Iarnród Éireann
Irish Rail

Rosslare ORE Hub

EIAR Technical Appendices

Technical Appendix 10:

Terrestrial Ecology

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

Co-funded by the European Union

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GLOSSARY OF TERMS

Term	Definition
Amber List species of Birds of Conservation Concern (BoCC)	Species of moderate conservation concern. Birds on this list may have experienced a moderate decline in population or range over a longer period, have localised populations, are rare breeders, or are species for which Ireland is of international importance.
Green List species of Birds of Conservation Concern (BoCC)	Species that are not currently of significant conservation concern.
Key Ecological Receptors	Key Ecological Receptors (KERs) are specific components of the environment, such as species, habitats, or ecosystems—that are particularly vulnerable or sensitive to environmental changes, impacts, or stressors. These receptors are identified in environmental impact assessments (EIAs), ecological risk assessments, and other environmental studies to determine the potential effects of proposed developments or activities on the natural environment.
Ramsar Convention	Convention on Wetlands of International Importance held at Ramsar in Iran 1971
Red Data Book	A list of threatened, vulnerable or rare Irish species
Red List species of Birds of Conservation Concern (BoCC)	Species of the highest conservation concern, typically those that are globally threatened, have experienced severe declines in Ireland, or are rare breeders.
Study Area	The geographical extent for which ecological data exists and has been obtained to produce the terrestrial ecological baseline.
Special Areas of Conservation	A Special Area of Conservation (SAC) is a designation under the European Union's Habitats Directive (Council Directive 92/43/EEC), which aims to protect and conserve habitats and species of European importance. SACs are established to safeguard a range of natural habitats and species (other than birds, which are protected under Special Protection Areas) that are considered valuable, rare, or threatened across Europe.
Source-Pathway-Receptor model	The Source-Pathway-Receptor (SPR) model is a framework used in environmental science, risk assessment, and management to

Term	Definition
	understand and assess the potential impact of a contaminant or hazard on a particular receptor (such as a human, animal, plant, or ecosystem). This model helps identify how pollutants or hazards can move from their origin (the source) through the environment (via a pathway) to potentially affect a receptor.
Special Protection Area	A Special Protection Area (SPA) is a designation under the European Union's Birds Directive, which is a legal framework aimed at protecting and managing wild bird populations and their habitats. SPAs are specifically established to safeguard the habitats of particularly vulnerable bird species, as well as migratory birds, ensuring their survival and maintaining biodiversity.
Zone of Influence (ZoI)	The area over which ecological features may be affected by the biophysical changes caused by a proposed project and associated activities.

GLOSSARY OF ABBREVIATIONS

Term	Definition
KER	Key Ecological Receptor
NBDC	National Biodiversity Data Centre
NPWS	National Parks and Wildlife Services
PDB	Proposed Development Boundary
SAC	Special Area of Conservation
S-P-R	Source-Pathway-Receptor
SPA	Special Protection Area
ZoI	Zone of Influence

10 TERRESTRIAL ECOLOGY

10.1 INTRODUCTION

This report has been prepared to accompany **Volume 2: Chapter 10: Terrestrial Ecology** of the Rosslare Europort ORE Hub project (hereafter the 'Proposed Development') Environmental Impact Assessment (EIA) Report.

This report has been informed by survey data provided by Inis Environmental Consultants Ltd. (INIS), who were commissioned by Iarnród Éireann (IÉ) to carry out terrestrial ecological surveys at Rosslare Europort based on a survey scope prepared by GDG within the terrestrial spatial footprint of the Proposed Development Boundary (PDB), detailing site usage and activity patterns of key receptor species at Rosslare Europort and a terrestrial ecology desk study undertaken by GDG.

Kevin Mc Elduff BSc completed all surveys associated with this project. Kevin is an Ecologist with INIS Environmental Consultants Ltd. and has a BSc (Hons) in Environmental Science from the University of Galway. He has 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 Screening for Appropriate Assessment (AA), Natura Impact Statements (NIS) and Ecological Impact Assessments (EcIA). He is also competent in the use of QGIS.

Natasha Collins BSc undertook bat emergence surveys for this project. She is an ecologist and was awarded an honours BSc in Wildlife Biology from IT Tralee. She has 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) Guidelines, including for receptors such as Hen Harrier, Whooper Swan, wintering Merlin etc.

Megan Lee MSc (Hons) BSc (Hons) completed bat emergence surveys for this project. Megan Lee is an Ecologist with Inis Environmental Consultants Ltd. Megan was awarded a BSc (Hons) in Environmental Science from National University of Ireland Galway in 2018 and a MSc (Hons) in Biodiversity and Land-use Planning from National University of Ireland Galway in 2020. Megan is a Qualifying member of the Chartered Institute of Ecology and Environmental Management. She has a wide range of experience in ecological report writing in addition to surveying, with particular focus on bird, bat, and mammal surveys.

This report has been prepared by Maggie Starr BSc (Hons) Marine Sciences. Maggie is an Ecologist and Ornithologist with experience in terrestrial, aquatic and marine/coastal ecology and is a trained Marine Mammal Observer (MMO). 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 (AA/NIS, PEAR, EcIA, EIAR).

This report has been reviewed by Joey O'Connor (BSc (Hons) Marine Science, MSc. Engineering in the Coastal Environment). 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.

10.1.1 SCOPE OF REPORT

The scope of this Report is to summarise the methodology and results of the terrestrial ecology desk study and the surveys conducted to inform the Terrestrial Ecology chapter of the Environmental Impact Assessment (EIA) Report of the Proposed Development.

The desk study was completed by GDG in 2024 while the following surveys were completed by INIS Ecology in 2023:

- Habitat Walkover Survey
- Mammal Walkover Survey
- Otter Survey
- Amphibian Surveys
- Reptile Surveys
- Preliminary Bat Roost Survey
- Bat Transect Surveys
- Bat Emergence Surveys
- Bat Static Detector Surveys

This Terrestrial Ecology Technical Appendix considers the ecological features present within the land area of the Proposed Development Boundary, from the High Water Mark (HWM) landward. The marine environment, extending below the HWM, along with the relevant ecological receptors associated with it, is addressed separately within the applicable biodiversity chapters and associated technical appendices of the EIAR.

10.2 METHODOLOGY

The terrestrial ecology data presented in this report comprise:

- desk study
- habitat and species surveys; and
- habitat mapping.

The detailed methodology for each component is described in the sections below.

An updated terrestrial ecology survey was conducted on **04/09/2025** to refresh the baseline surveys conducted throughout 2023 and confirm the presence/absence of key receptors. Methods followed those described below unless otherwise stated.

10.2.1 STUDY AREA AND SURVEY AREA

The Proposed Development is primarily situated within the marine environment, with a smaller section extending into the terrestrial environment. As a result, the Study Area and Survey Area relevant to Terrestrial Ecology focused specifically on the terrestrial footprint of the Proposed Development Boundary located within the existing port and included a small section of land that has not been previously developed (refer Figure 10-1**Error! Reference source not found.**).

The term **"Study Area"** refers to the extent of the desk study conducted to gather background information on terrestrial ecology species and habitats. The scope of the desk study included an examination of the habitat range and known ecological requirements for each species and habitat. This Study Area was established based on desk study findings regarding the presence or absence of protected habitats, flora, and fauna within the surrounds, species foraging ranges and best practice methodologies for assessing the footprint of potential effects on terrestrial ecological features. Buffer zones were incorporated as recommended by CIEEM (2018, 2022). CIEEM suggests that surveys incorporate buffer zones based on potential impact distances, ensuring that all relevant habitats are evaluated.

The **"Survey Area,"** is the geographic zone where field surveys were conducted, encompassing the Proposed Development Boundary and a species-specific buffer area (note no buffer was applied to habitats). While the Survey Area was defined by the Proposed Development Boundary and, where relevant, species-specific buffer zones, the Proposed Development Boundary has evolved through several iterations over the course of the project design, as described in Chapter 5: Assessment of Alternatives of Volume II of this EIAR.

Both the **Study Area** and the **Survey Area** consider landscape features such as water bodies, hedgerows, and forested areas, which may act as corridors or barriers for species movement. For instance, habitats connected to linear features are often included for species like bats, which rely on these corridors for commuting. The final determination of the Study Area and Survey Areas have relied on the ecologist's professional judgment. This approach ensures that the areas are appropriately scaled to capture potential effects on each habitat and species effectively.

Larger buffer areas were used for species with extensive foraging territories, such as large mammals like otters, to encompass their full range of movement and habitat use. Conversely, smaller buffer zones were designated for species with more localised foraging behaviour, such as small mammals and amphibians, allowing for a focused analysis of impacts within their immediate habitats. This tailored approach ensures that the unique ecological requirements of each species are thoroughly addressed in the impact assessment.

The Study Area and Survey Area for each habitat and species are detailed under the subheadings in Section 10.2.3 below.

In 2023, the otter survey extended ~300 m either side of the Proposed Development. Since then, the Proposed Development Boundary has changed. In 2025, the otter walkover survey covered the full extent east of the Small Boat Harbour along the hard breakwater (as in 2023) and was extended to a minimum of 150 m west of the Small Boat Harbour. This approach remains consistent with NRA (2008a) guidance (i.e. assessment up to 150 m from proposed works around breeding/resting features) and provides adequate coverage of potential impact pathways along the local coastline.

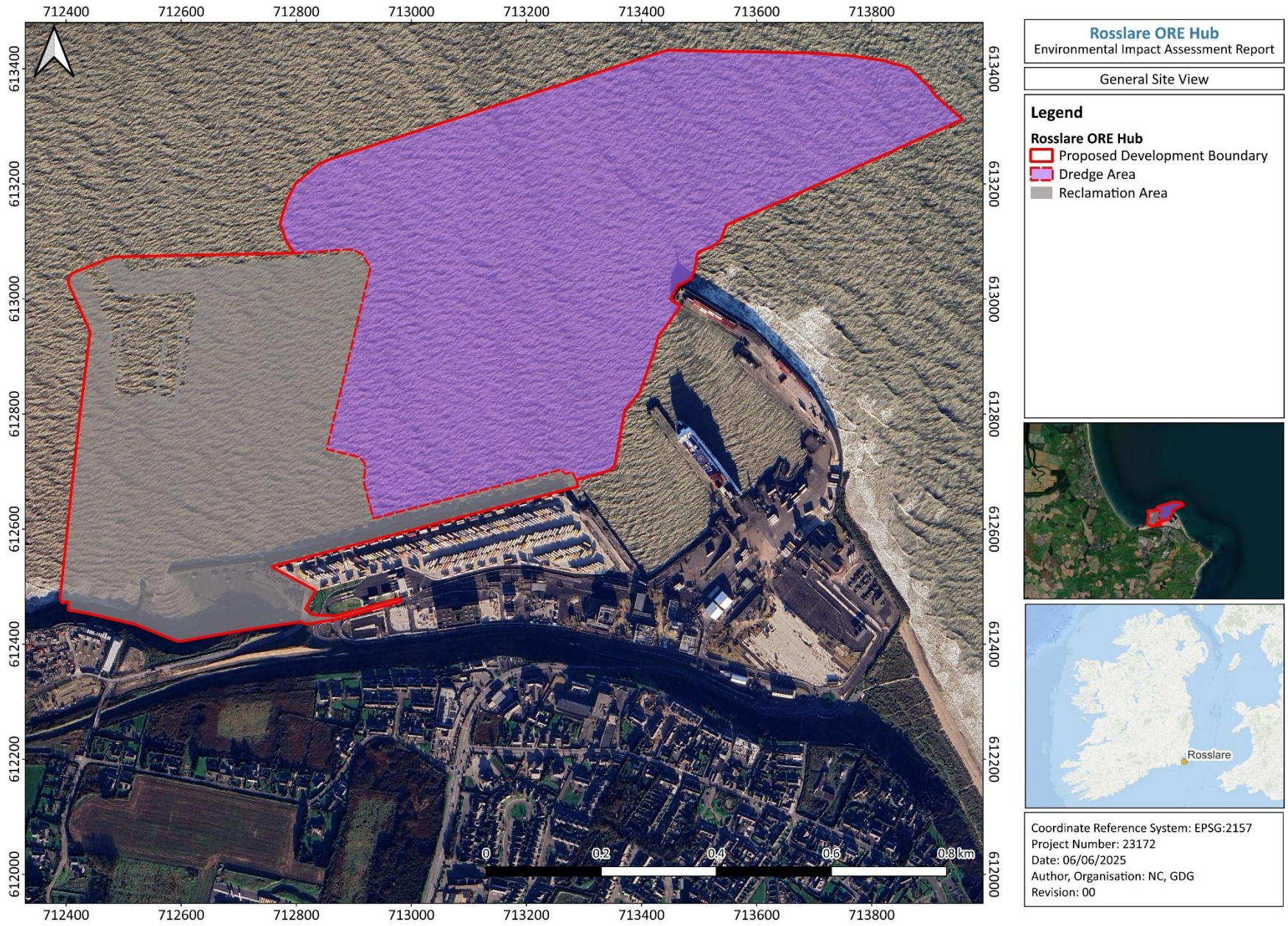

Figure 10-1 Proposed Development Boundary showing Reclamation Area and Dredge Area

10.2.2 DESK STUDY REVIEW

The desk study conducted for this report involved a thorough review of existing data, scientific literature, and relevant environmental records to establish a comprehensive understanding of the terrestrial environment within the PDB and surrounding region prior to the commencement of survey work. This study collated information from various sources, including previous environmental assessments, biodiversity databases, and satellite imagery, to identify key ecological features, species distributions, and potential environmental sensitivities. This involved identifying the proximity of the PDB to any statutory or non-statutory designated sites for nature conservation with terrestrial species qualifying interests.

Non-statutory designated sites are areas that have been identified for their ecological, geological, or landscape value but do not have legal protection under national or EU legislation. These sites are often recognised by conservation organisations, local authorities, or government agencies for their importance to biodiversity, wildlife habitats, or geological features. While they may not be legally protected like Special Areas of Conservation (SACs) or Natural Heritage Areas (NHAs), they are still considered in environmental planning and management.

10.2.2.1 KEY SOURCES

Key sources for the desk study included the National Biodiversity Data Centre (NBDC), satellite imagery, and previous environmental assessments provided by local authorities and the Environmental Protection Agency (EPA). These resources offered baseline information on species distributions, habitat types, and existing environmental conditions within the PDB.

The following key sources and organisations were consulted:

- National Biodiversity Data Centre. Biodiversity Maps; accessed at https://maps.biodiversityireland.ie/Map [accessed July 2024].
- National Parks and Wildlife Service. NPWS Map Viewer; accessed at https://www.npws.ie/maps-and-data [accessed July 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/

The guidelines listed below were consulted for the desk study preparation of this document to provide the scope, structure and content of the assessment:

- Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn) (Collins, 2016).
- Guidelines for Ecological Report Writing (CIEEM, 2017a).

- Guidelines for Preliminary Ecological Appraisals (CIEEM, 2017b).
- Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine (Version 1.2) (CIEEM, 2022).
- Environmental Impact Assessment of National Road Schemes –A Practical Guide (NRA, 2009).
- Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes (NRA, 2009a).
- Environmental Assessment and Construction Guidelines (NRA, 2006).
- Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022).
- Guidance on the Strict Protection of Certain Animal and Plant Species under the Habitats Directive in Ireland (NPWS, 2021)
- Irish Red Data Books 1 (Vascular Plants) and 2 (Vertebrates) (Curtis and McGough, 1988; Whilde, 1993)
- Ireland Red List No. 10: Vascular Plants (Wyse Jackson, *et al.,* 2016)
- Ireland Red List for Terrestrial Mammals (Marnell, Looney and Lawton, 2019)

10.2.2.2 WILDLIFE RECORDS (NBDC)

The National Biodiversity Data Centre (NBDC) is an Irish organisation responsible for collecting, managing, analysing, and sharing data on the country's biodiversity. It is funded by the Heritage Council and supported by the Department of Housing, Local Government and Heritage. The NBDC makes all validated biodiversity data available through Biodiversity Maps, an online data portal.

Users can view and examine biodiversity records and detailed species information through the interactive Biodiversity Maps portal (http://maps.biodiversityireland.ie/#/Home). This tool is useful for conducting a preliminary assessment of biodiversity considerations for specific proposed development sites.

For this purpose, the NBDC search tool was tailored to include all records within the 2km^2 grid containing the PDB. The main goal of this exercise is to identify any records of protected species or species of natural heritage significance near the PDB.

The NBDC database was searched for all relevant species within the terrestrial environment within the 2 km^2 grid T11G covering the spatial footprint of the PDB.

10.2.2.2.1 Otter (Lutra lutra)

As previously described in Section 10.2.1, an extended Study Area was employed to account for the wide-ranging movements of otters (*Lutra lutra*). Otters are opportunistic, semi-aquatic predators that exploit a variety of prey sources, including insects, freshwater and marine invertebrates, small mammals, birds, amphibians, and even fruit when available. 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 (80-100m), typically diving to depths of up to 10 meters (Liles, 2009; Kruk and Moorhouse,1991), but most feeding is done much closer to shore and in water less than 3m deep (Nolet, *et al.* 1993). 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. In coastal areas where food resources, like fish and crustaceans, are more abundant, otters may occupy smaller territories, sometimes as short as 2 km (Vincent Wildlife Trust, *n.d*.). Radio telemetry and spraint survey studies, particularly in Scotland, reveal that otters living exclusively along the coast tend to have smaller home ranges than their riverine counterparts (Kruuk, 1995; Macdonald & Mason, 1980). 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; Green, Green and Jefferies, 1984). 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.

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, 2003). These requirements influence their use of the coastline, as otters must return regularly to freshwater sources after foraging in the sea.

To reflect the typical range of otter movements within coastal and estuarine environments, the Study Area for the desk study was extended to include records from NBDC within 5km of the Proposed Development. The 2km^2 grids included T11G, (within which the PDB is situated), T11L, T11K, T11B, T10E, T10P, T10J, T00Z, T01V, T10X, T01W, T11A, T11F and T11C, ensuring comprehensive coverage of otter activity in both coastal and freshwater environments (as shown in Figure 10-2). This extension allows for a more accurate assessment of potential impacts on otter populations within the Proposed Development's Study Area.

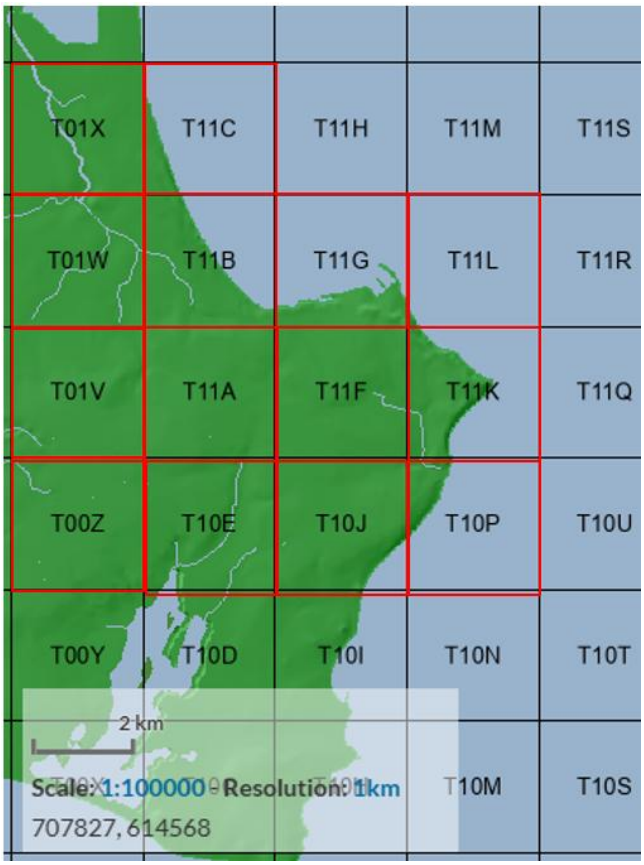

Figure 10-2: NBDC desk study search – 2km² grids in red outline

10.2.3 FIELD SURVEYS

Field surveys were undertaken by INIS Ecology LTD. conducted over the year 2023, in line with the ecological calendar year of suitable seasons to survey specific receptors as the majority of techniques available for surveying plants and animals are seasonally constrained. An additional update survey on 04/09/2025 was undertaken to record any changes since 2023, including targeted checks for otter signs and invasive non-native flora within the terrestrial footprint. Consequently, sufficient time was allocated to collect baseline data. To gather robust data capable of supporting an Environmental Impact Assessment Report (EIAR) for the Proposed Development, an entire survey season encompassing spring, summer, autumn, and winter was available. Seasonal constraints for each group or species-specific survey technique were adhered to, as outlined in the *Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes* (NRA, 2009a).

The surveys were designed in conjunction with Best Practice methods endorsed by the Chartered Institute of Ecology and Environmental Management (CIEEM) and National Roads Authority (NRA).

The field survey methodology was designed to systematically assess the terrestrial environment within the PDB. 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.

The survey boundary for each group varied as outlined below in Sections 10.2.2 to 10.2.3.

10.2.3.1 SPECIES SURVEYS

For the species survey, features of interest, as described below, were searched for and recorded to establish presence/absence of species of interest as part of the habitat survey site walkover. Photographs were taken of features where identified, with GPS location noted. The following guidelines were consulted to inform the survey approach:

- Guidelines for Assessment of Ecological Impacts of National Roads Schemes (NRA, 2009b)
- Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes (NRA, 2008)
- Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes (NRA, 2005a)
- Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (NRA, 2010)
- Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). Bat Conservation Trust (Collins, 2016). It should be noted that the 4th edition of these guidelines was released in 2023 after the completion of the bat surveys; therefore, this updated edition was not consulted.

Note:

Mammals (Non-Volant)

10.2.3.1.1 Mammal Walkover Surveys

Mammal walkover surveys were undertaken in accordance with NRA Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes (NRA, 2009a).

The mammal walkover surveys were conducted on 30/01/2023, 08/02/2023, 09/02/2023, and 03/03/2023. A follow-up mammal walkover was completed on 04/09/2025. Methods mirrored the 2023 approach. Targeted checks focussed on the western boundary of the Small Boat Harbour and adjacent vegetated sea cliffs where suitable features for otter couches and foraging occur. The Study Area included the terrestrial footprint of the Proposed Development, with a 50-meter buffer surrounding the landward side of the Proposed Development Boundary.

Evidence of mammals [particularly otters, pine martens, red squirrels, hedgehogs, badgers, pygmy shrews and bats] searched for included:

- Direct sightings

- Any sensitive features for breeding, resting, foraging or commuting
- Faeces/spraints/latrines
- Tracks and footprints
- Dens, burrows, setts, dreys
- Prints, slides (along watercourses), mammal trails, hair, snuffle holes
- **Prey/food remains** - Evidence of feeding includes chewed plants, stripped bark, or remains of prey. Deer browsing, rabbit and hare gnaw marks on tree bark, and remains of bird or small mammal prey left by foxes or stoats are typical examples.
- Hair and fur
- **Mammal pathways** (runs and trails) Well -used paths or trails created by repeated use by mammals, such as badgers or deer

Additionally, 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 Appendix C, Figure C-1.

The location of all signs was recorded via the use of a handheld GPS and photographs taken to visually catalogue the record.

10.2.3.1.2 Otter Surveys

A dedicated Otter survey was undertaken in accordance with NRA *Guidelines for Treatment of Otters During Construction of National Road Schemes* (NRA, 2006) to assess the suitability of the Proposed Development Site for Otter.

Otters are widespread in Ireland and inhabit a range of aquatic environments, both freshwater and marine, though they always require access to fresh water. Due to their territorial nature, otters frequently mark their territories with droppings, known as "spraints," which are often placed in conspicuous locations and are relatively easy to identify. Otters breed in burrows called "holts" and also use safe spots above ground, known as "couches," for daytime resting. Holts are commonly found under tree root systems close to water, though they can also be located some distance away.

Primarily crepuscular, otters are most active at dawn and dusk, feeding on various prey, predominantly fish and crustaceans, but occasionally birds and small mammals. Being crepuscular helps them avoid human activity and potential predators and also aligns with the activity patterns of their prey, such as fish and crustaceans, which can be more active at these times. However, otters can be flexible in their activity patterns, sometimes adapting to nocturnal or even diurnal habits depending on food availability, human disturbance, and seasonal changes.

Otters can breed at any time of the year, as they are not strictly seasonal breeders. However, environmental conditions and prey availability may influence the timing of reproductive peaks. Studies, such as those by Kruuk (2006) and Chanin (2013), suggest that while breeding can occur year-round, higher rates of cub births have been observed in the summer months. This pattern aligns with periods of greater prey abundance and favourable environmental conditions, which improve cub survival rates, attributed to the availability of food resources and milder environmental conditions compared to harsher winter months. Otter pups will suckle for approximately 14 weeks and remain with their mother for 7–12 months before dispersing to establish their own territories. Mortality of up to 50% in the first year is normal; however, those that survive their first year may live up to 8 years or more, although a lifespan of 3–4 years is more typical (NPWS, Otter Leaflet). Otter young stay in the den until 2–3 months of age, when they accompany their mother on their first fishing trips (Ruiz-Olmo, *et al*. 2002).

According to the NRA's (2008a) *Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes*, there are no seasonal constraints for conducting otter surveys. However, it is noted that dense vegetation, particularly during the summer months, can hinder the identification of otter holts or couches.

The otter survey was conducted on 12/09/2023 and included the coastline within the Proposed Development Site boundary plus a 300-meter survey buffer along the coastline on either side of the site, extending 300 meters west and 300 meters east of the Proposed Development Site (refer to Appendix C, Figure C-1) illustrating the otter-specific Study Area. For otter surveys related to construction, NRA (2008a) guidelines recommend assessing up to 150 meters from the proposed development, particularly around breeding holts, to minimise disturbance.

An update otter survey on 04/09/2025 repeated the shoreline inspection within the Proposed Development Boundary and, for health and safety reasons, extended search coverage to 200 m east of the Small Boat Harbour. This modification remains consistent with NRA (2008a) guidance (i.e., surveys up to 150 m from proposed works around breeding/resting features). All signs (spraints, couches, trails and prey remains) were recorded with handheld GPS and photographed.

A visual inspection of the shoreline for evidence of Otter was conducted. Types of evidence searched included:

- Otter holts
- Couches
- Spraints (Otter droppings)
- Anal jelly
- Tracks and footprints
- Slides and play areas

- Feeding remains

The location of all signs (if observed) was also recorded via the use of a handheld GPS and photographs taken to visually catalogue the record.

Volant Mammals (Bats)

Bat surveys were conducted from April to September 2023, following the guidelines from Collins, J. (edn.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn.) by The Conservation Trust (ISBN: 978-1-872745-96-1). The bat surveys conducted, along with their corresponding dates, are outlined below in Table 10-1.

Table 10-1: Summary of bat surveys conducted for the Proposed Development, including survey types and timing

Survey Type	Survey Timing
Preliminary Roost Assessment (PRA) to locate potential roosting sites	4th April 2023
Bat Emergence/Re-entry Surveys to confirm the presence of roosting bats in buildings/structures and trees within the Proposed Development Boundary	28th August 2023, 29th August 2023, and 30th August 2023
Transect Surveys to monitor bat activity and species presence along designated routes	17th April 2023, 19th June 2023, and 12th September 2023
Static Detector Surveys during the spring, summer, and autumn seasons to assess seasonal activity patterns	Spring: 4th April 2023 to 17th April 2023. Summer: 5th June 2023 to 18th July 2023. Autumn: 15th September to 25th September 2023.

10.2.3.1.3 Preliminary Roost Assessment (PRA)

A Preliminary Roost Assessment (PRA) was carried out to identify (if any) potential bat roosting sites within the Proposed Development Boundary on the 4th April 2023. Mature trees within the Study Area were assessed for their suitability as bat roosts, and any structures, such as buildings, were also examined. Preliminary Roost Assessments (PRAs) were performed during daylight hours to detect any obvious signs of bat activity around these structures and potential roosting areas, following guidance from Collins (2016).

Relevant Potential Roost Features (PRFs) within trees were visually inspected from ground level using binoculars and a high-powered torch to search for features which may provide potential roosting opportunities for bats, and for any building within the Survey Area. Signs of bat use include bat droppings, feeding remains, potential bat access points identified by characteristic staining and scratches, noise made by bats etc. The assessment took place on 4th April 2023, and all PRFs were categorised based on their roosting potential 'Negligible', 'Low', 'Moderate, or 'High as described in Table 10-2 below, which informed the required number of emergence and re-entry surveys, as per the Collins (2016) methodology. PRFs are described according to the current guidelines in Bat Surveys for Professional Ecologists: Good Practice Guidance (Collins edn., 2016).

Table 10-2: Roost Suitability Categorisation (Collins, *et al.*, 2016)

Suitability	Description of Roosting Habitats	Commuting and foraging habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and / or suitable surrounding habitats to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation). A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roost potential.	Habitat that could be used by small numbers of commuting bats such as a 'gappy' hedgerow or unvegetated stream, but isolated and not well connected to the surrounding landscape by other habitats. Suitable, but not isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to its size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessment in this table is made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to its size, shelter, protection, conditions and surrounding habitats.	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree lined watercourses and grazed parkland.

Suitability	Description of Roosting Habitats	Commuting and foraging habitats
		Site that is close to and connected to known roosts.

Based on the features present and the location of a given tree or structure, the potential for different types of bat roost was also considered, i.e., summer/maternity, transitional and hibernation roosts.

Features of interest for the PRA surveys included:

- Potential Roost Features (PRFs) and hibernation sites of bats, and determine the roost category/categories, e.g. the purpose and, therefore, the importance of the structure/tree
- Any sensitive features for breeding, resting, foraging or commuting
- Commuting corridors used by bats to and from their roost(s) with a description of any vegetation or other linear features of importance to bats
- Evidence of bat presence such as faeces/droppings, urine staining, scratch marks/characteristic staining and food remains (e.g. moth wings)
- Assess the suitability of various trees, cavities and derelict buildings on site (if any) as bat roosts
- To determine if bats are currently present or have been present in the past

Structures and trees were categorised by their roosting potential (Negligible, Low, Moderate or High) which then determined the number of emergence and re-entry surveys needed (Collins, 2016).

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 (refer to Table 10-2). For trees, further surveys are required if the trees are assessed as having 'Moderate' or higher suitability, or if evidence of bats is found during the PRA. If no or low suitability PRFs for bats are found then further surveys are not required (Collins (ed.) 2016).

10.2.3.1.4 Emergence Surveys

To conduct bat emergence surveys for buildings and trees, as per *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (Collins, 2016), the following steps are followed:

- **Timing**: Surveys are conducted at dusk and dawn to detect bats leaving or entering roosts. The optimal survey period is from May to September, with at least two surveys required for low suitability sites and three for moderate to high suitability.

- **Survey Area**: Potential roost features (PRFs) are identified during the Preliminary Roost Assessment (PRA), focusing on cracks, crevices, or other potential entry points

- **Equipment**: Handheld bat detectors and recording devices to capture echolocation calls for species identification

Dusk emergence surveys were carried out in suitable weather conditions (refer to Table 10-3) from the 28th August 2023, 29th August 2023, and 30th August 2023. Surveys were carried out with an appropriate number of surveyors to visually cover all the potential roosting features of the structure being surveyed. Surveys were carried out 15 minutes before sunset and continued until 1.5 – 2 hours after sunset, as per Best Practice Guidance (Collins, 2016). As per Collins (2016) one emergence or re-entry survey was completed on structures with low roosting potential. If a bat was observed emerging from the building, its emergence location, time of emergence and species (if possible) was recorded. General bat activity directly around the building, such as feeding and commuting, was also recorded.

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.

Table 10-3: Survey Times and Weather Condition Requirements as per Collins (2016) guidance

Survey Type	Start Time	End Time
Dusk Emergence	15 minutes before sunset	1.5-2hrs after sunset
Dawn Re-entry	1.5-2hrs before sunrise	15 minutes after sunrise
Area	Temperature Minimum	Wind Speed Maximum
Lowland	10°C	18 km/hr
Upland	8°C	27 km/hr

10.2.3.1.5 Bat Activity (Transect) Surveys

Three bat transect surveys were conducted on 17th April 2023, 19th June 2023, and 12th September 2023 to assess bat activity across the Proposed Development Boundary. These Bat Activity (Transect) Surveys provided insights into bat behaviour within the PDB and helped to identify flight paths and estimate bat numbers, following Collins (2016) *Bat Surveys for*

Professional Ecologists: Good Practice Guidelines. A transect route was carefully designed to cover all habitat types identified within the site (refer to Appendix C, Figure C-5).

Each transect survey was conducted at dusk, starting at sunset and continuing for 1.5 to 2 hours afterward, as recommended by Collins (2016). Handheld bat detectors, including the Anabat Walkabout and BatBox Duet models, were used to identify bat species based on their call frequencies. Surveyors adhered to Best Practice Guidance throughout the surveys, recording the number of bats, species, flight paths, and movement direction. 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.

10.2.3.1.6 Bat Activity (Static Detector) Surveys

Bat Activity (Static Detector) Surveys were carried out using six (6) ground level static detectors that were deployed in the seasons Spring, Summer and Autumn of 2023 within the Proposed Development Boundary. In Appendix C, Figure C-6, the locations of static detector deployments for the spring, summer and autumn surveys are illustrated. In accordance with the Bat Conservation Trust (BCT) guidelines (Collins, 2016), those features assessed as providing moderate or high suitability for commuting and/or foraging bats were subject to one static detector survey each month during the active bat season (which is typically between April and October, inclusive). Data was obtained for a minimum of 10 nights per season, as per NatureScot (2021) guidance. Reasonable time gaps were left between deployment periods for surveys in adjacent seasons to avoid contiguous survey periods (NatureScot, 2021).

Survey timings followed the recommendations as per Collins (2016) guidance as outlined in Table 10-4 below.

Table 10-4: Survey Times for Bat Activity Surveys using Static Detectors as per Collins (2016) guidance

Season	Timing	Dates Conducted	Deployment Length
Spring	April to May	4th April 2023 to 17th April 2023.	Minimum 10 nights
Summer	June to Mid-August	5th June 2023 to 18th July 2023.	Minimum 10 nights
Autumn	Mid-August to September	15th September to 25th September 2023.	Minimum 10 nights

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).

It is acknowledged that *Myotis spp.* can have very similar calls, and that the classification of sonograms can be imprecise, so all Myotis records should be considered as conferred records, i.e., *Myotis cf daubentonii*.

There can also be overlaps in call frequency between *Pipistrellus spp*. Calls with a CF component at 50kHz may be either Soprano Pipistrelle *Pipistrellus pygmaeus* or Common Pipistrelle *Pipistrellus pipistrellus*, while calls at 40kHz may be either Common Pipistrelle or Nathusius' Pipistrelle *Pipistrellus nathusii*. In most cases, it is possible to determine the species based on call characteristics and/or other calls immediately before or after the recording.

If a bat pass could not be confidently identified to species level it was recorded as an unidentified bat or identified only to genus level (e.g. *Myotis spp.*).

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). Specific thresholds for numbers of passes for each category are not applied, however 'low' numbers of bat passes suggest minimal activity (Negligible or Low), while 'high' numbers signal more frequent bat presence and movement (Moderate or High).

Collins (2016) also classifies activity levels for bats into categories based on the number of bat passes recorded per night, with thresholds that generally correspond to Negligible, Low, Moderate, and High activity levels.

Context -specific professional judgment was therefore applied to assign thresholds for the numbers of passes recorded to activity levels (refer to

Table 10-5).

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.

Please note 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).

Table 10-5: Categorisation of bat activity in relation to number of passes used for Proposed Development

Category	Number of Bat Passes
Negligible	<9
Low	10-49
Moderate	50-99
High	>100

Herpetofauna

10.2.3.1.7 Amphibian Surveys

Amphibian surveys were undertaken on 30th January 2023, 8th February 2023, 9th February 2023, and 3rd March 2023 in accordance with NRA *Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes* (NRA, 2009a).

Evidence of amphibians searched for included:

- Amphibian habitat suitability assessment (to support breeding common frog and smooth newt) – potential spawning habitat
- Live sightings/spawn

The entirety of the Proposed Development Boundary above HWM was surveyed for amphibians.

Surveys for both the common frog and the smooth newt were conducted on 04th April 2023, 19th June 2023, and 28th August 2023. These surveys focused on direct visual observations of live sightings, as no suitable habitat for these species was identified within the surveyed area during habitat suitability surveys.

10.2.3.1.8 Reptile Surveys

Reptile surveys were undertaken in accordance with NRA *Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes* (NRA, 2009) on 04/042023, 18/04/2023, 19/06/2023, and 28/08/2023.

According to the *NRA (2009a) guidance*, the best months to reliably observe reptiles are generally April to mid- or late-May, and mid- or late-August to mid-September, depending on weather conditions at the beginning and end of each period. The optimal survey times within these months depend on temperature, sunlight, and rainfall. Typically, surveys are most effective between 08:30 and 11:00 and between 16:00 and 18:30, as reptiles are likely to be basking during these cooler parts of the day. Early or late in the year, the middle of the day may

be more productive, whereas, during hotter months, reptiles will bask in the morning or evening when temperatures are cooler.

Between June and mid-August, there is often a narrow survey window early in the morning or later in the day when temperatures cool. When the air temperature exceeds 18°C, basking activity decreases, making surveys, particularly those involving refuges, less reliable. Optimal survey effectiveness is achieved when air temperatures are between 9°C and 18°C, conditions under which reptiles are more likely to be basking in accessible areas.

The Study Area for reptiles during the walkover survey was confined to the Proposed Development Boundary. Within this area, five artificial refugia were deployed at locations within the Proposed Development Site identified as suitable for reptiles. These refugia consisted of heavy-gauge rubber mats, approximately 1 meter by 0.5 meters, placed in areas expected to attract basking reptiles. Following their installation, the refugia were monitored through direct observational surveys to detect any reptile activity underneath. These refugia served as additional survey points to enhance detection of reptile presence within the PDB

Reptile surveys were conducted on 4th April 2023, 18th April 2023, 19th June 2023, and 28th August 2023. 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.

The surveys focused on (i) confirming the presence or absence of viviparous lizards in habitats directly affected by the development, (ii) assessing the lizards' distribution within the survey corridor, (iii) evaluating population viability (e.g., breeding evidence or injury indicators), (iv) identifying important habitat features such as hibernation sites, and (v) determining the value of various habitats for lizard use.

10.2.3.2 HABITATS WALKOVER SURVEY

10.2.3.2.1 Habitats

A habitat survey is a standardised method of recording habitat types and characteristic vegetation, as set out in the ‘Best Practice Guidance for Habitat Survey Mapping’ (The Heritage Council, 2011). A habitat survey is a method of collecting information about the ecology of a site. A confirmation habitat walkover was also undertaken on 04/09/2025, supported by drone (UAV) habitat mapping to refine habitat boundaries along inaccessible/unsafe margins of the Small Boat Harbour and the sedimentary sea cliffs.

“The fundamental piece of information collected is the habitat type to which a particular area can be assigned. Habitat types are determined by reference to a system of habitat classification, which must be clearly identified. The location and extent of different habitat types that are present in a site are mapped to provide a clear spatial record. Additional information on habitats may also be collected, such as dominant species or conservation status, depending on the objectives of the particular habitat survey. The results of a habitat survey provide basic ecological information that can be used for biodiversity conservation,

planning and/or management, including targeting of more detailed botanical or zoological investigations" – Smith, *et al*., 2011 (The Heritage Council).

The habitat walkover, which included a search for invasive non-native flora species, flora of conservation concern and Annex I habitats, was completed on 19th June 2023 (within the optimal seasonal survey window as recommended by the NRA (2009a)).

Habitat surveys, classification and mapping were undertaken as per the following national best practice guidance:

- Best Practice Guidance for Habitat Survey and Mapping (Smith et al., 2011)
- A Guide to Habitats in Ireland. Kilkenny, The Heritage Council. Fossitt, J. A. (2000)
- Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes (NRA, 2009a)

Habitats within the Proposed Development Boundary were classified and mapped according to Fossitt (2000) and target notes were used to record any additional features as per NRA (2009) and Smith, *et al*. (2011). Fossitt (2000) is a hierarchical classification system which links habitat types to specific plant communities. Photographs were collected of each habitat.

10.2.3.2.2 Annex I Habitats

An assessment of the Proposed Development Boundary for designated Annex I habitats of the EU Habitats Directive was completed 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).

10.2.3.2.3 Flora

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).

10.2.3.2.4 Invasive Non-Native Flora Species

A high-level invasive plant species search was conducted within the Proposed Development Boundary during the Habitat Walkover Survey (19/06/2023), with a focus on those listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2011) and species listed in NRA (2010). Other species which can negatively impact biodiversity were recorded and their distributions sketched on field maps. Target notes were taken to detail height, density, and any signs of previous management if invasive species were observed. The locations of all non-native / invasive species were recorded via the use of a handheld GPS and photographs taken to visually catalogue the record.

10.2.4 HABITAT MAPPING

10.2.4.1 GROUND HABITAT MAPPING

Mapping followed Smith et al. (2011) and maps were created using QGIS 3.34.5. Habitats were classified to Level 3 of Fossitt (2000), dominant species, indicator 'characteristic' species and/or species of conservation interest were noted along with the sediment/substrate within the habitat, with the Fossitt category codes given in parenthesis.

10.2.4.2 AERIAL (UAV) HABITAT MAPPING

An aerial habitat survey was carried out on 04/09/2025 using an unmanned aerial vehicle (DJI Mavic 3E) operated by a licensed remote pilot in accordance with Irish Aviation Authority (IAA) and EASA regulations. The survey collected high-resolution RGB imagery through pre-programmed autonomous flight lines flown within visual line of sight. Flight operations were conducted under suitable weather conditions and in compliance with site access and safety protocols. The imagery was subsequently processed and georeferenced, providing an additional dataset to support the ground-based habitat mapping (Section 10.2.4.1). These data were used to cross-check habitat boundaries, refine extent estimates, and improve mapping accuracy in areas where ground access was constrained.

10.3 RESULTS

This section presents the results of the desk study and surveys described in Section 2.

10.3.1 MAMMALS (NON-VOLANT) RESULTS

Documented non-volant mammal species recorded within the NBDC T11G square grid are listed in Table 10-6. No other non-volant terrestrial mammal records were found within the 2km^2 grid T11G.

Table 10-6: Protected non-volant mammal species recorded within the 2km^2 grid T11G (NBDC)

Species Name	Record Count	Date of Last Record	Designation
European Otter (*Lutra lutra*)	1	02/02/2012	Habitats Directive (92/43/EEC), Annex II, Annex IV Wildlife (Amendment) Act (2000) Bern Convention, Appendix II
West European Hedgehog (*Erinaceus europaeus*)	1	15/04/2020	Wildlife (Amendment) Act (2000)

The NBDC records for the extended search area for otter are shown in Table 10-7 below. The otter record mentioned in Table 10-6 above is also included (highlighted in bold) in Table 10-7.

Of the fourteen 2km^2 grid cells included in the desk search for otter (Figure 10-2), five grid cells contained otter records. The most recent recorded sighting was on 16th September 2017 in grid cell T01V with all other recorded sightings over 12 years old.

With the exception of grid T11G, it is evident from Figure 10-2 that the recorded sightings within the Study Area are associated with a freshwater river or stream.

Table 10-7: NBDC records of Otter within the wider area of the Proposed Development Site

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	2km² 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 within the NBDC 2km² grid T11G.				

Article 17 reporting otter records (NPWS, 2019) are shown in Figure 10-3. The most recent otter sighting in the Study Area was recorded on 18th October 2018 circa 5km southwest of the Proposed Development. Three of the otter sightings are also recorded on the NBDC database and are included in Table 10-7.

No evidence of otter was identified within or adjacent to the Survey Area during the Mammal Walkover Surveys in 2023. At that time, habitat suitability within the Survey Area for couches and holts was considered low, given the busy port environment (anthropogenic disturbances) and the prevalence of hard breakwater along the existing Small Boat Harbour.

However, during the updated Mammal Walkover Survey undertaken on 04/09/2025, clear evidence of otter activity was recorded. Multiple spraints (Figure 10-5) and couches (also along the sedimentary sea cliffs habitat) were observed along the hard breakwater on the western boundary of the Small Boat Harbour, and well-defined otter trails were noted through dense horsetail, scrub, and reed vegetation along the sedimentary sea cliffs (Figure 10-8, Figure 10-9). In addition, numerous remains of otter prey were recorded within these areas, as well as along the hard breakwater adjacent to the trailer yard and extending towards the Europort berths (Figure 10-6).

Couches are above-ground resting sites, distinct from holts, and are typically located in areas of dense cover close to water. In Ireland, they most often comprise flattened patches of vegetation such as reeds, tall grass, or scrub, but may also occur amongst driftwood, boulders, or within rock armour. They are usually associated with well-defined otter trails leading to and from the water's edge and are often accompanied by other signs of use such as spraints and prey remains. Within the Site, couches were observed at the base of the sedimentary sea cliffs where otter trails were noted leading onto the beach and hard breakwater, as well as on top of the hard breakwater along the western boundary of the Small Boat Harbour and within crevices of the seawall rock armour along the freight trailer storage area (Figure 10-7, Figure 10-9). These findings provide clear evidence that otters are regularly using these habitats for resting and shelter.

It is noted that weather conditions on the day of survey, and in the days and weeks preceding it, were unsettled, with heavy rainfall, strong winds, and high wave activity. These conditions are likely to have washed away or obscured additional spraints along the coastline and breakwater.

These findings, which are mapped in Figure 10-4, confirm that otters are actively using the Site and adjacent habitats for resting, commuting and foraging.

On the basis of this updated survey evidence, the Site now supports habitat features of **moderate to high suitability for otter**, including couches within rock armour and vegetated cliffs. The presence of recent sprainting activity indicates that otter are frequent users of the area, despite the level of port activity.

No sightings or evidence of other non-volant mammal species, such as Badger (*Meles meles*), Irish Hare (*Lepus timidus hibernicus*), Pine Marten (*Martes martes*) Pygmy Shrew (*Sorex minutus*) or Irish Stoat (*Mustela erminea hibernica*), were recorded during the course of the Mammal Walkover Survey and camera trapping surveys.

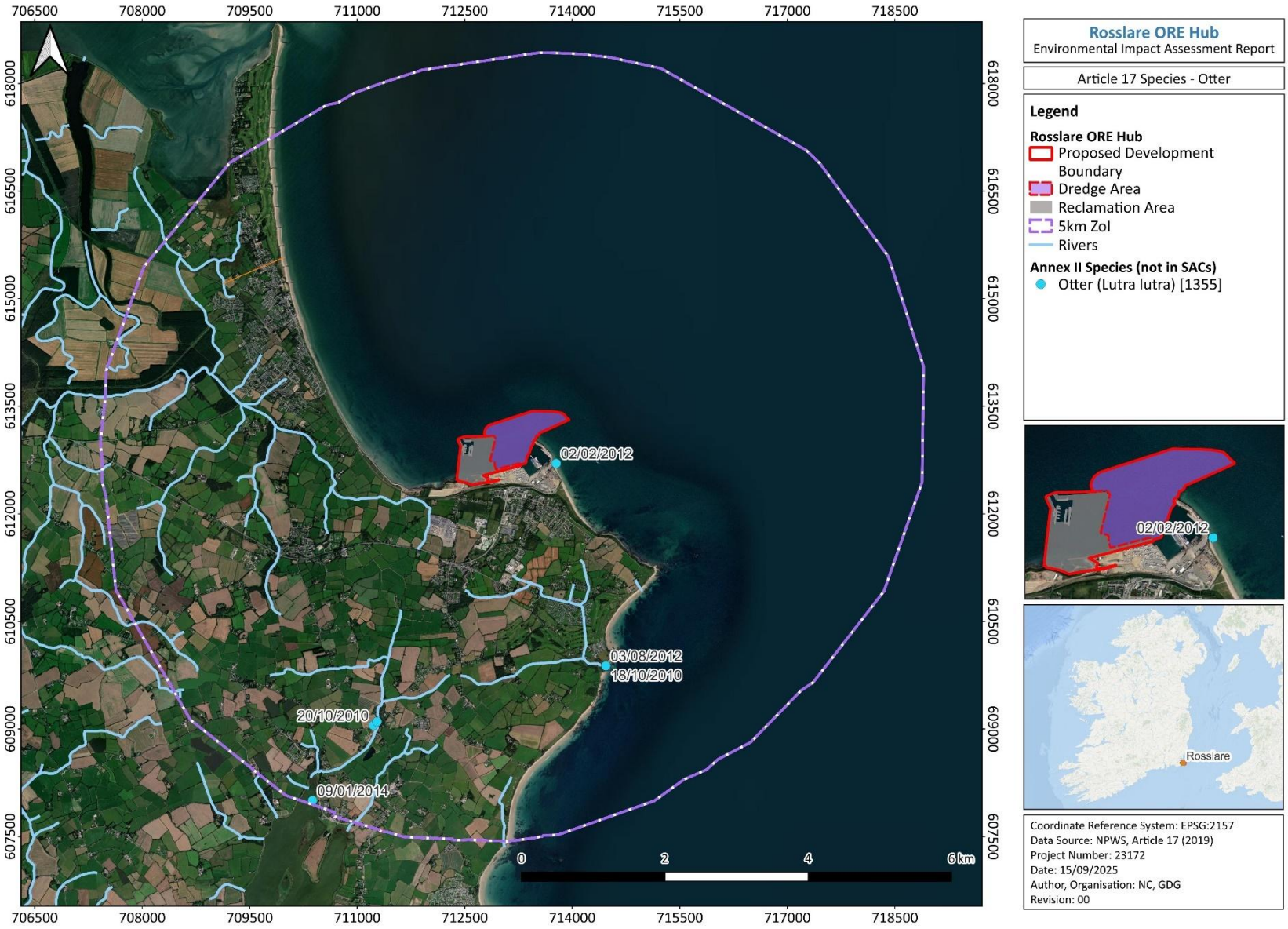

Figure 10-3: Article 17 data of otter records within 5km radius of the Proposed Development (NPWS, 2019)

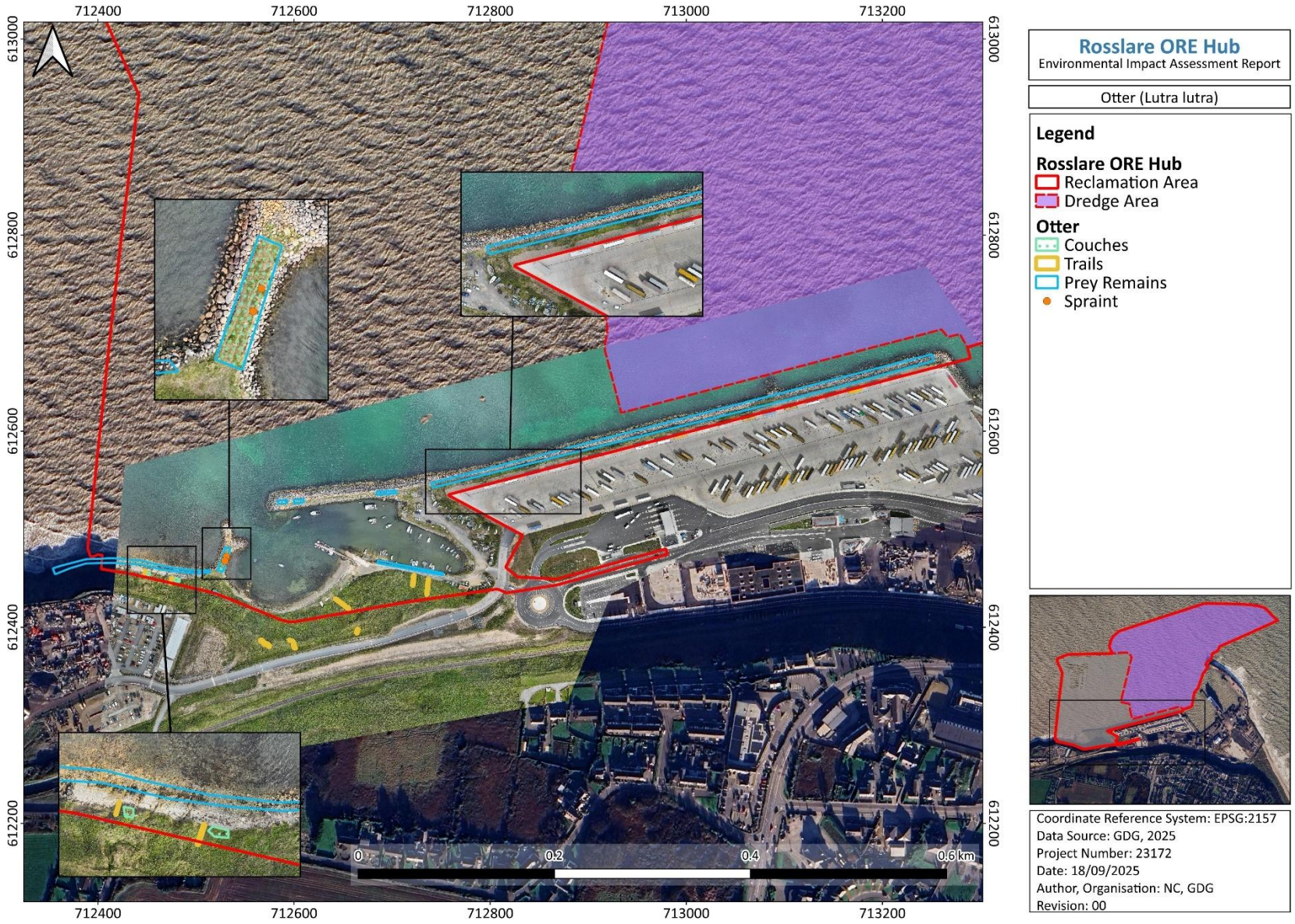

Figure 10-4 Mammal Walkover Survey – Otter Observations and Recordings (GDG, September 2025)

Figure 10-5 Otter Spraints recorded along the hard breakwater along the western boundary of the Small Boat Harbour

Figure 10-6 Otter prey remains recorded along the seawall jetty and hard breakwater within the Small Boat Harbour and along the freight trailer storage area, namely crustacean fragments (spraint circled in red), observed during the updated Mammal Walkover Survey on 04/09/2025

Figure 10-7 Examples of otter couches recorded within the Site on 04/09/2025, including flattened vegetation at the base of the sedimentary sea cliffs and resting sites on top of hard breakwater along the western boundary of the Small Boat Harbour

Figure 10-8 Well-defined otter trails observed along the western boundary of the Small Boat Harbour on top of the hard breakwater and within the vegetated sea cliffs, indicating regular commuting routes between the shoreline and adjacent vegetation (surveyed 04/09/2025)

Figure 10-9 Otter trails and couches recorded along the western boundary of the Small Boat Harbour on top of the hard breakwater, showing well-defined access routes through sea cliff vegetation (surveyed 04/09/2025). Spraints were recorded in this area

10.3.2 VOLANT MAMMALS (BATS)

One record from 2009 of one species of bat (*Soprano Pipistrelle*) was found within the NBDC 2km^2 grid T11G (Table 10-8).

Table 10-8: Volant (bat) species recorded within the 2km square grid T11G (NBDC)

Species Name	Record Count	Date of Last Record	Designation
Soprano Pipistrelle (*Pipistrellus pygmaeus*)	1	02/06/2009	Habitats Directive (92/43/EEC), Annex IV Wildlife (Amendment) Act (2000)

10.3.2.1 PRA SURVEY RESULTS

10.3.2.1.1 PRA Survey Results (2023)

Thirty (30) buildings and three (3) trees were identified and surveyed to determine their roosting suitability. No structures of 'High' or 'Moderate' roosting suitability were identified during the PRA.

While no bat roosts could be identified, twenty-one (21) buildings were classified as being of Low suitability to roosting bats, while nine (9) buildings were classified as being of Negligible suitability to roosting bats. All three (3) trees within the Proposed Development Boundary were classified as being of Negligible suitability to roosting bats. Based on ground level visual survey it was considered unlikely that any maternity roosts were present in trees within or adjoining the Proposed Development Boundary.

The full results of the PRA surveys of the structures and trees are presented in Appendix C, Table C.1. The mapped locations of the buildings and the trees that were assessed are shown in Appendix C, Figure C-3.

10.3.2.1.2 PRA Survey Results (2025)

Trees recorded within the Proposed Development Boundary were assessed as having Negligible suitability to support roosting bats. No features such as cracks, cavities, or loose bark were identified that would provide potential roosting opportunities.

Several small ancillary structures, including garden sheds associated with the fishermen's plots adjacent to the harbour, were assessed as having **Low suitability** due to the presence of limited PRFs (e.g. gaps beneath roof materials and cladding). No signs of bat presence, such as droppings, staining or feeding remains, were observed during the assessment. However, access to the interior of these sheds was not possible, and therefore a thorough search to determine the likelihood of a roosting site could not be undertaken. Based on their size, construction type and limited roosting opportunities, these structures were considered unlikely to support significant roosts, and no further survey effort was deemed necessary.

10.3.2.2 EMERGENCE SURVEY RESULTS

No bats were recorded emerging from any of the buildings during bat emergence surveys however bat commuting was recorded (Table 10-9 to Table 10-14 inclusive). Appendix C Figure C-4 includes satellite imagery of the structures assessed during the bat emergence surveys, along with photographs of the various structures taken during the PRA survey.

Building BL3

This structure is a small wooden storage shed, likely utilised by local fishermen. During the PRA survey, this structure was classified as having low roosting suitability. Consequently, a single emergence survey was undertaken for BL3. One surveyor, using a thermal camera, conducted an emergence survey of the building. No bats were observed emerging from BL3, confirming the absence of a bat roost within the structure. The survey results are summarised in Table 10-9.

Table 10-9: Bat activity recorded during emergence survey on the 28/08/23 at BL3

Species	Behaviour	Occurrence (no. of flight passes)
Common Pipistrelle (Pipistrellus pipistrellus sensu stricto)	Commuting	2

Building BL7, BL8 and BL9

These buildings are small wooden storage sheds, likely used by local fishermen. During the PRA survey, each was classified as having low roosting suitability. Consequently, a single emergence survey was conducted for each of BL7, BL8, and BL9 by two surveyors working in conjunction. No bats were observed emerging from any of the three structures, confirming the absence of bat roosts in BL7, BL8, and BL9. The survey results are presented in Table 10-10.

Table 10-10: Bat activity recorded during emergence survey on the 28/08/234 at BL7, BL8 and BL9

Species	Behaviour	Occurrence (no. of flight passes)
Common Pipistrelle	Commuting	2
Unidentified bat species	Commuting	1
Leisler's Bat (Nyctalus leisleri)	Commuting	1

Buildings BL11, BL12, BL13, BL14, BL15, BL16 and BL17

All of these buildings are small wooden storage sheds, likely utilised by local fishermen. Each building was classified as having low roosting suitability during the PRA survey. Consequently, a single emergence survey was conducted for each of the buildings listed above, with one surveyor working alongside a thermal camera. No bats were observed emerging from any of the three structures, confirming the absence of bat roosts within these buildings. The survey results are presented in Table 10-11.

Table 10-11: Bat activity recorded during emergence survey on the 29/08/234 at BL11 – BL17

Species	Behaviour	Occurrence (no. of flight passes)
Common Pipistrelle	Commuting	1

Buildings BL18, BL19, BL20, BL21, BL22, BL23 and BL24

All of these buildings are small wooden storage sheds, likely used by local fishermen. Each of these buildings was classified as having low roosting suitability. Consequently, one emergence survey was conducted for each of the buildings listed above, with one surveyor working in conjunction with a thermal camera. No bats were observed emerging from any of the three buildings, confirming that no bat roosts were present within the surveyed structures. The survey results are presented in Table 10-12.

Table 10-12: Bat activity recorded during emergence survey on the 30/08/234 at BL18 – BL24

Species	Behaviour	Occurrence (no. of flight passes)
Common Pipistrelle	Commuting	1
Leisler's Bat	Commuting	1

Buildings BL27 and BL28

These buildings are small wooden storage sheds, likely used by local fishermen. Both structures were classified as having low roosting suitability during the PRA survey. Consequently, one emergence survey was conducted at each of BL27 and BL28 by two surveyors working in conjunction. No bats were observed emerging from either building, confirming that no bat roosts were present within BL27 or BL28. The survey results are presented in Table 10-13.

Table 10-13: Bat activity recorded during emergence survey on the 29/08/234 at BL27 and BL28

Species	Behaviour	Occurrence (no. of flight passes)
Leisler's Bat	Commuting	2

Building BL30

This building is a small wooden storage shed, likely used by local fishermen. It was classified as having low roosting suitability during the PRA survey. Accordingly, one emergence survey was conducted at BL30 by two surveyors working in conjunction. No bats were observed emerging from BL30, confirming that no bat roost was present within the building. The survey results are presented in Table 10-14.

Table 10-14: Bat activity recorded during emergence survey on the 29/08/23 at BL30

Species	Behaviour	Occurrence (no. of flight passes)
Soprano Pipistrelle	Commuting	1
Leisler's Bat	Commuting	4

10.3.2.3 BAT ACTIVITY (TRANSECT) SURVEYS

One bat was recorded during the three bat transect surveys. The bat was observed visually and was not detected by the surveyors' bat detector therefore classification to species level is not possible. The results are presented in Table 10-15 below. The mapped location of the transect surveys can be seen in Appendix C, Figure C-5.

Table 10-15: Bat Activity (Transect) Survey Results

Transect Number	Date	Species	Behaviour	Occurrence (no. of flight passes)
1	17/04/2023	Nil sightings	N/A	N/A
2	19/06/2023	Unknown	Foraging	1
3	12/09/2023	Nil sightings	N/A	N/A

10.3.2.4 BAT ACTIVITY (STATIC DETECTOR) SURVEYS

Spring Static Deployment

The results of the spring static deployment recording activity levels for individual species for each location can be seen in Table 10-16 below. The mapped location of the spring, summer and autumn static deployment locations can be seen in Appendix C, Figure C-6.

Table 10-16: Spring Static Detector Bat Activity Survey Results

Location Number	Nights Active	Species	Average Bat Activity levels
1	14	Common Pipistrelle	High
		Soprano Pipistrelle	Low
		Brown Long-eared Bat (*Plecotus auritus*)	

Location Number	Nights Active	Species	Average Bat Activity levels
		Leisler's Bat	
2	14	Common Pipistrelle	High
		Leisler's Bat	Moderate
		Soprano Pipistrelle	
		Brown Long-eared Bat	Low
		Nathusius' Pipistrelle (*Pipistrellus nathusii*)	Negligible
		Myotis species	

Summer Static Detector Deployment

The results of the summer static deployment recordings of bat activity levels for individual species for each location can be seen in Table 10-17 below. The mapped location of the spring, summer and autumn static deployment locations can be seen in Appendix C, Figure C-6.

Table 10-17: Summer Static Detector Bat Activity Survey Results

Location Number	Nights Active	Bat Species	Average Bat Activity levels
1	14	Nil bat passes	Negligible
2	14	Common Pipistrelle	High
		Leisler's Bat	Moderate
		Soprano Pipistrelle	Low
		Nathusius' Pipistrelle	
		Brown Long-eared Bat	Negligible

Autumn Static Detector Deployment

The results of the summer static deployment recordings of bat activity levels for individual species for each location can be seen in Table 10-18 below. The mapped location of the spring, summer and autumn static deployment locations can be seen in Appendix C, Figure C-6.

Table 10-18: Autumn Static Detector Bat Activity Survey Results

Location Number	Nights Active	Bat Species	Average Bat Activity levels
1	10	Nil bat passes	Negligible
2	10	Leisler's Bat	Low
		Nathusius' Pipistrelle	Negligible

10.3.3 HERPETOFAUNA

10.3.3.1 AMPHIBIANS

No evidence of any amphibian species was identified within or adjacent to the Survey Area. No suitable amphibian breeding habitats were recorded, and therefore no further habitat suitability assessments were conducted.

10.3.3.1.1 Amphibian Survey (2025) Results

A targeted amphibian survey was undertaken on 04/09/2025 to update the baseline for the Proposed Development. Within the terrestrial footprint of the Proposed Development, no suitable breeding habitats were identified. Although the survey was completed after the summer months, when dry spells can reduce the visibility of potential breeding sites, the site does not contain depressions or areas capable of holding stagnant (steep vegetated sea cliffs) or slow-moving water suitable for amphibian breeding.

The smooth newt is dependent on ponds, ditches or shallow pools for breeding, although it may be found in a wide range of terrestrial habitats outside the breeding season, including dense vegetation, scrub and gardens (NBDC, Species Profile [online], 2025). While the vegetated sea cliffs within the Proposed Development Boundary, dominated by species such as great horsetail and large areas of bramble scrub, could provide damp and sheltered terrestrial cover, the absence of any suitable breeding ponds or freshwater features in or adjacent to the site precludes the presence of a newt population.

Smooth newts use terrestrial habitats for hibernation during the winter months, typically from October to March. They seek frost-free refuges such as tree roots, log and rock piles, or deep vegetation. In this context, sheltered areas of the vegetated sea cliffs could provide potential hibernation opportunities. However, in the absence of nearby freshwater breeding resources, the suitability of the site for supporting smooth newts year-round remains limited.

The surrounding marine environment is also unsuitable for amphibians due to its saline nature and exposure to tidal conditions. Accordingly, the likelihood of breeding amphibians occurring within the Proposed Development Boundary is considered low. While potential hibernation features were observed within the Survey Area, no direct evidence of amphibian presence was recorded.

10.3.3.2 REPTILES

No terrestrial reptile records were listed within the 2km^2 grid T11G (NBDC). One record of Leatherback Turtle (*Dermochelys coriacea*) was documented on 31/07/2011, however, the marine environment is not within the scope of this report.

On 18th April 2023 a single Common Lizard (*Lacerta* (*Zootoca*) *vivipara*) was recorded basking on an artificial refugia located in the southwest of the Survey Area – refer to Appendix C, Figure C-7. No other evidence of any reptile species was identified within or adjacent to the Proposed Development Boundary.

The Survey Area lacked the typical or preferred habitats for common lizards, such as woodland, marshes, heathland, bogs, sand dunes, and hedgerows. Consequently, the habitat suitability for common lizards within the site was assessed as low.

10.3.3.2.1 Reptile Survey (2025) Results

An updated reptile survey was undertaken in July 2025 to reassess the suitability of habitats within the Proposed Development Boundary. Unlike the 2023 survey, which included deployment and monitoring of artificial refugia in accordance with NRA (2009) guidance, the 2025 update comprised a targeted walkover assessment of terrestrial habitats to identify potential basking, foraging and sheltering opportunities for reptiles.

The Survey Area was dominated by steep vegetated sea cliffs, densely covered with great horsetail (*Equisetum telmateia*) and interspersed with large areas of bramble scrub. The Small Boat Harbour and adjacent foreshore supported a mixed shingle patch of beach and large rocky outcrops (in particular west of the Small Boat Harbour), while extensive sections of rock armour were present along the harbour walls and the trailer freight storage area. Above the cliffs, the environment was characterised by road infrastructure, earth banks and disturbed ground associated with the adjacent JP construction site.

These habitats provide some structural diversity and localised opportunities for basking and shelter (e.g. rock armour, earth banks, and scrub edges). However, much of the terrestrial footprint comprises highly modified or disturbed ground, and dense vegetation cover along the cliffs reduces the extent of open basking areas. Overall, habitat suitability for reptiles within the Survey Area is considered generally low, with some localised opportunities present.

No reptiles were observed during the 2025 survey. The single common lizard recorded in April 2023 on an artificial refugia remains the only confirmed reptile record within the Proposed Development Boundary. While some features such as rock armour, earth banks and scrub edges may provide occasional opportunities for basking or shelter, habitat availability overall is

limited and fragmented. Reptile presence within the site is therefore considered possible but likely to be at low density and restricted to localised areas of suitable habitat.

Potential hibernation opportunities were observed within the Survey Area, particularly within the rock armour, crevices in earth banks, and areas of dense scrub or vegetation piles. Common lizards typically hibernate (brumate) from October to March in frost-free refuges such as stone walls, log or rock piles, and dense ground vegetation. Therefore, these features within the Proposed Development could provide suitable overwintering cover.

10.3.4 HABITATS AND FLORA

10.3.4.1 ANNEX I HABITATS

During the habitat walkover survey, no habitat of Annex I quality was identified.

During the habitat walkover survey on 04/09/2025, no habitat of Annex I *quality* was identified within the Proposed Development Boundary. However, small, localised areas of shoreline habitat were observed aligning with both *Perennial Vegetation of Stony Banks* [1220] and *Annual Vegetation of Drift Lines* [1210]. These occurred in narrow, fragmented sections and were not extensive, but supported characteristic species such as sea sandwort (*Honckenya peploides*), sea beet (*Beta vulgaris* subsp. *maritima*), oraches (*Atriplex* spp.), sea mayweed (*Tripleurospermum maritimum*), and rock samphire (*Crithmum maritimum*). While these habitats correspond to Annex I types under the Habitats Directive, their extent and condition within the Survey Area do not represent Annex I *quality* examples. Their presence is nevertheless noted here for completeness.

Figure 10-10 Localised occurrence of *Perennial Vegetation of Stony Banks* [1220] and *Annual Vegetation of Drift Lines* [1210] along the southern boundary of the Small Boat Harbour, showing characteristic SPECIES (photo taken 04/09/2025).

The mapped Annex I habitats within 3km (direct measurement) of the Proposed Development are presented in Figure 10-11 and Figure 10-12 below.

One Annex I habitat (outside the boundary of an SAC) is recorded partially overlapping with the Proposed Development Boundary;

- Tidal Mudflats and Sandflats [1140]

Since this habitat lies below the mean high-water marks, it falls within the scope of Chapter 11: Benthic Ecology. For a detailed assessment, refer to Chapter 11: Benthic Ecology.

The following Annex I habitats (outside the boundary of an SAC) were mapped within 3km of the Proposed Development Boundary and are described below:

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

Marram Dunes (White Dunes) [2120]

The Annex I habitat Marram Dunes (White Dunes) [2120] is recorded approximately 3km northwest of the Proposed Development Boundary, with the distance measured seaward rather than across the land (refer to Figure 10-11). NPWS (2019) describes this habitat as follows:

"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 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."

Embryonic Shifting Dunes [2110]

The Annex I habitat Embryonic Shifting Dunes [2120] is recorded approximately 3km northwest of the Proposed Development Boundary, with the distance measured seaward rather than across the land (refer Figure 10-11). Another section of this habitat is located further south of the Proposed Development situated on Bing Bay Beach, past Greenore Point (refer Figure 10-12). NPWS (2019) describes this habitat as follows:

"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."

Fixed Dunes [2130]

The Annex I habitat Fixed Dunes [2130] is recorded approximately 5km south of the Proposed Development Site, with the distance measured seaward rather than across the land – refer Figure 10-12. NPWS (2019) describe this habitat as follows:

"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 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."

Humid Dune Slacks [2190]

The Annex I habitat Humid Dune Slacks [2190] is recorded over 6km south of the Proposed Development Boundary, with the distance measured seaward rather than across the land, situated on Bing Bay Beach (refer Figure 10-12). NPWS (2019) describe this habitat as follows:

"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.

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."

Annual Vegetation of Drift Lines [1210]

The Annex I habitat Annual Vegetation of Drift Lines [1210] is recorded approximately 3km south of the Proposed Development, with the distance measured seaward rather than across the land (refer Figure 10-12). NPWS (2019) describe this habitat as follows:

“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 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.”

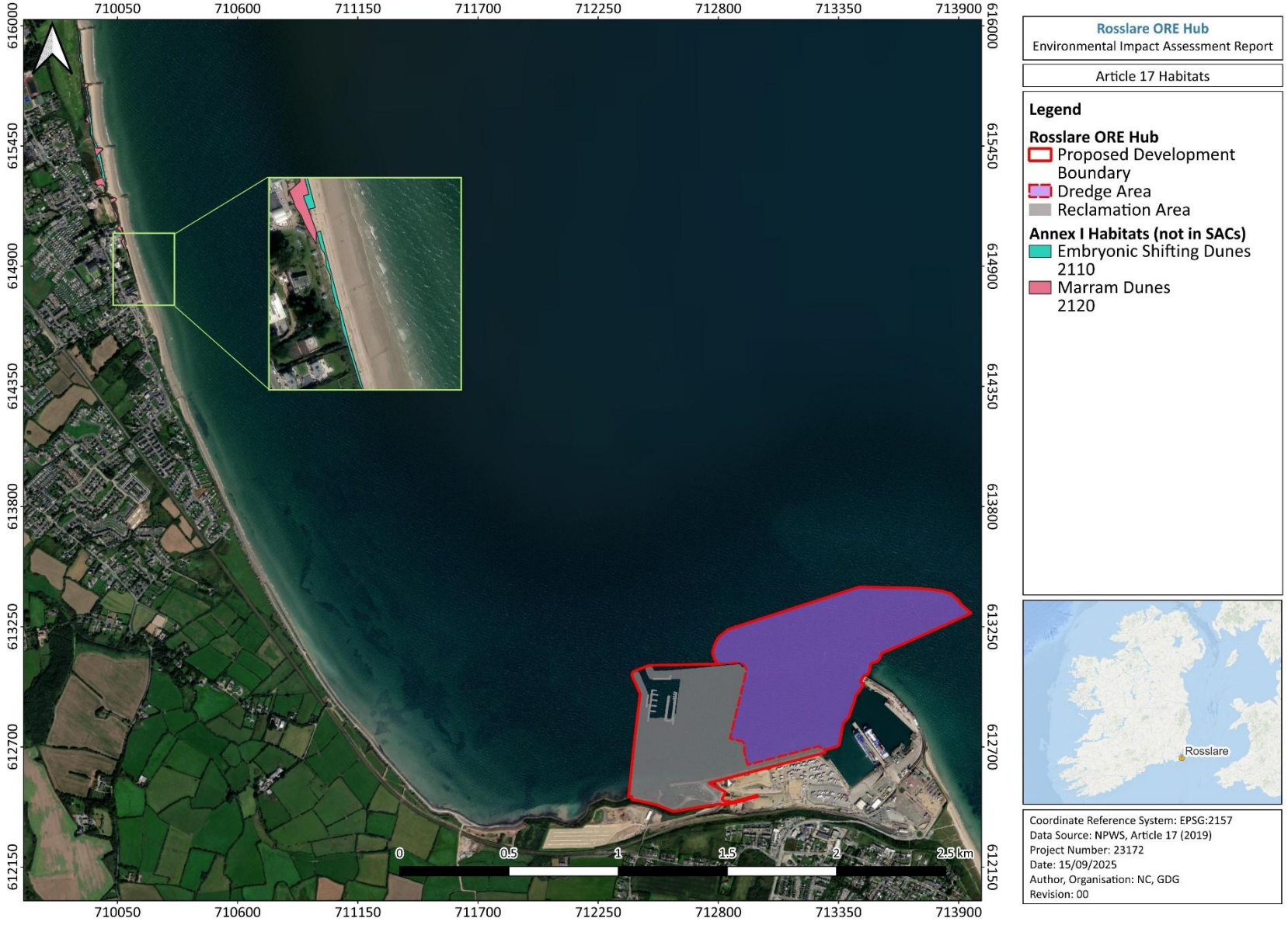

Figure 10-11: Annex I habitats predicted to be present within 3km northwards of the Proposed Development Site – Article 17 data (NPWS, 2019)

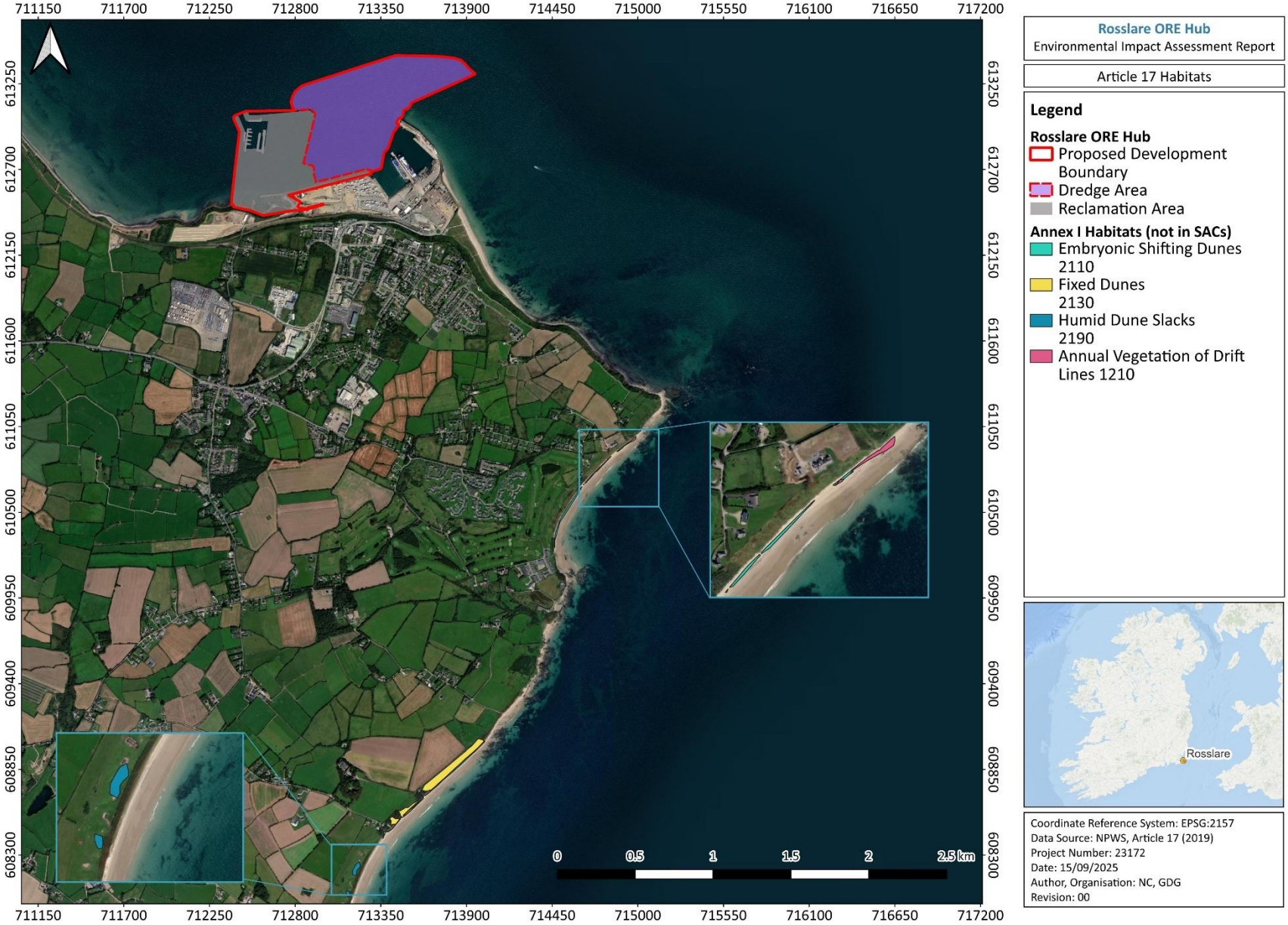

Figure 10-12: Annex I habitats predicted to be present within 3km southwards of the Proposed Development Site – Article 17 data (NPWS, 2019)

10.3.4.2 EUROPEAN DESIGNATED SITES FOR NATURE CONSERVATION (SACS)

There are seven (7) SACs within the vicinity of the Proposed Development Boundary. The closest designated SAC to the Proposed Development Boundary is Carnsore Point SAC, which is approximately 1.4 km southeast of the Proposed Development Boundary (refer to Table 10-19 and Figure 10-13).

Table 10-19: SACs within the vicinity of the Proposed Development Boundary

Site name & code	Distance to Proposed Development Site (km)	Relevant Terrestrial QI/SCI of the Natura 2000 site with S-P-R connectivity above the high-water mark
Carnsore Point SAC [2269]	1.4km directly	N/A
Long Bank SAC [2161]	1.5km directly	N/A
Lady's Island Lake SAC [0704]	4.4km directly 11.1km via the marine environment	Perennial vegetation of stony banks [1220] Coastal lagoons [1150]
Slaney River Valley SAC [0781]	5.3km directly 6.6km via the marine environment	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] *Lutra lutra* (Otter) [1355]
Blackwater Bank SAC [2953]	4.9km directly via the marine environment	N/A
Tacumshin Lake SAC [0709]	8.2km directly 15.9km via the marine environment	Coastal lagoons [1150] Annual vegetation of drift lines [1210] Perennial vegetation of stony banks [1220] Embryonic shifting dunes [2110]

Site name & code	Distance to Proposed Development Site (km)	Relevant Terrestrial QI/SCI of the Natura 2000 site with S-P-R connectivity above the high-water mark
		Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]
Raven Point Nature Reserve SAC [0710]	8.9km directly via the marine environment	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]

10.3.4.3 NATIONALLY DESIGNATED SITES FOR NATURE CONSERVATION

No NHAs spatially overlap with or are situated in the vicinity of the Proposed Development Boundary. There are four (4) pNHAs located within the vicinity of the Proposed Development Boundary, however, none of the four (4) pNHA overlap with the Proposed Development Boundary (refer to Table 10-20).

Table 10-20: pNHAs within the vicinity of the Proposed Development Boundary

pNHA name & code	Distance to Proposed Development Site (km)	Corresponding Natura 2000 Sites
St. Helen's Burrow [0782]	2.4	Carnsore Point SAC [2269] (Partially overlapping)
Wexford Slobs and Harbour [0712]	2.8	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	Lady's Island Lake SAC [0704] Lady's Island Lake SPA [4009]

pNHA name & code	Distance to Proposed Development Site (km)	Corresponding Natura 2000 Sites
Tacumshin Lake [0709]	8.1	Tacumshin Lake SAC [0709] Tacumshin Lake SPA [4092]

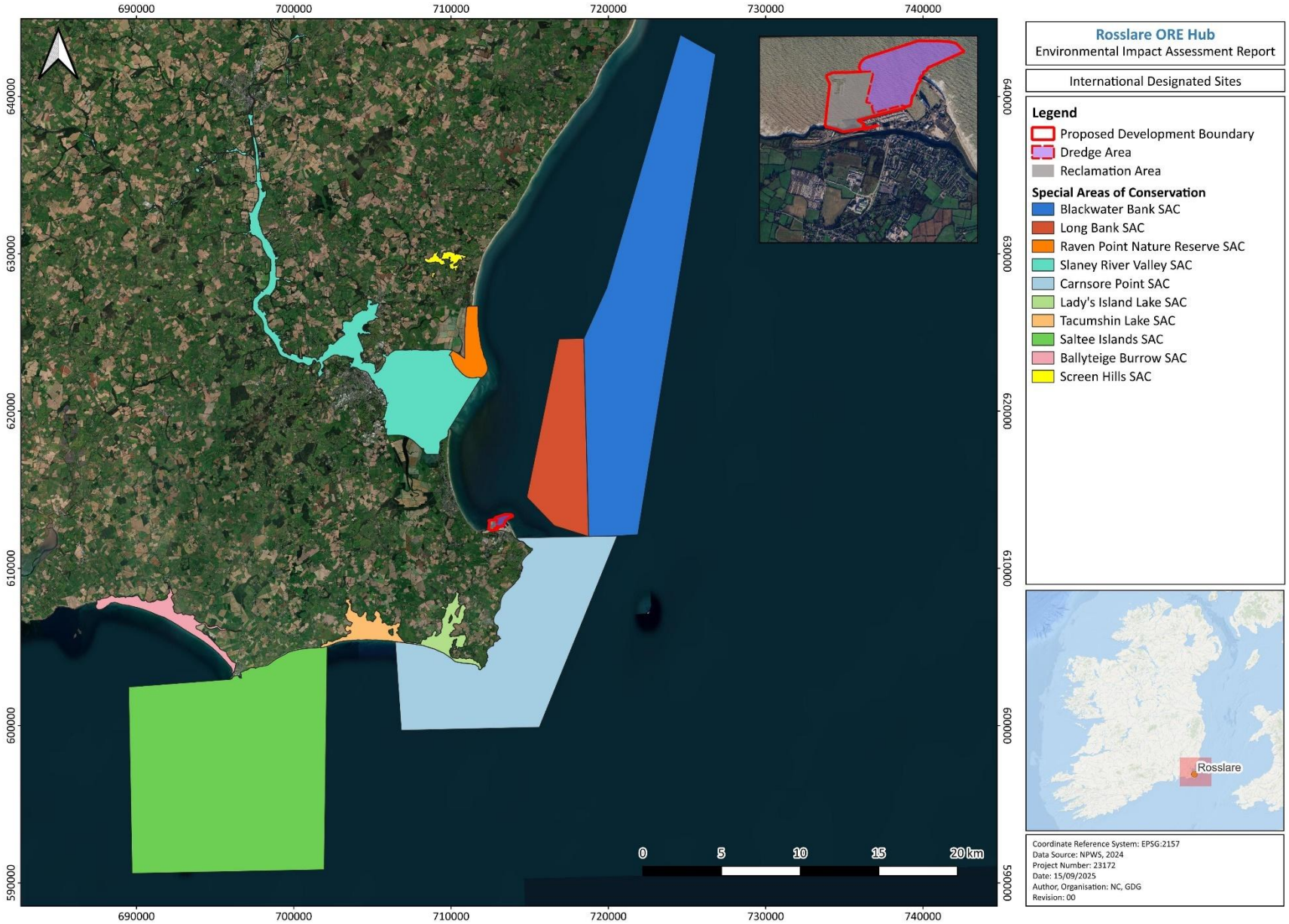

Figure 10-13: SACs in the vicinity of the Proposed Development Boundary

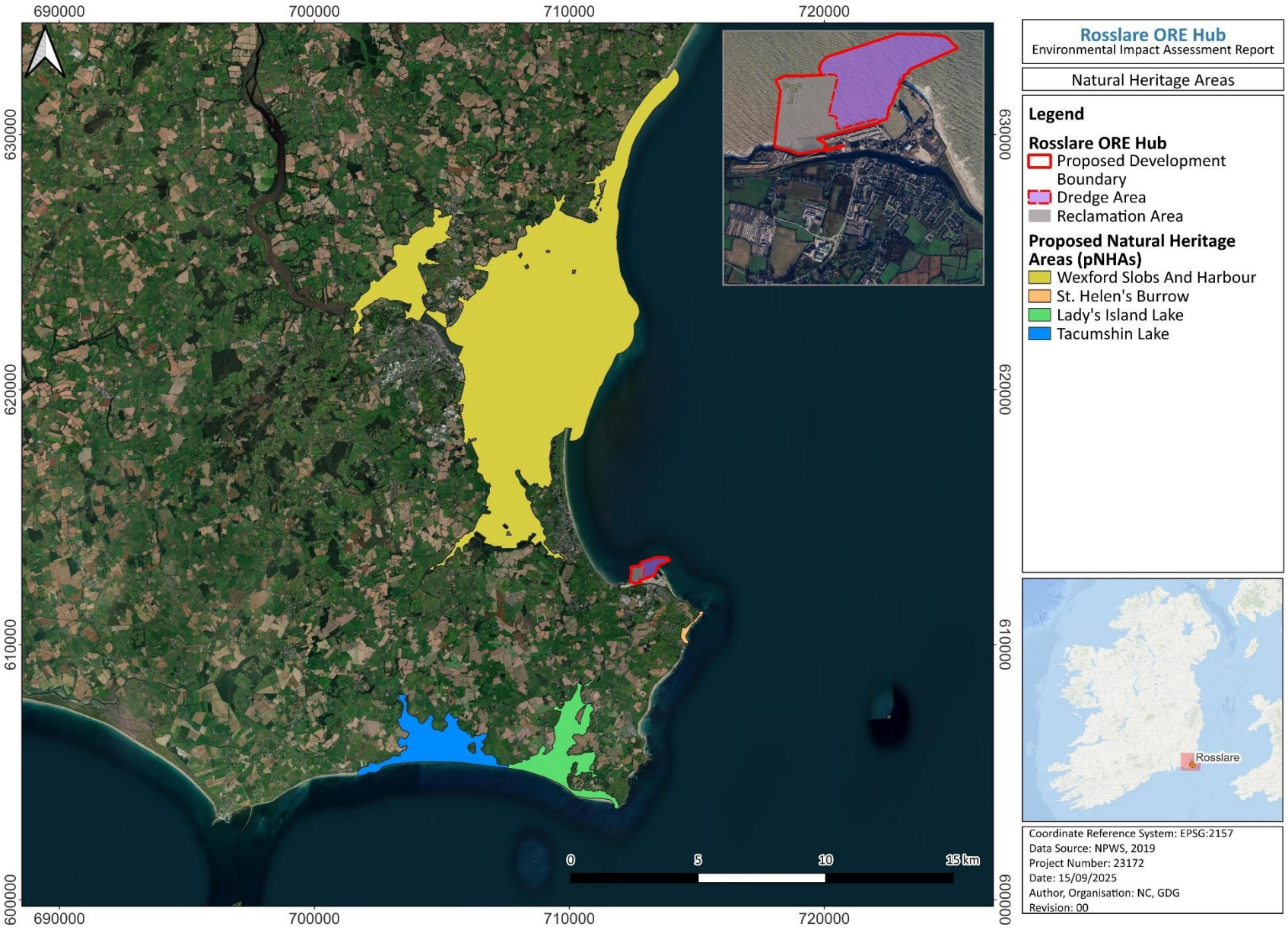

Figure 10-14: pNHAs in the vicinity of the Proposed Development

10.3.4.4 FLORA

10.3.4.4.1 Existing Records of Relevant Flora Species (Protected, threatened or invasive non-native species)

The desk study results for flora species within the 2km square grid T11G, sourced from the National Biodiversity Data Centre (NBDC) include both native and non-native species, as well as those of conservation interest. A full list of documented flora species within T11G is provided in Appendix B of this Technical Appendix.

Invasive species documented within T11G are listed in Table 10-21, while protected and/or threatened flora species are listed in Table 10-22.

Table 10-21: Invasive non-native flora species recorded within the 2km square grid T11G (NBDC)

Species Name	Record Count	Date of Last Record	Designation
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
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)
Sycamore (Acer pseudoplatanus)	12	05/06/2014	Invasive Species: Medium Impact
Three-cornered Garlic (*Allium triquetrum*)	18	19/05/2019	Invasive Species: Medium Impact Regulation S.I. 477 (Ireland)
Wall Cotoneaster (Cotoneaster horizontalis)	3	05/06/2014	Invasive Species: Medium Impact

Species Name	Record Count	Date of Last Record	Designation
Wild Parsnip (*Pastinaca sativa*)	3	05/06/2014	Invasive Species: Medium Impact

Table 10-22 IUCN Red-Listed flora species recorded within the 2km square grid T11G (NBDC).

Species Name	Record Count	Date of Last Record	Designation (IUCN Red-listed)
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

10.3.4.4.2 Survey Results of Invasive Non-Native Species (Flora)

No invasive species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations (S.I. 477 of 2011) were recorded within or adjacent to the Proposed Development Site. However, winter heliotrope (*Petasites fragrans*), a non-native species assessed as having medium invasive impact in Ireland (NBDC, 2025), was recorded along the stony bank behind the garden sheds owned by fishermen on the eastern boundary of the Small Boat Harbour.

Photographs of this species are provided in Figure 10-15, and its recorded location is shown in Figure 10-16**Figure X.X**.

Figure 10-15 Winter Heliotrope scattered along the eastern boundary of the Small Boat Harbour yard - photo taken 04/09/2025.

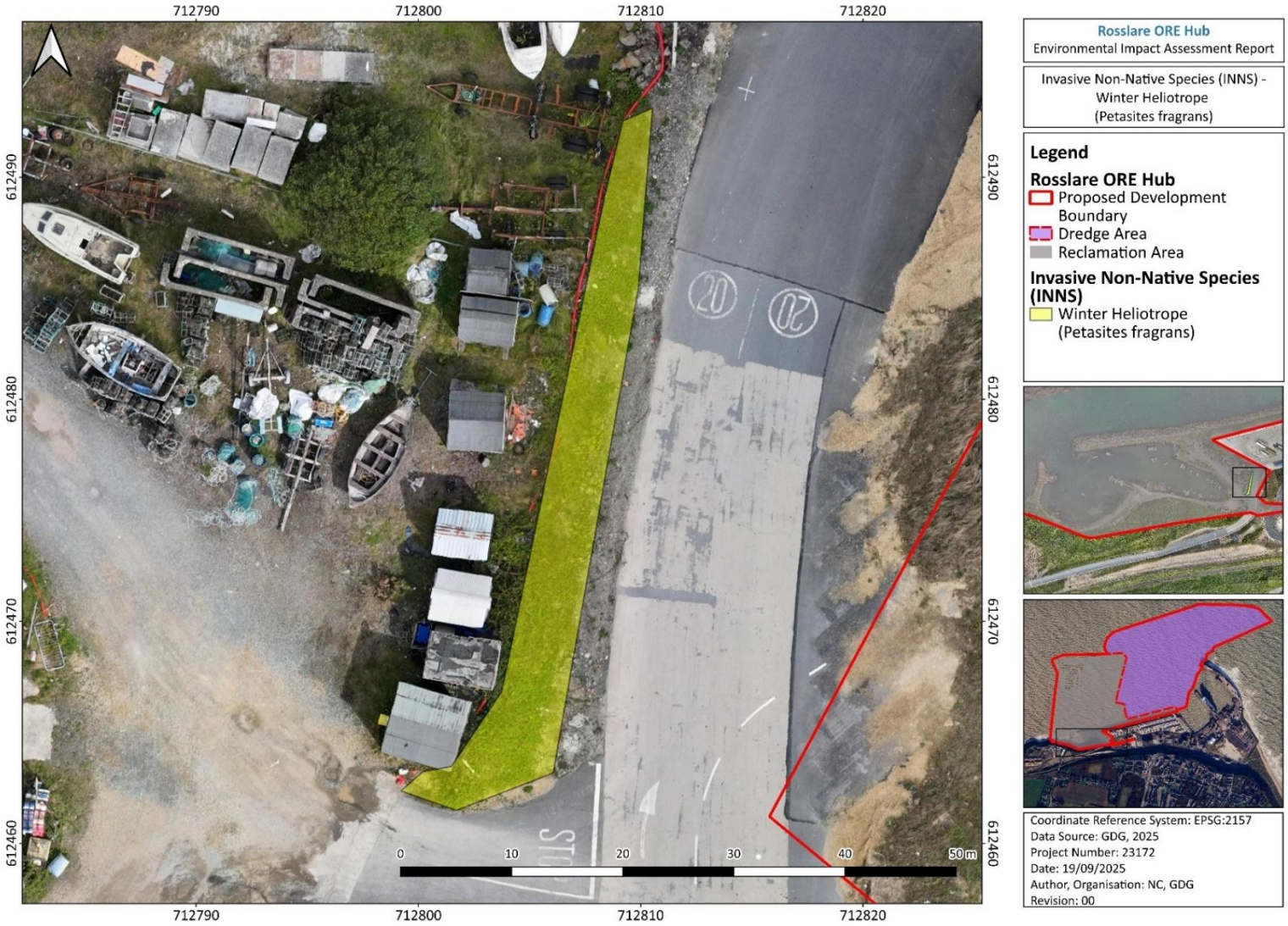

Figure 10-16 Location of Winter Heliotrope within the Proposed Development Site.

10.3.4.4.3 Survey Results of Protected Flora Species

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 by the ecologists during the 2023 and 2025 Survey.

10.3.4.5 HABITAT SURVEY RESULTS

Habitats recorded in the study area are listed in Table 10-23, where each habitat is described in detail with an accompanying photo of the habitat taken during the Walkover Survey.

Habitat maps showing the location and extent of each of the recorded habitats is shown in Figure 10-17 and **Error! Reference source not found.** and ecological value assigned to each habitat recorded is summarised in Table 10-24.

Table 10-23: Habitats recorded within the Study Area

Habitat Name & Code (as per Fossitt, 2000)	Description of habitat within the Proposed Development Site	Picture / Figure
Scrub (WS1)	WS1 was recorded in two main areas within the Proposed Development Boundary: a large area 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 sea cliff (CS1) habitat. Vegetation in these areas had received little recent management, with sward height of approx. 1-2 m in places. Species present in Scrub (WS1) habitat included reed (*Phragmites* spp.), briar (*Rubus fruticosus* agg.), horsetail (*Equisetum* spp.), hedge bindweed (*Calystegia sepium*), ragwort (*Jacobaea vulgaris*), perennial ryegrass (*Lolium perenne*), thistle (*Cirsium* spp.), soft rush (*Juncus effusus*), cock's-foot (*Dactylis glomerata*), ribwort plantain (*Plantago lanceolata*), common knapweed (*Centaurea nigra*), nettle (*Urtica dioica*), hawkbit (*Leontodon* spp.), hedge woundwort (*Stachys sylvatica*), cow parsley (*Anthriscus sylvestris*), and willowherb (*Epilobium* spp.). Areas of immature	

Habitat Name & Code (as per Fossitt, 2000)	Description of habitat within the Proposed Development Site	Picture / Figure
	grey willow (*Salix cinerea*) scrub were also observed within this habitat, developing in scattered patches.	
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 scrub and scattered herbs including thistle (*Cirsium* spp.), nettle (*Urtica dioica*), and soft rush (*Juncus effusus*). The habitat occurs on sloping and tall cliff faces directly exposed to marine environment.	

Habitat Name & Code (as per Fossitt, 2000)	Description of habitat within the Proposed Development Site	Picture / Figure
Reed and Large Sedge Swamps (FS1)	FS1 was recorded in gently sloping areas at the base of the cliffs and on ledges where persistent groundwater seepage maintains waterlogged clay soils. The habitat was most extensive at the base of the cliffs and on ledges, but particularly dense stands were noted along the southeast boundary of the Small Boat Harbour. These areas support extensive stands of reed (*Phragmites australis*) and great horsetail (*Equisetum telmateia*), which form the dominant vegetation cover. Other species were also recorded within this community, 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.	

Habitat Name & Code (as per Fossitt, 2000)	Description of habitat within the Proposed Development Site	Picture / Figure
		

Habitat Name & Code (as per Fossitt, 2000)	Description of habitat within the Proposed Development Site	Picture / Figure
Buildings and Artificial Surfaces (BL3)	Existing roadways, buildings and harbour infrastructure were classified as BL3.	

Habitat Name & Code (as per Fossitt, 2000)	Description of habitat within the Proposed Development Site	Picture / Figure
Seawalls, 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. Species present within this habitat were scarce in terms of coverage but had a few species scattered amongst the rocks including Rock Samphire (*Crithium maritinum*), Beet (*Beta vulgaris*), Ragwort, Greater Plantain (*Plantago major*) and Sea Mayweed (*Tripleurospermum maritimum*).	

Habitat Name & Code (as per Fossitt, 2000)	Description of habitat within the Proposed Development Site	Picture / Figure
Mixed Sediment Shores (LS5)	LS5 habitat was also present adjacent to areas of marine water habitats. There was little to no vegetation recorded within this habitat type.	

Habitat Name & Code (as per Fossitt, 2000)	Description of habitat within the Proposed Development Site	Picture / Figure
Shingle and Gravel Banks (CB1) *alignment with Perennial Vegetation of Stony Banks [1220] / Annual Vegetation of Drift Lines [1210]	A small, discontinuous strip of shoreline vegetation was recorded along the southern boundary of the Small Boat Harbour, above the highwater 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. The habitat does not meet the criteria for Annex I quality but is noted here for completeness.	

Habitat Name & Code (as per Fossitt, 2000)	Description of habitat within the Proposed Development Site	Picture / Figure
Dry Meadows and Grassy Verges (GS2)	Small areas of GS2 were present throughout the Proposed Development Boundary. 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.	

Habitat Name & Code (as per Fossitt, 2000)	Description of habitat within the Proposed Development Site	Picture / Figure
Recolonising Bare Ground (ED3)	A single small area of 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.	

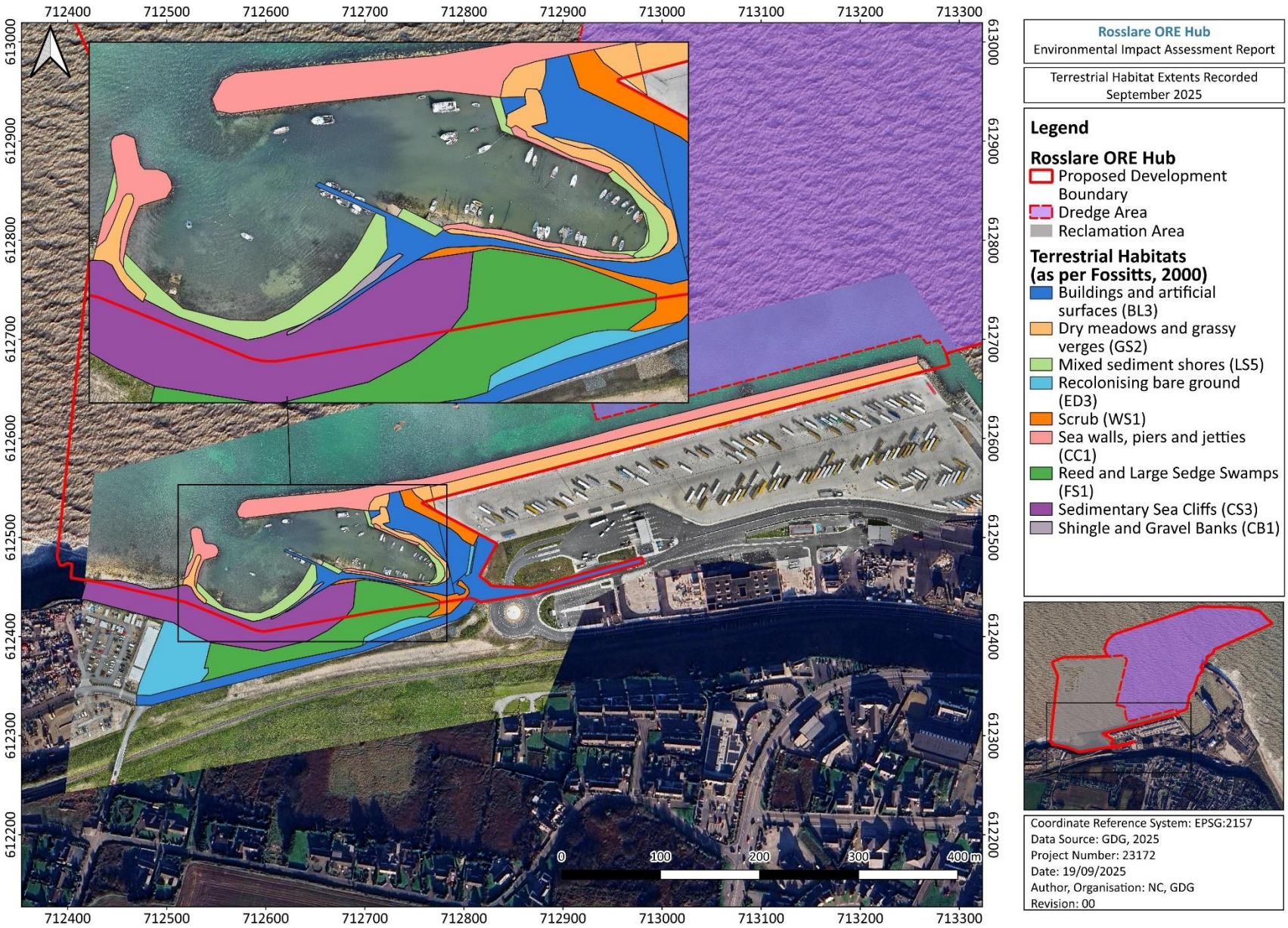

Figure 10-17: Habitat Map prepared by GDG based on September 2025 survey data with habitat codes as per Fossitt (2000)

Table 10-24: Habitats recorded within the Proposed Development Site and Ecological Importance

Habitat Name & Code (as per Fossitt, 2000)	Ecological Importance
Scrub (WS1)	Local Importance (Lower Value)
Sedimentary Sea Cliffs (CS3)	Local Importance (Higher Value)
Reed and Large Sedge Swamps (FS1)	Local Importance (Lower Value)
Buildings and Artificial Surfaces (BL3)	Local Importance (Lower Value)
Seawalls, Piers and Jetties (CC1)	Local Importance (Lower Value)
Mixed Sediment Shores (LS5)	Local Importance (Lower Value)
Shingle and Gravel Banks (CB1)	Local Importance (Lower Value)
Dry Meadows and Grassy Verges (GS2)	Local Importance (Lower Value)
Recolonising Bare Ground (ED3)	Local Importance (Lower Value)

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Appendices

APPENDIX A: PROTECTED SPECIES LEGISLATION SUMMARY

Wild animals that have been afforded protection under the Wildlife Acts include all deer species, otter, pine marten, Irish stoat, badger, all species of bats, Irish hare, red squirrel, hedgehog, pygmy shrew, common frog, natterjack toad, common lizard, smooth newt, freshwater pearl mussel, freshwater white-clawed crayfish, all species of birds, and the Kerry slug as well as marine mammals.

The legislation for species considered relevant to the Proposed Development is outlined below.

Otter (*Lutra lutra)*

Otters are protected under the Wildlife Acts (as amended) and are listed under Annex IIa and IVa of the EC Directive (92/43) "The Conservation of Natural Habitats and of Wild Fauna and Flora" (the Habitats Directive). Under these laws it is an offence to wilfully kill or injure an otter, disturb them during breeding (all year-round breeding season), or damage a resting (couches located above ground) or breeding site (maternal holts located underground). Otters, in addition, are listed as requiring strict protection in Appendix II of the Berne Convention on the Conservation of European Wildlife and Natural Habitats and are included in the Convention on International Trade of Endangered species (CITES).

West European Hedgehog (*Erinaceus europaeus*)

The West European hedgehog is protected under the Wildlife Acts (as amended) and is Ireland's only species of hedgehog. Classed as Least Concern on the IUCN red list, however, this is due to the fact that the species is data deficient. In Britain the hedgehog is classed as Vulnerable to Extinction.

Pine Marten (*Martes martes*)

The pine marten, the only native species of the genus Martes in Ireland, is protected under the Wildlife Acts (as amended) and is listed under Annex V of the EU Habitats Directive. In addition, the pine marten is designated under Appendix III of the Bern Convention. The conservation aim is to increase the population of the marten to favourable conservation status throughout Ireland, expanding its range. O'Reilly *et al*. (2021) conducted an island-wide survey examining the history, genetics, and conservation status of the pine marten in Ireland. Their study estimated the breeding population to be between 2,330 and 3,852 individuals.

Irish Stoat (*Mustela erminea subsp. hibernica*)

The Irish stoat is afforded protection under the Wildlife Acts 1976 (as amended) and the Wildlife (Protection of Wild Animals) Regulations, 1980 (S.I. No. 112/1980) which enabled Ireland to comply with the provisions of the Bern Convention (ratified in 1982).

Irish Hare (*Lepus timidus subsp. Hibernicus*)

The Irish hare is the only native lagomorph of three lagomorphs found on the Island of Ireland. The Irish hare belongs to the species mountain hare (*Lepus timidus*) of which there are at least sixteen subspecies, the Irish hare being endemic to Ireland. The Irish hare is widespread throughout the country and is found in habitats as far ranging as coastal dunes to mountain tops.

The Irish hare is legally protected since 1930 in the Republic of Ireland, initially under the Game Preservation Act (1930), then by the Wildlife Act (1976) and Wildlife (Amendment) Act 2000. It is listed on Appendix III of the Berne Convention, Annex V(a) of the EC Habitats Directive (92/43/EEC) and as an internationally important species in the Irish Red Data Book.

Eurasian Pygmy Shrew (*Sorex minutus*)

The pygmy shrew is Ireland's smallest mammal and until recently the only shrew species found in Ireland. It occupies a variety of habitats, from woodlands to grasslands, where it primarily feeds on insects. Despite its wide distribution, the pygmy shrew is sensitive to changes in its habitat caused by agricultural practices, urban development, and predation by introduced species like the greater white-toothed shrew (*Crocidura russula*). In terms of protection, the pygmy shrew is protected by the Wildlife Act (1976) and Wildlife (Amendment) Act 2000. It is not specifically listed under the European Union's Habitats Directive, but it benefits indirectly from broader conservation measures aimed at protecting natural habitats in Ireland.

Herpetofauna (Amphibians and Reptiles)

There are three native species of amphibian in Ireland and one native species of reptile, all of which are protected under the Wildlife Acts 1976 (as amended). The natural range of the natterjack toad (*Epidalea calamita*), listed under Annex IV of the Habitats Directive, is restricted to coastal zones of Dingle and Iveragh peninsulas in Co. Kerry. The common frog (*Rana temporaria*) is listed as an internationally important species and under Annex V of the Habitats Directive (92/43/EEC)

The smooth newt (*Lissotriton vulgaris*), the only member of the Urodela family (tailed amphibian) in Ireland, is afforded protection under Appendix III of the Bern Convention. The common lizard (*Zootoca vivipara*) is Ireland's only reptile and is afforded national protection only under the Wildlife Acts 1976 (as amended).

Bats (*Microchiroptera sp.)*

All Irish bats and their roosts are protected in Ireland under national and EU legislation, and it is an offence to disturb/interfere with them without a derogation licence (NPWS, 2023). All bat species are protected under the Wildlife Acts and Annex IV of the EU Habitats Directive. The Lesser Horseshoe bat Rhinolophus hipposideros is listed under Annex II of the EU Habitats Directive. Leisler's bat Nyctalus leisleri was listed in the 2009 published Red List as Near Threatened, however, in the most recent report in 2019 (Marnell *et al*., 2019) this species received the updated status Least Concern.

APPENDIX B: FLORA SPECIES RECORDS (NBDC)

B.1 TERRESTRIAL FLORA SPECIES RECORDED WITHIN THE 2KM SQUARE GIRD T11G (NBDC)

Below summarises the NBDC desk study results for terrestrial plants and trees within the spatial footprint and surrounding environment of the Proposed Development Boundary.

Species Name	Record Count	Date of Last Record	Designation
Scots Pine (Pinus sylvestris)	1	30/08/2020	N/A
Asplenium trichomanes subsp. quadrivalens	2	25/06/2010	N/A
Black Spleenwort (Asplenium adiantum-nigrum)	2	25/06/2010	N/A
Hart's-tongue (Phyllitis scolopendrium)	3	05/06/2014	N/A
Soft Shield-fern (Polystichum setiferum)	3	05/06/2014	N/A
Wall-rue (Asplenium ruta-muraria)	3	05/06/2014	N/A
Alder (Alnus glutinosa)	1	05/06/2014	N/A
Alexanders (Smyrnium olusatrum)	4	19/05/2019	N/A
Almond Willow (Salix triandra)	2	05/06/2014	N/A
Altar-lily (Zantedeschia aethiopica)	1	25/06/2010	N/A
American Willowherb (Epilobium ciliatum)	4	25/06/2010	N/A
Amphibious Bistort (Persicaria amphibia)	2	25/06/2010	N/A
Annual Beard-grass (Polypogon monspeliensis)	2	05/06/2014	N/A
Annual Meadow-grass (Poa annua)	4	05/06/2014	N/A
Annual Pearlwort (Sagina apetala)	2	25/06/2010	N/A
Anthyllis vulneraria subsp. lapponica	2	05/06/2014	N/A
Anthyllis vulneraria subsp. vulneraria	2	25/06/2010	N/A
Arenaria serpyllifolia sens.lat.	1	07/05/1990	N/A
Argentine Fleabane (Conyza bonariensis)	2	10/09/2011	N/A
Ash (Fraxinus excelsior)	2	05/06/2014	N/A
Atlantic Ivy (Hedera hibernica)	1	05/06/2014	N/A

Species Name	Record Count	Date of Last Record	Designation
Autumn Hawkbit (Leontodon autumnalis)	3	05/06/2014	N/A
Babington's Orache (Atriplex glabriuscula)	1	05/07/1989	N/A
Beaked Hawk's-beard (Crepis vesicaria)	5	05/06/2014	N/A
Bee Orchid (Ophrys apifera)	6	03/06/2019	N/A
Bilbao Fleabane (Conyza bilbaoana)	2	23/08/2010	N/A
Bird's-foot Clover (Trifolium ornithopodioides)	2	05/06/2014	N/A
Biting Stonecrop (Sedum acre)	1	16/06/2010	N/A
Bittersweet (Solanum dulcamara)	4	05/06/2014	N/A
Black Medick (Medicago lupulina)	5	05/06/2014	N/A
Black Mustard (Brassica nigra)	4	05/06/2014	N/A
Black-bindweed (Fallopia convolvulus)	1	25/06/2010	N/A
Blackthorn (Prunus spinosa)	3	19/05/2019	N/A
Bladder Campion (Silene vulgaris)	1	05/07/1989	N/A
Boreau's Ramping-fumitory (Fumaria muralis subsp. boraei)	5	05/06/2014	N/A
Bramble (Rubus fruticosus agg.)	5	05/06/2014	N/A
Bread Wheat (Triticum aestivum)	1	05/06/2014	N/A
Bristle Club-rush (Isolepis setacea)	2	05/07/1989	N/A
Bristly Oxtongue (Picris echioides)	7	05/06/2014	N/A
Broad-leaved Dock (Rumex obtusifolius)	4	05/06/2014	N/A
Broad-leaved Willowherb (Epilobium montanum)	2	25/06/2010	N/A
Buck's-horn Plantain (Plantago coronopus)	6	05/06/2014	N/A
Bulbous Buttercup (Ranunculus bulbosus)	3	19/05/2019	N/A
Bulbous Meadow-grass (Poa bulbosa)	3	28/06/2012	N/A
Bulbous Rush (Juncus bulbosus)	1	05/07/1989	N/A
Bulrush (Typha latifolia)	1	05/06/2014	N/A

Species Name	Record Count	Date of Last Record	Designation
Bush Vetch (Vicia sepium)	2	25/06/2010	N/A
Cabbage-palm (Cordyline australis)	2	05/06/2014	N/A
Calystegia sepium subsp. sepium	1	25/06/2010	N/A
Canadian Fleabane (Conyza canadensis)	3	29/07/2014	Invasive Species: Medium Impact
Carex muricata subsp. pairae	2	10/09/2011	N/A
Cat's-ear (Hypochaeris radicata)	8	05/06/2014	N/A
Changing Forget-me-not (Myosotis discolor)	3	05/06/2014	N/A
Charlock (Sinapis arvensis)	1	25/06/2010	N/A
Cleavers (Galium aparine)	3	05/06/2014	N/A
Clustered Dock (Rumex conglomeratus)	2	25/06/2010	N/A
Cock's-foot (Dactylis glomerata)	6	05/06/2014	N/A
Coltsfoot (Tussilago farfara)	4	05/06/2014	N/A
Common Bent (Agrostis capillaris)	1	25/06/2010	N/A
Common Bird's-foot-trefoil (Lotus corniculatus)	8	05/09/2020	N/A
Common Broomrape (Orobanche minor)	5	05/06/2014	Invasive Species: Medium Impact
Common Centaury (Centaurium erythraea)	5	05/06/2014	N/A
Common Chickweed (Stellaria media)	2	25/06/2010	N/A
Common Cornsalad (Valerianella locusta)	3	19/05/2019	N/A
Common Couch (Elytrigia repens)	2	25/06/2010	N/A
Common Dog-violet (Viola riviniana)	1	25/06/2010	N/A
Common Field-speedwell (Veronica persica)	3	25/06/2010	N/A
Common Figwort (Scrophularia nodosa)	1	18/10/2005	N/A
Common Fleabane (Pulicaria dysenterica)	8	31/08/2020	N/A
Common Knapweed (Centaurea nigra)	7	05/06/2014	N/A

Species Name	Record Count	Date of Last Record	Designation
Common Mallow (Malva sylvestris)	1	05/06/2014	N/A
Common Marsh-bedstraw (Galium palustre subsp. palustre)	2	25/06/2010	N/A
Common Mouse-ear (Cerastium fontanum)	4	05/06/2014	N/A
Common Nettle (Urtica dioica)	5	05/06/2014	N/A
Common Orache (Atriplex patula)	2	25/06/2010	N/A
Common Ragwort (Senecio jacobaea)	8	05/06/2014	N/A
Common Reed (Phragmites australis)	6	19/05/2019	N/A
Common Restharrow (Ononis repens)	6	19/05/2019	N/A
Common Sorrel (Rumex acetosa subsp. acetosa)	2	05/06/2014	N/A
Common Sorrel (Rumex acetosa)	2	11/05/1997	N/A
Common Spotted-orchid (Dactylorhiza fuchsii)	2	28/06/2012	N/A
Common Stork's-bill (Erodium cicutarium)	3	05/06/2014	N/A
Common Vetch (Vicia sativa subsp. segetalis)	6	19/05/2019	N/A
Compact Rush (Juncus conglomeratus)	3	05/06/2014	N/A
Corn Spurrey (Spergula arvensis)	2	18/10/2005	N/A
Crack-willow (Salix fragilis)	1	07/05/1990	N/A
Creeping Bent (Agrostis stolonifera)	6	05/06/2014	N/A
Creeping Buttercup (Ranunculus repens)	4	05/06/2014	N/A
Creeping Cinquefoil (Potentilla reptans)	4	05/06/2014	N/A
Creeping Thistle (Cirsium arvense)	5	05/06/2014	N/A
Crested Dog's-tail (Cynosurus cristatus)	3	05/06/2014	N/A
Cuckooflower (Cardamine pratensis)	3	30/04/2023	N/A
Curled Dock (Rumex crispus)	2	11/05/1997	N/A
Cut-leaved Crane's-bill (Geranium dissectum)	6	19/05/2019	N/A

Species Name	Record Count	Date of Last Record	Designation
Cymbalaria muralis subsp. muralis	1	25/06/2010	N/A
Daisy (Bellis perennis)	8	19/05/2019	N/A
Danish Scurvygrass (Cochlearia danica)	5	05/06/2014	N/A
Dog-rose (Rosa canina)	1	25/06/2010	N/A
Dove's-foot Crane's-bill (Geranium molle)	4	05/06/2014	N/A
Dune Fescue (Vulpia fasciculata)	3	25/06/2010	N/A
Dwarf Cherry (Prunus cerasus)	1	31/12/1897	N/A
Early Hair-grass (Aira praecox)	2	22/06/2006	N/A
Early Marsh-orchid (Dactylorhiza incarnata)	1	24/06/2010	N/A
Eastern Rocket (Sisymbrium orientale)	2	05/06/2014	N/A
Elder (Sambucus nigra)	2	25/06/2010	N/A
Elytrigia repens subsp. repens var. aristata	1	25/06/2010	N/A
Equal-leaved Knotgrass (Polygonum arenastrum)	1	05/07/1989	N/A
Erophila verna sens.lat.	1	05/07/1990	N/A
Escallonia macrantha	2	05/06/2014	N/A
Fairy Foxglove (Erinus alpinus)	1	05/06/2014	N/A
False Fox-sedge (Carex otrubae)	3	05/06/2014	N/A
False Oat-grass (Arrhenatherum elatius)	6	05/06/2014	N/A
Fat-hen (Chenopodium album)	2	18/10/2005	N/A
Fern-grass (Catapodium rigidum)	4	05/06/2014	N/A
Festuca rubra agg.	5	05/06/2014	N/A
Festuca rubra x Vulpia fasciculata = X Festulpia hubbardii	1	13/07/2006	N/A
Field Bindweed (Convolvulus arvensis)	3	05/06/2014	N/A
Field Forget-me-not (Myosotis arvensis)	2	19/05/2019	N/A
Field Horsetail (Equisetum arvense)	5	05/06/2014	N/A
Field Madder (Sherardia arvensis)	2	25/06/2010	N/A

Species Name	Record Count	Date of Last Record	Designation
Field Pansy (Viola arvensis)	2	05/06/2014	N/A
Field Wood-rush (Luzula campestris)	1	25/06/2010	N/A
Flowering Currant (Ribes sanguineum)	1	24/03/1994	N/A
Fool's Parsley (Aethusa cynapium)	1	05/07/1989	N/A
Fool's-water-cress (Apium nodiflorum)	1	07/05/1990	N/A
Four-leaved Allseed (Polycarpon tetraphyllum)	2	05/06/2014	N/A
Frosted Orache (Atriplex laciniata)	2	25/06/2010	N/A
Fuchsia magellanica	1	05/06/2014	N/A
Garden Pansy (Viola lutea x tricolor x altaica = V. x wittrockiana)	1	23/11/2006	N/A
Garden Privet (Ligustrum ovalifolium)	1	25/06/2010	N/A
Germander Speedwell (Veronica chamaedrys)	2	25/06/2010	N/A
Gladiolus communis subsp. byzantinus	1	05/06/2014	N/A
Glaucous Sedge (Carex flacca)	3	05/06/2014	N/A
Glebionis segetum	2	05/06/2014	Threatened Species: Near threatened
Gorse (Ulex europaeus)	6	19/05/2019	N/A
Great Brome (Anisantha diandra)	5	25/06/2010	N/A
Great Horsetail (Equisetum telmateia)	5	05/06/2014	N/A
Great Mullein (Verbascum thapsus)	2	16/06/2023	N/A
Great Willowherb (Epilobium hirsutum)	4	05/06/2014	N/A
Greater Bird's-foot-trefoil (Lotus pedunculatus)	2	25/06/2010	N/A
Greater Plantain (Plantago major)	5	19/05/2019	N/A
Greek Sea-spurrey (Spergularia bocconei)	2	05/06/2014	N/A
Ground-elder (Aegopodium podagraria)	1	05/06/2014	N/A
Groundsel (Senecio vulgaris)	6	19/05/2019	N/A

Species Name	Record Count	Date of Last Record	Designation
Guernsey Fleabane (Conyza sumatrensis)	2	23/08/2010	N/A
Hairy Bindweed (Calystegia pulchra)	1	05/07/1989	N/A
Hairy Bird's-foot-trefoil (Lotus subbiflorus)	6	10/09/2011	Threatened Species: Vulnerable
Hairy Bitter-cress (Cardamine hirsuta)	4	05/06/2014	N/A
Hairy Sedge (Carex hirta)	1	05/07/1989	N/A
Hairy Tare (Vicia hirsuta)	3	19/05/2019	N/A
Hard Rush (Juncus inflexus)	1	07/05/1990	N/A
Hare's-tail (Lagurus ovatus)	9	18/06/2020	N/A
Hawthorn (Crataegus monogyna)	2	05/06/2014	N/A
Hedge Bindweed (Calystegia sepium)	1	05/07/1989	N/A
Hedge Mustard (Sisymbrium officinale)	4	05/06/2014	N/A
Hedge Veronica (Hebe elliptica x speciosa = H. x franciscana)	2	25/06/2010	N/A
Hemlock (Conium maculatum)	1	07/05/1990	N/A
Hemlock Water-dropwort (Oenanthe crocata)	1	25/06/2010	N/A
Herb-Robert (Geranium robertianum)	1	25/06/2010	N/A
Hoary Cress (Lepidium draba)	1	25/06/2010	N/A
Hoary Mustard (Hirschfeldia incana)	1	18/10/2005	N/A
Hoary Willowherb (Epilobium parviflorum)	2	05/06/2014	N/A
Hogweed (Heracleum sphondylium)	5	19/05/2019	N/A
Hop Trefoil (Trifolium campestre)	2	05/06/2014	N/A
Japanese Honeysuckle (Lonicera japonica)	1	25/06/2010	Invasive Species: Medium Impact
Japanese Knotweed (Fallopia japonica)	5	14/05/2018	Invasive Species: High Impact Regulation S.I. 477 (Ireland)
Jersey Cudweed (Gnaphalium luteoalbum)	9	05/06/2014	N/A
Jointed Rush (Juncus articulatus)	4	05/06/2014	N/A

Species Name	Record Count	Date of Last Record	Designation
Keeled-fruited Cornsalad (Valerianella carinata)	1	25/06/2010	N/A
Kidney Vetch (Anthyllis vulneraria)	8	19/05/2019	N/A
Knotgrass (Polygonum aviculare)	2	25/06/2010	N/A
Knotted Clover (Trifolium striatum)	1	05/07/1989	N/A
Lady's Bedstraw (Galium verum)	3	25/06/2010	N/A
Lapsana communis subsp. communis	2	05/06/2014	N/A
Lesser Chickweed (Stellaria pallida)	1	23/11/2006	N/A
Lesser Hawkbit (Leontodon saxatilis)	2	25/06/2010	N/A
Lesser Sea-spurrey (Spergularia marina)	5	05/06/2014	N/A
Lesser Stitchwort (Stellaria graminea)	2	25/06/2010	N/A
Lesser Swine-cress (Coronopus didymus)	4	05/06/2014	N/A
Lesser Trefoil (Trifolium dubium)	8	05/06/2014	N/A
Little-robin (Geranium purpureum)	3	05/06/2014	Threatened Species: Endangered
Lyme-grass (Leymus arenarius)	4	25/06/2010	N/A
Marram (Ammophila arenaria)	7	19/05/2019	N/A
Marsh Cudweed (Gnaphalium uliginosum)	3	13/07/2012	N/A
Marsh Foxtail (Alopecurus geniculatus)	2	25/06/2010	N/A
Marsh Thistle (Cirsium palustre)	1	25/06/2010	N/A
Marsh Woundwort (Stachys palustris)	1	05/07/1989	N/A
Meadow Buttercup (Ranunculus acris)	6	05/06/2014	N/A
Meadow Vetchling (Lathyrus pratensis)	4	05/06/2014	N/A
Meadowsweet (Filipendula ulmaria)	2	25/06/2010	N/A
Montbretia (Crocosmia pottsii x aurea = C. x crocosmiiflora)	5	19/05/2019	N/A
Mugwort (Artemisia vulgaris)	3	05/06/2014	N/A
Nasturtium (Tropaeolum majus)	1	25/06/2010	N/A

Species Name	Record Count	Date of Last Record	Designation
Navelwort (Umbilicus rupestris)	2	25/06/2010	N/A
New Zealand Flax (Phormium tenax)	6	19/05/2019	N/A
Nipplewort (Lapsana communis)	1	07/05/1990	N/A
Oil-seed Rape (Brassica napus subsp. oleifera)	1	25/06/2010	N/A
Osier (Salix viminalis)	1	05/06/2014	N/A
Oval Sedge (Carex ovalis)	2	25/06/2010	N/A
Oxeye Daisy (Leucanthemum vulgare)	1	25/06/2010	N/A
Pale Flax (Linum bienne)	3	05/06/2014	Threatened Species: Near threatened
Pale Persicaria (Persicaria lapathifolia)	1	05/07/1989	N/A
Papaver dubium	1	05/06/2014	N/A
Parsley-piert (Aphanes arvensis)	2	25/06/2010	N/A
Pellitory-of-the-wall (Parietaria judaica)	1	05/06/2014	N/A
Perennial Rye-grass (Lolium perenne)	6	05/06/2014	N/A
Perennial Sow-thistle (Sonchus arvensis)	5	05/06/2014	N/A
Perforate St John's-wort (Hypericum perforatum)	1	05/06/2014	N/A
Petty Spurge (Euphorbia peplus)	4	05/06/2014	N/A
Pineappleweed (Matricaria discoidea)	3	19/05/2019	N/A
Pink-sorrel (Oxalis articulata)	1	01/10/1990	N/A
Plantago major subsp. intermedia	1	25/06/2010	N/A
Plantago major subsp. major	1	25/06/2010	N/A
Poa pratensis sens.lat.	1	22/06/2006	N/A
Pot Marigold (Calendula officinalis)	1	25/06/2010	N/A
Prickly Saltwort (Salsola kali subsp. kali)	1	05/07/1989	N/A
Prickly Sow-thistle (Sonchus asper)	4	19/05/2019	N/A
Procumbent Pearlwort (Sagina procumbens)	5	05/06/2014	N/A

Species Name	Record Count	Date of Last Record	Designation
Purple Ramping-fumitory (Fumaria purpurea)	4	05/06/2014	N/A
Purple-loosestrife (Lythrum salicaria)	2	25/06/2010	N/A
Pyramidal Orchid (Anacamptis pyramidalis)	4	15/06/2022	N/A
Rape (Brassica napus)	1	11/05/1997	N/A
Rat's-tail Fescue (Vulpia myuros)	3	05/06/2014	N/A
Red Bartsia (Odontites vernus)	1	05/07/1989	N/A
Red Clover (Trifolium pratense)	5	05/06/2014	N/A
Red Dead-nettle (Lamium purpureum)	2	25/06/2010	N/A
Red Fescue (Festuca rubra)	1	22/06/2006	N/A
Red Goosefoot (Chenopodium rubrum)	1	01/10/1990	N/A
Red Valerian (Centranthus ruber)	4	19/05/2019	N/A
Redshank (Persicaria maculosa)	2	25/06/2010	N/A
Ribwort Plantain (Plantago lanceolata)	7	19/05/2019	N/A
Rock Samphire (Crithmum maritimum)	1	05/06/2014	N/A
Rosebay Willowherb (Chamerion angustifolium)	2	05/06/2014	N/A
Rough Meadow-grass (Poa trivialis)	2	05/06/2014	N/A
Round-leaved Crane's-bill (Geranium rotundifolium)	2	25/06/2010	Threatened Species: Endangered
Rubus ulmifolius	2	23/08/2010	N/A
Rue-leaved Saxifrage (Saxifraga tridactylites)	2	05/06/2014	N/A
Rumex crispus subsp. crispus	4	05/06/2014	N/A
Rumex crispus subsp. littoreus	1	04/03/2006	N/A
Rumex crispus x obtusifolius = R. x pratensis	1	25/06/2010	N/A
Rumex sanguineus	2	25/06/2010	N/A
Rush-leaved Fescue (Festuca arenaria)	2	25/06/2010	N/A

Species Name	Record Count	Date of Last Record	Designation
Rusty Willow (Salix cinerea subsp. oleifolia)	3	05/06/2014	N/A
Sagina apetala subsp. apetala	3	05/06/2014	N/A
Sagina apetala subsp. erecta	1	05/07/1989	N/A
Saltmarsh Rush (Juncus gerardii)	1	05/06/2014	N/A
Sand Couch (Elytrigia juncea)	2	25/06/2010	N/A
Sand Sedge (Carex arenaria)	7	05/06/2014	N/A
Scarlet Pimpernel (Anagallis arvensis subsp. arvensis)	3	05/06/2014	N/A
Scarlet Pimpernel (Anagallis arvensis)	3	03/06/2019	N/A
Sea Beet (Beta vulgaris subsp. maritima)	5	05/06/2014	N/A
Sea Bindweed (Calystegia soldanella)	4	19/05/2019	N/A
Sea Fern-grass (Catapodium marinum)	5	05/06/2014	N/A
Sea Mayweed (Tripleurospermum maritimum)	4	19/05/2019	N/A
Sea Mouse-ear (Cerastium diffusum)	7	19/05/2019	N/A
Sea Pearlwort (Sagina maritima)	4	05/06/2014	N/A
Sea Rocket (Cakile maritima)	3	25/06/2010	N/A
Sea Sandwort (Honckenya peploides)	4	19/05/2019	N/A
Sea Spurge (Euphorbia paralias)	4	13/01/2018	N/A
Sea Stork's-bill (Erodium maritimum)	1	13/07/2012	N/A
Sea-buckthorn (Hippophae rhamnoides)	2	25/06/2010	Invasive Species: Medium Impact Regulation S.I. 477 (Ireland)
Selfheal (Prunella vulgaris)	3	05/06/2014	N/A
Sheep's Sorrel (Rumex acetosella)	3	05/06/2014	N/A
Shepherd's-purse (Capsella bursa-pastoris)	3	25/06/2010	N/A
Shining Crane's-bill (Geranium lucidum)	3	05/06/2014	N/A
Short-fruited Willowherb (Epilobium obscurum)	2	05/06/2014	N/A
Silver Hair-grass (Aira caryophyllea)	2	23/08/2010	N/A

Species Name	Record Count	Date of Last Record	Designation
Silverweed (Potentilla anserina)	2	05/07/1989	N/A
Slender Thistle (Carduus tenuiflorus)	1	05/07/1989	Threatened Species: Near threatened
Slender Trefoil (Trifolium micranthum)	1	05/07/1989	N/A
Smith's Pepperwort (Lepidium heterophyllum)	2	25/06/2010	N/A
Smooth Hawk's-beard (Crepis capillaris)	6	05/06/2014	N/A
Smooth Meadow-grass (Poa pratensis)	3	13/07/2006	N/A
Smooth Sow-thistle (Sonchus oleraceus)	7	19/05/2019	N/A
Snapdragon (Antirrhinum majus)	1	23/08/2010	N/A
Snow-in-summer (Cerastium tomentosum)	1	01/10/1990	N/A
Soapwort (Saponaria officinalis)	1	05/07/1989	N/A
Soft-brome (Bromus hordeaceus)	4	05/06/2014	N/A
Soft-rush (Juncus effusus)	3	05/06/2014	N/A
Solanum nigrum subsp. nigrum	1	29/07/2014	N/A
Spear Mint (Mentha spicata)	1	05/09/2020	N/A
Spear Thistle (Cirsium vulgare)	5	19/05/2019	N/A
Spear-leaved Orache (Atriplex prostrata)	2	25/06/2010	N/A
Spotted Medick (Medicago arabica)	1	25/06/2010	N/A
Spreading Meadow-grass (Poa humilis)	1	25/06/2010	N/A
Spring-sedge (Carex caryophyllea)	1	11/05/1997	N/A
Square-stalked St John's-wort (Hypericum tetrapterum)	1	05/06/2014	N/A
Squirreltail Fescue (Vulpia bromoides)	3	05/06/2014	N/A
Stern's Cotoneaster (Cotoneaster sternianus)	1	25/06/2010	N/A
Sticky Groundsel (Senecio viscosus)	3	29/07/2014	N/A
Sticky Mouse-ear (Cerastium glomeratum)	6	19/05/2019	N/A

Species Name	Record Count	Date of Last Record	Designation
Sun Spurge (Euphorbia helioscopia)	2	18/10/2005	N/A
Sweet Vernal-grass (Anthoxanthum odoratum)	3	05/06/2014	N/A
Swine-cress (Coronopus squamatus)	2	25/06/2010	N/A
Sycamore (Acer pseudoplatanus)	3	05/06/2014	Invasive Species: Medium Impact
Tall Fescue (Festuca arundinacea)	3	05/06/2014	N/A
Tall Ramping-fumitory (Fumaria bastardii)	1	05/07/1989	N/A
Taraxacum aggregate	2	25/06/2010	N/A
Thale Cress (Arabidopsis thaliana)	3	04/03/2006	N/A
Three-cornered Garlic (Allium triquetrum)	4	19/05/2019	Invasive Species: Medium Impact Regulation S.I. 477 (Ireland)
Thyme-leaved Sandwort (Arenaria serpyllifolia subsp. serpyllifolia)	2	05/06/2014	N/A
Thyme-leaved Sandwort (Arenaria serpyllifolia)	1	19/05/2019	N/A
Toad Rush (Juncus bufonius)	6	05/06/2014	N/A
Trailing St John's-wort (Hypericum humifusum)	1	23/08/2010	N/A
Tree-mallow (Lavatera arborea)	1	25/06/2010	N/A
Tufted Hair-grass (Deschampsia cespitosa)	1	25/06/2010	N/A
Tufted Vetch (Vicia cracca)	5	05/06/2014	N/A
Two-rowed Barley (Hordeum distichon)	1	31/12/1990	N/A
Veronica serpyllifolia subsp. serpyllifolia	2	25/06/2010	N/A
Vicia sativa	2	11/05/1997	N/A
Wall Barley (Hordeum murinum)	1	28/06/2012	N/A
Wall Cotoneaster (Cotoneaster horizontalis)	1	05/06/2014	Invasive Species: Medium Impact
Wall Speedwell (Veronica arvensis)	4	05/06/2014	N/A
Water Figwort (Scrophularia auriculata)	1	05/06/2014	N/A
Water Mint (Mentha aquatica)	1	25/06/2010	N/A

Species Name	Record Count	Date of Last Record	Designation
Weld (Reseda luteola)	2	05/06/2014	N/A
Western Marsh-orchid (Dactylorhiza occidentalis)	1	07/05/1990	N/A
White Clover (Trifolium repens)	8	05/06/2014	N/A
Wild Angelica (Angelica sylvestris)	2	25/06/2010	N/A
Wild Carrot (Daucus carota subsp. carota)	5	05/06/2014	N/A
Wild Carrot (Daucus carota)	2	19/05/2019	N/A
Wild Madder (Rubia peregrina)	1	10/09/2011	N/A
Wild Parsnip (Pastinaca sativa)	1	05/06/2014	Invasive Species: Medium Impact
Wild Plum (Prunus domestica)	1	05/06/2014	N/A
Wild Turnip (Brassica rapa subsp. campestris)	2	05/06/2014	N/A
Wilson's Honeysuckle (Lonicera nitida)	1	05/06/2014	N/A
Winter Heliotrope (Petasites fragrans)	1	05/06/2014	N/A
Winter-cress (Barbarea vulgaris)	2	05/06/2014	N/A
Wood Avens (Geum urbanum)	1	25/06/2010	N/A
Yarrow (Achillea millefolium)	2	25/06/2010	N/A
Yellow Oat-grass (Trisetum flavescens)	1	28/06/2012	N/A
Yellow-juiced Poppy (Papaver dubium subsp. lecoqii)	1	28/06/2012	N/A
Yorkshire-fog (Holcus lanatus)	4	05/06/2014	N/A

APPENDIX C: FIELD (SPECIES-SPECIFIC) SURVEY MAPS

C.1 MAMMAL SURVEY (CAMERA TRAPS)

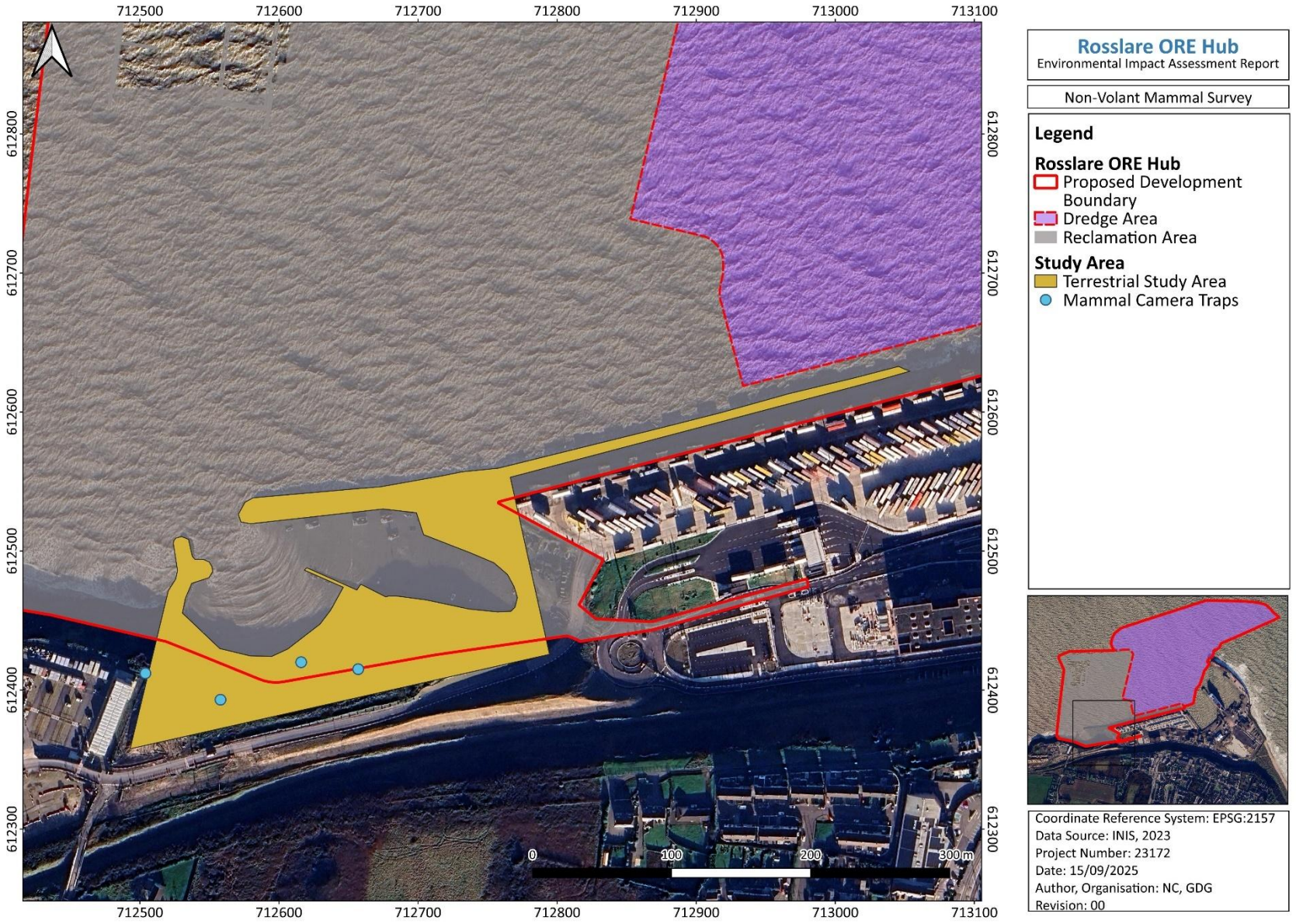


Figure C-1: Mammal Camera Trap Locations

C.2 OTTER SURVEY

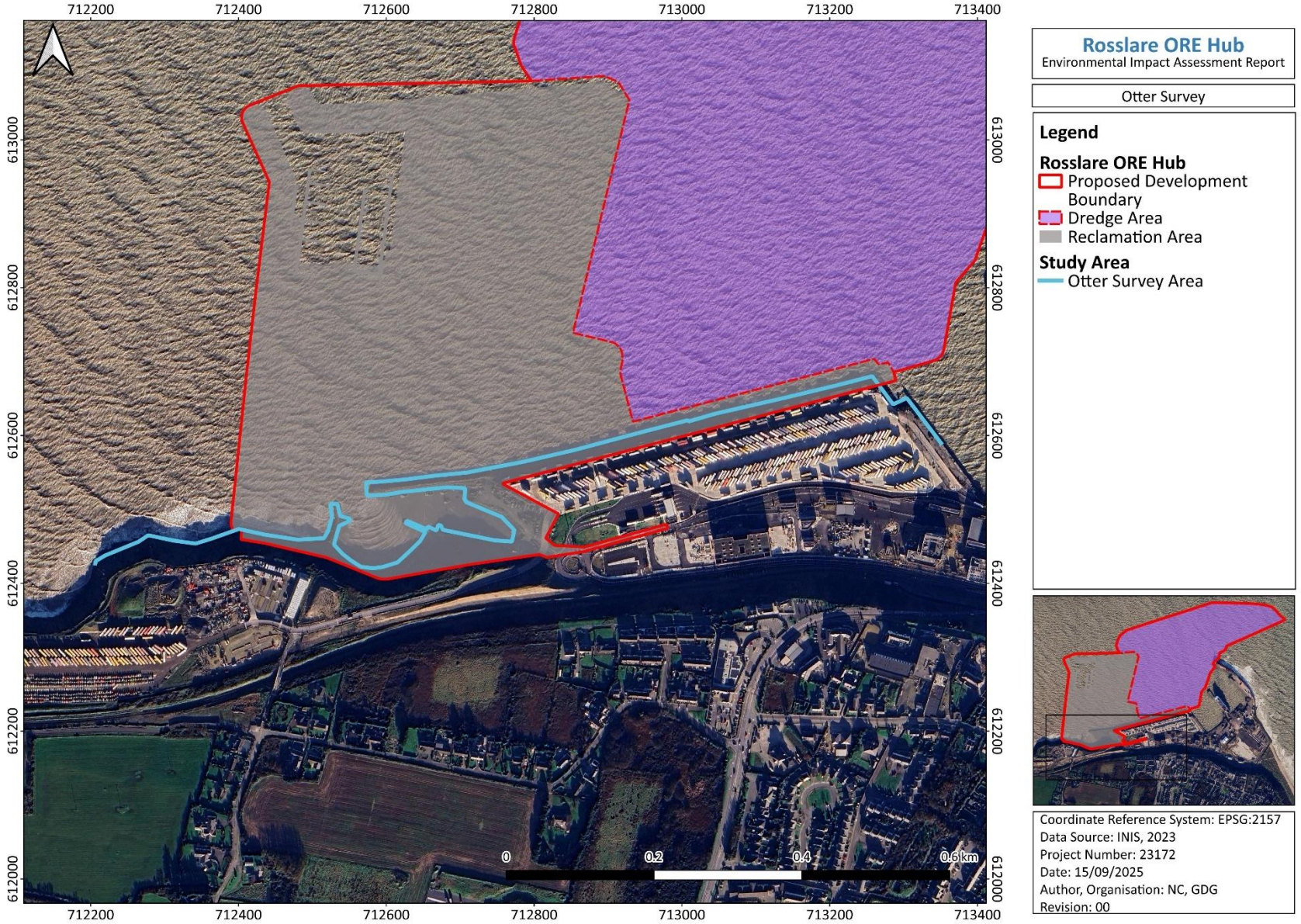


Figure C-2: Otter Survey Area extending 300m west and east outside the Proposed Development Site Layout

C.3 BAT SURVEYS

Figure C-3 The locations of structures and trees that were assessed during the PRA survey

The following photographs coincide with the buildings and trees that were assessed during the PRA survey as outlined in Table C-1 below.


BL3
BL4
BL5
BL5
BL6
BL7


BL8
BL9
BL10
BL11
BL12
BL13


BL14
BL15 & BL16
BL17
BL18
BL19
BL20
BL21
BL22


BL23
BL24
BL25
BL26
BL27
BL28
BL29
BL30

Table C-1: Preliminary Roost Assessment Results

Structure Code	Bat Roosting Suitability	ITM	Structure Type
BL1	Negligible	712520, 612436	Building
BL2	Negligible	712628, 612425	Building
BL3	Low	712664, 612451	Building
BL4	Negligible	712754, 612447	Building
BL5	Negligible	712758, 612446	Building
BL6	Negligible	712760, 612444	Building
BL7	Low	712766, 612443	Building

Structure Code	Bat Roosting Suitability	ITM	Structure Type
BL8	Low	712770, 612445	Building
BL9	Low	712773, 612444	Building
BL10	Negligible	712774, 612441	Building
BL11	Low	712782, 612438	Building
BL12	Low	712787, 612439	Building
BL13	Low	712791, 612440	Building
BL14	Low	712795, 612441	Building
BL15	Low	712798, 612444	Building
BL16	Low	712800, 612445	Building
BL17	Low	712801, 612447	Building
BL18	Low	712801, 612465	Building
BL19	Low	712803, 612469	Building
BL20	Low	712802, 612471	Building
BL21	Low	712802, 612471	Building
BL22	Low	712803, 612479	Building
BL23	Low	712804, 612483	Building
BL24	Low	712804, 612483	Building
BL25	Negligible	712784, 612504	Building
BL26	Negligible	712779, 612505	Building

Structure Code	Bat Roosting Suitability	ITM	Structure Type
BL27	Low	712774, 612511	Building
BL28	Low	712770, 612513	Building
BL29	Negligible	712760, 612519	Building
BL30	Low	712756, 612522	Building
TR1	Negligible	712530, 612357	Tree
TR2	Negligible	712518, 612353	Tree
TR3	Negligible	712512, 612351	Tree

Figure C-4: Satellite imagery (up close) showing the structures that underwent bat emergence surveys

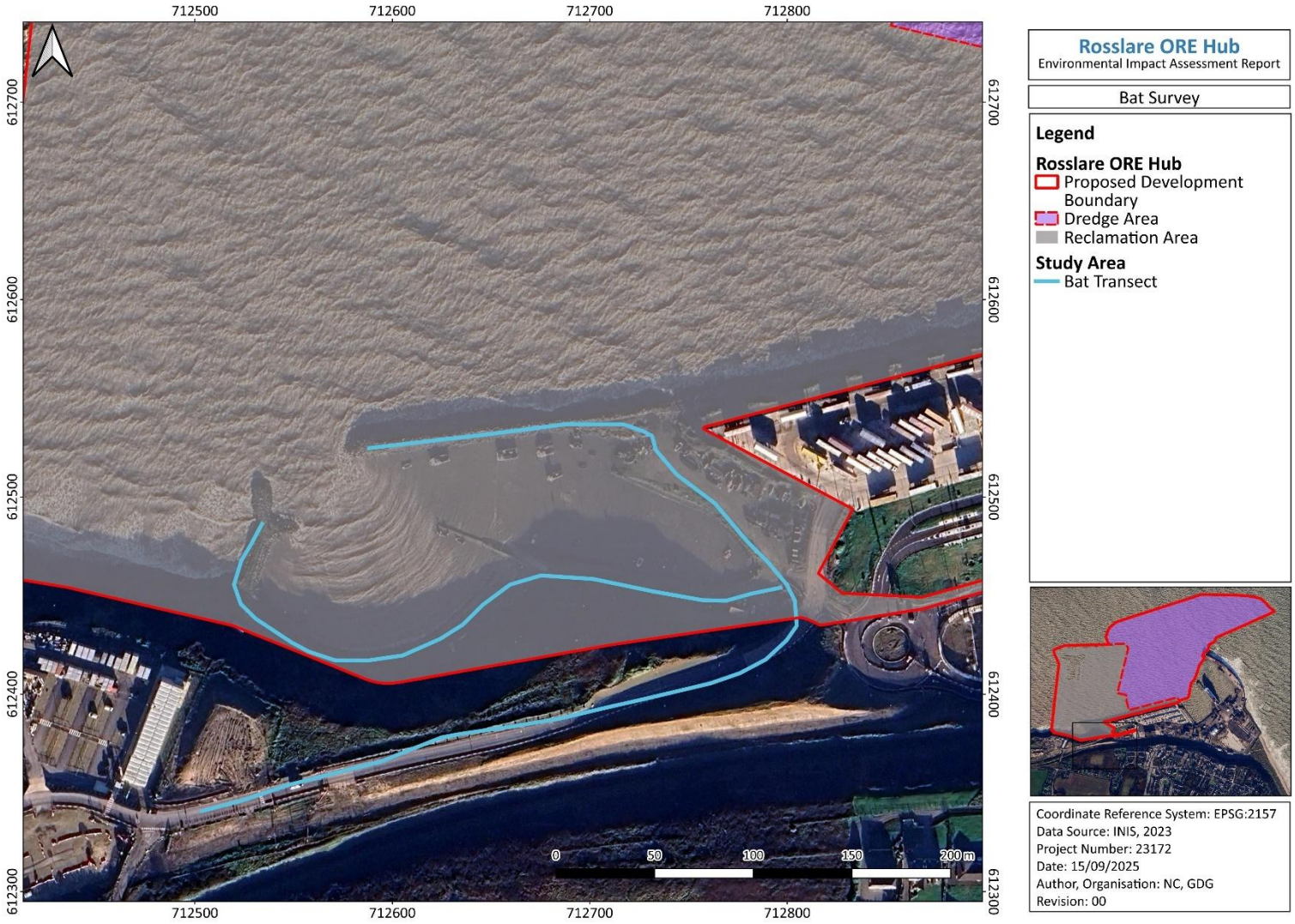


Figure C-5: Mapped location of the bat transect surveys

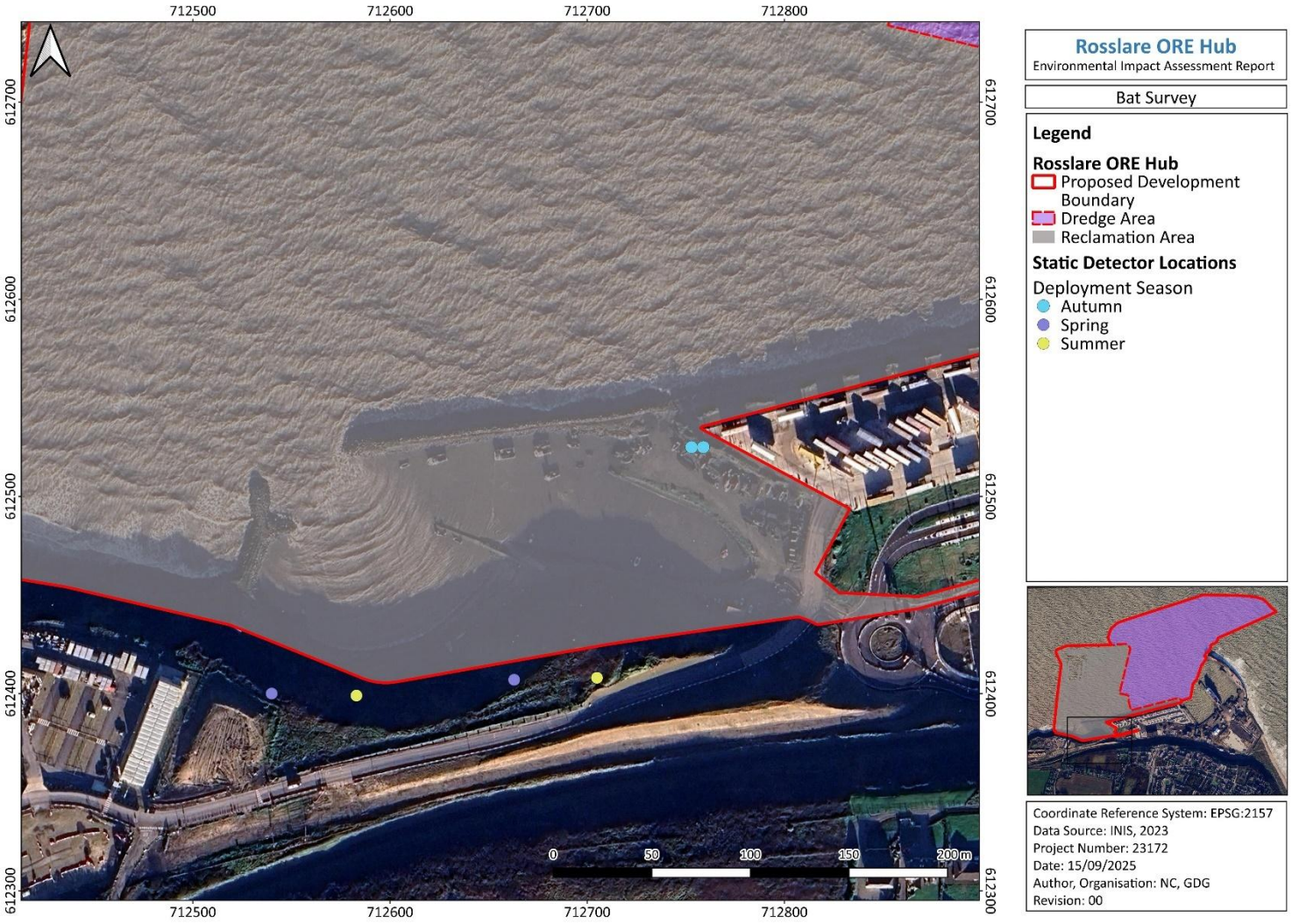


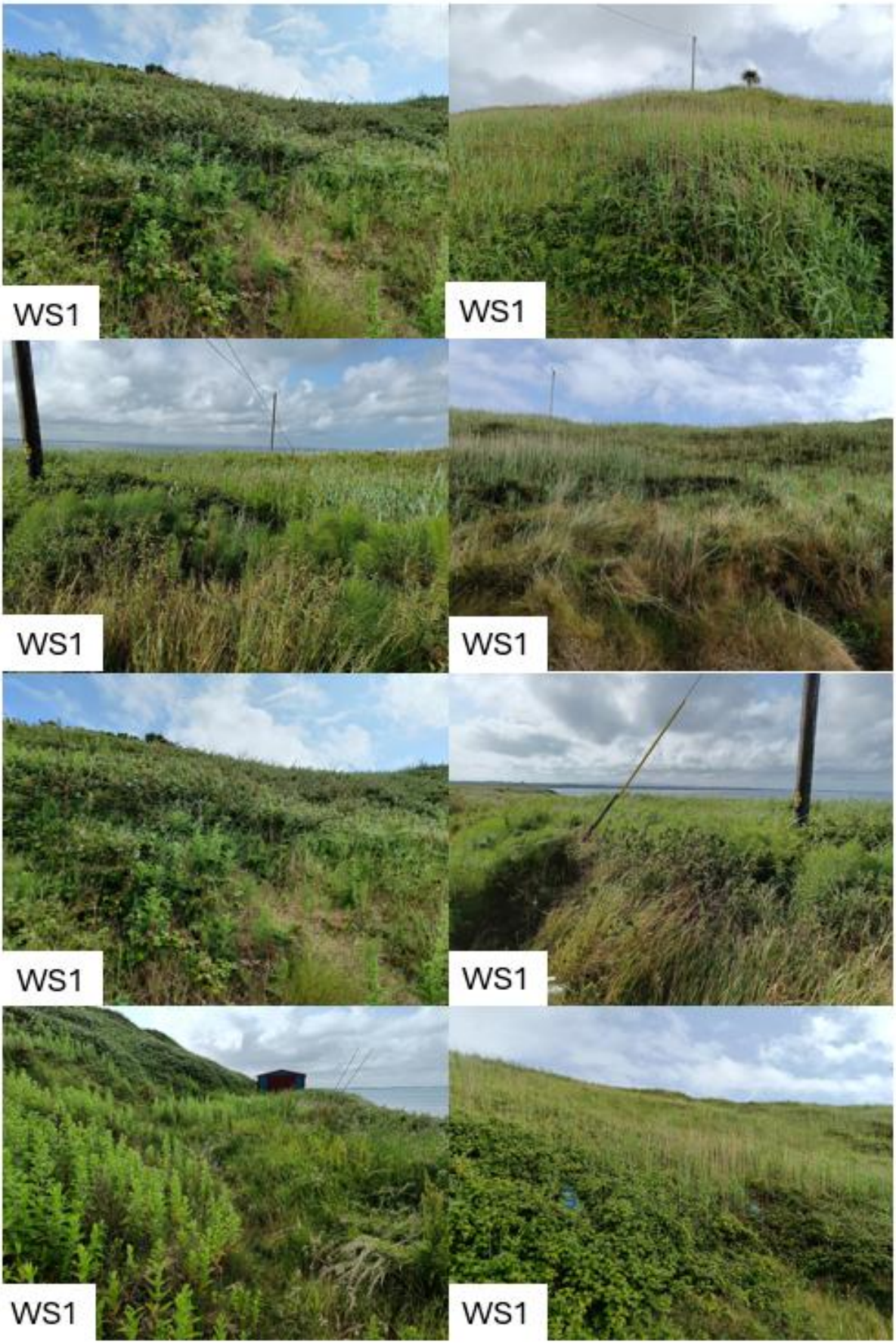
Figure C-6: Locations of static detector deployments for the spring, summer and autumn surveys

C.4 HERPETOFAUNA SURVEY

Appendix D:

Figure C-7: Reptile survey - location of basking common lizard

APPENDIX D: PHOTOGRAPHS


WS1
WS1
WS1
WS1
WS1
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