_00-DR-LL-9001) in Volume 3 of this EIAR:

- 545 street trees planted;
- 2995m^2 of proposed hedgerow;
- 56141m^2 of proposed species rich grassland;
- 204m^2 of proposed ornamental planting; and,
- 8372m^2 of proposed amenity grassland planting.

Habitat Degradation – Surface Water Quality

In terms of mitigation, a Surface Water Management Plan (SWMP) has been prepared (provided in the CEMP, Appendix A5.1 in Volume 4 of this EIAR), which details control and management measures for avoiding, preventing, or reducing any significant adverse impacts on the surface water environment during the Construction Phase of the Proposed Scheme.

It will be a condition of the Employer's Requirements that the successful contractor, immediately following appointment, must detail in the SWMP how it is intended to effectively implement all the applicable measures identified in this EIAR and any additional measures required pursuant to conditions imposed by An Bord Pleanála to any grant of approval.

At a minimum, all the control and management measures set out in the SWMP will be implemented by the appointed contractor. This includes measures relating to:

- Construction Compound management including the storage of fuels and materials;
- Control of Sediment;
- Use of Concrete;
- Management of vehicles and plant including refueling and wheel wash facilities (if necessary); and
- Monitoring.

Habitat Degradation – Groundwater

In the unlikely event that groundwater is encountered during the proposed works and temporary pumping at a localised location is required:

- An appropriate dewatering system and groundwater management system specific to the site conditions will be designed and implemented by the appointed contractor. These will include measures to minimise any surface water inflow into the excavation; and
- Qualitative and quantitative monitoring will be adopted to ensure that the water is of sufficient quality to discharge. The use of silt traps will be adopted if the monitoring indicates the requirement for same, with no silt or contaminated water permitted to discharge to the receiving water environment.

The mitigation measures to protect groundwater quantity and quality during the Construction Phase are also outlined in Chapter 14 (Land, Soils, Geology & Hydrogeology) and Appendix A5.1 CEMP in Volume 4 of this EIAR. This includes control measures for the loss or damage of topsoil, and the pollution of soil and groundwater.

Habitat Degradation – Air Quality

The mitigation measures to control dust emissions during the Construction Phase are outlined in Chapter 7 (Air Quality) and Appendix A5.1 CEMP in Volume 4 of this EIAR. These include standard measures to control nuisance dust such as inspection and cleaning of public roads, measures for stockpiling of materials within the Construction Compound, water misting / spraying, vehicle coverings, and hoarding around the Construction Compound.

Habitat Degradation – Invasive Species

During the interim between the original non-native invasive species surveys and commencement of construction, it is possible that newly established Third Schedule non-native invasive species may have become established within the footprint of the Proposed Scheme. The NTA will ensure that a confirmatory pre-construction invasive species survey will be undertaken by a suitably qualified specialist to confirm the absence and/or extent of all Third Schedule invasive species within the footprint of the Proposed Scheme. Where an infestation is confirmed / identified, this will require the implementation of a Non-Native Invasive Species Management Plan (ISMP).

Where a pre-construction invasive species re-survey identifies newly established non-native invasive species within the footprint of the Proposed Scheme, the ISMP produced will provide a detailed description of the infestations (*e.g.* approximate area of the respective colonies (m^2), where feasible; approximate total number of stems, pattern of growth and information on other vegetation present), and where necessary, include calculations of volumes of infested soils to be excavated.

The ISMP has been prepared to outline the strategy that will be adopted during the Construction Phase of the Proposed Scheme in order to manage and prevent the spread of the non-native invasive plant species. The ISMP will be finalised following the confirmatory pre-construction survey as advised by a suitably qualified specialist, with regard to the Management of Invasive Alien Plant Species on National Roads - Technical Guidance (TII

2020a) and Standard (TII 2020b), and other species-specific guidance documents including those listed in the ISMP, as necessary.

The NTA will ensure that all control measures specified in the ISMP shall be implemented by a suitably qualified and licensed specialist prior to the construction of the Proposed Scheme to control the spread of newly established non-native invasive species within the footprint of the Proposed Scheme. Furthermore, the appointed contractor will adhere to control measures specified within the ISMP throughout the Construction Phase of the Proposed Scheme. The site will be monitored by the appointed contractor after control measures have been implemented. Any re-growth, will be subsequently treated as detailed in ISMP.

12.5.1.3 **Rare and Protected Plant Species**

No protected plant species listed on the Flora (Protection) Order, 2015 were recorded within or in close proximity to the Proposed Scheme. Therefore, no mitigation is proposed.

12.5.1.4 **Mammals**

12.5.1.4.1 Bats

Protection of Bats during Vegetation Clearance

All bat species and their roost sites are strictly protected under both European and Irish legislation including:

- Wildlife Acts;
- Habitats Directive; and
- Birds and Habitats Regulations.

It is an offence to kill a bat or to damage or destroy the breeding or resting place of any bat species and it is not necessary that the action should be deliberate for on offence to occur. This places an onus of due diligence on anyone proposing to carry out works that might result in such damage or destruction. A derogation may be granted by the Minister where there is no satisfactory alternative and the derogation is not detrimental to the maintenance of the populations of the species to which the Habitats Directive relates at a favourable conservation status in their natural range.

A total of five potential roost features (PRFs) were identified in trees within the footprint of the Proposed Scheme during the multidisciplinary surveys to contain PRFs (see Figure 12.6.2 in Volume 3 of this EIAR). The following mitigation measures will be implemented by the appointed contractor to protect the PRFs:

- Retained trees with PRFs will be fenced off at the outset of works and for the duration of construction to avoid structural damage to the trunk, branches, or root system of the tree which could disturb roosting bats. Temporary fencing will be erected at a sufficient distance from the tree so as to enclose the Root Protection Area (RPA) of the tree. The RPA will be defined based upon the recommendation of a qualified arborist;
- Where fencing is not feasible due to insufficient space, protection for the tree will be afforded by wrapping hessian sacking (or suitable equivalent) around the trunk of the tree and strapping stout buffer timbers around it;
- The area within the RPA will not be used for vehicle parking or the storage of materials (including soils, oils and chemicals). The storage of hazardous materials (e.g. hydrocarbons) or concrete washout areas will not be undertaken within 10m of any retained trees, hedgerows and treelines;
- A qualified arborist shall assess the condition of, and advise on any repair works necessary to, any trees which are to be retained or that lie outside of the Proposed Scheme footprint but whose RPA is impacted by the works. Any remedial works required will be carried out by a qualified arborist;
- A buffer zone of at least 5m will be maintained between construction works and the identified trees to ensure that the RPAs are not damaged; and
- There will be no additional lighting within 5m of the PRF during the Construction Phase of the Proposed Scheme to avoid disturbance to roosting bats.

Habitat Loss & Fragmentation

Where practicable, habitats of importance to bats such as scattered trees and parkland, treeline and hedgerow habitat types, which lie within the footprint, or along the boundary of the Proposed Scheme, will be retained. These areas will be protected for the duration of construction works and fenced off at an appropriate distance. These areas of vegetation to be retained are shown on the Landscaping General Arrangement Drawings (BCIDA-ACM-ENV_LA-0001_XX_00-DR-LL-9001) in Volume 3 of this EIAR.

To minimise the loss of habitat associated with the Proposed Scheme, there are also areas within the Proposed Scheme footprint which are included for mitigation planting where general construction works will not be undertaken. Proposed planting incorporated into the Proposed Scheme will be implemented, shown as design mitigation, is listed below and displayed on the Landscaping General Arrangement Drawings (BCIDA-ACM-ENV_LA-0001_XX_00-DR-LL-9001) in Volume 3 of this EIAR:

- 545 street trees planted; and,
- 2995m^2 of proposed hedgerow.

Many species may not roost near a road development due to disturbance (e.g. high levels of artificial lighting). Whilst the planting is not likely to fully offset the loss of foraging and commuting habitat it is likely to provide additional foraging habitat after trees and hedgerows grow to a sufficient maturity.

12.5.1.4.2 Badgers

Badger, and their breeding and resting places, are protected under the Wildlife Acts and it is an offence under that legislation to intentionally kill or injure a badger or to wilfully interfere with or destroy their breeding or resting places (setts).

Disturbance / Displacement

Although there were no signs of badger recorded during field surveys, badger could potentially establish new territory within the ZoI of the Proposed Scheme. Therefore, the NTA will ensure that a confirmatory pre-construction check of all suitable badger habitat will be completed within the 12 month period prior to any construction works commencing. The presence of any new setts or significant badger activity will be treated and / or protected in accordance with the Guidelines for the Treatment of Badgers during the Construction of National Road Schemes (NRA, 2006a).

Protection of Badgers from Accidental Harm During Construction (Excavations)

Uncovered deep excavations could be potentially hazardous for badgers commuting/ foraging in the area. Badgers could fall into these excavations, becoming trapped and potentially hurt and distressed. To protect badgers from indirect harm during construction, all open excavations will be covered when not in use and backfilled as soon as practicable. Excavations will also be covered at night, where practicable, and any deep excavations which must be left open will have appropriate egress ramps in place to allow mammals to safely exit should they fall in.

12.5.1.4.3 Otter

Otter are listed on Annex II and Annex IV of the EU Habitats Directive. Otter are strictly protected under the Birds and Habitats Regulations. Otter, and their breeding and resting places, are also protected under the Wildlife Acts and it is an offence under that legislation to intentionally kill or injure an Otter or to wilfully interfere with or destroy their breeding or resting places (holts/couches). Otter are known to occur along the River Santry, and in the wider vicinity (e.g. Baldoyle).

Habitat Degradation / Reduced Prey Availability- Water Quality

The mitigation measures relating to the protection of water quality in receiving watercourses during construction are outlined in Chapter 13 (Water) and in Appendix A5.1 CEMP in Volume 4 of this EIAR. This includes details

on guidance documents and control measures for the Construction Compound, site establishment, storage of materials, waste and fuels, control of sediment, use of concrete, vehicles and plant, and water body inspections.

Loss of Breeding/ Resting Sites

Although there were no signs of otter recorded during field surveys, otter could potentially establish new holt or couch sites within the ZoI of the Proposed Scheme. Therefore, the NTA will ensure that a confirmatory pre-construction check of all suitable otter habitat will be completed within 12 months prior to any construction works commencing. The presence of any new holt / couch sites will be treated and / or protected in accordance with the Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes (NRA, 2008c).

12.5.1.4.4 Marine Mammals

Habitat and Food Resource Degradation- Water Quality

The mitigation measures relating to the protection of water quality in receiving watercourses during construction are outlined in Chapter 13 (Water) and in Appendix A5.1 CEMP in Volume 4 of this EIAR. This includes details on guidance documents and control measures for the Construction Compound, site establishment, storage of materials, waste and fuels, control of sediment, use of concrete, vehicles and plant, and water body inspections.

12.5.1.4.5 Other Mammals Species

No other protected mammal species were recorded during the multi-disciplinary surveys carried out along the Proposed Scheme. The Construction Phase of the Proposed Scheme is not deemed to affect the local mammal population and will not result in a likely significant negative effect, at any geographic scale. As such, no mitigation is proposed.

12.5.1.5 **Birds**

12.5.1.5.1 Breeding Birds

Habitat Loss & Fragmentation

Where practicable, habitats of importance to birds such as scattered trees and parkland, treeline and hedgerow habitat types, which lie within the footprint, or along the boundary of the Proposed Scheme, will be retained. These areas will be protected for the duration of construction works and fenced off at an appropriate distance. These areas of vegetation to be retained are shown on the Landscaping General Arrangement Drawings (BCIDA-ACM-ENV_LA-0001_XX_00-DR-LL-9001) in Volume 3 of this EIAR .

To minimise the loss of habitat associated with the Proposed Scheme, there are also areas within the Proposed Scheme footprint which are included for mitigation planting where general construction works will not be undertaken. Proposed planting incorporated into the Proposed Scheme will be implemented by the appointed contractor, is listed below and displayed on the Landscaping General Arrangement Drawings (BCIDA-ACM-ENV_LA-0001_XX_00-DR-LL-9001) in Volume 3 of this EIAR:

- 545 street trees planted;
- 2995m^2 of proposed hedgerow;
- 56141m^2 of proposed species rich grassland;
- 204m^2 of proposed ornamental planting; and,
- 8372m^2 of proposed amenity grassland planting.

Many species may not nest near a road development due to disturbance (e.g. drowning out of bird song by traffic noise). Whilst the planting is not likely to fully offset the loss of breeding and foraging habitat (due to the proximity of road traffic disturbance on the operational road) it is likely to provide additional foraging habitat for some species.

Mortality Risk

Where feasible, vegetation (*e.g.* hedgerows, trees, scrub, bankside vegetation and grassland) will not be removed, between the 1st March and the 31st August, to avoid direct impacts on nesting birds. Where the construction programme does not allow this seasonal restriction to be observed, then these areas will be inspected by a suitably qualified ecologist as engaged by the appointed contractor for the presence of breeding birds prior to clearance. Areas found not to contain nests will be cleared within 3 days of the nest survey, otherwise repeat surveys will be required. Vegetation clearance will not commence where nests are present, works will resume when birds have fledged and nests are no longer in use, or an agreement is reached with NPWS.

Habitat Degradation- Water Quality

The mitigation measures relating to the protection of water quality in receiving watercourses during construction are outlined in Chapter 13 (Water) and in Appendix A5.1 CEMP in Volume 4 of this EIAR. This includes details on guidance documents and control measures for the Construction Compound, site establishment, storage of materials, waste and fuels, control of sediment, use of concrete, vehicles and plant, and water body inspections.

12.5.1.5.2 Wintering Birds

Habitat Degradation - Water Quality

The mitigation measures relating to the protection of water quality in receiving watercourses during construction are outlined in Chapter 13 (Water) and in Appendix A5.1 CEMP in Volume 4 of this EIAR. This includes details on guidance documents and control measures for the Construction Compound, site establishment, storage of materials, waste and fuels, control of sediment, use of concrete, vehicles and plant, and water body inspections.

12.5.1.6 **Reptiles**

No reptile species were recorded during the multi-disciplinary surveys carried out along the Proposed Scheme. The Construction Phase of the Proposed Scheme is not deemed to affect the local reptile population and will not result in a likely significant negative effect, at any geographic scale. As such, no mitigation is proposed.

12.5.1.7 **Amphibians**

Habitat Loss, Disturbance & Mortality Risk

No amphibian species were recorded during the multi-disciplinary surveys carried out along the Proposed Scheme, despite the presence of suitable habitat within the footprint of the Proposed Scheme.

If vegetation clearance works are to begin during the season where frogspawn or tadpoles may be present (*i.e.* February to mid-summer), or where breeding adult newts, their eggs or larvae may be present (*i.e.* mid-March to September), a pre-construction survey of suitable habitat will be undertaken by a suitably qualified ecologist engaged by the appointed contractor to determine whether breeding amphibians are present.

In the case of common frog, any frog spawn, tadpoles, juvenile or adult frogs present will be captured, under licence from NPWS, and removed from affected habitat by hand net and translocated to the nearest area of available suitable habitat, beyond the ZoI of the Proposed Scheme.

In the case of smooth newt, individuals will be captured, under licence from NPWS, and removed from affected habitat either by hand net or by trapping and translocated to the nearest area of available suitable habitat, beyond the ZoI of the Proposed Scheme. If used, the type and design of traps shall be approved by the NPWS. This is a standard and proven method of catching and translocating smooth newt.

If the size or depth of the habitat feature is such that it cannot be determined by visual survey whether all amphibians have been captured, the suitably qualified ecologist engaged by the appointed contractor will advise on the appropriate course of action to confirm that no amphibian species remain. If drainage of the habitat feature is deemed to be the appropriate course of action, any mechanical pumps used will have a screen fitted, and be sited, such that no amphibian species can be sucked into the pump mechanism.

Any capture and translocation works shall be undertaken immediately in advance of site clearance / construction works commencing.

12.5.1.8 **Fish**

Habitat Degradation – Surface Water Quality

The mitigation measures relating to the protection of water quality in receiving watercourses during construction are outlined in Chapter 13 (Water) and in Appendix A5.1 CEMP in Volume 4 of this EIAR. This includes details on guidance documents and control measures for the Construction Compound, site establishment, storage of materials, waste and fuels, control of sediment, use of concrete, vehicles and plant, and water body inspections.

12.5.2 Operational Phase

12.5.2.1 **Designated Areas for Natura Conservation**

The mitigation measures that are specifically required to ensure that the Proposed Scheme will not adversely affect the integrity of the European sites within the ZoI are presented in the NIS. Following a consideration and assessment of the Proposed Scheme on the identified relevant European sites, the following mitigation measures were developed to address potential impacts that were identified:

- Measures to protect surface water quality during operation; and
- Measures to prevent the spread of invasive species to downstream European sites.

12.5.2.1.1 National sites

The mitigation strategy in relation to potential impacts arising from the Proposed Scheme on pNHAs within the ZoI are as set out for European sites as the boundaries of the pNHAs follow those of the SACs and SPAs. Therefore, the mitigation measures outlined in Section 12.5.1.1, and as detailed in the NIS (which accompanies the application for approval), will prevent the Proposed Scheme resulting in a significant negative effect on these pNHAs.

12.5.2.2 **Habitats**

Habitat Degradation- Surface Water Quality

Mitigation for the Operational Phase has been built into the design of the Proposed Scheme.. The increase in surface water run-off from the increase in impermeable area will be managed for the Proposed Scheme through a combination of bioretention areas and filtration drains. This drainage infrastructure will be installed by the appointed contractor, as shown in Surface Water Drainage Works drawings BCIDA-ACM-DNG_RD-0001_XX_OO-DR-CD-9001 in Volume 3 of this EIAR. Where no new paved areas are proposed, the existing drainage network will be retained and utilised. The effective implementation of these measures will ensure that there is no increase in existing runoff rates from newly paved areas and appropriate treatment to ensure runoff quality.

The range of measures including SuDS systems installed during the Construction Phase will reduce both the volume and rate of surface waters discharging into the existing surface water drainage network, as well as improving the environmental quality of any such discharges during the Operational Phase of the Proposed Scheme.

These standard drainage design controls have been proven through widespread use in developments across the country. The proposed SuDS drainage system incorporated into the design of the site are common drainage systems that are used in most development types. They are proposed and designed in accordance with the Greater Dublin Strategic Drainage Study (GDSDS, 2005). Once the Proposed Scheme is in operation, the Local Authority will be required to implement a maintenance and inspection regime (and / or emergency repairs if necessary). No additional mitigation is required.

Habitat Degradation- Invasive Species

The ISMP (see Appendix A5.1 CEMP in Volume 4 of the EIAR) has been prepared to outline the strategy that will be adopted during the Construction and Operational Phases of the Proposed Scheme in order to manage and prevent the spread of the non-native invasive plant species. The ISMP will be finalised following the confirmatory pre-construction survey as advised by a suitably qualified specialist, with regard to the Management of Invasive Alien Plant Species on National Roads - Technical Guidance (TII 2020a) and Standard (TII 2020b), and other species-specific guidance documents including those listed in the ISMP, as necessary.

The NTA will ensure that all control measures specified in the ISMP shall be implemented by a suitably qualified and licensed specialist. The site will be monitored by the appointed contractor after control measures have been implemented. Any re-growth, will be subsequently treated as detailed in the ISMP.

Once the Proposed Scheme is in operation, the Local Authority will implement a maintenance and inspection regime subject to their management procedures, where any introduction of non-native invasive plant species will be managed. No additional mitigation is required.

12.5.2.3 **Mammals**

12.5.2.3.1 Bats

Indirect Disturbance of Flight Patterns Due to Operational Lighting

Excess light spill from the Proposed Scheme may result in avoidance behaviour from bats within the vicinity of the Proposed Scheme. Where feasible, operational lighting will be kept to a minimum and light spill avoided.

A total of two areas were identified within the footprint of the Proposed Scheme where the installation of additional lighting in previously dark / poor lighting areas in Maypark and St. David's Wood, is required. The lighting design in these locations will be installed by the appointed contractor, which will ensure that light spill will be kept beneath 3 lux on the surrounding treelines, as shown on the Street Lighting drawings (BCIDA-ACM-LHT_RL-0001_XX_00-DR-EO-9001) in Volume 3 of this EIAR.

12.5.2.3.2 Badgers

There are no significant effects on badger predicted during the Operational Phase of the Proposed Scheme. Therefore, no mitigation is required.

12.5.2.3.3 Otter

As detailed in Section 12.5.2.2 mitigation for the Operational Phase has been built into the design of the Proposed Scheme. This includes the implementation of SuDS measures to ensure the avoidance of habitat degradation. No additional mitigation is required.

12.5.2.3.4 Marine Mammals

As detailed in Section 12.5.2.2 mitigation for the Operational Phase has been built into the design of the Proposed Scheme. This includes the implementation of SuDS measures to ensure the avoidance of habitat degradation. No additional mitigation is required.

12.5.2.3.5 Other Mammals Species

No significant effects on other mammal species are predicted during the Operational Phase of the development. Therefore, no mitigation is required.

12.5.2.4 **Birds**

12.5.2.4.1 Breeding Birds

Habitat Loss and Loss of Breeding / Resting Sites

As discussed in Section 12.5.1.5.1, planting of treeline, hedgerow and grassland habitats within the Proposed Scheme footprint will be carried out by the appointed contractor, as detailed in the landscape drawings which will provide suitable compensatory habitat for the breeding bird species recorded within the study area. Proposed planting incorporated into the Proposed Scheme will be implemented, shown as design mitigation, is listed below and displayed on the Landscaping General Arrangement Drawings (BCIDA-ACM-ENV_LA-0001_XX_00-DR-LL-9001) in Volume 3 of this EIAR:

- 545 street trees planted;
- 2995m^2 of proposed hedgerow;
- 56141m^2 of proposed species rich grassland;
- 204m^2 of proposed ornamental planting; and,
- 8372m^2 of proposed amenity grassland planting.

Many species may not nest near a road development due to disturbance (e.g. drowning out of bird song by traffic noise). Whilst the planting is not likely to fully offset the loss of breeding and foraging habitat (due to the proximity of road traffic disturbance on the operational road) it is likely to provide additional foraging habitat for some species.

Habitat Degradation- Surface Water

As detailed in Section 12.5.2.2 mitigation for the Operational Phase has been built into the design of the Proposed Scheme. This includes the implementation of SuDS measures to ensure the avoidance of habitat degradation. No additional mitigation is required.

12.5.2.4.2 Wintering Birds

Habitat Degradation- Surface Water

As detailed in Section 12.5.2.2 mitigation for the Operational Phase has been built into the design of the Proposed Scheme. This includes the implementation of SuDS measures to ensure the avoidance of habitat degradation. No additional mitigation is required.

12.5.2.5 **Reptiles**

No significant effects on reptile species are predicted during the Operational Phase of the Proposed Scheme. Therefore, no mitigation is required.

12.5.2.6 **Amphibians**

No significant effects on amphibian species are predicted during the Operational Phase of the Proposed Scheme. Therefore, no mitigation is required.

12.5.2.7 **Fish**

As detailed in Section 12.5.2.2 mitigation for the Operational Phase has been built into the design of the Proposed Scheme. This includes the implementation of SuDS measures to ensure the avoidance of habitat degradation. No additional mitigation is required.

12.6 Residual Impacts

12.6.1 Construction Phase

Following the implementation of the mitigation measures outlined in Section 12.5, the Proposed Scheme will not result in any significant residual effects above the local scale on the KERs identified (see Table 12.12) on its own, or cumulatively together with other proposed developments during the Construction Phase. Table 12.16 provides a summary of Construction Phase Significant Residual Impacts.

Table 12.16 Summary of Construction Phase Significant Residual Impacts

Ecological Receptor	Ecological Valuation	Potential Impact (Pre-Mitigation and Monitoring)	Potential Significance	Significant Residual Impact (Post Mitigation and Monitoring)
Designated Areas for Nature Conservation				
Baldoyle Bay SAC Baldoyle Bay SPA Baldoyle Bay pNHA	International Importance International Importance National Importance	Habitat Degradation (hydrology); Disturbance and Displacement	Likely significant effect at the international geographic scale	No significant residual effect
North Dublin Bay SAC; North Dublin Bay pNHA	International Importance National Importance	Habitat Degradation (hydrology; non-native invasive plant species)	Likely significant effect at the international geographic scale	No significant residual effect
South Dublin Bay SAC South Dublin Bay pNHA	International Importance National Importance	Habitat Degradation (hydrology; non-native invasive plant species)	Likely significant effect at the international geographic scale	No significant residual effect
Howth Head SAC Howth Head pNHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale	No significant residual effect
Rockabill to Dalkey Island SAC Dalkey Coastal Zone and Killiney Hill pNHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale	No significant residual effect
Lambay Island SAC Lambay Island pNHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale	No significant residual effect
South Dublin Bay and River Tolka Estuary SPA Dolphins, Dublin Docks pNHA South Dublin Bay pNHA Booterstown Marsh pNHA	International Importance National Importance National Importance National Importance	Habitat Degradation (hydrology; non-native invasive plant species); Disturbance and Displacement	Likely significant effect at the international geographic scale	No significant residual effect
North Bull Island SPA North Dublin Bay pNHA	International Importance National Importance	Habitat Degradation (hydrology; non-native invasive plant species); Disturbance and Displacement)	Likely significant effect at the international geographic scale	No significant residual effect
Malahide Estuary SPA Malahide Estuary pNHA	International Importance National Importance	Habitat Degradation (hydrology; non-native invasive plant species); Disturbance and Displacement)	Likely significant effect at the international geographic scale	No significant residual effect
Ireland's Eye SPA Ireland's Eye pNHA	International Importance National Importance	Habitat Degradation (hydrology); Disturbance and Displacement)	Likely significant effect at the international geographic scale	No significant residual effect

Ecological Receptor	Ecological Valuation	Potential Impact (Pre-Mitigation and Monitoring)	Potential Significance	Significant Residual Impact (Post Mitigation and Monitoring)
Howth Head Coast SPA Howth Head pNHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale	No significant residual effect
Rogerstown Estuary SPA Portraine Shore pNHA Rogerstown pNHA	International Importance National Importance National Importance	Habitat Degradation (hydrology; non-native invasive plant species); Disturbance and Displacement)	Likely significant effect at the international geographic scale	No significant residual effect
Lambay Island SPA Lambay Island pNHA	International Importance National Importance	Habitat Degradation (hydrology); Disturbance and Displacement)	Likely significant effect at the international geographic scale	No significant residual effect
Dalkey Island SPA Dalkey Coastal Zone and Killiney Hill pNHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale	No significant residual effect
Skerries Islands SPA Skerries Islands NHA	International Importance National Importance	Habitat Degradation (hydrology) ; Disturbance and Displacement)	Likely significant effect at the international geographic scale	No significant residual effect
The Murrough SPA The Murrough pNHA	International Importance National Importance	Habitat Degradation (hydrology) ; Disturbance and Displacement)	Likely significant effect at the international geographic scale	No significant residual effect
Habitats (outside of designated areas for nature conservation)				
Depositing / lowland rivers (FW2)	Local Importance (Higher Value)	Habitat Degradation (hydrology; non-native invasive plant species)	Likely significant effect at the local geographic scale	No significant residual effect
Dry calcareous and neutral grassland (GS1)	Local Importance (Higher Value)	Habitat Degradation (non-native invasive plant species)	Likely significant effect at the local geographic scale	Likely significant effect at the local geographic scale
Scattered trees and parkland (WD5)	Local Importance (Higher Value)	Habitat Degradation (non-native invasive plant species)	Likely significant effect at the local geographic scale	Likely significant effect at the local geographic scale
Hedgerows (WL1)	Local Importance (Higher Value)	Habitat Loss, Habitat Degradation (non-native invasive plant species)	Likely significant effect at the local geographic scale	Likely significant effect at the local geographic scale
Treelines (WL2)	Local Importance (Higher Value)	Habitat Loss, Habitat Degradation (non-native invasive plant species)	Likely significant effect at the local geographic scale	Likely significant effect at the local geographic scale
Fauna Species				
Bats	Local Importance (Higher Value)	Habitat loss / fragmentation; Disturbance / displacement	Likely significant effect at the local geographic scale	Likely significant effect at the local geographic scale
Badger	Local Importance (Higher Value)	Disturbance / displacement	Likely significant effect at the local geographic scale	Likely significant effect at the local geographic scale
Otter	County Importance	Habitat degradation (hydrology; disturbance / displacement)	Likely significant effect at the local geographic scale	Likely significant effect at the local geographic scale
Marine mammals	Local Importance (Higher Value) – County Importance	Habitat degradation (hydrology)	Likely significant effect at the local to national geographic scale	No significant residual effect
SCI bird species	International Importance	*See SPAs above*	*See SPAs above*	
All other breeding bird species (non-SCI)	Local Importance (Higher Value)	Habitat Loss; Mortality risk; Disturbance / Displacement; Habitat Degradation (hydrology)	Likely significant effect at the local geographic scale	Likely significant effect at the local geographic scale

Ecological Receptor	Ecological Valuation	Potential Impact (Pre-Mitigation and Monitoring)	Potential Significance	Significant Residual Impact (Post Mitigation and Monitoring)
All other wintering bird species (non-SCI)	Local Importance (Higher Value)	Habitat Loss; Mortality risk; Disturbance / Displacement; Habitat Degradation (hydrology)	Likely significant effect at the local geographic scale	Likely significant effect at the local geographic scale
Amphibians	Local Importance (Higher Value)	Habitat Degradation (hydrology); Mortality Risk	Likely significant effect at the local geographic scale	No significant residual effect
Fish	Local Importance (Higher Value) – County Importance	Habitat degradation (hydrology)	Likely significant effect at the local to national geographic scale	No significant residual effect

12.6.2 Operational Phase

Following the implementation of the mitigation measures outlined in Section 12.5, the Proposed Scheme will not result in any significant residual effects during the Operational Phase. Table 12.17 provides a summary of Operational Phase Significant Residual Impacts.

Table 12.17 Summary of Operational Phase Significant Residual Impacts

Ecological Receptor	Ecological Valuation	Potential Impacts (Pre-Mitigation and Monitoring)	Potential Significance	Significant Residual Impact (Post Mitigation and Monitoring)
Designated Areas for Nature Conservation				
Baldoyle Bay SAC Baldoyle Bay SPA Baldoyle Bay pNHA	International Importance International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale	No significant residual effect
North Dublin Bay SAC; North Dublin Bay pNHA	International Importance National Importance	Habitat Degradation (hydrology; non-native invasive plant species)	Likely significant effect at the international geographic scale	No significant residual effect
South Dublin Bay SAC South Dublin Bay pNHA	International Importance National Importance	Habitat Degradation (hydrology; non-native invasive plant species)	Likely significant effect at the international geographic scale	No significant residual effect
Howth Head SAC Howth Head pNHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale	No significant residual effect
Rockabill to Dalkey Island SAC Dalkey Coastal Zone and Killiney Hill pNHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale	No significant residual effect
South Dublin Bay and River Tolka Estuary SPA Dolphins, Dublin Docks pNHA South Dublin Bay pNHA Booterstown Marsh pNHA	International Importance National Importance National Importance National Importance	Habitat Degradation (hydrology; non-native invasive plant species)	Likely significant effect at the international geographic scale	No significant residual effect
North Bull Island SPA North Dublin Bay pNHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale	No significant residual effect
Dalkey Island SPA Dalkey Coastal Zone and Killiney Hill pNHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale	No significant residual effect
Malahide Estuary SPA Malahide Estuary pNHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale	No significant residual effect

Ecological Receptor	Ecological Valuation	Potential Impacts (Pre-Mitigation and Monitoring)	Potential Significance	Significant Residual Impact (Post Mitigation and Monitoring)
Ireland's Eye SPA Ireland's Eye pNHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale	No significant residual effect
Rockabill SPA Rockabill Island pNHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale	No significant residual effect
Rogerstown Estuary SPA Portraine Shore pNHA Rogerstown pNHA	International Importance National Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale	No significant residual effect
Lambay Island SAC Lambay Island SPA Lambay Island pNHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale	No significant residual effect
Dalkey Island SPA Dalkey Coastal Zone and Killiney Hill pNHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale	No significant residual effect
Skerries Islands SPA Skerries Islands NHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale	No significant residual effect
The Murrough SPA The Murrough pNHA	International Importance National Importance	Habitat Degradation (hydrology)	Likely significant effect at the international geographic scale	No significant residual effect
North Dublin Bay pNHA	International Importance National Importance National Importance	Habitat Degradation (air quality)	Likely significant effect at the local geographic scale	Likely significant effect at the local geographic scale
Habitats (outside of designated areas for nature conservation)				
Depositing/lowland rivers (FW2)	Local Importance (Higher Value)	Habitat degradation (hydrology; non-native invasive plant species)	Likely significant effect at the local geographic scale	No significant residual effect
Fauna Species				
Bats	Local Importance (Higher Value)	Disturbance / displacement	Likely significant effect at the local geographic scale	No significant residual effect
Otter	County Importance	Habitat Degradation (hydrology)	Likely significant effect at the local geographic scale	No significant residual effect
Marine mammals	Local Importance (Higher Value) – County Importance	Habitat Degradation (hydrology)	Likely significant effect at the local geographic scale	No significant residual effect
SCI bird species	International Importance	*See SPAs above*		
All other breeding bird species (non-SCI)	Local Importance (Higher Value)	Habitat Degradation (hydrology)	Likely significant effect at the local geographic scale	No significant residual effect
All other wintering bird species (non-SCI)	Local Importance (Higher Value)	Habitat Degradation (hydrology)	Likely significant effect at the local geographic scale	No significant residual effect
Fish	Local Importance (Higher Value) – County Importance	Habitat degradation (hydrology)	Likely significant effect at the local to national geographic scale	No significant residual effect

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S.I. No. 345/2021 - European Union Habitats (Glenasmole Valley Special Area of Conservation 001209) Regulations 2021.

S.I. No. 472/2021 - European Union Habitats (Baldoyle Bay Special Area of Conservation 000199) Regulations 2021.

S.I. No. 524/2021 - European Union Habitats (Howth Head Special Area of Conservation 000202) Regulations 2021.

Wildlife Acts 1976 (as amended).