Iarnród Éireann
Irish Rail

Rosslare ORE Hub

EIAR Environmental Topic Chapters

Chapter 10:

Terrestrial Ecology

venterra | GDG GAVIN & DOHERTY GEOSOLUTIONS | NICHOLAS O'DWYER an RSK company

Co-funded by the European Union

TABLE OF CONTENTS

Chapter			Page
10	**Terrestrial Ecology**		**10-1**
10.1	Introduction		10-1
	10.1.1	Relevant Legislation and Guidelines	10-2
10.2	Assessment Methodology		10-5
	10.2.1	Statement of Competence	10-5
	10.2.2	Topic-specific Consultation	10-6
	10.2.3	Introduction	10-7
	10.2.4	Desk Study	10-12
	10.2.5	Ecological Surveys	10-15
	10.2.6	Methodology For Assessment of Effects	10-25
	10.2.7	Difficulties and Uncertainties	10-30
10.3	Baseline: Terrestrial Ecology in Receiving Environment		10-30
	10.3.1	General Site Description and Context	10-30
	10.3.2	European Designated Sites: Special Areas of Conservation	10-31
	10.3.3	Nationally Designated Sites	10-38
	10.3.4	Other Designated Sites	10-40
	10.3.5	Habitats and Flora	10-40
	10.3.6	Invasive Non-Native Species (INNS)	10-53
	10.3.7	Non-Volant Mammals	10-56
	10.3.8	Volant Mammals (Bats)	10-61
	10.3.9	Herpetofauna	10-66
10.4	Assessment of Impacts/Effects		10-67
	10.4.1	Establishing Zone of Influence	10-67
	10.4.2	“Do-Nothing” Scenario	10-69
	10.4.3	Primary mitigation	10-69
	10.4.4	Tertiary Mitigation	10-73
	10.4.5	Key Ecological Receptors	10-75
	10.4.6	Construction Phase Impacts on Terrestrial Ecology KEy ecological receptors	10-90
	10.4.7	Operational Phase Impacts on Terrestrial Ecology	10-99
	10.4.8	Significance of Effects	10-102
10.5	Secondary Mitigation		10-104
	10.5.1	Construction Phase Mitigation Measures	10-104
	10.5.2	Operational Phase Mitigation Measures	10-112
10.6	Cumulative and Residual Effects		10-112
	10.6.1	Cumulative Effects and Other Interactions	10-112
	10.6.2	Residual Effects	10-119
10.7	Biodiversity Enhancement measures		10-120
10.8	Summary		10-121
10.9	References		10-125

LIST OF TABLES

Table 10.1: Summary of field surveys conducted in 2023 10-16
Table 10.2: SACs in the vicinity of the Proposed Development 10-32
Table 10.3: pNHAs in the general vicinity of the Proposed Development Boundary 10-38
Table 10.4: Habitats recorded within the Proposed Development and Ecological Importance 10-40
Table 10.5: Annex I habitats outside an SAC within the vicinity of the Proposed Development 10-46
Table 10.6: IUCN Red listed flora species recorded within the 2km2 grid T11G (NBDC) 10-53
Table 10.7: Invasive non-native flora species recorded within the 2km2 grid T11G (NBDC) – Third Schedule species are in bold 10-54
Table 10.8: NBDC records of Otter within the wider area of the Proposed Development 10-57
Table 10.9: Bat activity recorded during the emergence surveys 10-64
Table 10.10: Results of the Spring, Summer and Autumn Static Detector Survey 10-65
Table 10.11:Summary of Ecological Valuation and Identification of KERs 10-76
Table 10.12: Summary of KERs identified within the ZoI of the Proposed Development 10-89
Table 10.13: Summary of Predicted Impacts on Terrestrial KERs, Significance of Effects, Spatial Extent of Significant Effects, and Secondary Mitigation Requirements 10-103
Table 10.14: Projects considered for cumulative effects on Terrestrial Receptors in conjunction with the Proposed Development 10-114
Table 10.15: Inter-related effects (phase) assessment for terrestrial ecological receptor. 10-117
Table 10.16: Assessment Summary 10-122

LIST OF FIGURES

Figure 10.1: Otter Zone of Influence (ZoI) for the Proposed Development 10-9
Figure 10.2: Proposed Development Boundary showing Terrestrial (above HWM) and Marine (below HWM) Environments 10-11
Figure 10.3: NBDC desk study search – 2km2 grids with red outline 10-14
Figure 10.4: European designated sites (i.e. SACs) in the general vicinity of the Proposed Development 10-37
Figure 10.5:Natural Heritage Areas sites within 5km of the Proposed Development 10-39
Figure 10.6: Habitats recorded during the Habitat Walkover Survey (2025), as per Fossitt, 2000 10-44
Figure 10.7: Annex I habitats predicted to be present north of the Proposed Development – Article 17 data (NPWS, 2019) 10-51
Figure 10.8: Annex I habitats predicted to be present south of the Proposed Development – Article 17 data (NPWS, 2019) 10-52
Figure 10.9: Non-Native Invasive Species Recorded - Winter heliotrope (*Petasites fragrans*) from GDG Terrestrial Habitats Survey (September 2025) 10-55
Figure 10.10: Otter records and date recorded within 5km of the Proposed Development from Article 17 submitted data (NPWS, 2019) 10-59

LIST OF ABBREVIATIONS

AA	Appropriate Assessment
AC	Annexed Community
BCI	Biodiversity Climate Impact
BTO	British Trust for Ornithology
cSAC	Candidate Special Area of Conservation
cSPA	Candidate Special Protection Area
DAFM	Department of Agriculture, Food and the Marine
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EPA	Environmental Protection Agency
EU	European Union
FCS	Favourable Conservation Status
GDG	Gavin & Doherty Geosolutions
GIS	Geographic Information System
IFI	Inland Fisheries Ireland
INNS	Invasive Non-Native Species
IUCN	International Union for Conservation of Nature
KER	Key Ecological Receptor
LoLo	Lift-On Lift-Off
NBAP	National Biodiversity Action Plan
NBDC	National Biodiversity Data Centre
NIS	Natura Impact Statement
NHA	Natural Heritage Area
NPWS	National Parks and Wildlife Service
NRA	National Roads Authority
NS	National Status
pNHA	Proposed Natural Heritage Area
PRA	Preliminary Roost Assessment
RMP	Record of Monuments and Places
SAC	Special Area of Conservation
SCI	Site of Community Importance
SPA	Special Protection Area
WFD	Water Framework Directive

Funded by the European Union. Views and opinions expressed are however those of the Author(s) only and do not necessarily reflect those of the European Union. Neither the European Union nor any granting authority can be held responsible for them.

10 TERRESTRIAL ECOLOGY

10.1 INTRODUCTION

Iarnród Éireann – Irish Rail is applying for development permission for the Rosslare Offshore Renewable Energy Hub (hereafter the 'Proposed Development'), located immediately adjacent and to the northwest of the existing Rosslare Europort at Rosslare Harbour in County Wexford, which is operated by Iarnród Éireann. The Proposed Development includes capital dredging to achieve navigable depths for vessels delivering ORE components; land reclamation to create a storage area for these components; and construction of two new berths to facilitate loading and unloading of ORE components. The land reclamation works include infilling the existing small boat harbour, after the construction of a new small boat harbour. The Proposed Development also includes the installation of a new slipway and facility for local clubs, such as the Sea Scouts.

The purpose of the Proposed Development is to provide a facility for the efficient handling and storage, marshalling, staging and integration of ORE components to facilitate installation of offshore wind energy projects by ORE developers and operators. The Proposed Development is designed to provide facilities that accommodate a wide range of infrastructure uses, both for current requirements and anticipated future needs. For instance, the Proposed Development could be used for traditional port activities if required, including during periods of reduced ORE-related activity. Refer to EIAR Chapter 6: Project Description for further detail.

This chapter of the Environmental Impact Assessment Report (EIAR) presents the assessment of the likely significant effects on terrestrial ecology arising from the construction and operation of the Proposed Development, both alone and cumulatively with other projects. The scope of this chapter was determined following issue of a scoping report to the following topic-relevant stakeholders (see EIAR Chapter 4: Scoping and Consultation for full details of consultation):

- National Parks and Wildlife Service; and
- Wexford County Council

The terrestrial footprint of the Proposed Development comprises approximately 2.64 ha of land immediately adjacent to Rosslare Europort. This includes the areas required for the land reclamation tie-in to the shore, access roads, laydown areas, terrestrial site compounds, and connections to existing infrastructure. The EIAR Terrestrial Ecology Chapter assesses all land-based works within this defined footprint.

The assessment presented in this chapter has been informed by the following technical appendix:

- EIAR Technical Appendix 10: Terrestrial Ecology Technical Report

This chapter evaluates the importance of the terrestrial ecological resources present and defines the degree of significance of potential impacts resulting from the Proposed Development. In the context of the Terrestrial Ecology EIAR chapter, terrestrial ecology specifically refers to the assessment of ecological receptors and their habitats located above the high-water mark, including terrestrial habitats, flora, and fauna. The assessment addresses potential impacts from the construction and

operational phases of the Proposed Development on terrestrial species, habitats, and designated conservation areas occurring within or influenced by activities above this mark. The report also identifies appropriate mitigation measures and residual impacts.

Within the Terrestrial Ecology chapter, a summary of topic-relevant guidance and data sources used to characterise the topic-specific Study Area are detailed. The topic-specific methodology followed in assessing the impacts of the Proposed Development on topic-specific environmental receptors is set out, as is the assessment of likely effects on the topic-specific environmental receptors arising from the construction and operation of the Proposed Development. Relevant mitigation measures, following the mitigation hierarchy of avoidance, minimisation, restoration and offsets, and/or monitoring requirements, are proposed in respect of any significant effects including potential cumulative effects. A summary of residual effects is provided, where relevant.

The focus of this chapter is on terrestrial flora and fauna, including non-volant terrestrial mammals, volant mammals (bats), herpetofauna (amphibians and reptiles), terrestrial habitats, higher plants, and the environmental protection that exists in the Study Area for these groups. The term *Study Area* refers to the extent of the desk study conducted to gather background information on each species-specific and encompasses the extent of the Survey Area. The extent of the Study Area was defined in line with guidance from the Chartered Institute of Ecology and Environmental Management *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine Version 1.3* (CIEEM, 2024) and the National Roads Authority *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (NRA, 2009), which recommend that study areas encompass both the Proposed Development footprint and a surrounding zone sufficient to capture all ecological receptors potentially subject to impact pathways. The Study Area therefore includes the terrestrial footprint of the Proposed Development and its immediate surroundings, as well as the wider desk study area from which ecological records were collated. Avifaunal receptors are assessed separately in Chapter 14: Ornithology of this EIAR. Marine benthic ecology (up to high water mark), fisheries and fish ecology and marine mammal receptors are considered separately in Chapter 11: Benthic Ecology, Chapter 12: Fish, Shellfish and Turtle Ecology, Chapter 13: Marine Mammals and Chapter 15: Commercial Fisheries and Aquaculture, respectively. This chapter is based on the findings of project-specific terrestrial ecological surveys undertaken at the Proposed Development location and on a desk-based review of publicly available information.

A Stage 1 Screening Report for Appropriate Assessment (AA) and Stage 2 Natura Impact Statement (NIS) have been produced and are included in Volume 4 of this EIAR.

10.1.1 RELEVANT LEGISLATION AND GUIDELINES

Regulations and guidance pertaining to ecology and biodiversity are outlined in Chapter 2: Legislation and Policy Context of this EIAR. This section details the regulations and guidance specific to terrestrial ecology.

10.1.1.1 LEGISLATION

In preparation of this Chapter reference has also been made to the following national and international legislation, and due regard to relevant case law including :

- EIA Directive as amended
- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (Habitats Directive);
- European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011) as amended;
- European Communities (Natural Habitats) Regulations, S.I. 94/1997 as amended by S.I. 233/1998 & S.I. 378/2005 (The Habitats Regulations);
- The Wildlife Act 1976 (as amended);
- The Flora (Protection) Order, 2022 (S.I. No. 235/2022); and
- The Transport (Railway Infrastructure) Act, 2001 (the 2001 Act) (as amended and substituted).
- S.I. No. 272 of 2009: European Communities Environmental Objectives (Surface Waters) Regulations 2009 and S.I. No. 722 of 2003 European Communities (Water Policy) Regulations 2003 which give further effect to EU Water Framework Directive (2000/60/EC)

10.1.1.2 GUIDANCE

This Terrestrial Ecology chapter has been informed by the following guidance documents:

- CIEEM (2024) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Version 1.3. Chartered Institute of Ecology and Environmental Management
- Collins, J. (ed.). (2023). Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th ed.)
- Fossitt (2000) – A Guide to Habitats in Ireland
- Institution of Lighting Professionals (ILP) (2023) *Guidance Note 08/23: Bats and Artificial Lighting at Night.* Institution of Lighting Professionals and Bat Conservation Trust
- NBDC (2019) Pollinator-friendly management of: Transport Corridors. All-Ireland Pollinator Plan, Guidelines 9. National Biodiversity Data Centre Series No. 20, Waterford. Sept, 2019
- National Roads Authority (NRA, now TII) (2009a) Guidelines for Assessment of Ecological Impacts of National Road Schemes
- NRA (2009b) Ecological Survey 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 (Revision 1)

- NRA (2008b) Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes
- NRA (2006a) Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes
- NRA (2006b) Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes
- NRA (2006c) Guidelines for the protection and preservation of trees, hedgerows and scrub prior to, during and post Construction of National Road Schemes
- NRA (2005a) Guidelines for the Treatment of Badgers Prior to the Construction of National Road Schemes
- NRA (2005b) Guidelines for the Treatment of Bats during the Construction of National Road Schemes
- Transport Infrastructure Ireland (TII) (2020a) The Management of Invasive Alien Plant Species on National Roads – Standard
- TII (2020b) The Management of Invasive Alien Plant Species on National Roads – Technical Guidance
- 'Bat Surveys: Good Practice Guidelines' prepared by the Bat Conservation Trust (Collins 2016)

10.1.1.3 POLICIES AND PLANS

This Terrestrial Ecology chapter has been informed by the following policies and plans:

- EU Biodiversity Strategy for 2030
- Ireland's 4th National Biodiversity Plan (2023-2030)
- National Biodiversity Data Centre (2021) All Ireland Pollinator Plan 2021-2025
- National Marine Planning Framework
- Wexford County Development Plan 2022-2028

National Biodiversity Action Plan

4th National Biodiversity Action Plan 2023-2030 (Department of Housing, Local Government and Heritage, 2024) (the "NBAP"). The NBAP strives for a "whole of government, whole of society" approach to the governance and conservation of biodiversity. Section 59B of the Wildlife Act 1976 (as amended by section 5 of the Wildlife (Amendment) Act 2023), introduced an obligation on public bodies in their performance of their function to have regard, inter alia, to the objectives and targets of the NBAP. In this regard, 59B states:

> (1) To the extent that it may affect or relate to the functions of a public body, the public body shall, in the performance of its functions, have regard to—
>
> (a) a plan, programme or strategy,

(b) the objectives and targets in a National Biodiversity Action Plan, and

(c) guidelines that may be prepared by the Minister, where he or she considers it appropriate, providing practical guidance to the public body in relation to a plan, programme or strategy or meeting the objectives and targets of a National Biodiversity Action Plan.

(2) A requirement under subsection (1) shall apply in respect of, as the case may be, a plan, programme or strategy, National Biodiversity Action Plan or guidelines or an amendment of any of them, on and from the date of the publication of a notice under section 59C(5) concerning the plan, programme or strategy, National Biodiversity Action Plan or guidelines or an amendment of any of them.

The NBAP sets out 5 strategic objectives, while addressing new and emerging issues:

- Objective 1 - Adopt a Whole of Government, Whole of Society Approach to Biodiversity
- Objective 2 - Meet Urgent Conservation and Restoration Needs
- Objective 3 - Secure Nature's Contribution to People
- Objective 4 - Enhance the Evidence Base for Action on Biodiversity
- Objective 5 - Strengthen Ireland's Contribution to International Biodiversity Initiatives

10.2 ASSESSMENT METHODOLOGY

10.2.1 STATEMENT OF COMPETENCE

This report has been prepared by Maggie Starr (BSc. (Hons) Marine Sciences), Joey O'Connor (BSc. (Hons) Marine Science, MSc. Engineering in the Coastal Environment) and Charlotte Manwaring (BSc. (Hons) Geological Science, MSc. Geochemistry).

Maggie is an Ecologist and Ornithologist with experience in terrestrial, aquatic and marine/coastal ecology and is a trained Marine Mammal Observer (MMO). She is also a Qualifying Member of the Chartered Institute of Ecology and Environmental Management (CIEEM). Her expertise includes specialised mammal, bird (land based and aerial) and habitat surveys, as well as freshwater surveys such as assessments for white-clawed crayfish, pearl mussels, and Biotic Indices (Q-values) Surveys. Her current work includes ecological and environmental desktop studies for terrestrial, aquatic and marine environments, specialised mammal surveys, ornithological surveys, map preparation and reporting (Appropriate Assessment (AA) / Natura Impact Statements (NIS), Ecological Impact Assessment (EcIA), EIAR).

Maggie completed the terrestrial ecology desktop study, conducted updated surveys in September 2025, and is lead author for the chapter.

Joey is an Environmental Impact Assessment practitioner and Marine Scientist with coastal engineering expertise. Joey has had an overview role in this project as EIAR coordinator and Biodiversity Lead.

Charlotte is a Senior Environmental Scientist at GDG with 25 years' experience and an ISEP Practitioner. She has worked across the environmental, compliance, planning and monitoring industries for both the public and private sector. She has experience in environmental impact assessment of port expansion, onshore windfarm and energy from waste projects and of marine licencing.

Charlotte has been involved in the management of the project, reporting and review of the chapter.

INIS Environmental Consultants Ltd. completed all terrestrial ecology surveys:

- Kevin McElduff (BSc (Hons) Environmental Science) completed all surveys associated with this project. He is an Ecologist with experience in multi-disciplinary surveys, including habitat classification, mammal surveys, vantage point surveys, invertebrate surveys, breeding wader surveys, bat surveys and Ecological Clerk of Works (ECoW). Kevin has experience in ecological report writing including AA, NIS and EcIA. He is also competent in the use of QGIS.
- Natasha Collins (BSc (Hons) Wildlife Biology) undertook bat emergence surveys for this project. She is an ecologist with a broad range of experience in surveying, including vantage point surveys and breeding/winter bird transects, habitat classification, aquatic invertebrate surveys and bat surveys. As part of her role as an Ecologist with INIS, Natasha regularly conducts ornithological surveys for various projects across Ireland. Natasha has experience in conducting Vantage Point surveys in line with Best Practice (SNH[1]) Guidelines, including for receptors such as Hen Harrier, Whooper Swan, wintering Merlin etc.
- Megan Lee (BSc (Hons) Environmental Science, MSc (Hons) Biodiversity and Land-use Planning) completed bat emergence surveys for this project. Megan Lee is an Ecologist and a Qualifying member of the Chartered Institute of Ecology and Environmental Management (CIEEM). She has a wide range of experience in ecological report writing in addition to surveying, with particular focus on bird, bat, and mammal surveys.

10.2.2 TOPIC-SPECIFIC CONSULTATION

A full list of consultees contacted during the Environmental Impact Assessment (EIA) process is provided in Chapter 4: Scoping and Consultation. Formal consultations were undertaken with the following organisations, which were considered particularly relevant to terrestrial ecology and nature conservation:

- An Bord Pleanála (now An Coimisiún Pleanála)
- National Parks and Wildlife Service (NPWS)
- Wexford County Council Biodiversity Officer

An Bord Pleanála advised potential impacts on terrestrial habitats and species should be considered in the EIAR and that it is important that the EIAR includes robust impact assessments, setting out of

[1] Scottish Natural Heritage, now NatureScot

methodology, most up to date data, source of survey data, dates of surveys etc and identify areas of uncertainty.

The Wexford County Council Biodiversity Officer raised queries regarding otter (*Lutra lutra*) and bat species, with specific reference to the lighting mitigation proposed for bats and disturbance to otters during construction. These issues have been addressed in the relevant sections of this chapter.

NPWS did not provide any terrestrial ecology-specific feedback during consultations.

10.2.3 INTRODUCTION

The data sources for this chapter of the EIAR include a comprehensive desk study and project-specific surveys as summarised below and detailed in EIAR Technical Appendix 10: Terrestrial Ecology Technical Report.

10.2.3.1 STUDY AREA AND SURVEY AREA

The term **"Study Area",** as used in this chapter, refers to the extent of the desk study conducted to gather background information on each species-specific ecological receptor. This scope includes an examination of the habitat range and known ecological requirements for each species to inform the initial stages of assessment, and best practice methodology referenced above for assessing effects on those ecological features.

The term **"Survey Area"** refers to the geographic area where field surveys were conducted, encompassing the Proposed Development Boundary and a buffer area tailored to the specific needs of each ecological receptor. This approach follows guidance from CIEEM (2024) and the National Roads Authority (NRA, 2009), which recommend that survey areas should be defined by the project's zone of influence and by receptor ecology. A 50m buffer was generally applied around the Proposed Development. However, to ensure comprehensive coverage, different buffer zones were applied based on the species-specific ranging behaviour and habitat use patterns. To ensure comprehensive coverage, different buffer zones were applied where required, based on species-specific ranging behaviour and habitat use patterns. Anticipated impact types, such as habitat loss, noise, light pollution, and hydrological changes, were used to determine the extent of each species-specific survey area.

The Study Area and Survey Area for each habitat and species considered are detailed under the subheadings in Sections 10.2.4 and 10.2.50.

10.2.3.2 ZONE OF INFLUENCE

The Zone of Influence (ZoI) is defined as the area over which ecological features may be subject to significant impacts as a result of the Proposed Development and associated activities (CIEEM, 2024). The ZoI varies across KERs based on the predicted impacts and potential impact pathways of direct, indirect, secondary, and cumulative impacts. The ZoI includes areas that could be affected by changes in air, water, noise, light, and ecological connectivity, extending beyond the immediate Proposed Development Boundary, providing a framework to assess all effects on nearby habitats and species.

The ZoI was determined based on the sensitivities and connectivity of each potential receptor identified in the Study Area using the Source-Pathway-Receptor model, which focuses on habitats and species which may experience changes due to the Proposed Development. The terrestrial ecology ZoI of the Proposed Development is limited to the Proposed Development Boundary for most terrestrial ecology receptors, with the exception of otter to reflect their relatively larger foraging ranges.

The ZoI reflects the area where changes due to the Proposed Development may occur and varies by receptor. Features outside the ZoI are not considered KERs as a Source Pathway Receptor connection is not possible.

Considering the ZoI for Otter

In defining the ZoI for otter (*Lutra lutra*), their ecology in coastal environments has been considered. Otters are highly territorial, with home ranges varying widely depending on food availability and habitat type. In freshwater or upland systems, territories may exceed 20 km where prey is less abundant (Kruuk, 2006). In contrast, coastal otters generally occupy much smaller territories, reflecting the higher prey availability in marine and estuarine environments.

Multiple studies confirm that coastal otter foraging ranges can be as short as 2 km of coastline where prey resources are plentiful (Vincent Wildlife Trust, n.d.; Kruuk, 1995; O'Sullivan, 1993). On Shetland, for example, otters occur at an average density of one adult per kilometre of coastline, with individuals typically using several kilometres of shore (Kruuk, 1995).

Coastal otters forage primarily within 80–100 m of the shoreline, usually in shallow water less than 3 m deep, though dives of up to 10 m have been recorded (Kruuk & Moorhouse, 1991; Liles, 2009; Nolet *et al.,* 1993). Despite their marine foraging behaviour, otters are heavily dependent on freshwater access points for drinking and grooming to maintain the waterproof quality of their fur (DAFM, 2009; Kruuk, 2006; Chanin, 2013). Accordingly, coastal otter activity is often concentrated near the outflows of streams and rivers (Kruuk & Balharry, 1990; Kruuk and Moorshouse, 1991), a relationship also confirmed in Cork Harbour where activity was strongly associated with freshwater inputs (Dalton, Healy & Murphy, 2021).

On this basis, a 2 km stretch of coastline is considered an appropriate ZoI for assessing potential effects on otter in relation to the Proposed Development. The ZoI (shown in Figure 10.1) is delineated based on the typical coastal foraging range of the species. The ZoI incorporates adjacent shoreline and nearshore marine habitats within the expected commuting and foraging distance of otters potentially using the area

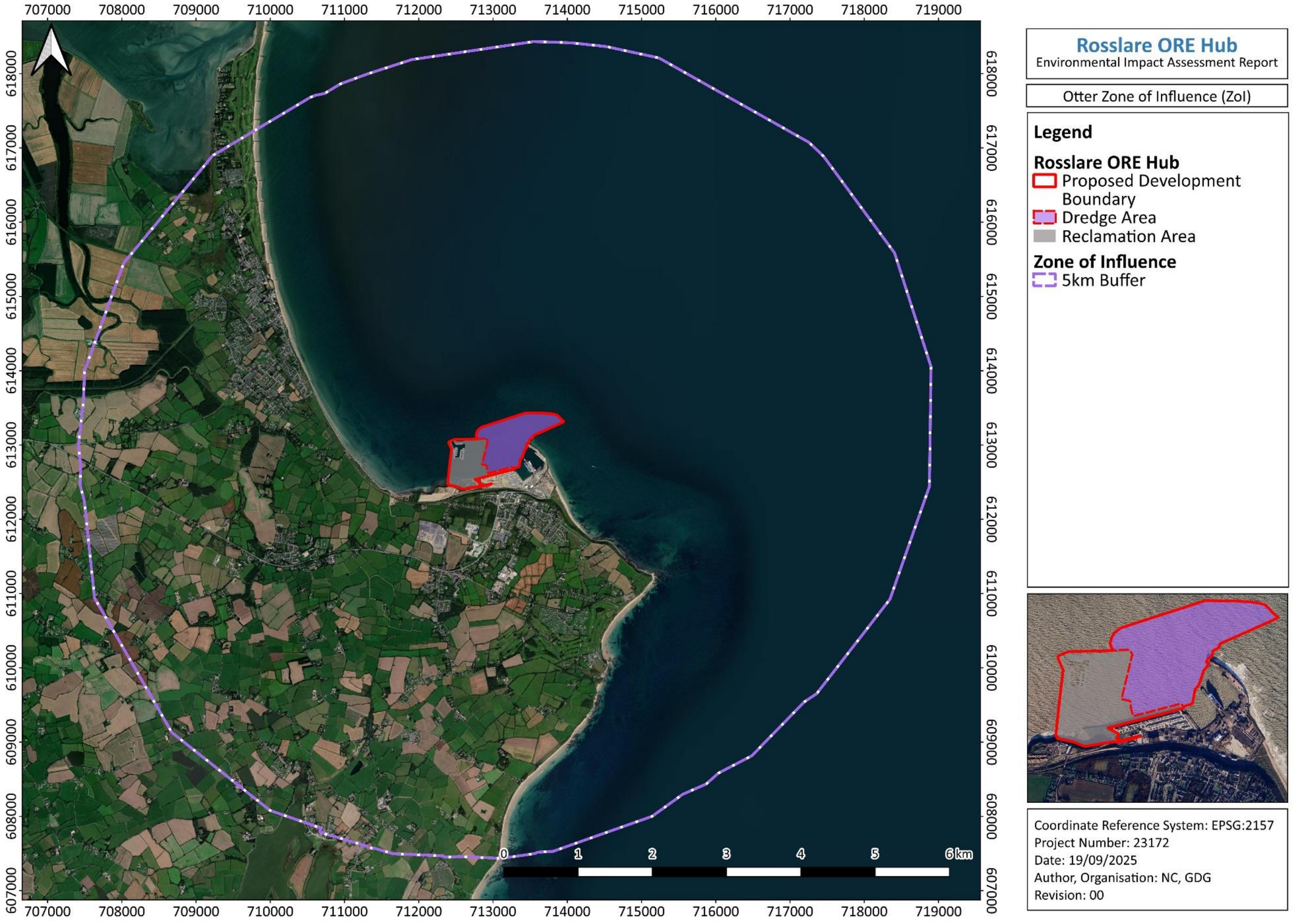

Figure 10.1: Otter Zone of Influence (ZoI) for the Proposed Development

10.2.3.3 KEY ECOLOGICAL RECEPTORS

Key Ecological Receptors (KERs) include habitats and species of ecological significance occurring, or likely to occur, within the defined ZoI of the Proposed Development in line with CIEEM (2024) guidelines which define KERs as features '*both of sufficient value to be material in decision making and likely to be affected significantly*'. To determine terrestrial ecology KERs for the Proposed Development the value of each ecological feature likely to be in the ZoI has been assessed in a geographical context, based on its contribution to biodiversity at scales ranging from international to local. Features of Local Importance (Higher Value) or greater are classified as KERs, while habitats (unless they support KER species) or species of Local Importance (Lower Value) are not. This evaluation takes into consideration the feature's extent or population size within the site compared to its wider distribution, as well as any characteristics that may enhance or reduce its importance, such as species richness or depletion.

Although habitats and species not classified as KERs have biodiversity value, predicted impacts from the Proposed Development on these habitats and species are unlikely to result in significant effects on overall biodiversity. The Proposed Development is primarily situated within the marine environment (Figure 10.2), with a marine footprint of 73.95 ha and a terrestrial footprint of 3.05 ha. Results of both the desk study and ecological field surveys conducted have been used to identify the habitats and species present within the terrestrial footprint of the Proposed Development and its surrounding areas (i.e., the Study Area).

All designated conservation areas within the ZoI of the Proposed Development are classified as KERs due to their inherent conservation importance, and typical foraging ranges of mobile Qualifying Interests (QIs) of SACs were used to define the ZoI for these SACs. Designated sites beyond the ZoI are excluded, as no source-pathway-receptor connection has been identified which would allow these sites to be impacted.

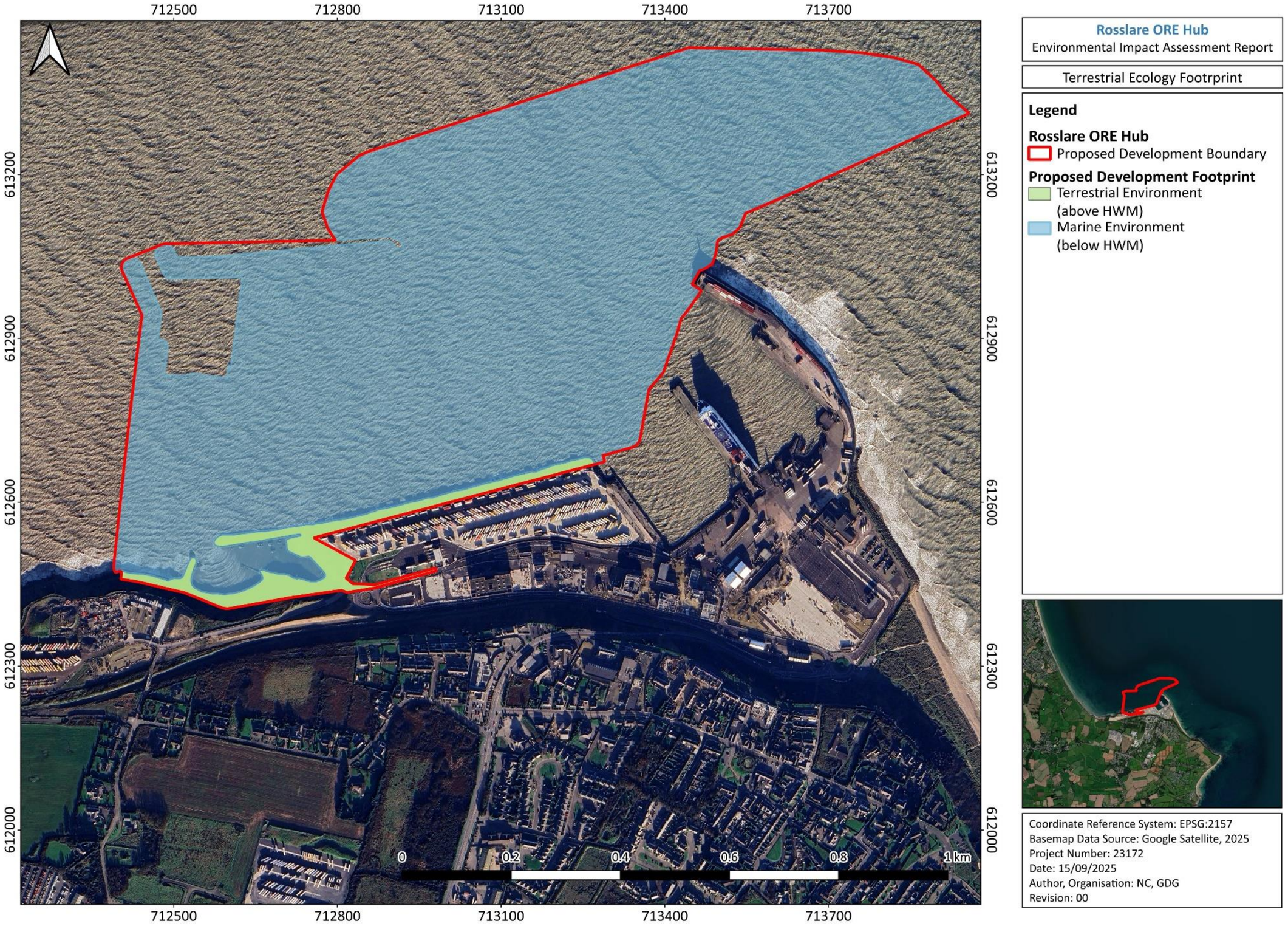

Figure 10.2: Proposed Development Boundary showing Terrestrial (above HWM) and Marine (below HWM) Environments

10.2.4 DESK STUDY

The desk study conducted for this report included a thorough review of existing data, scientific literature, and relevant environmental records to establish a comprehensive understanding of the terrestrial environment within the Proposed Development Boundary and the defined Study Area, which encompasses the ZoI for potential impacts. This study collated information from sources including previous environmental assessments, biodiversity databases, and satellite imagery, to identify KERs, species distributions, and potential environmental sensitivities. This involved identifying the proximity of the Proposed Development to any statutory or non-statutory designated sites for nature conservation with terrestrial species qualifying interests.

10.2.4.1 KEY SOURCES

The following sources were consulted:

- National Biodiversity Data Centre. Biodiversity Maps; accessed at https://maps.biodiversityireland.ie/Map [accessed December 2024].
- National Parks and Wildlife Service. NPWS Map Viewer; accessed at https://www.npws.ie/maps-and-data [accessed December 2024].
- Article 17 Reports (NPWS, 2019)
    - GIS spatial data for Article 17 Reports- Article 17 GIS and Metadata Downloads | National Parks & Wildlife Service (npws.ie)
- Maps from Environmental Protection Agency, Ireland – https://gis.epa.ie/EPAMaps/
- National Parks and Wildlife Service (NPWS) (2024) Protected Sites Data on
    - European Sites, available at: https://www.npws.ie/protected-sites/sac and https://www.npws.ie/protected-sites/spa. Downloaded in 2024.
    - Natural Heritage Areas (NHAs) and/ proposed Natural Heritage Areas (pNHAs), available at https://www.npws.ie/protected-sites/nha. Department of Housing, Local Government and Heritage. Downloaded in 2024.
- Mott MacDonald (2022) N25 Rosslare Europort Access Road, Planning and Environmental Considerations Report (PECR), Wexford County Council (WCC, Applicant), submitted to WCC Planning Board.
- APEM (2022) Extension to Existing Berth 3 and New Two-Tier Linkspan at Rosslare Europort – Appropriate Assessment (AA) Screening Report, Iarnród Éireann (Applicant), submitted to Foreshore Unit, Department of Housing, Local Government and Heritage (DHLGH).

10.2.4.2 WILDLIFE RECORDS

National Biodiversity Data Centre

The National Biodiversity Data Centre (NBDC) is an Irish organisation responsible for collecting, managing, analysing, and sharing all validated biodiversity data available through Biodiversity Maps, an online data portal. The NBDC makes all validated biodiversity data available through Biodiversity Maps, an online data portal.

For this assessment, the NBDC search tool was used to identify all records within a 2km^2 grid containing the Proposed Development to provide a dataset that aligns with the likely ZoI of the Proposed Development, ensuring that locally relevant biodiversity information is captured.

An extended Study Area (5km) was employed to account for the wide-ranging movements of otters (*Lutra lutra*). Coastal otters, in particular, exhibit a broader niche than their freshwater counterparts, feeding on a wide range of intertidal prey (Reid *et al.*, 2013). Coastal otters tend to feed close to the shore (approximately 80 - 100m), typically diving to depths of up to 10 meters (Kruk and Moorhouse,1991; Liles, 2009). This coastal behaviour implies that otters would follow the shoreline rather than crossing directly through the open marine environment.

Otters are highly territorial animals, with home ranges that vary significantly depending on food availability and habitat type. Studies indicate that the territories of Eurasian otters can extend for several kilometres, with the specific range size being strongly influenced by local environmental conditions. In coastal areas where food resources, like fish and crustaceans, are more abundant, otters may occupy smaller territories, sometimes as short as 2 km. Conversely, in upland or less productive freshwater systems, otters may need to cover far larger distances to access sufficient food, resulting in territories that span over 20 km (Kruuk, 2006; O'Sullivan, 1993).

To reflect the typical range of otter movements within coastal and estuarine environments, the Study Area was extended to include records from NBDC within 5km of the Proposed Development (see grids in red outline below in Figure 10.3). These were searched for otter records, ensuring comprehensive coverage of otter activity in both coastal and freshwater environments.

The NBDC database was searched for all other relevant terrestrial species records above within the 2 km^2 grid T11G covering the spatial footprint of the Proposed Development Boundary.

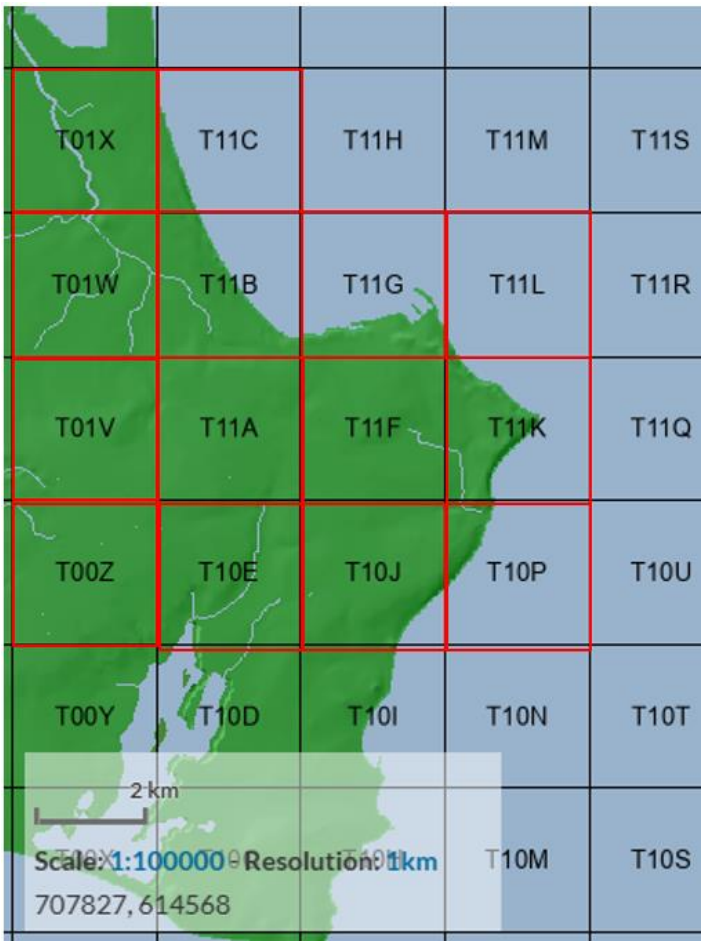

Figure 10.3: NBDC desk study search – 2km2 grids with red outline

Article 17 (NPWS, 2019a)

Article 17 data was also reviewed within a 5 km radius for otter.

10.2.4.3 DESIGNATED NATURE CONSERVATION RECORDS

NPWS Map Viewer was used to identify internationally significant sites, such as Special Areas of Conservation (SACs), candidate Special Areas of Conservation (cSACs), Special Protection Areas (SPAs), and candidate Special Protection Areas (cSPAs). These sites together constitute *European Sites* and are afforded the same level of protection under the Habitats Directive and Birds Directive.

Natural Heritage Areas (NHAs) are designated under the Wildlife Act 1976, as amended, to protect habitats, species, or geological features of national significance. Many NHAs in Ireland have boundaries that overlap with European sites. While some NHAs remain as proposed designations (referred to as 'proposed NHAs' or pNHAs) and are not yet fully enacted under this legislation, they are afforded interim protection through planning regulations, which require planning authorities to recognise their ecological value.

10.2.5 ECOLOGICAL SURVEYS

Field survey methodology is detailed in EIAR Technical Appendix 10: Terrestrial Ecology of Volume III of this EIAR and is summarised below.

10.2.5.1 OVERVIEW OF ECOLOGICAL SURVEYS

Field surveys were undertaken by Inis Ecology LTD. over the course of 2023 and in September 2025 by GDG, following best practice methods as outlined below for each relevant receptor. The surveys were designed in conjunction with best practice methods as outlined below for each relevant receptor. Surveys were conducted using a combination of transect walks and remote sensing techniques to ensure comprehensive coverage and accurate data collection. The methodology was tailored to local ecological conditions, with specific protocols established for different habitat types and species groups, ensuring that all relevant environmental factors were thoroughly evaluated.

Seasonality of surveys can significantly influence the detection of certain species. Many species exhibit seasonal patterns, with specific life stages or behaviours occurring at different times of the year. An extended survey timeframe with multiple site visits was therefore implemented throughout 2023. This approach allowed for data collection during the optimum windows for various species, ensuring comprehensive coverage across taxa, including flowering plants and wildlife.

The surveys collectively provide baseline information on the existing ecology of the Study Area. The surveys aimed to detect the presence, or likely presence, of rare/threatened, protected or invasive species, and to record the habitats present within the Survey Area.

Table 10.1 provides a summary of the field surveys undertaken in 2023 and 2025 included for completeness to ensure the ecological baseline reflects current site conditions.

Table 10.1: Summary of field surveys conducted in 2023

Survey	Date	Survey Area / Guidance & additional comments
Habitat Walkover Survey		
Features Surveyed • Habitats as per Fossitt's (2000) • Annex I Habitats • Flora Species • Invasive Non-native Species	19/06/2023, 04/09/2025	Survey was undertaken within the Proposed Development Boundary. Habitat assessment categories used were consistent with those outlined in the Heritage Council's *Guide to Habitats in Ireland* (Fossitt, 2000) and habitats were classified to Level 3, with the Fossitt category codes given in parenthesis. Mapping followed the guideline Best Practice Guidance for Habitat Survey and Mapping (Smith *et al*., 2011) and maps were created using QGIS 3.22.5. An assessment of the Proposed Development for Annex I habitats designated under the EU Habitats Directive was conducted by first reviewing mapped data to identify potential Annex I habitats to determine their presence/absence in consultation with the habitat descriptions provided in the most recent Article 17 Reports (NPWS, 2019), along with the Interpretation Manual of European Union Habitats (EC, 2013). Following this, field surveys were carried out to confirm the presence or absence of these habitats using established field habitat survey methods. Plant nomenclature for vascular plants followed 'New Flora of the British Isles' (Stace, 2010), while mosses and liverworts nomenclature followed 'Mosses and Liverworts of Britain and Ireland - a field guide' (British Bryological Society, 2010). A high-level invasive non-native species (INNS) search was conducted within the Proposed Development Boundary with a focus on those listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2011), as amended, listed in NRA's (2010) Guidelines for the Management of Noxious Weeds and Non- Native Invasive Plant Species on National Roads. Other species which can negatively impact biodiversity were also recorded and their distributions sketched

Survey	Date	Survey Area / Guidance & additional comments
		on field maps. Target notes were taken which detailed height, density, and any signs of previous management if invasive species were observed. The locations of all non-native / invasive species (if any) were also recorded via the use of a handheld GPS and photographs taken to visually catalogue the record. **Note:** Updated walkover survey undertaken across the Proposed Development Boundary to confirm the validity of 2023 baseline data and ensure up-to-date coverage for terrestrial habitats, flora, invasive species, and potential signs of protected species. Included drone habitat mapping, tree and hedgerow condition survey, and re-check of artificial reptile refugia. Findings are reported in the updated Terrestrial Technical Appendix (2025).
Mammal (non-volant) Survey		
Features Surveyed **Mammal Walkover Survey** Including, but not limited to, badgers, stoat, pine marten, hedgehog, Irish hare	30/01/2023, 08/02/2023, 09/02/2023, 03/03/2023. 04/09/2025	Within Proposed Development Boundary plus 50m survey buffer. Survey buffer also re-covered in 2025 Mammal Walkover Survey. Surveys included amphibian habitat suitability assessments in both 2023 and 2025.. In 2023, four (4) camera traps were deployed in conjunction with the mammal walkover surveys to further inform on the potential use of the Proposed Development Boundary by non-volant mammal species. Camera trap placement was informed by the mammal walkover surveys. The locations of the four camera traps are presented in EIAR Technical Appendix 10 (Appendix C, Figure C.1). Camera traps were not repeated in 2025 as the updated walkover survey did not identify any holts, setts, or other features requiring further targeted monitoring.
Features Surveyed **Otter**	12/09/2023 04/09/2025	Surveys covered the Proposed Development Boundary plus a 300m survey buffer along the coastline either side of the Site (extended 300m along the western boundary of the Proposed Development Boundary and continued 300m east towards the existing port. The same buffer extent was re-surveyed in 2025. While the Proposed Development Boundary had been refined since the 2023

Survey	Date	Survey Area / Guidance & additional comments
		surveys, the additional area covered (~200 m) ensured full coverage in line with standard otter survey buffers for Ireland (NRA, 2009).
Herpetofauna		
Features Surveyed **Amphibians**	04/04/2023, 19/06/2023, 28/08/2023. 04/09/2025	Entirety of the Proposed Development Boundary and all waterbodies within the vicinity of the Proposed Development Boundary. Amphibian habitat suitability surveys were conducted during the mammal walkover survey in both 2023 and 2025, in line with NRA *Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes* (NRA, 2009). Evidence of amphibians searched for included habitat suitability assessment (potential spawning habitat to support breeding common frog and smooth newt), and live sightings/spawn. During the mammal walkover surveys conducted on 30th January 2023, 8th February 2023, 9th February 2023, and 3rd March 2023, amphibian habitat suitability assessments were also carried out. These assessments determined that no habitats suitable/typical for breeding amphibians were identified within the Proposed Development Boundary. The updated walkover survey in September 2025 re-confirmed this finding, with no suitable breeding habitats recorded and no evidence of amphibians observed. As a result, no further habitat suitability assessments were conducted. Spawning habitats for breeding common frogs in Ireland typically include shallow, still, or slow-moving freshwater bodies with low levels of disturbance. Examples include ponds, ditches, flooded grasslands, and wetlands. These habitats provide suitable conditions for egg laying, with submerged vegetation often used to attach spawn. For smooth newts, breeding habitats include small, unpolluted water bodies such as ponds, lakes, ditches, or slow-moving streams. Key characteristics include areas with abundant aquatic vegetation, which is essential for egg-laying as females wrap each egg individually in a folded leaf. Smooth newts

Survey	Date	Survey Area / Guidance & additional comments
		also require nearby terrestrial habitats such as grasslands, woodlands, or scrub for foraging and shelter outside the breeding season. Both species favour water bodies that are free from predatory fish and have minimal human disturbance, as these factors significantly affect breeding success. These surveys relied on direct visual observations of live sightings, as no suitable habitat for these species was identified within the surveyed area.
Features Surveyed **Reptiles** (Reptile Walkover Survey, deployment of artificial refugia for direct observational surveys)	04/04/2023, 18/04/2023, 19/06/2023, 28/08/2023. 04/09/2025	Surveys were undertaken within the Proposed Development Boundary for walkover survey in line with NRA *Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes* (NRA, 2009). In 2023, artificial refugia were deployed at 5 identified locations of potential suitability within the Proposed Development Boundary and monitored through direct observational surveys. During each survey, a combined approach was employed, where suitable basking spots were carefully observed while moving between the artificial refugia. This technique allowed for a thorough examination of both the natural basking areas and the deployed refuges, enhancing the likelihood of detecting reptile activity. To ensure comprehensive data collection and confirm species absence, surveys were conducted four (4) times during appropriate weather conditions over the lizards' active season to confirm presence/absence. In September 2025, a follow-up reptile walkover survey was undertaken across the Proposed Development Boundary. Artificial refugia were not deployed during this top-up survey; instead, effort focused on a systematic search of suitable natural basking sites and terrestrial habitats to validate and update the earlier survey effort. For detailed methodology followed during the herpetofauna surveys refer to EIAR Technical Appendix 10

Survey	Date	Survey Area / Guidance & additional comments
Volant Mammals - Bats		
Features Surveyed **Bats: Preliminary Roost Assessment (PRA)**	04/04/2023 04/09/2025	Surveys were undertaken across the Proposed Development Boundary and the immediate surrounds as detailed in the EIAR Technical Appendix 10: – Terrestrial Ecology Technical Report (Appendix C, Figure C.3). The PRA focussed on identifying built or natural features within the footprint of the Proposed Development Boundary. Daytime visual assessments were conducted to identify potential bat roosting sites within the Proposed Development Boundary, following best practice guidelines (Collins (ed.), 2016). Trees and structures were assessed and categorised based on their roosting potential (Negligible, Low, Moderate, or High), which informed the requirement of any follow-up emergence and re-entry surveys, as per the Collins (2016) methodology. The PRA was first completed in April 2023 and was repeated in September 2025 to update and validate the baseline. The 2023 survey adhered to the recognised criteria outlined in Collins (ed.) (2016), For the 2025 PRA, the updated 4th edition of the Bat Conservation Trust guidelines (Collins, 2023) was consulted to ensure alignment with current best practice.
Features Surveyed **Bats: Bat Emergence Survey**	28/08/23, 29/08/23 and 30/08/23	Within the Proposed Development Boundary. Following the PRA survey, any trees or structures deemed suitable for bat roosting, as per Collins (ed.) (2016), were subjected to bat emergence surveys, as detailed in EIAR Technical Appendix 10.1. In accordance with Collins (ed.) (2016), for buildings or structures where the presence of bats cannot be ruled out or evidence of bats is identified during a PRA, those with 'Low' suitability for bats require the ecologist to use professional judgement to determine if further surveys, such as bat emergence surveys, are necessary. For trees, further surveys are only conducted if they are assessed as having

Survey	Date	Survey Area / Guidance & additional comments
		'Moderate' or higher suitability, or if evidence of bats is found during the PRA, however, if no or low suitability Potential Roost Features (PRFs) for bats are found then further surveys are not required (Collins (ed.) 2016). Of the thirty (30) structures that underwent a PRA survey, twenty-one (21) were assessed as having 'Low' roosting suitability and were subjected to bat emergence surveys. The three (3) trees assessed were classified as having 'Negligible' bat roosting suitability; therefore, no bat emergence surveys were required for these features. Buildings BL3, BL7, BL8 and BL9 were surveyed on 28th August 2023, buildings BL11, BL12, BL13, BL14, BL15, BL16, BL17, BL27, BL28 and BL30 were surveyed on 29/08/2023 and buildings BL18, BL19, BL20, BL21, BL22, BL23 and BL24 were surveyed on 30th August 2023. Dusk emergence surveys were carried out 15 minutes before sunset and continued until 1.5 – 2 hours after sunset, as per Best Practice Guidance (Collins, 2016) on 28th August 2023, 29th August 2023 and 30th August 2023. Bat activity surveys were conducted with handheld bat detectors. The Anabat Walkabout and BatBox Duet batloggers were used by surveyors to identify bat species, based on their call frequencies. General bat activity directly around the building, such as feeding and commuting, was also recorded. Surveyors undertook their work individually or in pairs. The PRA was repeated in September 2025 in line with Collins (2023). No trees or structures within the updated Proposed Development Boundary or immediate surrounds were identified as requiring follow-up emergence surveys.
Features Surveyed **Bats: Bat Activity Transect Surveys**	17/04/2023, 19/06/2023, 12/09/2023.	Within the Proposed Development Boundary. Three (3) walked Bat Activity (Transect) Surveys were conducted in 2023 (17th April 2023, 19th June 2023, 12th September 2023)) to assess bat activity within the Proposed Development Boundary (see

Survey	Date	Survey Area / Guidance & additional comments
		Appendix 10), focusing on identifying flight lines and estimating bat numbers. Following a thorough assessment of the characteristics of the Proposed Development Boundary, a bat transect route was designed to encompass all habitat types present within the area (see Figure 1.3 EIAR Technical Appendix 10; Appendix C, Figure C.5). These surveys were performed at dusk, starting at sunset and continuing for 1.5 to 2 hours afterward, using handheld bat detectors (Anabat Walkabout and BatBox Duet models), in line with best practice guidance from Collins (2016). Upon hearing a bat, surveyors recorded the bat's location, the direction and height of the bat's flight and any notable behaviour (e.g. foraging or commuting) where possible. In addition, direct observations of how bats interact with and use the landscape were also documented (number of bats, flightlines and direction), providing further insight into their behaviour within the Survey Area. Bat species were identified based on their call frequencies using Anabat Walkabout and BatBox Duet detectors. During the surveys, the number of bats, species, flight lines, and flight directions were recorded in accordance with the established methodology. No further transect surveys were undertaken in 2025, as the updated PRA and survey review confirmed that the 2023 transect effort remained sufficient to establish baseline conditions.
Features Surveyed **Bats: Bat Activity Static Detector Surveys**	**Spring (14 nights)** 04/04/2023 to 17/04/2023 **Summer (14 nights)** 05/06/2023 to 18/07/2023	Within the Proposed Development Boundary for a period of 14 nights during Spring and Summer, and 11 nights during Autumn. Three (3) Bat Activity (Static Detector) Surveys were carried out using six (6) ground level static detectors that were deployed in the Spring, Summer and Autumn seasons of 2023 within the Proposed Development Boundary (refer to EIAR Technical Appendix 10 for the locations of the static detectors). Data was obtained for a minimum of 10 nights per season, as per Collins (2016) guidance.

<table>
<tr><th>Survey</th><th>Date</th><th>Survey Area / Guidance & additional comments</th></tr>
<tr><td></td><td>Autumn (11 nights)
15/09/2023 to 25/09/2023</td><td>
The Anabat Express passive bat detector was used to collect data for the ground level static detector surveys. Sonograms from Anabat Express detectors were obtained in the ‘zero-crossing’ format and viewed using AnalookW software (Corben, 2014). Species were identified with reference to British Bat Calls: A Guide to Species Identification (Russ, 2012) based primarily on frequency and call shape, but also with reference to call slope for Myotis spp. Social calls were classified as unidentified bats unless they closely matched the examples provided in Russ (2012).
Bat activity recorded at each static detector location was categorised by the number of passes for each species. Species activity level was categorised as Negligible, Low, Moderate or High depending on the number of bat passes recorded (Mathews et al., 2016). In accordance with Collins (ed.) (2016), activity levels for bats are classified into categories based on the number of bat passes recorded per night, with thresholds that generally correspond to Negligible (very few or no bat passes, indicating minimal bat presence), Low (occasional bat passes, indicating limited use by bats), Moderate (frequent bat passes, suggesting regular but not intensive use by bats), and High (numerous bat passes, indicating high levels of bat activity in the area) activity levels. While the exact threshold numbers for each category are not universally defined in the guidelines, they typically relate to the relative frequency of bat passes detected on-site during surveys.
In the table below, the categorisation of bat activity in relation to number of bat passes for this survey are outlined (Mathews, et al., 2016).
<table>
<tr><th>Category</th><th>Number of Bat Passes</th></tr>
<tr><td>Negligible</td><td><9</td></tr>
<tr><td>Low</td><td>10-49</td></tr>
<tr><td>Moderate</td><td>50-99</td></tr>
</table>
</td></tr>
</table>

Survey	Date	Survey Area / Guidance & additional comments
		<table><tr><td>High</td><td>>100</td></tr></table> It is noted that activity levels can only be compared within a species and not between species, due to differences in the detection distances for each species and their flight characteristics (Marchant, 2020). The static detectors were positioned at a specific height, which may have favoured the detection of lower-flying species over higher-flying species, potentially making it easier to record activity for species with flight patterns closer to the detector. No static detector surveys were undertaken in 2025, as the updated PRA and survey review confirmed that the 2023 static detector dataset remained sufficient to establish baseline conditions.

10.2.5.2 SEASONALITY OF SURVEYS

Seasonality plays a crucial role in ecological surveys, as the timing of surveys can significantly influence the detection of certain species. Many species exhibit seasonal patterns, with specific life stages or behaviours occurring at different times of the year. Consequently, it is not feasible to capture data for all organisms during a single survey visit. To address this challenge, an extended survey timeframe with multiple site visits was implemented throughout the year 2023. This approach allowed for data collection during the optimum windows for various species, ensuring comprehensive coverage across taxa, including flowering plants and wildlife.

The 2025 survey was conducted in September to capture late-season activity for flora and fauna, allowing assessment of residual vegetation communities following the main growing season, as well as potential use of habitats by protected species such as bats and reptiles before the onset of winter dormancy.

10.2.6 METHODOLOGY FOR ASSESSMENT OF EFFECTS

This section outlines the approach taken to assess the potential impacts of the Proposed Development on Terrestrial Ecology receptors.

10.2.6.1 ECOLOGICAL EVALUATION

In line with the CIEEM (2024) guidelines, ecological features within the ZoI (refer to section 10.2.3.2) of the Proposed Development that are considered to be of sufficient ecological importance and are likely to be significantly impacted have been identified as **KERs**. The baseline information obtained has been used to provide an understanding of the value of each receptor relevant to this topic (the 'baseline scenario'), and its sensitivity to the potential impacts associated with the construction phase and operation phase of the Proposed Development.

Beneficial effects do not require mitigation measures as their effects are positive, although enhancement measures may be considered where opportunities exist to further improve ecological outcomes.

The assessment methodology focuses on evaluating the significance of potential impacts on identified receptors by considering their ecological importance (at an appropriate geographic scale), their legal protection and conservation status, their sensitivity to change, and the predicted magnitude, duration, and reversibility of impacts.

The value of the site to each receptor is assessed using a combination of survey data, desk study information, expert judgment, and contextual knowledge of the site and the surrounding area, alongside consideration of conservation importance and relevant legal protection.

10.2.6.2 ECOLOGICAL IMPACT ASSESSMENT

The following approach was taken, as recommended by CIEEM (2024) guidelines for ecological impact assessment in the UK and Ireland:

- Describing the Baseline: Establishes current conditions within the study area to serve as a comparison point for assessing potential changes (Section 10.3)

- Identifying Receptors: Determines specific flora, terrestrial fauna and habitats that could be affected by the Proposed Development (section 10.3)
- Assessing Conservation Importance: Evaluates the ecological value of the receptors within the Study Area that may be impacted (Section 10.4)
- Characterising Impacts and their effects: Considers the effects of construction, and operations along with the nature of these impacts (Section 10.4)
- Determining Significance: Utilises expert judgment to evaluate the significance of the identified impacts (Section 10.4.8)
- Mitigation Measures: Identifies potential mitigation strategies to reduce significant adverse effects (Section 10.5)
- Residual Impact: Assesses remaining impacts after applying mitigation measures. Identifies appropriate compensation measures to offset significant residual effects. Identifies opportunities for ecological enhancement (Section 10.6).
- Cumulative and Transboundary Effects: Examines the broader effects of the Proposed Development, including those in combination with other projects and across borders (Section 10.6).

The assessment of potential ecological impacts is conducted using the Source-Pathway-Receptor (S-P-R) model (OPR, 2021), which serves as a framework for understanding how potential pathways of impacts may occur between the Proposed Development and terrestrial ecological receptors. If one of these elements is absent or removed—for instance, if the pathway is interrupted or if there is no relevant receptor within the Zone of Influence—then it can be concluded that a significant ecological impact is unlikely. This approach ensures that only plausible and relevant impacts are considered in the assessment, streamlining the focus on genuine ecological risks. The assessment encompasses all habitats, species and ecological resources that could potentially be affected by the Proposed Development.

Characterising and Describing the Impacts

1. **Nature of the Effect**: Whether the impact is expected to be positive, neutral, or negative. This helps to identify whether the Proposed Development may improve, have no impact on, or cause harm to ecological features.
2. **Significance of the Effect**: The importance of the impact on the environment, based on the value of the affected ecological receptor and the scale of the change. This assesses whether the impact is significant enough to influence decision-making.
3. **Extent and Context**: The geographical scope of the impact, considering how far-reaching it is (e.g., local, regional, national) and whether the receptor is rare, sensitive, or under threat within the specific context.

4. **Probability**: The likelihood of the effect occurring, considering factors such as the type of development activity and its interaction with ecological receptors. This helps assess whether the impact is probable or uncertain.
5. **Duration and Frequency**: How long the impact will last (e.g., short-term, medium-term, or long-term) and how often the impact is likely to occur (e.g., continuous or intermittent). For example, construction-related impacts may be temporary, while operational impacts could persist over the project's lifespan.
6. **Reversibility:** An irreversible effect is one from which recovery is not possible within a reasonable timescale or there is no reasonable chance of action being taken to reverse it. A reversible effect is one from which spontaneous recovery is possible or which may be counteracted by mitigation.
7. **Cumulative Effects**: This considers the combined impact of the Proposed Development when assessed alongside other existing or planned projects. Individually insignificant impacts may become significant when combined over time or across a wider area. This is crucial for assessing long-term, widespread ecological changes.

By considering all of these parameters, the potential impacts of the Proposed Development are evaluated comprehensively, ensuring that all relevant ecological aspects are addressed systematically in line with best practice standards.

Impact / Effect Significance

Significant effects are likely to arise when impacts affect:

- The **structure and function** (or integrity) of specific sites, habitats, or ecosystems; or
- The conservation **status** of habitats and species, which encompasses parameters such as range, structure and function, and future prospects, as well as changes in their extent abundance, or distribution.

Ecological integrity and conservation priorities are at the forefront of the assessment, with emphasis placed on understanding how the Proposed Development could alter key environmental features.

The nature of these impacts can vary in terms of their scale, extent, duration, timing, and frequency. These factors are combined to assess the overall magnitude of impact on both the 'conservation status' of the valued receptors and the 'integrity' of the habitats supporting them:

- **Integrity** refers to the coherence of an ecological structure and the functioning of a site or habitat that allows it to support its associated plant and animal communities for which it has been valued.
- **Conservation** status reflects the ability of a habitat, plant or animal community, or population to maintain its size/extent, distribution, and overall viability.

Conservation status is therefore largely determined by the extent to which integrity is maintained. An impact on the integrity of an ecological site or ecosystem is considered significant if it drives the ecosystem away from a favourable status by altering or removing the key processes that sustain its

habitats or species. This includes impacts that change the characteristics, distribution, structure, or function of the habitats involved and those that reduce the population size or long-term survival of species within the ecosystem. It follows that habitats may or may not be valued ecological receptors in their own right. Wherever possible, the magnitude of the impact is quantified. Professional judgment is then applied to categorise the effects on receptors.

The **significance of effect** refers to the extent to which an impact on an ecological receptor is considered important or meaningful in terms of its conservation status, ecological function, or value.

Under the CIEEM (2024) methodology, the significance of an impact on an ecological receptor is evaluated based on the geographical scale at which the receptor's integrity or conservation status is impacted, such as local, county, regional, national, or international levels. In some cases, an impact may not be significant at the scale at which the receptor is valued but could still be significant at a lower scale. For instance, while a particular effect might not influence the global conservation status of a species of international importance, it could still have a localised effect on that species. In these situations, the impact would be deemed significant at the local scale, reflecting the receptor's importance within that specific context, rather than on an international scale.

In the present assessment of terrestrial ecology, this approach has been taken, with the impacts on biodiversity by the Proposed Development assessed using the binary classification of **"significant"** or **"not significant."** For the purposes of this EIAR, a **significant effect** is defined as an effect that, either on its own or in combination with other plans or projects, is likely to affect the integrity of an ecological receptor (e.g. site, habitat, species population) at the geographic scale at which it is valued, such that conservation objectives, structure and function, or population viability may be compromised. A **not significant effect** is defined as an effect that is minor, temporary, reversible, or otherwise sufficiently mitigated such that it does not affect the integrity or conservation status of the receptor at the relevant geographic scale.

By simplifying the assessment, this approach allows for a clear determination of the potential ecological impacts, with significant effects identified where mitigation may be required, and not significant effects deemed minor, temporary, or adequately mitigated. This helps streamline the decision-making process, particularly where impacts are either obvious in scale or where integrated mitigations has already been established to reduce impacts below the threshold of significance.

10.2.6.3 MITIGATION MEASURES

Where significant impacts have been identified, the mitigation hierarchy has been taken into account, as suggested in the 2024 CIEEM Guidelines, which sets out a sequential approach of avoidance of impacts where possible, application of mitigation measures to minimise unavoidable impacts where not and then compensation for any remaining impacts. All proposed mitigation measures follow industry best practice. Those for protected species follow the prescribed regulatory protocols. Once avoidance and mitigation measures have been applied, along with any necessary compensation measures, and opportunities for enhancement incorporated, residual impacts have then been identified.

As discussed in Chapter 1: Introduction and Methodology, three types of mitigation measures are considered in this chapter.

- Primary mitigation
- Secondary mitigation
- Tertiary mitigation

10.2.6.4 DEFINING RESIDUAL IMPACT

Following the application of mitigation measures, impacts to each ecological feature are reassessed, and any residual impacts are reported.

Residual impacts are those impacts that remain after all mitigation measures have been implemented. These impacts reflect the lasting effects of the Proposed Development on the environment, despite efforts to avoid, minimise, or mitigate them. Residual impacts are evaluated to determine their significance, considering the effectiveness of mitigation strategies, and are a key factor in understanding the overall environmental implications of the project.

For the purposes of this assessment:

- A level of residual effect of moderate or more will be considered a 'significant' effect in EIA terms; and
- a level of residual effect of minor or less will be considered 'not significant' in EIA terms.

10.2.6.5 CUMULATIVE EFFECTS

Cumulative effects refer to the combined impact of multiple activities or developments on the environment, which may arise from individual actions over time or from different sources acting together. These effects can result from the accumulation of minor impacts, which may not be significant on their own but, when combined, lead to more substantial and long-lasting changes to ecosystems, habitats, species, or other environmental receptors. Cumulative effects consider both direct and indirect impacts and often involve interactions across spatial and temporal scales.

When considering cumulative effects, the following development types are typically included:

1. **Existing Developments**: Projects that are already built and operational
2. **Planned Developments**: Projects that have been approved or are in the planning process but not yet constructed
3. **Proposed Developments**: Developments for which applications have been submitted or are under consideration
4. **Ongoing Developments**: Projects currently under construction or undergoing phased implementation

These types of developments are assessed together to understand their combined impact on the environment.

10.2.7 DIFFICULTIES AND UNCERTAINTIES

The freely available desk study results should not be considered definitive datasets for the area under investigation. These results often represent a snapshot of existing records, which can be incomplete or outdated. An absence of desk study data does not necessarily imply that the site is devoid of significant flora or fauna, either from a historical or current perspective. Ecological conditions may have changed, and certain species or habitats might be under-recorded or overlooked in previous surveys. Desk study data relies on records submitted by individuals and organisations, so an absence of records for certain habitats or species does not necessarily indicate that they are absent from the study area. Conversely, the presence of records does not guarantee that these habitats or species still occur within the area or are relevant to the current development context. Biological records vary in accuracy and completeness.

It is noted that location information for records of a number of species is confidential and not provided on publicly available databases such as the National Biodiversity Data Centre (NBDC). The exact locations of otter holts and couches, as well as badger setts, are often withheld in publicly available reports and databases such as the NBDC to protect these animals from illegal persecution or disturbance.

No limitations were experienced accessing the Proposed Development Boundary during the field surveys.

Habitat mapping was informed by high-resolution drone imagery collected during the September 2025 walkover survey, which provided accurate mapping of habitat boundaries across the Proposed Development Boundary. Where habitat map boundaries align with visible boundaries on recent aerial photographs, the resolution reflects the precision of the drone survey outputs, supplemented by ground-truthing during fieldwork. Any habitat area measurements provided are therefore robust and suitable for assessment purposes, though they may be subject to minor adjustment at detailed design stage.

Assessment is limited by the temporal and spatial coverage of surveys, which were conducted in 2023 and September 2025.

10.3 BASELINE: TERRESTRIAL ECOLOGY IN RECEIVING ENVIRONMENT

10.3.1 GENERAL SITE DESCRIPTION AND CONTEXT

The receiving environment for the Proposed Development consists of industrial infrastructure, marine and natural habitats. Situated on Ireland's southeastern coast in County Wexford, Rosslare Harbour is a major commercial port with connections to Ireland, the UK, and mainland Europe. This area is developed, with existing port facilities including ferry berths, cargo handling areas, and a small boat harbour, all protected by substantial rock armour revetment and breakwater armour units designed to shield the harbour from coastal conditions. Infrastructure improvements nearby, such as the new Rosslare Europort Access Road (REAR), aim to enhance transport connectivity and traffic flow. The N25 and N11 road networks provide access to the port, and the Irish Rail line runs parallel to the site, reinforcing its industrial character.

The surrounding landscape is largely industrial, with reduced green space and natural features. The coastline, close to the Proposed Development is artificial, with hardstanding, paved areas, and structures linked to port operations. The small strip of scrub and grassland adjacent to the port is also influenced by human activity. Approximately 1.8 hectares of habitat will be removed, primarily consisting of artificial surfaces and scrub.

The port itself lacks major ecological corridors like rivers, treelines, or forests; instead, its primary connection is through the marine environment. More diverse habitats, such as dunes, estuaries, and wetlands, exist in the wider landscape around Wexford Harbour and the Slaney River Valley, offering richer foraging and shelter for wildlife.

Rosslare Harbour and the surrounding landscape are influenced by man-made infrastructure, with much of the nearby coastline shaped by industrial and port facilities that limit natural habitats. Within the Proposed Development Boundary and its surroundings, the coastline is dominated by artificial structures and other unnatural features, reflecting long-standing anthropogenic disturbances that have been in place for over 100 years.

10.3.2 EUROPEAN DESIGNATED SITES: SPECIAL AREAS OF CONSERVATION

The Proposed Development Boundary does not directly overlap with the boundary of any Special Area of Conservation (SAC). There are ten (10) SACs within the vicinity of the Proposed Development (Figure 10.3). However, only those with a hydrological or ecological connection to the Proposed Development are considered to have a Source-Pathway-Receptor connection to the Proposed Development. The Proposed Development Boundary is potentially hydrologically connected to these European sites via the River Slaney estuary and the Irish and Celtic Sea.

The closest designated SAC is Carnsore Point SAC, located approximately 1.4 km southeast of the Proposed Development via the marine environment (see Table 10.2).

The terrestrial component of the Proposed Development is not connected to any European sites outside of the Slaney River Valley SAC via groundwater or other ecological pathways.

For the purposes of this assessment these SACs are valued as being of **International Importance**.

Special Protection Areas (SPAs) are not listed here, as ornithological receptors are assessed separately in Chapter 14: Ornithology of this EIAR. The focus of this section is therefore limited to SACs with potential terrestrial or hydrological connections to the Proposed Development.

Table 10.2: SACs in the vicinity of the Proposed Development

Site name & code	Distance to Proposed Development (km)	Relevant Terrestrial QI/SCI of the Natura 2000 site with terrestrial S-P-R connectivity above the high-water mark
Carnsore Point SAC [2269]	1.4km directly	The QIs for Carnsore Point SAC are exclusively marine in nature, with no terrestrial habitats (above high-water mark) or terrestrial species listed within the designation. As a result, there are no potential terrestrial receptors present for potential impacts arising from the Proposed Development, and therefore, no S-P-R link is established.
Long Bank SAC [2161]	1.5km directly	The QIs for Long Bank SAC are exclusively marine in nature, with no terrestrial habitats (above high-water mark) or terrestrial species listed within the designation. As a result, there are no potential terrestrial receptors present for potential impacts arising from the Proposed Development, and therefore, no S-P-R link is established.
Lady's Island Lake SAC [0704]	4.4km directly 11.1km via the marine environment	The QIs for Lady's Island Lake SAC include coastal lagoon habitats, separate from the sea, and species primarily associated with wetland and aquatic environments. This natural separation limits any potential influences on the lagoon's ecological receptors from the Proposed Development via marine pathways. Given that no hydrological impact pathway or source has been identified for terrestrial habitats or species in this context, there is no viable S-P-R link to the QIs.
Slaney River Valley SAC [0781]	5.3km directly 6.6km via the marine environment	Relevant Terrestrial QI habitats of the SAC: • Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] • Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) [91E0] • Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] • Mediterranean salt meadows (*Juncetalia maritimi*) [1410]

Site name & code	Distance to Proposed Development (km)	Relevant Terrestrial QI/SCI of the Natura 2000 site with terrestrial S-P-R connectivity above the high-water mark
		There is **no viable impact pathway** between the Proposed Development and the QI habitats listed above, as there is no hydrological or ecological connection that could result in significant effects. Relevant terrestrial QI species of the SAC: • *Lutra lutra* (Otter) [1355] However, a potential **ecological connection** may exist between QI otter and the Proposed Development via the marine environment, depending on individual movement patterns and habitat use in the vicinity of Rosslare Harbour. This potential pathway is considered in the impact assessment.
Blackwater Bank SAC [2953]	4.9km directly via the marine environment	The QIs for Blackwater Bank SAC are marine in nature, with no terrestrial habitats (above high-water mark) or terrestrial species listed. As there are no potential terrestrial receptors arising from the Proposed Development, **no S-P-R link is established.**
Tacumshin Lake SAC [0709]	8.2km directly 15.9km via the marine environment	Relevant terrestrial QI habitats of the SAC: • Coastal lagoons [1150] • Annual vegetation of drift lines [1210] • Perennial vegetation of stony banks [1220] • Embryonic shifting dunes [2110] • Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] Given the distance between the work area and the SAC there is no viable S-P-R link. Some of the QIs for Tacumshin Lake SAC, are terrestrial based habitats that support plant and animal communities adapted to specific coastal conditions. However, given the distance of 15.9 km via the marine environment between

Site name & code	Distance to Proposed Development (km)	Relevant Terrestrial QI/SCI of the Natura 2000 site with terrestrial S-P-R connectivity above the high-water mark
		the SAC and the Proposed Development, and the lack of a terrestrial impact pathway, there is **no viable S-P-R link applicable to this assessment**.
Raven Point Nature Reserve SAC [0710]	8.9km directly via the marine environment	Relevant terrestrial QI habitats of the SAC: • Annual vegetation of drift lines [1210] • Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] • Embryonic shifting dunes [2110] • Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] • Dunes with *Salix repens* ssp. *argentea* (*Salicion arenariae*) [2170] • Humid dune slacks [2190] Some of the QIs for Raven Point Nature Reserve SAC are coastal and dune habitats that, while influenced by marine processes, are situated at the interface between terrestrial and marine environments. However, given the distance of 8.9 km via the marine environment between the SAC and the Proposed Development, there is a lack of a viable impact pathway. Sediment dispersal modelling results for dredging related activities indicates suspended sediment may travel approximately 2.5km southeast along the shore to Greenore Point and westward by 1.5km to Rosehill Bay Beach, remaining well outside the SAC. This further supports the absence of an impact pathway to the SAC. Therefore, given the distance between the SAC and the Proposed Development, there is **no viable S-P-R link**.

Site name & code	Distance to Proposed Development (km)	Relevant Terrestrial QI/SCI of the Natura 2000 site with terrestrial S-P-R connectivity above the high-water mark
Saltee Islands SAC [0707]	12.7km directly 21km via the marine environment	The terrestrial QI of the Saltee Islands SAC is *Vegetated sea cliffs of the Atlantic and Baltic coasts* (Habitat code 1230). However, as the SAC is over 20km from the Proposed Development and the only potential impact pathway is through the marine environment, **no viable or likely S-P-R link is established** within this assessment.
Ballyteige Burrow SAC	16.9 km directly 27.9 km via the marine environment	Relevant terrestrial QI habitats of the SAC: • Mudflats and sandflats not covered by seawater at low tide [1140] • Annual vegetation of drift lines [1210] • Perennial vegetation of stony banks [1220] • Salicornia and other annuals colonising mud and sand [1310] • Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] • Mediterranean salt meadows (*Juncetalia maritimi*) [1410] • Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*) [1420] • Embryonic shifting dunes [2110] • Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] • Atlantic decalcified fixed dunes (Calluno-Ulicetea) [2150] • Humid dune slacks [2190]

Site name & code	Distance to Proposed Development (km)	Relevant Terrestrial QI/SCI of the Natura 2000 site with terrestrial S-P-R connectivity above the high-water mark
		This SAC supports a wide range of Annex I coastal and dune habitats, all of which are terrestrial or occur at the land–sea interface. However, the site lies c. 27.9 km via the marine environment from the Proposed Development, with no direct hydrological or ecological pathway linking the works footprint to the dune, saltmarsh or lagoon systems of the SAC. Sediment modelling for the Proposed Development has shown dispersal is restricted to within a few kilometres of Rosslare Harbour and does not extend to Ballyteige Burrow. As a result, there is **no viable S-P-R link** between the Proposed Development and the terrestrial QIs of this SAC.
Screen Hills SAC	15.8 km directly	Relevant terrestrial QI habitats of the SAC: • Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110] • European dry heaths [4030] This SAC comprises kettle-hole lakes and heathland habitats situated inland from Rosslare Harbour. The terrestrial QIs are isolated from the Proposed Development by agricultural land and settlement, with no hydrological or ecological pathway connecting them to the works footprint. Given the inland location, separation distance (c. 15.8 km), and absence of a plausible impact mechanism, there is **no viable S-P-R link** between the Proposed Development and the terrestrial QIs of this SAC.

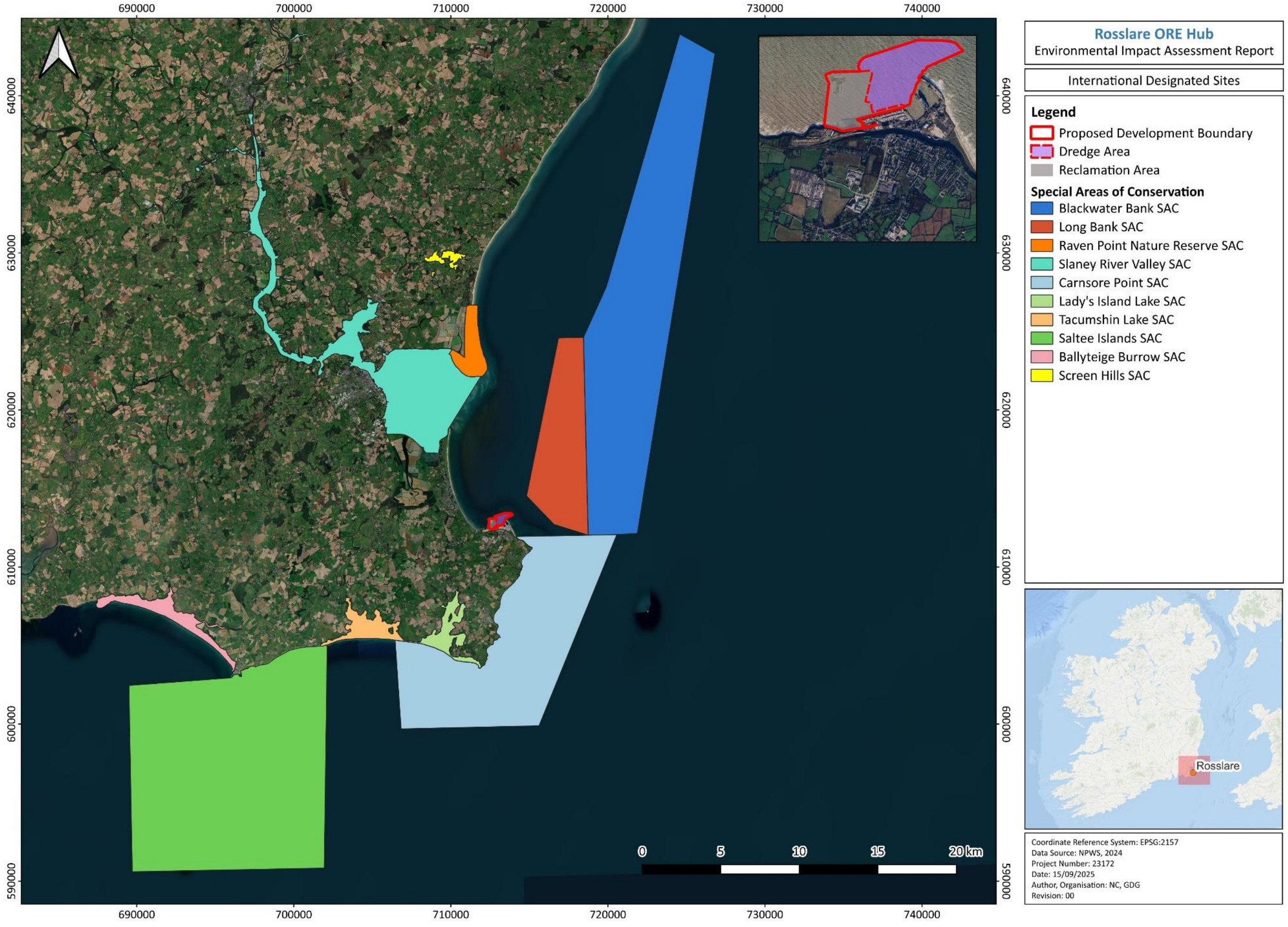

Figure 10.4: European designated sites (i.e. SACs) in the general vicinity of the Proposed Development

10.3.3 NATIONALLY DESIGNATED SITES

No NHAs spatially overlap with the Proposed Development Boundary. A total of three pNHAs are located within the vicinity of the Proposed Development - see and Figure 10.5**.**

Table 10.3: pNHAs in the general vicinity of the Proposed Development Boundary

pNHA name & code	Distance to Proposed Site (km)	Corresponding Natura 2000 Sites
St. Helen's Burrow [0782]	2.3km directly, 2.4km via the marine environment	Carnsore Point SAC [2269] (Partially overlapping)
Wexford Slobs and Harbour [0712]	2.7km directly, 5.5km via the marine environment,	Slaney River Valley SAC [0781] Wexford Harbour and Slobs SPA [4076] Raven Point Nature Reserve SAC [0710] The Raven SPA [4019]
Lady's Island Lake [0704]	4.1 directly, 11.1km via the marine environment	Lady's Island Lake SAC [0704] Lady's Island Lake SPA [4009]
Tacumshin Lake [0709]	8.7 km directly, 16.1km via the marine environment	Tacumshin Lake SAC [0709] Tacumshin Lake SPA [4092]

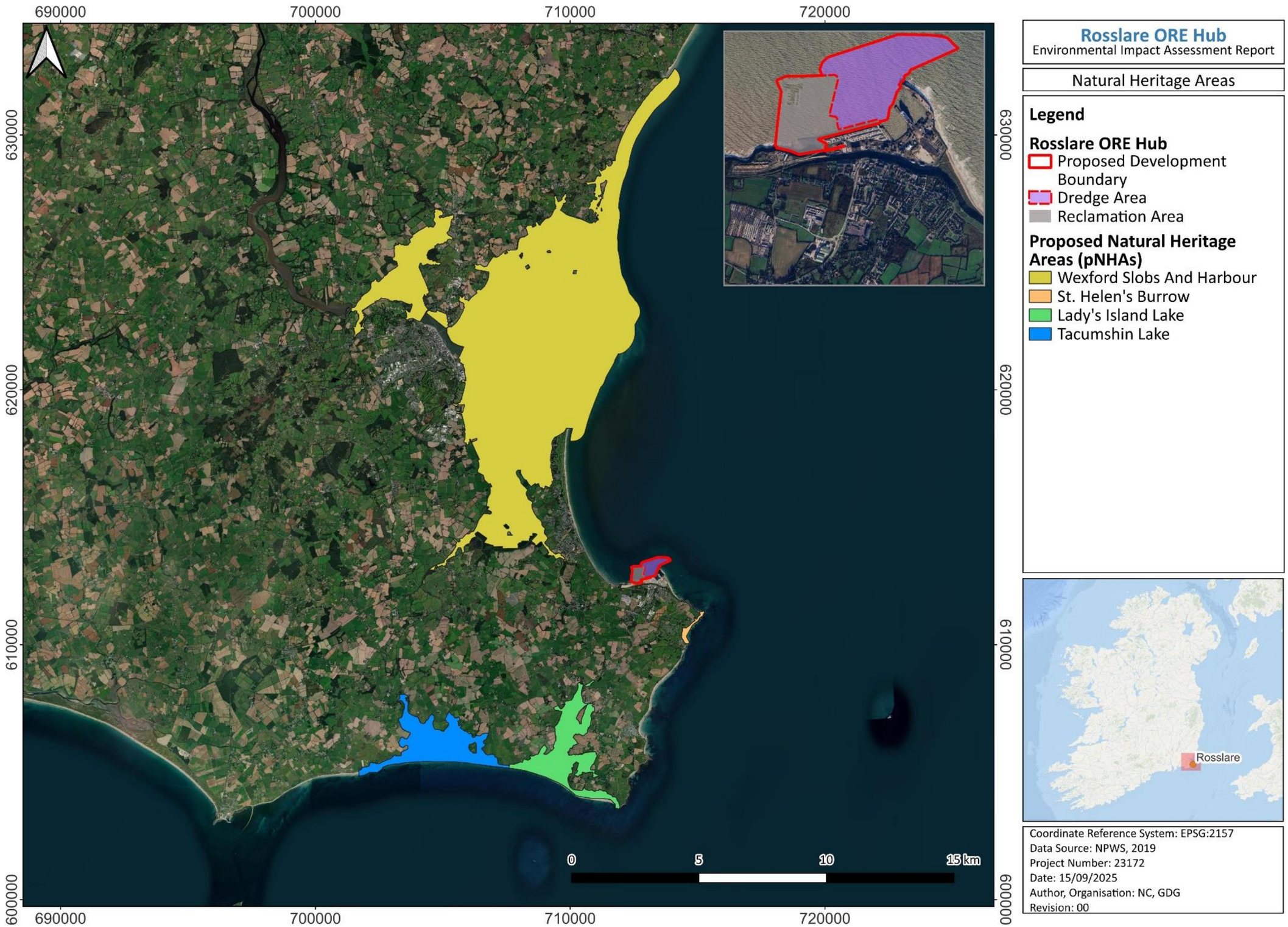

Figure 10.5:Natural Heritage Areas sites within 5km of the Proposed Development

10.3.4 OTHER DESIGNATED SITES

There are no National Parks within proximity or ecologically connected to the Proposed Development.

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

RAMSAR sites, Nature Reserves (Wexford Wildfowl Nature Reserve and The Raven Nature Reserve) and Wildfowl Sanctuaries (Tern Island and Rosslare Point) are discussed in Chapter 14: Ornithology.

10.3.5 HABITATS AND FLORA

The habitats and flora identified through the desk study and recorded during the Habitat Walkover Survey are detailed in this section.

10.3.5.1 HABITATS

A description of the habitats recorded and classified, as per Fossitt (2000), within the Proposed Development during the most recent Habitats Walkover Survey (September 2025) is presented here and includes a description of corresponding Annex I habitat types, where applicable. The recorded habitats and corresponding level of ecological importance are outlined, determined in accordance with NRA (2009) and CIEEM (2024) guidelines as outlined in Section 10.2. Extent and distribution of habitats recorded can be seen in Figure 10.6. The habitat map presented in Figure 10.6 was produced by GDG based on the September 2025 walkover survey. Approximately 1.8 hectares of habitat will be removed, primarily consisting of artificial surfaces and scrub.

Table 10.4: Habitats recorded within the Proposed Development and Ecological Importance

Habitat Name & Code (as per Fossitt, 2000)	Ecological Importance	Area of Habitat to be Removed (ha)
Scrub (WS1)	Local Importance (Lower Value)	0.15
Sedimentary Sea Cliffs (CS3)	Local Importance (Higher Value)	0.36
Reed and Large Sedge Swamps (FS1)	Local Importance (Higher Value)	0.19
Buildings and Artificial Surfaces (BL3)	Local Importance (Lower Value)	0.7
Seawalls, Piers and Jetties (CC1)	Local Importance (Lower Value)	0.8
Mixed Sediment Shores (LS5)	Local Importance (Lower Value)	0.06
Shingle and Gravel Banks (CB1)	Local Importance (Lower Value)	0.02
Dry Meadows and Grassy Verges (GS2)	Local Importance (Lower Value)	0.16
Recolonising Bare Ground (ED3)	Local Importance (Lower Value)	0.01

Scrub (WS1)

WS1 was recorded in two main areas within the Proposed Development Boundary during Habitats Walkover Survey in September 2025. A large block was present along the eastern boundary of the Small Boat Harbour, behind the dry-docked boats and sheds, and further extensive patches occurred along the southern boundary, interspersed within the sedimentary sea cliff (CS3) habitats and areas of tall reed and large sedge swamp (FS1). Vegetation in this habitat had received little recent management, with sward height of approx. 1.5 m in places. Species present in Scrub (WS1) habitat were Briar (*Rubus fruticosus agg*.), Hedge Bindweed (*Calystegia sepium*), Ragwort (*Jacobaea vulgaris*), Perennial Ryegrass (*Lolium perenne*), Thistle (*Cirsium* spp.), Cock's-foot (*Dactylis glomerata*), Ribwort Plantain (*Plantago lanceolatum*), Common Knapweed (Centaurea *nigra*), Nettle (*Urtica dioica*), Hawkbit (*Leontodon* spp.), Hedge Woundwort (*Stachys sylvatica*), Cow Parsley (*Anthriscus sylvestris*) and Willowherb (*Epibolium* spp.). Scattered patches of immature grey willow (*Salix cinerea*) scrub were also observed developing within this habitat.

This habitat type is considered of **Local Importance (Lower Value)** because it is a common habitat that typically supports widespread, generalist species rather than rare or sensitive ones. Although it provides ecological functions, such as cover for small mammals, it lacks the biodiversity richness and ecological sensitivity associated with higher-value habitats.

Approximately 0.2 ha of scrub within the Proposed Development Boundary will be removed, largely at the harbour interface. However, remaining areas of scrub outside the footprint will retain connectivity to the wider terrestrial environment, ensuring continued ecological linkages for species potentially utilising this habitat.

*Sedimentary Sea Cliffs (**CS3)***

CS3 was recorded along the steep sedimentary cliffs forming the seaward edge of the Proposed Development Boundary. Groundwater seepage maintains persistently moist soils along the cliff face, supporting dense stands of reed (*Phragmites australis*) and Great Horsetail (*Equisetum telmateia*). These species dominate large sections of the cliff vegetation, interspersed with bramble (*Rubus fruticosus* agg.) scrub and scattered herbs including thistle (Cirsium spp.), nettle (*Urtica dioica*), and soft rush (*Juncus effusus*). The habitat occurs on tall, sloping cliff faces directly exposed to the marine environment and forms part of a wider mosaic with scrub (WS1) and reed and large sedge swamp (FS1) habitats along the southern boundary.

This habitat is considered of **Local Importance (Higher Value)** as it represents a semi-natural coastal feature that, while common in the region, provides structurally diverse vegetation and supports species adapted to steep, dynamic maritime conditions.

Buildings and Artificial Surfaces (BL3)

Existing roadways, buildings and harbour infrastructure were classified as Buildings and Artificial Surfaces (BL3).

No bat roosts found were found in any of the structures.

Given the above, this habitat has low ecological value and is therefore of Local **Importance (Lower Value)**.

Sea walls, piers and jetties (CC1)

This habitat was recorded along the current small boat harbour and is partially inundated by the sea water, extending out either side of the entrance to the small boat harbour. Flora species present within this habitat were scarce in terms of coverage but a few species were scattered amongst the rocks including Rock Samphire (*Crithium maritinum*), Beet (*Beta vulgaris*), Ragwort, Greater Plantain (*Plantago major*) and Sea Mayweed (*Tripleurospermum maritimum*).

This habitat is an artificial structure for coastal defences (breakwater or groyne) to protect the current small boat harbour from waves, tides, and storm surges. This habitat type is of **Local Importance (Lower Value)** due the built artificial nature of the habitat and lack of diversity in flora present.

Mixed Sediment Shores (LS5)

Mixed Sediment Shores (LS5) habitat was present adjacent to areas of marine water habitats. There was little to no vegetation recorded within this habitat type.

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

*Shingle and **Gravel Banks (CB1)***

A small, discontinuous strip of shoreline vegetation was recorded along the southern boundary of the Small Boat Harbour, positioned above the high-water mark. The habitat comprised a narrow band of shingle and coarse sand supporting scattered perennial and annual coastal species. Characteristic species recorded included sea sandwort (*Honckenya peploides*), sea beet (*Beta vulgaris* subsp. *maritima*), oraches (*Atriplex* spp.), sea mayweed (*Tripleurospermum maritimum*), and occasional rock samphire (*Crithmum maritimum*).

The vegetation shows affinities with Annex I habitats Perennial Vegetation of Stony Banks [1220] and Annual Vegetation of Drift Lines [1210]. However, its extent is very limited, highly fragmented, and of low ecological quality due to the modified shoreline context and proximity to the Small Boat Harbour. As such, the habitat does not meet the criteria for Annex I quality but is noted here for completeness.

Dry Meadows and Grassy Verges (GS2)

Small areas of Dry Meadows and Grassy Verges (GS2) were present throughout the Proposed Development. Species recorded within these areas were Cow Parsley, Cock's-foot, Kidney Vetch (*Anthyllis vulneraria*), Perennial Ryegrass, Hedge Woundwort, Beet, Dandelion (*Taraxacum* spp.) and Ragwort.

This habitat type is generally considered of **Local Importance (Lower Value)** due to its limited species diversity and dominance of fast-growing grass species. This habitat was recorded within a small spatial extent within the Proposed Development.

Reed and Large Sedge Swamps (FS1)

FS1 was recorded throughout the sloping cliffs of the Proposed Development Boundary, where persistent groundwater seepage maintains waterlogged clay soils. The habitat was most extensive at

the base of the cliffs and on ledges, with particularly dense stands noted along the southeast boundary of the Small Boat Harbour. These areas supported extensive growth of reed (*Phragmites australis*) and Great Horsetail (*Equisetum telmateia*), which formed the dominant vegetation cover. Other species were also recorded, including bramble (*Rubus fruticosus* agg.), briar, and hedge bindweed (*Calystegia sepium*), although these occurred more locally and were not structurally dominant.

Overall, the vegetation is best described as tall-herb swamp, with reeds and horsetail by far the most abundant species, accompanied by scattered scrub and climbers along the community margins. This habitat is considered of **Local Importance (Higher Value)** as it is dominated by widespread species, though it provides valuable cover and foraging opportunities for invertebrates, amphibians, and small mammals. FS1 also forms part of a wider habitat mosaic with scrub (WS1) and sea cliffs (CS3) along the southern boundary of the Proposed Development.

*Recolonising **Bare Ground (ED3)***

A single small area of Recolonising Bare Ground (ED3) was recorded in the southwest of the Proposed Development Boundary. Freshly exposed soil evidenced the recent clearing of this habitat prior to the time of surveying. Vegetation coverage was sparse, with immature grass shoots identified.

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

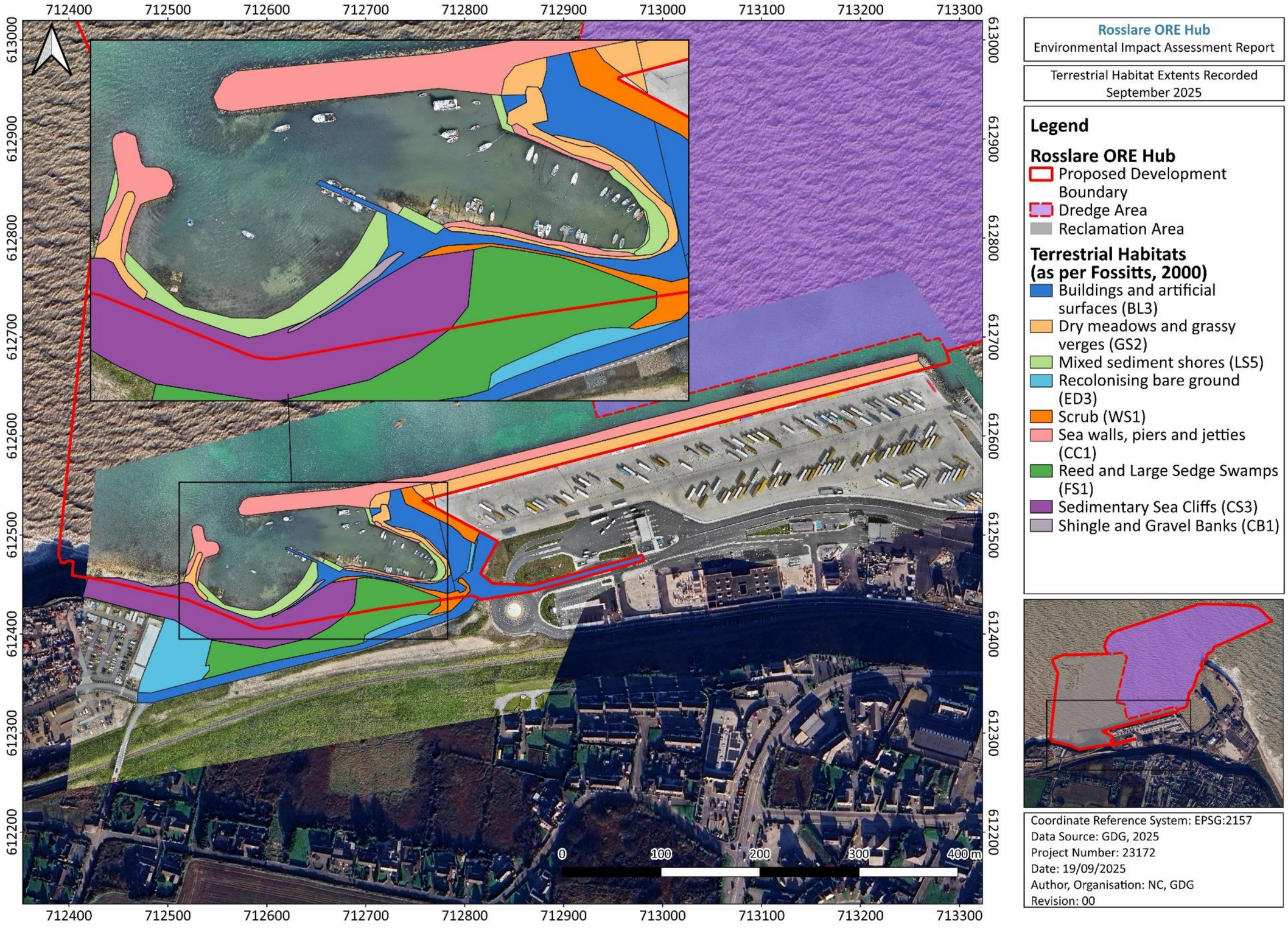

Figure 10.6: Habitats recorded during the Habitat Walkover Survey (2025), as per Fossitt, 2000

10.3.5.2 ANNEX I HABITATS

Based on the descriptions and characteristics outlined in the *EU Interpretation Manual* and *The Status of EU Protected Habitats and Species in Ireland, Volume 1: Summary Overview* (NPWS, 2019), no habitat that would qualify as Annex I habitat was identified within the Proposed Development Boundary during the habitat walkover survey. extensive

The known extant mapped areas of Ireland's 58 Annex I habitats (92/43/EEC) were consulted (NPWS, 2019). The mapped terrestrial Annex I habitats within the vicinity of the Proposed Development Boundary are presented in Figure 10.7 and Figure 10.8 below.

The following Annex I habitats (outside the boundary of an SAC) were mapped within the vicinity of the Proposed Development Boundary and are described below:

- Marram Dunes [2120]
- Embryonic Shifting Dunes [2110]
- Fixed Dunes [2130]
- Humid Dune Slacks [2190]
- Annual Vegetation of Drift Lines [1210]

All mapped Annex I habitats (NPWS, 2019) outside of SACs are considered of International Importance due to their listing under the EU Habitats Directive.

During the September 2025 survey, a narrow and discontinuous strip of shingle and coarse sand vegetation (CB1) was recorded along the southern boundary of the Small Boat Harbour, above the high-water mark. This vegetation displayed affinities with Annex I habitats Annual Vegetation of Drift Lines [1210] and Perennial Vegetation of Stony Banks [1220]. However, its extent was very limited, highly fragmented, and of low ecological quality due to the modified shoreline context and proximity to the Small Boat Harbour. It does not meet the criteria for Annex I quality but is noted here for completeness.

Table 10.5: Annex I habitats outside an SAC within the vicinity of the Proposed Development

Annex I Habitat	Distance from Proposed Development (km)	Site Description and S-P-R link (Yes/No)
Marram Dunes (White Dunes) [2120]	Approx. 3km northwest of the Proposed Development (via the marine environment). See Figure 10.7	This habitat is described in The Status of EU Protected Habitats and Species in Ireland, Volume 1: Summary Overview (NPWS, 2019) as: "Marram dunes are partly stabilised and are dominated by marram (*Ammophila arenaria*). They tend to be taller than embryonic shifting dunes and form further inland from these. The dunes are actively created by marram, which traps sand. The dunes can build and erode quickly because of the presence of bare sand, and they are sometimes referred to as mobile dunes." "The Overall Conservation Status is assessed as Inadequate due to pressures associated with recreation and coastal defences. Change in status since the 2007 report is due to alterations in the methods of assessment and does not represent genuine change on the ground. However, for this dynamic habitat, natural losses which occur are not related to human activities, and these are not considered to represent a deterioration in the conservation status." The potential impact pathway is via marine sediment transport and shoreline processes. Sediment dispersal from dredging or reclamation could theoretically move northwest along the coast and interact with coastal systems supporting this Annex I habitat. As a result an S-P-R link is identified, and this habitat is included for further assessment. This habitat is considered to be of **International Importance**.
Embryonic Shifting Dunes [2110]	Approx. 3km northwest of the Proposed Development	This habitat is described in The Status of EU Protected Habitats and Species in Ireland, Volume 1: Summary Overview (NPWS, 2019) as:

Annex I Habitat	Distance from Proposed Development (km)	Site Description and S-P-R link (Yes/No)
	via the marine environment. Another section of this habitat is located further south of the Proposed Development situated on Bing Bay Beach, past Greenore Point. See Figure 10.7and Figure 10.8.	"Embryonic shifting dunes are low sand mounds (generally less than a metre high) occurring between the high tide mark and the partially stabilised marram dunes. They are unstable habitats where wind-blown sand is common, and they are still vulnerable to saltwater intrusion. They represent the initial phase of dune formation and typically form where sand gathers around salt-tolerant species such as lyme grass (*Leymus arenarius*) and sand couch grass (*Elytrigia juncea*). "Although minor losses have been reported for this habitat they are considered negligible at a national level. The Overall Status is assessed as Inadequate due mainly to recreational pressures and coastal defences, which can interfere with the local sediment and wave dynamics. There is unlikely to have been any recent decline in condition." The potential impact pathway is via sediment dispersal and alteration of coastal sediment dynamics from the Proposed Development (e.g. dredging and reclamation). Sediment deposition or changes in hydrodynamics could theoretically influence shoreline processes that support dune formation both to the northwest (adjacent to Rosslare Back Strand) and south of the Proposed Development (Bing Bay Beach). As a result an S-P-R link is identified, and this habitat is included for further assessment. This habitat is considered to be of **International Importance**.
Fixed Dunes [2130]	Approx. 5km south of the Proposed Development	This habitat is described in The Status of EU Protected Habitats and Species in Ireland, Volume 1: Summary Overview (NPWS, 2019) as: "Fixed dunes are the more stabilised areas of dune systems located inland from mobile dune habitats, where the wind speed and the influence of tidal inundation and salt spray is reduced. As this area is relatively

Annex I Habitat	Distance from Proposed Development (km)	Site Description and S-P-R link (Yes/No)
	via the marine environment. See Figure 10.8.	sheltered, sand mobility is greatly reduced, leading to the development of a more or less closed or 'fixed' carpet of vegetation." "Only very minor losses in habitat area have been recorded, and these losses have been compensated by larger gains due to accretion. The Overall Status is assessed as Bad due to pressures associated with recreation and ecologically unsuitable grazing. The absence of adequate measures to address undergrazing and the resulting encroachment of scrub and bracken could lead to a further reduction in the conservation value of the habitat in future." The potential impact pathway to this habitat would theoretically be via changes in coastal sediment supply or hydrodynamics arising from dredging and reclamation activities at the Proposed Development. However, given the distance of 5 km, and the fact that sediment dispersal modelling indicates changes are limited to a much smaller local extent, no realistic source-pathway-receptor link exists. Therefore, there is no viable S-P-R link between the Proposed Development and the Annex I habitat.
Humid Dune Slacks [2190]	Over 6km south of the Proposed Development Boundary via the marine environment, situated on Bing Bay Beach.	This habitat is described in The Status of EU Protected Habitats and Species in Ireland, Volume 1: Summary Overview (NPWS, 2019) as: "Dune slacks are wet, nutrient-enriched depressions between dune ridges. They are characterised by the occurrence of a water table that is maintained by the combination of an impermeable layer in the soil, or by deeper salt water and precipitation. In winter, where there is relatively high rainfall and low evaporation, the water table normally rises above the soil surface and inundation occurs. In spring and during the major part of the summer, the water level drops, but the top layer of the soil remains damp."

Annex I Habitat	Distance from Proposed Development (km)	Site Description and S-P-R link (Yes/No)
	See Figure 10.8	"The Overall Status is assessed as Inadequate and declining due to the on-going losses and pressures from interference in the local hydrology, recreation and agriculture. The range of ecological variation within the habitat is also under threat, with pioneer slacks and very wet slacks being poorly represented in Ireland. Further research is required on hydrological functioning and understanding of natural versus anthropogenic succession." The potential impact pathway to this habitat would be via changes to hydrology or sediment transport processes that could alter groundwater levels or dune system dynamics. However, dune depressions or slacks are primarily maintained by a high-water table, fed by precipitation and local groundwater regimes, to maintain moist or flooded conditions. Although primarily reliant on rainfall and freshwater sources, dune slacks can be indirectly affected by seawater intrusion, particularly in low-lying coastal areas where saltwater may seep into the groundwater. Seasonal variations, such as winter rainfall, can raise water levels and temporarily inundate these areas. Given the distance of over 6 km and the localised extent of predicted sediment dispersal from the Proposed Development, no realistic mechanism exists for the Proposed Development to alter the hydrological regime or ecological functioning of these habitats. Therefore, **there is no viable S-P-R link** between the Proposed Development and the Annex I habitat.
Annual Vegetation of Drift Lines [1210]	Approx. 3km south of the Proposed Development	This habitat is described in The Status of EU Protected Habitats and Species in Ireland, Volume 1: Summary Overview (NPWS, 2019) as: "This type of vegetation occurs around the high tide mark at the upper part of the strand, where tidal litter accumulates. Tidal litter contains marine organic matter including seaweed, which provides nutrients for strandline vegetation. … This habitat is generally very species poor, fragmented and does not occupy large

Annex I Habitat	Distance from Proposed Development (km)	Site Description and S-P-R link (Yes/No)
	via the marine environment. See Figure 10.8.	areas due to its narrow, linear nature. It exists in a state of instability and may be absent in some years due to natural and/or anthropogenic causes." "The Overall Status is assessed as Inadequate due to pressures associated with recreation (notably beach cleaning) and coastal defences, which can interfere with sediment dynamics. The trend is declining due to on-going losses." This habitat is hydrologically influenced by the sea, relying on the regular deposition of tidal litter and marine organic matter (such as seaweed) that accumulates around the high tide mark to provide essential nutrients for strandline vegetation. As a result, its existence and quality are closely tied to coastal processes and sediment transport driven by the marine environment. The potential impact pathway to this habitat would be via changes in sediment dynamics or increased suspended sediment that could affect the deposition of marine organic matter and stability of the narrow drift line zone. However, sediment dispersal modelling for the Proposed Development predicts that suspended sediment plumes will not extend far enough to influence coastal processes at this location. Therefore, **no viable S-P-R link** exists between the Proposed Development and this Annex I habitat.

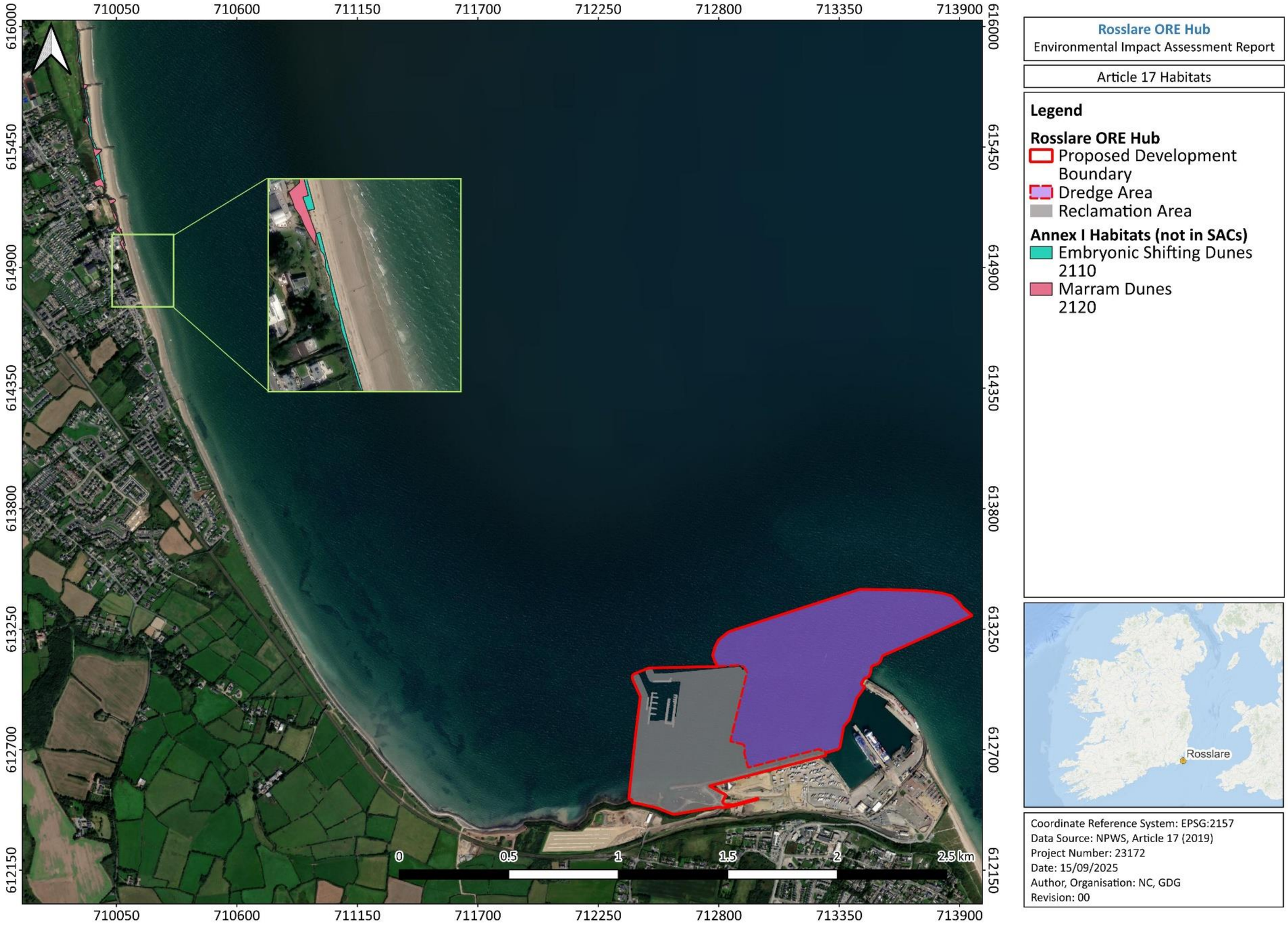

Figure 10.7: Annex I habitats predicted to be present north of the Proposed Development – Article 17 data (NPWS, 2019)

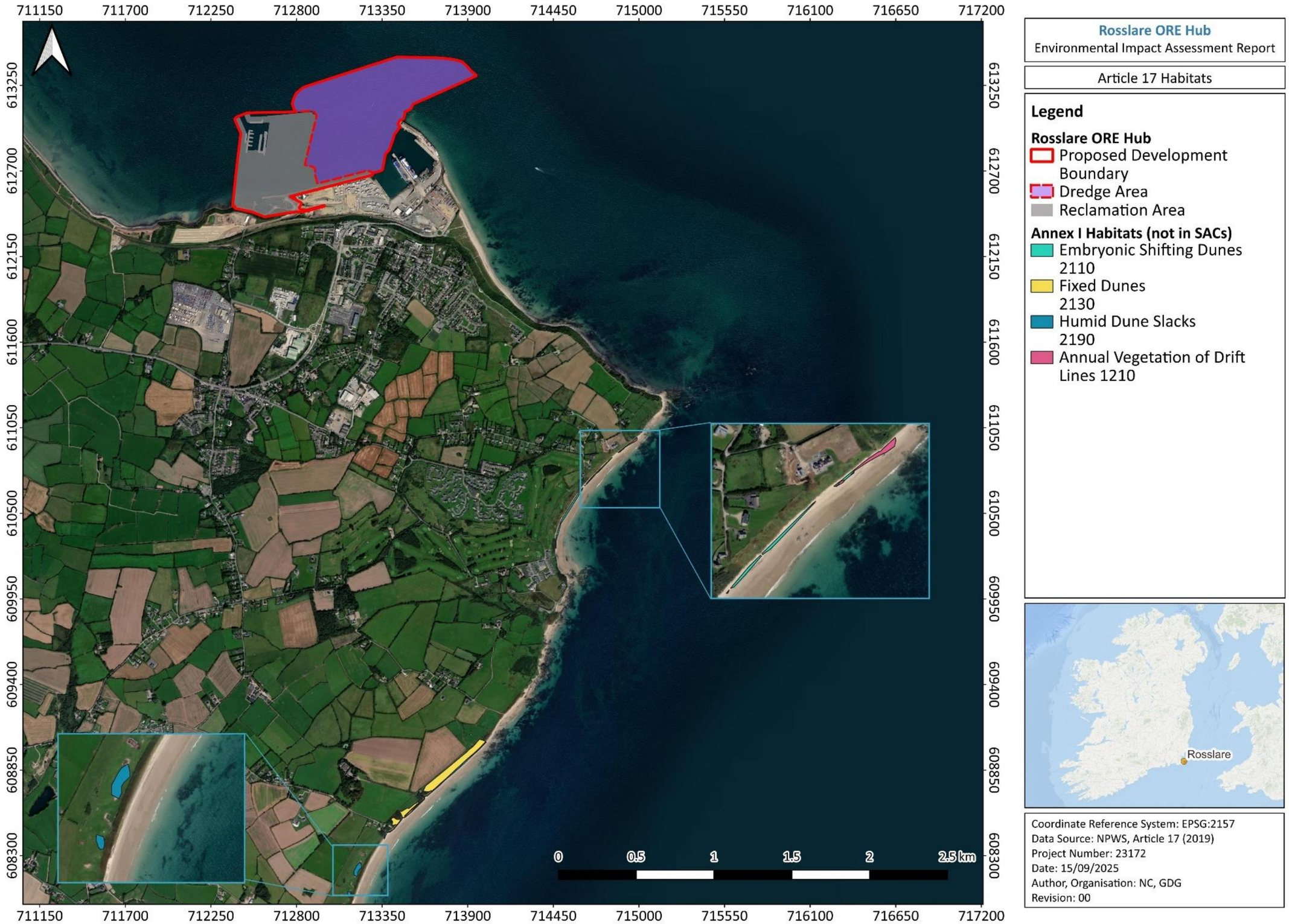

Figure 10.8: Annex I habitats predicted to be present south of the Proposed Development – Article 17 data (NPWS, 2019)

10.3.5.3 FLORA

No flora species of conservation concern listed in column (1) of the Schedule of the Flora (Protection) Order 2022 (S.I. No. 235/2022) or from the Irish Red List (Wyse Jackson et. al., 2016) were observed during the Field Surveys within the Proposed Development Boundary.

The NBDC records highlighted one plant species listed under the Flora Protection Order (2022) within T11G 2km^2 grid; Hairy Bird's-foot-trefoil (*Lotus subbiflorus*); however, this species was not recorded during the Habitat Walkover Survey. The NBDC records of this species were documented across the wider search area (i.e., not within the terrestrial Study Area). This species is considered to be of Local Importance (Higher Value) due to not being present within the ZoI of the Proposed Development.

The NBDC records highlighted five vascular plant species on the Red List of Vascular Plants in Ireland – refer to Table 10.6 below. These species are considered of Local Importance (Higher Value) due to not being present within the ZoI of the Proposed Development.

These protected flora species are considered of **Local Importance (Higher Value).**

Table 10.6: IUCN Red listed flora species recorded within the 2km2 grid T11G (NBDC)

Species Name	Record Count	Date of Last Record	Designation
Corn Marigold (*Glebionis segetum*)	3	05/06/2014	Threatened Species: Near threatened
Hairy Bird's-foot-trefoil (*Lotus subbiflorus*)	7	10/09/2011	Threatened Species: Near threatened Flora (Protection) Order 2022
Little-robin (*Geranium purpureum*)	3	05/06/2014	Threatened Species: Near threatened
Pale Flax (*Linum bienne*)	7	05/06/2014	Threatened Species: Near threatened
Round-leaved Crane's-bill (*Geranium rotundifolium*)	2	25/06/2010	Threatened Species: Least Concern
Slender Thistle (*Carduus tenuiflorus*)	4	23/08/2010	Threatened Species: Near threatened

10.3.6 INVASIVE NON-NATIVE SPECIES (INNS)

The desk study identified records (NBDC, T11G) of nine invasive non-native species (INNS), with three of the INNS listed in the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No. 477 of 2011) – refer to Table 10.7. These species are listed as non-native species subject to restrictions. The Birds and Natural Habitats Regulations 2011 (SI 477 of

2011), as amended, Section 49(2) prohibits the introduction, establishment and dispersal of species listed in the Third Schedule. Furthermore, Sections 52(7) and (8) of the Wildlife Act 1976, as amended, make it an offence to plant or otherwise cause to grow in a wild state exotic species of plants.

No INNS listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations (S.I. 477 of 2011) or other high-impact INNS were recorded within or adjacent to the Proposed Development Boundary during the baseline field surveys. Winter heliotrope (*Petasites fragrans*) a medium-impact invasive species not listed on the Third Schedule, was recorded in discrete patches during the 2025 field survey (Figure 10.9).

Winter heliotrope is an established invasive plant in Ireland that can form dense ground cover, out-competing native flora and altering habitat structure.

INNS are not regarded as Key Ecological Receptors (KERs) in this assessment due to their potential to negatively impact biodiversity. However, they remain a relevant consideration for construction-phase management measures and are addressed further in Section 10.4.6.

Table 10.7: Invasive non-native flora species recorded within the 2km2 grid T11G (NBDC) – Third Schedule species are in bold

Species Name	Record Count	Date of Last Record	Designation
Japanese Knotweed (*Fallopia japonica*)	17	14/05/2018	Invasive Species: High Impact Regulation S.I. 477 (Ireland)
Sea-buckthorn (*Hippophae rhamnoides*)	11	06/09/2017	Invasive Species: Medium Impact Regulation S.I. 477 (Ireland)
Three-cornered Garlic (*Allium triquetrum*)	18	19/05/2019	Invasive Species: Medium Impact Regulation S.I. 477 (Ireland)
Canadian Fleabane (*Conyza canadensis*)	4	29/07/2014	Invasive Species: Medium Impact
Common Broomrape (*Orobanche minor*)	5	05/06/2014	Invasive Species: Medium Impact
Japanese Honeysuckle (*Lonicera japonica*)	1	25/06/2010	Invasive Species: Medium Impact
Sycamore (*Acer pseudoplatanus*)	12	05/06/2014	Invasive Species: Medium Impact
Wall Cotoneaster (*Cotoneaster horizontalis*)	3	05/06/2014	Invasive Species: Medium Impact
Wild Parsnip (*Pastinaca sativa*)	3	05/06/2014	Invasive Species: Medium Impact

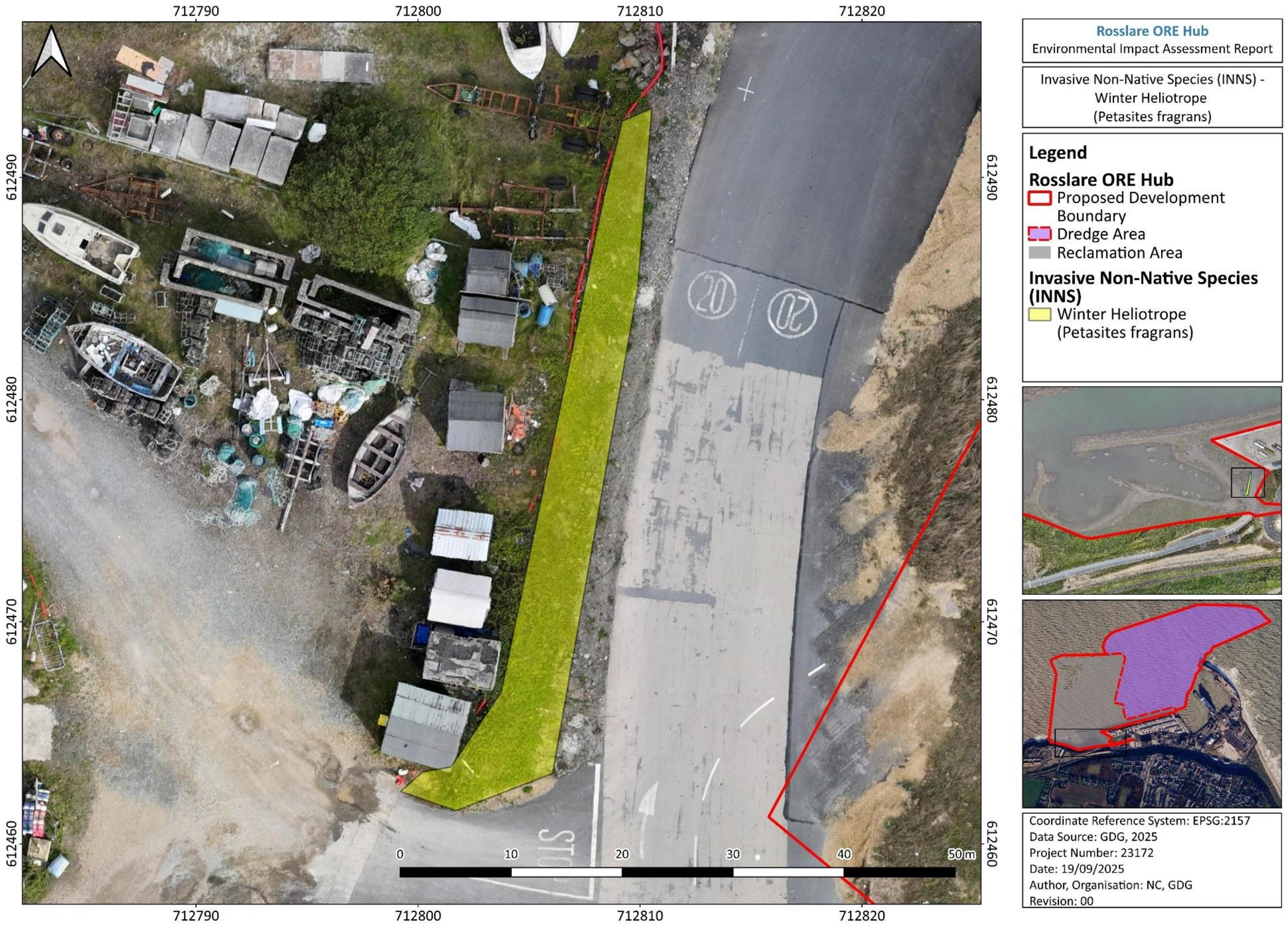

Figure 10.9: Non-Native Invasive Species Recorded - Winter heliotrope (*Petasites fragrans*) from GDG Terrestrial Habitats Survey (September 2025)

10.3.7 NON-VOLANT MAMMALS

The NBDC records search identified two records of non-volant mammals within the 2km^2 grid T11G (search area); one historical record of otter (*Lutra lutra*) from 2012 and one record of West European hedgehog (*Erinaceus europaeus*) from 2020.

No live sightings or evidence of other non-volant mammal species were recorded during the course of the 2023 walkover, camera trapping surveys or during surveys for other receptors. In particular, no evidence of nationally protected species such as badger (*Meles meles*), Irish hare (*Lepus timidus hibernicus*), deer, pygmy shrew (*Sorex minutus*), West European hedgehog, red squirrel (*Sciurus vulgaris*) or Irish stoat (*Mustela erminea hibernica*) was recorded during these surveys.

Evidence of otter activity was identified within the Proposed Development Boundary during the 2025 survey (10.3.7.1)

10.3.7.1 OTTER

Otter is listed under Annex II and Annex IV of the EU Habitats Directive, receiving strict protection through both the Habitats Directive and the European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. 477 of 2011), as amended. The otter is listed in Appendix III of the Bern Convention. In addition, otter has most recently been assessed as Near Threatened under criteria A2c for The IUCN Red List of Threatened Species (Loy, et al., 2022, amended version of 2021).

For otters, cub rearing takes place within natal holts, which are typically unmarked by spraint (Heggberget & Christensen, 1994; Kruuk, 1995). Although breeding is possible year-round, a peak in births occurs in spring and early summer in Ireland (Vincent Wildlife Trust Ireland, n.d.; Conserve Ireland, n.d.), with studies elsewhere also showing peaks in summer and early autumn (Heggberget & Christensen, 1994; Kruuk, 1995; Ruiz-Olmo et al., 2002). Litters usually consist of two to three cubs, and mothers keep cubs within holts for up to two months before gradually moving them (Ruiz-Olmo et al., 2002).

Coastal otters, while predominantly foraging in the marine environment, are heavily reliant on nearby freshwater rivers and streams for essential behaviours such as drinking and washing to remove salt deposits to maintain the waterproof quality of their fur (DAFM, 2009; Kruuk, 2006; Chanin, 2013). These requirements influence their use of the coastline, as otters must return regularly to freshwater sources after foraging in the sea. Surveys of coastal otters often focus on areas near the outflows of coastal streams, which serve as critical freshwater access points (Kruuk & Balhary, 1990; Moorehouse, 1988).

Coastal otters, particularly in areas where prey is abundant, such as Wexford Harbour, are known to maintain much smaller territories than freshwater otters, with some studies recording foraging ranges as short as 2 km of coastline (Vincent Wildlife Trust, n.d.; Kruuk, 1995; O'Sullivan, 1993). In contrast, otters in freshwater or upland systems may occupy territories exceeding 20 km where prey is less available (Kruuk, 2006). On Shetland, for example, the average distribution is approximately one adult otter per kilometre of coastline, with each individual utilising several kilometres of shore (Kruuk, 1995).

Coastal otters tend to feed close to the shore (approximately 80–100m) and typically dive to depths of up to 10m (Kruk and Moorhouse*, 1991;* Liles*, 2009*), but most feeding is done much closer to shore and in water less than 3m deep (Nolet, *et al.* 1993). In Wales, it has been confirmed that otters regularly utilise the coast near freshwater streams for foraging, including in the marine environment (Liles, 2003a; Strachan, *et al*., 2005). In a study of otter activity across the Cork Harbour area, coastal otter activity was found to be strongly correlated with the presence of freshwater (Dalton, Healy, and Murphy, 2021). However, the extent to which they venture along the open coast, away from freshwater sources, remains unclear.

As described above, a 5 km extended Study Area for otter was used. The NBDC records for the extended search area for otter are shown in Table 10.8. The otter record from TG11 mentioned above is also included here for clarity, as highlighted in bold in Table 10.8.

Of the fourteen 2km^2 grids included in the desk search for otter (as shown in Figure 10.3), five grids contained documented otter records. However, these record counts are low (1-2 records per grid), with the most recent sighting dated 16th September 2017 in grid T01V. The majority of the remaining records are over 12 years old. With the exception of grid T11G all otter records within the Study Area are associated with a freshwater river or stream, (Figure 10.10). The otter record in grid T11G corresponds to the dated Article 17 (NPWS, 2019) record shown in Table 10.8 below.

During the walkover survey in September 2025, fresh evidence of otter activity was recorded within the Proposed Development Boundary (see EIAR Technical Appendix 10 for full details). This included spraints along the rocky intertidal including the breakwater surrounding the Small Boat Harbour, slides on the sedimentary cliffs, prey remains near the harbour edge and several couches located along vegetated sections of the sedimentary sea cliffs (CS3), in proximity to the reed and large sedge swamp (FS1) habitats and along the marram grass on the breakwater. No holts were identified during the survey. The couches are considered to be indicative of temporary resting places rather than permanent breeding sites, but they nonetheless confirm regular otter presence and use of the shoreline environment for both foraging and resting. These observations demonstrate that otters have actively utilised the immediate coastal zone within the Proposed Development, consistent with their reliance on intertidal prey resources and their need for shoreline refuges close to freshwater inflows.

Table 10.8: NBDC records of Otter within the wider area of the Proposed Development

Species Name	2km^2 Grid	Record Count	Date of Last Record	Designation
Otter (*Lutra lutra*)	**T11G***	**1**	**02/02/2012**	Habitats Directive (92/43/EEC), Annex II, Annex IV Wildlife (Amendment) Act (2000)
	T10P	2	03/08/2012	
	T01V	1	16/09/2017	
	T10E	2	20/10/2010	

Species Name	2km^2 Grid	Record Count	Date of Last Record	Designation
	T11B	2	16/12/1980	Bern Convention, Appendix II
* The terrestrial footprint of the Proposed Development is confined within the NBDC 2km^2 grid T11G.				

The Slaney River Valley SAC is the closest Natura 2000 site designated for otter, located *c*. 6.6km north of the Proposed Development directly via the marine environment. The Proposed Development is connected hydrologically to the Slaney River Valley SAC through Rosslare Bay and Wexford Harbour. Please note coastal otters are expected to follow the coastline rather than taking a more direct route across open water. Consequently, the distance an otter is expected to need to travel to reach the Proposed Development is approximately 8 km. As coastal otters tend to have foraging ranges typically in the order of 2 km in productive marine environment where prey is abundant (Kruuk, 2006; O'Sullivan, 1993), it is unlikely that otters from the SAC population would venture the c. 6 km required to reach the Proposed Development.

The Miltown_Rosslare_010 river waterbody flows northward by Rosslare town, approximately 550 m from the Proposed Development boundary (at the closest point), before turning west-northwest towards Rosslare Strand and discharging into Wexford Harbour (refer to the river closest to the Proposed Development Boundary to the southwest of the Proposed Development in Figure 10.10). This section of the river is approximately 8 km long and is *circa* 1.2 km from the boundary of the Slaney River Valley SAC, where the river joins the Wexford Harbour and Slobs waterbody.

This watercourse is assumed to have flow year-round, albeit at reduced levels during drier summer months. It is primarily fed by field drains from surrounding farmland and has sufficient flow to be culverted beneath the N25 near its source west of Kilrane, with several small bridges crossing it along farm tracks.

While this river system provides connectivity to Wexford Harbour, it is not considered to support suitable habitat for otters to forage, as it is largely fed by agricultural drains and lacks the structural complexity typically associated with high-quality otter foraging areas, such as deep pools and abundant prey availability. However, given its connection to the broader harbour system, it is possible that otters could use it for movement.

The stretch of coastline to the north and northwest of the Proposed Development, towards Wexford Harbour and the Slobs, is bordered by a railway line. While there are some urbanised sections along this coastline, particularly near Rosslare town, other areas become less developed and more open as they extend towards Wexford Harbour and the Slobs, where agricultural habitats and access routes to the coastline are more prevalent.

The otter population from the Slaney River Valley SAC is considered to be of **International Importance** due to its inclusion in Annex II and Annex IV of the Habitats Directive. All other otter populations within the ZoI of the Proposed Development are valued as being of **County Importance.**

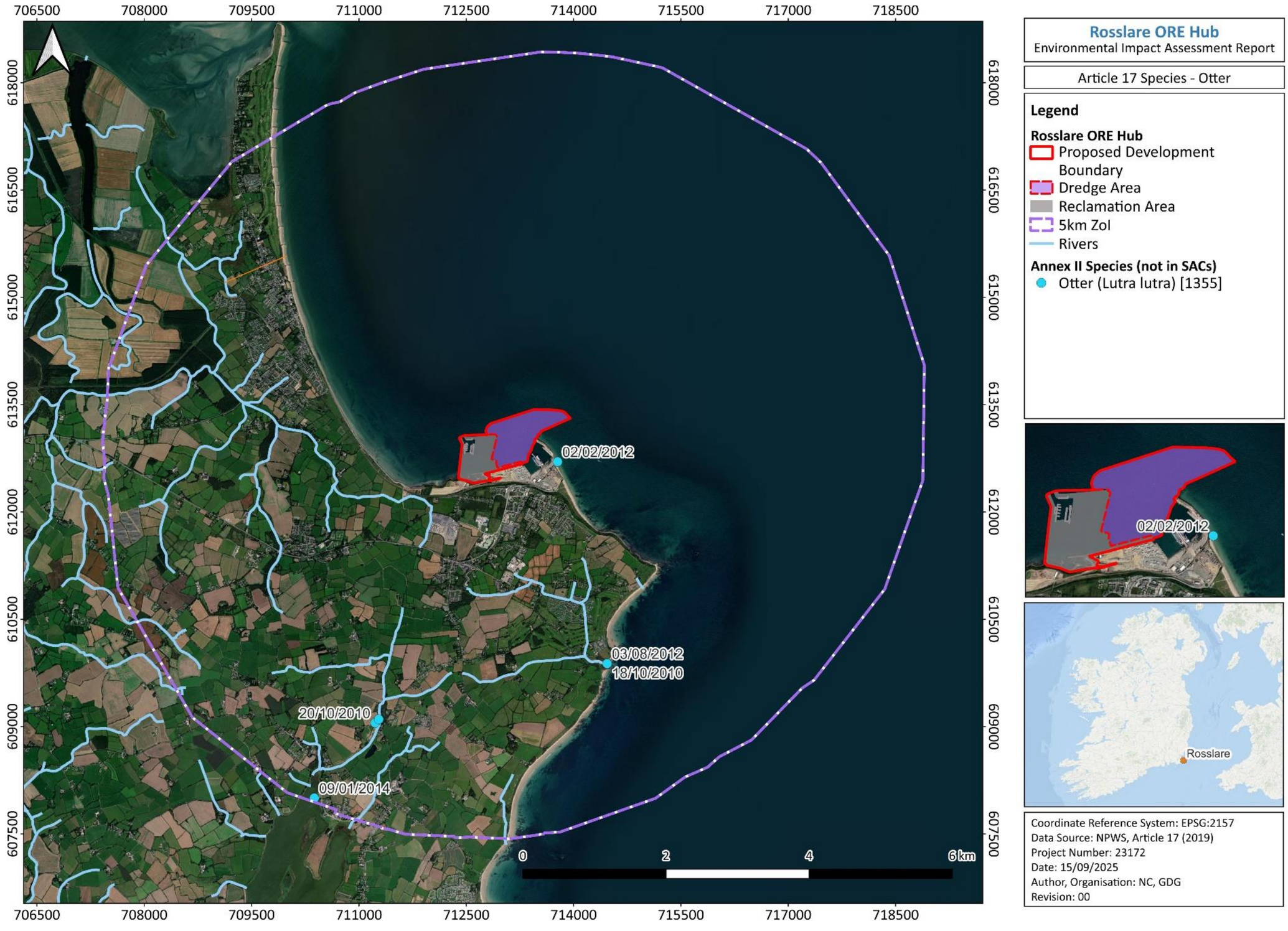

Figure 10.10: Otter records and date recorded within 5km of the Proposed Development from Article 17 submitted data (NPWS, 2019)

10.3.7.2 BADGER

Badgers are common and widespread in agricultural habitats and due to the badger's stable populations status as Least Concern in Ireland. A search of the NBDC desk study indicates numerous badger records throughout the wider area, particularly in inland agricultural lands areas beyond Rosslare Europort. No signs of foraging or setts were identified during surveys, indicating that badgers are not currently using the site. Field surveys conducted for the Rosslare Europort Access Road (REAR) development in 2022 (Mott MacDonald, 2022) recorded mammal trails to the southwest corner of the works footprint and within scrub habitat to the south of the railway line. However, no evidence of badger activity, such as setts, was recorded within the area surveyed.

Badgers are commonly associated with inland habitats such as woodlands, farmland, and hedgerows though badgers can establish setts and scavenge for food in semi-urban and fragmented habitats, provided there is sufficient cover and access to food resources. Coastal badger populations tend to establish setts in areas with suitable shelter, such as dunes, coastal woodlands, or scrub, where they can find protection and access to food, while also avoiding building setts in areas prone to flooding. The site's scrub habitat is limited in extent, reducing its potential to support badger populations, which typically prefer larger, well-vegetated areas for sett construction and foraging. As a biodiversity feature at this site of proposed development, local badger populations are valued to be of **Local Importance (Lower Value)**.

10.3.7.3 OTHER MAMMALS

The Red List of Irish terrestrial mammals (Marnell, *et al.*, 2019), classifies the conservation status of badger and hedgehog as of "Least Concern."

The scrub habitat within and adjacent to the Proposed Development Boundary may offer suitable conditions for mammal species such as hedgehog, Irish stoat, Irish hare and pygmy shrew as these species inhabit a variety of environments but are typically found in areas with dense ground cover. Irish hares, known to inhabit a wide range of habitats, from coastal dunes to mountain tops, may also utilise the adjoining agricultural fields for foraging and commuting.

The scrub habitat offers suitable coverage and foraging grounds to support these mammals, providing continuous shelter and food resources. The connectivity of the scrub with surrounding habitats increases its suitability for these species, allowing for movement across the landscape. This well-structured habitat is an important ecological feature.

The Proposed Development is bounded by the coastline to the north and a road to the south. This surrounding infrastructure creates physical barriers that limit habitat connectivity, making the Proposed Development, including the scrub habitat, less suitable for sustaining mammal populations. Mammals such as stoats, hares, hedgehogs, and pygmy shrews typically require more secluded and connected habitats to establish stable populations and forage effectively. The Proposed Development Boundary does not contain features that would elevate its conservation importance for these species compared to other more suitable inland areas

As protected species under the Wildlife Act 1976, as amended, these species hold conservation significance at the local level. The resident populations in the wider environment surrounding the Proposed Development are therefore considered to be of **Local Importance (Lower Value)**.

10.3.8 VOLANT MAMMALS (BATS)

All bats in Ireland and their roosts (breeding and resting) are protected under the Wildlife Act (1976, as amended) which makes it an offence to wilfully interfere with or destroy the breeding or resting place of these species in Ireland. All bat species are also listed on Annex IV of the Habitats Directive, with the lesser horseshoe bat also listed on Annex II. In addition, all bat species are listed under Appendix II and Appendix III of the Bern Convention. Therefore, there is an obligation to protect the habitat of bats, including ecological corridors used as foraging areas.

The following bat species are found in Ireland (BCI website, accessed February 2025).

Common and Soprano Pipistrelle species

The common pipistrelle and soprano pipistrelle are Ireland's two smallest and most common bat species. Both are frequently observed shortly after dusk in urban and rural areas, displaying a rapid, twisting flight as they pursue small insect prey, including midges, mosquitoes, and moths. A single pipistrelle, weighing only 5–6 grams, can consume up to 3,000 insects in one night.

These species commonly roost in buildings, favouring confined spaces such as behind hanging tiles, soffit boards, or between roofing felt and roof tiles, rather than open attic spaces. They are also known to roost in tree holes and other sheltered locations. The soprano pipistrelle typically forms larger maternity roosts, with colonies reaching up to 1,500 individuals, whereas the common pipistrelle tends to form smaller maternity roosts.

The two species are distinguished by their echolocation calls, with the common pipistrelle echolocating at a peak frequency of 46 kHz, while the soprano pipistrelle emits calls at a higher frequency, peaking at 55 kHz. Both species are monitored through Ireland's Car-based Bat Monitoring Scheme by Bat Conservation Ireland, which has recorded a significant increase in soprano pipistrelle populations since 2003, while common pipistrelle numbers have also increased, though at a slower rate.

Nathusius' Pipistrelle

The Nathusius' pipistrelle was first confirmed breeding in Ireland in May 1997 near Lough Neagh. Since then, it has been recorded across Northern Ireland, primarily near Loughs Neagh and Erne. In the Republic of Ireland, the species has been detected using bat detectors in several counties, and small roosts have been identified, but breeding has yet to be confirmed. Due to its similarity in appearance to the common and soprano pipistrelles, it is possible that this species has been under-recorded in roost surveys, or the Irish population may be relatively recent in origin.

Research by the Centre for Irish Bat Research suggests that the population of Nathusius' pipistrelle in Ireland is expanding, likely due to global warming. This species is migratory in Europe, with recorded migrations exceeding 1,600 km between summer and hibernation sites. However, it remains unclear whether the Irish population migrates within Ireland or to another country for overwintering. There is evidence that Nathusius' pipistrelle bats migrate from Britain to continental Europe for the winter, but the migration patterns of the Irish population are not well understood. The species typically forages over water or along forest tracks. The species is recorded by the Car-based Bat Monitoring Scheme by Bat Conservation Ireland, although in such low numbers that its annual population trend is difficult to establish with certainty.

Leisler's Bat

The Leisler's bat is the largest bat species in Ireland and is commonly found roosting in buildings, although approximately 13% of recorded roosts in Ireland have been located in trees. This species has a distinctive level flight at greater heights than other Irish bats, from which it dives down to catch prey such as dung flies and beetles. It is often observed soon after sunset, flying over open spaces such as parks and fields. Due to its early emergence and relatively large size, it may sometimes be mistaken for a swift, but it can be distinguished by its wing shape—swifts have smoothly curved, scimitar-like wings—and the fact that swifts produce audible shrieks, whereas Leisler's bats are inaudible without a bat detector.

Leisler's bat is relatively rare in Britain and the rest of Europe but is considered common in Ireland, making the Irish population of international importance. The species is monitored through the Car-based Bat Monitoring Scheme by Bat Conservation Ireland, which has recorded significant population increases since 2003. The reasons for this increase are not well understood but may be linked to recovery from past declines, increased woodland cover, and/or climate change.

Brown Long-eared Bat

The brown long-eared bat is distinguished by its exceptionally large ears, which are nearly as long as its body. Although likely common in Ireland, this species is rarely seen in flight as it primarily forages within woodlands, flying among foliage and gleaning moths and other insects directly from leaves. It emits quiet echolocation sounds through its nose, making it difficult to detect using standard bat detectors. Larger prey items, such as noctuid moths, are often taken to a feeding perch, typically located in porches or outbuildings. These perches can be identified by the accumulation of insect remains, such as moth wings, beneath them.

The brown long-eared bat commonly roosts in buildings, favouring **large attic spaces**, churches, outbuildings, and tree holes. In 2007, the Brown Long-eared Bat Roost Monitoring Scheme was established by Bat Conservation Ireland to track population trends, with results indicating that the species has remained stable to date.

NBDC records search identified one historical (more than 15 years old) record of bats, Soprano Pipistrelle (*Pipistrellus pygmaeus*), within the 2km^2 grid T11G (search area).

During the field surveys for the REAR project, an external assessment of a structure (house) was undertaken to examine the structure for potential entrance and exit points for roosting bats (Mott MacDonald, 2022). This house was the only feature identified as a possible bat roost site within the ZoI of the REAR development.

It should be noted that the bat species recorded during the project-specific field surveys are all common species and of "Least concern" (Nelson *et al.*, 2019).

10.3.8.1 PRA SURVEY RESULTS

A desk study was undertaken as part of the PRA, which included a review of historic Ordnance Survey mapping and Geological Survey Ireland datasets. In addition, a field survey was conducted to visually inspect for man-made structures or natural underground features (e.g. culverts, cellars, or voids). No such features were identified through either the desk study or field inspection.

Relevant features within the Proposed Development Boundary therefore consist only of trees and buildings. No roosting bats were encountered during the current survey, and no unoccupied roosts which contained signs of bats were encountered. Roosting sites were therefore absent within the Proposed Development Boundary when the survey was conducted.

While no bat roosts could be identified, trees and buildings had features which were considered to have potential to support roosting bats. The trees are categorised according to their potential to support roosting bats following Collins (ed.) (2016). Twenty-one (21) buildings were classified as being of Low suitability to roosting bats, while 9 buildings were classified as being of Negligible suitability. No structures of High or Moderate suitability were identified during the PRA. All three (3) trees within the Proposed Development were classified as being of Negligible suitability to roosting bats.

The suitability of the buildings and trees was re-assessed in September 2025 to validate the baseline. This survey was undertaken with reference to the updated *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (Collins et al., 2023). No roosts or signs of bats were recorded, and no change in suitability was identified compared to the 2023 baseline. All buildings and trees within the Proposed Development remain categorised as Low or Negligible suitability for roosting bats. On this basis, no further bat surveys were deemed necessary.

The results of the PRA surveys of the buildings and trees are presented in EIAR Technical Appendix 10 (Table C.1). Pictures of the structures and trees surveyed during the PRA are located in EIAR Technical Appendix 10 (Appendix C). The mapped locations of the buildings and the trees that were assessed are shown in EIAR Technical Appendix 10 (Appendix C, Figure C.3).

10.3.8.2 BAT EMERGENCE SURVEYS

No bats were recorded emerging from any of the buildings during project-specific bat emergence surveys; however, bat species were recorded commuting in the area. The bat activity recorded during the emergence surveys is presented in Table 10.9. The results of the bat emergence surveys of the buildings are presented in EIAR Technical Appendix 10. The mapped locations of the structures that were assessed are shown in EIAR Technical Appendix 10 (Appendix C, Figure C.3).

Table 10.9: Bat activity recorded during the emergence surveys

Structure (Label no.)	Species	Behaviour	Occurrence (no. of flight passes)
BL3	Common Pipistrelle	Commuting	2
BL7, BL8 and BL9	Common Pipistrelle	Commuting	2
	Unidentified bat species	Commuting	1
	Leisler's Bat	Commuting	1
BL11, BL12, BL13, BL14, BL15, BL16 and BL17	Common Pipistrelle	Commuting	1
BL18, BL19, BL20, BL21, BL22, BL23 and BL24	Common Pipistrelle	Commuting	1
	Leisler's Bat	Commuting	1
BL27 and BL28	Leisler's Bat	Commuting	2
BL30	Soprano Pipistrelle	Commuting	1
	Leisler's Bat	Commuting	4

10.3.8.3 BAT ACTIVITY TRANSECT SURVEYS

One bat was recorded during the course of the three bat transect surveys. This individual was observed visually and was not detected by the surveyors' bat detector therefore classification to species level was not possible.

The results of the Transect Surveys and the mapped location of the transect surveys are presented in EIAR Technical Appendix 10 (Appendix C).

10.3.8.4 BAT ACTIVITY STATIC DETECTOR SURVEYS

The results of the bat activity static and the categorisation of bat activity are presented in Table 10.10. It is important to note that activity levels can only be compared within a species and not between species due to variations in detection distances and flight characteristics for each species (Marchant, 2020). The static detectors were positioned at a specific height, which may have favoured the detection of lower-flying species over higher-flying species, potentially making it easier to record activity for species with flight patterns closer to the detector.

Table 10.10: Results of the Spring, Summer and Autumn Static Detector Survey

Location Number	Nights Active	ITM	Bat Species	Average Bat Activity levels
Spring Static Detector Survey - from 04/04/2023 to 17/04/2023				
1	14	712663, 612407	Common Pipistrelle (*Pipistrellus pipistrellus sensu stricto*)	High
			Soprano Pipistrelle (*Pipistrellus pygmaeus*)	Low
			Brown Long-eared Bat (*Plecotus auritus*)	
			Leisler's Bat (*Nyctalus leisleri*)	
2	14	712540, 612400	Common Pipistrelle (*Pipistrellus pipistrellus sensu stricto*)	High
			Leisler's Bat (*Nyctalus leisleri*)	Moderate
			Soprano Pipistrelle (*Pipistrellus pygmaeus*)	
			Brown Long-eared Bat (*Plecotus auritus*)	Low
			Nathusius' Pipistrelle (*Pipistrellus nathusii*)	Negligible
			Myotis species	
Summer Static Detector Survey - from 05/06/2023 to 18/07/2023				
1	14	712583, 612399	Nil bat passes	Negligible
2	14	712705, 612408	Common Pipistrelle (*Pipistrellus pipistrellus sensu stricto*)	High
			Leisler's Bat (*Nyctalus leisleri*)	Moderate
			Soprano Pipistrelle (*Pipistrellus pygmaeus*)	Low
			Nathusius' Pipistrelle (*Pipistrellus nathusii*)	
			Brown Long-eared Bat (*Plecotus auritus*)	Negligible
Autumn Static Detector Survey - from 15/09/2023 to 25/09/2023				
1	10	712759, 612525	Nil bat passes	Negligible
2	10	712753, 612438	Leisler's Bat (*Nyctalus leisleri*)	Low
			Nathusius' Pipistrelle (*Pipistrellus nathusii*)	Negligible

10.3.9 HERPETOFAUNA

There are four native species of herpetofauna in Ireland including the natterjack toad (*Epidalea calamita*), smooth newt (*Lissotriton vulgaris*), the common frog (*Rana temporaria*), and the common lizard (*Zootoca vivipara*).

The natterjack toad is listed under Annex IV of the Habitats Directive, with its natural range limited to the coastal zones of the Dingle and Iveragh peninsulas in Co. Kerry, and a translocated population in The Raven, Co. Wexford, and can be seen within the North Sloblands area. The common frog, legally protected under the Wildlife Acts 1976, as amended, is listed as internationally important under Annex V of the EU Habitats Directive and Appendix III of the Bern Convention. The smooth newt is also protected under Schedule 5 of the Wildlife Act 1976, as amended, and listed in Appendix III of the Bern Convention.

The common lizard is Ireland's only native terrestrial reptile and is protected under the Wildlife Act 1976, as amended.

No NBDC records of herpetofauna were documented within the 2km^2 grid T11G.

During the field surveys conducted for the REAR project, habitat for amphibious species was found to be very limited over the surveyed site, with only a small section of ditch running along the southern and western boundary, immediately north of the car compound to be broad and filled with pooled standing water, providing suitable conditions for amphibians (Mott MacDonald, 2022).

Amphibians

During the mammal walkover surveys, amphibian habitat suitability assessments were also carried out. These assessments determined that no habitats suitable/typical for breeding amphibians were identified within the Proposed Development Boundary. No waterbodies were observed within or in the vicinity of the Proposed Development Boundary. As a result, no further habitat suitability assessments were conducted.

No evidence of amphibian species was identified within or adjacent to the Proposed Development Boundary or any waterbody within the vicinity during the amphibian survey or anecdotally during surveys for other receptors.

During the amphibian survey, it was found that the Proposed Development offers limited suitability for amphibians. Smooth newts rely on freshwater or brackish wetlands with submerged vegetation for breeding. The Proposed Development does not contain any recorded wetlands, and as a result, it does not provide suitable breeding grounds for smooth newts. Similarly, common frogs breed in still or slow-moving freshwater habitats, such as ponds, ditches, and damp areas with dense vegetation, which offer ample cover for egg-laying. This lack of wetland features indicates that the Proposed Development does not support the necessary conditions for sustaining local amphibian populations such as smooth newts and common frog.

Notwithstanding this, the dense scrub habitat serves as valuable terrestrial cover, supporting newts during their non-breeding season by offering shelter for foraging, hibernation, and protection from predators.

Both the common frog and smooth newt have a Least Concern conservation status (King, *et al*., 2011), the local amphibian population is of **Local Importance (Lower Value).**

Reptiles

Reptile surveys were undertaken and provided baseline data on the habitat suitability for reptiles within the Proposed Development. Artificial refugia were deployed at five locations within the Proposed Development that were identified as being of potential suitability to common lizards (*Lacerta* (*Zootoca) vivipara*) and were surveyed for basking reptiles in direct observational surveys. On 18th April 2023 a single common lizard was recorded basking on an artificial refugia located in the southwest of the Proposed Development Boundary (ITM 712555, 612417) – see EIAR Technical Appendix 10 (Appendix C). No other evidence of any reptile species was identified within or adjacent to the Proposed Development Boundary.

The Proposed Development Boundary, with its scrub habitat and patches of reeds within damp areas, provides a suitable environment for the common lizard. This species thrives in areas with dense vegetation for cover, along with sunlit spots for basking—a behaviour essential for their thermoregulation. The Proposed Development's coastal location also aligns with the common lizard's preference for habitats like dunes and coastal grasslands, where they can find shelter, food, and adequate basking spots. The mix of scrub and reeds in damp areas is likely to support a range of invertebrate prey, making this habitat suitable for foraging.

While the Proposed Development's proximity to busy roads may pose some challenges, its natural features are generally well-suited to supporting a population of common lizards, particularly in quieter, sheltered sections away from high-traffic zones.

Due to the presence of one common lizard within the Proposed Development recorded on the artificial refugia and high habitat suitability the common lizard population is of **Local Importance (Higher Value).**

10.4 ASSESSMENT OF IMPACTS/EFFECTS

10.4.1 ESTABLISHING ZONE OF INFLUENCE

10.4.1.1 HABITATS

The ZoI for terrestrial habitats in relation to the Proposed Development is primarily confined to the terrestrial footprint of the Proposed Development Boundary. This includes potential indirect effects such as shading and air quality changes (dust) that may impact nearby vegetation and habitat structure. Due to the absence of hydrogeological or hydrological connections such as rivers or groundwater flows that could extend impacts to distant wetland or aquatic habitats, the assessment focused on the Zone of Impact, encompassing areas of direct habitat loss and localised changes in air quality.

10.4.1.2 NON-VOLANT MAMMALS

The ZoI for disturbance impacts on mammal species such as badgers, otters, hedgehogs, and stoats may cover greater distances compared to small mammals, as these species are capable of dispersing several kilometres from their natal places.

Badgers and Other Non-volant Mammals

Given the predominantly marine location of the Proposed Development, its sensitive and minimal design approach concerning the terrestrial environment, and the nature of the existing habitats within the terrestrial portion of the Proposed Development Boundary, the potential for wide-scale impacts to terrestrial habitats, flora, and fauna in the surrounding area is considered low. Impacts from the Proposed Development are likely confined to the Proposed Development Boundary itself but may extend slightly for otters in the area.

Furthermore, the scale and nature of the Proposed Development, combined with the existing urbanised and commercialised landscape of the Rosslare Harbour area, significantly limit the scope of terrestrial impacts. Non-volant mammals such as badgers and hedgehogs are expected to have limited interaction with the Proposed Development, given the high levels of anthropogenic activity and the minimal availability of suitable habitats. Badgers, which typically prefer agricultural fields and woodlands for foraging and sett-building, are unlikely to utilise the site due to the lack of such habitat features within the Proposed Development Boundary. Consequently, the potential ZoI of the Proposed Development is considered limited to less than 1km beyond the Proposed Development Boundary.

Otter

Given the typical foraging ranges of coastal otters (Kruuk, 1995; Macdonald & Mason, 1980), the absence of significant freshwater features within the immediate area (Dalton, Healy, and Murphy, 2021; DAFM, 2009; Kruuk, 2006; Chanin, 2013; Kruuk & Balhary, 1990), and the high levels of anthropogenic activity, it is considered reasonable to adopt a precautionary ZoI of 5 km for otters beyond the Proposed Development Boundary. This approach reflects their potential foraging range along coastlines, which is often as short as 2 km but may extend further under certain conditions.

This approach ensures a focused and proportionate assessment, capturing any potential impacts on nearby habitats and species, while reflecting the constrained suitability of the site for these terrestrial receptors.

10.4.1.3 HERPETOFAUNA

The ZoI for amphibian species is expected to encompass areas of direct habitat loss and fragmentation within the Proposed Development Boundary, along with any indirect effects on water quality in hydrologically connected wetland habitats (if identified). However, no wetland habitat comprising still or slow-flowing water—which is essential for amphibian breeding—was recorded within the Proposed Development Boundary, further limiting the potential ZoI for amphibians.

For the common lizard, the ZoI is likely to be restricted to direct habitat loss, fragmentation within theProposed Development Boundary, as well as disturbance or displacement within areas of the Proposed Development Boundary where construction is proposed to occur.

10.4.1.4 VOLANT MAMMALS (BATS)

Impacts on bats varies depending on several factors, including species, roost type, surrounding habitat, and commuting routes. The ZoI for volant mammals is therefore the Proposed Development Boundary and a buffer of 3 km.

10.4.1.5 DESIGNATED SITES

The designated search area for European and national sites was determined based on the Source-Pathway-Receptor model, focusing on potential pathways of impact between the Proposed Development and Special Areas of Conservation (SACs) or Natural Heritage Areas (NHAs) within the terrestrial environment.

10.4.2 "DO-NOTHING" SCENARIO

In this Environmental Impact Assessment Report (EIAR), the term 'Do Nothing' scenario is used to describe the 'evolution of the baseline without the Proposed Development.'

Rosslare Europort is a heavily built area, with existing operational and development activities taking place. Habitat changes related to ongoing activities are expected to have already influenced local fauna biodiversity and distributions, and this influence is likely to persist. Existing land use zonings provide insight into anticipated biodiversity trends in the near to medium term, as these zonings guide and support direct development in the surrounding area. The full extent of the Proposed Development lies within lands zoned under the Wexford County Development Plan 2022-2028. Land within the Europort area and access corridors will continue to be utilised for port-related purposes, including the movement of trucks transporting cargo and delivery containers for import and export purposes. Surrounding lands in Rosslare are predominantly zoned for residential, commercial, or industrial use.

In the Do-Nothing Scenario, the Proposed Development would not proceed, leaving the existing environmental conditions unchanged. In the short term the existing habitats would persist without any significant alterations to terrestrial biodiversity in the area, as no construction activities associated with the Proposed Development would occur. The existing small boat harbour operation activities would continue, maintaining the current levels of disturbance and activity within the area. Consequently, while changes to biodiversity may occur, they would likely follow the same trajectory that the surrounding habitats have experienced over the past few decades. Natural processes, such as habitat succession and seasonal ecological changes, would continue uninterrupted. Ongoing environmental pressures unrelated to the Proposed Project, such as habitat degradation, pollution, or invasive species, could still impact on terrestrial ecology in the area over time.

10.4.3 PRIMARY MITIGATION

Primary mitigation refers to mitigation which is integrated into the design of the Proposed Development.

Where potentially significant or higher adverse effects remain despite project design and embedded mitigation, additional measures (i.e., secondary mitigation) have been proposed. These will be fully implemented to minimise potential impacts of the Proposed Development.

Further mitigation for effects assessed as not significant is also outlined below, where the scale of construction activities warrants general mitigation measures and best-practice design to reduce any effects on the receiving environment.

The impact assessment in Section 10.4.7 includes consideration of measures integrated into the engineering design (i.e., primary mitigation), aimed at preventing, reducing, and, where possible,

offsetting significant adverse impacts on the environment. For a full description of primary mitigation measures integrated into the design of the Proposed Development, refer to Chapter 6: Project Description.

10.4.3.1 NOISE ATTENUATION MEASURES

Perimeter Bund and Noise Attenuation Measures for Piling

NPWS (2014) recommends incorporation of the use of fully enclosing or confined bubble curtains, encircling absorptive barriers (e.g., isolation casings, cofferdams) or other demonstrably effective noise reduction methods at the immediate works site, in order to reduce underwater sound propagation from on-site operations, as studies have shown that such methods can provide a significant reduction in sound input to the wider aquatic environment in the order of 10-30 dB. Use of these recommended risk minimisation measures is further supported by modelling undertaken by Stokes *et al*. (2010), which predicted noise reductions of approximately 20 dB when employing large de-watered cofferdams, and a review completed by JNCC (2024), which found physical noise abatement systems used for offshore piling can reduce underwater noise levels by up to 24 dB.

As described in Chapter 6: Project Description and shown on the application drawings, a perimeter bund of rockfill will be constructed in advance of piling activities. This integrated design feature will act as a physical barrier between the piling works and the open marine environment. These bunds serve dual functions: (i) providing a safe and stable platform for land-based piling equipment, and (ii) significantly attenuating underwater noise transmission into the wider marine environment. At the ORE Berth 1 and ORE Berth 2 quay walls, bunds will be progressively advanced from the shoreline, ensuring that piling is always carried out within an enclosed environment. As piling progresses, the bunds will be excavated and repositioned forward, ensuring that piling always occurs within an enclosed environment.

For piling at the New Small Boat Harbour, the rockfill bunds forming part of the permanent perimeter of the reclamation area will be temporarily extended to fully enclose the Small Boat Harbour to contain underwater noise generated by impact piling. This will create a closed lagoon during piling works, shielding the open sea from underwater noise propagation. Once piling within the Small Boat Harbour is complete, the temporary rockfill closure will be removed and the material reused in subsequent phases of the works.

This bunded piling approach will result in a substantial reduction in noise transmission into open water compared to conventional offshore piling operations. By acting as a natural noise barrier, the bund will limit the spatial extent of auditory injury and behavioural disturbance for marine mammals and semi-aquatic mammals such as the otter. The containment of piling noise within the bunded area considerably reduces noise propagation into open water, thereby lowering the potential impact on sensitive mammal species.

Rotary Bored Piling Technique and Noise Reduction

The bearing piles for the two main quays will generally comprise rotary bored piles due to the presence of underlying rock that does not ideally allow for impact driving. Rotary bored piling uses a

slow, controlled drilling to advance piles, rather than percussive hammering. As such rotary piling is considerably quieter than conventional impact piling.

The primary use of rotary bored piling techniques for the majority of the Proposed Development's piling activities represents a fundamental 'designed-in' noise mitigation measure. Unlike impact piling - known to generates intense, impulsive broadband noise with peak sound pressure levels often exceeding 210-240 dB re 1 µPa @ 1m - rotary drilling produces continuous, lower-level noise. Scientific studies, such as Erbe and McPherson (2017), have measured source levels for geotechnical drilling in the range of 142-145 dB re 1 µPa rms @ 1m, demonstrating a reduction in overall noise energy and peak pressure by tens of decibels compared to impact piling. Rotary piling substantially reduces the potential for high-intensity noise exposure to marine fauna, rendering the modelled worst-case impacts for impact piling (110m PTS, 1800m TTS) as highly precautionary in the context of the proposed methodology.

Additionally, since piling will be undertaken from a rockfill bund rather than directly through the water column, the risk of sound transfer into the marine environment is further reduced compared to piling from a barge.

Depending on the Contractor’s approach, pile installation is expected to take 15-18 months, as rotary bored piling is generally slower than impact piling. During peak productivity, two to three rotary piling rigs are expected to be operational on-site.

Rock Blasting Approach and Environmental Controls

As part of the Proposed Development, rock blasting may be required along the quay wall to facilitate the installation of infill sheet piles between the main bearing piles. The method assumes that a line of retaining wall along the quay face will be pre-drilled and blasted using explosives to fracture the underlying rock.

NPWS (2014) recommends incorporation of the use of fully enclosing or confined bubble curtains, encircling absorptive barriers (e.g., isolation casings, cofferdams) or other demonstrably effective noise reduction methods at the immediate works site, in order to reduce underwater sound propagation from on-site operations, as studies have shown that such methods can provide a significant reduction in sound input to the wider aquatic environment in the order of 10-30 dB, with Stokes *et al*. (2010) predicting ~20 dB for de-watered cofferdams, and JNCC (2024) reporting reductions of up to 24 dB for physical abatement systems.

In this case, blasting works will be carried out from land-based equipment positioned directly on the sequentially advanced rockfill bunds along the ORE Berth 1 and ORE Berth 2 alignments. The bunds serve dual functions - providing a safe working platform for land-based piling/blasting equipment, and acting as an acoustic barrier that significantly reduces noise transmission into open waters.

To further control sound propagation, only the minimum quantity of explosives required to achieve effective rock fracture will be used, and where practicable, multiple smaller blasts will be favoured over fewer large detonations to reduce peak sound levels. In addition, explosive charges will be placed within boreholes or shallow depressions and stemmed with suitable materials (e.g. gravel, crushed rock) to further reduce propagation of underwater sound.

To ensure controlled execution and minimise environmental impacts, each blast will be spaced approximately 2–3 weeks apart, progressing sequentially along the quay wall to allow for installation of the main quay wall bearing piles. Each blast is expected to prepare a length of c. 30 m of quay wall, requiring approximately 20 individual blasting days to complete both ORE Berths. Each blast will involve up to 15No. holes, 90mm in diameter, drilled at 2m centres to a depth of c. -16 mCD. Each hole will receive 50kgs of explosive such as 'Kemex 70' (as used at Rossaveel Fishery Harbour Centre, Co. Galway) and will be detonated using non-electric starter line for safety considerations on site.

All drilling and blasting work will be conducted from the dry rock-filled platform, with an effective rock overburden to c. +4 mCD above the blast point. This significantly dampens vibration and sound propagation into the water column. The bund therefore provides an effective natural acoustic barrier, materially reducing the transmission of impulsive sound waves and minimising potential impacts on marine mammals and other sensitive receptors. A sloping revetment will also be installed as shown on the application drawings.

In addition, to ensure controlled execution and minimise environmental impacts, each blast will be spaced approximately 2–3 weeks apart, progressing sequentially along the quay wall to allow for installation of the main quay wall bearing piles.

10.4.3.2 POLLUTION EVENT

Chapter 7: Soils, Geology, Hydrogeology and Contamination and Chapter 9: Water Quality and Flood Risk describe primary mitigation incorporated into the design of the Proposed Development that will function during operation of the Proposed Development. It describes the measures that will be employed to avoid the release of pollutants, including waste, sewage and the accidental release of hydrocarbons, during the operational phase of the Proposed Development.

10.4.3.3 LIGHTING MEASURES

To address potential ecological impacts of artificial lighting on bats, a sensitive lighting strategy has been developed in accordance with best-practice guidance, specifically Bats and Artificial Lighting at Night: Guidance Note 08/23 (ILP and BCT, 2023). The strategy follows the mitigation hierarchy by prioritising avoidance of sensitive features, minimising lighting extent and duration, and reducing potential ecological disturbance through design and control.

The Proposed Development is located entirely within a working port environment and includes approximately 21 hectares of land reclamation to support offshore renewable energy operations. Lighting will be introduced within the marine environment and across existing infrastructure, where a baseline of artificial lighting is already present. The lighting scheme has been developed to minimise ecological effects and includes the following measures:

- Lighting Control by Zone: The 21 ha ORE storage yard will be lit using 30 m high lighting masts arranged around the perimeter. Each mast will be individually controlled, with lamp clusters directed downward onto specific operational areas. Lighting will be switched on only when personnel are active within a given zone. Once work is completed, lights will be turned off or dimmed to approximately 20% of full output to maintain basic safety/security lighting.

- Smart Lighting for Access Roads and Harbour: The access road, ORE Operations Compound, and Small Boat Harbour will be lit using 8 m and 12 m lighting columns, activated by motion sensors at either end. When triggered, full lighting will operate for ~5 minutes to ensure safe access, after which luminaires will dim to 20% output.
- Warm White, Directional, and Shielded Lighting: All luminaires will be downward-directed LED units with a warm white colour temperature (≤2700 K), with reduced blue light content and negligible upward light. Optical shielding will be incorporated to minimise lateral spill. Lighting is therefore focused strictly on operational zones, and does not extend to adjacent vegetated or undeveloped areas.
- Compliance with Functional Lighting Standards: Average lux levels have been selected to meet operational safety needs while avoiding over-illumination:
    - ORE Storage Yard: 20 lux (uniformity 0.25)
    - Fishing quay/slipway/parking: 30 lux (uniformity 0.25)
    - ORE Berths 1 and 2: 50 lux (uniformity 0.40)
    - Road lighting: 20 lux average (uniformity 0.40), consistent with IS EN 13201-2 (C2 class)
    - Pontoon lighting: Low-level pedestal-mounted bulkhead lights at 1 m height (20 lux, 0.25 uniformity)

These design and operational features were developed with input from lighting professionals and informed by ecological survey data. No lighting will fall on potential bat commuting or foraging features, and dark corridors will be maintained along the limited vegetated site boundaries. Given the low habitat value of the surrounding environment, lack of roosts or key flight corridors, and adoption of integrated mitigation, lighting-related impacts on bats are considered not significant.

10.4.4 TERTIARY MITIGATION

The International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/785), is an international marine environmental convention which aims to prevent both operational and accidental discharge into the marine from sea going vessels. Ireland ratified the various elements of the MARPOL Convention through the Sea Pollution Act 1991, the Sea Pollution (Amendment) Act 1999 and the Sea Pollution (Miscellaneous Provisions) Act 2006. MARPOL 73/78 was given further legal effect through Statutory Instruments introduced under these Acts. The Acts place a legal obligation upon operators of vessels to implement measures to prevent both operational and accidental discharges from ships of substances, which may damage the marine environment as well as human health.

The construction and operational activities will result in an increase in vessels and therefore a potential risk of accidental spills however an incidence of pollution whether from an accidental occurrence or operational activities is not considered likely considering the legal obligations to comply with MARPOL 73/78.

The Wildlife Act 1976, as amended, provides that it is an offence to destroy vegetation on uncultivated land between 1st March and 31st August (inclusive). As such, pre-construction site

clearance works and removal of any vegetation including trees, scrub, hedgerows and shrubs will take place outside this period, which will ensure that there will be no disturbance to these habitats within the Proposed Development Boundary during this period.

Integrated measures for surface water runoff will include the collection and treatment of surface water through oil interceptors before discharge, maintaining water quality standards and preventing pollutants from reaching local watercourses. Additionally, an Oil Spill Response Plan will be implemented to manage any potential spills of oil or Hazardous and Noxious Substances (HNS) within the Harbour Limits, following Rosslare Europort's established protocols (Rosslare Europort, 2018).

The following good practice guidelines during the Construction Phase will be implemented for all species:

- Any excavations left open overnight will have a means of escape for otters (and all other species), a ramp at least 30cm in width and angled no greater than 45° will be placed inside the hole/trench overnight to allow the mammal to escape.
- Temporary fencing is essential and will be placed around the machinery at the end of the working day (cordoned off) and any machinery that could potentially harm mammals (and other species such as common lizard) will be made safe overnight.
- All proposed works for the Proposed Development during the construction phase will be restricted to daylight hours (where possible), to minimise disturbance to nocturnal creatures.
- To avoid risking mammals and other species becoming trapped in excavations created during site works, holes and trenches will also be covered with timber mats or appropriately fenced off. Fencing will be designed with adequate height to keep deer out while being low enough to prevent entry by smaller mammals, such as badgers and otters, as well as herpetofauna (common lizard, smooth newt and common frog). N.B. Fencing will be checked regularly to ensure no animals are trapped.
- Timber mats will be placed on wet concrete as this could present a hazard to wildlife where small mammals or herpetofauna may become stuck.
- Good practice guidelines during construction as described above, will be implemented to mitigate construction impacts on other mammals and herpetofauna potentially resting (e.g. hibernating hedgehogs, smooth newt and common lizard), commuting and foraging in the Proposed Site.

Additional tertiary mitigation measures relevant to terrestrial ecology receptors are set out to mitigate the potential for the accidental release of pollutants including hydrocarbons and cementitious material during the construction phase by Chapter 7: Soils, Geology, Hydrogeology and Contamination, Chapter 9: Water Quality and Flood Risk of this EIAR and the outline Construction Environmental Management Plan (oCEMP) which accompanies this application.

10.4.5 KEY ECOLOGICAL RECEPTORS

Table 10.11 below provides a comprehensive summary of the ecological evaluation for all receptors that could potentially be affected by the Proposed Development and identifies the KERs to be assessed further. KERs which are assessed further are summarised in Table 10.12.

In line with CIEEM (2022) and NRA (2009) guidelines, KERs include areas of conservation within the ZoI of the Proposed Development due to their potential exposure to impacts. Conversely, features beyond the ZoI are not considered KERs. Habitats valued as Local Importance (Higher Value) or greater are also regarded as KERs, as they contribute significantly to local biodiversity. Lower-value habitats, including built or highly modified areas such as BL3 and ED3, are generally not considered KERs.

Table 10.11:Summary of Ecological Valuation and Identification of KERs

Receptor	Evaluation Rationale	Receptor Value	KER?
Designated Sites for Nature Conservation within the vicinity of the Proposed Development- SACs			
Slaney River Valley SAC [0781] – located 6.6km northwest from Proposed Development via the marine environment. Located 5.3km directly to the Proposed Development.	The Slaney River Valley SAC encompasses a diverse range of habitats and species, some of which are pertinent to terrestrial ecology: *Old sessile oak woods with Ilex and Blechnum in the British Isles* [91A0], *Alluvial forests with Alnus glutinosa and Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0], and *Otter* [1355]. The SAC is located approximately 6.6 km northwest from the nearest point of the Proposed Development Boundary, with hydrological connectivity present through the coastal waters. While this SAC supports Annex II-listed otters (*Lutra lutra*), available research (Vincent Wildlife Trust, n.d.; Kruuk, 1995; O'Sullivan, 1993) indicates that coastal otters typically maintain small foraging ranges (<2 km), particularly in prey-rich estuarine environments such as Wexford Harbour. Given the distance from the SAC and the availability of high-quality foraging and freshwater resources within Wexford Harbour and the Slobs, it is unlikely that otters associated with the SAC population would travel as far as the Proposed Development site. Although no evidence of otter activity was recorded during the survey, including camera traps, the coastal environment within the Proposed Development Boundary could theoretically provide opportunistic foraging habitat. However, the Miltown_Rosslare_010 river waterbody, located 550 m from the Proposed Development at its	International Importance	No

Receptor	Evaluation Rationale	Receptor Value	KER?
	closest point, flows northward by Rosslare town before discharging into Wexford Harbour. While this river provides a hydrological connection to the Slaney River Valley SAC, it is a small, low-flow watercourse, largely fed by agricultural drains, and not suitable for otter foraging. Additionally, the river's variable flow levels throughout the year make it an unreliable freshwater source, further reducing its potential importance for otters. Coastal otters typically remain close to the shore (<100m) when foraging and are not known to traverse long distances across open water. Given that the Proposed Development Boundary is over 8 km from the SAC, otters would need to travel an extensive distance along the coastline or through unsuitable inland waterways to reach the site—a highly unlikely scenario given their foraging behaviour and habitat preferences. As a result, *ex situ* QI Otter associated with the SAC are not considered a KER for this assessment, as **a viable pathway for their presence within the Proposed Development Boundary is unlikely.**		
Designated Sites for Nature Conservation within the vicinity of the Proposed Development - pNHAs			
St. Helen's Burrow pNHA [0782] – located 2.5km directly via terrestrial-based	The glaciomarine muds and silts at St. Helen's Burrow pNHA primarily contribute to geological and paleoenvironmental understanding rather than directly to terrestrial ecology. These sediments are valuable for reconstructing historical glacial conditions, but they generally do not	National Importance	No

Receptor	Evaluation Rationale	Receptor Value	KER?
impact pathway from land reclamation and construction activities, 2.3km from the dredging activities via the marine-based impact pathway.	impact current terrestrial habitats or species directly. Thus, while the site holds geological significance, it has minimal relevance to terrestrial ecology in terms of habitat or species conservation in the present day. Therefore, no impact source has been identified for St. Helen's Burrow pNHA that is relevant to the Terrestrial Ecology chapter.		
Wexford Slobs and Harbour pNHA [0712] – located 2.7km directly from Proposed Development, 6km via the marine-based impact pathway	The Wexford Slobs and Harbour pNHA has limited relevance for terrestrial ecology within the scope of the Terrestrial Ecology chapter. Since this pNHA primarily supports habitats for waterfowl and wading birds associated with wetlands and estuarine environments, its main relevance pertains to ornithology rather than terrestrial habitats or species. Therefore, any ecological concerns for this area would be addressed in the ornithological section rather than the Terrestrial Ecology chapter. Therefore, no impact source has been identified for Wexford Slobs and Harbour pNHA that is relevant to the Terrestrial Ecology chapter.	National Importance	No
Lady's Island Lake [0704] – located 4.1km directly from the Proposed	Lady's Island Lake pNHA holds limited relevance to the Terrestrial Ecology chapter, as it primarily consists of lagoon and coastal habitats that support aquatic and bird species. In addition, this large natural sedimentary percolating lagoon is separated from the sea by a sand and gravel barrier and dunes, which further isolates its lagoon and coastal	National Importance	No

Receptor	Evaluation Rationale	Receptor Value	KER?
Development Boundary	habitats from potential terrestrial impact pathways. This natural separation limits any potential influences on the lagoon's ecological receptors from the Proposed Development via terrestrial and marine pathways. Since no impact pathway or source has been identified for terrestrial habitats or species in this context, it does not require further consideration in the Terrestrial Ecology chapter.		
Habitats			
Annex I Habitats (outside an SAC) Marram Dunes (White Dunes) [2120] Embryonic Shifting Dunes [2110]	A viable source-pathway-receptor link may exist between the Proposed Development and the Annex I habitats Marram Dunes [2120] and Embryonic Shifting Dunes [2120] due to potential changes in sediment dispersal and deposition patterns. The source of impact is the disturbance and potential resuspension of sediments during dredging and reclamation activities, which may influence sediment transport dynamics. The pathway is through tidal and wave-driven sediment movement, which could alter the natural sediment supply to these dune systems, potentially affecting their stability, accretion, or erosion rates. Given the sensitivity of these habitats to changes in sediment deposition, any alteration to sediment dynamics could have implications for their structure and ecological function.	International Importance	Yes

Receptor	Evaluation Rationale	Receptor Value	KER?
Scrub (WS1)	This habitat covers a small area within the Proposed Development Boundary and is regarded as common, lacking significant biodiversity or rarity. According to the ecological value criteria outlined by EPA (2022) and TII (2009) which include naturalness, size, rarity, and diversity, it does not hold notable ecological importance. Therefore, it is not considered to be a KER	Local Importance (Lower Value)	No
Buildings and Artificial Surfaces (BL3)	Buildings and Artificial Surfaces (BL3) within the area mainly consist of small garden sheds and cabins that do not provide highly valuable habitats for roosting bats and offer minimal biodiversity value. Consequently, this habitat type is not considered to be a KER.	Negligible	No
Seawalls, piers and jetties (CC1)	Seawalls, piers, and jetties (CC1) generally have limited ecological value for terrestrial receptors. These man-made structures inherently support less biodiversity compared to natural habitats, although their value can vary based on specific circumstances. Common in developed coastal areas, seawalls, piers, jetties, and breakwaters are not rare habitats and do not support diverse ecosystems for terrestrial flora and fauna. Due to their artificial nature, limited flora diversity, and ubiquity, these structures are considered of lower ecological value. The Sea walls, piers, and jetties (CC1) habitat may be considered of moderate nature conservation value for nesting birds. However, birds are not relevant to this chapter, as they are assessed separately in	Local Importance (Lower Value)	No

Receptor	Evaluation Rationale	Receptor Value	KER?
	Chapter 14: Ornithology. Consequently, this habitat type is not considered to be a KER.		
Mixed Sediment Shores (LS5)	Mixed Sediment Shores (LS5) are typically natural habitats, especially when influenced minimally by human activity, such as natural tidal systems and sediment deposition. The more natural and undisturbed the shore, the higher its ecological importance. However, in this case the habitat is characterised by rocks from an artificial breakwater surrounding an almost enclosed small harbour and shows little to no vegetation cover. Given its small size, semi-natural state, and significant alteration, this mixed sediment shore exhibits low biodiversity. According to the ecological value criteria outlined by EPA (2022) and NRA (2009), it is therefore considered to be of low ecological value. Consequently, this habitat type is not considered to be a KER.	Local Importance (Lower Value)	No
Shingle and Gravel Banks (CB1)	A narrow, discontinuous strip of shingle and coarse sand with scattered coastal vegetation was recorded along the southern boundary of the Small Boat Harbour, above the high-water mark. While the habitat shows affinities with Annex I habitats [1220] *Perennial Vegetation of Stony Banks* and [1210] *Annual Vegetation of Drift Lines*, its extent is extremely limited, fragmented, and of low ecological quality due to the modified shoreline context. It is therefore considered of Local	Local Importance (Lower Value)	No

Receptor	Evaluation Rationale	Receptor Value	KER?
	Importance (Lower Value) and has been scoped out of further assessment as a KER.		
Dry Meadows and Grassy Verges (GS2)	A very small proportion of the Proposed Development Boundary consists of Dry Meadows and Grassy Verges (GS2). This habitat does not represent a significant biodiversity resource, as it occupies only a limited area within the site. Additionally, this habitat type is ubiquitous and does not inherently support high biodiversity or rarity. In accordance with the ecological value criteria outlined by EPA (2022) and TII (2009), specifically naturalness, size, rarity, and diversity, this habitat is considered of low ecological value. Consequently, his habitat is not considered to be a KER.	Site Importance (Lower Value)	No
Sedimentary Sea Cliffs (CS3)	A very small section of this habitat will be directly removed by the Proposed Development (approximately 1.5 m into the face of the cliff). While the habitat is recognised as being of Local Importance (Higher Value), the scale of removal is negligible relative to the wider extent of the feature. Potential indirect effects, such as dust deposition, are not anticipated to result in significant adverse impacts, as effective dust suppression and management measures are set out in Chapter 18: Air Quality. On this basis, the habitat has been scoped out as a KER.	Local Importance (Higher Value)	No
Reed and Large Sedge Swamps (FS1)	This habitat occurs in small, discrete patches within the Proposed Development area. It is classified as being of Local Importance (Higher Value) but will only be minimally affected by the works footprint. As	Local Importance (Higher Value)	No

Receptor	Evaluation Rationale	Receptor Value	KER?
	with CS3, the risk of indirect impacts (e.g. dust) is considered negligible given the primary mitigation measures proposed in Chapter 18: Air Quality. The habitat has therefore been scoped out as a KER, as significant residual effects are not anticipated.		
Recolonising Bare Ground (ED3)	Recolonising Bare Ground (ED3) does not represent a significant biodiversity resource and is considered ubiquitous, lacking inherent biodiversity or rarity. Based on the ecological value criteria outlined by EPA (2022) and NRA (2009) — naturalness, size, rarity, and diversity — this habitat is of low ecological value. Therefore, this habitat is not considered to be a KER.	Local Importance (Lower Value)	No
Flora Species			
Flora Species listed on the Flora Protection Order (FPO)	Although often limited in diversity, their presence enhances overall biodiversity, particularly alongside other rare species. These fragile species are highly sensitive to environmental changes, requiring careful conservation management. The six species under the FPO recorded within the NBDC 2km^2 grid T11G and their desirable habitat are assessed below. Corn Marigold typically prefers disturbed, arable land like farmland or open fields. Hairy Bird's-foot-trefoil often requires grassland or areas with open, well-drained soils. Pale Flax prefers well-drained, calcareous soils, often found in dry grasslands. The types of habitats found within	Local Importance (Higher Value)	No

Receptor	Evaluation Rationale	Receptor Value	KER?
	the Proposed Development Boundary (e.g., scrub, or disturbed ground) do not offer the conditions that these particular species typically require to grow or thrive. Little-robin and Round-leaved Crane's-bill are often associated with rocky or sandy soils with some level of disturbance or open ground. The dense scrub backing the mixed sediment shoreline and the limited, busy shoreline environment along the small boat harbour offer neither the dry, well-drained conditions nor the open space these species typically require. The presence of reeds and great horsetail indicates a somewhat moister, denser environment, which would further inhibit these species from establishing there. Slender Thistle also tends to thrive in disturbed or open coastal areas but would likely struggle to compete in a dense, scrubby environment. The sloping gradient with thick vegetation, combined with the small stretch of shoreline along an active harbour, doesn't provide the open, disturbed ground or sandy coastal habitat Slender Thistle prefers. No FPO-listed species were recorded during the habitat walkover survey, though some are documented in the wider area. Therefore, FPO-listed flora species are not carried forward into the design mitigation and impact assessment sections.		
Flora Species on Irelands Red Lists	Flora species classified as Near Threatened (NT) and Endangered (EN) on Ireland's Red Lists are of high conservation concern, with risks of decline or extinction. These designations highlight the importance of	Local Importance (Higher Value)	No

Receptor	Evaluation Rationale	Receptor Value	KER?
(Near Threatened and Endangered)	focused conservation efforts to protect Ireland's biodiversity. The presence of these species often indicates minimally disturbed, high-quality habitats, and even small populations are crucial for species survival due to their limited numbers. No NT or EN species were recorded during the habitat survey, though some have been documented in the surrounding area. Therefore, NT and EN flora species are not considered KERs.		
All other non-Red listed flora species	Non-Red listed flora species are those that, while present within a given area, are not considered at risk of extinction and do not face immediate conservation threats. Their ecological value is lower compared to Red-listed species, as their commonness reduces their rarity value and reflects their adaptability to various environments. Additionally, the terrestrial spatial footprint of the Proposed Development is minimal, affecting only a small portion of the scrub habitat (approximately 1m above seawater). Due to their commonness and lower conservation concern, these non-Red listed flora species are not considered further in this assessment.	Local Importance (Lower Value)	No
Invasive Non-Native Species (INNS)	Winter heliotrope was recorded within the Proposed Development during the walkover survey in September 2025. No species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations (S.I. 477 of 2011) or other high-impact INNS were identified. However, Winter heliotrope (*Petasites fragrans*), a medium-	Not applicable - not a KER (assessed separately for	*Yes *included in the assessment for clarity, but not considered a KER as they

Receptor	Evaluation Rationale	Receptor Value	KER?
	impact INNS, was recorded in discrete patches within the terrestrial footprint (see EIAR Technical Appendix 10 for full details). While INNS do not have conservation value and are therefore not considered KERs, they have the potential to negatively affect native biodiversity and therefore require management. Their presence is addressed separately in the impact assessment and mitigation sections below.	management purposes).	hold no positive ecological value
Fauna Species			
Otter (non-SAC populations)	The otter (*Lutra lutra*) is a species of significant conservation importance in Ireland, despite its classification as "Least Concern" in the Red List of Irish Mammals (Marnell *et al*., 2019). Ireland represents a stronghold for this species, highlighting its importance in maintaining global biodiversity. Therefore, otter is carried forward into the design mitigation and impact assessment sections. The otter population near the Proposed Development is assessed as separate to the River Slaney SAC population and has been assigned 'county importance'. Refer to foraging ranges of coastal otters in Section 10.3.7.1. Otter (non-SAC populations) are considered a KER.	County Importance	Yes

Receptor	Evaluation Rationale	Receptor Value	KER?
Badger	While badgers are commonly associated with farmland, woodland, and hedgerow habitats, their presence and ecological value are largely determined by habitat suitability and availability. The Proposed Development, characterised by a coastal setting, limited scrub, and the busy small boat harbour, is not considered suitable for badgers and the site is bordered by the coast and busy roadways, further restricting habitat connectivity and movement for badgers. Badger is not considered a KER in this assessment.	Local Importance (Lower Value)	No
Other Mammals protected under the Wildlife Act1976, as amended	Due to the low suitability of the Proposed Development, other mammals are not considered KERs.	Local Importance (Lower Value)	No
Amphibians	The Proposed Development lacks any aquatic habitat features, making it unsuitable for breeding amphibians. While local populations of common frogs and smooth newts are considered to be of Local Importance (Higher Value), they are not regarded as KERs.	Local Importance (Lower Value)	No
Reptiles – Common Lizard	Due to the potential habitat suitability for reptiles at the Proposed Development and recording of a reptile on survey, reptiles are considered KERs.	Local Importance (Higher Value)	Yes

Receptor	Evaluation Rationale	Receptor Value	KER?
Bats	Given the Proposed Development's potential role as part of a foraging route for bats, as identified through project-specific surveys, bats are considered KERs.	Local Importance (Higher Value)	Yes

Table 10.12: Summary of KERs identified within the ZoI of the Proposed Development

KER	Justification	ZoI
Annex I habitats: **- Marram Dunes (White Dunes) [2120]** **- Embryonic Shifting Dunes [2110]**	A source-pathway-receptor link may exist between the Proposed Development and the Annex I habitats Marram Dunes [2120] and Embryonic Shifting Dunes [2110] due to potential changes in sediment dispersal. Dredging and reclamation could resuspend sediments, altering transport dynamics via tidal and wave action. This may affect sediment supply to the dunes, impacting their stability, erosion, or accretion, with potential consequences for their ecological function.	Approx. 3km northwest of the Proposed Development via the marine environment
Otter	Although no evidence of otter was recorded during the field surveys, the coastal habitat within the Proposed Development Boundary is considered suitable for foraging and potentially for the establishment of holts. As a result, otters are considered a KER.	Within 5 km of the Proposed Development Boundary
Common Lizard	As suitable habitat for reptiles exists within the Proposed Development Boundary and a common lizard was recorded during surveys, common lizard is therefore identified as KERs.	Within the Proposed Development Boundary
Bats	As project-specific surveys have identified the Proposed Development environs as a potential foraging route for bats, they are considered KERs.	Within 3 km of the Proposed Development Boundary

10.4.6 CONSTRUCTION PHASE IMPACTS ON TERRESTRIAL ECOLOGY KEY ECOLOGICAL RECEPTORS

10.4.6.1 SUMMARY OF RELEVANT CONSTRUCTION PHASE IMPACTS

Construction phase activities are described in detail in Chapter 6: Project Description of this EIAR.

The construction phase activities that are relevant to terrestrial ecological receptors are:

- **Habitat Removal/Degradation:** The infilling of the existing small boat harbour will result in the loss of shoreline, scrub habitat and vegetated sedimentary sea cliffs, as well as localised degradation of adjacent habitats due to construction disturbance (e.g., edge effects, compaction, and altered drainage). These works will also alter local topography and landforms through excavation and earthworks.
- **Sediment Dispersal:** Dredging and the disposal of dredged material may cause sediment dispersion, potentially affecting adjacent terrestrial and coastal habitats through changes in sediment transport and deposition patterns.
- **Underwater Noise:** Piling, blasting, and dredging will generate underwater noise, which may cause temporary or permanent hearing damage (PTS/TTS) in otters and could lead to short-term displacement from foraging areas.
- **Displacement Effects:** Airborne noise, vibration and dust emissions from construction activities may lead to temporary displacement of otters, but due to their expected return after disturbance, long-term displacement is unlikely.

10.4.6.2 EMBRYONIC SHIFTING DUNES [2110] AND MARRAM DUNES (WHITE DUNES) [2120]- ANNEX I HABITATS (NOT IN SAC)

Habitat Degradation

Sediment dispersal modelling (EIAR Technical Appendix 8: Coastal Processes of Volume III of this EIAR) indicates that increased suspended sediment concentrations will extend approximately 2.5km southeast and 1.5km westward from the Proposed Development.

Increased suspended sediment concentrations and associated changes in bed level caused by sediment suspension from dredging and disposal activities are therefore not anticipated to affect the Embryonic Shifting Dunes and Marram Dunes (White Dunes) habitats, the closest of which is located approximately 3 km northwest of the Proposed Development Boundary.

Therefore, impacts on this Annex I habitat during the construction phase of the Proposed Development are considered **not significant**.

10.4.6.3 BATS

The three (3) trees within the Proposed Development were assessed during the PRA survey and determined to have negligible roosting potential due to their immaturity and lack of features such as cracks, crevices, or dense ivy cover. Of the thirty (30) structures, consisting mainly of small garden sheds and metal containers/cabins, twenty-one (21) were assessed as having low roosting potential, while the remaining nine (9) were deemed to having negligible suitability for roosting bats. Bat

emergence surveys were carried out on the twenty-one (21) structures classified as having low roosting potential. Although bat activity was recorded in the area during these surveys, no bats were observed emerging from the structures, confirming the absence of roosting bats within the Proposed Development Boundary.

Bat activity surveys recorded occasional commuting activity, primarily by common pipistrelle and Leisler's bat, with occasional observations of soprano pipistrelle activity. Activity levels were generally low across all survey methods, with a single bat visually observed during the transect surveys and occasional bat passes recorded during the static detector surveys. Common pipistrelle was recorded frequently at specific static locations, while Leisler's bat was also detected in spring and summer with fewer detections in autumn. Minimal activity by soprano pipistrelle and negligible activity by Nathusius' pipistrelle and brown long-eared bat were recorded.

As part of the updated walkover survey in September 2025, the suitability of the buildings and trees was re-assessed to validate the baseline, with reference to the updated *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (Collins *et al*., 2023). No roosts or signs of bats were recorded, and no change in suitability was identified compared to the 2023 baseline. All buildings and trees within the Proposed Development remain categorised as Low or Negligible suitability for roosting bats (see EIAR Technical Appendix 10 for full details). No further surveys were deemed necessary following this update.

The Proposed Development is located within a busy port environment with existing lighting and significant anthropogenic activity. The urbanised landscape near the coast creates barriers to bat movement with more suitable foraging and commuting habitats, such as hedgerows and treelines, located inland further west, away from the Proposed Development Boundary. There are no linear features in the area to directly connect the outer, more suitable habitats to the Proposed Development Boundary.

Construction lighting will be task-specific, directional, and confined to active work areas and vessel decks, as described in Chapter 4: Project Description. It will only be used when required during hours of darkness for specific activities such as dredging; there will be no broad area illumination beyond safety needs and the construction period will be over a ≈24 month period.

Given this limited, focused use - and evidence that common pipistrelle can tolerate low-level lighting when managed appropriately

(ILP, 2023) - effects on commuting and foraging bats are considered **not significant**.

10.4.6.4 OTTER

The 2023 baseline surveys did not record any evidence of otter activity within the Proposed Development Boundary. However, during the updated terrestrial walkover survey in September 2025, fresh evidence of otter use was identified. Multiple signs (trails and couches) of activity were recorded along the vegetated sedimentary sea cliffs (CS3) and the breakwater (spraints, couches and prey remains) surrounding the Small Boat Harbour, including spraints, prey remains, trails, and couches, confirming active use of the site by otter for both foraging and resting. No holts were identified.

Injury or Mortality from Vessel Collisions during Dredging

During dredging, vessel movements will increase slightly within Rosslare Harbour. However, the addition of 1-2 vessels for dredging will not significantly elevate activity levels in this already busy port. Any otters in the area are likely accustomed to regular vessel traffic, and, if present, they are likely adapted and acclimated to these conditions.

On this basis, the significance of the effects of vessel collision on otters during dredging is considered **not significant**.

Injury, Mortality or Displacement due to Underwater Noise

Although otters are less sensitive to underwater noise than some marine mammals and spend most of their time on land (Ruiz-Olmo, Jiménez and Chacón, 2007), impulsive noise from piling and blasting can still pose risks. High noise levels near foraging or resting areas may lead to temporary or permanent hearing damage, affecting their ability to detect prey and communicate. Sudden, loud sounds may also disorient otters, increasing their risk of injury when escaping disturbances.

Noise modelling was conducted for impact piling, rock blasting and dredging activities that may be required for the Proposed Development. For full details on the methodology of the noise modelling, including limitations, please refer to Chapter 13: Marine Mammals.

Underwater hearing thresholds for Eurasian otter (*Lutra lutra*) are not defined. The Phocid Carnivores in Water (PCW) hearing group was applied as a proxy for otter, providing a conservative worst-case scenario for evaluating potential PTS and TTS impacts (Southall *et al*., 2019; NMFS, 2018).

The significance of noise-related impacts is influenced by proximity to the noise source (e.g., piling, blasting and dredging).

- Permanent Threshold Shift (PTS) refers to a permanent loss of hearing sensitivity due to high-intensity noise exposure (irreversible auditory injury).
- Temporary Threshold Shift (TTS), on the other hand, is a temporary reduction in hearing sensitivity, with full recovery over time.

Both PTS and TTS impacts depend on intensity, duration, and frequency of noise exposure, as well as the species' sensitivity to underwater noise.

The zero-to-peak Sound Pressure Level (SPL) is a measure of the maximum pressure level of a sound wave relative to a reference pressure level. It represents the largest instantaneous pressure change caused by the sound source, measured in decibels (dB re 1 µPa for underwater noise). SPL is expressed in decibels (dB re 1 $\mu Pa^2 \cdot s$) and is used to evaluate the risk of both temporary (TTS) and permanent threshold shifts (PTS) in hearing. In the context of underwater noise, it is used to assess the potential for auditory injury in species sensitive to impulsive sounds, such as otters when they are present in aquatic environments. This metric is particularly relevant for short-duration, high-intensity noise sources, such as blasting or pile driving.

The weighted cumulative Sound Exposure Level (cSEL) accounts for the total energy of sound exposure over a specified time period (e.g., 24 hours) and considers the hearing sensitivity of the

species in question (i.e., weighted). Weighting is applied to adjust for the species' auditory frequency range, ensuring the measure reflects the potential impact on their hearing. cSEL is expressed in decibels (dB re 1 $\mu Pa^2 \cdot s$) and is used to evaluate the risk of both TTS and PTS in hearing. For otters, this metric is important when assessing the cumulative impacts of sustained noise-generating activities, such as dredging or prolonged pile driving.

To accurately model cumulative impacts of noise exposure, the noise modelling assumed marine mammals swim away from the sound source at different speeds and initial starting distances. The modelling results are presented for swim speeds ranging from 1.5–3 m/s to reflect variability in species' swimming capabilities. An adult female otter is estimated to swim at maximum speeds of 1.3–1.5 m/s when underwater and swim at about 0.26 m/s when searching for food (Nolet, et al. 1993; Pfeiffer and Culik 1998). However, otter prefers to swim at speeds of 0.89 m/s (Pfeiffer and Culik 1998).

It should be noted that displacement to marine mammals from impact piling has been assessed by comparing the estimated maximum noise levels to a single-pulse unweighted SEL threshold of 145 dB re 1 $\mu Pa^2 s$. This threshold is mainly based on observations of harbour porpoise displacement from impulsive noise (Brandt *et al.,* 2016; Thompson *et al.*, 2013; Lucke *et al.*, 2009), which may be conservative for other species, such as otter. Tougaard (2016) indicates that disturbance to seals could result in displacement at similar sound levels, supporting the use of this conservative threshold.

If rock blasting is required, only one event will occur per day, with intervals of 2–3 weeks between events. A short-term startle response is expected (if species are within the potential zone of impact), with animals likely returning to their original locations, making long-term displacement of otters unlikely.

Displacement to otters from dredging within the Proposed Development Boundary has been assessed by comparing the estimated noise levels to an SPL threshold of 140 dB re 1 μPa^2. This threshold is based on observations of disturbance to marine mammals from non-impulsive noise sources (by Southall *et al.*, 2007).

For full details of the modelling undertaken please see EIAR Technical Appendix 13: Marine Mammals.

Noise Modelling Predictions – Piling

The significance of noise-related impacts from piling depends on proximity to the piling activities.

Noise modelling was conducted to inform the assessment of potential impacts from piling, with impact piling considered as the worst-case scenario due to its higher levels of underwater noise generation. As outlined in Section 10.4.3.1 and Chapter 6: Project Description, piling will primarily involve rotary bored piling, which produces substantially lower noise levels than impact piling. In addition, where impact piling is required (e.g., in the Small Boat Harbour), a reduced hammer energy (120 kJ) will be used, further lowering noise output compared to the worst-case scenario modelled (240 kJ). Piling will also occur within a bunded environment, which will act as a physical barrier between piling works and the open marine environment, further attenuating noise transmission. Therefore, noise levels in practice are expected to be considerably lower compared to the modelling

predictions due to the combined use of rotary bored piling, reduced hammer energy for any impact piling, and the bunded construction environment.

Various piling activities will be conducted during the construction of the Proposed Development. The noise modelling analysis therefore focused on impact piling with a hammer energy of 240 kJ, representing the most impactful scenario in terms of underwater noise emissions. However, as noted above, the actual piling methodology and site conditions differ from the worst-case modelling scenario, and noise levels in practice are expected to be considerably lower due to the combined use of rotary bored piling, reduced hammer energy for any impact piling, and the bunded construction environment.

The influence of piling within the bund on underwater noise emitted from piling activities (see Chapter 6: Project Description of this EIAR) could not be considered in the noise modelling undertaken, as there is insufficient empirical data to establish definitive values for the noise attenuation levels provided by bunds. Additionally, the noise of piling within an enclosed bunded area cannot be precisely modelled due to site-specific variables, including bund structure, water depth, and substrate composition, all of which influence noise attenuation. As a result, while the bund is expected to reduce sound input to the wider aquatic environment in the order of 10-30 dB (DAHG, 2014), the exact reduction in underwater noise levels cannot be determined by the noise modelling undertaken.

Noise modelling undertaken for the underwater noise generating activities associated with the Proposed Development (piling, dredging and blasting) indicates impact piling has the smallest predicted PTS zone, with thresholds exceeded within 8m for the PCW hearing group. However, predicted distances to weighted cSEL thresholds for PTS are not exceeded at any of the assessed swim speeds for PCW.

The likelihood of PTS occurrence in otters is extremely low, as the predicted PTS impact range from impact piling is only 8 m, and otters are unlikely to remain in such close proximity to construction activities (Tolrà, Ruiz-Olmo, and Riera, 2024; Stepien *et al*., 2024). PTS results in permanent auditory damage, which could impair otters' foraging efficiency and communication; however, given their preference for nearshore shallow waters and natural avoidance of disturbance, direct exposure to these noise levels within 8 m of the piling activities is considered highly unlikely.

Integrated noise-reduction measures incorporated into the project design will further reduce the potential for auditory injury. The bunded piling environment will act as a physical barrier, limiting underwater noise propagation, while the primary use of rotary bored piling—a quieter alternative to conventional impact piling—will substantially reduce overall noise emissions. If impact piling is required, a lower-energy hammer (120 kJ) is predicted to be used, further minimising noise levels in open water.

With piling occurring within a contained bunded area, noise levels are expected to be at least 10 dB lower than the worst-case scenario (DAHG, 2014). Consequently, the actual PTS impact zone is expected to be significantly smaller than predicted, with negligible risk of exposure to otters. Considering the very restricted PTS impact range, the presence of a bunded piling area, the primary use of quieter piling methods, and the reduced-energy hammer for impact piling, the overall risk of

auditory injury and displacement to otters from piling is considered negligible, and therefore **not significant**.

To avoid predicted cSEL thresholds for TTS, species in the PCW group would need to swim away from the piling activity from an initial distance of at least 80m if swimming at a speed of 1.5 m/s for this group, at 40 m at 2.0 m/s, at 30 m at 2.5 m/s, and 20 m at 3.0 m/s, indicating that TTS is a potential concern only in close proximity to the piling source.

Construction-related disturbance is expected to deter otters from the immediate vicinity of piling activities, reducing the likelihood of exposure to noise levels capable of inducing TTS. Studies on similar species indicate that individuals tend to maintain distance from high-intensity noise sources, which inherently lowers the risk of auditory impacts.

The predicted TTS impact range extends up to 80 m, however, given otters' natural avoidance behaviour (Tolrà, Ruiz-Olmo, and Riera, 2024; Stepien *et al*., 2024) and the intermittent nature of piling, exposure to TTS-inducing noise levels is expected to be limited in both duration and extent. Additionally, short recovery times have been observed in species following exposure to pile-driving noise, indicating that any temporary avoidance would not result in prolonged displacement or habitat exclusion.

As TTS is a temporary and reversible condition, does not result in long-term auditory impairment, and has a restricted impact range, the risk of sustained auditory effects or behavioural disruption for otters is minimal, and is therefore considered **not significant**.

The displacement zone is predicted to extend up to 4.6 km from the piling sound source. However, considering the integrated design measures (rotary bored piling as the primary method, reduced hammer energy for impact piling, and the bunded piling environment), the actual displacement impact range is expected to be significantly smaller than modelled. While temporary avoidance of the immediate piling area may occur, otters have access to alternative foraging and movement corridors along the coastline. Given their preference for nearshore waters and ability to relocate to quieter areas, any displacement effects are expected to be short-term and localised.

The 2025 surveys recorded moderate to high levels of otter activity, including evidence of foraging and commuting within the ZoI. On this basis, and adopting a precautionary approach, displacement impacts are considered potentially significant despite the likely overestimation of the modelled range. This reflects both the ecological importance of otters as a KER and the regular use of the area for coastal foraging.

Therefore, the overall risk of displacement effects on otters is considered **significant at a local level**.

Noise Modelling Predictions – Rock Blasting

The significance of noise-related impacts from blasting depends on proximity to the blasting site.

For the OCW hearing group, which includes otters, the PTS threshold for blasting is predicted to be exceeded at distances up to 320 m, with an upper and lower range of 95 – 525 m representing uncertainty in the model. This indicates a small-to-moderate spatial extent where PTS could occur if otters are present during blasting activities.

Given the permanent nature of PTS and the lack of any warning or ramp-up before blasting occurs, otters within this range would not have the opportunity to leave before exposure. PTS results in irreversible auditory injury, impairing otters' ability to navigate, forage, detect cues in the aquatic environment, and communicate. Baseline surveys confirm active otter use of the Proposed Development Boundary and surrounding habitats (spraints, couches, prey remains, and trails recorded in 2025), meaning otters may realistically be present within the predicted PTS zone. Therefore, the effects of PTS up to 320 m from the blasting source are considered **significant**, as individuals present within this range would be at risk of irreversible auditory injury.

The TTS threshold for blasting is predicted to be exceeded at distances up to 590 m with a range of 175 – 965 m representing uncertainty in the model. This presents a larger area of potential temporary auditory injury compared to PTS but remains moderate in spatial extent. While TTS is temporary, it can impair otters' foraging efficiency and reduce their ability to detect environmental cues or maintain social interactions. Given the confirmed otter presence within the Proposed Development Boundary and surrounds, the effects of TTS up to 590 m from the blasting source are also considered **significant,** as they have the potential to disrupt essential behaviours.

As outlined in Section 10.4.3 above and Chapter 6: Project Description, blasting will be infrequent, with a maximum of one event per day and intervals of 2–3 weeks between events. Blasting will also occur within the confined Small Boat Harbour, where temporary bunds will act as a physical barrier between blasting works and open water.

There is some inherent uncertainty in predicting the characteristics of underwater noise from confined explosives, which are less widely studied than open-water detonations. Limited measurements from comparable harbour blasting activities show substantial variability: Nedwell and Thandavamoorthy (1992) recorded zero-to-peak pressures as low as 6% of equivalent open-water conditions, while Hempen *et al*. (2007) reported values of 19–41% during blasting at the Miami Harbour Deepening Project. On this basis, the present assessment applies a mid-range value of 23.5% to estimate likely sound pressure levels from confined blasting, with lower and upper bounds of 6–41% used to define precautionary ranges for potential impact distances. The weight of explosive relevant to these calculations is that contained in a single drill hole, as short delays between detonations prevent pressures from overlapping constructively.

Accordingly, the actual PTS and TTS zones of impact for otters are expected to be substantially smaller than the precautionary open-water predictions (320 m and 590 m, respectively), with risk further reduced by the infrequent blasting schedule and the likelihood of otter avoidance behaviour.

Notwithstanding these mitigating factors, given the impulsive nature of blasting, the absence of any ramp-up, and the confirmed active use of the Proposed Development Boundary by otters, the risk of both PTS and TTS is considered significant on a precautionary basis.

Therefore, blasting-related noise impacts on otters are assessed as **significant**.

Noise Modelling Predictions - Dredging

For dredging, the noise modelling predicts that distances to zero-to-peak SPL thresholds and weighted cSELs at any swim speed for PTS and TTS thresholds for the PCW hearing group will not be

exceeded. Therefore, no impacts of PTS or TTS on the PCW hearing group or otters during dredging activities are predicted to occur.

Noise modelling based on harbour porpoise (considered a conservative proxy for seals and subsequently, for otters) predicts avoidance behaviours due to levels exceeding the SPL displacement threshold of 140 dB re 1 µPa² up to 1.3 km from the dredging activity. This has the potential to disrupt key behaviours, including foraging, communication, and movement along the coastline.

Otters were confirmed within the Proposed Development Boundary during the September 2025 Terrestrial Walkover Survey, with evidence of active use for resting and foraging (spraints, prey remains, couches, and trails). Displacement of individuals from this area could therefore interrupt essential behaviours, particularly where coastal foraging routes or prey resources overlap with the predicted displacement zone. While otters are known to adjust their movement patterns in response to disturbance (Tolrà, Ruiz-Olmo, and Riera, 2024; Stepien *et al*., 2024) and may relocate to alternative habitats during noisy activities, the extended two-year dredging programme increases the likelihood of sustained disturbance effects rather than short-term disruption.

On this basis, and considering the confirmed moderate to high activity levels recorded during recent surveys, behavioural disturbance effects from dredging are assessed as **significant at the local level**.

Degradation of Habitat and Food Sources – Impacts on Water Quality (Increased Sedimentation)

Dredging and disposal activities during construction will lead to increased suspended sediment concentrations (SSC), which can degrade food sources for otters by reducing the availability of prey species sensitive to increased sediment levels.

Sediment dispersal modelling (EIAR Technical Appendix 8: Coastal Processes of Volume III of this EIAR) indicates increased SSCs will extend approximately 2.5km southeast and 1.5km westward from the Proposed Development Boundary. The maximum predicted SSC level increase is 9.96 mg/L at Carnsore Point SAC, which is within acceptable levels for environmental protection (EIAR Technical Appendix 8: Coastal Processes of Volume III of this EIAR). Increased suspended sediment concentrations and associated impacts on water quality are therefore not anticipated to affect food sources for otter.

Therefore, effects on otters of potential impacts on prey species from increased sedimentation during dredging activities are considered **not significant**.

Loss of Breeding and Resting Sites – disturbance and displacement

No signs of otter activity, such as holts, couches, or spraints, were recorded during site walkovers within the Proposed Development area. However, it is likely that otters occasionally use the coastal waters along the shore, given their adaptability and ranging behaviour in coastal environments. Coastal otters are known to utilise such areas opportunistically for foraging, though their presence is often transient and influenced by the availability of prey and access to freshwater (Kruuk, 2006; Chanin, 2013; Dalton, Healy, and Murphy, 2021).

Signs of otter activity, such as territorial markings and food remains, typically include spraints (droppings) placed in visible locations to demarcate territorial boundaries. However, female otters do not leave spraints near natal holts to keep them hidden and secure, often choosing remote

locations away from the sight of other otters and human activity. Natal holts may also be located up to 1 km from a waterbody (CIEEM, 2011). These behaviours make signs of breeding activity less apparent. Given the absence of other indicators, such as well-defined paths or other evidence near prominent shoreline features, it is unlikely that the Proposed Development area serves as a significant breeding or resting habitat for otters. Considering the absence of evidence for resting, the availability of alternative suitable habitats in the surrounding area, and the temporary nature of potential disturbances, the Proposed Development is not expected to result in significant effects on otters at a local or regional scale. Therefore, potential impacts resulting in the loss of breeding and resting sites due to disturbance and displacement is considered **not significant.**

Impact on Prey Availability due to Underwater Noise

Underwater noise from construction activities such as piling, blasting, and dredging can impact habitats used by otters, potentially affecting prey availability. Elevated noise levels may cause fish and other aquatic species to move away from the area, which could reduce otter foraging success by decreasing prey abundance.

The noise modelling undertaken has found potential injury to fish species during piling is predicted to be very limited and confined to within 50 m of the piling location while rock blasting within the Proposed Development Boundary could potentially result in injury to fish species. It is predicted that the dredging will not result in injury to any fish species. Prey species may temporarily leave the area during piling and blasting activities and lead to a temporary reduction in prey availability within the construction area for foraging otters during the active construction period. The impacts from these activities are expected to be localised and short-term, with no significant effects on otters from reduction in prey availability anticipated.

Therefore, considering these factors, effects on otters from impacts on foraging habitat and prey availability due to underwater noise are considered **not significant**.

Potential construction noise (in-air), lighting and visual disturbance to otters

Temporary lighting at the site compound may have minimal effects on otters given their crepuscular activity patterns and the existing profile of lighting within the existing port which lies adjacent to the Proposed Development Boundary. Otters in the area are likely either accustomed to or avoid these existing light sources, and the ongoing anthropogenic activity characteristic of this busy port likely contributes to the low or absent otter populations. Additionally, planned lighting measures aimed at other light-sensitive species, such as bats including directional and shielded lighting will further reduce any potential impact on otters. Therefore, the effects of disturbance from impacts of lighting on otter are considered **not significant**.

In terms of visual disturbance from vessel activity, the addition of 1-2 vessels for dredging and infilling activities is not expected to significantly affect otter behaviour. The area already experiences high levels of vessel traffic, and any otters nearby would likely be accustomed to such activities. Operating within designated routes and adhering to harbour speed restrictions means that vessel activity will remain within the Proposed Development Site, minimising disturbance. By keeping vessels in the harbour rather than moving in and out, the likelihood of disturbance is further reduced, deterring otters from approaching the affected area and helping to contain activity within a

predictable zone. Therefore, the effects of impacts of visual disturbance on otter are considered **not significant**.

In-air noise effects on otters are expected to be minimal, with impacts unlikely to extend beyond 150 m (NRA, 2006, CIEEM, 2011). Therefore, the effects of impacts of airborne noise are considered **not significant**.

10.4.6.5 COMMON LIZARD

Habitat Loss

The Proposed Development will result in the loss of suitable habitat (0.6 ha of scrub) for common lizards within the Proposed Development Boundary. This habitat loss is unlikely to have an effect on the local lizard population as more extensive and suitable habitat, such as grasslands, scrub and recolonising ground, will remain in the wider landscape. Therefore, the impact of habitat loss on common lizards is considered **not significant**.

Increased Risk of Disturbance and Direct Mortality from construction activities

Site clearance works associated with the Proposed Development pose a risk of disturbing or harming common lizards, particularly during hibernation when they shelter in secure spots. This risk is heightened if construction overlaps with these areas during colder months. However, during the active season (typically March to October), common lizards are more mobile and likely to avoid disturbances.

While the ongoing activity associated with the port and small boat harbour has likely reduced lizard numbers in the area, there are sections of scrub habitat landward of the small boat harbour that provide suitable areas for basking lizards. Additionally, structures and other features within the small boat harbour offer potential hibernation sites for lizards during colder months.

Given the presence of suitable habitat and the observation of a lizard during the field surveys, effects of the impact of mortality to individual lizards is considered **significant**.

10.4.7 OPERATIONAL PHASE IMPACTS ON TERRESTRIAL ECOLOGY

10.4.7.1 BATS

Disturbance of Flight Patterns due to Operational Lighting (Light Spill)

Artificial lighting at night (ALAN) is widely recognised as a potential ecological stressor for bats, which are nocturnal and rely on dark environments for foraging and commuting. Lighting can disrupt bat activity by increasing exposure to predators, altering prey availability, and causing barrier effects along flight paths. The effects are highly species-specific, with slower-flying, light-averse species (e.g. *Myotis* spp., brown long-eared bats) more negatively affected than faster-flying, edge-adapted species such as common pipistrelle, which may even exploit lighting to forage for insects congregating around luminaires (Rydell, 1992; ILP and BCT, 2023).

During static detector surveys within the Proposed Development site, common pipistrelle activity was high in spring and summer during the 2023 surveys. Leisler's bat was recorded at low to moderate levels, while other species such as soprano pipistrelle and brown long-eared bats were

recorded at lower levels or not at all. The dominant species are therefore those more tolerant of light, supporting the likelihood of limited behavioural disruption in response to carefully designed lighting.

The Proposed Development is situated within a highly modified coastal environment associated with existing infrastructure at Rosslare Europort, where baseline artificial lighting is already present. The Proposed Development includes land reclamation and extension of port operations into the adjacent marine environment. Field surveys undertaken in 2023 to assess bat activity and roost potential did not identify any features of medium/high suitability for roosting bats within or immediately adjacent to the Proposed Development Boundary. A PRA survey was repeated again in September 2025 to update the baseline data, however no PRFs were identified and no further surveys were required. No mature treelines, hedgerows, or other vegetated linear features typically associated with commuting corridors were recorded within the footprint of the Proposed Development. While some low levels of bat activity were detected during the 2023 surveys, these were primarily associated with more light-tolerant species such as common pipistrelle and Leisler's bats, and no evidence was found of Key Habitats for light-sensitive species or functionally significant commuting routes within the surveyed area.

The lighting associated with the operational phase is not expected to substantially exceed existing ambient levels from ongoing port activity and has been designed in accordance with current best-practice guidance to limit ecological effects. As outlined in Chapter 4: Project Description (and in Section 10.4.3.3), the lighting scheme includes the use of warm white LED luminaires (<2700 K) with zero upward light output, directional and cowled fittings, and automation (e.g. timers, motion sensors) to limit the duration and spatial extent of illumination. Column heights have also been selected to reduce horizontal spill, particularly towards any areas with ecological sensitivity. These measures are in line with the recommendations in ILP GN08/23 (ILP and BCT, 2023) and the earlier Bats and Lighting Guidelines (ILP, 2018), and aim to maintain light levels within thresholds demonstrated to minimise impacts on bats, particularly edge-adapted species such as *Pipistrellus* spp.

Given the absence of significant roosting or commuting habitat, the dominance of more light-tolerant bat species, and the integration of sensitive lighting design, the potential for disturbance or disruption to local bat populations during the operational phase is considered negligible. The lighting scheme is not expected to sever any functional ecological corridors, nor result in significant light spill onto valuable habitats. Operational lighting impacts on bats are therefore assessed as **not significant**.

Mortality/Injury from Collision with Vessels due to Increased Vessel Activity

Bats foraging near the port may encounter ships or vessels entering the harbour; however, these vessels will be moving at slow speeds, as is typical in port environments. This low-speed movement reduces the likelihood of collisions, allowing bats to avoid approaching vessels.

This collision risk already exists within the port due to ongoing vessel activity. The expected increase in vessels associated with the operational phase of the Proposed Development is not anticipated to

increase the likelihood of vessel collision. The effects of this impact is therefore considered **not significant**.

10.4.7.2 OTTER

Permanent Loss of Foraging Habitat

The September 2025 terrestrial walkover survey confirmed that otters actively use the Proposed Development Boundary for foraging and resting, with spraints, prey remains, couches, and trails recorded along the vegetated sedimentary sea cliffs (CS3) and the breakwater surrounding the Small Boat Harbour. This indicates that the site currently provides functional foraging habitat.

The Proposed Development will result in the permanent loss of this foraging habitat due to land reclamation and infilling. However, the area directly affected is small in the context of the wider coastline, and extensive alternative foraging habitat and resting areas is available in adjacent coastal waters and estuarine areas. Given the availability of these alternative habitats and the highly mobile nature of otters, the permanent loss of foraging habitat within the Proposed Development Boundary is considered **not significant**.

Ongoing Disturbance from Noise and Activity due to increased vessel activity

The operational phase will involve an increase in vessel activity; however, Rosslare Harbour is already a busy port environment with high baseline levels of marine traffic. Otters using the area are therefore likely to be habituated to regular vessel activity and noise. The addition of project-related vessel movements is not predicted to substantially elevate disturbance beyond existing levels. Furthermore, vessel operators will be required to adhere to Rosslare Harbour's operational speed restrictions and navigation requirements, which will minimise the risk of collision or disturbance.

Otters are highly mobile and can avoid vessels if encountered directly. Although some localised avoidance of operational areas may occur, otters will retain access to extensive alternative foraging and commuting habitat along the wider coastline. Accordingly, ongoing disturbance from noise and vessel activity during operation is considered **not significant**.

Potential Runoff and Water Quality Impacts

Wastewater generated during operation will be directed to the Wastewater Treatment Works operated by Uisce Éireann for Rosslare Harbour, ensuring that no untreated wastewater enters the environment. Surface water runoff will be collected and treated through oil interceptors before discharge, maintaining water quality standards and preventing pollutants from reaching local watercourses. Additionally, an Oil Spill Response Plan will be implemented to manage any potential spills of oil or Hazardous and Noxious Substances (HNS) within the Harbour Limits, following Rosslare Europort's established protocols (Rosslare Europort, 2018).

With these measures in place, potential impacts on water quality and knock-on effects to otter prey resources will be effectively managed. Effects on otter from operational runoff or water quality impacts are therefore considered **not significant**.

10.4.7.3 COMMON LIZARD

Ongoing Disturbance and displacement – habitat loss

Regular site activity, noise, and human presence during the operational phase may deter common lizards from returning to or establishing within the immediate area. Increased human presence and activity could disrupt the natural behaviour of lizards, potentially making the habitat less attractive for basking, foraging, or seeking shelter.

However, given the limited extent of suitable habitat currently within the Proposed Development Boundary and the availability of more extensive, undisturbed habitats in the surrounding area, common lizards are expected to favour these less disturbed areas. As a result, the effects of this impact on common lizard is considered **not significant**.

Edge Effect and Microclimate Changes

Infrastructure and stored components within the Proposed Development Boundary could introduce edge effects along habitat boundaries, including changes in sunlight exposure, increased wind, and shifts in humidity levels. These changes may impact vegetation structure and microclimates, potentially affecting basking and cover areas for any common lizards near the Proposed Development Boundary, as variations in sunlight and wind influence temperature and moisture, key factors for lizard thermoregulation and shelter.

Considering the small area of suitable habitat within the Proposed Development Boundary and the availability of more extensive, undisturbed habitats nearby, these edge effects are expected to be localised and minor. Therefore, the effects of this impact on common lizards is considered **not significant**.

Displacement due to Artificial Lighting

Lighting required for operational safety during the Proposed Development's operational phase could deter common lizards from using habitats near illuminated areas, potentially disrupting their natural behaviours. Artificial lighting may interfere with key activities such as basking and foraging, as lizards tend to avoid brightly lit areas, especially during dawn and dusk when they are most active. The light may alter the microclimate around illuminated spots, impacting temperature and humidity levels essential for lizard thermoregulation.

Considering the small area of suitable habitat within the existing Proposed Development Boundary and the availability of more extensive, undisturbed habitats nearby, any potential disruption caused by lighting is expected to be limited. The effects of operational lighting on common lizards within the Proposed Development Boundary is considered **not significant**.

10.4.8 SIGNIFICANCE OF EFFECTS

Table 10.13 gives the analysis of the significance of effects during the construction and operational phases of the Proposed Development based on the magnitude of the likely effect and sensitivities of receptors within the ZoI.

Table 10.13: Summary of Predicted Impacts on Terrestrial KERs, Significance of Effects, Spatial Extent of Significant Effects, and Secondary Mitigation Requirements

KER	Impact	Significance of effect	Spatial extent of significant effect	Secondary Mitigation required
Construction Phase				
Bats	Lighting	Not Significant	N/A	No
Otter	Injury or mortality from vessel collision during dredging activities	Not Significant	N/A	No
	Injury, mortality or displacement due to underwater noise:			
	• During Piling Activities	Significant	4.6 km displacement	Yes
	• During Blasting Activities	Significant	590 m from the sound source (TTS)	Yes
	• During Dredging Activities	Significant	1.3 km displacement	Yes
	Degradation of habitat and food sources – impacts on water quality (increased sedimentation)	Not Significant	N/A	No
	Loss of breeding and resting sites – disturbance and displacement	Not Significant	N/A	No
	Impact on prey availability due to underwater noise	Not Significant	N/A	No
	Potential construction noise (in-air), lighting and visual disturbance	Not Significant	N/A	No
Common Lizard	Habitat Loss	Not Significant	N/A	No
	Increased risk of disturbance and direct mortality from construction activities	Significant	Within the Proposed Development Boundary	Yes
Operational Phase				
Bats	Disturbance to flight patterns due to operational lighting (light spill)	Not Significant	N/A	No
	Mortality/injury due to vessel collision	Not Significant	N/A	No
Otter	Permanent loss of foraging habitat	Not Significant	N/A	No
	Ongoing disturbance from noise and activity due to increased vessel activity	Not Significant	N/A	No

KER	Impact	Significance of effect	Spatial extent of significant effect	Secondary Mitigation required
	Potential runoff and water quality impacts	Not Significant	N/A	No
Common Lizard	Habitat loss due to ongoing disturbance and displacement	Not Significant	N/A	No
	Edge effect and microclimatic changes	Not Significant	N/A	No
	Displacement due to artificial lighting	Not Significant	N/A	No

10.5 SECONDARY MITIGATION

These mitigation measures will be implemented to prevent adverse effects on terrestrial ecology from the Proposed Development. In some cases, secondary mitigation has been identified even where effects are assessed as *not significant*. This does not reflect any uncertainty in the significance determinations but rather provides an additional layer of precautionary protection for KERs. The application of such measures reflects best practice in ecological management and ensures that, where potential sensitivities exist, the Proposed Development is delivered with a robust environmental safeguard.

10.5.1 CONSTRUCTION PHASE MITIGATION MEASURES

The following avoidance and mitigation measures are proposed to minimise effects on terrestrial ecology receptors during the Construction Phase of the Proposed Development.

10.5.1.1 PRE-CONSTRUCTION SURVEYS

Pre-construction survey will be undertaken by a suitably qualified Ecological Clerk of Work (ECoW) for protected species prior to vegetation clearance and/or construction. These will include, but not limited to, the following:

- Badger:

  A confirmatory badger survey will be carried out by a qualified ECoW. The survey area will extend up to 150m beyond all works areas within suitable habitat, in line with the *Guidelines for the Treatment of Badgers during the Construction of National Road Schemes* (NRA, 2005). Should a sett be recorded within the scheme extents prior to construction, steps for sett closure will need to be documented in the mitigation strategy and presented up front in the ECoW Survey Report. These steps will include measures to ensure compliance with relevant guidelines and best practices. Good practice guidelines during construction as described below in Section 10.5.1.2, will be implemented to mitigate potential construction impacts on badgers commuting and foraging within the Proposed Development Boundary.

- Otter:

  The 2023 baseline surveys did not record evidence of otter activity; however, the updated 2025 walkover confirmed active use of the site by otters, with spraints, prey remains, trails,

and couches recorded along the breakwater and vegetated sedimentary sea cliffs (CS3). No holts were identified. As a precautionary measure, pre-construction surveys shall be undertaken by an experienced ecologist no more than 10-12 months in advance of the commencement of works to confirm whether otter holts, couches, or intensified activity have become established within or adjacent to the Proposed Development Boundary. This timeline will allow for preparation of a derogation application under the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended), in the unlikely event that one is required. If changes to otter activity is observed during the pre-construction surveys within the Proposed Development Boundary, good practice guidelines during construction as described below will be implemented to mitigate construction impacts on otters potentially commuting and foraging in the Proposed Development Site

  - Exclusion zones will be established around identified holts, with a buffer distance determined based on guidance from the *NRA Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes* (2008).
  - Timing restrictions will be implemented on construction activities to avoid peak otter activity periods, particularly during crepuscular and nocturnal hours.
  - Monitoring by the ECoW during construction will ensure compliance with mitigation measures and allow a rapid response to any unforeseen otter activity.
  - Toolbox talks will be delivered to all construction staff by the ECoW prior to works commencing, highlighting the presence of otters, the mitigation measures in place, how to identify otter signs, and the procedures to follow if otters are encountered during construction, as set out above.

- Bats:

  The 2023 surveys identified no bat roosts within the Proposed Development Boundary, and the 2025 PRA confirmed no evidence of roosts or features triggering the need for further surveys. However, as a precautionary measure, a confirmatory bat PRA survey shall be conducted by a qualified ecologist with bat expertise to ensure no roosts have become established within the Proposed Development Boundary prior to the commencement of any construction stage activities in sufficient time to allow for preparation of an application for a derogation under the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended), in the unlikely event that one is required.

  - If roosting/foraging bats are identified, the Design and Construction of bat mitigation measures will comply with the requirements of the bat specialist, the Standards, and the UK bat mitigation guidelines '*A Guide to Impact Assessment, Mitigation and Compensation for Developments Affecting Bats*' (Reason and Wray, 2023).

10.5.1.2 OTTER

While a number of integrated noise-reduction measures have been incorporated into the design of the Proposed Development as primary mitigation (Section 10.4.3), and broader statutory or regulatory measures function as tertiary mitigation (Section 10.4.4), further secondary mitigation is

required where significant residual impacts are predicted to remain, particularly in relation to underwater noise during blasting activities during the construction stage.

The following secondary mitigation measures comprise project-specific actions designed to further reduce the scale, intensity, or likelihood of effects on otters, particularly in relation to piling, blasting, and dredging. Although NPWS (DAHG, 2014) guidance was developed for marine mammals, these measures are also applied to otters to ensure compliance with best practice guidelines and legislative protections under the Wildlife Acts 1976-2018 and the EU Habitats Directive (92/43/EEC). Should updated statutory guidelines be issued before or during the construction phase that supersede the 2014 guidance, the updated guidelines will be fully adhered to.

Mitigation measures will apply to noise-producing activities such as piling, blasting (if required), dredging, and sediment dumping to ensure potential impacts on otters are reduced to negligible levels.

General Mitigation Measures

The following measures will be implemented during piling, blasting and dredging (including perimeter bund installation and reclamation area infilling) works:

- A trained and experienced Marine Mammal Observer (MMO) or MMOs shall be appointed to monitor for otters during piling, dredging, dumping of sediment, rock placement and blasting operations. The MMO will scan the surrounding area to ensure no otters are in the pre-determined exclusion zone in the 30-minute period prior to operations. The appropriate Monitored Zone (MZ) recommended by NPWS (DAHG, 2014) will be implemented during dredging works, including dumping, piling and blasting activities.
- For dredging and material placement within the enclosed lagoon (Small Boat Harbour) and bunded areas (ORE Berths), MMOs will conduct a 30-minute pre-watch prior to commencement to ensure no otters are present within the bunded areas prior to any material placement activities. The 30-minute pre-watch is only required if the MMO has not been continuously present leading up to the rock placement activities. For example, if the MMO is already conducting a pre-watch during dredging operations, this monitoring will continue through the dredging activities and the transit from the Dredging Area to the Reclamation Area, covering the requirements for material placement. If material placement occurs prior to or following dredging activities, the pre-watch can be coordinated to include all activities within a single continuous monitoring period.
- MMOs will be positioned on appropriate elevated platforms from which the entire MZ can be effectively covered without any obstruction of view. MMOs will be positioned as near to the centre of the MZ as is practicable, i.e., adjacent to the sound source.
- Noise-producing activities will only commence in daylight hours where effective visual monitoring, as performed and determined by the MMO, has been achieved. Where effective visual monitoring is not possible, the sound-producing activities will be postponed until effective visual monitoring is possible. Visual scanning for otters will only be effective during daylight hours and if the sea state is World Meteorological Organisation (WMO) Sea State 4 (≈Beaufort Force 4 conditions) or less.

- A clear communication protocol, agreed on-site, will be established between the MMO and the Works Superintendent to confirm whether the relevant activity may proceed or resume following a break. Activities shall only commence or resume upon positive confirmation from the MMO.
- All otter detections will be systematically recorded, encompassing both sightings observed during formal monitoring watches and incidental observations made outside of these designated periods, including observations made by additional personnel onsite. Detailed records of all otter sightings documented will be reported to the NPWS.
- Any approach by otters into the immediate (<50m) works will be reported to NPWS without delay.

Piling Specific Remedial and Mitigation Measures

Note: As piling will be conducted within contained (small boat harbour) and partially enclosed (ORE berths) bunded areas, with impact piling with a lower energy level of 120 kJ (small boat harbour) and rotary piling (ORE berths) as the primary methods of piling employed, the PTS and TTS zones of impact are expected to reduce considerably in distance to negligible levels.

Measures proposed to specifically reduce the potential impacts of noise from piling activities on otters are:

- A 1,000 m Monitored Zone (MZ) will be applied, with a 30-minute pre-watch required before commencement. No otters may be present in the MZ during this period.
    - Once operations are underway with appropriate ramp-up, activities will continue regardless of night-time conditions, reduced visibility, or the presence of marine mammals within the MZ.
- Bunded Area Checks: For works within the enclosed Small Boat Harbour or bunded areas at the ORE Berths, MMOs will confirm the absence of otters within the enclosed areas before works commence.
- Ramp-Up Procedures: A ramp-up or soft start will be used for where practicable, and possible to do, gradually increasing underwater noise levels over 20–40 minutes after pre-start monitoring.
    - Where the measures outlined for a ramp-up procedure cannot be implemented, alternative approaches must be considered. These alternatives should involve introducing underwater acoustic energy in a consistent, gradual, and sequential manner over a period of 20–40 minutes before reaching full output.

Real-Time Acoustic Monitoring (SAM): During the harbour seal breeding season (May–July), real-time underwater noise monitoring will be used to constrain disturbance. The 140 dB re 1 μPa^2 (SPLrms) displacement threshold will be applied to ensure that noise remains below this level beyond the 1,000 m MZ. If the threshold is exceeded outside the MZ, works will cease. Appropriate adjustments will then be implemented to ensure that displacement thresholds remain below this level outside the MZ before piling can resume.

As per NPWS guidance (DAHG, 2014), once piling operations are underway following the 30-minute pre-watch by the MMO and an appropriate ramp-up procedure, activities will continue regardless of the presence of an otter or marine mammal within the MZ.

Otters are known to have peak breeding and cub-rearing activity during spring and summer months in Ireland and elsewhere (Heggberget & Christensen, 1994; Kruuk, 1995; Ruiz-Olmo et al., 2002; Vincent Wildlife Trust Ireland, n.d.; Conserve Ireland, n.d.). The application of SAM thresholds during the May–July seal breeding season therefore also provides additional protection by reducing the risk of disturbance to otters during their peak breeding period

- Reporting Requirements: All sightings will be logged and reported to NPWS.

These mitigation measures, which incorporate both visual observation and acoustic monitoring, will ensure that underwater noise from piling activities associated with the Proposed Development does not result in any adverse effects on otters.

Blasting Specific Remedial and Mitigation Measure

The JNCC (2025) guidelines highlight that ADDs are required for predicted injury ranges exceeding 1 km (i.e., the MZ), with the objective of encouraging marine mammals to vacate the area before detonation. While specific guidance on ADD use is not provided by NPWS (DAHG, 2014), reference has been made to the JNCC (2025) guidelines, which outline the most recent best practice in mitigating injury to marine mammals from underwater explosions.

The following mitigation measures will also be implemented during blasting activities, in accordance with the NPWS "*Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters*" (DAHG, 2014) and the JNCC "Guidelines on the use of underwater explosives near marine mammals" (JNCC, 2025).

The JNCC (2025) guidelines recommend that ADDs are used for predicted injury ranges exceeding 1 km (i.e. the MZ), with the objective of encouraging marine mammals to vacate the area before detonation.

While ADDs are primarily designed to deter seals, a controlled study specifically investigated their effects on non-target species, namely Eurasian otters. Two rehabilitated otters were exposed to simulated acoustic harassment device (AHD) sounds at 1 kHz and 14 kHz, with received levels ranging from 105 to 145 dB re 1 µPa rms while retrieving fish from a feeding station underwater. These levels were 40–80 dB lower than the source levels of commercial AHDs. The otters exhibited clear behavioural responses, including withdrawal from the feeder, startle reactions, and increased time spent at the surface (Stepien *et al.,* 2024). The study concluded that AHDs are capable of deterring otters and may exclude them from areas where devices are deployed.

Although the study used rehabilitated individuals, the authors note that wild otters — being less habituated to human activity and sound — are likely to show stronger avoidance responses. On this basis, the deployment of ADDs in advance of blasting is expected to be effective in ensuring otters vacate the 1,000 m MZ prior to detonation. This represents a precautionary measure to prevent exposure to impulsive sound levels capable of causing PTS or TTS. This approach is consistent with

the JNCC (2025) guidance on blasting mitigation for marine mammals and extends the same principles to otters.

It is recognised that the use of ADDs could cause temporary disturbance to otters present within the Proposed Development Boundary; however, blasting will only occur once every 2–3 weeks, and ADD deployment will therefore not be continuous or applied on consecutive days. As such, any disturbance effects from ADD use are not predicted to be long term or irreversible. Importantly, this approach ensures that otters will not be exposed to impulsive noise levels with the potential to cause TTS or PTS, thereby avoiding permanent auditory injury.

The following will be applied in all blasting operations:

- 1,000 m MZ: A 1,000 m exclusion zone (as per DAHG, 2014) will be established around the blasting location. A 30-minute pre-blast watch will be conducted by a qualified MMO to confirm that no marine mammals or otters are present within the MZ. If any are observed, detonation will be postponed until the zone is clear.
- Acoustic Deterrent Device (ADD) Use:
    - An ADD(s) will be deployed prior to detonation to encourage marine mammals and otters to vacate the 1,000 m MZ. ADDs will be deployed as follows:

        (1) Positioned as close to the detonation site as safely possible.

        (2) Activated only after a 30-minute visual check confirms no marine mammals or otters within 100 m of the device(s).

        (3) Remain active during any delay due to mammal presence; if delays are prolonged, the ADD may be paused to avoid habituation and restarted after 20 minutes to reinitiate deterrence.

        (4) ADD duration and configuration will be agreed with the statutory authority and tailored to ensure effective deterrence from the full PTS zone.

- Species-Specific ADD Configuration:
    - To avoid unnecessary auditory impacts, an ADD specifically designed for harbour porpoise (e.g. FaunaGuard Porpoise Module) will be used. These devices emit high-frequency signals (60–150 kHz) at lower sound pressure levels, aligned with the species' auditory range. This frequency band also falls well within the functional hearing range of phocid carnivores (100 Hz–130 kHz in water) as defined by Southall *et al*. (2007), which are used here as a recognised proxy for otters. On this basis, the ADDs are expected to elicit effective avoidance responses not only in porpoises but also in otters, ensuring that both species are deterred from the MZ prior to blasting. They also include:

        (1) Ramp-up features to gradually increase signal strength.

(2) Variable signal sequences to minimise habituation. This approach reduces the risk of TTS while ensuring mammals vacate the area prior to detonation (Schaffeld *et al*., 2019).

- Daylight-Only Blasting: All blasting will be conducted during daylight hours to ensure effective visual monitoring. Early-day scheduling will allow flexibility for postponement in case of mammal presence or poor conditions.
- Fixed MMO Location and Continuous Monitoring: MMOs will maintain a fixed observation point throughout the 30-minute pre-watch and up to the point of detonation. If any mammal enters the MZ during this period, the blast will be cancelled or delayed until the zone is clear.
- Blast Delay Protocol: If mammals remain within the MZ, blasting will not proceed until clearance is confirmed through visual observation and/or ADD effectiveness.
- Data Recording and Reporting: All sightings and mitigation actions will be recorded using NPWS standardised forms and submitted post-works.

The above approach follows the precautionary principle while balancing the minimisation of potential disturbance from ADDs with the necessity of ensuring marine mammals and otter are not within the PTS zone of impact before detonation. These mitigation measures, which incorporate both visual observation and acoustic deterrents, will ensure that underwater noise from blasting activities associated with the Proposed Development does not result in any adverse effects on marine mammals or otters.

These measures aim to reduce potential auditory injury and disturbance to otters, ensuring that displacement and behavioural impacts remain minimal.

Dredging Specific Remedial and Mitigation Measure

The following mitigation measures will be implemented during dredging activities, in accordance with the NPWS "*Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters*" (DAHG, 2014):

- 500 m MZ: A 30-minute pre-watch will be undertaken by a qualified MMO before the onset of any dredging or sediment disposal activity. No dredging will commence unless the MMO confirms that no marine mammals or otters have been observed within a 500 m MZ during this period.
- No Requirement to Halt Once Active: In line with NPWS guidance, once dredging has commenced (following the pre-watch and a soft start or ramp-up where appropriate), operations may continue regardless of visibility, weather conditions, or mammal presence within the MZ.
- Best Practice During Operations: MMOs will remain present during active dredging and, where feasible, may recommend brief pauses or adjustments to the works to allow nearby animals to move away from the source.

- Seasonal Real-Time Monitoring: Although dredging noise is not predicted to exceed auditory injury thresholds for otters, behavioural disturbance and temporary displacement remain possible within the predicted 1.3 km disturbance range**.** To manage this risk, real-time Static Acoustic Monitoring (SAM) will be used during the harbour seal breeding season (May to July), which overlaps with the peak otter breeding and cub-rearing season (spring and summer), when otters are most dependent on stable foraging conditions to support energetic demands (Heggberget & Christensen, 1994; Kruuk, 1995; Ruiz-Olmo *et al.*, 2002). A displacement threshold of 140 dB re 1 µPa² will be applied as a precautionary benchmark, consistent with thresholds established for sensitive hearing groups.
    - If SAM detects that this threshold is exceeded beyond 1,000 m from the dredging operations, works will be paused and adjustments made before recommencing. This will ensure that potential disturbance to otters remains spatially constrained and that otters with dependent cubs are not subject to prolonged exclusion from the Proposed Development Area.

These mitigation measures, which incorporate both visual observation and acoustic monitoring, will ensure that underwater noise from dredging activities associated with the Proposed Development does not result in any adverse effects on marine mammals and otters.

10.5.1.3 COMMON LIZARD

To protect reptiles potentially in the area during construction, temporary fencing (such as bitumen felt, tin, carpet tiles, or bitumen onduline) will be installed to prevent reptiles from entering active construction zones where they may be at risk. This will be designed so that reptiles cannot pass under, over, or through it. It should be buried securely into the ground and high enough to prevent reptiles from climbing or jumping over. Temporary fencing can be installed in areas with extensive construction activities, such as zones where scrub will be removed or at the interface between the proposed land reclamation works and the onshore area. This approach will help reduce potential harm to reptiles by keeping them out of high-risk zones during construction.

Progressive habitat manipulation will be conducted during the lizard active season (March to October) to encourage lizards to move naturally out of the works area. Vegetation clearance will be carried out in stages, with an initial cut to approximately 150 mm, followed by a second cut to ground level. This phased approach will guide lizards towards adjacent suitable habitats. To prevent lizards from returning, reptile-proof fencing may be erected around the works area.

If trapping and relocation are required, reptile-proof fencing will first be installed around the works area to ensure lizards cannot re-enter. Artificial refugia, such as roofing felt or mats, will be placed to attract lizards. These refugia will be checked daily, and any lizards found will be captured and relocated to a pre-identified receptor site. Habitat manipulation may also be employed to concentrate lizards into smaller areas, making the capture process more efficient.

Following the trapping phase, a systematic destructive search of the topsoil layers will be carried out to locate any remaining lizards. This process involves carefully excavating and inspecting the soil and will only be undertaken once it is reasonably certain that most lizards have been removed to minimise risks of harm.

If translocation is necessary, a receptor site meeting specific criteria will be identified. The site must be located close to the Proposed Development Boundary within the same Local Planning Authority area and be at least the same size as the lost habitat or larger for high-quality habitats. It must include features such as hibernation sites and water bodies, be free from development risks, and be managed to maintain its suitability for reptiles in the long term. New habitats will be prepared and improved as necessary before the commencement of capture and translocation to ensure their suitability for reptiles. Adequate time will be allowed for habitat establishment, ensuring that translocated lizards can thrive in their new environment.

10.5.2 OPERATIONAL PHASE MITIGATION MEASURES

No operational phase secondary mitigation measures have been identified for Terrestrial Ecology receptors.

10.6 CUMULATIVE AND RESIDUAL EFFECTS

10.6.1 CUMULATIVE EFFECTS AND OTHER INTERACTIONS

10.6.1.1 METHODOLOGY

While a single development may not in itself cause a significant impact on the terrestrial environment, a combination of projects within a localised area may result in cumulative negative impacts. Therefore, the cumulative impacts of a project or plan, in association with other projects and plans, must be considered when assessing the potential impacts.

Transboundary effects refer to significant effects that a proposed development in one country may have on the environment of another. The United Nations Economic Commission for Europe (UNECE) Convention on Environmental Impact Assessment in a Transboundary Context, referred to as the 'Espoo Convention', adopted in 1991, establishes the requirement to consider transboundary impacts. The Espoo Convention mandates that assessments extend across borders between Parties of the Convention when a planned activity may cause significant adverse transboundary impacts.

Chapter 25: Interactions of this EIAR considers and assesses cumulative and transboundary effects that may arise as a result of the Proposed Development. Potential impacts relevant to terrestrial ecological receptors, including habitats and species, are documented in Table 10.14 below. Additional projects identified as having the potential to act in combination with the Proposed Development are those most likely to contribute to, or generate, similar pressures to those identified in this assessment.

Further details of these projects and on the assessment methods are provided in Chapter 25: Interactions.

10.6.1.2 ASSESSMENT OF CUMULATIVE IMPACTS

The Cumulative Effects Assessment (CEA) for terrestrial KERs does not identify any significant cumulative effects resulting from the Proposed Development alongside other developments during either the construction or operational phases.

The following impacts were considered by the cumulative assessment:

- Disturbance from construction activities such as habitat loss (removal, disturbance and displacement), habitat degradation and habitat fragmentation.
- Displacement due to increased vessel activities.

The overall significance of the cumulative effect is considered **not significant** for all KERs.

Table 10.14: Projects considered for cumulative effects on Terrestrial Receptors in conjunction with the Proposed Development

Project	During the Construction Phase	During the Operational Phase	Assessment outcome of cumulative effect on terrestrial receptors
N25 Rosslare Europort Access Road (REAR)	Yes	No	Wexford County Council (WCC) proposes to develop the N25 Rosslare Europort Access Road. The proposed road scheme will improve the existing L3068 Ballygeary Link Road to the standards required for a national primary road and to meet the forecast future demand for port traffic. Once operational, traffic generated by activities within the ORE Hub will use this REAR for all transit to and from the facility. If the construction phase of both projects overlaps there may be cumulative effects on terrestrial ecology receptors. No cumulative effects on terrestrial ecology receptors are anticipated in the operational phase.
Maintenance dredging at Rosslare Europort and Ballygeary Harbour, Co. Wexford	No	Yes	This potential cumulative effect is relevant to otter, and no other KERs Iarnród Éireann is responsible for maintenance dredging at Rosslare Harbour, a routine activity independent of the Proposed Development. To minimise cumulative impacts, Iarnród Éireann will ensure maintenance dredging activities do not occur simultaneously with the capital dredging required for the Proposed Development. No cumulative effects on terrestrial ecology receptors are anticipated in the construction phase.

Project	During the Construction Phase	During the Operational Phase	Assessment outcome of cumulative effect on terrestrial receptors
			There may be cumulative effects on terrestrial ecology receptors in the operational phase.

10.6.1.3 ASSESSMENT OF INTERACTIONS

The inter-related effects assessment examines the potential for interactions between relevant effects across multiple topics, occurring both spatially and temporally, to create combined effects on a receptor group. This approach integrates findings from individual assessment chapters to identify any additional impacts that, when considered collectively, may be of greater significance than the effects assessed in isolation for a receptor group.

This includes an assessment of:

- **Phase effects:** The evaluation of the potential for all relevant effects across multiple topics to interact, spatially and temporally, creating inter-related effects on a receptor group.

The term 'receptor group' is used to emphasise that the inter-relationships assessment considers not just individual receptors but focuses on groups of receptors that may be particularly sensitive to inter-related effects.

As the Proposed Development will primarily take place in the marine environment, other ecological receptors, including marine mammals and other marine megafauna and ornithological receptors, have been assessed separately in Chapter 13 and Chapter 14, respectively. Within the Terrestrial Ecology EIA Chapter, only the otter was identified as an applicable KER for the assessment of interactions due to its semi-aquatic nature, making it susceptible to both terrestrial and marine-associated impacts. All other terrestrial receptors have no inter-related effects, as they are strictly land-based with no pathways or sources of potential impacts from marine-related topics.

The potential inter-related effects that could arise in relation to otter are summarised inTable 10.15. Any additional effects are evaluated additively and qualitatively using expert judgement to ensure a comprehensive assessment of potential impacts.

Table 10.15: Inter-related effects (phase) assessment for terrestrial ecological receptor.

Impact / Receptor	Related Chapter	Phase Assessment
Combination of disturbance from underwater noise, the presence of vessels and indirect impacts on prey species	Chapter 9: Water Quality and Flood Risk Chapter 11: Benthic Ecology Chapter 12: Fish, Shellfish and Turtle Ecology Chapter 19: Navigation and Shipping	When considered in combination, the greatest potential for spatial and temporal interactions affecting otters arises from underwater noise impacts, vessel activity, and habitat disturbance. The potential impacts, such as disturbance from piling, blasting, dredging, and vessel operations, were assessed as not significant following the implementation of appropriate mitigation measures. While noise-producing activities and vessel presence may overlap spatially and temporally within the Proposed Development area, it is likely that pre-construction vessel movements and noise from dredging activities may deter otters from the immediate area. This could, in turn, reduce the extent of disturbance or displacement caused by piling, dredging or blasting itself. Similarly, underwater noise from piling activities has the potential to temporarily displace otters from the vicinity, which may reduce the likelihood of direct vessel interactions. As such, the significance of receptor-led effects is not anticipated to increase beyond those already assessed and remains not significant. Additionally, potential disturbances to prey species (such as fish and benthic invertebrates) were assessed in Chapter 11: Benthic Ecology and Chapter 12: Fishing and Fish Ecology. These assessments concluded that any disturbances to prey availability are expected to be highly localised, with sufficient alternative foraging habitat available to otters beyond the potential impact zone.

Impact / Receptor	Related Chapter	Phase Assessment
		Otters are likely to be deterred from areas where prey availability may temporarily decline and are expected to use more suitable foraging habitats away from increased anthropogenic disturbances during the construction phase. While a temporary reduction in prey availability may occur, the likelihood of this leading to a significant impact on local otter populations is considered low. Overall, the combined receptor-led effects on otters do not exceed those already assessed and are therefore considered not significant.

10.6.1.4 ASSESSMENT OF TRANSBOUNDARY IMPACTS

The magnitude of all identified construction and operational phase impacts of the Proposed Development on terrestrial receptors has been documented above. The ZoI for these potential impacts is limited to 15 km, as outlined in the scoping methodology, and no projects beyond this ZoI have been identified that could lead to cumulative impacts. Therefore, transboundary impacts are not considered further.

In principle, transboundary effects could occur where a development in one country affect terrestrial habitats or species in another country or state. However, for terrestrial ecology, transboundary impacts are highly unlikely due to the site-specific nature of the effects. Unlike marine ecosystems, terrestrial species and habitats, including bats, otters, and reptiles, are not subject to transboundary movements to the same extent.

Although bats are capable of commuting several kilometers between roosts and foraging sites, impacts from the Proposed Development are highly localised, and integrated measures (e.g. directional lighting, retention of habitat features) further minimise potential effects. Similarly, habitat loss or fragmentation for terrestrial receptors, such as common lizards or foraging bats, is restricted to the immediate surroundings of the Proposed Development Boundary and will not extend beyond the ZoI.

On this basis, no pathways exist for significant transboundary impacts on terrestrial habitats or species.

10.6.2 RESIDUAL EFFECTS

10.6.2.1 RESIDUAL EFFECTS - CONSTRUCTION PHASE

Following the implementation of the mitigation measures outlined in Sections 10.5 residual effects of the Proposed Development are not anticipated to be significant for any KERs during the construction phase.

For otter, mitigation of underwater noise will be achieved through the presence of a MMO during noise-generating construction activities (piling, blasting, dredging, and disposal). With these measures in place, residual effects of underwater noise on otters will be **not significant**.

To minimise potential impacts on common lizard, a combination of exclusion, habitat manipulation, and, if necessary, translocation measures will be implemented. Temporary fencing will be installed to prevent reptiles from entering active construction zones, particularly in areas undergoing scrub removal or land reclamation works. This fencing will be securely buried into the ground and high enough to prevent climbing or jumping. With these measures in place, potential impacts on common lizard populations within the Proposed Development area will be effectively mitigated, reducing the risk of injury or habitat loss. Therefore, impacts on common lizard will be **not significant**.

A pre-construction survey programme will be conducted by a qualified Ecological Clerk of Works (ECoW) to assess badgers, otters, and bats before vegetation clearance and construction. For badgers, a confirmatory survey within 150 m of the works area will follow NRA (2005) guidelines, with mitigation measures in place if a sett is identified. For otters, pre-construction surveys will confirm any changes in habitat use. If necessary, exclusion zones, timing restrictions, and monitoring will be

implemented. For bats, a Preliminary Roost Assessment (PRA) will ensure no new roosts have formed. If bats are present, mitigation will follow UK Bat Mitigation Guidelines (Reason & Wray, 2023). Toolbox talks delivered by the ECoW will ensure all construction personnel are aware of protected species, exclusion zones, and appropriate response protocols. With these measures, residual effects on badgers, otters, and bats will be **not significant**.

Finally, INNS risks, including Winter heliotrope (*Petasites fragrans*) recorded within the Proposed Development, will be managed through the Invasive Species Management Plan (ISMP). With these biosecurity measures in place, residual effects associated with INNS will be **not significant**.

10.6.2.2 RESIDUAL EFFECTS - OPERATIONAL PHASE

The Proposed Development is not anticipated to result in any significant residual effects for any KERs.

10.7 BIODIVERSITY ENHANCEMENT MEASURES

In addition to mitigation measures outlined in preceding sections, the Proposed Development incorporates environmental enhancements aimed at providing biodiversity benefits within and adjacent to the terrestrial footprint.

As part of the landscape design, salt-tolerant native tree and shrub species will be planted along the landward side of the reclaimed area. This planting scheme will deliver multiple biodiversity functions, including:

- Habitat creation: provision of structural and floristic diversity in what is otherwise a highly modified environment
- Ecological connectivity: establishment of continuous vegetated corridors that link with existing scrub, large reeds and sedge habitat and vegetated sea cliff habitat, facilitating the movement of invertebrates, herpetofauna and small mammals including otter
- Shelter and cover: dense shrub layers and ground-level vegetation will offer shelter for species such as hedgehog and provide refuges for amphibians and reptiles in suitable microhabitats
- Foraging resources: native flowering and fruiting species will increase the availability of nectar, pollen, and berries for invertebrates and small mammals

Please refer to the drawings which accompanying the application.

10.8 SUMMARY

This chapter of the EIAR has assessed the potential environmental impacts on Terrestrial Ecology from the construction and operation phases of the Proposed Development, the assessment is summarised in Table 10.16.

The terrestrial ecology assessment has evaluated the potential impacts of the Proposed Development on habitats and terrestrial species within and adjacent to the development footprint at Rosslare Harbour. The assessment was informed by a comprehensive desktop review, field surveys undertaken in 2023 and an updated programme of surveys in 2025, and consultation with statutory bodies.

The Proposed Development is located within a highly modified port environment, with limited areas of semi-natural habitat. The KERs identified include bats, otter, common lizard, and the Annex I habitats Marram Dunes (White Dunes) and Embryonic Shifting Dunes. Potential impacts considered include the permanent loss of habitats, light disturbance to commuting bats, and risk of injury or displacement to otter associated with underwater noise during piling, dredging, and blasting.

Integrated primary measures have been incorporated into the design of the Proposed Development, including the use of a perimeter bund to contain construction noise and directional lighting to reduce light spill onto sensitive habitats. In addition, the INNS winter heliotrope (*Petasites fragrans*), was recorded during the 2025 surveys. The potential for invasive species spread, particularly within disturbed or modified habitats, has therefore been considered alongside the assessment of receptors.

Potential impacts assessed therefore include the permanent loss of habitats, light disturbance to commuting and foraging bats, risk of injury or displacement to otter associated with underwater noise during piling, dredging, and blasting, and the introduction or spread of invasive species.

Integrated primary measures have been incorporated into the design of the Proposed Development, including the use of a perimeter bund to contain construction noise and directional lighting to reduce light spill onto sensitive habitats. In addition, tertiary mitigation measures, including the adoption of invasive species biosecurity and management protocols will be implemented to prevent the spread of winter heliotrope and other potential invasive species during construction. A suite of further construction-phase secondary mitigation measures will be implemented to avoid or reduce impacts on terrestrial ecology receptors. These include pre-construction surveys for protected species, best-practice construction protocols, and the use of MMOs to monitor for otters prior to underwater noise-producing activities.

Following the implementation of these measures, no significant residual effects on terrestrial ecology receptors are predicted during either the construction or operational phases. While some short-term cumulative effects may occur during overlapping construction works in the area, particularly in relation to otter and bats, these are not expected to be significant. No significant cumulative effects are anticipated during operation.

The Proposed Development will not result in significant effects on terrestrial habitats, species, or invasive species management, either alone or in combination with other plans or projects.

Table 10.16: Assessment Summary

Potential Effect	Construction/ Operation	Beneficial / Adverse/ Neutral	Extent (Site/Local/National / Transboundary)	Short term/ Long term	Direct/ Indirect	Permanent / Temporary	Reversible / Irreversible	Significance of Effect (according to defined criteria)	Proposed mitigation	Residual Effects (according to defined criteria)
Embryonic shifting dunes and marram dunes – Habitat Degradation	Construction	Adverse	Local	Short term	Indirect	Temporary	Reversible	Not Significant	n/a	Not Significant
Embryonic shifting dunes and marram dunes – Increased suspended sediment concentrations	Construction	Adverse	Local	Short term	Indirect	Temporary	Reversible	Not Significant	n/a	Not Significant
Bats	Construction	Adverse	Site	Short term	Direct	Temporary	Reversible	Not Significant	n/a	Not Significant
Otter – injury or mortality from vessel collision	Construction	Adverse	Site	Short term	Direct	Temporary	Reversible	Not Significant	n/a	Not Significant
Otter – Injury, Mortality of Displacement due to underwater noise	Construction	Adverse	Site	Short term	Direct	Temporary	Reversible	Not Significant	n/a	Not Significant
Otter – Piling	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Significant	A suite of further construction-phase secondary mitigation and remedial measures will be implemented to avoid or reduce impacts on terrestrial ecology receptors. These include pre-construction surveys for protected species, best-practice construction protocols, and the use of MMOs to	Not Significant

Potential Effect	Construction/ Operation	Beneficial / Adverse/ Neutral	Extent (Site/Local/National / Transboundary)	Short term/ Long term	Direct/ Indirect	Permanent / Temporary	Reversible / Irreversible	Significance of Effect (according to defined criteria)	Proposed mitigation	Residual Effects (according to defined criteria)
									monitor for otters prior to underwater noise-producing activities.	
Otter Noise – Rock Blasting	Construction	Adverse	Site	Short term	Direct	Temporary	Reversible	Significant		Not Significant
Otter Noise - Dredging	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Significant		Not Significant
Otter - Degradation of habitat and food sources	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Not Significant	n/a	Not Significant
Otter - Loss of breeding and resting sites – disturbance and displacement	Construction	Adverse	Site	Short term	Direct	Temporary	Reversible	Not Significant	n/a	Not Significant
Otter - Prey availability due to underwater noise	Construction	Adverse	Site	Short term	Indirect	Temporary	Reversible	Not Significant	n/a	Not Significant
Otter – construction (in air), lighting and visual disturbance	Construction	Adverse	Site	Short term	Direct	Temporary	Reversible	Not Significant	n/a	Not Significant
Common Lizard – Habitat loss	Construction	Adverse	Site	Short term	Direct	Temporary	Reversible	Not Significant	n/a	Not Significant
Common Lizard – disturbance and direct mortality from construction activities	Construction	Adverse	Site	Short term	Direct	Temporary	Irreversible	Significant		
Bats – Disturbance of flight patterns due to operational lighting	Operation	Adverse	Site	Long term	Direct	Permanent	Irreversible	Not Significant	n/a	Not Significant

Potential Effect	Construction/ Operation	Beneficial / Adverse/ Neutral	Extent (Site/Local/National / Transboundary)	Short term/ Long term	Direct/ Indirect	Permanent / Temporary	Reversible / Irreversible	Significance of Effect (according to defined criteria)	Proposed mitigation	Residual Effects (according to defined criteria)
Bats – mortality/injury from collision with vessels	Operation	Adverse/ neutral	Site	Long tern	Direct	Permanent	Irreversible	Not Significant	n/a	Not Significant
Otter – permanent loss of foraging habitat	Operation	Adverse	Site	Long term	Direct	Permanent	Irreversible	Not Significant	n/a	Not Significant
Otter – Disturbance from noise and activity due to increased vessel activity	Operation	Adverse	Site	Long term	Direct	Permanent	Irreversible	Not Significant	n/a	Not Significant
Otter – potential runoff and water quality	Operation	Adverse	Site	Long term	Direct	Permanent	Reversible	Not Significant	n/a	Not Significant
Common lizard – habitat loss	Operation	Adverse	Site	Long term	Direct	Permanent	Irreversible	Not Significant	n/a	Not Significant
Common lizard – Edge effect and microclimate changes	Operation	Adverse	Site	Long term	Direct	Permanent	Irreversible	Not Significant	n/a	Not Significant
Common Lizard – Displacement due to Artificial lighting	Operation	Adverse	Site	Long term	Direct	Permanent	Irreversible	Not Significant	n/a	Not Significant

10.9 REFERENCES

Abbott, I. (2024). *Mitchelstown Convent Bat Surveys: May 2024*. Abbott Ecology. Prepared for Appletree Developments Limited.

Altringham J.D. 2012. Bats: From Evolution to Conservation. Oxford University Press. New York, NY

Andren, H. (1994). Effects of habitat fragmentation on birds and mammals in landscapes with different proportions of suitable habitat: A review. *Oikos, 71*(3), 355-366. https://doi.org/10.2307/3545823

BCI (2010) Bat Conservation Ireland *Bats and lighting: Guidance notes for planners, engineers, architects and developers*. Bat Conservation Ireland. https://www.batconservationireland.org/wp-content/uploads/2013/09/BCIrelandGuidelines_Lighting.pdf

Brandt M., Dragon A., Diederichs A., Schubert A., Kosarev V., Nehls G., Wahl V., Michalik A., Braasch A., Hinz C., Ketzer C., Todeskino D., Gauger M., Laczny M. and Piper W. (2016). Effects of offshore pile driving on harbour porpoise abundance in the German Bight: Assessment of noise effects. Report by BioConsult SH, IBL Umweltplanung GmbH, and Institute of Applied Ecology (IfAO). pp. 262.

BSG Ecology (2014) North Sea Ferries Bat Migration Research Report.

CIEEM (2011) Otters and development: Guidance for developers, planning officers, and ecologists. Chartered Institute of Ecology and Environmental Management.

CIEEM (Chartered Institute of Ecology and Environmental Management) (2024) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*. Version 1.3. Winchester: CIEEM. Available at: https://cieem.net/resource/guidelines-for-ecological-impact-assessment-ecia/

Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd ed.) London: Bat Conservation Trust

Collins, J. (Ed.). (2023) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (4th ed.). London: Bat Conservation Trust.

Dalton, R., Healy, T., Murphy, A. (2021) A study of Otter in Cork City and the Cork Harbour Area, Prepared for Cork Nature Network CLG

Department of Communications, Marine and Natural Resources (DCMNR). (2005). *Port policy strategy statement*. https://assets.gov.ie/19096/15adf464273b4b129fa4c656d3354b06.pdf

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

Erbe, C., Dunlop, R., & Dolman, S. (2018). Effects of noise on marine mammals. In H. Slabbekoorn, R. J. Dooling, A. N. Popper, & R. R. Fay (Eds.), *Effects of Anthropogenic Noise on Animals* (pp. 277–309). Springer. https://doi.org/10.1007/978-1-4939-8574-6_10

Gili, F., Fassone, C., Rolando, A., Bertolino, S. (2024) In the Spotlight: Bat Activity Shifts in Response to Intense Lighting of a Large Railway Construction Site. *Sustainability*. 2024; 16(6):2337. https://doi.org/10.3390/su16062337

Green, J., Green, R., & Jefferies, D. J. (1984) A radio-tracking survey of otters *Lutra lutra* on a Perthshire river system. *Lutra*, 27, 85-145. Hermans, C., Litovska, I., de Pastors, M., Visser, M.E., and Spoelstra, K. (2024) Artificial light at night drives diel activity patterns of synanthropic pipistrelle bats and their prey. Sci Total Environ. 2024 Aug 25;940:173699. doi: 10.1016/j.scitotenv.2024.173699. Epub 2024 Jun 1. PMID: 38830420.

Heggberget, T.M. & Christensen, H. (1994) Reproductive timing in Eurasian otters on the coast of Norway. Ecography 17: 339-348.

IAQM (2024) 'Guidance on the Assessment of the Impacts of Construction on Air Quality and the Determination of their Significance'. The Institute of Air Quality Management

ILP (2018) Institution of Lighting Professionals. Bats and artificial lighting in the UK Guidance Note 08/18. Rugby, Warwickshire: Institution of Lighting Professionals. Available at: https://cdn.bats.org.uk/uploads/pdf/Resources/ilp-guidance-note-8-bats-and-artificial-lighting-comp…

ILP and BCT (2023) *Guidance Note 08/23: Bats and Artificial Lighting at Night.* Institution of Lighting Professionals and Bat Conservation Trust.

Irish Whale and Dolphin Group (IWDG). (2005*). Code of conduct for all watercraft encountering whales and dolphins* (Marine Notice No. 15). Retrieved from https://iwdg.ie/cms_files/wp-content/uploads/2022/06/Code-of-Conduct-When-Encountering-Whales-And-Dolphins-A3-Document.pdf

Jones, T.R., Henderson, C.J., Olds, A.D. *et al.* The Mouths of Estuaries Are Key Transition Zones that Concentrate the Ecological Effects of Predators. *Estuaries and Coasts* **44**, 1557–1567 (2021). https://doi.org/10.1007/s12237-020-00862-6

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

Kruuk, H. & Moorhouse, A. (1991) The spatial organization of otters (*Lutra lutra*) in Shetland. J. Zool. 224, 41-57.

Kruuk, H. (1995) *Wild Otters: Predation and Populations* (online edn, Oxford Academic, 31 Oct. 2023), https://doi.org/10.1093/oso/9780198540700.001.0001,accessed 19 Dec. 2024.

Kruuk, H. (2006). *Otters: Ecology, Behaviour and Conservation*. Oxford University Press.

Kruuk, H. & Balharry, D.. (2009). Effects of sea water on thermal insulation of the otter, *Lutra lutra*. Journal of Zoology. 220. 405 - 415. 10.1111/j.1469-7998.1990.tb04315.x.

Liles, G. (2009). Otter (*Lutra lutra*) activity on the open coast and islands within the Pembrokeshire Marine Special Area of Conservation. A report to the Pembrokeshire Marine SAC Relevant Authorities Group.

Limpens, H., Lagerveld, S., Ahlen, I., Anxionnat, D., Aughney, T., Baagoe, H., Bach, L., Bach, P., Boshamer, J., Boughey, K., Le Campion, T.,, Christensen, M., Douma, T., Dubourg-Savage, M-J.,

Durinck, J., Elmeros, M., Haarsma, A-J., Haddow, J., Hargreaves, D., Hurst, J., Jansen, E., Johansen, T., de Jong, J., Jouan, D., van der Kooji, J., Kyheroinen, E., Mathews, F., Michaelsen, T., Moller, J., Pettersons, G., Roche, N., Rodrigues, L., Russ, J., Smits, Q., Swift, S., Fjederholt, E., Twisk, P., Vandendriesche, B. and Schillemans, M. (2017) Migrating bats at the southern North Sea approach to an estimation of migration populations of bats at the southern North Sea. Technical Report Zoodiervereniging (Dutch Mammal Society).

Løkkeborg, S., Ona, E., Vold, A., and Salthaug, A. (2012) Sounds from seismic air guns: gear-and species-specific effects on catch rates and fish distribution. Can. J. Fish. Aquat. Sci. 69 (8): 1278-1291.

Loy, A., Kranz, A., Oleynikov, A., Roos, A., Savage, M. & Duplaix, N. (2022) *Lutra lutra* (amended version of 2021 assessment). The IUCN Red List of Threatened Species 2022: e.T12419A218069689. https://dx.doi.org/10.2305/IUCN.UK.2022-2.RLTS.T12419A218069689.en

Lucke, K., Siebert, U., Lepper, P. A., & Blanchet, M.-A. (2009). Temporary shift in masked hearing thresholds in a harbor porpoise (*Phocoena phocoena*) after exposure to seismic airgun stimuli. *The Journal of the Acoustical Society of America, 125*(6), 4060–4070. https://doi.org/10.1121/1.3117443

Luo, J., Clarin, B.M., Borissov, I.M., and Siemers, B.M. (2014) "*Are torpid bats immune to anthropogenic noise?*" J Exp Biol. 2014 Apr 1;217(Pt 7):1072-8. doi: 10.1242/jeb.092890. Epub 2013 Dec 5. PMID: 24311817.

Mathews, F., Roche, N., Aughney, T., Jones, N., Day, J., Baker, J., & Langton, S. (2015) 'Barriers and benefits: Implications of artificial night-lighting for the distribution of common bats in Britain and Ireland', *Philosophical Transactions of the Royal Society B: Biological Sciences*, 370(1667), p. 20140124. doi: 10.1098/rstb.2014.0124.

Mathews, F., Richardson, S., Lintott, P. and Hosken, D. (2016) Understanding the risk to European protected species (bats) at onshore wind turbine sites to inform risk management

Marchant, N. (2020) COOM Green Energy Volume 2 - Main EIAR. Inis Environmental Consultants Ltd, Ennis, Co. Clare.

Marnell, F., Kingston, N., & Looney, D. (2019). *Ireland Red List No. 12: Terrestrial Mammals.* National Parks and Wildlife Service, Department of Culture, Heritage, and the Gaeltacht, Ireland.

Marnell, F., Kelleher, C. & Mullen, E. (2022) Bat mitigation guidelines for Ireland v2. Irish Wildlife Manuals, No. 134. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland

Macdonald, S. M., and Mason, C. F. (1980) Observations on the marking behaviour of a coastal population of otters. [Accessed 19 December, 2025]. Available from: http://rcin.org.pl/ibs/Content/10633/PDF/BI002_2613_Cz-40-2_Acta-T25-nr19-245-253_o.pdf

Mott MacDonald (2022) N25 Rosslare Europort Access Road, Planning and Environmental Considerations Report (PECR). Wexford County Council.

Nedwell, J. R., & Thandavamoorthy, T. S. (1992). The waterborne pressure wave from buried explosive charges: An experimental investigation. *Applied Acoustics, 37*(1). https://doi.org/10.1016/0003-682X(92)90007-F.

Nelson, B., Cummins, S., Fay, L., Jeffrey, R., Kelly, S., Kingston, N., Lockhart, N., Marnell, F., Tierney, D. and Wyse Jackson, M. (2019) Checklists of protected and threatened species in Ireland. Irish Wildlife Manuals, No. 116. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland.

Nolet, B. A., Wansink, D. E. H., & Kruuk, H. (1993). Diving of Otters (*Lutra lutra*) in a Marine Habitat: Use of Depths by a Single-Prey Loader. *Journal of Animal Ecology*, *62*(1), 22–32. https://doi.org/10.2307/5479

NPWS (2007) *Conservation Status Assessment Report for Otter (Lutra lutra)*. Department of the Environment, Heritage and Local Government, Dublin.

NPWS (2011a) Conservation Objectives: Slaney River Valley SAC 000781. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2011b) Site Synopsis: Slaney River Valley SAC 000781. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2014) *Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters*. Department of Arts, Heritage and the Gaeltacht.

NPWS (2019) *The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview.* Department of Culture, Heritage and the Gaeltacht. Retrieved from https://www.npws.ie/sites/default/files/publications/pdf/Art17-Vol1-web.pdf

NRA (2008) *Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes.* National Roads Authority, Dublin. Available at: https://www.tii.ie/media/wsmlbxmv/guidelines-for-the-treatment-of-otters-prior-to-the-construction-of-national-road-schemes.pdf

Transport Infrastructure Ireland TII (2020a) The Management of Invasive Alien Plant Species on National Roads – Standard

TII (2020b) The Management of Invasive Alien Plant Species on National Roads – Technical Guidance;

National Road Authority (NRA, now TII) (2009a) Guidelines for Assessment of Ecological Impacts of National Road Schemes

NRA (2009b) Ecological Survey 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 (Revision 1)

NRA (2008b) Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes

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

NRA (2006b) Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes

NRA (2006c) Guidelines for the protection and preservation of trees, hedgerows and scrub prior to, during and post Construction of National Road Schemes

NRA (2005a) Guidelines for the Treatment of Badgers Prior to the Construction of National Road Schemes

NRA (2005b) Guidelines for the Treatment of Bats during the Construction of National Road Schemes.

NRA (2011). *Introduction to the NRA Design Manual for Roads and Bridges.*

O'Sullivan, W. M. (1993). *The distribution, status and habitat of the Irish otter*. Irish Naturalists' Journal.

Peng, C., Zhao, X., Liu, S., Shi, W., Han, Y., Guo, C., Jiang, J., Wan, H., Shen, T., and Liu, G. (2016) Effects of anthropogenic sound on digging behavior, metabolism, Ca 2+/Mg 2+ ATPase activity, and metabolism-related gene expression of the bivalve Sinonovacula constricta. Sci. Rpts. 6: 24266.

Popper A. N., Hawkins A. D., Fay R. R., Mann D., Bartol S., Carlson T., Coombs S., Ellison W. T., Gentry R., Halvorsen M. B., Lokkeborg S., Rogers P., Southall B. L., Zeddies D. G., Tavolga W. N. (2014). Sound Exposure Guidelines for Fishes and Sea Turtles: A Technical Report by ANSI-Accredited Standards Committee S3/SCI and registered with ANSI. Springer Briefs in Oceanography.

Ratcliffe, D.A. (1977) A Nature Conservation Review. Cambridge: Cambridge University Press.

Reason, P.F., and Wray, S. (2023) UK Bat Mitigation Guidelines: a guide to impact assessment, mitigation and compensation for developments affecting bats. Version 1.1. Chartered Institute of Ecology and Environmental Management, Ampfield.

Reid, N., Hayden, B., Lundy, M.G., Pietravalle, S., McDonald, R.A. & Montgomery, W.I. (2013) National Otter Survey of Ireland 2010/12. Irish Wildlife Manuals No. 76. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

Reusch, C., Vindas-Picado, J.B., Scholz, C., Hoffmeister, U., & Voigt, C.C. (2024). Light-averse behaviour of attic-dwelling bats when commuting through urban areas. *Global Ecology and Conservation*, *54*, e03112

Ruiz-Olmo, J., Olmo-Vidal, J. M., Mañas, S., Batet, A. (2002) The influence of resource seasonality on the breeding patterns of the Eurasian otter (*Lutra lutra*) in Mediterranean habitats. Canadian Journal of Zoology 80:2178–2189. https://doi.org/10.1139/z02-186

Ruiz-Olmo, J., Batet, A., Jiménez, J., & Martínez, D. (2005). Habitat selection by female otters with small cubs in freshwater habitats in northeast Spain. *Lutra*, *48*(1), 45-5612. https://www.researchgate.net/publication/292154809

Ruiz-Olmo, J., Jiménez, J. and Chacón, W. (2007) The importance of ponds for the otter (*Lutra lutra*) during drought periods in Mediterranean ecosystems: A case study in Bergantes River. Mammalia, Vol. 71 (Issue 1-2), pp. 16-24. https://doi.org/10.1515/MAMM.2007.003

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

Rydell, J. (1992). Exploitation of Insects around Streetlamps by Bats in Sweden. Functional Ecology, 6(6), 744–750. https://doi.org/10.2307/2389972

Schaffeld, T., Ruser, A., Woelfing, B., Baltzer, J., Kristensen, J. H., Larsson, J., Schnitzler, J. G., & Siebert, U. (2019) The use of seal scarers as a protective mitigation measure can induce hearing impairment in harbour porpoises. *The Journal of the Acoustical Society of America*, *146*(6), 4288. https://doi.org/10.1121/1.5135303

Schaub, A., Ostwald, J., and Siemers, B.M. (2008) "Foraging bats avoid noise." Journal of Experimental Biology 211: 3,174-3,180.

Siemers, B.M., and Schaub, A. (2011) "Hunting at the highway: traffic noise reduces foraging efficiency in acoustic predators." Proceedings of the Royal Society B. 278: 1,646-1,652.

Slotte, A., Hansen, K., Dalen, J., and One, E. (2004) Acoustic mapping of pelagic fish distribution and abundance in relation to a seismic shooting area off the Norwegian west coast. Fish. Res. 67: 143-150.

Solan, M., Hauton, C., Godbold, J. A., Wood, C. L., Leighton, T. G., and White, P. (2016) "Anthropogenic sources of underwater sound can modify how sediment-dwelling invertebrates mediate ecosystem properties," Scientific Reports 6, 20540.

de Soto, N., Delorme, N., Atkins, J. *et al.* (2013) Anthropogenic noise causes body malformations and delays development in marine larvae. *Sci Rep* **3**, 2831. https://doi.org/10.1038/srep02831

Southall B. L., Bowles A. E., Ellison W. T., Finneran J. J., Gentry R. L., Greene C. R. Jr., Kastak D., Ketten D. R., Miller J. H., Nachtigall P. E., Richardson W. J., Thomas J. A., and Tyack P. L. (2007). Marine mammals noise exposure criteria: initial scientific recommendations. *Marine Mammals 33*(4).

Southall, B. L., Finneran, J. J., Reichmuth, C., Nachtigall, P. E., Ketten, D. R., Bowles, A. E., Ellison, W. T., Nowacek, D. P., & Tyack, P. L. (2019) Marine Mammal Noise Exposure Criteria: Updated Scientific Recommendations for Residual Hearing Effects. *Aquatic Mammals*, 45(2), 125-232. https://doi.org/10.1578/AM.45.2.2019.125

Stepien, E. N., Galatius, A., Hansen, K. A., Nabe-Nielsen, J., Teilmann, J., & Wahlberg, M. (2024) Response of Eurasian otters (*Lutra lutra*) to underwater acoustic harassment device sounds. *Scientific Reports*, *14*(1), 6303. https://doi.org/10.1038/s41598-024-55481-z

Stone, E.L., Harris, S. and Jones, G. (2015) 'Impacts of artificial lighting on bats: A review of challenges and solutions', *Mammalian Biology*, 80(3), pp. 213–219. doi: 10.1016/j.mambio.2015.02.004.

Thompson P. M., Brookes K. L., Graham I. M., Barton T. R., Needham K., Bradbury G., and Merchant N. D. (2013). Short term disturbance by a commercial two-dimensional seismic survey does not lead to long-term displacement. Proceeding of the Royal Society B, Biological Sciences. http://rspb.royalsocietypublishing.org/content/280/1771/20132001.

Todd, V.L.G., Todd, I.B., Gardiner, J.C., Morrin, E.C., MacPherson, N.A., DiMarzio, N.A. and Thomsen, F. (2015) 'A review of impacts of marine dredging activities on marine mammals', *ICES Journal of Marine Science*, 72(2), pp. 328–340. doi: 10.1093/icesjms/fsu187.

Tolrà, A., Ruiz-Olmo, J., and Riera, J. Ll. (2024). Human disturbance and habitat structure drive Eurasian otter habitat selection in heavily anthropized river basins. *Biodiversity and Conservation*. https://doi.org/10.1007/s10531-024-02826-9

Tougaard J. (2016). Input to revision of guidelines regarding underwater noise from oil and gas activities – effects on marine mammals and mitigation measures. Aarhus University, DCE – Danish Centre for Environmental and Energy, 52 pp. Scientific Report from DCE – Danish Centre for Environment and Energy No. 202. http://dce2.au.dk/pub/SR202.pdf.

Weilgart, L. (2018). *The Impact of Ocean Noise Pollution on Fish and Invertebrates*. Report by OceanCare.

Wyse Jackson, M., FitzPatrick, Ú., Cole, E., Jebb, M., McFerran, D., Sheehy Skeffington, M. & Wright, M. (2016) Ireland Red List No. 10: Vascular Plants. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs, Dublin, Ireland.

Iarnród Éireann
Irish Rail

venterra

GDG
GAVIN & DOHERTY
GEOSOLUTIONS

NICHOLAS
O'DWYER
an RSK company

Co-funded by
the European Union