Environmental Impact Assessment Report (EIAR) Volume 2 Main Body Part 2

Chapter 8

In respect of

The Royal Canal Urban Greenway

On behalf of

Fingal County Council

October 2026

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8 Biodiversity

8.1 Introduction

JBA Consulting Ireland Ltd. has been commissioned by DBFL Consulting Engineers, on behalf of Fingal County Council (FCC) to provide the Biodiversity Section of the EIAR in relation to the proposed Royal Canal Urban Greenway, hereafter referred to as the Proposed Development.

This Chapter of the EIAR describes and assesses the likely significant effects of the Proposed Development on Biodiversity during the construction phase and operational phase. In accordance with the requirements of Directive 2011/92/EU, as amended by Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 on the assessment of the effects of certain public and private projects on the environment (EIA Directive), it describes and assess the likely direct and indirect significant effects of the Proposed Development on Biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC.

This Biodiversity Chapter requires one also read in conjunction, the below chapters and their respective appendices, which provide further detail on related impacts and the proposed mitigation measures for topics discussed within this chapter:

- Chapter 5 (Air Quality)
- Chapter 6 (Climatic Factors)
- Chapter 7 (Noise and Vibration)
- Chapter 9 (Archaeology and Cultural Heritage)
- Chapter 10 (Landscape and Visual)
- Chapter 11 (Land, Soils and Geology)
- Chapter 12 (Water)
- Chapter 14 (Material Assets – Traffic and Transport)
- Chapter 15 (Material Assets – Waste Management)
- Chapter 16 (Material Assets – Utilities)

8.1.1 Background of the Proposed Development

The Royal Canal Urban Greenway is an 8.1km pedestrian and cycle route which is to be constructed along or adjacent to the Royal Canal as it heads eastwards from the Kildare County Boundary at Confey Slipway to Talbot Bridge, (Old Navan Road, near 12th Lock) where it will tie into the completed Ashtown Greenway. The Proposed Development forms part of the strategic Dublin–Galway cycle corridor (266 km), first identified in the National Cycle Network Scoping Study 2010, and will complete the missing link in the Royal Canal Greenway between Maynooth and Spencer Dock, Dublin.

The proposed Greenway is a joint scheme. Fingal County Council (the Client) is the scheme promoter in conjunction with the National Transport Authority (NTA) as the funding body and Waterways Ireland (WI), who are the principal property owner. The Greenway is for the exclusive use of pedal cyclists and pedestrians.

The Proposed Development will provide a high-quality, safe, attractive and environmentally sensitive walking and cycling corridor serving Castleknock, Blanchardstown, Clonsilla, Coolmine, and the wider Dublin 15 area. This significant new amenity will encourage recreation while offering an attractive sustainable transport option for residents and commuters, delivering environmental, economic and health benefits. The Proposed Development will provide an important active travel and recreational corridor supporting sustainable mobility, connectivity and accessibility across the wider area.

Construction of this section of the Royal Canal Greenway will be of long-term public interest, providing a benefit regionally, and nationally. The Proposed Development has been guided by and delivers on a broad range of national, regional, and local policy.

8.1.2 Do Nothing Scenario

The 'do nothing' scenario for the Proposed Development is that pedestrians and cyclists will continue to walk and cycle along the existing narrow and substantially unsurfaced towpath. The towpath along the 'Deep Sinking' section is very dangerous at present. This section typically consists of a 2-3m wide track, with local pinch points of approx. 1.3m, flanked by a deep cutting of 1.0-9.0m to the canal.

Also, tree roots cross the towpath at a number of locations, creating trip hazards.

Accessibility to the Greenway on the southern embankment is restricted between Kennan Bridge (Porterstown Road) and Kirkpatrick Bridge (Coolmine Road) (approx. 900m) and between Kirkpatrick Bridge (Coolmine Road) and Granard Bridge (Castleknock Road) (approx. 1.5km) due to the railway line on the southern side of the towpath, thereby preventing permeability and linkages from residential catchments, resulting in less passive surveillance and security for users.

The existing towpath results in an environment that is not safe, not comfortable and not attractive for pedestrians and cyclists. The latent commuter and recreational user demand will continue to be supressed by the existing poor walking and cycling environment along the towpath (particularly within the 'Deep Sinking' section.

In the context of human health, the benefits of walking and cycling are well documented and include improved cardiovascular fitness, chronic disease prevention, improved mental health wellbeing, strengthened immune system and a reduced risk of cancer, obesity and coronary heart disease. These benefits will not be realised in the 'do nothing' scenario.

If the proposed Greenway is not constructed, the additional economic benefit which could be derived from the project will not be realised. This benefit can be estimated in basic terms by reference to the Department of Public Expenditure and Reforms 'Public Capital programme 2021 – 2030: Labour Intensity of Public Investment'. The paper estimates that for a €1 million increase in construction expenditure, direct and indirect employment will increase by approximately 8 job years. The analysis, also have estimated, that on average, approximately 80,742 construction jobs will be sustained per year as a result of public investment over the period of 2021 and 2030.

In the 'do nothing' scenario, the long-standing objectives of the Fingal County Development Plan to deliver the proposed development will not be realised.

Based on the reasons outlined above, the 'do nothing' scenario would leave a section of the strategic Dublin–Galway cycle corridor (266 km) incomplete.

8.1.3 Characteristics of the Proposed Development

A summary of the Proposed Development and relevance to biodiversity is presented here prior to the impact assessment section.

The proposed Greenway route is approximately 8.1km in length. Approximately 5km of the route will be along the canal towpath, while 3.1km of the Greenway will be away from the towpath, reflecting local constraints including trees, habitats and existing topography. The Greenway route will also tie into the recently constructed pedestrian/cycle routes at St. Joseph's and Windmill Court residential developments, which have a combined length of approximately 800m.The location of the bridges throughout the development are located in Figure 8-1.

The Proposed Development includes:

- Construction of the Greenway route, including the following pavements and surfacing:
  - Section 1 – unbound surface (width 2-3m) from Kildare County Border (Confey Slipway) to Hansfield Railway Bridge (Ch. 0 – 3200m).
  - Section 2 – bituminous surface (3-4m width) for the majority of the section, with the exception of pre-cast concrete cantilevered boardwalk from approx. Ch. 4235–4610.
  - Section 3 - bituminous surface (4m width) for the majority of the section, in-situ concrete surfacing and portions of raised boardwalk due to local topography.
- Construction of embankments and retaining structures along certain sections of the route where the topography requires stabilisation.
- Provision of 3 no. toucan signalised crossings and 1 no. zebra crossing at road interfaces along the route.
- Lighting will not be provided on the western section of the Proposed Development. Lighting will be provided from Hansfield Railway Bridge to the 12th Lock, approximately Ch. 3200m to Ch. 8100m. The lighting design will be developed in accordance with relevant design standards and the environmental considerations assessed in the EIAR.
- To prevent the Greenway overlooking the back gardens of the residents of Delwood Park and for security reasons, the ground level of the Greenway is proposed to be lowered to match, or be lower than, the existing ground level of the adjacent back gardens and a 2m high timber palisade fence provided, with an anti-climb wire mesh fence (Ch. 6200 – 6800).
- Construction of the Quarry Bridge (30m single span composite steel beam and concrete deck bridge) which spans a steep section of historic quarry on the northern bank of the Royal Canal (Ch. +6500m).
- The 2m high fence line to be maintained along the southern side of the Greenway along the Brompton green area. To provide further privacy to the Brompton residents, planting and railings will be provided on the Brompton side of the Greenway through the Brompton green area.
- Construction of Landmark Bridge, a steel bridge which will traverse the canal at approximately Ch. 7115m to Ch. 7350m. The bridge will be approximately 235m in length and will have a maximum single span of approximately 30m.
- Construction of an underpass is proposed in Section 3 beneath Castleknock Road on the southern side of Granard Bridge (Ch. +7820).
- A Pocket Park is proposed at Hansfield, south of the St. Joseph's residential development. The park will have a wildflower meadow, native hedgerow, embankment slide, informal play area and benches etc.
- Removal of two existing residential properties and associated ancillary structures in the vicinity of Hansfield Road in order to facilitate the delivery of the Greenway alignment and associated pocket park infrastructure.
- To offset the removal of trees, hedgerows and vegetation along the Proposed Development, a variety of native/naturalized species have been selected to create new woodland cover as part of the Proposed Development's Landscape Plan. This includes additionally compensatory planting of woodland offsite, to the east of St Catherines Park, adjacent to the Royal Canal.

In relation to biodiversity, the proposed project will include the removal of topsoil and sub soil, removal of vegetation and some loss of habitat along the Proposed Development where grounds work will take place. The following section describes the potential impacts arising from the proposed development which has been assessed as part of this EIAR.

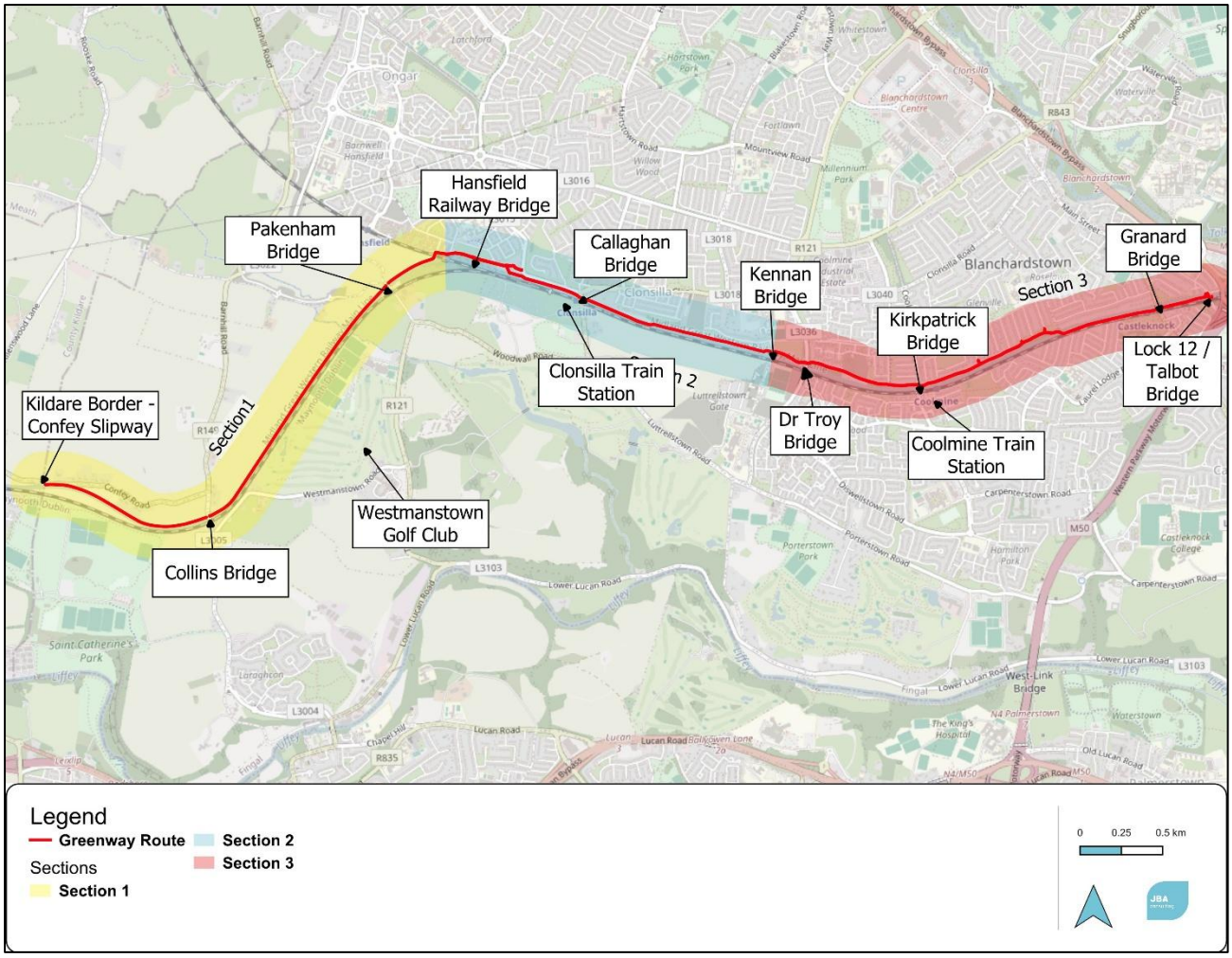


Figure 8-1: Map of Proposed Development along the Royal Canal, with existing bridges and train stations highlighted

8.1.3.1 Construction Phase Overview

The principal construction activities associated with the Proposed Development are anticipated to include site establishment, fencing of works areas, temporary traffic management, temporary surface water management, vegetation clearance, topsoil stripping, earthworks, utilities works, pavement construction, construction of the proposed bridges, boardwalks and underpass, ancillary roadworks, accommodation works, landscaping and reinstatement. These activities are described at a level appropriate to the scheme description, with further detail provided in the Outline Construction Management Plan and the relevant technical chapters of the EIAR.

1. Fencing of construction areas and establishment of temporary site compounds.
2. Implementation of temporary traffic management measures.
3. Establishment of temporary surface water management and pollution prevention measures.
4. Stripping and management of topsoil and existing surfacing, as required.
5. Earthworks to formation level, including excavation, filling, regrading, profiling and management of surplus or unsuitable material.
6. Clearance of selected trees, hedgerows and vegetation where required to facilitate the works.
7. Construction of Quarry Bridge and associated boardwalk sections.
8. Construction of Landmark Bridge and associated ramped sections.
9. Excavation and construction works at Granard Bridge to facilitate the proposed underpass, including associated reinstatement works.
10. Installation, diversion and protection of utilities and services, including associated drainage works.
11. Construction of pavement foundations, concrete surfaces, kerbs and surfacing.
12. Implementation of environmental design and mitigation measures identified in the EIAR, including badger underpasses and compensatory planting, where required.
13. Ancillary roadworks, including signage, public lighting, road markings and traffic signals.
14. Accommodation works associated with affected properties, including fencing, boundary treatments and planting.
15. Landscaping and reinstatement works, including verge formation, seeding, tree and shrub planting, and permanent boundary treatments.
16. Temporary site compounds, storage areas, and construction access arrangements will be reinstated upon completion of the works.

8.1.4 Aims

The aims of this assessment are to:

- Establish baseline ecological conditions to enable identification of potentially important key ecological receptors within the zone of influence of the project.
- Determine the ecological value of identified ecological receptors, including species, habitats, and KERs.
- Assess the significance of direct and indirect impacts of the Proposed Development on ecological receptors of value.
- Following the mitigation hierarchy, identify avoidance through preventative measures, as well as remediation and compensatory measures as a last resort when avoidance is not achievable.
- Identify residual impacts after mitigation and the significance of their effects.

8.1.5 The Team

The chapter was contributed to by Mark Desmond (BSc (Hons) Biology, MSc Marine Biology), Hannah Mulcahy (BSc (Hons) Botany and Plant Science MSc Taxonomy and Biodiversity of Plants). Michael Coyle (BA, MSc) and Jai Dolan (BSc (Hons), MSc). Mark and Michael had over three years' experience in consultancy. Hannah has six years in consultancy and Jai has over two years' experience in ecological consultancy.

The assessment has been overseen by Rachael Brady (BSc, MSc, CEcol, MCIEEM) and Patricia Byrne (BSc (Hons), PhD, MCIEEM). Rachael is a Technical Director for ecology and has over 20 years' experience within environmental consultancy. Patricia is a Principal Ecologist with 20 years' experience of environmental and ecological work, with the last nine years with JBA. She has authored and reviewed numerous ecological assessments under the Habitats Directive; and prepared numerous EcIAs for residential developments, biodiversity chapters for residential developments and biodiversity chapters for EIARs for various developments and flood relief schemes.

8.2 Policy, Legislation and Guidance

This assessment was prepared with regard to the following legislation, policy documents and guidance:

8.2.1.1 National and International Legislation

- The Planning & Development Act 2000 (as amended) hereafter referred to as the Planning Acts.
- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (Habitats Directive);
- Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (Birds Directive);
- Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 as amended by Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 on the assessment of the effects of certain public and private projects on the environment;
- European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011) (as amended);
- EU Water Framework Directive (2000/60/EC) and European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003);
- Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration
- Wildlife Acts 1976-2021, and Wildlife (Amendment) Act 2023;
- Flora (Protection) Order, 2022 (S.I. No. 235 of 2022);
- Inland Fisheries Acts 1959 to 2017, revised to 2025;
- Environment (Miscellaneous Provisions) Act 2011;
- The Local Government (Water Pollution) Act, 1977 (as amended by Sections 3 and 24 of the 1990 Act), and 'Revised Act' (2024).
- EU Water Framework Directive (2000/60/EC) and European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003)
- Planning and Development Act 2000 (as amended); Revised to 31 December 2025 (DHLGH, 2024a);
- Planning and Development Regulations 2001 (as amended); Revised to 2025) (DHLGH, 2024b);
- Transport (Railway Infrastructure) Act 2001 (as amended 2021);

8.2.1.2 Relevant Policies and Plans

The policy documents to which this assessment has had regard include the following:

- National Biodiversity Action Plan 2023-2030
- Fingal Development Plan 2023-2029
- Fingal Biodiversity Action Plan 2023-2029
- National Planning Framework: Project Ireland 2040;

8.2.1.3 Guidance

The guidance documents that have been taken into account in conducting this assessment include the following:

- Guidelines for planning authorities and An Board Pleanála on carrying out environmental impact assessment (Department of Housing, Planning and Local Governments, August 2018)
- Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management (CIEEM, 2024).
- Guidelines on the information to be contained in Environmental Impact Assessment Reports Environmental Protection Agency (EPA, 2022).
- Environmental Impact Assessment of Rural Cycleways (Offline & Greenway) – A Practical Guide (TII, 2024).
- Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009).
- Environmental Impact Assessment of National Road Schemes – A Practical Guide (NRA, 2008a).
- Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (NRA, 2008b)
- Guidelines for the Treatment of Badgers Prior to the Construction of National Road Schemes (National Roads Authority, 2005)
- Guidelines for the Treatment of Otters Prior to the Construction of National Roads Schemes (NRA, 2006).
- Best Practice Guidance for Habitat Survey and Mapping. The Heritage Council. (Smith et al., 2011).
- Guidelines on the Protection of Fisheries during construction works in and adjacent to water. (Inland Fisheries Ireland, 2016).
- Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th Edition) (Collins (ed.), Bat Conservation Trust (updated 2024)
- Bat Mitigation Guidelines for Ireland (Marnell et al., 2022);
- UK Bat Mitigation Guidelines (Reason, P.F. and Wray, S. (2025))
- The Bat Workers' Manual, 3rd Edition (Mitchell-Jones & McLeish, 2012)
- Guidance Note 08/18. Bats and Artificial Lighting in the UK - Bats and the Built Environment series (ILP, 2018).i
- Environmentally Friendly Lighting Guide (Dark Sky Ireland, 2026).
- Guidelines on The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads (NRA, 2010)
- Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (EU 2013);
- Assessment of the distribution and abundance of Kingfisher *Alcedo atthis* and other riparian birds on six SAC river systems in Ireland (Cummins et. al, 2010).
- Planning for Watercourses in the Urban Environment. A Guide to the Protection of Watercourses through the use of Buffer Zones, Sustainable Drainage Systems, In-stream Rehabilitation, Climate / Flood Risk and Recreational Planning, IFI 2020.

- Waterbird Disturbance Mitigation Toolkit Informing Estuarine Planning & Construction Projects (Cutts et al., 2013)

8.3 Impact Assessment Methodology

The assessment considers the works related to the construction phase of the Proposed Development, taking into account different options of construction methodology (see Chapter 2 Description of Project and Alternatives), and the operational phase of the Proposed Development. The assessment methodology of this chapter is outlined in the sections below.

8.3.1 Zone of Influence

The Zone of Influence (ZoI) for the proposed project is based on a judgement of the likely extent of the ecological impacts on key ecological receptors and is based on the source-pathway-receptor model (Secton 8.4.11). The ZoI is applicable for both the project's construction and operational phases. The ZoI will vary for different key ecological receptors, depending on their sensitivity to environmental change, as described in the following sub-sections (8.3.1.1 to 8.3.1.11 inclusive), which outline the respective ZoI for each ecological receptor. The ZoI is determined using expert opinion informed by the site's environmental characteristics, e.g. the characteristics of the underlying aquifer for ZoI for groundwater.

8.3.1.1 Terrestrial Habitats

In relation to terrestrial habitats, impacts will be limited to the lands within the immediate boundary of the Proposed Development route which varies between 2-4m wide, as well as the immediate surrounding environs (e.g., overshading and soil; root compaction and changes to local hydrological regimes). This includes the existing ecological corridor running on either bank of the Royal Canal. While physical habitat removal/damage will largely be limited to within the Proposed Development boundary, additional audible and visual disturbance will affect the habitats present on the opposite bank of the Proposed Development. Therefore, these areas are considered within the project's terrestrial ZoI.

8.3.1.2 Surface Water

Surface water hydrological connections (e.g., drainage ditches, canals, wetlands and rivers) are often subject to the most far-reaching impacts due to their lotic or semi-lotic nature. It becomes increasingly difficult to precisely predict the likely significance of adverse water-borne pollutants as they travel downstream from the pollution point source, given potential dilution and retention factors along the course of an impacted watercourse. Under the precautionary principle any designated sites including the Dublin Bay Natura 2000 sites (North Bull Island SPA, North Dublin Bay SAC, North-west Irish Sea SPA, South Dublin Bay SAC, and South Dublin Bay and River Tolka Estuary SPA) protected habitats or species (flora and fauna) located downstream of the Royal Canal which pass through the footprint of the proposed project will be considered to be within the hydrological ZoI of this development. The listed European sites are also connected to the Proposed Development via the River Liffey. The project's ZoI is therefore considered to include the Royal Canal (from the Dublin/Kildare County border to where the Royal Canal drains into the River Liffey), River Liffey, and Dublin Bay and its associated Natura 2000 sites (North Bull Island SPA, North Dublin Bay SAC, North-west Irish Sea SPA, South Dublin Bay SAC, and South Dublin Bay and River Tolka Estuary SPA), as well as the habitats, floral, and fauna of these associated waterbodies.

8.3.1.3 Groundwater

With regard to groundwater and groundwater-to-surface water connections, the ZoI is largely determined by the site's underlying bedrock, the soil /sub-soil permeability, and the characteristics of the underlying aquifer(s). The sub-soil permeability is generally low (GSI, 2026). The aquifer vulnerability classification for the site (GSI, 2026) ranges from "Extreme with exposed rock" to "Moderate" along the Proposed Development while the underlying bedrock and aquifer is considered poorly productive aquifer which is generally unproductive except for local zones. The majority of the canal is located within the Lucan Formation, constituting of Dark limestone and shale. The stretch of

the canal located from the Castleknock Bridge is part of the Tober Colleen Formation, consisting of Calcareous shale and limestone conglomerate while Calcareous shale and limestone conglomerate is also seen at different points through the site. The area referred to as the Deep Sinking between Kennan Bridge and Castleknock train station, Chainage +5330-7780, has a number of exposed rock faces, which were created during the construction of the canal which included blasting through the old Carpenterstown Quarries (GSI, 2026). The Deep Sinking is narrower than the rest of the Royal Canal, and the towpath is up to 30 foot above the water along this stretch. The top and sub soil depth is shallow throughout the length of the Proposed Development. All of these factors result in the local groundwater having limited flow and carrying capacity, with the likelihood of water being discharged into the nearest watercourse as opposed to being transferred across any large distance, in this case that being the Royal Canal. In terms of groundwater, given the characteristics of the underlying aquifer, as outlined by GSI (2026) and location of the Proposed Development, the project's ZoI is considered to be the immediate vicinity of the works, including the Royal Canal adjacent to the Proposed Development.

In regard to groundwater and groundwater-to-surface water connections, the ZoI is largely determined by the site's underlying bedrock, the soil /sub-soil permeability, and the characteristics of the underlying aquifer(s). The underlying bedrock of the Proposed Development is comprised of dark-grey to black, fine-grained, occasionally cherty, micritic limestones that weather paler, usually to pale grey. There are rare dark coarser grained calcarenitic limestones, sometimes graded, and interbedded dark-grey calcar. This bedrock is largely overlain with limestone till, with smaller linear pockets of limestone gravels and alluvial sediments (particularly within the Tolka Valley Park). There is generally a low sub-soil permeability throughout the boundary of the Proposed Development (GSI, 2024). As result of the above characteristics the site's aquifer vulnerability status ranges from 'Moderate' to 'Rock at or near Surface or Karst', with the more vulnerable areas located within historic and existing river / stream valleys. The aquifer within the underlying bedrock is considered to be locally important, with moderate productivity, though only in local zones. Therefore, the aquifer has a limited and relatively poorly connected network of fractures, fissures and joints, giving a low fissure permeability which tends to decrease further with depth. Generally, the lack of connection between the limited fissures results in relatively poor aquifer storage and flow paths that may only extend a few hundred meters (GSI, 2024). Therefore, the groundwater ZoI will be set to 300m given the characteristics of underlying aquifer.

Regarding the groundwater-to-surface water impact pathway, the characteristics of the underlying aquifer means it is likely to rapidly discharge to the nearby watercourses, i.e. the Royal Canal and Rusk Stream (GSI, 2024). Therefore, the groundwater-to-surface water ZoI will also be set to 300m, with the addition of downstream surface water hydrological connections.

8.3.1.4 Air

In respect to ZoI for air pollution (emissions and dust), habitats and species within 250m of the boundary of the Proposed Development were considered as per the Institute of Air Quality Management (IAQM, 2024). In this case, this includes the Royal Canal adjacent to the Proposed Development as well as the woodland, grassland, and riparian habitats bordering the canal.

8.3.1.5 Physical (Vibration and Clearance Works), Audible and Visual Disturbance

In relation to physical (vibration and clearance works); audible and visual disturbance, faunal species will be considered on a species-by-species basis. Generally, smaller mammal species (e.g., Pygmy Shrew) will be given 100m disturbance zones, which is reflective of their relatively small territories. For larger mammals, such as Otter and Badger, a 150m disturbance ZoI can be established given the sensitivity of their resting / breeding location, i.e., holts and setts. A 150m disturbance ZoI has been detailed within best practice guidance documents Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes (NRA, 2006) and Guidelines for the Treatment of Badgers Prior to the Construction of National Road Schemes (2005).

8.3.1.6 Bats

The ZoI for local bats species is centred around the degradation or removal of foraging and commuting habitats; lighting impacts within and adjacent to footprint of the development; as well as the developments's proximity to known bat roosts within the locality. Of the above impacts, the degradation of habitats will be the furthest reaching and will therefore set the ZoI for local bat species impacts. As habitat degradation can potential occur within the surface water, groundwater and air (dust) ZoIs, the ZoI for local bat species will be set to 300m, with the addition of downstream hydrological connections. This ZoI will include areas which are present within local bat species' core sustenance zones (a 3km radius around each of bat roosts) (Collins, 2024).

8.3.1.7 Birds

The ZoI for breeding and wintering bird species is linked with direct habitat loss and degradation within the footprint of the proposed project. Additional adverse impacts for breeding and wintering birds will likely arise from the disturbance from construction works, which can extend 500m (Cutts, et al. 2013).

8.3.1.8 Amphibians

The ZoI for amphibians (Common Frog and Smooth Newt) is linked to wetland and freshwater aquatic habitats, which could potentially be degraded as a result of the proposed project. Therefore, the ZoI for these faunal species will mirror that of the groundwater-to-surface water ZoI, i.e., 300m, which was determined based on the characteristics of the underlying aquifer. This will also include the addition of downstream surface water hydrological connections, which includes the downstream sections of the Royal Canal and the Rusk Stream.

8.3.1.9 Freshwater Species

The ZoI for freshwater macrophytes, fish and aquatic invertebrates is linked to the wetland and aquatic habitats, which could potentially be degraded as a result of the proposed project. Therefore, the ZoI for these floral / faunal species will mirror that of the surface water ZoI, i.e., the downstream habitats present within the Royal Canal and Rusk Stream. This will also include the addition of downstream surface water hydrological connections of the Royal Canal and the Rusk Stream.

8.3.1.10 Terrestrial Invertebrates

The ZoI for terrestrial invertebrates is generally linked with direct habitat loss and degradation, as well as construction and operational disturbances. As the furthest impact pathway that can affect terrestrial habitats has been determined to be the immediate Royal Canal corridor, as outlined in sub-section 8.3.1.1, this will also be the ZoI distance for terrestrial invertebrate species.

8.3.1.11 Source-Pathway-Receptor (S-P-R) Model and Designated Natura Conservation Sites

8.3.1.11.1 Designated Nature Conservation Sites

The conservation of habitats and species through the designation of conservation areas is required under European and national legislation. There are several different types of designated site in Ireland. Statutorily designated sites of international importance including Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) are collectively known as Natura 2000 sites. These sites contain examples of some of the most important natural and semi-natural ecosystems in Europe. Nationally designated sites include Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs). Other designated sites include UNESCO Biosphere (internationally designated areas of high biological and cultural value, created under the UNESCO Man and the Biosphere Programme)), Ramsar (internationally important wetlands protected under the Ramsar Convention), and Special Amenity Area Order (SAAO) (national legal designation to protect areas of outstanding landscapes, nature and amenities) sites.

8.3.1.11.2 Source-Pathway-Receptor (S-P-R) Model

All sensitive receptors, including European (Natura 2000) sites connected through a source-pathway-receptor (S-P-R) model were considered, as per guidance in Appropriate Assessment Screening for Development Management (OPR, 2021). This S-P-R model has also been extended to include the NHAs, pNHAs, and other protected/designated sites (i.e. Ramsar sites, UNESCO Biospheres), as well as the additional receptors described above in sub-sections 8.3.1.1 to 8.3.1.10. The S-P-R model uses an examination of the construction methods or project description to determine sources of direct and indirect impact. The S-P-R model also allows a zone of influence (ZoI) for the project to be generated based on the size, scale, location, and nature of the works involved. The pathways for impact are also analysed to see if a functional link or ecological pathway for impact is present.

Within the ZoI a S-P-R model was used to screen the sites which are present, as per OPR Practice Note PN01 Appropriate Assessment Screening for Development Management (OPR, 2021). A separate Appropriate Assessment (AA) Screening report (JBA, 2026) has been produced which examines the likely pathways and impacts of the Proposed Development on connected Natura 2000 sites. Based on the S-P-R model, alongside the ZoI for surface water as described in sub-section 8.3.1.2, downstream Natura 2000 sites were included within the Project's ZoI, which included the Dublin Bay Natura 2000 sites (South Dublin Bay and River Tolka Estuary SPA, South Dublin Bay SAC, North Bull Island SPA, North Dublin Bay SAC, and North-west Irish Sea SPA). These sites are directly hydrologically linked to the Proposed Development via the Royal Canal and Liffey Estuary Lower transitional waterbody. Additionally, the Rye Water Valley/Carton SAC was included based on the potential for its Qualifying Interest (QI) Whorl Snail species *Vertigo* spp. to appear within the Royal Canal.

Furthermore, the S-P-R model also identified five pNHAs which are connected to the Proposed Development via the surface water pathway, leading to their inclusion within the Proposed Development's ZoI. These include: Royal Canal pNHA, Liffey Valley pNHA, North Dublin Bay pNHA, South Dublin Bay pNHA, and Dolphins, Dublin Bay pNHA. Additionally, following the same reasoning as the Rye Water Valley/Carton SAC, the Rye Water Valley/Carton pNHA was also included within the Proposed Development's ZoI.

A number of other designated sites were identified using the S-P-R model as within the ZoI of the Proposed Development, including two Ramsar wetland sites (Sandymount Strand/Tolka Estuary [Site code: 832]; and North Bull Island [Site code: 406].), North Bull Island Special Amenity Area Order (SAAO) site and the UNESCO Dublin Bay Biosphere. These sites are, similar to the Dublin Bay Natura 2000 sites, downstream of the Proposed Development and hydrologically connected via the via the Royal Canal and Liffey Estuary Lower transitional waterbody.

These designated and sites/areas are discussed further in sub-sections 8.6.1.1 to 8.6.1.3 inclusive.

8.3.2 Water Framework Directive

8.3.2.1 Background

In response to the increasing threat of pollution and the increasing demand from the public for cleaner rivers, lakes and beaches, the EU developed the Water Framework Directive (WFD). This Directive is unique in that, for the first time, it establishes a framework for the protection of all waters including rivers, lakes, estuaries, coastal waters and groundwater, and their dependent wildlife/habitats under one piece of environmental legislation for all European member states. The WFD (Directive 2000/60/EC) is a substantial piece of EU water legislation that came into force in 2000. The overarching objective of the WFD is for the water bodies in Europe to attain Good or High Ecological Status. The Environment

Protection Agency (EPA) is the competentauthority in Ireland responsible for delivering the WFD. River Basin Management Plans (RBMP) have been created which set out measures to ensure that water bodies in the countryachieve 'Good Ecological Status'. Good Ecological Status will depend on the quality of the individual quality elements on which the Ecological status is scored; namely the biological, chemical and morphological condition in a particular water body. Any reduction in any of these elements will result in a reduction ofthe overall ecological status.

8.3.2.2 Water Framework Status and Objectives

Ireland's third River Basin Management Plan for Ireland - 'Water Action Plan 2024: A River Basin Management Plan' (DHLGH, 2024) sets out the measures that are necessary to protect and restore water quality in Ireland. The overall aim of the plan is to ensure that our natural waters are sustainably managed and that freshwater resources are protected so as to maintain and improve Ireland's water environment. The 3rd cycle Catchment Reports were published in 2024. The Catchment Reports provide a summary of the water quality assessment outcomes for respective catchments, including status and risk categories, significant threats and pressures, details on protected areas and a comparison between cycle 2 and cycle 3.

8.3.3 Data Collection

8.3.3.1 Desk Review

When determining the pre- work conditions on-site, including the presence or absence of protected or rare habitats and/or species, the precautionary principle was used where limited information was available. To determine the baseline conditions along the Proposed Development, following the respective zone of influences described in sub-section 8.3.1, a review of available survey and database information was made, which includes the following:

- A desk-based assessment was carried out to collate information regarding protected/rare species and designated nature conservation sites in, or within close proximity to, the Proposed Development. This included the synopsis for the Royal Canal proposed Natural Heritage Area (NHA) and review of reports of surveys prior to 2022. Of particular importance was the baseline survey carried out by BEC Consultants (BEC, 2013) and additional surveys carried out by Natura Environmental Consultants (2018).
- A data search for ecological records of species, including protected species, was conducted using the National Biodiversity Data Centre Mapping System (NBDC, 2026). This data search included a 2km around the Proposed Development which was deemed suitable for terrestrial ecological receptors as this buffer included biodiversity hotspot areas within the proximity of the Proposed Development. This includes the woodland around Connolly hospital Blanchardstown to the east of the Proposed Development, as well as the woodland and riparian habitats present within St Catherine's Park and Luttrellstown Castle Resort to the south of the Proposed Development's western extent. As such biodiversity records from these ecologically sensitive areas were included within the data search. Species are limited to the scattered parklands and the Royal Canal and its riparian habitats. As such 2km, was deemed to be ecologically appropriate buffer. Additionally, based on the determination of the respective ZoI for aquatic habitats, as described in sub-section 8.3.1, the data search included records from the downstream sections of the Royal Canal. Records were only taken from within a period of 10 years. Data from prior to this period was deemed to be less ecologically relevant based on expert opinion.
- Information in relation to the key ecological receptors/Qualifying Interests/Special Conservation Interests, conservation status and objectives of statutory designated sites including Special Protection Areas (SPAs), Special Areas of Conservation (SACs), Ramsar Sites, Natural Heritage Areas (NHAs) and proposed NHAs (pNHA) identified using the S-P-R model, as described in sub-

section 8.3.1.11, was collected from the online resources provided by the National Parks and Wildlife Service (NPWS, 2026a).

- Records from the Botanical Society of Britain & Ireland (BSBI).

Other information on the local area was obtained, including:

- NPWS (2025a). The Status of EU Protected Habitats and Species in Ireland. National Parks and Wildlife Service, Department of the Culture, Heritage and the Gaeltacht, Dublin, Ireland;
- NPWS (2025b). The Status of EU Protected Habitats and Species in Ireland. Habitats Assessment Volume 2. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland;
- NPWS (2025c). The Status of EU Protected Habitats and Species in Ireland. Species Assessment Volume 3. Habitats Assessment Volume 2. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland;
- Environmental Protection Agency online databases on water quality (Available online at https://gis.epa.ie/EPAMaps/);
- Aerial photography available from https://store.osi.ie and Google Maps http://maps.google.com/ ;
- Online data available on Natura 2000 sites as held by the National Parks and Wildlife Service (NPWS) from www.npws.ie;
- All Ireland Red Data lists for vascular flora, mammals, butterflies, non-marine molluscs, dragonflies & damselflies, amphibians and fish (Available at http://npws.ie/publications/redlists);
- Water Framework Directive water maps (available online at https://gis.epa.ie/EPAMaps/Water and https://www.catchments.ie/); and
- International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species (available online at http://www.iucnredlist.org).
- Fingal Biodiversity Action Plan 2023-2030 (Available at https://www.fingal.ie/sites/default/files/2023-12/Fingal%20Biodiversity%20Action%20Plan%202023-2030.pdf).
- Bat records from Bat Conservation Ireland's (BCI) database.

8.3.3.2 Field Surveys

In order to assess the habitats, floral and faunal groups within the terrestrial and aquatic ZoI of the Proposed Development, as described in sub-section 8.3.1, a number of surveys were undertaken between 2022 and 2026 by JBA Consulting, as well as by Triturus Environmental Ltd, Evelyn Moorkens & Associates and Bat Eco Services. These surveys aimed to outline the baseline environment along the Royal Canal adjacent to the Proposed Development, as well as identify sensitive ecological receptors. These are detailed in sub-sections 8.3.3.2.2 and 8.3.3.2.3.

Additional desktop data from previous surveys along the Royal Canal as well as surveys undertaken for projects in the vicinity of the canal were also utilised to inform the ecological baseline. These surveys are outlined first, within the following sub-section 8.3.3.2.1.

8.3.3.2.1 Previous Surveys/Separate Project Surveys

A number of surveys (BEC, 2013; Natura Environmental Consultants, 2018, see Appendices 5.1 and 5.2) previously conducted along the Royal Canal, were identified during the desktop review and used to inform the project's baseline. Additionally, ecological surveys were undertaken for two plans, the Old Schoolhouse Masterplan (2024) and Kellystown Local Area Plan 2021 – 2027 (2019) adjacent to the

Proposed Development. These surveys are shown in 8.3.3.2.1 and described in detail in the following sub-sections.

Table 8-1: Surveys previously conducted along Royal Canal/Surveys conducted for separate projects within the vicinity of the Royal Canal 2004 - 2024

Company	Project	Ecological Receptor	Location	Dates
IFI	WFD Monitoring Program for Canals	Fish	Royal Canal (full length)	2011
BEC	Baseline ecological study for the National Transport Authority (NTA)	Habitats and species	Royal Canal between Talbot Bridge (12th Lock), Blanchardstown, Co. Dublin and Maynooth Train Station, Maynooth, Co. Kildare.	2013
BEC	Baseline ecological study for the National Transport Authority (NTA)	Calcareous springs	Royal Canal between Talbot Bridge (12th Lock), Blanchardstown, Co. Dublin and Maynooth Train Station, Maynooth, Co. Kildare.	2013
BEC	Baseline ecological study for the National Transport Authority (NTA)	Mammals	Royal Canal between Talbot Bridge (12th Lock), Blanchardstown, Co. Dublin and Maynooth Train Station, Maynooth, Co. Kildare.	2013
BEC	Baseline ecological study for the National Transport Authority (NTA)	Birds	Royal Canal between Talbot Bridge (12th Lock), Blanchardstown, Co. Dublin and Maynooth Train Station, Maynooth, Co. Kildare.	2013
Keeley	Mammal baseline study along the Royal Canal for Waterways Ireland & FCC Parks Division	Bats (activity)	Ashtown to Blanchardstown and Clonsilla Railway Station to Pakenham Bridge along the Royal Canal	July – October 2004 (3 surveys – no specified individual dates

Company	Project	Ecological Receptor	Location	Dates
Keeley	Mammal baseline study along the Royal Canal for Waterways Ireland & FCC Parks Division	Non-volant mammal species	Royal Canal from Leixlip to Ashtown	4th December 2004
Evelyn Moorkens & Associates	Baseline Survey for Richard Nairn of Natura Environmental Consultants	Molluscan Survey of potential *Vertigo* habitats	Royal Canal - Blanchardstown to Dublin/Kildare Border	2016
Natura Environmental Consultants	Baseline Survey for FCC to inform planning for the Proposed Development	Habitats and species	Royal Canal between the 12th Lock and the Dublin/Kildare Border	2018
Natura Environmental Consultants	Baseline Survey for FCC to inform planning for the Proposed Development	Grassland	Royal Canal between the 12th Lock and the Dublin/Kildare Border	2018
Natura Environmental Consultants	Baseline Survey for FCC to inform planning for the Proposed Development	Woodland	Royal Canal between the 12th Lock and the Dublin/Kildare Border	2018
Natura Environmental Consultants	Baseline Survey for FCC to inform planning for the Proposed Development	Breeding waterbirds	Royal Canal between the 12th Lock and the Dublin/Kildare Border	2018
Natura Environmental Consultants	Baseline Survey for FCC to inform planning for the Proposed Development	Non-volant mammals	Royal Canal between the 12th Lock and the Dublin/Kildare Border	2018
Natura Environmental Consultants	Baseline Survey for FCC to inform planning for the Proposed Development	Terrestrial molluscs	Royal Canal between the 12th Lock and the Dublin/Kildare Border	2018
Ecological Solutions (Dr. Chris Smal)	Proposed Development at the Old Schoolhouse	Badger and other non-volant mammals	Old Schoolhouse lands adjacent to the Royal Canal (chainages +4580 - +5300)	31st January and 2nd February 2022

Company	Project	Ecological Receptor	Location	Dates
	(rejected application)			
ORS Consultants	Old Schoolhouse Masterplan	Habitats, amphibians, reptiles, invertebrates, invasive species	Old Schoolhouse lands adjacent to the Royal Canal (chainages +4580 - +5300)	July 2024
ORS Consultants	Old Schoolhouse Masterplan	Birds	Old Schoolhouse lands adjacent to the Royal Canal (chainages +4580 - +5300)	4th, 8th, and 10th July 2024
ORS Consultants	Old Schoolhouse Masterplan	Aquatic macroinvertebrates	Old Schoolhouse lands adjacent to the Royal Canal (chainages +4580 - +5300)	July 2024
ORS Consultants	Old Schoolhouse Masterplan	Bats (preliminary roost assessment)	Old Schoolhouse lands adjacent to the Royal Canal (chainages +4580 - +5300)	July 2024
Minogue and Associates	Kellystown LAP	Habitats	Lands at Kellystown, Dublin 15 (chainages +4120 - +5330)	9th August 2019
Minogue and Associates	Kellystown LAP	Birds	Lands at Kellystown, Dublin 15 (chainages +4120 - +5330)	19th August 2019
Minogue and Associates	Kellystown LAP	Bats (roosting and activity)	Lands at Kellystown, Dublin 15 (chainages +4120 - +5330)	July – August 2019

8.3.3.2.1.1 Previous Ecological Surveys along the Royal Canal

Baseline ecological surveys of the Royal Canal were conducted between Maynooth Train Station and the 12th Lock at Talbot Bridge by BEC Consultants Ltd in 2013. The results of this survey were published in a Baseline Ecological Report (BEC, 2013) (see Appendix 8.5.1).

In order to supplement the 2013 surveys by BEC Consultants more detailed surveys were conducted by Natura Environmental Consultants (Natura Environmental Consultants, 2018, see Appendix 8.5.2) and specialist contractors. Within this 2018 study by Natura Environmental Consultants, is a reference to a personal comment from Paul MacLoone of IFI, that an electro-fishing survey was conducted between Collins Bridge and the 13th Lock surveys in 2011, the results of which were discussed within the report. Evelyn Moorkens & Associates carried out a Molluscan Survey of potential *Vertigo* habitats, also included in the Natura 2018 report.

8.3.3.2.1.2 Proposed Development at Old Schoolhouse Clonsilla (Rejected Planning Application)

In 2021, An Bord Pleanala rejected a proposal for a residential development on a site bordering the Royal Canal at Clonsilla, west Dublin. The site is a narrow strip of land west of Porterstown Road and south of The Village residential estate. The site area is c. 2.3 ha in extent, and about 850m in length, varying in width from c. 24 to c. 30m. It is overgrown in parts with dense scrub of Blackthorn and Bramble. The Old Schoolhouse is a deserted, protected, structure situated at the east end of the linear site. The ABP report included reference to inadequacies in the EcIA with regard to mammal surveys. In addition, submissions were made that reported presence of Badger and Otter on site; these are protected species under the Irish Wildlife Acts (Smal, 2022).

Dr. Chris Smal of Ecological Solutions was requested to inspect the Old Schoolhouse site and adjudge presence of Badgers, Otter, and other non-avian fauna on site (excluding bats). Two surveys were conducted on 31st January 2022, and 2nd February 2022, which found evidence of high levels of Badger activity within the site, while there was evidence of Otter present along the Royal Canal adjacent to the site.

8.3.3.2.1.3 Old Schoolhouse Masterplan Surveys

A Masterplan has been prepared for the lands adjacent to the Old Schoolhouse, Clonsilla, adjacent to the Royal Canal (FCC, 2025). The focal point of the Masterplan lands is the former Old Schoolhouse building which is a Protected Structure (RPS Ref. 0700). The Masterplan outlines the future development of the lands around the existing Schoolhouse to the west of Porterstown Road (chainages +4580 - +5300). An Ecological Assessment Report was carried out as part of the Masterplan for the subject land located at the Old Schoolhouse, Clonsilla, by ORS Consultants on behalf of FCC (ORS, 2025). To inform this report, a variety of ecological surveys were conducted of the area around and adjacent to the Old Schoolhouse, chainages +4580 - +5300 (8.6.2.3).

A habitat survey was conducted in July 2024 by ORS Consultants (ORS, 2025). The survey mapped all habitats on site in accordance with the National Habitat-survey Guidance (Smith et al., 2011). A macroinvertebrate survey of two areas of the Royal Canal adjacent to the site was undertaken. Three bird surveys were undertaken on 4th, 8th and 10th of July 2024. Alongside the habitat survey, signs of mammal, amphibian, reptile, invertebrate, and invasive species were also recorded. Camera traps were left on site to record evidence of non-volant mammals. Additionally, a Preliminary Bat Roost Potential (BRP) Survey was conducted alongside the habitat survey in July 2024.

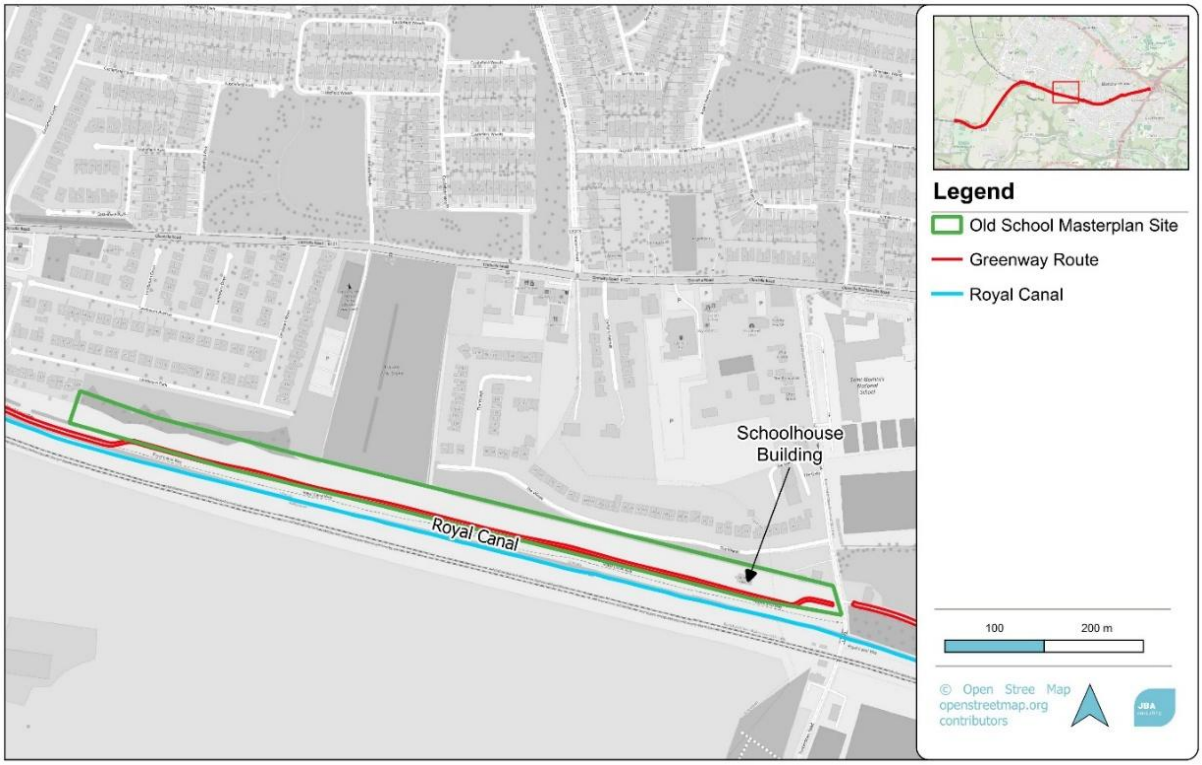


Figure 8-2: Overview of the Old Schoolhouse Masterplan survey area (ORS, 2025)

8.3.3.2.1.4 Kellystown Local Area Plan

FCC has prepared the Kellystown Local Area Plan (LAP), which seeks to establish a land use strategy for the proper planning and sustainable development of lands at Kellystown, Dublin 15. The Kellystown Local Area Plan outlines key objectives for the sustainable development of these lands. As part of the plan, a baseline ecological report was prepared by Minogue and Associates on behalf of FCC (Minogue and Associates, 2021). To inform the baseline ecological report for the Kellystown LAP, Minogue and Associates conducted a series of ecological surveys covering the lands at Kellystown, Dublin 15 (Figure 8-3). A habitat survey on 8th of August 2019 was conducted covering the site area, as well as the area along the Royal Canal to the north of the LAP, including an area on the adjacent bank of the canal, chainages +4120 - +5330 (Minogue and Associates, 2021). A bird survey was conducted on 19th of August 2019. Bat activity surveys were conducted between July and August 2019, and an emergence survey was conducted on 19th of August 2019.

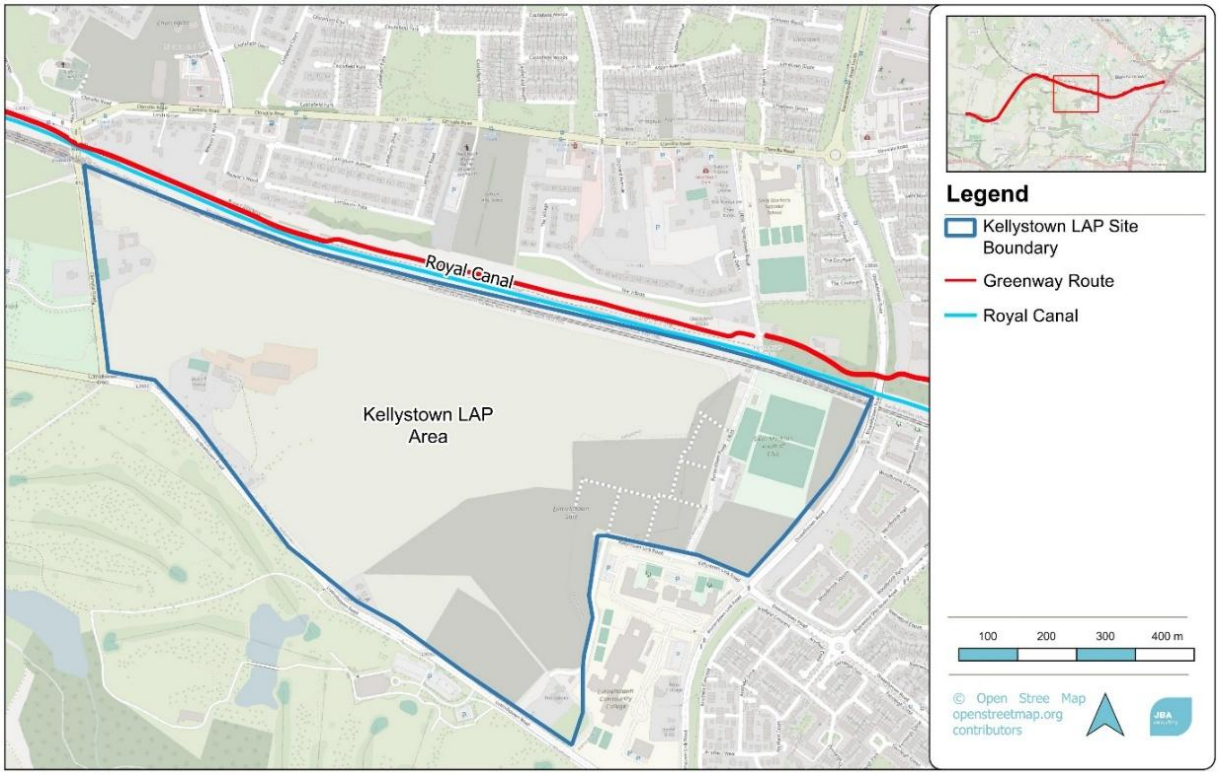


Figure 8-3: Overview of the Kellystown LAP survey area (Minogue and Associates, 2021)

8.3.3.2.2 Project Specific Surveys

8.3.3.2.2.1 JBA Survey Team

The following JBA members of staff were involved during at least one of the project-specific surveys conducted for the Proposed Development:

- Patricia Byrne (BSc (Hons) Zoology, PhD, MCIEEM) is Principal Ecologist with JBA Consulting, with over 20 years' experience in environmental and ecological research, teaching and reporting; and with nine years in ecological consultancy. Patricia is a full Member of the Chartered Institute of Ecological and Environmental Management (CIEEM).
- William Mulville BSc (Hons) Zoology, MSc, MCIEEM. William is Senior Ecologist with JBA Consulting, with over 9 years' experience in environmental and ecological research, outreach and reporting; including over seven years in ecological consultancy.
- Hannah Mulcahy is a Senior Ecologist with over 6 years of consulting experience. She is an expert in plant identification and has written numerous AA Screening Reports, Natura Impact Statements, Preliminary Ecological Appraisals, and Ecological Impact Assessments. Her consultancy experience has included detailed vegetation surveys, bat surveys, mammal, bird and pollinator surveys.
- Mark Desmond (BSc (Hons) Biology, MSc Marine Biology) was an Ecologist with JBA Consulting with over 3 years' experience in ecological surveying and ecological consultancy.
- Eimear Stephenson was a Graduate Ecologist with JBA Consulting who assisted on OPW Heritage Projects and ecological surveying.
- Michael Coyle (BA (Hons) Plant Science, MSc in Ecosystem Science and Policy) was an Ecologist with JBA Consulting and has over 3 years' experience in ecological consultancy.
- Matt Hosking (BSc (Hons) Wildlife Biology) is an Ecologist with JBA Consulting with 3 years' experience in ecological surveying and ecological consultancy.

- Jai Dolan (BSc (Hons) Geography, MSc in Conservation) is an Ecologist with JBA Consulting with more than two years' experience in ecological consultancy.
- Abbie Doyle (BSc (Hons) Geoscience, MSc Environmental Science) is a Graduate Ecologist with JBA Consulting with 9 months experience in ecological consultancy.
- Jemima Kivikoski (BSc, PGDip) is an Environmental Analyst in Hydraulic Modelling with JBA with over 3 years' experience in environmental consultancy.

8.3.3.2.2.2 JBA Surveys along Proposed Development

In 2022 JBA were commissioned to do ecological surveys for the proposed Royal Canal Urban Greenway. Various ecological surveys were carried out along the Proposed Development of Royal Canal Urban Greenway by JBA Ecologists Patricia Byrne, William Mulville, Hannah Mulcahy, Mark Desmond, Éimear Stephenson and Michael Coyle between 2022 and 2023, with additional surveying completed in 2024, 2025, and 2026 by JBA Ecologists Patricia Byrne, William Mulville, Michael Coyle, Matt Hosking, Jai Dolan, Abbie Doyle, and JBA Environmental Scientist Jemima Kivikoski.

The surveys recorded habitats and protected species, following the methods outlined in the documents below:

- Heritage Council (2011). Best Practice Guidance for Habitat Survey and Mapping (Smith et al. 2011).
- Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (NRA, 2009).
- CBS Manual - Guidelines for Countryside Bird Survey participants (BWI, 2012);

Aerial photographs and site maps assisted with the surveys. Habitats have been classified and described following Fossitt (2000). Nomenclature for higher plants follows that given in The New Flora of the British Isles 4th Edition (Stace, 2019).

Table 8-2 contains the details of all JBA survey dates from 2022-2026 and types of surveys undertaken. Additional details of the surveys undertaken by JBA are outlined below.

Table 8-2: Surveys conducted by JBA Consulting along Royal Canal 2022-2026

Ecological Receptor	Location	Dates
Habitats	Royal Canal between the 12th Lock and the Dublin/Kildare Border (Chainages 0 - +8063)	May 2022
Habitats, Riparian Birds, Terrestrial Invertebrates	Royal Canal between the 12th Lock and the Dublin/Kildare Border (Chainages 0 - +8063)	July 2024
Grassland relevé	Plot 1 and 2: Canal Section 2, north of Pakenham Bridge (2 plots carried out here at Plot 1: ITM 703860 738310, Chainages +2950, and Plot 2: ITM	July 2022

Ecological Receptor	Location	Dates
	703953 738362, Chainage +3100) Plot 3: Callahan Bridge- Railway bridge (Plot at ITM: 704596 738273, Chainage + 3770) Plot 4: Canal Section 2 on steep slope (Plot taken at ITM 705672 737911, Chainage +4800)	
Grassland relevé	Plot 1: Canal Section 2, north of Pakenham Bridge (Plot 1: ITM 703860 738310, Chainage +2950)	May 2023
Calcareous Spring, Grassland relevé	Deep Sinking area east of Kennan Bridge by BEC in 2013, between Chainages +5400-5450. Plot 1: ITM 703860 738310, Chainage +2950	July 2022, June 2025
Potential Roost Feature Assessment	Royal Canal between the 12th Lock and the Dublin/Kildare Border (Chainages 0 - +8063)	February 2026
Birds	Royal Canal between the 12th Lock and the Dublin/Kildare Border (Chainages 0 - +8063)	April, May, June 2022
Birds	Royal Canal between the 12th Lock and the Dublin/Kildare Border (Chainages 0 - +8063)	June 2024
Birds	Royal Canal between the 12th Lock and the Dublin/Kildare Border (Chainages 0 - +8063)	April – June 2025
Kingfisher	Location of Proposed Landmark Bridge (Chainages +7150 – 7250)	April – June 2025
Invertebrates – Pollinators and Adult Aquatic Invertebrates.	Royal Canal between the 12th Lock and the Dublin/Kildare Border (Chainages 0 - +8063)	July 2022 August 2024

Ecological Receptor	Location	Dates
eDNA survey	3 locations along the Royal Canal: 12th Lock 53.38261768360494, -6.365864597251432 (Chainages + 8000) Clonsilla Station 53.38397257095294, -6.425906687832375 (Chainages + 4100) Confrey 53.37437267665995, -6.484893828557263 (about 800m to the west of the start of the Proposed Development (Chainages 0)).	July 2024
Habitats	Royal Canal between the 12th Lock and the Dublin/Kildare Border (Chainages 0 - +8063)	May – June 2026

8.3.3.2.2.3 Habitat Mapping

JBA Consulting conducted a baseline habitat survey on Wednesday 18th May 2022. The 2022 survey was conducted JBA Ecologists Patricia Byrne, William Mulville, Éimear Stephenson and Michael Coyle. A follow-up habitat survey was conducted on the 15th of July 2024 to record any changes that may have occurred since the JBA surveys in 2022. This survey was conducted by JBA Ecologists Patricia Byrne, Michael Coyle, Matt Hosking, Jai Dolan and JBA Environmental Scientist Jemima Kivikoski. Additional updates to the habitat map and associated species lists were made during the faunal specific surveys conducted between 2022-2026 inclusive. Additional habitat surveys along the Proposed Development were conducted on 28/05/2026 by JBA Ecologists Matt Hosking and Jai Dolan, and on 04/06/2026 by JBA Ecologists Patricia Byrne, William Mulville, Jai Dolan, and Abbie Doyle. The study area of these habitat surveys was based on the terrestrial ZoI as described in 8.3.1.1, which included the Royal Canal ecological corridor along the Proposed Development.

The results of the habitat survey conducted by ORS in July 2024 as part of the Old School Masterplan Baseline Ecological Report (ORS, 2025) were also incorporated into the final habitat mapping.

8.3.3.2.2.4 Updated Grassland Surveys 2022, 2024 and 2025 - Habitat classification and identifying Annex I grassland habitats

After initial habitat mapping of the proposed site, a further grassland survey was conducted by JBA Ecologists Hannah Mulcahy and Michael Coyle on the 11th of June 2022. A follow-up assessment of these grasslands was conducted by JBA Ecologists Michael Coyle and Matt Hosking in 2024 and 2025. All habitats including grasslands were resurveyed in 2026 by JBA Ecologists Patricia Byrne, William Mulville, Matt Hosking, and Jai Dolan.

The methodology for identifying the species-rich grasslands as Annex I habitats were adapted from:

- Irish Wildlife Manual No. 78 The Irish semi-natural grasslands survey 2007-2012 (O'Neill et al. 2013)
- Irish Wildlife Manual No. 102 The monitoring and assessment of three EU Habitats Directive Annex I Grassland Habitat (Martin et al. 2018)

The methodology from these manuals was used to determine if each relevé passed the criteria used to assess the condition of the following Annex I habitats:

- Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) [6210]; important orchid sites [*6210]
- Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) [6510]

Following the guidance documents listed above, 2 x 2 metre Relevé (Quadrat or Plot) were sampled in the grassland areas that were indicated to be the above Annex I grassland (6210 or 6510) by BEC in 2018 (Natura Environmental Consultants, 2018). The location of a relevé within each grassland area was chosen (not picked at random) based primarily on the overall species-richness of the grassland habitat within the polygon.

Each relevé includes a complete list of plant species in a 2x2 metre quadrat, as well as percentage cover of each plant species. Extra species outside the 2x2 plot within 10-20 metre radius were also recorded. Additional data was also noted, including cover of forbs, and graminoids, ratio of forb to graminoid cover, and median vegetation height. Other parameters include percentage cover of bare soil, bare rock, leaf litter, surface water, total field layer, total bryophyte cover, and presence of any negative indicator species. This information determines the condition of the grassland.

8.3.3.2.2.5 Bird Surveys

JBA conducted initial breeding bird surveys covering the terrestrial habitats within the Royal Canal ecological corridor along the Proposed Development on 21 April 2022, 24 May 2022 and 21 June 2022, with follow-up surveys on the 25thJune 2024, 23rd April 2024, 14th May 2025, and 18th June 2025. A specific Kingfisher survey was included in the 2025 survey dates at the area of the proposed Landmark Bridge.

Breeding bird surveys were carried out by JBA Consulting with an initial survey of Sections 2 and Section 3 of the Proposed Development across two mornings on the 20th and 21st of April 2022. Further surveys were conducted on the 18th of May 2022, the 21st of June 2022 and the 25th of June 2024. A dedicated riparian bird survey covering the Royal Canal itself, for the length of the Proposed Development, was conducted on the 15th of July 2024. Additional observations of breeding and riparian birds within the Royal Canal ecological corridor along the Proposed Development were made during the habitat surveys conducted on 28/05/2026 by JBA Ecologists Matt Hosking and Jai Dolan, and on 04/06/2026 by JBA Ecologists Patricia Byrne, William Mulville, Jai Dolan, and Abbie Doyle.

No specific wintering bird surveys were conducted due to the limited potential supporting habitat for migratory wintering bird species, with absence of low-cut grassy fields/pitches. Additionally, the site's location, over 9.5km inland from Dublin Bay, puts the Proposed Development outside the typical foraging range for most migratory wintering bird species typically present within Dublin Bay.

Surveys followed guidance provided in Country Bird Survey (CBS) Manual (BWI, 2012). Surveys involved a team of two walking the length of the Proposed Development and recording bird species and their activity, e.g. singing, bringing food to nest, carrying nest material, occupying nest etc. Records of breeding birds and all waterbirds were also taken during each habitat survey, with presence and absence of species recorded, as well as any nesting features.

All waterbird species spotted or heard were recorded and breeding species were determined by observation of their behaviour against a table of standardized indicators. These are the same indicators used in the Bird Atlas 2007-2011 (Balmer et al. 2013). For example, Swallows frequently flew along the canal foraging but there were no breeding or roosting signs evident.

8.3.3.2.2.6 Invertebrate Surveys

A survey of terrestrial invertebrates (pollinators) and adult aquatic invertebrates, as well their habitat usage, covering the terrestrial and aquatic habitats within the Royal Canal ecological corridor along the Proposed Development, was carried out on 14 July 2022 by JBA ecologists Mark Desmond and Michael Coyle. A follow-up survey was conducted on the 13th of August 2024 by JBA Ecologists Patricia Byrne, Wiliam Mulville, Jai Dolan and Matt Hosking.

The surveys were conducted on a sunny day with low wind. A roving transect along the Proposed Development was followed with species presence and relative abundance noted. These surveys are representative of an accurate description of the baseline.

8.3.3.2.3 Additional Non-JBA Ecological Surveys along Royal Canal

Various additional specialist ecological surveys were carried out along the Proposed Development of Royal Canal Urban Greenway as part of this project to assess sensitive faunal groups vulnerable to the impacts of the Proposed Development. These include:

- Macrophyte surveys by Triturus Environmental Ltd, April – June 2023 and 2024
- Annual Badger and Otter Surveys by Triturus Environmental Ltd, from November 2021 – 2025
- Bat Surveys by Bat Eco Services 2022 & 2025
- Aquatic Macroinvertebrate surveys by Triturus Environmental Ltd, April/May 2023
- Dedicated Glutinous Snail *Myxas glutinosa* survey by Triturus Environmental Ltd, 2023 and 2025
- Freshwater molluscs survey by Evelyn Moorkens & Associates, April 2024

Table 8-3 contains the details of the dates of these additional ecological surveys from 2022-2026 and the types of surveys undertaken, as well as the respective study area for each survey. Additional details of these surveys are outlined below.

Table 8-3:Non-JBA ecological surveys conducted along Royal Canal 2022-2026

Company	Ecological Receptor	Location	Survey dates
Triturus Environmental Ltd (2024c) (Appendix 5.5.3)	Macrophytes	Royal Canal between Croke Park and Harbour Road, Kilcock	April – June 2023
Triturus Environmental Ltd (2025d) (Appendix 5.5.4)	Macrophytes	Royal Canal between Croke Park and Harbour Road, Kilcock	April – June 2024
Triturus Environmental Ltd (2022a)	Badger	8.5km of linear canal corridor between the Kildare/Fingal County boundary and	Nov 2021, Jan 2022

Company	Ecological Receptor	Location	Survey dates
		the M50, east of the 12th lock, Castleknock	
Triturus Environmental Ltd (2022a)	Badger	8.5km of linear canal corridor between the Kildare/Fingal County boundary and the M50, east of the 12th lock, Castleknock	March, May 2022
Triturus Environmental Ltd (2023a)	Badger	8.5km of linear canal corridor between the Kildare/Fingal County boundary and the M50, east of the 12th lock, Castleknock	April 2023
Triturus Environmental Ltd (2025a) (Appendix 5.5.9)	Badger	8.5km of linear canal corridor between the Kildare/Fingal County boundary and the M50, east of the 12th lock, Castleknock	April 2025
Triturus Environmental Ltd (2022b)	Otter	1st to 16th lock	Nov 2021, Jan 2022
Triturus Environmental Ltd (2024b)	Otter	1st to 16th lock	January – April 2024
Triturus Environmental Ltd (2025b) (Appendix 5.5.10a)	Otter	8.5km of linear canal corridor between the Kildare/Fingal County boundary and the M50, east of the 12th lock, Castleknock	April 2025
Triturus Environmental Ltd (2026) (Appendix 5.5.10b)	Otter	1st to 16th lock	November – December 2025

Company	Ecological Receptor	Location	Survey dates
Bat Eco Services (Dr Tina Aughney) (2022)	Bats	Royal Canal between 12th Lock to Dublin/Kildare County border	May, June 2022
Bat Eco Services (Dr Tina Aughney) (2025)	Bats	Royal Canal between 12th Lock to Dublin/Kildare County border	September 2025
Bat Eco Services (Dr Tina Aughney) (2026) (Appendix 8.5.8)	Bats	Royal Canal between 12th Lock to Dublin/Kildare County border	April 2026
Triturus Environmental Ltd (2024d) (Appendix 5.5.5)	Aquatic macroinvertebrate	1st to 16th lock	April – May 2023
Evelyn Moorkens & Associates (2025) (Appendix 5.5.6)	Freshwater molluscs	1st to 16th lock	April 2024
Triturus Environmental Ltd (2025c) (Appendix 8.5.7)	Glutinous Snail *Myxas glutinosa*	Royal Canal c.3km between Confey slipway and Packenham Bridge (Chainages 0-2850), and 300m of canal in the vicinity of Callaghan's Bridge, Clonsilla (chainages 3950 to 4250).	May 2025

8.3.3.2.3.1 Macrophytes

Given the suitability of the Royal Canal for rare and protected macrophyte species, dedicated macrophyte surveys were undertaken by Triturus Environmental Ltd within the Royal Canal between Croke Park and Harbour Road, Kilcock between April and June in 2023 and 2024 (see Appendix 8.5.3 and Appendix 8.5.4). These surveys involved taking samples at a total of 20 100m transect sites between the 1st Lock and Kilcock. Samples were collected at each 100m transect by hand and or using a handheld grapnel from both the bank and or boat. A total of 10 grapnel throws were made within each 100m transect (i.e. every 10m) to maximise the number of meso-habitats sampled. An estimate of the percentage cover occupied by each species was made using a combination of the grapnel samples and a visual assessment. Cover for aquatic macrophyte species was assessed relative to the canal width and expressed on a version of the DAFOR scale:

- D - Dominant (>70% cover)
- A - Abundant (31-70% cover)
- F - Frequent (11-30% cover)
- O - Occasional (3-10% cover)
- R - Rare (<3% cover)

Species nomenclature was according to Stace (2019). Rare species as per national Red lists (Wyse-Jackson et al., 2016; Lockhart et al., 2012; Stewart & Church, 1992) were identified in the field with the assistance of Paul Green (former BSBI Ireland Officer).

Table 8-4: Location of n=20 macrophyte survey sites along the Royal Canal, 2023 and 2024 (Triturus Environmental Ltd., 2024c, 2025d). Sampling locations highlighted are located within the Proposed Development

Site number	Location	X (ITM)	Y (ITM)
1	Croke Park	716029	735928
2	Between 2nd & 3rd lock	715688	736059
3	Between 3rd & 4th lock	715425	736151
4	Cross Guns Bridge	715085	736272
5	Cross Guns Quay, Phibsborough	714865	736363
6	6th lock	714588	736479
7	Cabra West	713991	736847
8	Broombridge station	713251	737176
9	R805 road crossing	712689	737359
10	11th lock	709852	737849
11	Granard Bridge	708376	738086
12	Pakenham Bridge	703843	738284
13	Collin's Bridge	702735	736842
14	Confey slipway	701575	736997
15	Cope Bridge	700861	737068
16	Leixlip Louisa Bridge	699242	736491
17	300m east of Pike Bridge	696397	737339
18	Maynooth Harbour	693782	737401
19	Jackson's Bridge	691578	737700
20	Harbour Road, Kilcock	688949	739402

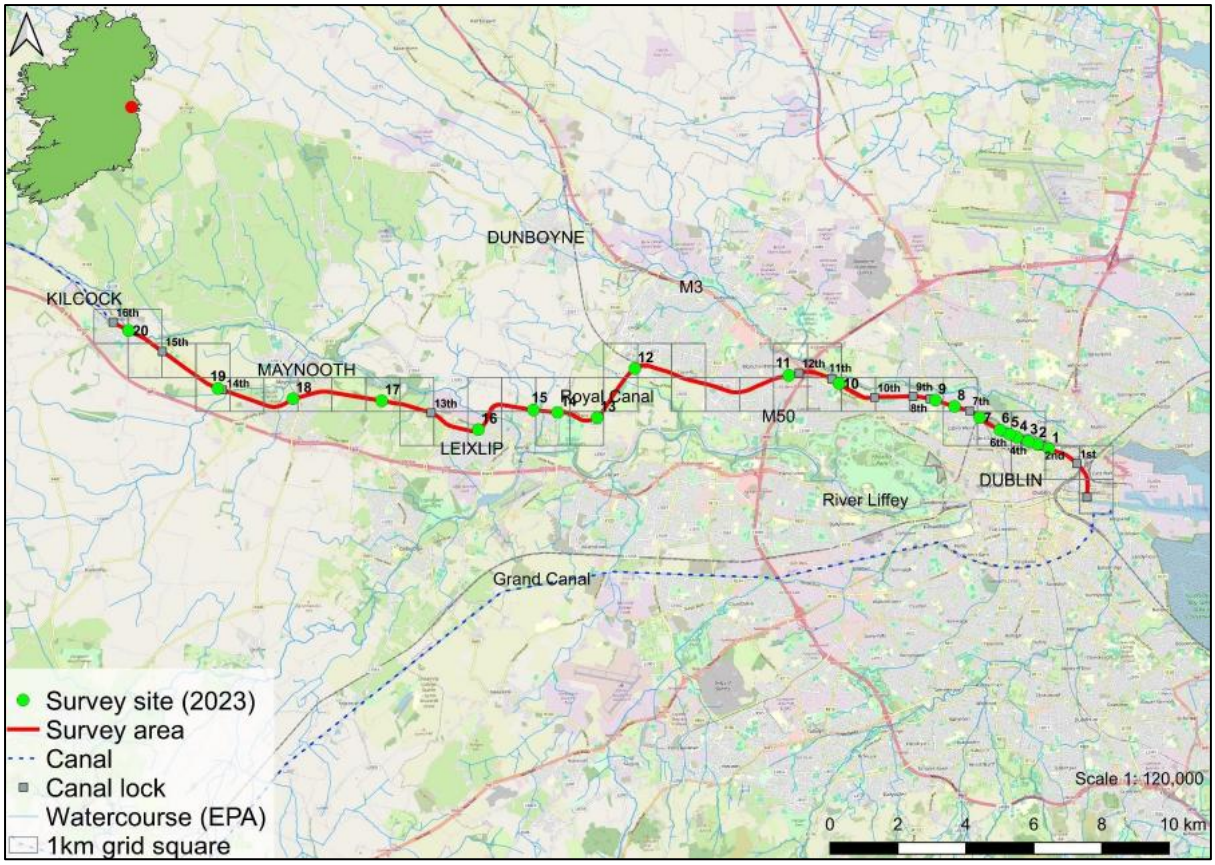


Figure 8-4: Overview of the Royal Canal macrophyte survey area and monitoring sites, 2023 and 2024 (covering 43 no. 1km grid squares/monads) (Triturus Environmental Ltd., 2024c, 2025d)

Statistical analysis of the results of the surveys was performed using species accumulation curves. These curves are used to describe the increase of species with the increase in sampling effort and serve as an indicator of the validity and adequacy of sampling (Ugland et al., 2003). Sites with a high proportion of rare species and few abundant species have a species accumulation curve with a low inflection point on the y-axis and a long upward sloping line to the asymptote, whereas sites with a high proportion of relatively abundant species have a steep rising initial slope, plateau early and provide an accurate estimate of species richness with less sampling effort than when there is a higher proportion of rare species (Thompson & Withers, 2003). The cumulative number of species recorded was plotted against the number of sampling sites to interrogate the macrophyte and bryophyte data collected (Triturus Environmental Ltd., 2023c, 2024c).

Additionally, a desk study was also conducted, which included a review of Botanical Society of Britain & Ireland (BSBI) records for rare & protected macrophyte species within the Royal Canal. These records indicated the presence of several rare and/or protected plant species within the Royal Canal within the last 20 years.

8.3.3.2.3.2 Badger

Following indications of Badger *Meles meles* presence during previous mammal surveys conducted, a specific Badger survey was commissioned to understand the size of the local Badger population and its usage of the habitats within close vicinity of the Proposed Development.

Triturus Environmental Ltd. undertook this work and performed initial surveys within the 8.5km of linear Royal Canal ecological corridor between the Kildare/Fingal County boundary and the M50, east of the 12th lock, Castleknock in November and January 2021. Badger setts and evidence of foraging were

recorded during this initial survey. Follow-up survey covering the same study area were undertaken on 31st March and 9th May 2022 to identify Badger setts and any potential adjoining foraging areas. These additional surveys also examined areas of habitat which had been subject to interim alterations in the Proposed Development alignment (e.g. St. Joseph's, Hansfield). The methodology and results of these surveys are described in detail in two published reports (Triturus Environmental Ltd. 2022a). Triturus Environmental Ltd. conducted an additional survey on 4th April 2023 in the vicinity of the Old School House, Porterstown following extensive land clearance works (Triturus Environmental Ltd, 2023a), and additional follow up surveys covering the initial entire study area in February 2024 (Triturus Environmental Ltd., 2024a), and April 2025 (Triturus Environmental Ltd. 2025a, see Appendix 5.5..9).

8.3.3.2.3.3 Otter

Surveys for Otter *Lutra lutra* covering the Royal Canal ecological corridor between the 1st to 16th lock were conducted, with a report published in July 2022 (Triturus Environmental Ltd. 2022b). Walkover Otter surveys of the Royal Canal were undertaken on the 29th to 30th of November 2021 and on the 17th of January 2022. Whilst survey effort was focused on the canal and immediate riparian corridor, adjoining habitats with suitability for Otter were also surveyed, where present. The survey followed the best practice survey methodology for Otter as recommended by Lenton et al. (1980), Chanin (2003) and Bailey & Rochford (2006). However, the methodology differed in that the entire waterline was surveyed rather than the standard 500-600m sections from accessible points (e.g. bridges). The novel survey technique, known as a total corridor Otter survey (TCOS) (Macklin et al., 2019), encompassed the entire riparian zone along both banks of the Royal Canal and in-channel (boat-based) surveys.

The linear survey area was divided into 34 no. discrete 500m sections (17 along each canal bank) to facilitate greater resolution of data. Further information can be found in the Otter Report (Triturus Environmental Ltd, 2022b).

Additional Otter surveying was conducted by Triturus Environmental Ltd. in January-April 2023 (Triturus Environmental Lt, 2024b), April of 2025 (Triturus Environmental Ltd. 2025b, see Appendix 5.5.10.1), and in November – December 2025 (Triturus Environmental Ltd, 2026, see Appendix 5.5.10.2). The 2023 and November – December 2025 surveys comprised approximately 33km of the Royal Canal between the 1st lock (Dublin City Centre) to the 16th lock (Kilcock), while the April 2025 survey comprised of the 8.5km linear canal between the Kildare/Dublin border and the M50, east of the 12th Lock. Throughout all the Otter surveys, surveying followed the TCOS methodology.

8.3.3.2.3.4 Bats

A number of bat surveys were conducted along the Proposed Development by specialist bat ecologist Dr Tina Aughney of Bat Eco Services in 2022 and 2025 (Bat Eco Services, 2026; see Appendix 8.5.8). A full list of project-specific bat surveys conducted along the Proposed Development is shown below in Table 8-5.

Table 8-5:Non-JBA project specific bat surveys conducted along Proposed Development 2022-2026

Company	Survey Type	Date(s)
Bat Eco Services (Dr Tina Aughney)	Daytime Roost Assessment	2nd May 2022
Bat Eco Services (Dr Tina Aughney)	Dawn Emergence Survey	2nd May 2022
Bat Eco Services (Dr Tina Aughney)	Dawn Emergence Survey	3rd May 2022
Bat Eco Services (Dr Tina Aughney)	Dawn Emergence Survey	5th May 2022

Company	Survey Type	Date(s)
Bat Eco Services (Dr Tina Aughney)	Dawn Emergence Survey	10th May 2022
Bat Eco Services (Dr Tina Aughney)	Dusk Emergence Survey	6th May 2022
Bat Eco Services (Dr Tina Aughney)	Dusk Emergence Survey	11th May 2022
Bat Eco Services (Dr Tina Aughney)	Passive Static Bat Detector Survey	2nd May to 7th May 2022 (5-nights recording, 22:00 hours to 06:00 hours)
Bat Eco Services (Dr Tina Aughney)	Passive Static Bat Detector Survey	22nd September to 3rd October 2025 (10 nights recording, 22:00 hours to 06:00 hours)
Bat Eco Services (Dr Tina Aughney)	Bat Activity Survey	24th April 2026

2022 Bat Eco Services Ltd Surveys

Daytime inspections of bridges along the Proposed Development were undertaken on 2nd of May 2022 by Bat Eco Services using visual checks, torches and an endoscope to look for bats or signs such as droppings, staining, and crevice use. All but two bridges were accessible, with only Talbot and Kirkpatrick Bridge inaccessible to surveyors. All accessible bridges were assessed using the Billington & Norman (1997) roost-potential classification system. The bridges assessed during these surveys are shown below in Table 8-6 and the location of the bridges surveyed are shown in Table 8-6.

Table 8-6: Bridges inspected during 2022 surveys by Bat Eco Services

Bridge Code	Description	Grid Reference (ITM)
Bridge 1	Stone bridge, single arch (pedestrian), crevices suitable.	709035, 738184
Bridge 2 Talbot Bridge	Natural stone bridge, single arch, difficult to access (canal gates)	708708, 738166
Bridge 3 Granard Bridge	Stone arch bridge, old pointing of crevices note, small crevices.	708423, 738096
Bridge 4 Kirkpatrick Bridge	Stone arch bridge with metal bridge extension – not accessible. Steep banks either side of canal.	706964, 738590
Bridge 5 Dr. Troy Bridge	Modern bridge, no crevices suitable for roosting bats. High concrete bridge.	706282, 737706
Bridge 6 Kennan Bridge	Natural stone, single arch (road bridge) – number of crevices. Recently pointed.	706081, 737773

Bridge Code	Description	Grid Reference (ITM)
Bridge 7 Callaghan Bridge	Natural stone, single arch (road bridge) – number of crevices.	704924, 738144
Bridge 8 Hansfield Railway Bridge	Modern bridge (Deep Sink area). No suitable roosts spaces.	704102, 738389
Bridge 9 Pakenham Bridge	Natural stone, single arch (road bridge) – small number of crevices.	703763, 738225
Bridge 10 Collins Bridge	Natural stone, single arch (road bridge L3005) – small number of crevices.	702679, 736809

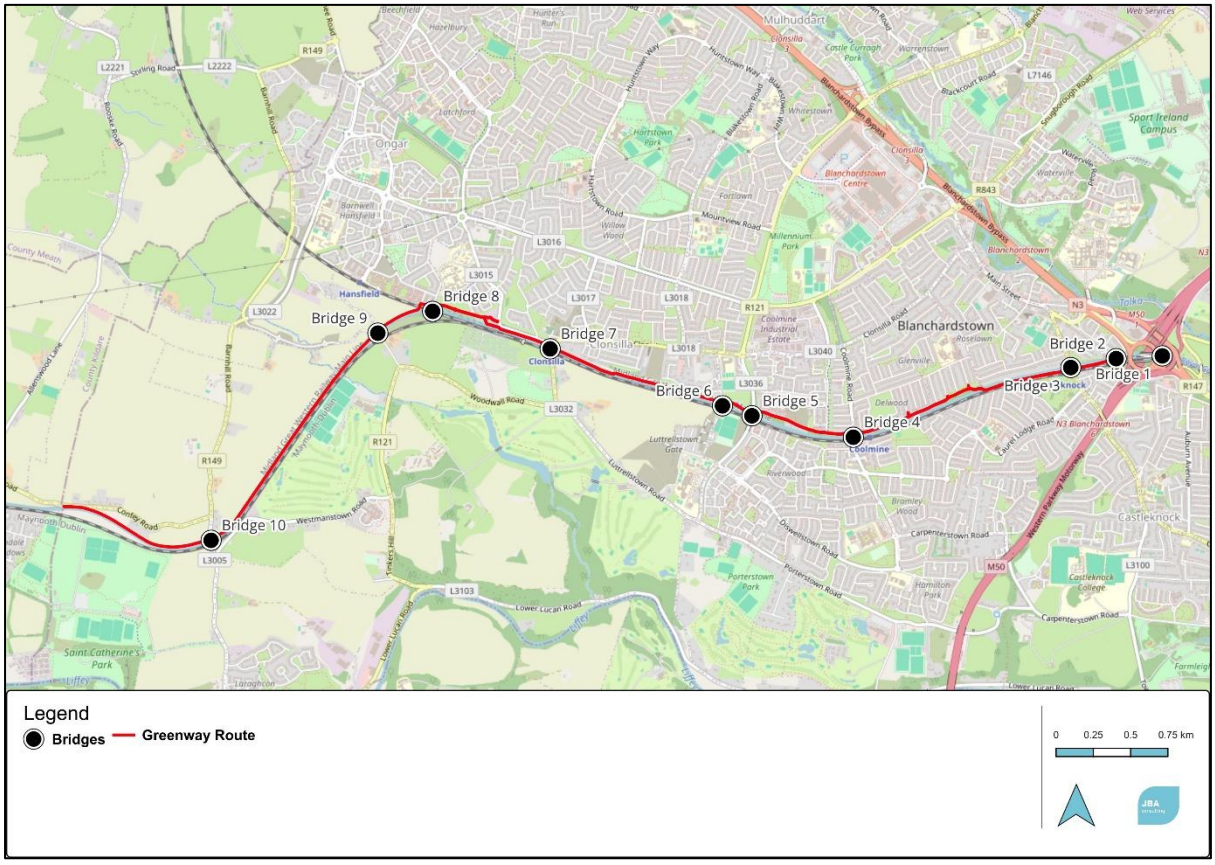


Figure 8-5: Bridges surveyed along the Proposed Development in 2022 by Bat Eco Services Ltd. (Bat Eco Services, 2025)

Dusk and dawn emergence surveys were carried out at four bridges (Bridge 1- In middle of M50 road complex, Clonsilla, Bridge 9 and Bridge 10), identified as having the highest roosting potential during the previous bat roost assessment surveys, between the 2nd-11th of May 2022.

Surveyors used Anabat Walkabout Full Spectrum Bat Detector, Petersson D200 Heterodyne Bat Detector, and Bat Logger M2 Spectrum Bat Detectors were used. Calls were analysed using Kaleidoscope Pro and validation of bat species was completed by the principal bat surveyor prior to mapping. The survey area was divided into two halves with Clonsilla Bridge as the dividing point.

Passive static monitoring along the Royal Canal was undertaken from 2nd May to 7th May 2022 (5 nights recording, 22:00hrs to 06:00hrs). This involved leaving a static bat detector unit (with ultrasonic microphone) in a specific location and set to record for a specified period of time. The following static bat detectors were used at 12 locations along the Proposed Development (Figure 8-6):

- Silicon Labs AudioMoth with Passive Full Spectrum recording function and MEMS microphone which is surface mounted

- Wildlife Acoustics with Passive Full Spectrum recording function and SMM-U2 microphone

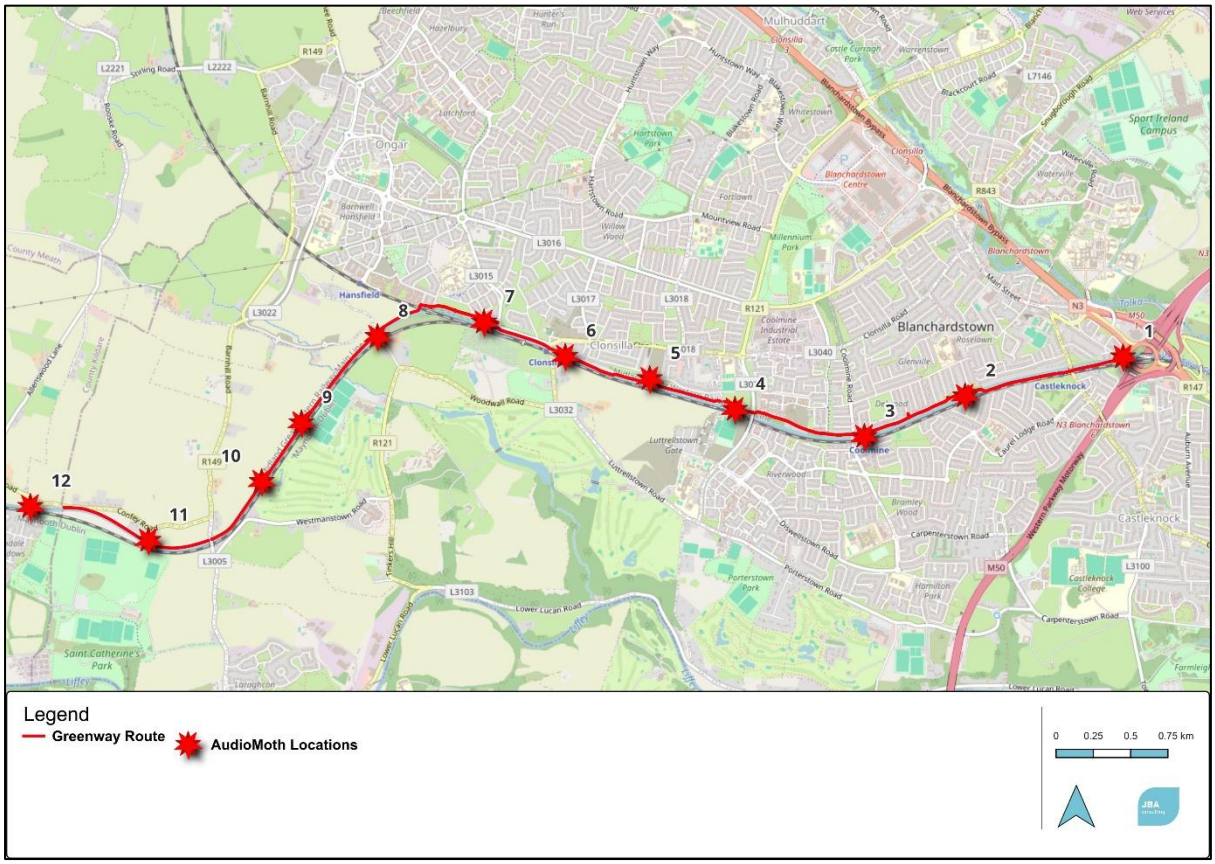


Figure 8-6: Location of static units deployed during 2022 static surveillance (Bat Eco Services, 2026)

The recordings are analysed using Wildlife Acoustics Kaleidoscope Pro. The Auto-Id function was used for all sound files, and manual verification was then used to ensure the auto-id function is accurate. This is particularly important for less common bat species and cryptic bat species such as Myotis species, where distinguishing call is more challenging. In addition, "Noise" and "Unidentified" sound files are also checked. Each sequence of bat pulses was noted as a bat pass to indicate level of bat activity for each species recorded. This is either expressed as the number of bat passes per hour or per survey night. The static recording units were set to recorded for 10 secs with 20 sec sleeps from 22:00hrs to 06:00hrs.

2025 Bat Eco Services Ltd Surveys

Repeat static surveillance was undertaken by Bat Eco Services in the month of September 2025, while no walking transects were undertaken as this survey technique is more appropriate during the main activity window for bats in Ireland, between May and August. 12 locations (Figure 8-7), similar to the 12 locations surveyed in 2022, were re-surveyed to compare activity levels between the two surveillance years. Undertaking static surveillance in September is likely to record less bat activity compared to month of June, when the 2022 static surveillance was undertaken. However, this was offset by a longer

static surveillance period in 2025, with 10 consecutive nights surveyed, in order to record the full suite of bat species in the area.

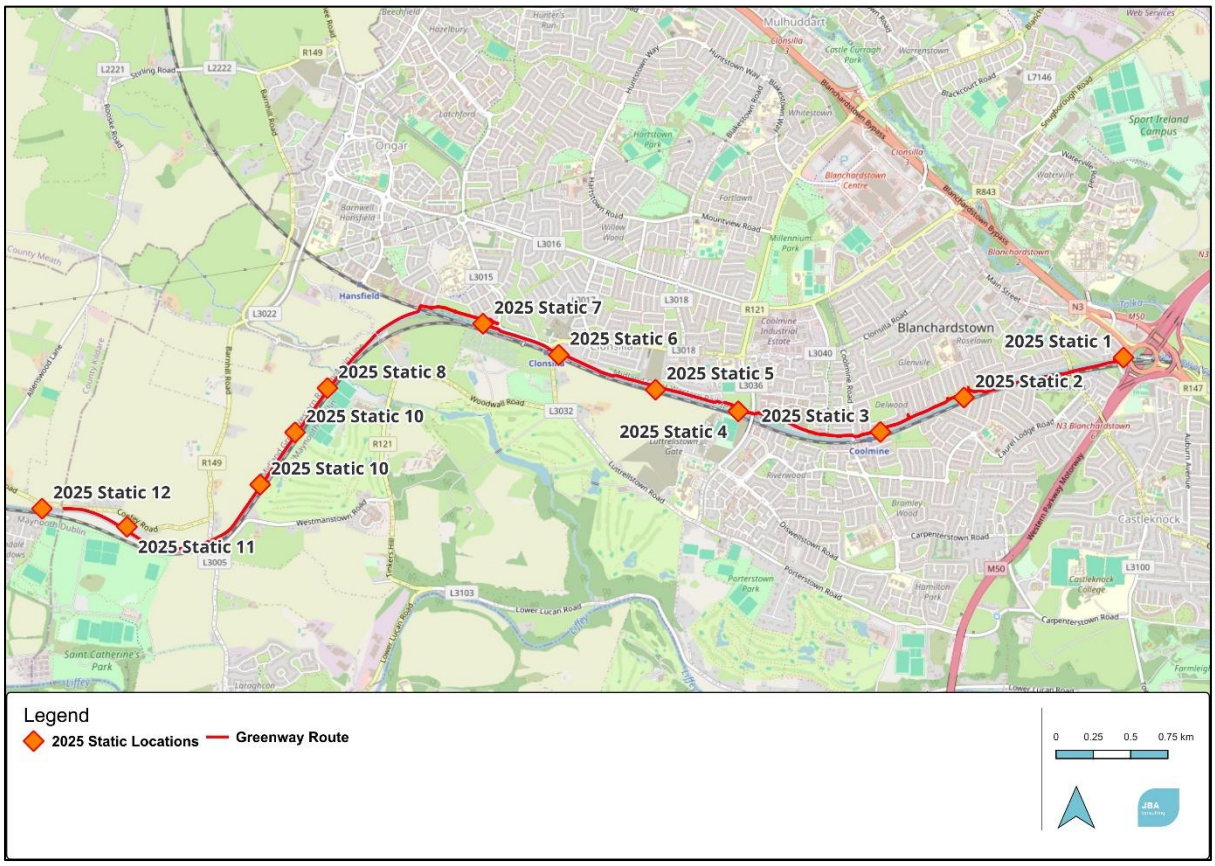


Figure 8-7: Location of static units deployed in 2025 (Bat Eco Services, 2026)

2026 Bat Eco Surveys

Two transect surveys along the entirety of the 8km Proposed Development was conducted on 15th April 2026 and 24th April 2026, with the entire 8km Proposed Development being walked. The surveys were conducted from 21:30 hours to 02:00 hrs (4.5 hrs) starting at the 12th Lock and heading towards Leixlip.

8.3.3.2.3.5 Macro invertebrates

Surveys for aquatic macro-invertebrates were undertaken by Triturus Environmental Ltd. during the April-May period of 2023 (Triturus Environmental Ltd., 2024d) (see Appendix 8.5.5). This survey comprised approximately 33km of the Royal Canal between the 1st lock (Dublin City Centre) to the 16th lock (Kilcock). The survey was conducted through the collection of sweep samples at 20 surveying locations along the canal. Surveying was conducted using a standard pond net (250mm width, mesh size 500 µm) The survey followed the methodology outlined in Cheal et al. (1993), comprising of the movement of a net along the canal bed, collecting epibenthic and epiphytic invertebrates during 3-minute periods of sampling. Sampling was divided among a range of meso-habitats in order to get an accurate representation of sub-habitat types. With the exception of critically endangered Glutinous Snail *Myxas glutinosa*, contents of samples were fixed in 70% ethanol for subsequent laboratory identification. Species were identified from the NPWS Red List publications for beetles (Foster et al., 2009), mayflies (Kelly-Quinn & Regan, 2012), stoneflies (Feeley et al., 2020) and other relevant taxa (i.e. Byrne et al., 2009; Nelson et al., 2011). The location of macro-invertebrate surveys is outlined in Table 8-7 below, with the ones associated with the Royal Canal Greenway highlighted in blue (Site nos. 13, 14 and 15).

Table 8-7: Location of the macro-invertebrate surveys along the Royal Canal (Triturus Environmental Ltd 2024d)

Site Number	Location
1	Croke Park
2	Between 2nd and 3rd lock
3	Between 3rd and 4th lock
4	Cross Guns Bridge
5	Cross Guns Quay, Phibsborough
6	6th lock
7	Cabra West
8	Broombridge station
9	R805 road crossing
10	11th lock
11	Granard Bridge
12	Pakenham Bridge
13	Collin's Bridge
14	Confey slipway
15	Cope Bridge
16	Leixlip Louisa Bridge
17	300m east of Pike Bridge
18	Maynooth Harbour
19	Jackson's Bridge
20	Harbour Road, Kilcock

This macro-invertebrate report is the first in a series of four of annual surveying and reporting to take place between 2023 and 2026.

Surveys for freshwater molluscs, with a particular focus on Glutinous Snail were undertaken by Evelyn Moorkens & Associates between 18th and 23rd April 2024 (Moorkens and Killeen, 2025, see Appendix 8.5.6). The surveys focused on this species as around 50% of the global population is estimated to live in Ireland in the Grand and Royal Canals (Byrne et al., 2009). This population is considered to be of global importance, and *Myxas* is listed as endangered in Ireland and appears on the IUCN Red List (Virnaski et al., 2013). The species is now extinct in Northern Ireland, and its range is limited to Republic of Ireland (Byrne et al., 2009). While the decline in this species is not fully understood, it has been suggested that this species has very low tolerance to various environmental factors, particularly eutrophication (Donohue et al., 2009, Carlsson, 2000). Additionally, research has suggested the snail is susceptible to biodegradable pollution, (Mouthon and Charvet, 1999), high degree of water's hardness (Beriozkina et al., 1980), and low values of ambient pH (Vinarski et al., 2013). It is believed that this species' glutinous mantle allows for greater absorption, making it more susceptible to pollution and changes in water quality. As such this species is particularly vulnerable to surface water pollution.

These 2024 surveys for freshwater molluscs included a total of 20 sampling sites from Allen Bridge, west of Kilcock to Mountjoy in Dublin city centre. Twelve of the sites sampled coincided with areas previously surveyed in 2003 sites (Moorkens and Killeen, 2005). Eight further sites were added: one west of the M50 at Clonsilla Station, and 7 east of the M50, including a section at Shandon Gardens, Phibsborough. The area of the Royal Canal east of the Third Lock was not surveyed as the towpaths were closed for construction works. The survey was conducted using an extendable robust, aluminium-framed pond net (handle and frame 2.4m in length, equipped with a 0.5mm nylon mesh bag). Both bivalves and the gastropods were collected. At each survey site a set of samples was taken, each set consisting of sub-samples from a range of sub-habitat locations, of which the net contents were amalgamated into a bucket. The sample was agitated in water to release snails from the weed, allowed to settle, and then snail-free vegetation was removed from the sample. The locations of Glutinous Snail

surveys are outlined in Table 8-8 below, with the ones associated with the Royal Canal Greenway highlighted.

Table 8-8: Location of the critically endangered Glutinous Snail surveys along the Royal Canal (Evelyn Moorkens & Associates, 2025), with locations along the Proposed Development highlighted

Site Number	Location
1	West of Kilcock
2	Opp Carton House
3	Dewey Bridge
4	Louisa Bridge
5	Leixlip Stn, Confey
6	At RCAG slipway
7	Collins Bridge
8	Westmanstown
9	Clonsilla Station
10	Castleknock Station
11	NW of 11th Lock
12	E of Ashtown Bridge/10th Lock
13	W of Reilly Bridge 8th/Lock
14	NW of Broombridge
15	NW of 7th Lock
16	SE of 7th Lock
17	Shandon gardens NW end
18	Shandon gardens NW of 6th Lock
19	Royal Canal Bank, SE of 5th Lock and Cross Gun's Bridge
20	By Mountjoy Prison, between 4th and 3rd Locks

Surveys for Glutinous Snail were additionally undertaken by Triturus Environmental Ltd. between 29th and 30th May 2025 (Triturus Environmental Ltd. 2025c, see Appendix 8.5.7). These surveys were carried out along around 3km of the Royal Canal between Confey slipway and Pakenham Bridge. The survey area was delineated into 29 no. contiguous 100m sections, with a further 3 no. 100m sections in the vicinity of Callaghan's Bridge, Clonsilla, also surveyed. Surveyors employed a combination of sweep sampling (hand net 250mm width, 300mm deep with 500µm mesh size), hand searching of boulder refugia (Willing & Hughes, 2017) and snorkelling techniques in each 100m survey section, with all meso-habitats investigated. Handheld GPS was used to record the location of Glutinous Snail individuals or groups, with notes of macrophyte and riparian plant associations made for both supporting and non-supporting habitat areas also taken. In addition to the targeted Glutinous Snail surveys, 4 no. composite sweep samples were collected throughout the survey area to determine macroinvertebrate community composition and detect any other rare/protected species. Surveying was conducting using a standard pond net (250mm width, mesh size 500 µm). The survey followed the methodology outlined in Cheal et al., (1993) comprising of the movement of a net along the canal bed, collecting epibenthic and epiphytic invertebrates from the substratum. Samples were identified in the field, but where unusual specimens were encountered, they were fixed in 70% ethanol for subsequent laboratory identification. No Glutinous Snails were retained, and all specimens were released to their site of origin. The Glutinous Snail survey area is shown in Figure 8-8.

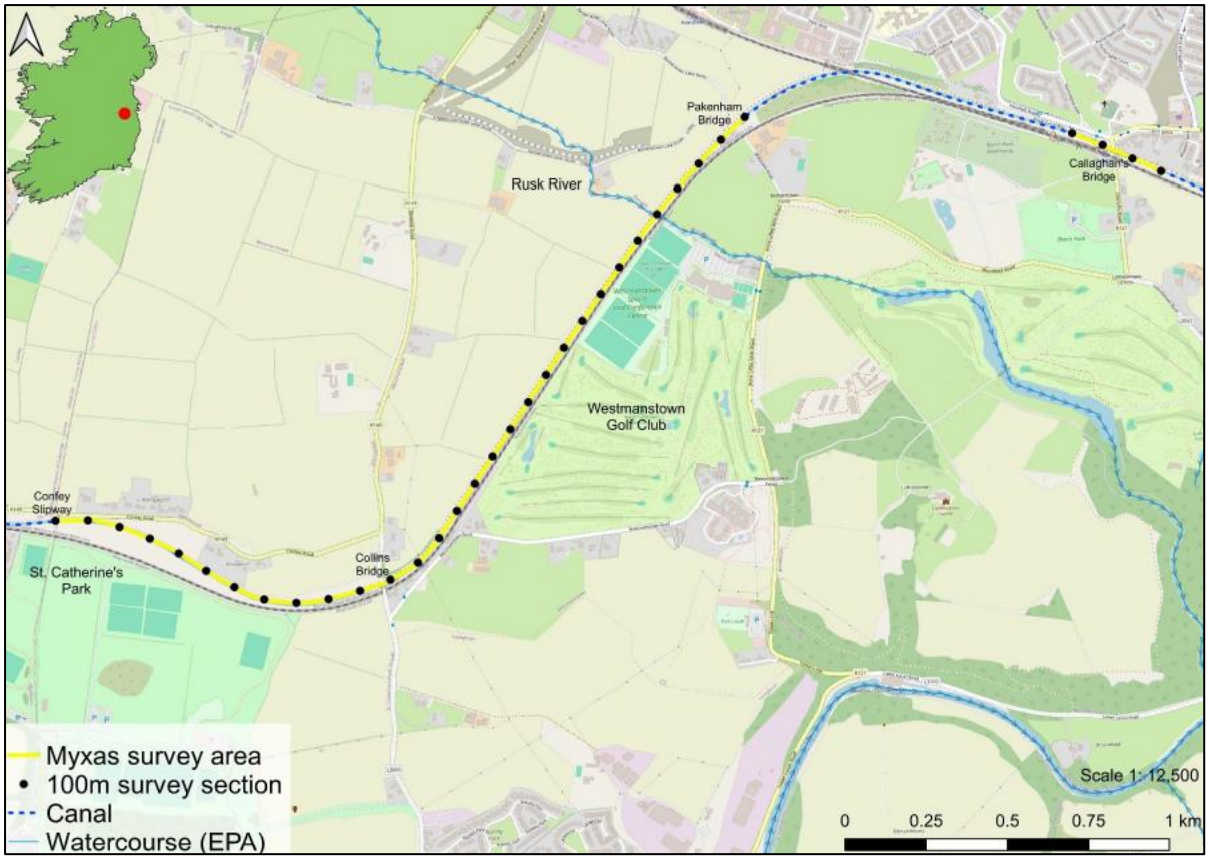


Figure 8-8: Overview of the Royal Canal Urban Greenway Glutinous Snail survey areas, May 2025 (Triturus Environmental Ltd. 2025c)

8.3.4 Assessment of Key Ecological Receptors

The ecological receptors identified during the walkover surveys and from desk-based assessments were reviewed. A methodology for the assessment of these receptors and the significance of predicted impacts is presented below based on NRA/TII and CIEEM guidelines on ecological impact assessments.

In addition to this Biodiversity Chapter, a separate Appropriate Assessment (AA) Screening Report has been produced (JBA, 2026) to assess the potential for significant effects on Designated Natura 2000 sites.

The screening stage of the Appropriate Assessment is to determine:

- Whether the proposed plan or project is directly connected with or necessary for the management of the European designated site for nature conservation
- If it is likely to have a significant adverse effect on the European designated site, either individually or in combination with other plans or projects

For those sites where, potential likely significant effects are identified, either alone or in combination with other plans or projects, further assessment is necessary to determine if the proposals will have an adverse impact on the integrity of a European designated Natura 2000 site, in view of the site's conservation objectives (i.e., the process proceeds to Stage 2).

The AA Screening Report produced for the Proposed Development concluded that likely significant effects via the surface water, groundwater-to-surface water and air pathways were not predicted for the QIs / SCIs of the North Dublin Bay SAC, South Dublin Bay SAC and Rockabill to Dalkey Island SAC; and the SCIs of North Bull Island SPA, South Dublin Bay and Tolka Estuary SPA, North-West Irish Sea SPA and Rye Water Valley/Carton SAC, arising from the Proposed Development, either alone or in-combination with other plans or projects

The final Screening for AA determination will be made by Fingal County Council. The Natura 2000 sites were additionally assessed within this Chapter.

8.3.4.1 Valuation of Key Ecological Receptors (KERs)

The value of designated sites, habitats and species populations is assessed with reference to:

- Their importance in terms of 'biodiversity conservation' value (which relates to the need to conserve representative areas of different habitats and the genetic diversity of species populations).

The valuation of designated sites considers different levels of statutory and non-statutory protection. Assessment of habitat value depends on several factors, including the size of the habitat, its conservation status and quality. The assessment also takes account of connected off-site habitat that has the potential to increase the value of the on-site habitat through association. Valuation of species depends on a number of factors including distribution, status, rarity, vulnerability, and the population size present.

KERs, including designated sites, habitats and species populations have been valued using the scale in Table 8-9 based on the NRA (now Transport Infrastructure Ireland or TII) Guidelines for ecological impacts (NRA, 2008c, rev. 2009).

Table 8-9:Examples of criteria used to define the value of ecological receptors (NRA, 2008c, rev. 2009)

Level of Value	Examples of Criteria
International	'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation. Proposed Special Protection Area (pSPA). Site that fulfills the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended). Features essential to maintaining the coherence of the Natura 2000 Network. Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive. Resident or regularly occurring populations (assessed to be important at the national level) of the following: • Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or • Species of animal and plants listed in Annex II and/or IV of the Habitats Directive. Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971). World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972). Biosphere Reserve (UNESCO Man & The Biosphere Programme). Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979). Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979). Biogenetic Reserve under the Council of Europe. European Diploma Site under the Council of Europe. Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).
National	Site designated or proposed as a Natural Heritage Area (NHA). Statutory Nature Reserve. Refuge for Fauna and Flora protected under the Wildlife Acts. National Park. Undesignated site fulfilling the criteria for designation as a National Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park. Resident or regularly occurring populations (assessed to be important at the national level) of the following: • Species protected under the Wildlife Acts; and/or • Species listed on the relevant Red Data list. Site containing 'viable areas' of the habitat types listed in Annex I of the Habitats Directive.
County	Area of Special Amenity.

Level of Value	Examples of Criteria
(Co. Dublin)	Area subject to a Tree Preservation Order. Area of High Amenity, or equivalent, designated under the County Development Plan. Resident or regularly occurring populations (assessed to be important at the County level)10 of the following: • Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; • Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; • Species protected under the Wildlife Acts; and/or • Species listed on the relevant Red Data list. Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance. County importance populations of species, or viable areas of semi-natural habitats or natural heritage features identified in the National or Local BAP, if this has been prepared. Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county. Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.
Local (higher value)	Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared; Resident or regularly occurring populations (assessed to be important at the Local level) of the following: • Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; • Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; • Species protected under the Wildlife Acts; and/or • Species listed on the relevant Red Data list. Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality; Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.
Local (lower value)	Sites containing small areas of semi-natural habitat that are of some local importance for wildlife; Sites or features containing non-native species that are of some importance in maintaining habitat links.

Guidance published by CIEEM (2024) recommends breaking down the importance of key ecological receptors in a geographic context similar to the NRA guidance shown in Table 8-9 with the following frame of reference to be adapted to local circumstances.

- International and European
- National
- Regional
- Metropolitan, County (Dublin) , vice-County or other local authority-wide area
- River Basin District
- Estuarine system/Coastal cell
- Local.

The NRA (2008, rev. 2009) guidance is congruent with CIEEM (2024). The NRA (2008, rev. 2009) guidance on geographic criteria for ecological valuation, as described in Table 8-10, is followed in this chapter.

8.3.4.2 Descriptive Terminology

Ecological effects or impacts can be described and categorised in a number of ways. Examples of relevant terms are listed in Table 8-10 below following EPA Guidelines (EPA, 2022).

Table 8-10: Categories of Effects (derived EPA, 2022)

Description	Categories of Effects
Quality of Effects	**Positive Effects** A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
	Neutral Effects No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error
	Negative/adverse Effects A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).
Describing the Significance of Effects	**Imperceptible** An effect capable of measurement but without significant consequences.
	Not Significant An effect which causes noticeable changes in the character of the environment but without significant consequences.
	Slight Effects An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate Effects

Description	Categories of Effects
	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
	Significant Effects An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment.
	Very Significant An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment.
	Profound Effects An effect which obliterates sensitive characteristics.
Describing the Extent and Context of Effects	**Extent** Describe the size of the area, the number of sites and the proportion of a population affected by an effect.
	Context Describe whether the extent, duration or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)
Describing the Probability of Effects	**Likely Effects** The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
	Unlikely Effects The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Describing Duration and Frequency of Effects	**Momentary Effects** Effects lasting from seconds to minutes
	Brief Effects Effects lasting less than a day
	Temporary Effects Effects lasting less than a year
	Short-term Effects Effects lasting one to seven years.
	Medium-term Effects Effects lasting seven to fifteen years.
	Long-term Effects Effects lasting fifteen to sixty years.
	Permanent Effects Effects lasting over sixty years.
	Reversible Effects Effects that can be undone, for example through remediation or restoration.
	Frequency of effects

Description	Categories of Effects
	Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually).
Describing the Types of Effects	**Indirect Effects (a.k.a. Secondary or Off-site Effects)** Effects on the environment, which are not a direct result of the project, often produced away from the project site of because of a complex pathway
	Cumulative Effects The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects.
	Do-nothing Effects The environment as it would be in the future should the subject project not be carried out.
	Worst Case Effects The effects arising from a project in the case where mitigation measures substantially fail.
	Indeterminable Effects The effects arising from a project in the case where mitigation measures substantially fail.
	Irreversible Effects When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
	Residual Effects The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic Effects Where the resultant effect is of greater significance than the sum of its constituents (e.g. combination of SOx and NOx to produce smog).

8.3.4.3 Significance of impacts

The overall significance of an impact can be derived from its description of effect, which includes its character, magnitude, duration, probability and expected consequences, compared with the value of an ecological receptor. A chart showing the typical classifications of the significance of effects is shown overleaf in Figure 8-9 which is taken from the EPAs EIAR Guidelines (2022). Additionally, the context and character of an ecological receptor must also be assessed. This includes the location of a receptor with respect to an impact and the relative connectivity between them. This should be determined before assessing the significance of the impact. The magnitude of an impact is placed on an ordinal scale from Negligible to High, as shown in Table 8-10. The sensitivity of the receptor and significance of an impact is also described on an ordinal scale from Negligible to High.

The placement of the general description of the effect (magnitude of an impact), and the sensitivity/significance of the ecological receptor on this ordinal scale is determined by a Competent Person (a qualified ecologist in this case) as they interpret the qualities of the effect from the categories listed in Table 8-10Table 8-9 and the receptors sensitivity and significance. Level of significance, also described as value of the receptor is previously set out in Sub-section 8.3.4 above. Sensitivity of the

receptor is assessed by the Competent Person based on the receptor's characteristics and how susceptible to impact they are from the type of effect.

The overall significance of an effect is then categorised into one of the following seven classifications:

- Imperceptible
- Not Significant
- Slight
- Moderate
- Significant
- Very Significant
- Profound

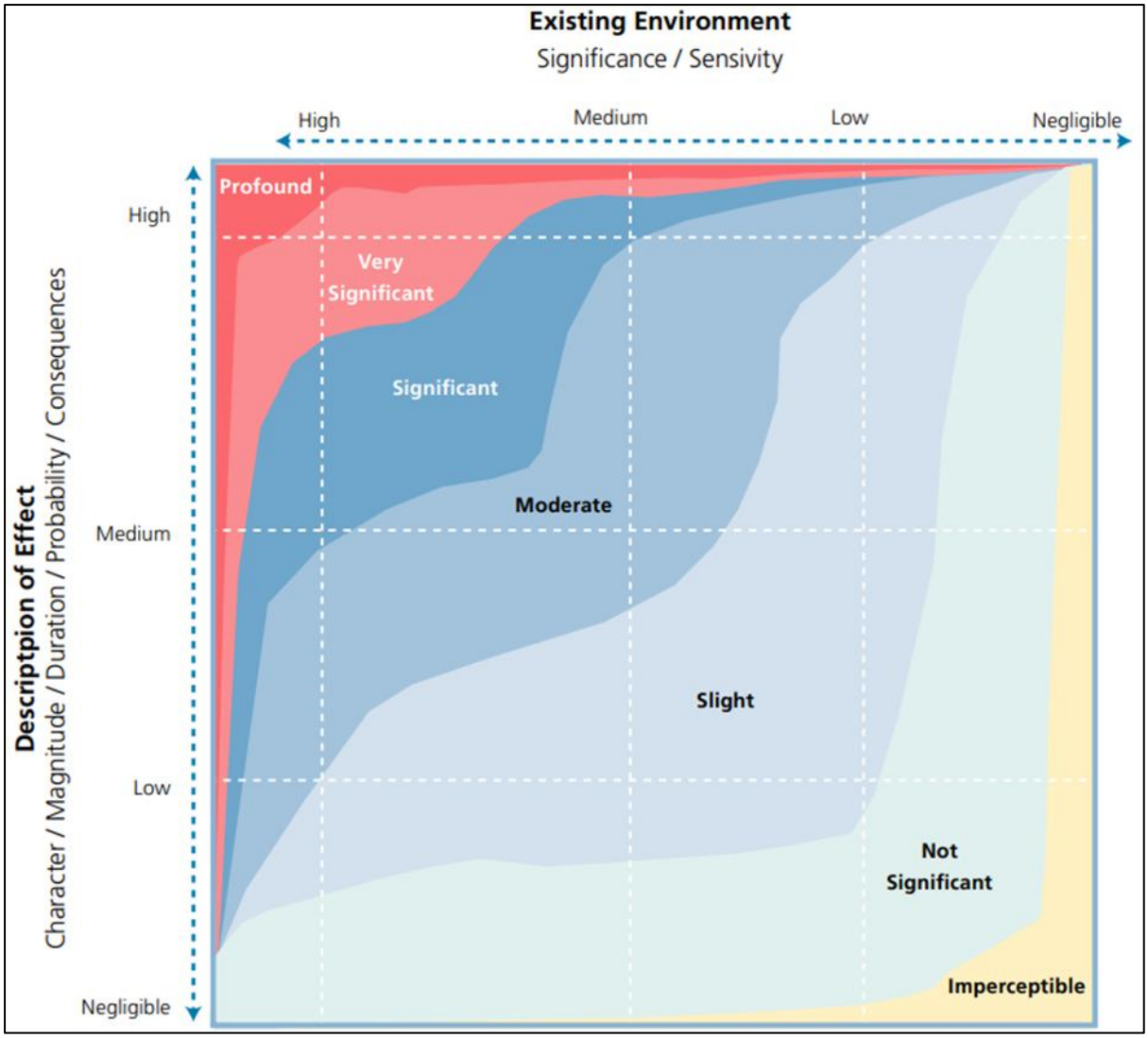


Figure 8-9: Chart showing the typical classifications of the significance of effects (EPA, 2022)

This chart has been interpreted as a significance of impacts matrix. The scale has been ordered into an upper and lower bound for each qualitative category, so that degrees of significance within subcategories can be interpreted by the Competent Person. As Figure 8-9 frames the significance of effects as a defined categorical scale rather than a sliding gradient as is shown in the EPA guidance, it is intended to be used as an initial reference resource, rather than definitive method of assigning impacts.

8.4 Conservation Status

The definitions for conservation status given in the EU Habitats Directive 92/43/EEC, in relation to habitats and species, are also used in the CIEEM (2024) and NRA (2009) guidance:

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

An impact on the conservation status of a habitat or species is considered to be significant if it will result in a change in conservation status. After the definitions provided in the EU Habitats Directive 92/43/EEC, the conservation status of a habitat is favourable when:

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

And the conservation status of a species is favourable when:

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

If it is determined that the ecological integrity and/or conservation status of a KER will be impacted on, then the level of significance of that impact is related to the geographical scale at which the impact will occur (i.e., local, county / regional, national, international). In some cases, an impact may not be significant at the geographic scale at which the KER has been valued (e.g., national) but may be significant at a lower geographical level (e.g., local).

8.4.1 Residual Impacts

The residual impacts of the Proposed Development are defined as the final predicted effects which occur after the proposed mitigation measures have been implemented. This is carried out where mitigation is proven to be effective and will be implemented effectively with a high certainty. Where significant residual impacts are still identified, further mitigation measures will be proposed as part of the EIA process to avoid, reduce, or minimise them. Each impact assessment section assigns a final significance level to the impact described, which considers and includes the implementation of any stated mitigation measures; these are the residual impacts.

8.4.2 Cumulative Impacts

Potential sources of cumulative impacts on the ecology of valued KERs are assessed in sub-section 8.8 of this chapter. Potential sources of cumulative impacts were sought within ranges, territories or catchments where there is the potential for a significant impact on a site or species.

8.4.3 Biodiversity Net Gain

A planning stage note is provided in Appendix 8.6 to qualitatively assess the Proposed Development's expected Biodiversity Net Gain (BNG) drawing on the EIAR, ecological surveys and landscape proposals.

8.4.4 Constraints and Limitations

This Biodiversity Chapter is based on ecological site surveys and existing data from the above-mentioned sources. The chapter necessarily relies on some assumptions and is inevitably subject to some limitations as detailed below. These do not affect the conclusion, but the following points are recorded in order to ensure the basis of the assessment is clear:

- Information on the works and conditions on site is based on current knowledge at the time of writing. The site surveys have followed CIEEM (2019) Advice note on the lifespan of ecological reports and surveys.
- The Arboricultural Report (Charles McCorkell Arboricultural Consultancy, 2026) (see Appendix 10.1) outlines sections/group of trees that may be partially removed. In certain instances, these trees were not individually assessed due to terrain constraints and the thickness of the understorey vegetation within the woodland habitat between Coolmine and Castleknock train stations (approximate chainages +6250 - +7150).
- Where field data and desktop data are limited, professional judgement and the precautionary principle is utilised when determining potential ecological sensitivities within the proposed developments' ZoI. This was the case for a section of woodland between Coolmine and Castleknock train stations, approximate Chainages +6250 - +7150 where access was limited due to steep terrain and thick scrub cover for all ecological surveys undertaken for this project. During the 2026 surveys, surveyors were able to survey between Chainages +6250 – +6600 before the terrain became too steep/the Bramble cover was too thick. Surveyors were also limited by a lack of visibility within these areas due to the thickness of understorey vegetation and terrain constraints. For the section of this woodland between Chainages + 6600 – +6820, surveyors assessed the habitat from the opposite bank using binoculars. For the section of this woodland between Chainages +6820 - + 7150, surveyors similarly completed their assessment from the opposite bank, as well as from the green space to the north of this section. For both these areas, desk-based resources were also consulted (including satellite imagery and online aerial photography). The precautionary principle has been applied particularly regarding flora and fauna, including in terms of the presence of protected species based on the findings for accessible sections of the woodland. The limitation is incorporated into the assessment regarding the certainty and predictability of the assessment and does not impact the findings of the assessment.
- Additionally, similar limitations apply for the woodland section between Chainages +5430 - + 5520 which was similarly challenging to assess due to the thickness of the understorey vegetation. During the 2026 surveys, surveyors were able to successfully walk this entire area. However, their visibility was limited due to the thickness of the understorey vegetation, which ultimately limited their ability to walk the exact Proposed Development through this area. The precautionary principle has been applied particularly regarding flora and fauna, based on the findings for accessible sections of the woodland. The limitation is incorporated into the assessment regarding the certainty and predictability of the assessment and does not impact the findings of the assessment.

8.5 Stakeholder Consultation

Throughout the design of the Proposed Development, ongoing consultation took place between JBA (lead project ecological consultants), DBFL (Project management and responsible for the design of the Proposed Development), Fingal County Council (Local Authority proposing the Proposed Development) and Waterways Ireland (WI) (owners and managers of the Royal Canal).

Regular progress meetings were held between 2023 and 2026 which included DBFL, FCC, and WI staff. Additional consultation was made with DBFL, Fingal County Council, JBA, and NPWS on 9 September 2025. The final Proposed Development was explained, and the results of habitat and species-specific surveys were presented.

The main concern of NPWS was the impact of lighting on bats, as other Greenways had caused disturbance to local bat populations with inappropriate lighting design, resulting in reduced bat numbers. NPWS had concerns with the occurrence of Daubenton's bat, which is highly sensitive to light, and the specific locations which are important for bats within the Proposed Development, i.e. in the vicinity of

the Old School House and along the canal, particularly within the area of the Deep Sinking. NPWS stated that lighting along the development will have an impact on bats and nocturnal mammals such as shrews, Hedgehog and Badger. Discussion was had on the most suitable lighting for minimising impacts on bats and nocturnal non-volant mammals, with FCC agreeing that the most up-to-date lighting design will be used, in line with best practise guidance outlined in Bat Conservation Trust (2023). Additionally, no lighting will be installed along the canal within the rural area between the county border with Kildare and the Hansfield Railway Bridge (Chainage 0 - +3200), with lighting proposed only for the area of the Greenway to the east of this bridge.

NPWS had concerns with occurrence of Badger and their sett locations throughout the Proposed Development and the potential for disturbance, either physically or audibly to Badger population and their setts. They also want to ensure correct management of calcareous grassland areas during construction north of Pakenham Bridge (between Chainages + 2950 – 3100), the provision of natural planting throughout the development, and avoiding non-native seeded 'wildflower meadows'. The occurrence of the rare plant Hairy St John's wort *Hypericum hirsutum,* listed in the Flora Protection Order (2022), was raised, and though it was not recorded in surveys it does occur within 5km of the site. NPWS requested the addition of mitigation measures to address their concerns and a preview of the EIAR Biodiversity chapter.

8.6 Baseline Environment

This baseline environment section presents information gathered from existing reports and desk-based sources as detailed in sub-section 8.6.1 and a series of ecological site visits conducted on the dates listed in section 8.6.2. This section provides a description of the current state of the environment (baseline scenario) for the Royal Canal and the habitats and species present along its banks for the length of the Proposed Development, as well as of downstream/other KERs identified as being connected to the Proposed Development using the S-P-R model (outlined in sub-section 8.3.1.11). This section also describes the expected evolution of the baseline environment in the absence of the Proposed Development (see sub-section 8.6.3).

8.6.1 Desktop Study

The data gathered from the desktop review of the data sources outlined in sub-section 8.3.3.1 are incorporated into the sections below under the specific headings where relevant.

8.6.1.1 Natura 2000 Sites

A S-P-R model was used to identify all European (Natura 2000) which are present within the ZoI, as per OPR Practice Note PN01 Appropriate Assessment Screening for Development Management (OPR, 2021). The S-P-R model also considered the characteristics and vulnerabilities of the respective QIs/SCIs and conservation objectives of any Natura 2000 sites within the Proposed Development's ZoI, as well as the characteristics of the Proposed Development.

As outlined previously with the S-P-R model (sub-section 8.3.1.11), sites which are directly hydrologically connected to the site were considered, as well as sites whose QI/SCI have the potential to be impacted by the Proposed Development via surface water, groundwater, and physical impact (audible and visual) pathways. Following the application of the S-P-R model, 6 Natura 2000 sites were identified withint he ZoI of the Proposed Development, including:

- North Dublin Bay SAC (000206)
- Rye Water Valley/Carton SAC (001398)
- South Dublin Bay SAC (000210)
- South Dublin Bay and River Tolka Estuary SPA (004024)
- North Bull Island SPA (004006)
- North-west Irish Sea SPA (004236)

Table 8-11 below lists these designated sites within the ZoI and their respective direct and hydrological distances (approximate) from the proposed development sites. The Natura 2000 sites are mapped in relation to the Proposed Development in Figure 8-10.

Table 8-11: Natura 2000 sites located within the Zone of Influence (ZoI) of the proposed development

Natura 2000 site	Site Code	Approximate direct distance from site	Approximate hydrological distance
North Dublin Bay SAC	000206	12km	15.2km via surface water pathways (Royal Canal and River Liffey)

South Dublin Bay SAC	000210	11km	14.3km via surface water pathways (Royal Canal and River Liffey)
South Dublin Bay and River Tolka Estuary SPA	004024	9.5km	13.4km via surface water pathways (Royal Canal and River Liffey)
North Bull Island SPA	004006	12km	15.2km via surface water pathways (Royal Canal and River Liffey)
North-west Irish Sea SPA	004236	15km	16km via surface water pathways (Royal Canal and River Liffey)
Rye Water Valley/Carton SAC	001398	1.3km	n/a (located upstream of site, not connected to the site via surface water and groundwater pathways.

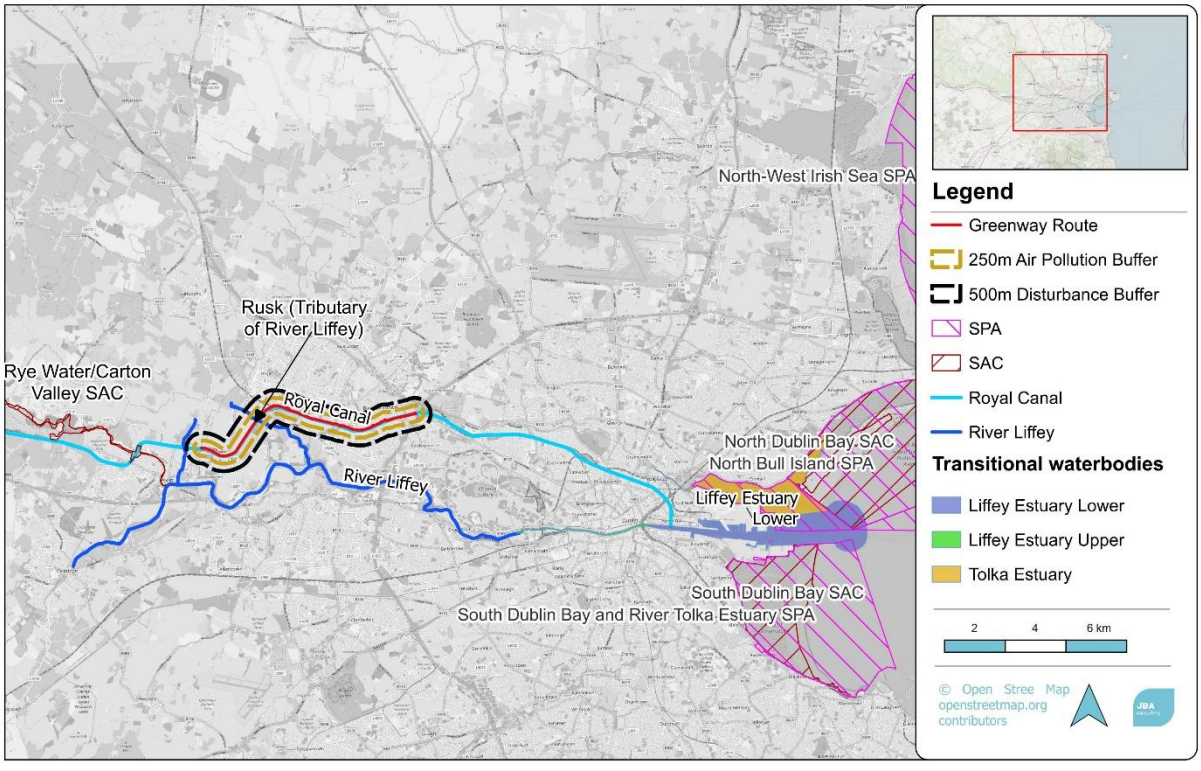


Figure 8-10: Natura 2000 sites connected via the source-pathway-receptor model (©OSM, 2026).

The nearest Natura 2000 site, the Rye Water/Carlton Valley SAC, is located upstream of the site and as such is not anticipated to be impacted by the Proposed Development. The North Dublin Bay SAC, South Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA, North Bull Island SPA, and North-west Irish Sea SPA are downstream of the site and are connected via the Roya Canal. The nearest downstream Natura 2000 site is the South Dublin Bay and River Tolka Estuary SPA, which is located 13.4km downstream of the Proposed Development.

8.6.1.1.1 North Dublin Bay SAC, South Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA, North Bull Island SPA, and North-west Irish Sea SPA sites

As outlined within the Screening for AA Report, potential pollutant sources present during the construction phase include hydrocarbon pollutants present within the fuel tank of construction vehicles, (i.e. excavators), concrete/bituminous mixtures used in paving, and spoil generated from excavations/site clearance that leach into the canal following rainfall events. Potential hydrocarbon spill events are most likely to occur as a result of minor drips which will release small volumes of hydrocarbons into the environment. Small scale pollutant spill events like these are unlikely to enter the canal itself, instead being absorbed locally or intercepted by the retained existing vegetative buffer strip along the banks of the canal. In the case of larger spill events, resulting from the improper oil changes on site, or in the unlikely case of a serious event such as the rollover or crash of a construction vehicle, pollutants are likely to bypass the vegetative buffer strip and enter the Royal Canal. However, the existing riparian vegetation along the canal is likely to partially buffer larger pollutant spill events, intercepting runoff sediments and promoting microbial degradation of hydrocarbons before reaching water bodies, thereby partially reducing the volume of pollutants reaching the canal (Berríos-Rolón et al., 2025). Any pollutants that enter the canal would then have to travel a minimum of 13.5km within this surface waterbody to reach the River Tolka and the nearest Natura 2000 site, South Dublin Bay and River Tolka Estuary SPA. During this time hydrocarbon pollutants would undergo a significant degree of dilution within the Royal Canal and a degree of biodegradation by local microorganisms within the canal water body.

Furthermore, this is compounded by the slow flow rates within the Royal Canal, influenced by the 12 gates/locks, which restrict flow rates between the site and Spencer Dock in Dublin City, where the canal flows into the River Liffey Estuary. Additionally, the high presence and complexity of the macrophyte cover, in large part due to the slow flowing nature of the canal, is likely to further increase the trapping of sediment and retention of hydrocarbons (Rovira et al., 2016). Any hydrocarbons absorbed by sediment, either by soils that leach into the canal or within sediment directly within the canal itself are likely to be trapped by this macrophyte network as well as deposited during the 13.5km journey. The retention/trapping of any hydrocarbon laden sediment within the canal allows greater time for their removal from the water column via phytoremediation by aquatic microorganisms (Dhir et al., 2009).

Similar to hydrocarbon pollution, other pollution sources such as from concrete/bituminous mixtures used in paving or excess spoil generated from excavations/sit are likely to be retained/diluted to non-deleterious levels within the canal before reaching the Liffey Estuary and the nearest Natura 2000 site. As such, any surface water pollutants generated during the construction phase that travel downstream via the Royal Canal itself are not anticipated to impact any Natura 2000 site.

Likewise, in the event any surface water pollutants entering the tributary Rusk Stream (which is culverted under the Royal Canal), and subsequently the River Liffey, they would have to travel a distance of 11.5km within these surface watercourses (2.7km within the Rusk Stream, and 8.8km within the River Liffey), before travelling a further 9.5km within the Liffey Estuary Upper and Lower transitional waterbodies. Any surface water pollutants entering this watercourse would most likely enter the west of the canal, where they undergo an initial degree of retention by the approximately 5m thick treeline/grassy verge separating this watercourse from the proposed works. After travelling an approximate 750m downstream within the Rusk Stream, surface water pollutants would enter a stretch of ponds/wetlands, spanning approximately 950m, within the Golf Course at Luttrellstown Castle. Similar to the canal, this area's slow flow rates, coupled with the higher concentration/complexity of the macrophyte community present, will increase the trapping, retention, and local accumulation of surface

water pollutants, including hydrocarbons, ultimately reducing them to non-deleterious levels. This will prevent impacts to the River Liffey, which already has poor EPA status (EPA, 2024), and subsequently to the Dublin Bay and the Natura 2000 sites within ZoI downstream of the Proposed Development.

An additional source of potential pollutants includes the construction compounds, which have the potential to release wastewater, hydrocarbon, and dust-based pollutants, However, given the pre-determined location of these compounds, away from the Royal Canal watercourse, substantial buffers, including treelines and the grassy verge bordering the canal, will exist between these compounds and the canal itself. In the unlikely event any surface water pollutants were able to traverse these significant buffers, for the reasons outlined above, including the slow-flowing nature of the canal and the hydrological distance between the site and the Dublin Bay, likely significant impacts on the Dublin Bay Natura 2000 sites (North Dublin Bay SAC, South Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA, North Bull Island SPA, and North-west Irish Sea SPA) identified within ZoI are not predicted. Therefore, these sites are not assessed further within this Chapter.

8.6.1.1.2 Rye Water valley/Carton SAC

The Rye Water Valley/Carton SAC is not connected to the proposed project. However, it has been included for initial assessment due to its proximity to the Proposed Development, located within 2km of the Proposed Development, and the potential for the sections of the Royal Canal immediately adjacent to the site to provide ex-situ habitat for QI *Vertigo* Whorl snail species. Additionally, the QI Petrifying springs with tufa formation was identified in close proximity to the Proposed Development. A description of this SAC, alongside its associated Qis and respective project-relevant threats/pressures is included in Table 8-12. Therefore, under the precautionary principle, this SAC has been included for further assessment within this report, within sub-sections 8.6.2.1.5 and 8.6.2.3.7.

Table 8-12: NPWS Site Brief and Qualifying Interests of Rye Water / Carton House SAC (discussed further in sub-sections 8.6.2.1.5 and 8.6.2.3.7)

Site Name	Site Description	Qualifying Interests	Project Relevant Threats / Pressures: Impact (Source)
Rye Water Valley/Carton SAC (001398)	Hairy St. John's Word occurs within Carton Estate, while the woods in Carton Demesne are the site of the rare fungus *Diderma deplanatum*, while the woods are known to have Kingfisher sightings, while the waters are also spawning grounds for the Trout, Salmon and rare White-clawed Crayfish. (NPWS, 2013)	Petrifying springs with tufa formation (*Cratoneurion*) [7220] Narrow-mouthed Whorl Snail *Vertigo angustior* [1014] Desmoulin's Whorl Snail *Vertigo moulinsiana* [1016] (NPWS, 2021)	Continuous urbanization Moderate impact (outside) Dispersed habitation Low impact (outside) Roads, motorways Low impact (outside) Fertilization Low impact (outside) (EEA, 2024)

8.6.1.2 Natural Heritage Areas

There are 6 pNHAs and no NHAs located within the ZoI of the site (Table 8-13 and Figure 8-11). Of these 6 pNHAs, four are within Natura 2000 designated sites. These are North Dublin Bay pNHA, which is within North Dublin Bay SAC and North Bull Island SPA, South Dublin Bay pNHA and Dolphins, Dublin Docks pNHA which are both within South Dublin Bay SAC and South Dublin Bay and River Tolka Estuary SPA, and finally there is Rye water Valley/Carton pNHA which is within Rye water Valley/Carton SAC. These pNHAs have the same designated KERs as their respective SACs and SPAs.

Table 8-13: pNHAs within 10km of the site and if they require further assessment

pNHA Site code	pNHA Site name	Distance from site (km)	Inclusion/exclusion in impact assessment
002103	Royal Canal	Directly adjacent	Included in impact assessment: Included within impact assessment due to this site's proximity to the Proposed Development.
000128	Liffey Valley	700m (No downstream hydrological connection)	Included in impact assessment: Included within impact assessment due to this site's proximity to the Proposed Development.
001398	Rye Water Valley/Carton	1.4km (No downstream hydrological connection)	Further Assessed in sub-sections 8.6.2.1.5 and 8.6.2.3.7 Associated Natura 2000 site assessed further in sub-sections 8.6.2.1.5 and 8.6.2.3.7 due to potential presence of associated QI Spring habitat and Whorl Snail species within the project's ZoI. This assessment is also outlined separately within the Screening for AA Report (JBA, 2026).
000206	North Dublin Bay	9km 14.2km (Downstream hydrologically)	Excluded from impact assessment: Associated Natura 2000 site excluded from impact assessment as outlined in sub-section 8.6.1.1.1, significant impacts are not anticipated due to the hydrological distance and nature of the hydrological pathway between this site and the

pNHA Site code	pNHA Site name	Distance from site (km)	Inclusion/exclusion in impact assessment
			Proposed Development.
000201	South Dublin Bay	11.4km (14km Downstream hydrologically)	Excluded from impact assessment: Associated Natura 2000 site excluded from impact assessment as outlined in sub-section 8.6.1.1.1, significant impacts are not anticipated due to the hydrological distance and nature of the hydrological pathway between this site and the Proposed Development.
000201	Dolphins, Dublin Bay	12km (12.9km downstream hydrologically)	Excluded from impact assessment: Excluded from impact assessment due to this site's hydrological distance from the Proposed Development.

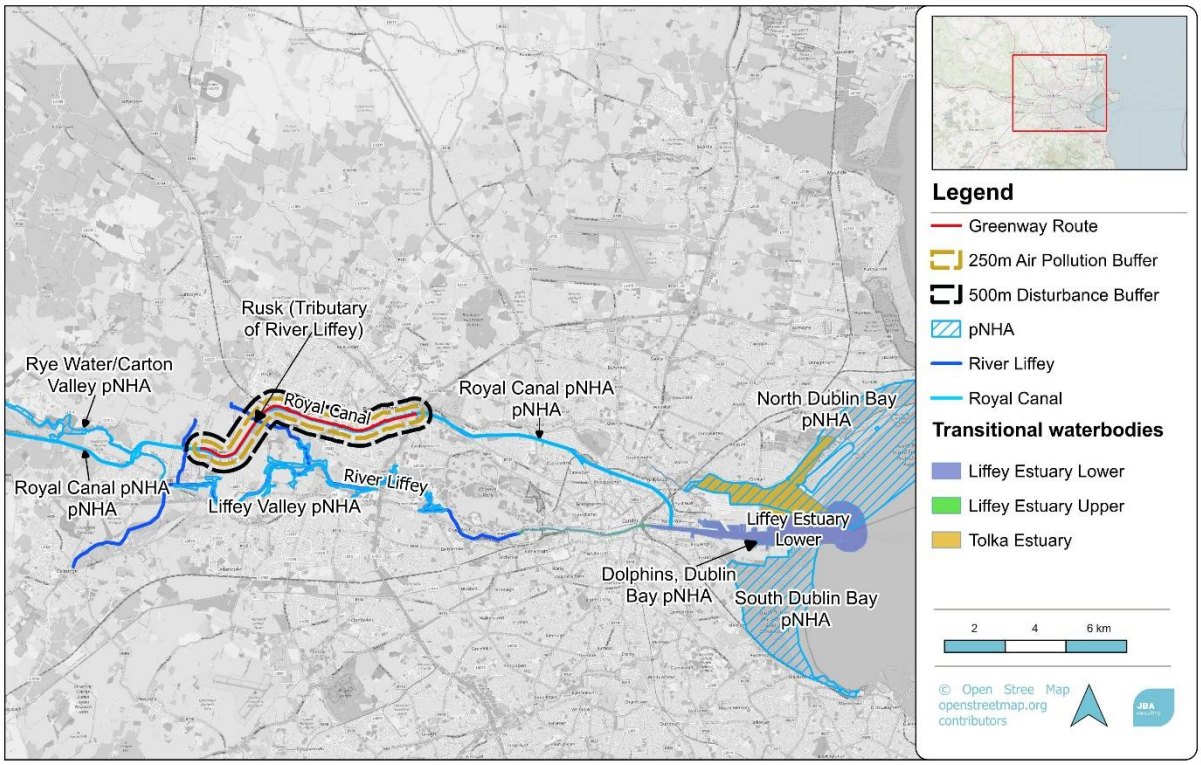


Figure 8-11: pNHAs that have a downstream hydrological connection (©OSM, 2026)

The Royal Canal pNHA is located directly adjacent to the Proposed Development; much of the Proposed Development will run along the old canal towpath. The Royal Canal is a man-made

watercourse, and the pNHA site includes both the central channel and the bank sides. The legally protected Opposite-leaved Pondweed *Groenlandia densa* (Flora Protection Order 2022) is present at one site in Dublin. This species is discussed further in sub-section 8.6.2.2 of this report. The Proposed Development runs through the Royal Canal pNHA and if unmitigated, has the potential to cause significant impacts to this site. As such this pNHA is included within the impact assessment of this Chapter (sub-section 8.7) and is mapped in figures Figure 8-12 to Figure 8-18 inclusive.

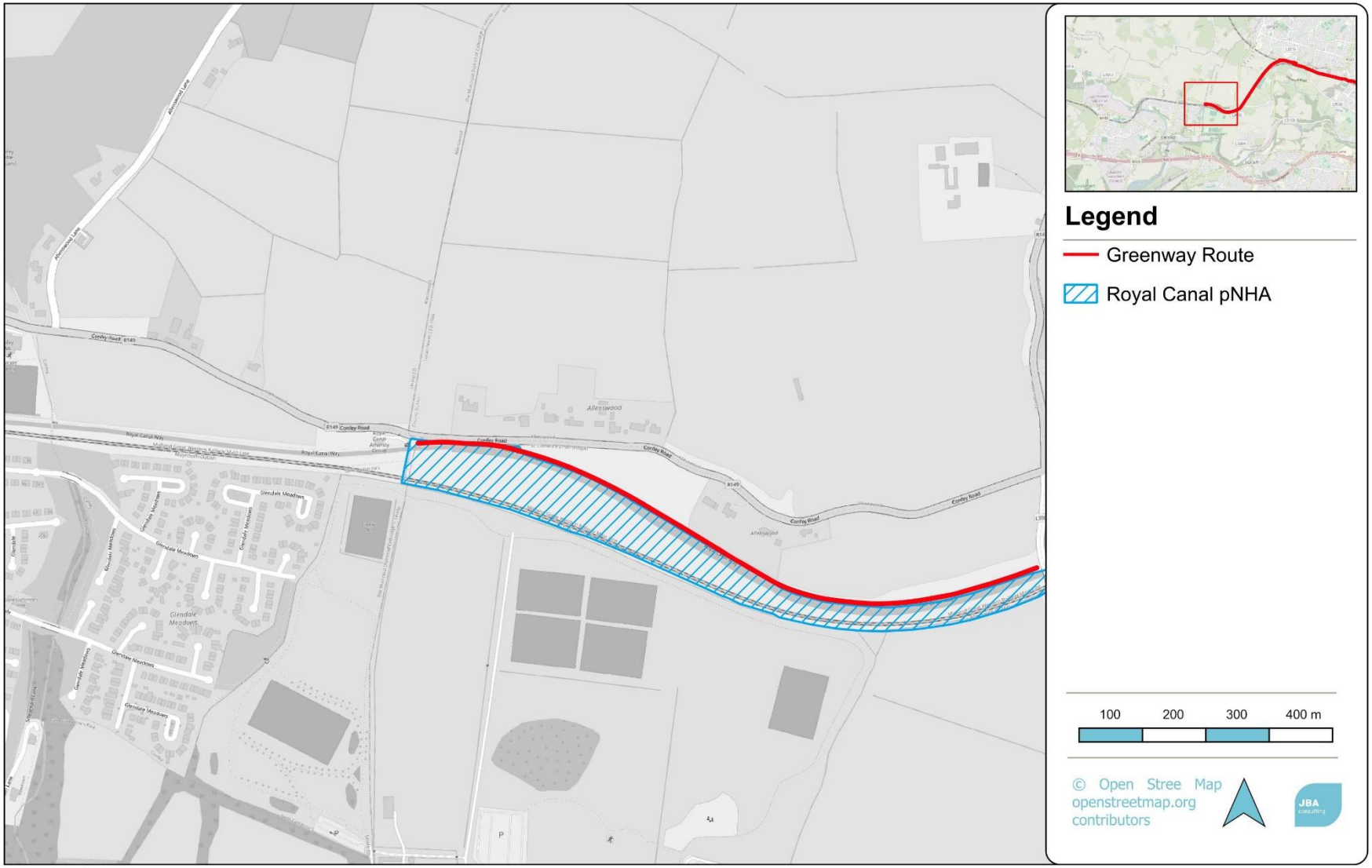


Figure 8-12: Location of Proposed Development in relation to the Royal Canal pNHA - Confey (Chainages +00 - +850) (©OSM, 2026)

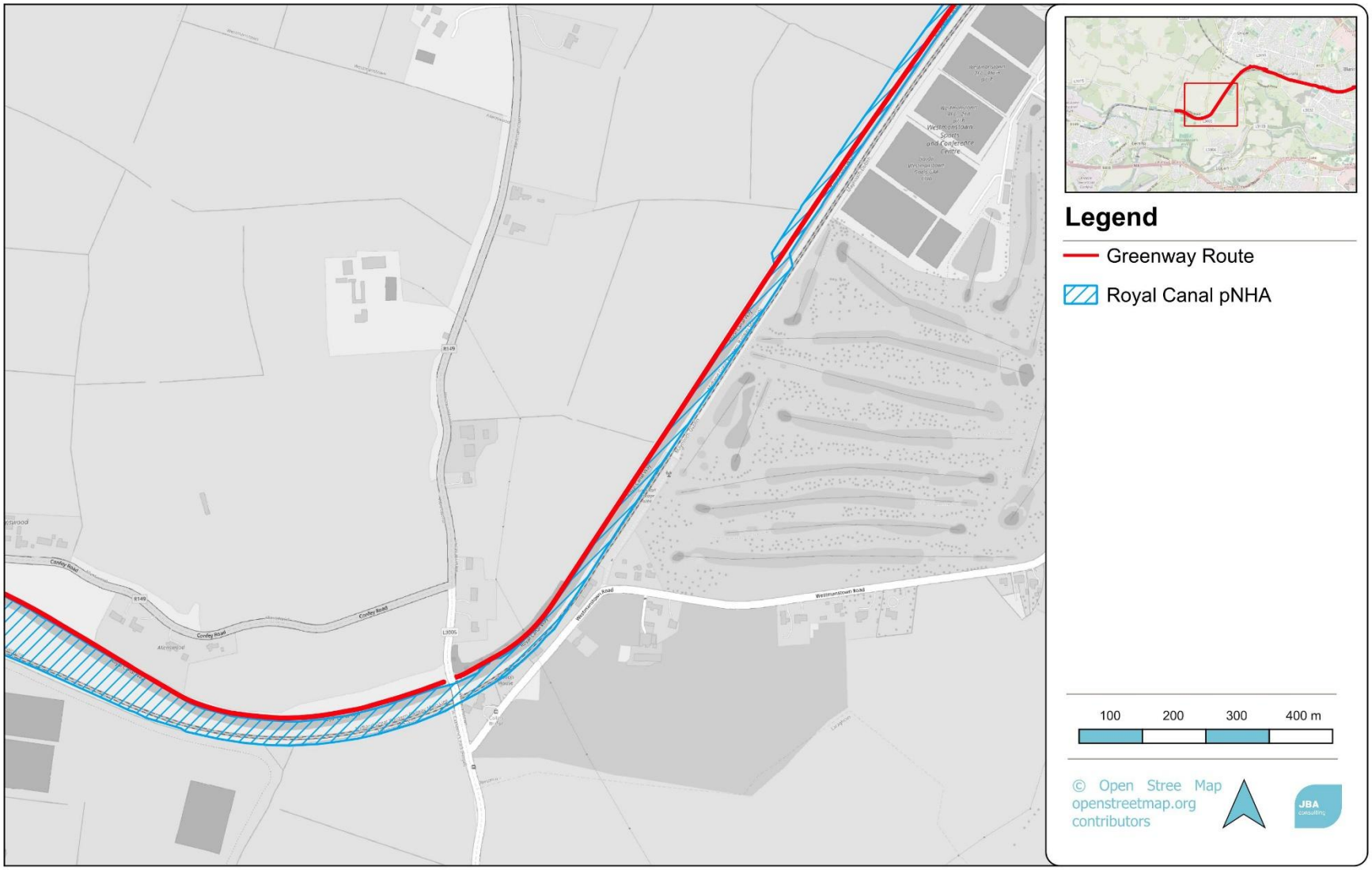


Figure 8-13: Location of Proposed Development in relation to the Royal Canal pNHA – Westmanstown Golf Club (Chainages +650 - +1950) (©OSM, 2026)

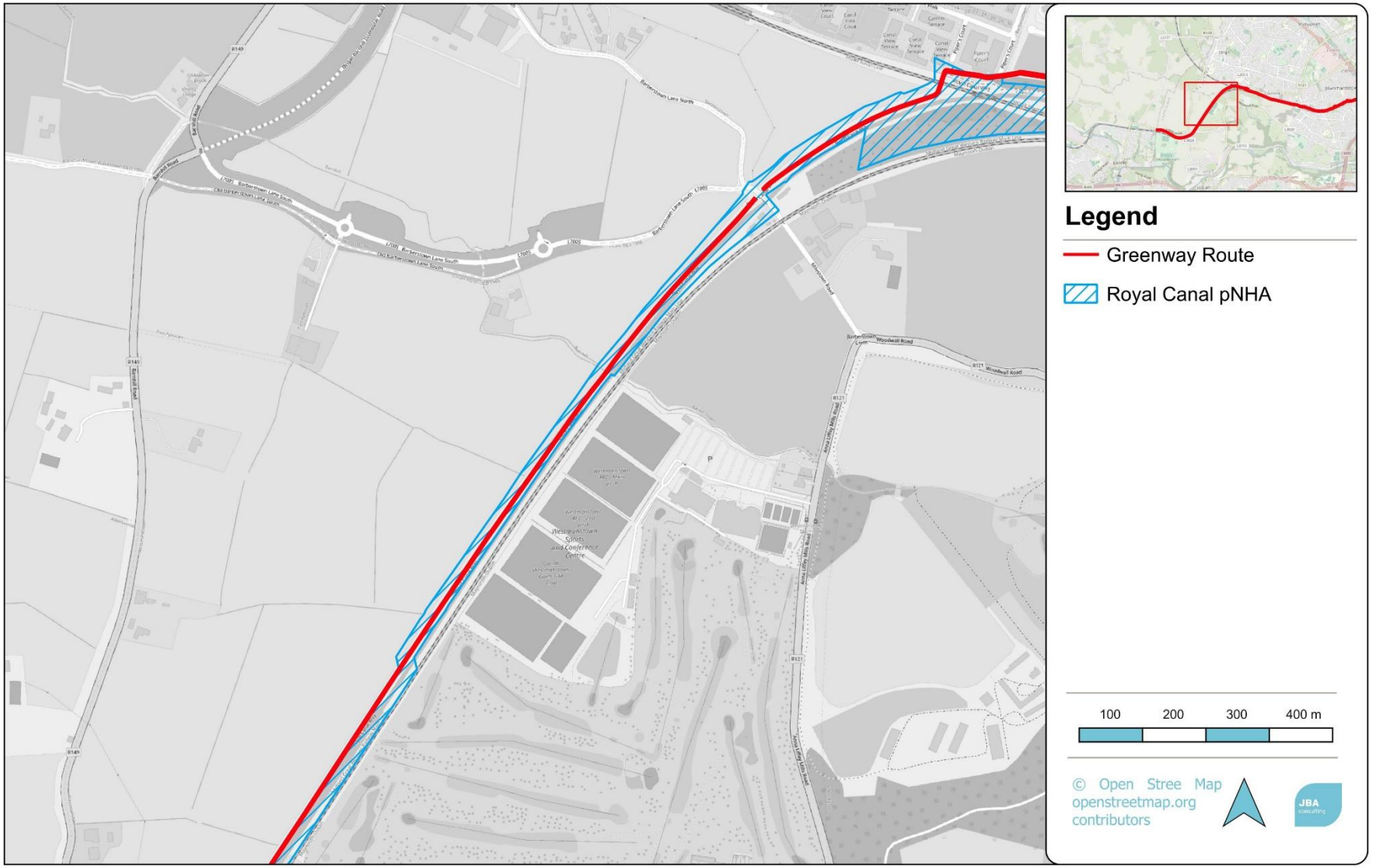


Figure 8-14: Location of Proposed Development in relation to the Royal Canal pNHA - Westmanstown (Chainages +1650 - +2950) (©OSM, 2026)

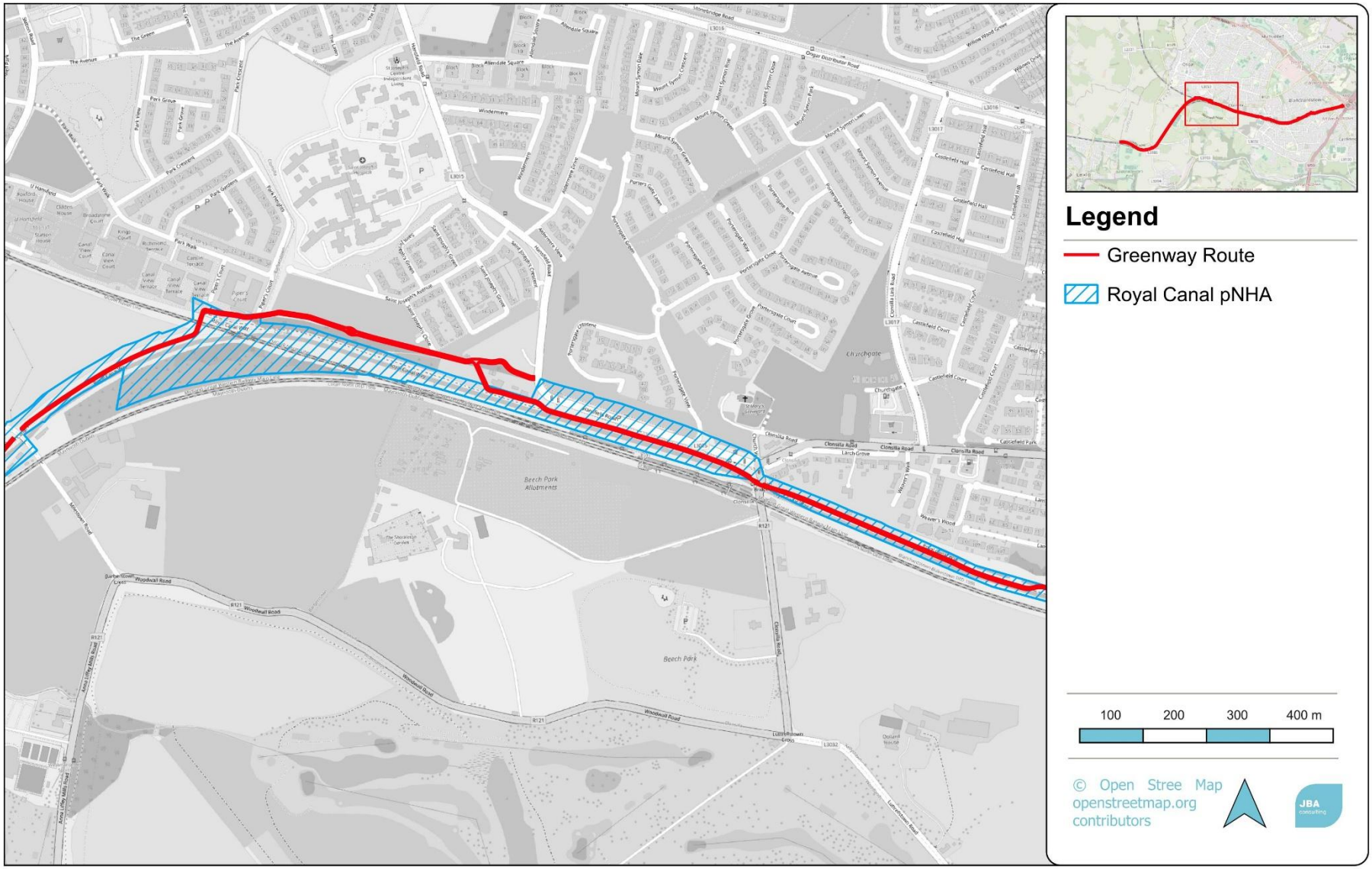


Figure 8-15: Location of Proposed Development in relation to the Royal Canal pNHA – Barberstown (Chainages +2880 - +4300) (©OSM, 2026)

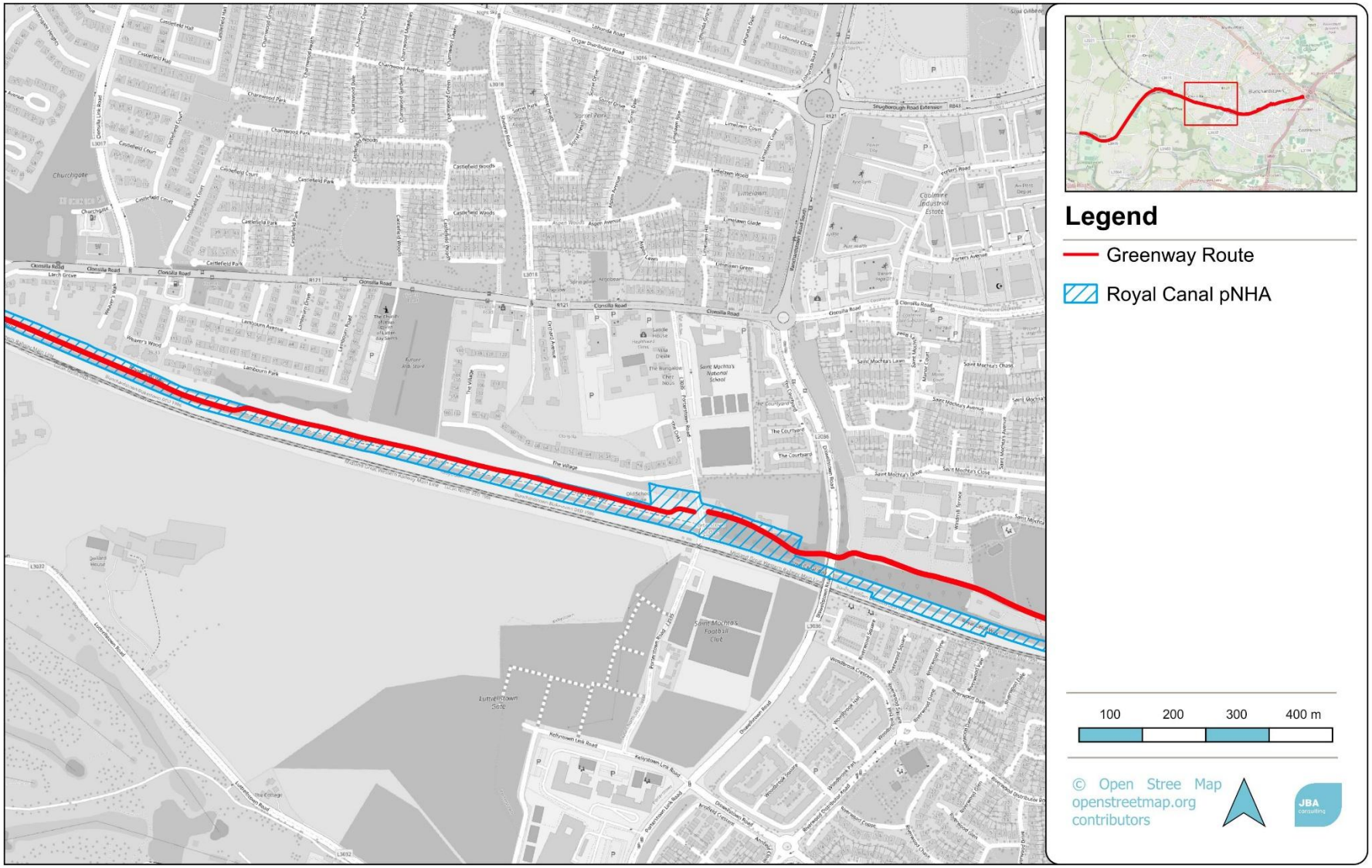


Figure 8-16: Location of Proposed Development in relation to the Royal Canal pNHA – Old Schoolhouse (Chainages +4300 - +5900) (©OSM, 2026)

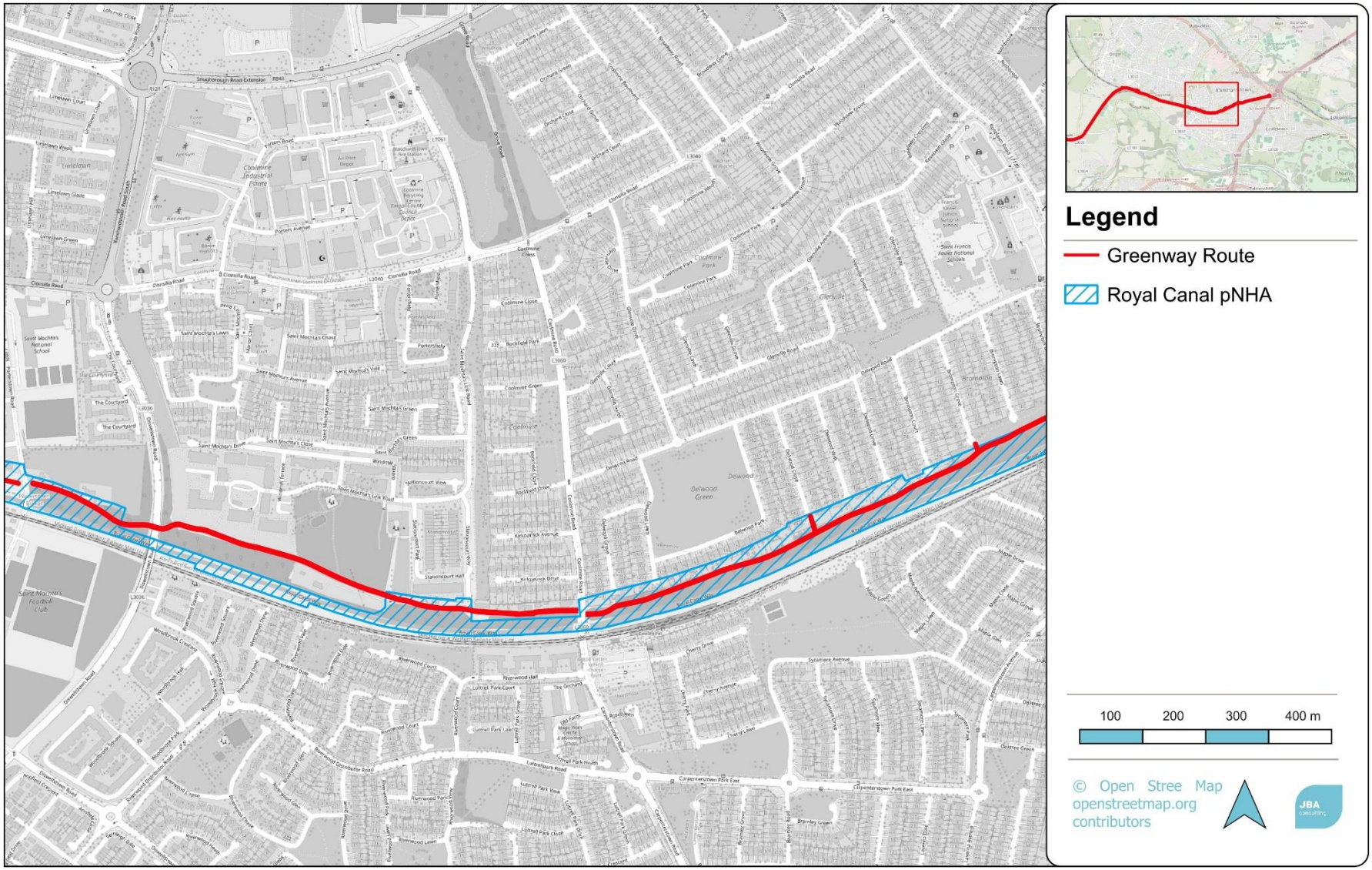


Figure 8-17: Location of Proposed Development in relation to the Royal Canal pNHA – Coolmine (Chainages +5300 - +6950) (©OSM, 2026)

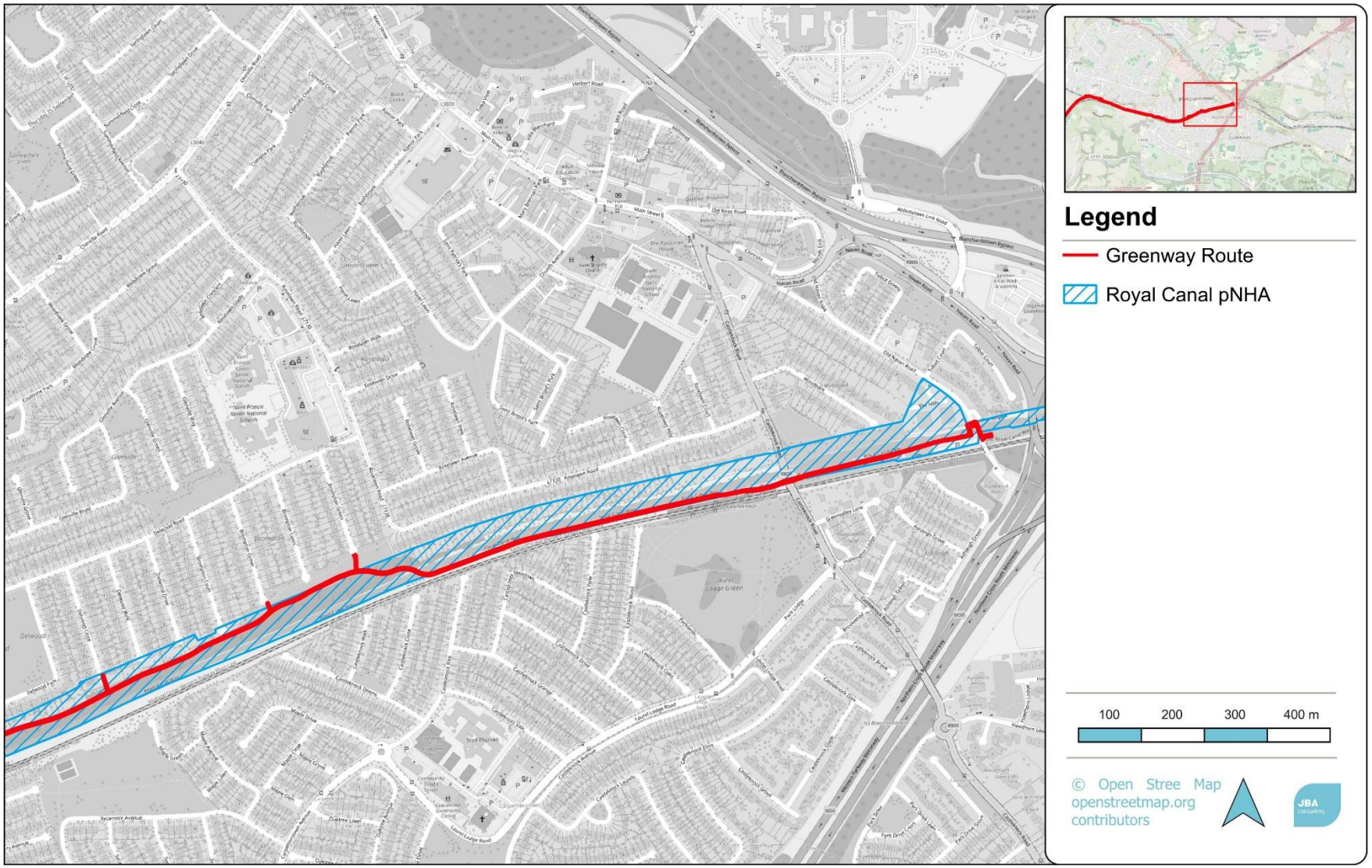


Figure 8-18: Location of Proposed Development in relation to the Royal Canal pNHA - Castleknock (Chainages +6550 - +8100) (©OSM, 2026)

Liffey Valley pNHA is located 700m to the south of the Royal Canal and includes the river and the low hills which it meanders through. The Rusk Stream, a tributary of the River Liffey, crosses under the Royal Canal within the site, and although there is no hydrographic connection, there is potential for works to impact this water course, therefore Liffey Valley pNHA is considered further in this report. Additionally, the Rye Water Valley / Carton House pNHA is considered further due to potential presence of its associated SAC's QI Spring habitat and Whorl Snail species within the project's ZoI. This site is discussed further in sub-sections 8.6.2.1.5 and 8.6.2.3.7 of this Chapter.

Site descriptions and the associated KERs of the pNHAs assessed further in this report are provided in Table 8-14.

Table 8-14: NPWS Site Briefs and KERs of pNHAs included for further assessment

Site Name	NPWS Site Brief of Study Area (NPWS, 2009)	KERs
Rye Water Valley / Carton House pNHA	The marsh, mineral spring and seepage area found at Louisa Bridge supports a good diversity of plant species, including stoneworts, Marsh Arrowgrass *Triglochin palustris*, Purple Moor-grass *Molinea caerulea*, sedges *Carex* spp., Common Butterwort *Pinguicula vulgaris*, Marsh Lousewort *Pedicularis palustris*, Grass-of-Parnassus *Parnassia palustris* and Cuckooflower *Cardamine pratensis*. The mineral spring found at the site is of a type considered to be rare in Europe and is a habitat listed on Annex I of the E.U. Habitats Directive. The Red Data Book species Blue Fleabane *Erigeron acer* is found growing on a wall at Louisa Bridge. The River Rye Water is also a spawning ground for Brown Trout *Salmo trutta* and Atlantic Salmon *Salmo salar*. It also hosts White-clawed Crayfish *Austropotamobius pallipes* has been recorded at Leixlip. The rare Narrow-mouthed Whorl Snail *Vertigo angustior* and Desmoulin's Whorl Snail *Vertigo moulinsiana* occur in marsh vegetation near Louisa Bridge. Both are rare in Ireland and in Europe and are listed on Annex II of the E.U. Habitats Directive. The Keeled Skimmer dragonfly *Orthetrum coerulescens* has also been recorded at Louisa Bridge.	- Atlantic Salmon *Salmo salar* - White-clawed Crayfish *Austropotamobius pallipes* - Blue Fleabane *Erigeron acer* - Keeled Skimmer *Orthetrum coerulescens*
Royal Canal pNHA	A number of different habitats are found within the canal boundaries - hedgerow, tall herbs, calcareous grassland, reed fringe, open water, scrub and woodland. The vegetation of the towpath is usually dominated by grass species. Crested Dog's-tail *Cynosurus cristatus*, Quaking-grass *Briza media* and Sweet Vernal-grass *Anthoxanthum odoratum* are typical species of the calcareous grasslands of the midlands. Otter *Lutra lutra* spraints are found along the towpath, particularly where the canal passes over a river or stream. The rare and legally protected Opposite-leaved Pondweed *Groenlandia densa* (Flora Protection Order 1987) is present at one site in Dublin, between Locks 4 and 5. The ecological value of the canal lies more in the diversity of species	- Otter *Lutra lutra* - Opposite-leaved Pondweed *Groenlandia densa*

	it supports along its linear habitats than in the presence of rare species. It crosses through agricultural land and therefore provides a refuge for species threatened by modern farming methods.	
Liffey Valley pNHA	The Liffey Valley site is situated along the River Liffey between Leixlip Bridge on the Kildare-Dublin border and downstream of the weir at Glenaulin, Palmerstown, Co. Dublin. The river meanders through low hills for much of its course through the site and forms the focus for the site itself. The Mill Race between Palmerstown and the weir at the Wren's Nest Public House is also included in the site. The river is a Salmon river and there are a series of weirs along the river between Palmerstown and Leixlip. The water level in the Mill Race has dropped and the channel has been filled with vegetation in a number of areas as a result. The threatened Green Figwort *Scrophularia umbrosa*, a species listed in the Irish Red Data Book, is recorded from a number of stations along the river within the site. This stretch of the river Liffey has the greatest number of recently recorded populations of this species in Ireland. The rare and legally protected Hairy St. John's-wort *Hypericum hirsutum* (Flora Protection Order 1987) has been recorded from the woodlands in this site. This species has only been recorded in Kildare and Dublin, at sites on the river Liffey, since 1970. The threatened Yellow Archangel *Lamiastrum galeobdolon*, listed in the Irish Red Data Book, is also recorded from these woodlands.	- Green Figwort *Scrophularia umbrosa* - St. John's-wort *Hypericum hirsutum* - Yellow Archangel *Lamiastrum galeobdolon*

8.6.1.3 Other Designated Sites

A number of other designated sites are present within the ZoI of the Proposed Development, including two Ramsar wetland sites (Sandymount Strand/Tolka Estuary [Site code: 832]; and North Bull Island [Site code: 406]), North Bull Island SAAO site and the UNESCO Dublin Bay Biosphere. As the Ramsar and Special Amenity Area Order (SAAO) sites are encompassed within the boundaries of the European and nationally designated sites, and as such share the same biodiversity receptors (i.e. KERs). Similar to the Natura 2000 sites associated with the Dublin Bay (North Dublin Bay SAC, North Bull Island SPA, South Dublin Bay SAC, South Dublin Bay and River Tolka estuary SPA, and North-west Irish Sea SPA) and as outlined in sub-section 8.6.1.1.1, impacts from the Proposed Development are not predicted to give rise to significant impacts on the KERs within these sites due to the hydrological distance between the Proposed Development and these designated sites. These designated sites are therefore not assessed further within this impact assessment.

The UNESCO Dublin Bay Biosphere extends to over 300km^2 of marine and terrestrial habitat, including North Bull Island and other ecologically significant habitats, such as the Tolka and Baldoyle Estuaries, Howth Head, Dalkey Island, Killiney Hill and Booterstown Marsh. KERs identified within the UNESCO Dublin Bay Biosphere (and the ZoI), which have been recorded outside of the boundaries of the other designated sites (NBDC, 2026) are listed below:

- Bottle-nosed Dolphin *Tursiops truncatus*;
- Harbour Porpoise;
- Kittiwake;
- Manx Shearwater;
- Sandwich Tern *Thalasseus sandvicensis*;
- Lesser Black-backed Gull; and
- Black-headed Gull.

The UNESCO Dublin Bay Biosphere area extends beyond the boundaries of the Natura 2000 sites identified within ZoI. However, similar to the Dublin Bay Natura 2000 sites, (North Dublin Bay SAC, North Bull Island SPA, South Dublin Bay SAC, South Dublin Bay and River Tolka estuary SPA, and North-west Irish Sea SPA) and as outlined in sub-section 8.6.1.1.1, impacts from the Proposed Development are not predicted to give rise to significant impacts on the KERs within this site due to the hydrological distance between the Proposed Development and this designated site. Therefore, this designated site is not assessed further within this impact assessment.

8.6.1.4 Protected Species

Records of protected fauna including birds, amphibians, fish and mammals collated from the National Biodiversity Data Centre (NBDC, 2026) database, present within 2km of the Proposed Development, as well as within sections of the Royal Canal downstream of the Proposed Development. Records were taken from within a period of 10 years. Data from prior to this period was deemed to be less ecologically relevant based on expert opinion. This study area was chosen for the search of the NBDC records based on the freshwater and terrestrial habitat ZoI for the Proposed Development, as outlined in sub-sections 8.3.1.1 and 8.3.1.9.

A full list of the NBDC data is available in Appendix 8.1 This table includes their level of protection, if they are red or amber listed on the International Union for the Conservation of Nature and Natural Resources (IUCN) Red List and the date of the last record of this species at this location. Additionally, these records are expanded on further within their relevant species sub-sections (within sub-sections 8.6.2.2 and 8.6.2.3).

8.6.1.5 Invasive Non-native Species

The Records of Invasive Non-native Species (INNS) collated from the NBDC (2026) database, present within 2km of the Proposed Development, as well as within sections of the Royal Canal downstream of the Proposed Development are present in Table 8-15 and in Appendix 8.2. Records were taken from within a period of 10 years. Data from prior to this period was deemed to be less ecologically relevant based on expert opinion

Table 8-15: INNS recorded within 2km buffer of the Proposed Development and within downstream sections of the Royal Canal

INNS	Impact	Regulation S.I. 374/2024, 2025/1422
Barnacle Goose *Branta leucopsis*	-	No
Canada Goose *Branta canadensis*	High	Yes
Greylag Goose *Anser anser*	-	Yes
Mandarin Duck *Aix galericulata*	-	No
Ring-necked Parakeet *Psittacula krameri*	High	No
Australian flatworm *Australoplana sanguinea*	Medium	No
New Zealand Flatworm *Arthurdendyus triangulatus*	High	No
American Skunk-cabbage *Lysichiton americanus*	Medium	Yes
Brazilian Giant-rhubarb *Gunnera manicata*	Medium	Yes
Butterfly-bush *Buddleja davidii*	Medium	No
Canadian Fleabane *Conyza canadensis*	Medium	No
Canadian Waterweed *Elodea canadensis*	High	No
Cherry Laurel *Prunus laurocerasus*	High	No
Common Broomrape *Orobanche minor*	Medium	No
Evergreen Oak	Medium	No

INNS	Impact	Regulation S.I. 374/2024, 2025/1422
Quercus ilex		
False-acacia *Robinia pseudoacacia*	Medium	No
Few-flowered Garlic *Allium paradoxum*	-	No
Giant Hogweed *Heracleum mantegazzianum*	High	Yes
Giant-rhubarb *Gunnera tinctoria*	High	Yes
Himalayan Balsam *Impatiens glandulifera*	High	Yes
Himalayan Honeysuckle *Leycesteria formosa*	Medium	No
Japanese Knotweed *Fallopia japonica*	High	Yes
Japanese Rose *Rosa rugosa*	Medium	No
Narrow-leaved Ragwort *Senecio inaequidens*	Medium	No
Nuttall's Waterweed *Elodea nuttallii*	High	Yes
Ragweed *Ambrosia artemisiifolia*	Medium	No
Spanish Bluebell *Hyacinthoides hispanica*	-	Yes
Sycamore *Acer pseudoplatanus*	Medium	No
Three-cornered Garlic *Allium triquetrum*	Medium	Yes
Traveller's-joy *Clematis vitalba*	Medium	No
Turkey Oak *Quercus cerris*	Medium	No

INNS	Impact	Regulation S.I. 374/2024, 2025/1422
Wall Cotoneaster *Cotoneaster horizontalis*	Medium	No
Wild Parsnip *Pastinaca sativa*	Medium	No
Harlequin Ladybird *Harmonia axyridis*	High	Yes
Jenkins' Spire Snail *Potamopyrgus antipodarum*	Medium	No
Pond Terrapin *Trachemys scripta*	Medium	No
American Mink *Neovison vison*	High	Yes
Brown Rat *Rattus norvegicus*	High	No
Fallow Deer *Dama dama*	High	Yes
Ferret *Mustela putorius* subsp. *furo*	High	No
Grey Squirrel *Sciurus carolinensis*	High	Yes
House Mouse *Mus musculus*	High	No
Rabbit *Oryctolagus cuniculus*	Medium	No

A full list of the INNS present within the NBDC records since 2016 are listed in Appendix 8.2.

8.6.1.6 Aquatic Habitat – On and Off-Site Receptors

The Proposed Development site lies within the Water Framework Directive (WFD) Liffey and Dublin Bay Catchment. The Proposed Development runs along/adjacent to the Royal Canal Main Line (Liffey and Dublin Bay) waterbody, while the river waterbodies of the Liffey_180 (Rusk Stream) intersects directly with the Proposed Development, though not directly. The Liffey_180, a tributary of the River Liffey is culverted under the Royal Canal near to Westmanstown Sports Centre. The Royal Canal flows in an easterly direction to enter the River Liffey at Ringsend, just west of Tom Clark Bridge. The waterbodies of Tolka_040 and Liffey_160 are within close proximity of the Proposed Development. The proposed site is located across the Liffey_SC_100 sub catchment of the River Liffey and Tolka_SC_020 sub catchment of the River Tolka, each of which drain into their respective rivers, before discharging into Dublin Bay and then interacting with the North Dublin Bay SAC, North Bull Island SPA, South Dublin Bay and River Tolka SAC. Surface waterbodies are seen in Figure 8-19.

The Liffey is Dublin City's most important river for legally protected species including Atlantic Salmon, Brown Trout, the critically endangered European Eel, Brook and River Lamprey, and White-clawed crayfish, as outlined within the Dublin City Biodiversity Action Plan 2021-2025 (Dublin City Council, 2021).

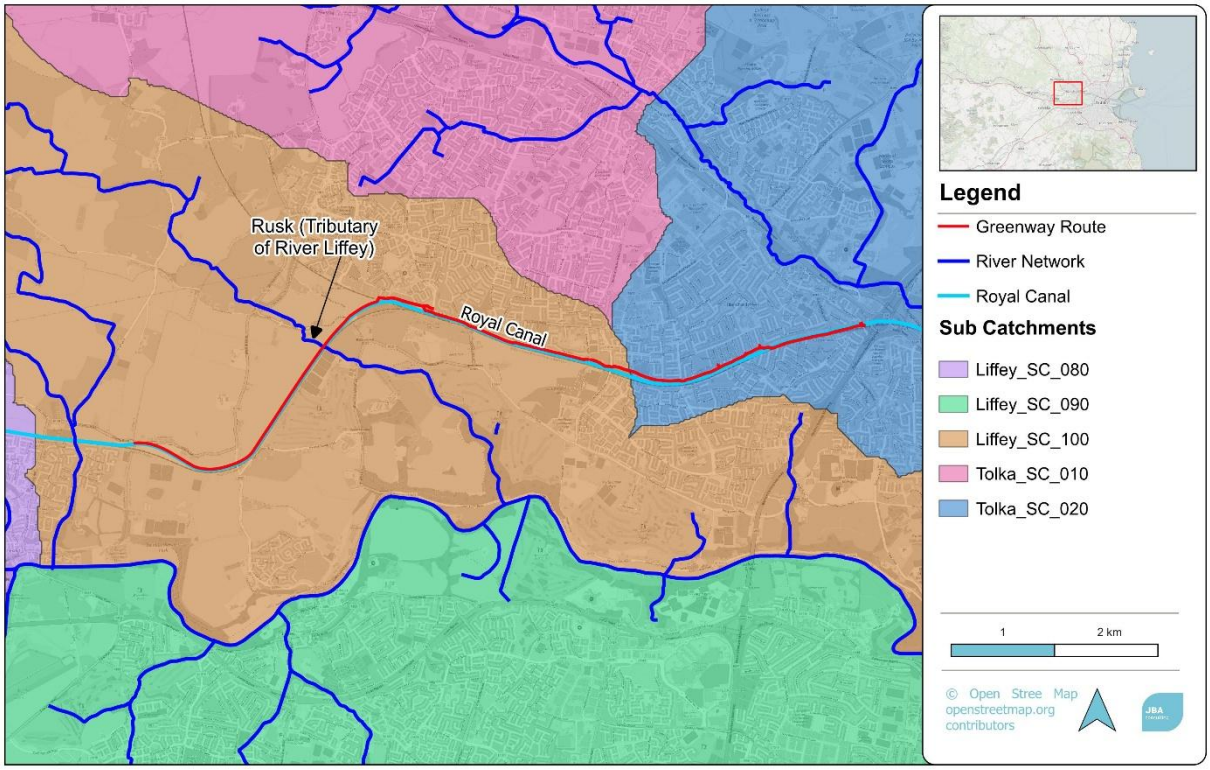


Figure 8-19 Surface waterbodies within the vicinity of the proposed site (©OSM, 2026)

8.6.1.7 Surface Water Body Status

The Royal Canal Main Line (Liffey and Dublin Bay) [IE_09_AWB_RCMLE] is an artificial waterbody and has achieved 'Good ecological potential. The WFD (2016-2021) status of the River Liffey and the River Tolka, the nearest natural surface waterbodies, are both considered to be Poor. The WFD status (2016-2021) for transitional waterbodies Liffey Estuary Upper and Liffey Estuary Lower are considered to be 'At Risk', with urban wastewater being the main environmental pressure. Surface water pathways to Dublin Bay are seen in Figure 8-20. The Proposed Development must not result in any reduction of status of the above waterbodies during the construction and operational phases.

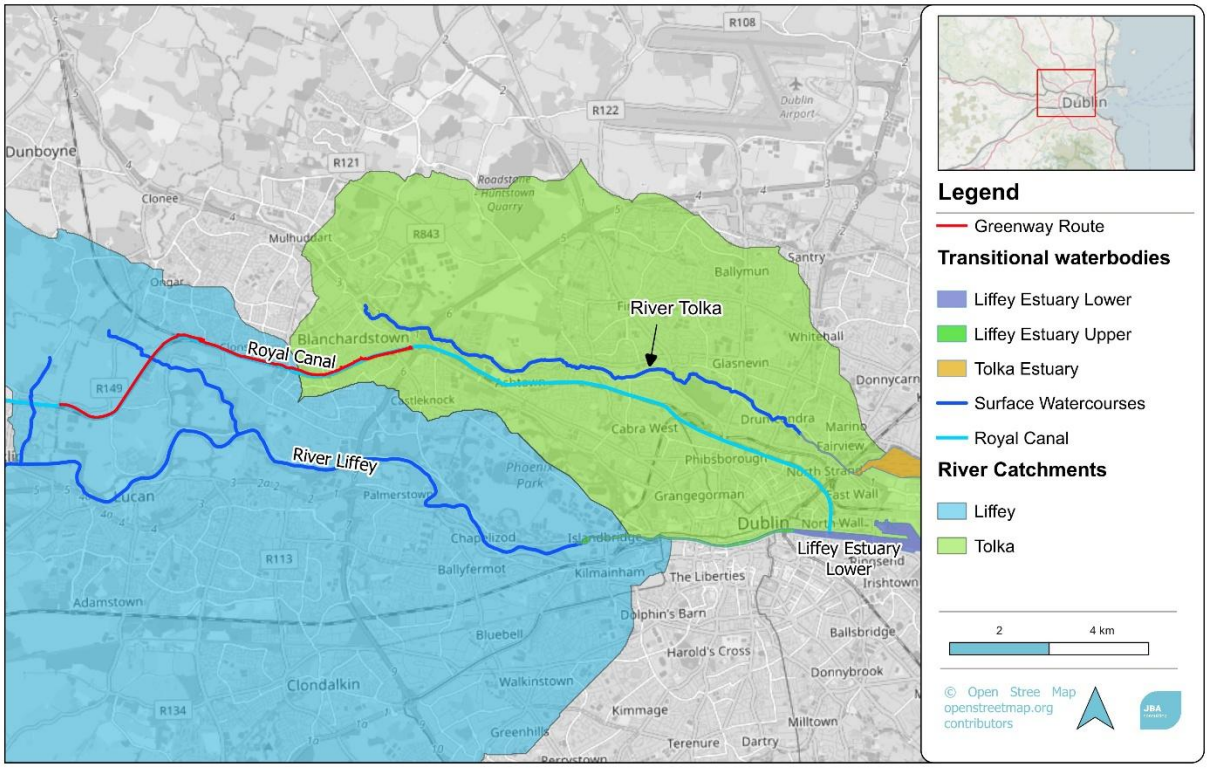


Figure 8-20: Surface water pathways from Proposed Development to Dublin Bay (©OSM, 2026)

8.6.1.8 Groundwater Body Status and Geology

The Proposed Development is located within Dublin (IE_EA_G_008) groundwater body (Figure 8-21) (EPA 2022). The sub-soil permeability is generally low (GSI, 2026). Groundwater strikes were recorded where encountered during slit trenching operations, typically as a slow seepage (see Chapter 11 – Land, Soils & Geology).

The 1:100,000 scale GSI bedrock geology map indicates that the Proposed Development is underlain for the most part by Dark Limestone and Shale (`calp) (Lucan Formation), with the eastern most approximately 650m being underlain by Calcareous shale, limestone conglomerate (Tober Colleen Formation) (GSI, 2026). Limestone bedrock underlies the entire development, made up for the most part by Dark Limestone and Shale (`calp) (Lucan Formation) along with Calcareous shale, limestone conglomerate (Tober Colleen Formation). The bedrock aquifer underlying the majority of the Proposed Development is classified by GSI as a “Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones”, with the exception of the easternmost 700m which are underlain by a “Poor Aquifer – Bedrock which is Generally Unproductive except for Local Zones”. Groundwater vulnerability describes the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated by human activities. Groundwater vulnerability is varied across the Proposed Development extents, ranging from "moderate” to “extreme”, as seen in Figure 8-22. The areas of highest vulnerability correspond to the locations where rock is at or near the surface, or where there is only a thin covering of soil. It is noted that the aquifer vulnerability classification does not consider the nature of the underlying ‘receiving’ aquifer with respect to resource value or significance of pollution occurring and is only a reflection on the protection afforded to the aquifer by overlying deposits.

The Proposed Development must not have a negative effect on this groundwater body and should support its maintaining 'Good' status into the future.

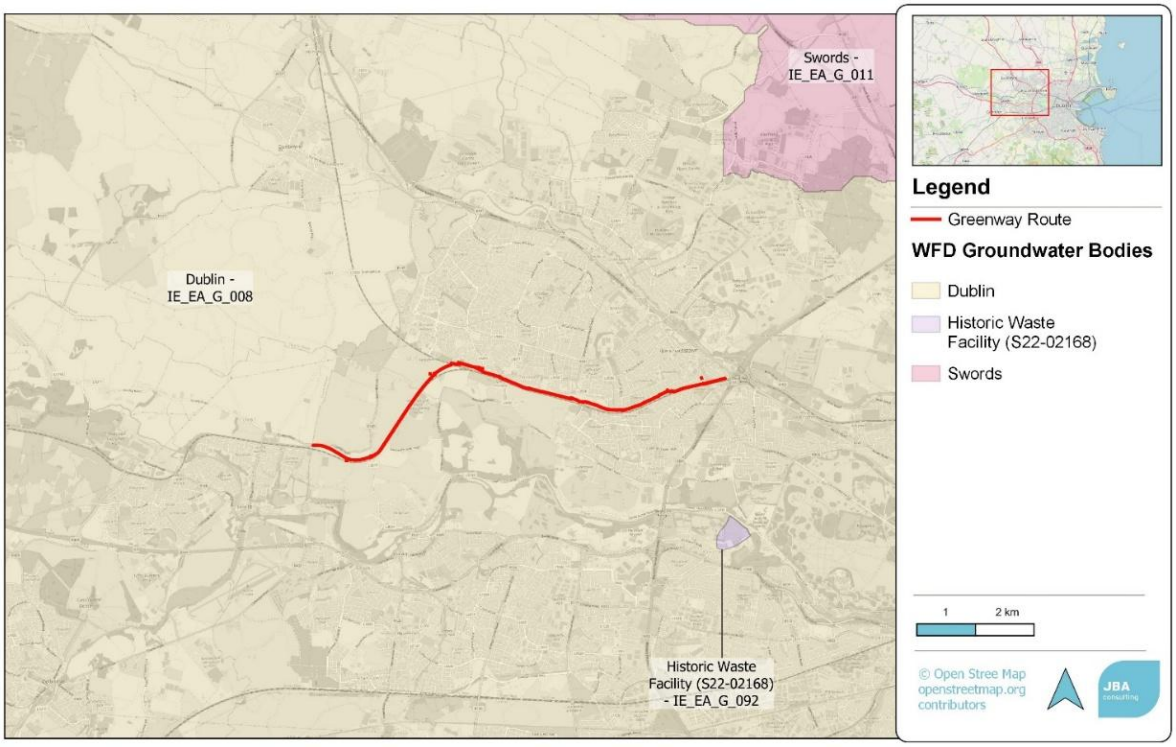


Figure 8-21: Groundwater bodies within the vicinity of the site (©OSM, 2026)

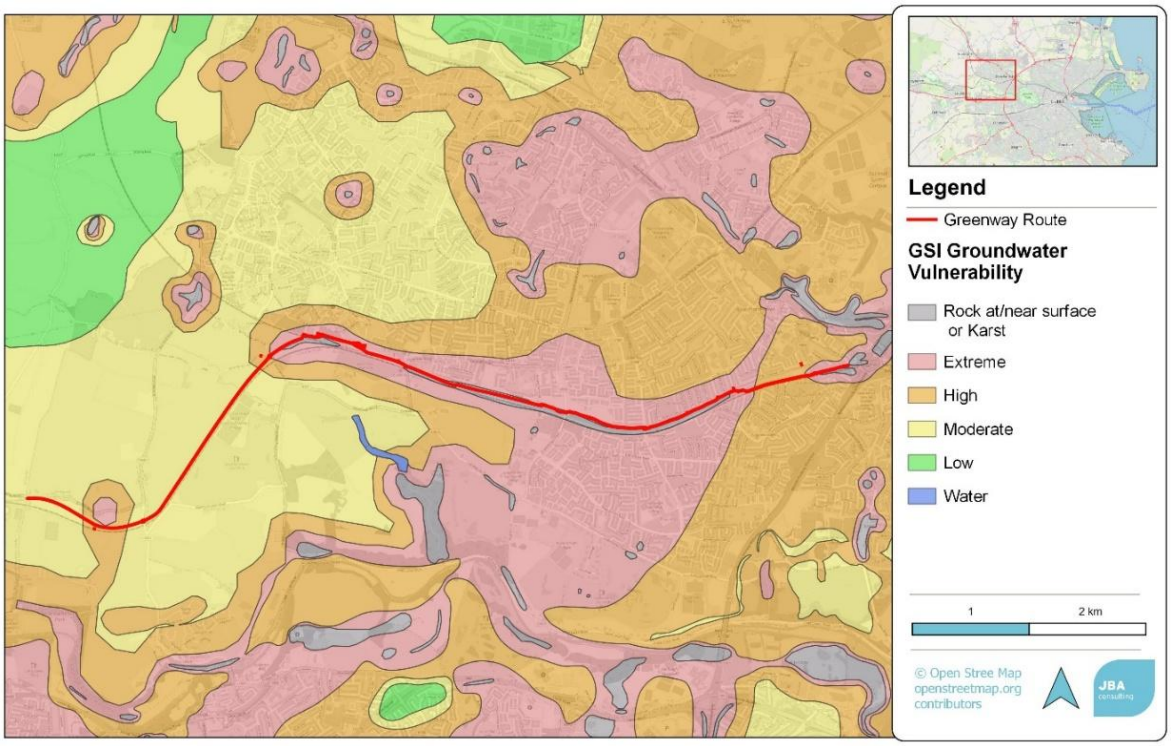


Figure 8-22: Groundwater vulnerability along the Proposed Development (©OSM, 2026)

8.6.2 Ecological Baseline Surveying

Results from JBA ecological surveys and surveys by other consultants are described below in sub-sections 8.6.2.1, 8.6.2.2, and 8.6.2.3.

8.6.2.1 Habitats

The habitats recorded during the initial habitat surveys conducted by JBA, as outlined in sub-sections 8.3.3.2.2.3 and 8.3.3.2.2.4, and based on the results of the habitat survey conducted by ORS in July 2024 as part of the Old School Masterplan Baseline Ecological Report are listed below. The value of these habitats is in line with the NRA guidance outlined in sub-section 8.3.4.1 and is based on the ecological surveys, previous ORS Baseline Ecology Report and desktop study.

Habitats recorded are listed in Table 8-16 and descriptions are provided in the sections below. An overview of habitats found along the Proposed Development is shown in Figure 8-23. This map is broken down into 15 separate maps (A-O) shown in Appendix 8.3.

Table 8-16: List of habitats recorded on site

Habitat	Fossitt Code	Connection to Annex 1 Habitat
BL1	Stone walls and other stonework	None in Proposed Development
BL2	Earth banks	None in Proposed Development
BL3	Buildings and artificial surfaces	None in Proposed Development
ED3	Recolonising bare ground	None in Proposed Development
FP1	Calcareous springs	Petrifying springs with tufa formation (Cratoneurion) [7220]
FS1	Reed and large sedge swamps	None in Proposed Development
FW3	Canals	None in Proposed Development
FW4	Drainage ditches	None in Proposed Development
GA1	Improved agricultural grassland	None in Proposed Development
GA2	Amenity grassland (improved)	None in Proposed Development
GS1	Dry calcareous and neutral grassland	Lowland hay meadows [6510]
GS2	Dry meadows and grassy verges	None in Proposed Development
Mosaic: GS2/WS1	Mosaic: Dry meadows and grassy verges/Scrub	None in Proposed Development
WD1	(Mixed) broadleaved woodland	None in Proposed Development
WL1	Hedgerows	None in Proposed Development
Mixed: WL1/FW4	Mixed: Hedgerows/Drainage Ditches	None in Proposed Development
Mixed: WL1/WL2	Mixed: Hedgerows/Treelines	None in Proposed Development
WL2	Treelines	None in Proposed Development
Mixed: WL2/FW4	Mixed: Treelines/Drainage ditches	None in Proposed Development
Mixed: WL2/GS2	Mixed: Treelines/Dry meadows and grassy verges	None in Proposed Development
WS1	Scrub	None in Proposed Development

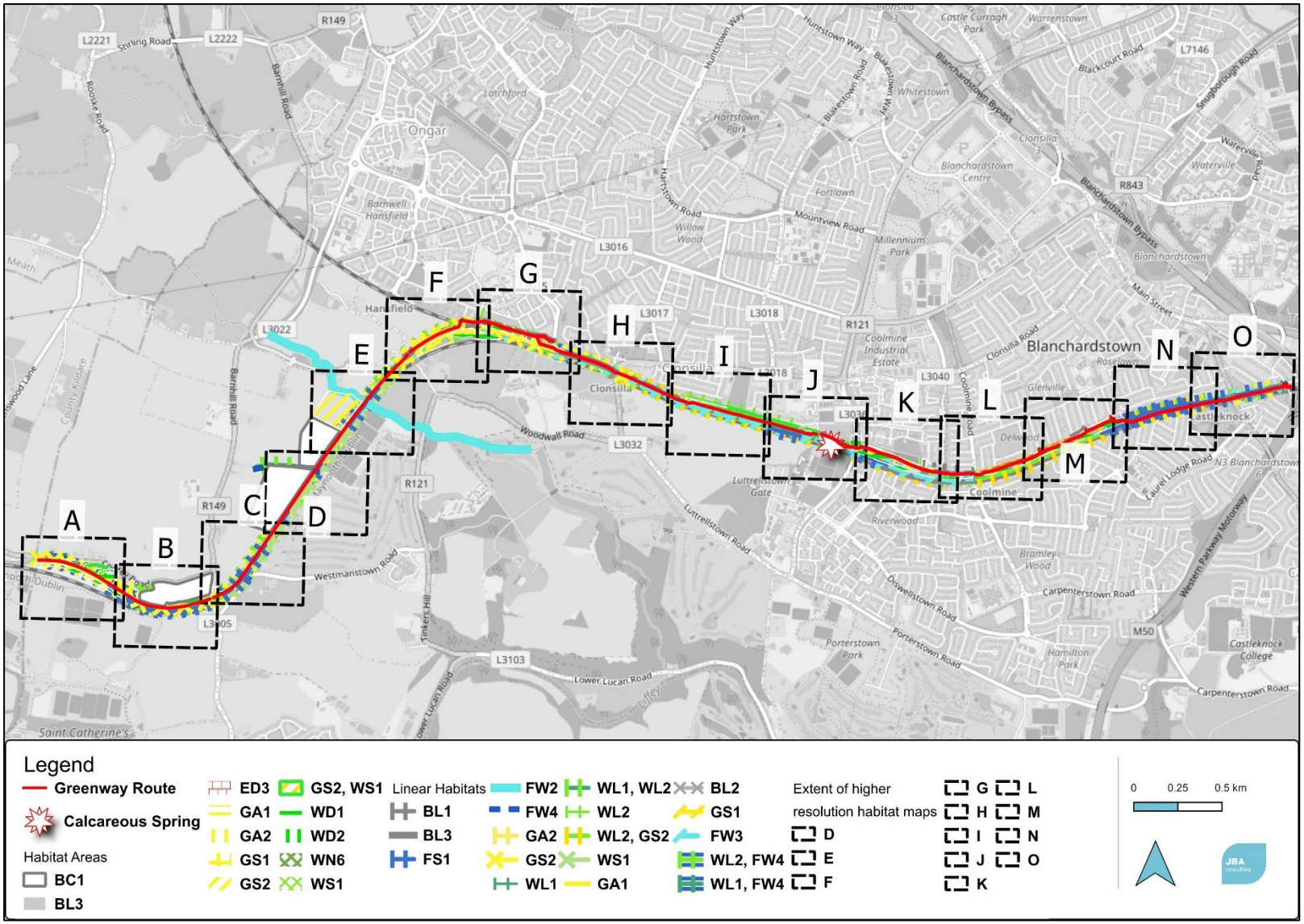


Figure 8-23: Habitat map of entire route of the Proposed Development. Labels A-O Correspond with maps in Appendix 8.3 (©OSM, 2026)

8.6.2.1.1 BL1 - Stone walls and stonework

Stone walls and brick work were often encountered along the boundaries of residential gardens, as well as along Porterstown Road, to the east of the Old Schoolhouse. Additionally there are several stone bridges present crossing over the Royal Canal. Ivy *Hedera helix* and Bramble *Rubus fructicosus* agg. associated with adjacent woodland and scrub habitats were noted along with sparse moss cover.

The stone bridges crossing over the Royal Canal have bat roosting and bird nesting potential. Therefore, in the context of the area of the development and the lands immediately adjacent, the BL1 habitat is considered to be of **local (higher value) ecological value** given its low value habitat with low levels of important vegetation.

8.6.2.1.2 BL2 - Earth banks

A bank of stone and earth is present along a 100m (approx.) stretch of the Proposed Development west of Kennan Bridge, Chainages +5250 - +5320. This feature is a mixture of cobble aggregate formed as mounds in sections. Dandelion species *Taraxacum* spp., Smooth Hawk's-beard *Crepis capillaris* and Dogrose *Rosa canina* were present as well as Bush Vetch *Vicia sepium.* Ant holes were present along the entirety of the feature, with frequent mining into earth between the stones. This feature was also present under the treeline (WL2) west of Clonsilla Train Station. An example of this habitat is shown in Figure 8-24.



Figure 8-24: Earth bank (BL2) with ant burrow activity.

In the context of the area of the development and the lands immediately adjacent, the BL2 Earth Bank habitat is considered to be of **local (higher value) ecological importance**, given the utilisation by ant species, and the potential of inhabitants by mining bee species.

8.6.2.1.3 BL3 - Buildings and artificial surfaces

A number of metal fences, tarmac and paved paths and buildings are found along the Proposed Development. There are aspects of this habitat, such as roadways and adjacent buildings, that are **considered to be of local (lower value) ecological importance**, due to the absence of ecological receptors. There are however features such as bridges that have nesting potential for local fauna.

During the breeding bird surveys in 2024 and 2025, Barn Swallow *Hirundo rustica* were recorded nesting under the M3 Parkway Rail Line crossing over the Royal Canal, Chainages +3270-3290. Additionally the Old Schoolhouse building present between Chainages +4300 - +5900, as well 2 houses located to the east of the Hansfield Railway Bridge (Chainages +3120 – 3600) Have potential roosting features for bats. These features are therefore considered to be of **local (higher value) ecological importance**.

8.6.2.1.4 ED3 – Recolonising bare ground

This habitat corresponds to an area east of the Old School House which is slowly grading into recolonizing bare ground. During the 2024 survey, this area near to the Old School House building was being colonised by grassland and scrub species, including Ragwort *Jacobaea vulgaris* , Mallow *Malva sylvestris*, Yorkshire Fog *Holcus lanatus*, Red Clover *Trifolium pratense*, Yarrow *Achillea millefolium*, Ribwort Plantain *Plantago lanceolata*, Common Knapweed *Centaurea nigra*, Creeping Cinquefoil *Potentilla reptans*, White Clover *Trifolium repens,* Dandelion species, Greater Plantain *Plantago major* Meadow Buttercup *Ranunculus acris*, Clustered Dock *Rumex conglomeratus*, Nipplewort *Lapsana communis*, Creeping Buttercup *Ranunculus repens*, Perennial Ryegrass *Lolium perenne*, Self Heal *Prunella vulgaris*, Common Hogweed *Heracleum sphondylium*, Gorse *Ulex europaeus*, Common Restharrow *Ononis repens*, Cow Parsley *Anthriscus sylvestris*, Greater Stitchwort *Stellaria holostea*, Field Scabious *Knautia arvensis*, and Hawthorn *Crataegus monogyna*. Ragwort and high floral diversity provide for the larval growth of Cinnabar Moth *Tyria jacobaeae* and is a food source for other invertebrate species.

This habitat was also surveyed by ORS in July 2024 as part of the Old School Masterplan (ORS, 2024). The floral species recorded were consistent with the previous JBA surveys, and this area was found to be becoming increasingly dominated by recolonising species and grasses.

During the 2026 surveys, this area was found to be comprised of a similar species composition, with the area still being recolonised by a mix of grassland and scrub species. New species recorded within this habitat, in addition to the species listed above, include Creeping Thistle *Cirsium arvense*, Spear Thistle *Cirsium vulgare*, Black Medic *Medicago lupulina*, Smooth Hawk's-beard, Bush Vetch, Bird's-foot Trefoil *Lotus corniculatus*, False Oatgrass *Arrhenatherum elatius*, Bramble, Rough Hawk's-beard *Crepis biennis*, Ivy, Wild Carrot *Daucus carota*, Oxeye Daisy *Leucanthemum vulgare*, Druce's Cranesbill *Geranium x oxonianum*, and Glaucous Sedge *Carex flacca*. Alder *Alnus glutinosa*, Downy Birch *Betula pubescens*, and Sycamore *Acer pseudoplantis* saplings were also recorded within this habitat.

Based on the findings of the ecological surveys and the results outlined in the Old School Masterplan, this habitat is considered to be of **local (lower value) ecological importance** due to its ability to support the foraging activities of local fauna.

8.6.2.1.5 FP2 - Calcareous Springs:

A calcareous spring with tufa like deposits was recorded on the south side of the canal bank in the Deep Sinking area east of Kennan Bridge by BEC in 2013, between Chainages +5400-5450. The spring is at the base of a steep rocky bank and is located on the opposite bank of the works and therefore it is unlikely that this habitat or the flow of groundwater will be disturbed by the Proposed Development. The location was confirmed when resurveyed by JBA ecologists in July 2022 (Figure 8-25), although the spring was dry after a long period of dry weather; this spring was also dry in the 2024 resurvey of the site. Calcareous deposits (tufa) were observed on the vegetation and soil on the bank of the canal. This habitat may correspond with Annex I habitat Petrifying springs with tufa formation (*Cratoneurion*) (7220), however the spring had low bryophyte diversity.

Petrifying springs with tufa formation (*Cratoneurion*) [7220] is a QI habitat of the Rye Water Valley/Carton SAC. This habitat is located over 5km downstream of the Rye Water Valley/Carton SAC,

and this spring is isolated from this site. Therefore, it is not considered to be ex-situ QI supporting habitat for the Rye Water Valley/Carton SAC. However, this habitat is considered to be of **county level ecological importance** due to lower occurrence of springs in the wider area and will be assessed as a separate receptor to the Rye Water Valley/Carton SAC.



Figure 8-25 (L) View of spring well from North side of canal and steep steps to access the spring. (R) view of base of spring where locals used to collect water, tufa deposits can be seen on the bank to the left of the image, located between Chainages. +5400 - +5450

8.6.2.1.6 FS1 - Reed and large sedge swamps

Reed beds and species associated with swamp habitats frequently occurred along the edges of the canal itself, particularly along Section 1 of the Proposed Development (Figure 8-26). This habitat was often fragmented. While this habitat occurs within the canal, it is distinct from FW3 - Canals due to its well-developed nature which has created functionally separate habitat used by aquatic species including invertebrate, bird, and fish species. Species composition included Common Reed *Phragmites australis*, Common Club Rush *Schoenoplectus lacustris*, Unbranched Bur-reed *Sparganium emersum*, Branched Bur-reed Reed *Sparganium erectum*, Bottle Sedge *Carex rostrata*, Reed Canary Grass *Phalaris arundinaceae*, Reed Sweet-grass *Glyceria maxima*, Marsh Marigold *Caltha palustris*, and Yellow Iris *Iris pseudacorus*. During the 2026 surveys, no new species were identified within this habitat, with Yellow Iris being the most widespread floral species.



Figure 8-26: Reed bed habitat bordering the Royal Canal along Section 1 of the Proposed Development, to the west of Collins Bridge (Chainages +650 – 1050)

Due to the various species dependent on this habitat, including the critically endangered Glutinous Snail which may utilise this habitat for foraging and refugia, and its importance to the integrity of the Royal Canal pNHA, it is considered of **national level ecological importance**.

8.6.2.1.7 FW3 - Canals

Canal habitat was present along the entire route of the Proposed Development, although the marginal vegetation was often broken down into separate, vegetation from the banks including Common Club-rush, Common Reed and Bulrush which had occasionally spread further into the centre of the canal waterbody. The canal itself included species such as Yellow Water-lily *Nuphar lutea*, (shown in Figure 8-27), Water Plantain *Alisma plantago-aquatica*, Common Clubrush, Canadian Pondweed *Elodea canadensis*, Floating Sweet-grass *Glyceria fluitans*, Greater Spearwort *Ranunculus lingua*, Mare's Tail *Hippuris vulgaris*, Waterweeds *Elodea* spp., Reed Sweet-grass and Ivy-leaved Duckweed *Lemna trisulca*, while along the banks were some terrestrial species including Willow *Salix* spp., Sycamore saplings, and Rosebay Willowherb *Chamaenerion angustifolium*. Of note within the canal was the presence of the locally rare Red Pondweed *Potamogeton alpinus* (Figure 8-28), which was located at various places within the canal.

Due to the various species dependent on this habitat, and its importance to the integrity of the Royal Canal pNHA, it is considered of **national level ecological importance**.



Figure 8-27: Yellow Water-lily present in the Canal (FW3) - Chainages +3050 - +3150.



Figure 8-28: Red Pondweed located within the Canal

8.6.2.1.8 FW4 - Drainage ditches

A number of drainage ditches were found along the western section of the development along the existing towpath. For the majority of the surveys, these ditches were dry, although during a survey in February 2026, after weeks of rain, it was noted that these ditches were wet with flow present. Fools Watercress *Apium nodiflorum* and Duckweed *Lemna* spp. were noted within the wet ditch to the west of the site in June 2026. One distinct drainage ditch was recorded south of the canal, on the opposite bank to the Proposed Development, and immediately west of Castleknock train station.

Given the steep banks and variable water level in the ditches due to the connection to local watercourses in flood conditions, and the potential that the drainage ditches could accommodate local amphibians, it is considered of **local (higher level) ecological importance**.

8.6.2.1.9 GA1 - Improved agricultural grassland

This includes intensively managed sections of grassland near the Proposed Development, often fertilised and regularly cut for agriculture, dominated by Ryegrass species *Lolium* spp., including along the final stretch of the Proposed Development (Chainages + 7800 – 7950). This habitat has limited foraging opportunities for local fauna. This habitat is therefore considered to be of **local (lower value) ecological importance**.

8.6.2.1.10 GA2 - Amenity grassland (improved)

Several verges and areas of grassland along the Proposed Development are managed as green spaces and regularly cut, with low species diversity dominated by Rye-grass species. This includes the green spaces alongside Windmill Park Lane (Chainages + 5550 – 5950). This habitat has limited foraging opportunities for local fauna. This habitat is therefore considered to be of **local (lower value) ecological importance**.

8.6.2.1.11 GS1 - Dry calcareous and neutral grassland

A poor-quality verge of Dry calcareous grassland was recorded west of the Hansfield Bridge. Species included Creeping Buttercup, Bush Vetch, Cock's-foot *Dactylis glomerata*, Rough Hawkbit, *Leontodon hispidus*, Bramble along the edge, Thistle spp., Dandelion species, Lady's Bedstraw *Galium verum*, Common Knapweed, Common Hogweed, Meadowsweet *Filipendula ulmaria*, Common Vetchling *Lathyrus pratensis*, Sweet Vernal-grass *Anthoxanthum odoratum* and Germander Speedwell *Veronica chamaedrys*. Much of this habitat would not qualify as either of the Annex I habitats of Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometea*) (*important orchid sites) [6210] or Lowland Hay meadows [6510]. Some of this grassland has begun to transition into scrub but is still classified as GS1. However, some grassland areas were indicated to be Annex I grassland (6210 or 6510) by BEC in 2013 (BEC, 2013) and were re-surveyed by JBA as detailed in sub-section 8.3.3.2.2.4. The results of this survey are detailed below.

Annex I grassland on Royal Canal

On 12th July 2022 sections of this habitat along the Royal Canal were surveyed to further identify if these habitats could be Annex I habitats Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometea*) (*important orchid sites) [6210] or Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis)* [6510]. Three locations were surveyed for Annex I grassland habitat:

- Plot 1 and 2: Canal Section 2, north of Pakenham Bridge (2 plots carried out here at Plot 1: ITM 703860 738310, Chainages +2950, and Plot 2: ITM 703953 738362, Chainages +3100)
- Plot 3: Callahan Bridge- Railway bridge (Plot at ITM: 704596 738273, Chainages + 3770)
- Plot 4: Canal Section 2 on steep slope (Plot taken at ITM 705672 737911, Chainages +4800)
- Plot 5: East of Collins Bridge (Plot taken at ITM 02959 737132, Chainages +1470)
- Plot 6: West of Collins Bridge (Plot taken at ITM 702295 736781, Chainages +670)

The locations are shown in Figure 8-29.

It was found that, following the guidance outlined in 8.3.3.2.2.4, none of these grasslands had enough positive indicator species to qualify as Annex I habitat Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometea*) (*important orchid sites) [6210]. However, between all the plots the positive indicator species for [6210] included the following species recorded: Field Scabious, Kidney Vetch *Anthyllis vulneraria,* Bird's-foot Trefoil, Wild Carrot, Rough Hawkbit / Lesser Hawkbit *Leontodon hispidus / L. saxatilis,* Glaucous Sedge, Downy Oatgrass *Helictotrichon pubescens,* Oregano *Origanum vulgare* and Lady's Bedstraw.

Plot 1 and Plot 4 were found to have over the threshold of 7 positive indicator and 2 high-quality positive indicator species for Lowland hay meadow (*Alopecurus pratensis, Sanguisorba officinalis)* [6510].

Plot 1 contained the following indicator species for Lowland hay meadow: Common Knapweed, Common Hogweed, Cat's-ear *Hypochaeris radicata*, Ribwort Plantain, Common Vetchling, Meadow Buttercup, Tufted Vetch, and two high-quality indicator species; Yellow Rattle *Rhinanthus minor* and Bird's-foot Trefoil. This grassland passes for Annex I Lowland hay meadow [6510], however, the condition is poor due to high cover (rankness) from negative indicator False Oatgrass. Note that Plot 2 is from the same bank as Plot 1 but was found to be too rank and had less cover of forbs and does not pass as Annex I Lowland hay meadow [6510]. This grassland bank is dredged material from the canal, which was removed approximately 20 years ago. The management by WI of this grassland is that it is cut once a year in September. Other grassland species recorded here included Lady's Bedstraw, False Oatgrass, False Brome, Red Fescue *Festuca rubra,* Oregano, Creeping Cinquefoil, Yorkshire Fog, Sweet Vernal-grass, Common Vetch *Vicia sativa,* Common Agrimony *Agrimonia eupatoria,* Creeping Bent-grass *Agrostis stolonifera,* Hemp Agrimony *Eupatorium cannabinum,* Meadow Fescue *Festuca pratensis,* Glaucous Sedge, Common Restharrow, Cock's-foot, Meadowsweet *Fillipendula ulmaria*, and Cleavers *Gallium aparine*.

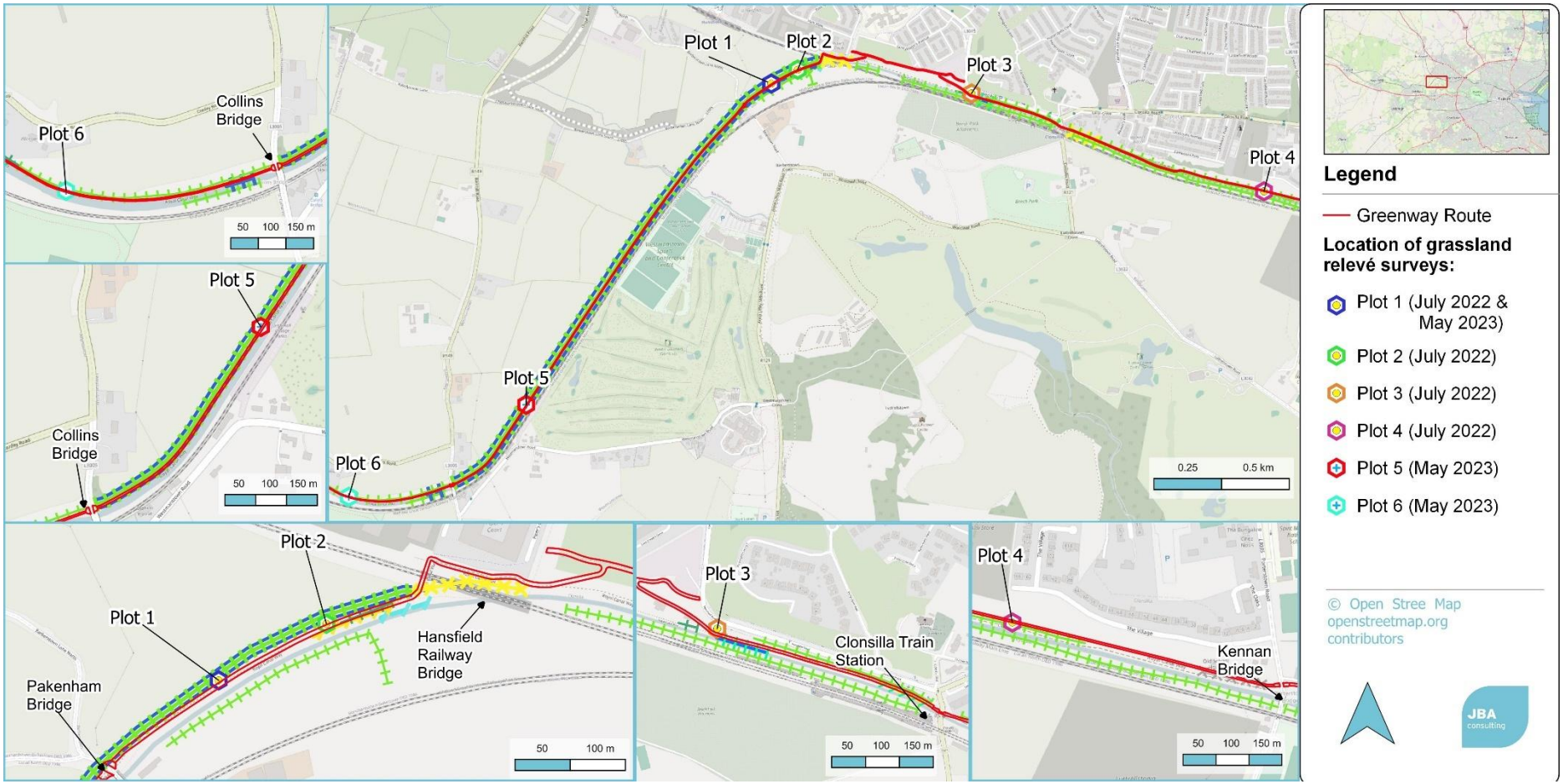


Figure 8-29: Location of grassland relevé surveys (©OSM, 2026)



Figure 8-30: Plot 1 relevé (12th July 2022) passed for Annex I Lowland Hay meadow [6510]. Oregano, Restharrow and Lady's Bedstraw were dominate forbs in this plot, located Chainages +2950

Plot 4 contained the following positive indicator species for Lowland hay meadow: Common Knapweed, Ribwort Plantain, Wild Carrot, Rough Hawkbit, Red Clover, Meadow Buttercup and High-quality indicators; Bird's-foot Trefoil, Yellow Rattle and Field Scabious. This grassland passes for Annex I Lowland hay meadow [6510], however this is under threat from scrub, and the condition was low due to high cover of bare soil due to steepness of slope. Other grassland species recorded here included Oregano, Yorkshire Fog, Common Agrimony, Kidney Vetch, Glaucous Sedge, Downy Oatgrass, Common Bent *Agrostis capillaris*, Perennial Ryegrass, Common Restharrow, White Clover, Bush Vetch, Hop Trefoil *Trifolium campestre* and scrub species Alder, Hawthorn, and Gorse.



Figure 8-31 The Steep bank at plot 4 also passed criteria for [6510], with Field Scabious, Carrot, and Oregano being the dominant forbs here, but it is also scrubbing-over and had high bare soil, located: Chainages +4550.

Plot 3 did not have enough positive indicator species to qualify as Annex I [6510], and also had a high amount of scrub species including Sycamore, Bramble, Alder, Ash *Fraxinus excelsior*, Rosebay Willowherb and *Eupatorium* spp. This area is located on a steep bank and is not considered a species rich grassland and is more associated with woodland edge species. Species recorded in this plot included Bird's-foot Trefoil, Common Knapweed, Ribwort Plantain, Smooth Hawk's-beard, Glaucous Sedge, Common Bent, Perennial Ryegrass, White Clover, Bush Vetch, Oxeye Daisy, Self Heal, False Oatgrass, False Brome, Red Fescue, Creeping Cinquefoil, Creeping Thistle, Imperforate St John's-wort *Hypericum maculatum,* Black Medic, Bramble, Curly Dock, Hoary Ragwort *Senecio erucifolius,* Common Ragwort, Dandelion species, Germander Speedwell, Cleavers, Nipplewort, Common Sowthistle *Sonchus oleraceus,* Herb Robert *Geranium robertianum,* Wood Avens *Geum urbanum,* and Tutsan.

Plot 1 and Plot 4 have a species assemblage which correspond with the Annex I habitat Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis)* [6510], while Plot 2 and 3 have a species assemblage that falls below the criteria of an Annex I habitat. On the 18th of May 2023, Plot 1 was resurveyed, with the addition of two newer plots located near to Collins Bridge which were surveyed for the first time. The results from Plot 1 contained a species makeup similar to the survey in 2022, and the categorization of this Plot as an Annex I habitat remains unchanged.

The locations of Plots 5 and 6 were randomly generated prior to visitation, and upon arrival a relevé was not conducted due to the initial recognition that the sites would not meet the criteria for any Annex I habitat, including Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometea*) (*important orchid sites) [6210] or Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis)* [6510]. The species present within these plots included a high cover of Cleavers, Lady's Bedstraw, Meadowsweet, and a bare cover of Germander Speedwell, Red Clover, White clover, Meadow Buttercup, Ribwort Plantain, Common Hogweed, Rough Hawkbit, and Bird's-foot Trefoil.

A grassland relevé survey of Plot 1 was also conducted in 2025 by JBA Ecologists Michael Coyle and Matt Hosking. The species composition and condition were found to be consistent with the previous surveys. A grassland relevé survey of Plot 4 was not carried out, as it was noted during the breeding bird surveys in 2024 and 2025 that this area was transitioning towards scrub habitat and its species diversity had declined.

The species assemblages present within Plots 1 and 4 correspond with the Annex I Habitat Lowland hay meadows [6510]. While the presence of undesignated Annex I habitat is significant, this area falls outside the NRA/TII designation for internationally important ecological features. For an Annex I habitat to fall within this category, the habitat must be either essential to maintaining the coherence of a Natura 2000 site(s) or contain best examples of a specific habitat type (NRA, 2009). As Plots 1 and 4 do not fall within these criteria, they are not considered to be of international ecological importance.

Additionally, during the 2026 habitat surveys, the area of Plot 4 was determined to have transitioned into a scrub and meadow mosaic. While the Lowland hay meadow high-quality positive indicator species Bird's-foot Trefoil and Field Scabious were still present within this habitat, this area had significant Bramble coverage. As such, this area is no longer considered to have the future potential to become the Annex I habitat Lowland hay meadows and instead is transitioning towards scrub habitat. Furthermore, during the 2026 habitat surveys Plots 1, 2, and 3 were noted as having broadly similar species assemblages to the existing survey data. Plot 2 was noted to be of a higher quality than Plot 1 which was less species rich then previously recorded, although Plot 2 still failed to meet criteria for the Annex I habitats Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometea*) (*important orchid sites) [6210] or Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis)* [6510]. Plot 3 was noted to have been managed to prevent this section naturally transitioning into scrub (Figure 8-32). While Plot 1 was deemed to have declined in quality, this area

still has the future potential, under suitable management practises, to meet the criteria for the Annex I grassland habitat Lowland hay meadows [6510].



Figure 8-32 Condition of grassland habitat at the location of Plot 3 in June 2026

Sites containing viable areas of habitat types listed in Annex I of the Habitats Directive fall within the national importance categorization for ecological receptors (NRA, 2009). As none of the Plots adjacent to the Proposed Development no longer meet the criteria for the Annex I grassland habitat Lowland hay meadows [6510], there areas fall below the national importance categorization for ecological receptors. However, given their future potential to meet the criteria for Lowland hay meadows [6510], Plots 1, 2, and 3 are of **county level ecological importance**. These areas are still considered important within the locality and are proposed for appropriate management in the Fingal Biodiversity Action Plan (BAP) 2022-2030 (FCC, 2023b). Plot 4 is considered to no longer categorize as GS1 or as the Annex I habitat Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis)* [6510] and is instead considered to be part of the scrub understorey of the treelines habitat running adjacent to the existing towpath.

Additionally, as stated in the separate Screening for AA accompanying the EIAR (JBA, 2026), while the Annex I quality habitat Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis)* [6510]) was identified along the Proposed Development within Plots 1 and 4, this habitat, or the Annex I 'semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometea) (*important orchid sites) [6210] are not QIs of any of the Natura 2000 sites within the Zol. A separate Screening for AA is therefore not required to address impacts on these habitats. Impacts on these grassland habitats are assessed further within this report.

8.6.2.1.12 GS2 - Dry meadows and grassy verges

Sections of unmanaged grassy verges and unkept grass spaces along the Royal Canal have graded into dry meadows due to a lack of human intervention (Figure 8-33). A section of this habitat to the west of the Old School House, located between Chainages +5050 - +5220 (Figure 8-34), were also surveyed as part of the Old School Masterplan Ecological Baseline (ORS, 2025). There was no evidence of any

protected flora within the meadow area, and the recorded species list was largely similar to the JBA species list. During the 2026 surveys, this area was reclassified as a scrub / meadow mosaic habitat that is gradually transitioning towards the former (see sub-section 8.6.2.1.13). A small area of meadow remains to the south of the Old Schoolhouse Building, whose species composition has been covered above.



Figure 8-33: Grassy verge habitat bordering existing pathway along the Royal Canal, to the west of Collins Bridge (Chainages +650 – 1050)

The various grassy verges include species such as Ribwort Plantain, White Clover, Red Clover, Rough Hawkbit, Bush Vetch, Black Medick, Creeping Buttercup, Willowherb *Epilobium* spp., immature Alder, False Oatgrass, Meadowsweet, Chickweed *Stellaria media*, Common Knapweed, Germander Speedwell, Meadow Buttercup, Creeping Cinquefoil, Timothy Grass *Phleum pratense*, Hemp Agrimony, Pignut *Carya glabra*, Common Bent, Common Restharrow, Marsh Valerian *Valeriana dioica*, Hedgerow Cranesbill *Geranium pyrenaicum*, Meadow Vetchling, Common Couch *Elymus repens* and Cock's-foot (Figure 8-34).

In addition to these stretches of meadow grassland areas, there were continuous stretches of meadow verges along large stretches of the canal bank. There was no transitional stage of this grassland grading into a marsh or wet grassland before the body of the canal, these sections had a solid soil bank and were dominated by meadow species including Yorkshire Fog, Horsetail species *Epilobium* spp., Nettle *Urtica dioica*, Bramble, Ribwort Plantain, Creeping Buttercup, Common Hogweed, Lesser Hawkbit, Hedge Bindweed *Calystegia sepium*, Meadowsweet, Cow Parsley and Butterbur *Petasites hybridus.* Additionally in some sections of meadow, there was some Common Reed that had been established.

These areas of grassland have not been recently disturbed and are rank in nature and have foraging potential for local faunal groups. Therefore, this habitat is **considered to be of local (higher value) ecological importance.**



Figure 8-34: Dry meadow (GS2) surrounded by scrub (WS1) west of Kennan bridge, located between Chainages +5050 - +5220 as recorded during the initial JBA habitat surveys and by ORS (2025). This area has now been reclassified as a scrub / meadow mosaic.

In the 2024 surveys, there was one record of Pyramid Orchid *Anacamptis pyramidalis* (Figure 8-35) found in the grassy verges south of the Old School House building. No Orchid species were recorded within this verge during the 2026 habitat survey.



Figure 8-35: Pyramidal orchid in the vicinity of the Old School House

8.6.2.1.13 Mosaic: GS2 / WS1 - Dry meadows and grassy verges, Scrub mosaic

This habitat is present where the dry meadow grades into surrounding scrub (WS1). This includes an area to the west of the Old Schoolhouse (Figure 8-36), as well as an area to the east of the Old Schoolhouse building surrounding a section of recolonising bare ground (Figure 8-37). The whole area extends between Chainages + 4500 - +5250. Species present within these areas are largely consistent with previously described dry meadow and grassy verge habitat, and the scrub (WS1) habitat described in sub-section 8.6.2.1.19. Floral species include Dandelion species, Smooth Hawk's-beard, Rough Hawkbit, Meadow Buttercup, Lady's Bedstraw, Bush Vetch, Meadow Vetchling, Germander Speedwell, Creeping Cinquefoil, Meadow Brome, Common Knapweed, Bird's-foot Trefoil, Common Hogweed, False Oatgrass, Sweet Vernal-grass, Creeping Thistle, Yarrow, Cock's-foot, Ribwort Plantain, Creeping Buttercup, Wood Speedwell *Veronica montana*, Common Restharrow, Rosebay Willowherb, Yorkshire Fog, Wild Carrot, Black Medic, Field Speedwell *Veronica arvensis*, Smooth Meadow Grass, Cowslip *Primula veris*, White Clover, Red Clover, Nettle, Common Sedge *Carex nigra*, Glaucous Sedge, Perennial Ryegrass, Lesser Stitchwort *Stellaria graminea*, Colt's-foot, Common Mouse Ear, Oxeye Daisy, Tufted Vetch, Hemp Agrimony, Common Vetch, Meadow Sweet, Lesser Trefoil *Trifolium dubium*, Yellow Iris, Sorrel *Rumex acetosa*, Greater Stitchwort, Climbing Nightshade *Solanum dulcamara*, Sweet Pea *Lathyrus odoratus*, Curly Dock, Broad-leaved Dock *Rumex obtusifolius*, Ivy, Cat's-ear, Druce's Cranesbill, Annual Meadow-grass *Poa annua*, False Brome, Kidney Vetch, Hedge Cranesbill *Geranium pyrenaicum*, Dark Columbine *Aquilegia atrata*, Salad Burnet *Sanguisorba minor*, Hegde Woundwort, Marsh Valerian, and Spear Thistle.

Woody/typical scrub plant species recorded in this habitat include Hawthorn, Blackthorn *Prunus spinosa*, Gorse, and Bramble. These species typically comprise of around 50% of this habitat's area. Additionally, Alder, Ash, Downy Birch, and Sycamore saplings were recorded within this habitat.



Figure 8-36: Area of meadow / scrub mosaic habitat to the west of the Old Schoolhouse (Chainages + 4500 - +4800)



Figure 8-37: Area of meadow / scrub mosaic habitat to the east of the Old Schoolhouse (Chainages +5210 - 5270)

The invertebrate species Small White *Pieris rapae*, Red-tailed Bumblebee *Bombus lapidarius*, Early Bumblebee *Bombus pratorum*, Painted Lady *Vanessa cardui*, and Meadow Brown *Maniola jurtina* were recorded within this habitat.

The invasive species Butterly-bush *Buddleja davidii* was recorded within this habitat to the east of the Old Schoolhouse.

The species composition is made up of those found above and described below in scrub (WS1). This habitat has high species diversity and supports the foraging activities of local faunal groups. Therefore, this habitat is considered to be of **local (higher value) ecological importance**.

8.6.2.1.14 WD1 - (Mixed) Broadleaved woodland

Mixed broadleaved woodland was the most common woodland type recorded throughout the site, being recorded in several areas on both sides of the canal, but more extensively on the north side.

Typical species included Ash, Holly *Ilex aquifolium*, Sycamore, Elder *Sambucus nigra*, Blackthorn, Hazel *Corylus avellana*, Horse-chestnut *Aesculus hippocastanum*, Downy Birch, White Poplar *Populus alba*, and Pedunculate Oak *Quercus robur* with some variation between areas.

The main area of woodland extended eastwards between Kennan Bridge (Porterstown Road) and Rose Lawn (Chainages +6300 - +7150), near the proposed new Landmark bridge. Descriptions of this woodland are divided into sections, depending on site access points.

East of the Dublin-Kildare County Border (Chainages 0 - +250)

This habitat was found along the south bank of the Royal Canal, extending from the Kildare border (Ch 0 - + 250). There was an additional section of this habitat to the north of the Royal Canal, which is separated from the canal by the existing path and a drainage ditch (Chainages +160 – 200) (Figure 8-38). Species are dominated by Grey Willow and Ash, with some Alder, and dense Bramble cover.



Figure 8-38: (Mixed) broadleaved woodland habitat to the north of the Royal Canal between Chainages +160 - 200

Collins Bridge (Chainages +790 -1150)

There is a section of (Mixed) broadleaved woodland to the north of the Royal Canal, extending between Chainages +790 – 1150. Between Chainages + 1050 – 1070, the R149 divides this woodland habitat. Species present were broadly similar to the woodland habitat between Chainages 0 - +250.

Hansfield Railway Bridge (Chainages +3120 – 3600)

There is a section of woodland to west of the Hansfield Railway Bridge, on the southern bank of the Royal Canal. There are additional sections of woodland between Chainages +3150 – 3530, and Chainages +3560 – 3590 to the north of the existing towpath, on the north bank of the Royal Canal. Tree species recorded within this section include Alder, Ash, Elder, and Sycamore. The understorey is dominated by Bramble and Ivy, with Gorse, Hedge Bindweed, and Hart's-tongue Fern *Asplenium scolopendrium* also present (Figure 8-39).



Figure 8-39: Woodland understorey present within (Mixed) broadleaved woodland habitat between Chainages +3150 – 3530

Kennan Bridge to Kirkpatrick Bridge (Chainages +5350 - +6240)

Broadleaved woodland habitat is present between Kennan Bridge and Kirkpatrick Bridge (Chainages +5350 - +6240) (Figure 8-40). This habitat was formerly classified as Oak-Ash-Hazel Woodland (WN2) but was reclassified as a mixed broadband woodland (WD1) following the 2026 surveys. Surveyors were able to better assess this habitat after successfully walking through a section of this habitat between Chainages +5430 - + 5520, as well as re-walking along Windmill Park Lane to assess the northern sections of this habitat between Chainages +5500 - +6200 (Figure 8-41).



Figure 8-40: Additional section of (Mixed) broadleaved woodland habitat located between Kennan Bridge and Kirkpatrick Bridge (Chainages +5340 - +6240)



Figure 8-41: Northern extent of woodland habitat along Windmill Park Lane habitat between Chainages +5500 - +6200

This section of mixed broadleaved woodland is largely free from significant dumping and disturbance. The tree species recorded within this section of mixed broadleaved woodland include Ash, Elder, Hazel, Pedunculate Oak, Holly, Hawthorn, Blackthorn, Horse Chestnut, Alder, White Poplar, Leyland cypress, *Cupressus* × *leylandii*, Sycamore, and Beech *Fagus sylvatica*. Ash was the most dominant species within this section of woodland, and several Ash trees within this habitat showed signs of Ash dieback disease. Ground floral species recorded include Bramble, Lord's-and-ladies *Arum italicum*, Hart's-tongue Fern, Common Hogweed, Male Fern *Dryopteris filix-mas*, Nettle, Herb Robert, Cleavers, Ivy, Soft Shield Fern *Polystichum setiferum*, Dogrose *Rosa canina*, Honeysuckle *Lonicera periclymenum*, and Hedge Bindweed. There are several large areas of very dense Bramble within this habitat, including along the Proposed Development (Figure 8-39).



Figure 8-42: Understorey within woodland habitat between Chainages +5430 - + 5520 including dense Bramble patch in the rear

During the 2026 surveys, surveyors noted signs of Badger activity throughout the woodland habitat between Chainages +5430 - + 5520, including potential abandoned sett entrances. Mammal pathways were frequently observed through the Bramble understorey sections of this habitat.

The invasive species Cotoneaster species *Rosaceae* spp. and Winter Heliotrope *Petasites pyrenaicus* are present within this section of woodland. There is a significant cluster of Winter Heliotrope present between Chainages + 5750 – 5900 (Figure 8-43).

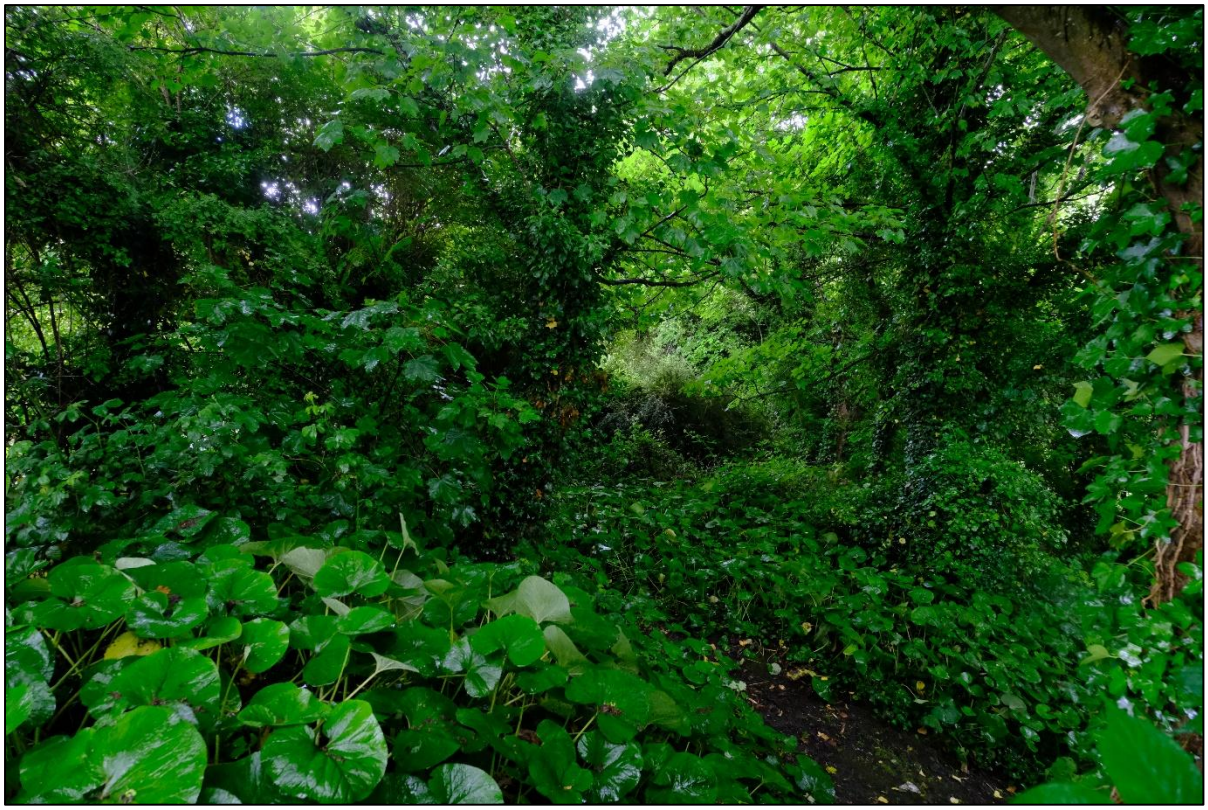


Figure 8-43: Winter Heliotrope present within woodland habitat to the south of Windmill Park Lane (Chainages + 5750 – 5900)

Kirkpatrick Bridge to Roselawn (Chainages +6300 - +7150)

Mixed woodland habitat was found along a 900m stretch of the north bank east of Coolmine Train station (Chainages +6300 - +7150) (Figure 8-44). This woodland occurs in what is called the Deep Sinking area of the Royal canal. The canal was cut through limestone, resulting in very steep rocky terrain (Figure 8-45). A historic quarry is located about 200m to the east of Kirkpatrick Bridge (Figure 8-46). This is where the proposed quarry bridge and elevated board walk over uneven terrain will be located. Surveys of this area were limited due to the steepness of the terrain and thickness of the understorey vegetation. Surveyors were able to assess the area of this habitat between Chainages +6300 - + 6600 from within the woodland, while the rest of the woodland was assessed using binoculars from the opposite bank or/and from a public green space to the north between Chainages + 6800 - +7150 (Figure 8-47).



Figure 8-44: Frequent Sycamore and other non-native species found in mixed broadleaved woodland (WD1) east of Coolmine Train Station



Figure 8-45: Steep terrain within woodland habitat east of Coolmine with typical understorey species present, including Ivy, Hart's-tongue Fern, Sycamore Saplings, and Spurge Laurel



Figure 8-46: Woodland habitat present within historic quarry 200m east of the Kirkpatrick Bridge



Figure 8-47: Woodland habitat adjacent to the public green space by Roselawn between Chainages + 6800 - +7150

The habitat contains the tree species Ash *Fraxinus excelsior*, Beech *Fagus sylvatica*, Holly *Ilex aquifolium*, Sycamore, Elder, Blackthorn, Crab Apple, Hazel, Horse-chestnut *Aesculus hippocastanum*, Lime *Tilia x europaea*, and Pedunculate Oak. Ash was the most commonly recorded tree species within this habitat.

The understorey was dominated by thick sections of Bramble (Figure 8-48). Other understorey species recorded include Gorse, Ivy, Lord's-and-ladies, Hart's Tongue, Male Fern, Herb Robert, Cock's-foot, Common Hogweed, Cow Parsley, Dogrose, Nettle, Creeping Thistle, Cleavers, Wood Avens, Dandelion species, Tutsan, Barren Strawberry *Potentilla sterilis*, and Violet species *Viola* spp.. The fungi Collared Earthstar *Geastrum triplex* was recorded in the woodland. Several non-native species were recorded including Russian Vine *Fallopia baldschuanica*, Cotoneaster species, Cherry Laurel *Prunus laurocerasus,* and among others garden escapees Spurge Laurel *Daphne laureola*. Spurge Laurel was the most widespread non-native species within this habitat. The eastern section of this habitat is largely impenetrable coming from the west due to dense bramble and steep terrain (Chainages + 6600 - 7100). Previous reports (Natura Environmental Consultants, 2018, see Appendix 8.5.2) also found the topography very uneven with intermittent very steep banks which are not suitable for public access.



Figure 8-48: Typical thick Bramble understorey within woodland habitat between Coolmine Road and Roselawn Road (Chainages +6300 - +7170)

During the 2026 surveys, it was noted that a significant amount of dumping of organic and inorganic waste/refuse from the properties bordering this woodland, between Chainages + 6350 - + 6550, had occurred. Several sections of the woodland directly bordering these gardens had large Nettle patches, in part due to the dumping of garden waste leading to the excess fertilisation of the underlying soil. There was evidence of old localised bonfires within this section, which has led to sections of the understorey being cleared of vegetation. Additionally, it was noted that a section of this woodland after the Quarry Bridge between Chainages +6515 - +6550 has been replaced by extensions to the back gardens from the properties to the north.



Figure 8-49: Evidence of dumping of garden waste adjacent to the properties bordering the woodland's northern extent between Chainages + 6350 - + 6550



Figure 8-50: Evidence of an old bonfire alongside littering within woodland habitat between Chainages + 6350 - + 6550

The woodland noticeably begins to improve in quality between Chainages +6600 - +7100. Both Barren Strawberry and Violet species are associated with ancient woodland habitat, and are considered to be an indicator of healthier, higher quality woodland. The area between Chainages +6600 - +7100 is therefore considered to be in better condition than the previous sections of this habitat which showed considerable signs of disturbance. Additionally, several Ash trees within this habitat showed signs of Ash dieback disease, although there were a number of healthy Ash trees alongside the greenspace near Roselawn Avenue (Chainages +6800 - +7100). Furthermore, during the December 2025 survey and subsequent 2026 habitat survey, a section of this woodland between Chainages +7100 - +7150 had largely been cleared of vegetation, with several trees felled (Figure 8-51).



Figure 8-51: Section of woodland habitat cleared between Chainages +7100 - +7150 as seen from the green space to the north by Roselawn

The invasive species Cotoneaster was recorded periodically within this habitat, and there were large sections of Winter Heliotrope present within the woodland to the south of Windmill Park Lane (Chainages +5500 - +6200).

This habitat is an important wildlife corridor within the greater locality and is considered to be of **county level ecological importance**. The prevalence of native tree species is also important within the area, as well as the presence of higher quality woodland understorey indicator species. Natural woodlands are highlighted and described in the Fingal BAP 2023-2030 (FCC, 2023b).

8.6.2.1.15 WL1 - Hedgerows

Hedgerows frequently occurred along the route of the Proposed Development. Species present included Hawthorn, young Ash, Elder, Blackthorn, Dogrose and non-native species such as Cherry Laurel, Privets *Ligustrum* spp., Sycamore and Beech. Hedgerow habitat is an important foraging and commuting feature and offers a refuge to wide variety of species. This habitat is an important foraging and commuting feature and offers a refuge to wide variety of species. The habitat is of **county level ecological importance** and is described in the Fingal BAP 2023-2030.

8.6.2.1.16 WL2 - Treelines

Treelines were frequently found along both banks of the Royal Canal and were often made up of similar species to the (Mixed) broadleaved woodland (WD1) habitat described above in sub-section 8.6.2.1.14.

Species included Ash predominantly, with Hawthorn, Sycamore, Elder, Alder, Lime species *Tilia* spp., Hazel, with an understory of Bramble, with Dandelion species, Nettle, Ivy, Cleavers, Bush Vetch, Creeping Buttercup, Shining Cranesbill *Geranium lucidum*, and Clustered Dock also present. Garden escapees such as Cotoneaster were present in some sections. The understory of some sections west of Clonsilla Train station had an abundance of Three-Cornered Garlic *Allium triquetrum*, and areas under the treeline east of Kennan Bridge had a high abundance of Winter Heliotrope. Additionally, several Ash trees within this habitat showed signs of Ash dieback disease.

Additionally, a treeline along the southern boundary of the Royal Canal, between Chainages +4120 - 5330, was assessed during a hedgerow appraisal conducted as part of the Kellystown LAP (Minogue and Associates, 2019). This treeline is mature and was deemed to be of high value, eventually grading into a linear woodland. This treeline connects with 8 hedgerows/treeline to the south. The treeline was dominated by Ash, Hawthorn, and Holly.

The invasive species Cotoneaster and Winter Heliotrope were recorded periodically within this habitat (Figure 8-52).

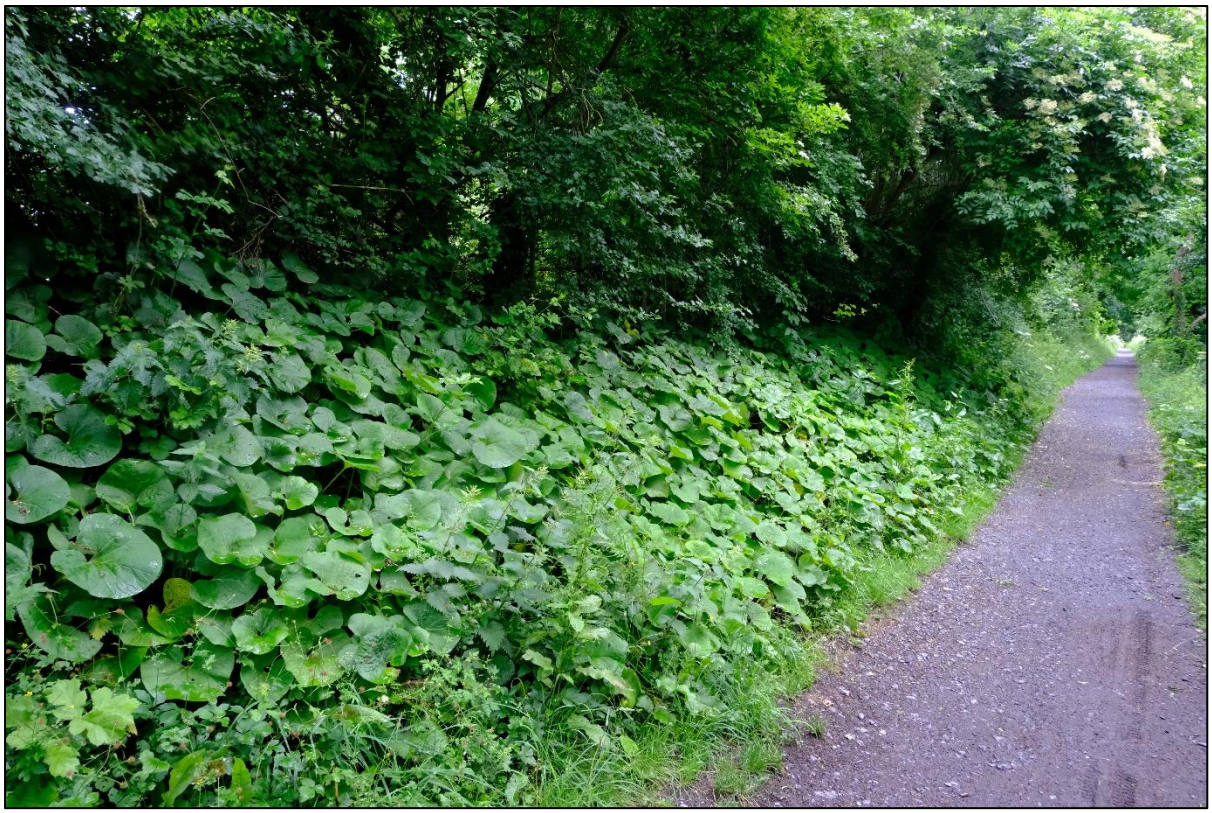


Figure 8-52 Winter Heliotrope recorded within treeline habitat to the north of the Royal Canal

Much like hedgerow, this linear habitat is of **county level ecological importance**.

8.6.2.1.17 Mixed: WL1/FW4 / Mixed: WL2/FW4 – Hedgerows/Treelines over drainage ditches

This habitat describes sections of hedgerow and treeline where a drainage ditch was present along their base, within Section 1 of the Proposed Development to the west of Collins Bridge (Chainages + 150 - 1050) (Figure 8-53).



Figure 8-53 Wet drainage ditch (FW4) running along the boundary of a treeline - Chainages +650 - 1050

The species composition was the same as described above (WL1 and WL2) but also included a wetted ditch. Much like hedgerow, this linear habitat is of **county level ecological importance.**

8.6.2.1.18 Mixed: WL2/GS2 – Mixed Treelines / Dry meadows and grassy verges

This habitat describes several mixed linear strips of treelines and grassy verges bordering the existing towpath along the Royal Canal. This habitat is characterized by linear habitats comprised of intermittent sections of tree coverage, with an understory typical of dry meadow and grassy verge habitats. Tree species recorded within this habitat include Ash, Sycamore, Holly, Hawthorn, Alder, and Wild Cherry *Prunus avium*.

Ground floral species recorded within this habitat include Wood Dock *Rumex sanguineus*, Cow Parsley, Nettle, Cleavers, Common Hogweed, Ivy, Bush Vetch, Hart's-tongue Fern, Wood Avens, Smooth Meadow Grass, Dandelion species, Red Campion, Cock's-foot, Perennial Ryegrass, Wood Speedwell, Red Valerian *Valeriana rubra*, Meadow Buttercup, Spear Thistle, Creeping Thistle, Common Plantain, Smooth Hawk's-beard, Ribwort Plantain, Hemp Agrimony, Rosebay Willowherb, Mint species *Mentha* spp., Meadowsweet, Soft Shield Fern, Smooth Sow-thistle, Colt's-foot, Garlic Mustard *Alliaria petiolata*, Cock's-foot, Creeping Thistle, False Oatgrass, Meadow Vetchling, Lady's Bedstraw, Rough Hawk's-beard, Rough Hawkbit, Honeysuckle, Wood Speedwell, Broad-leaved Dock, Curly Dock, Great Willowherb *Epilobium hirsutum*, Lord's-and-ladies, Foxglove *Digitalis purpurea*, Weld *Reseda luteola*, Wild Carrot, Common Valerian *Valeriana officinalis*, Dog Violet *Viola riviniana*, Polypody Fern *Polypodium vulgare*, and Nipplewort.

The invasive species Cotoneaster species was recorded within this habitat.

Much like hedgerow, this linear habitat is of **county level ecological importance**.

8.6.2.1.19 WS1 - Scrub

There are small sections of scrub intermittently along the route, including bordering the scrub/meadow mosaic habitat to the west of the Old Schoolhouse (Chainages + 4500). The mosaic habitat is naturally transitioning into scrub habitat within this area (Chainages +4550 - +5250). Species include, young Ash, Gorse, Bramble, Nettle, Hawthorn, Blackthorn, Creeping Thistle, Bush Vetch, Meadow Buttercup, Common Hogweed, Ivy, Germander Speed Well, Cleavers, White and Red Clover, Curly Dock, Creeping Buttercup, Cowslip, Creeping Cinquefoil, Ribwort Plantain and Sweet Vernal-grass.

There are also linear sections of scrub present along the southern bank of the canal southwest of the Barberstown crossing varying in width. Species include small Grey Willow *Salix cinerea* and Hawthorn shrubs, Bramble with Willowherb *Epilobium* spp. and tall grasses. This scrub transitions into FS2 Tall Herb Swamps nearer the canal.

This habitat is important cover for small mammals and birds, and offers foraging opportunities to number of species, it is **considered of local (higher value) ecological importance**.

8.6.2.2 Protected Flora

8.6.2.2.1 JBA and Previous ORS Surveys

There were no plant species listed under the Flora (Protection) Order 2022 recorded during the JBA surveys. During the surveys conducted as part of the Old School House Masterplan, no protected floral species were recorded adjacent to the Old School House or within the Royal Canal (ORS, 2025).

8.6.2.2.2 Desk Study

A search of the NBDC records within 2km of the Proposed Development and within downstream sections of the Royal Canal indicated records of the FPO species Hairy St John's-wort *Hypericum hirsutum*. The near threatened and Floral Protection Order (FPO) species Opposite-leaved Pondweed has been previously recorded within downstream sections of the Royal Canal between the 4th and 5th lock (Royal Canal pNHA site brief, NPWS, 2009), and in 2023,between the 1st and 3rd locks, as part of a separate project conducted by JBA Consulting (JBA, 2024).

Furthermore, Triturus performed an extensive desk study using BSBI records, which indicated high numbers of recordings for the near threatened and Floral Protection Order (FPO) species Opposite-leaved Pondweed within the Royal Canal (Triturus Environmental Ltd., 2023c). These records were largely confined to between the 1st and 6th locks, within the period of 2010-2023. Additionally, there were 9 records of the vulnerable species Tassel Stonewort *Tolypella intricate* within the Royal Canal between the 1st lock and Kilcock. The nationally rare species Pointed Stonewort *Nitella mucronate* were recorded in 2018 between Spencer Dock and the 6th lock and between the 11th lock and Talbot Bridge. There were a in both 2023 and 2024. The same methodology was used for both survey years, and the same 20 sites were surveyed. The results of these surveys are presented below in 8.6.2.2.2.1 and 8.6.2.2.2.2.

8.6.2.2.2.1 2023 Surveys (Triturus Environmental Ltd., 2024c)

During the 2023 surveys, a total of *n*=38 macrophyte species and *n*=1 no. aquatic bryophytes were recorded. The macrophyte communities within the canal naturally varied between sites/canal sections. A detailed breakdown of the species recorded during the 2023 surveys is shown below in Table 8-17, which also shows the number of locations each species was recorded in.

Table 8-17: Summary of the macrophyte species recorded from the Royal Canal, April-June 2023 (Triturus Environmental Ltd., 2024c)

Common name	Species	Conservation status	No. sites	% occurrence in sampling sites
Submerged/floating Species				
Canadian pondweed	*Elodea canadensis*	**Invasive species (S.I. 477/2011)**	17	89%
Yellow water lily	*Nuphar lutea*	Least Concern	14	74%

Ivy-leaved duckweed	*Lemna trisulca*	Least Concern	13	68%
Mare's-tail	*Hippuris vulgaris*	Least Concern	13	68%
Whorled water-milfoil	*Myriophyllum verticillatum*	Least Concern	9	47%
Common water plantain	*Alisma plantago-aquatica*	Least Concern	9	47%
Nuttall's pondweed	*Elodea nuttallii*	**Invasive species (S.I. 477/2011)**	8	42%
Spiked water-milfoil	*Myriophyllum spicatum*	Least Concern	6	32%
Fennel pondweed	*Stuckenia pectinata*	Least Concern	6	32%
Amphibious bistort	*Persicaria amphibia*	Least Concern	5	26%
Horned pondweed	*Zannichellia palustris*	Least Concern	4	21%
Arrowhead	*Sagittaria sagittifolia*	Least Concern	4	21%
Curled pondweed	*Potamogeton crispus*	Least Concern	3	16%
Opposite-leaved pondweed	*Groenlandia densa*	**Near threatened (Stewart & Church, 1992); FPO**	2	11%
Fan-leaved water-crowfoot	*Ranunculus circinatus*	Least Concern	2	11%
Small pondweed	*Potamogeton pusillus*	Least Concern	1	5%
Long-leaved pondweed	*Potamogeton × angustifolius*	Least Concern	1	5%
Rigid hornwort	*Ceratophyllum demersum*	Least Concern	1	5%
Floating sweet-grass	*Glyceria fluitans*	Least Concern	1	5%
White water lily	*Nymphae alba*	Least Concern	1	5%
Emergent Species				
Branched bur-reed	*Sparganium erectum*	Least Concern	13	68%
Reed sweet-grass	*Glyceria maxima*	Least Concern	10	53%
Iris	*Iris psuedacorus*	Least Concern	10	53%

Common clubrush	*Schoenoplectus lacustris*	Least Concern	8	42%
Bottle sedge	*Carex rostrata*	Least Concern	5	26%
Water mint	*Mentha aquatica*	Least Concern	4	21%
Hemlock water-dropwort	*Oenanthe crocata*	Least Concern	3	16%
Bulrush	*Typha latifolia*	Least Concern	1	5%
Reed canary grass	*Phalaris arundinacea*	Least Concern	1	5%
Great fen-sedge	*Cladium mariscus*	Least Concern	1	5%
Bryophytes				
River moss	*Fontinalis antipyretica*	Least Concern	6	32%
Charophytes				
Clustered stonewort	*Tolypella glomerata*	Least Concern	7	37%
Fragile stonewort	*Chara globularis*	Least Concern	6	32%
Common stonewort	*Chara vulgaris*	Least Concern	4	21%
Bristly stonewort	*Chara hispida*	Least Concern	4	21%
Delicate stonewort	*Chara virgata*	Least Concern	2	11%
Opposite stonewort	*Chara contraria*	Least Concern	2	11%
Pointed stonewort	*Nitella mucronata*	**Rare (Stewart & Church, 1992)**	2	11%

Of note, the Red-listed Pointed Stonewort was recorded at site 2 (near Binn's Bridge) and site 17 (near Pike Bridge). Whilst the species was frequent at site 2, being well scattered on exposed areas of silt throughout the 100m transect, it was rare at site 17, being confined to a large bay east of Pike Bridge (Figure 8-54). The FPO Near-threatened species Opposite-leaved Pondweed was recorded at sites 1 and 2 (Figure 8-55 and Figure 8-56), between the 1st and 2nd locks and the 2nd and 3rd locks respectively. small, dense stand of Opposite-leaved Pondweed was identified alongside the wall of the 2nd lock (site 2), whilst the species was sparsely scattered at site 1.

Additionally Clustered Stonewort, which is considered to be nationally rare was recorded at 7 sites (1, 6, 11, 13, 14, 15, and 16) (Figure 8-57 and Figure 8-58). No examples of the vulnerable Tassel Stonewort were identified during the survey despite previous records within the survey area. With the exception of Clustered Stonewort, no FPO/rare/uncommon macrophyte species were recorded within the Royal Canal along the Proposed Development.

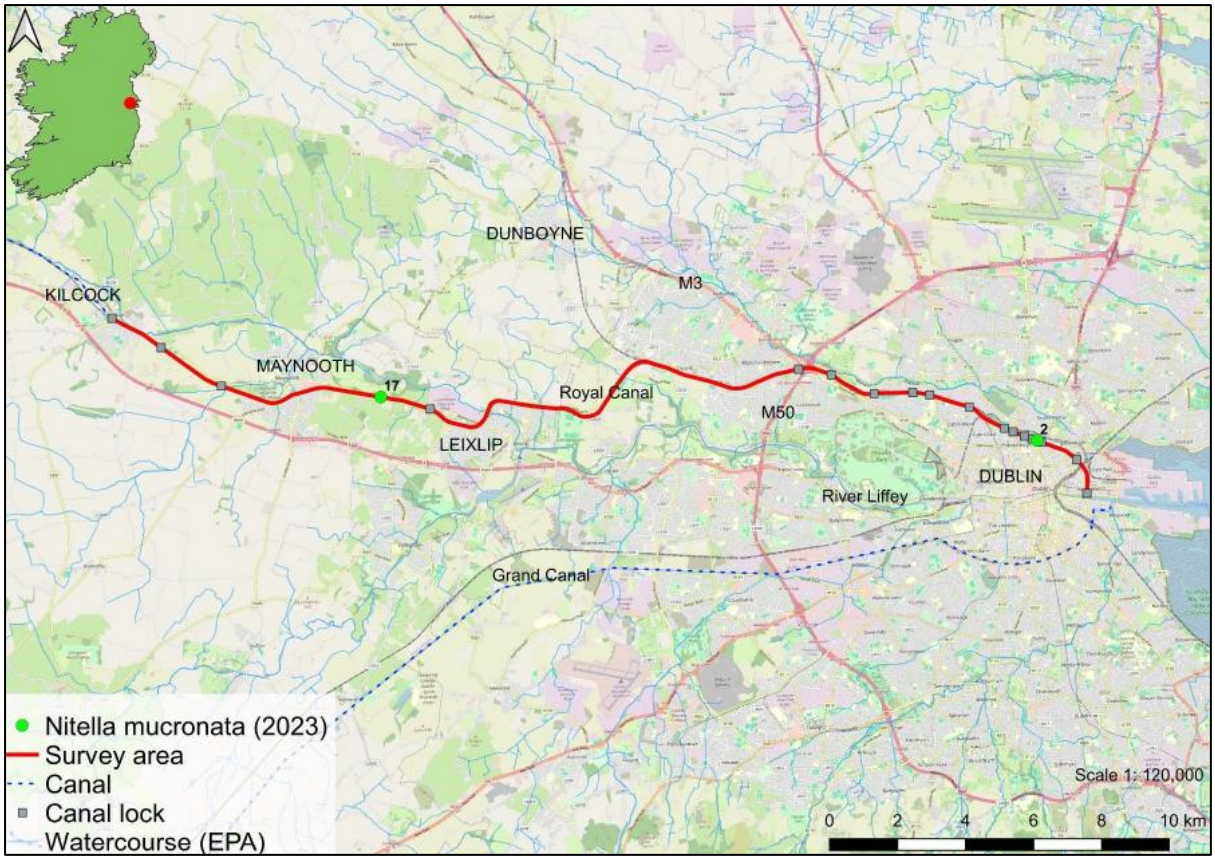


Figure 8-54: Positive, Red-listed Pointed Stonewort sites in the Royal Canal survey area, April-June 2023 (Triturus Environmental Ltd., 2024c)

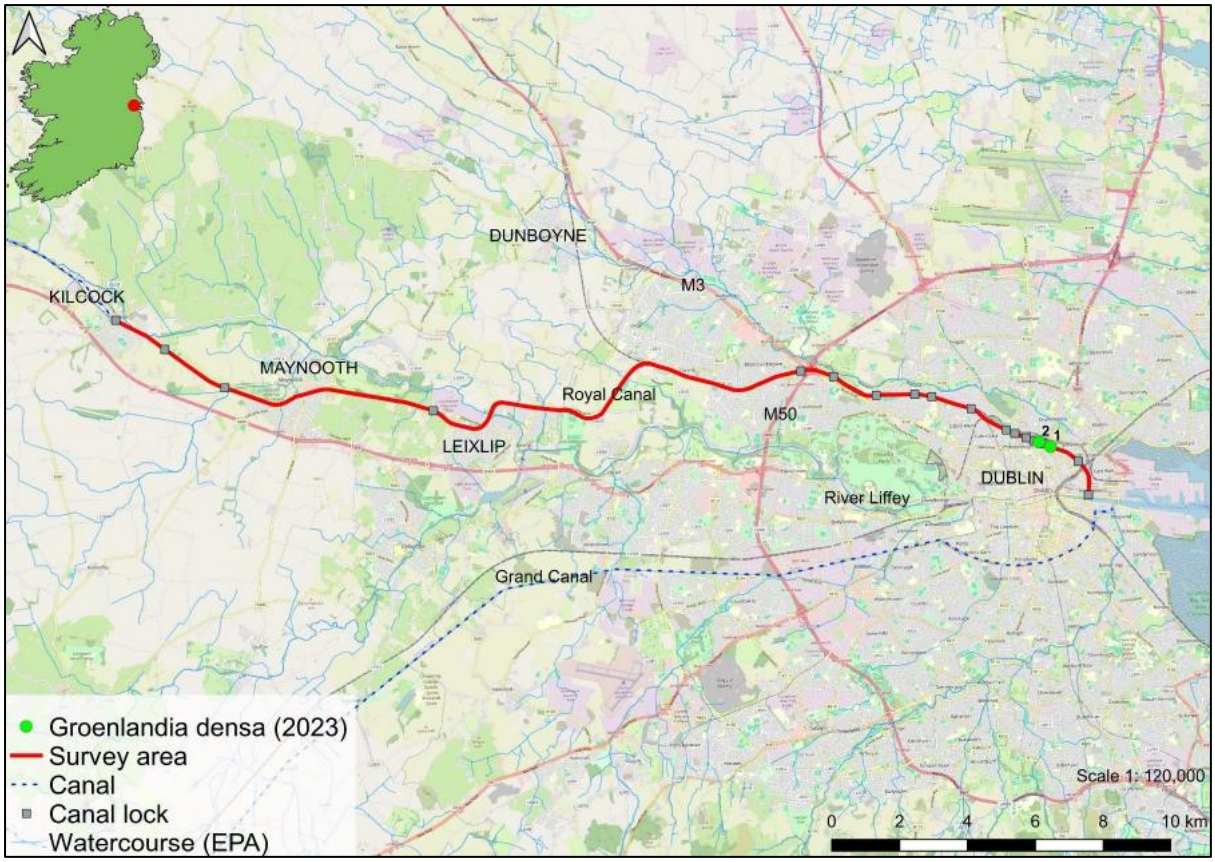


Figure 8-55: Positive FPO species Opposite-leaved Pondweed sites in the Royal Canal survey area, April-June 2023 (Triturus Environmental Ltd., 2024c)



Figure 8-56: Small stand of the near threatened, FPO species Opposite-leaved Pondweed recorded from site 2 adjacent the 2nd lock, May 2023 (Triturus Environmental Ltd., 2024c)

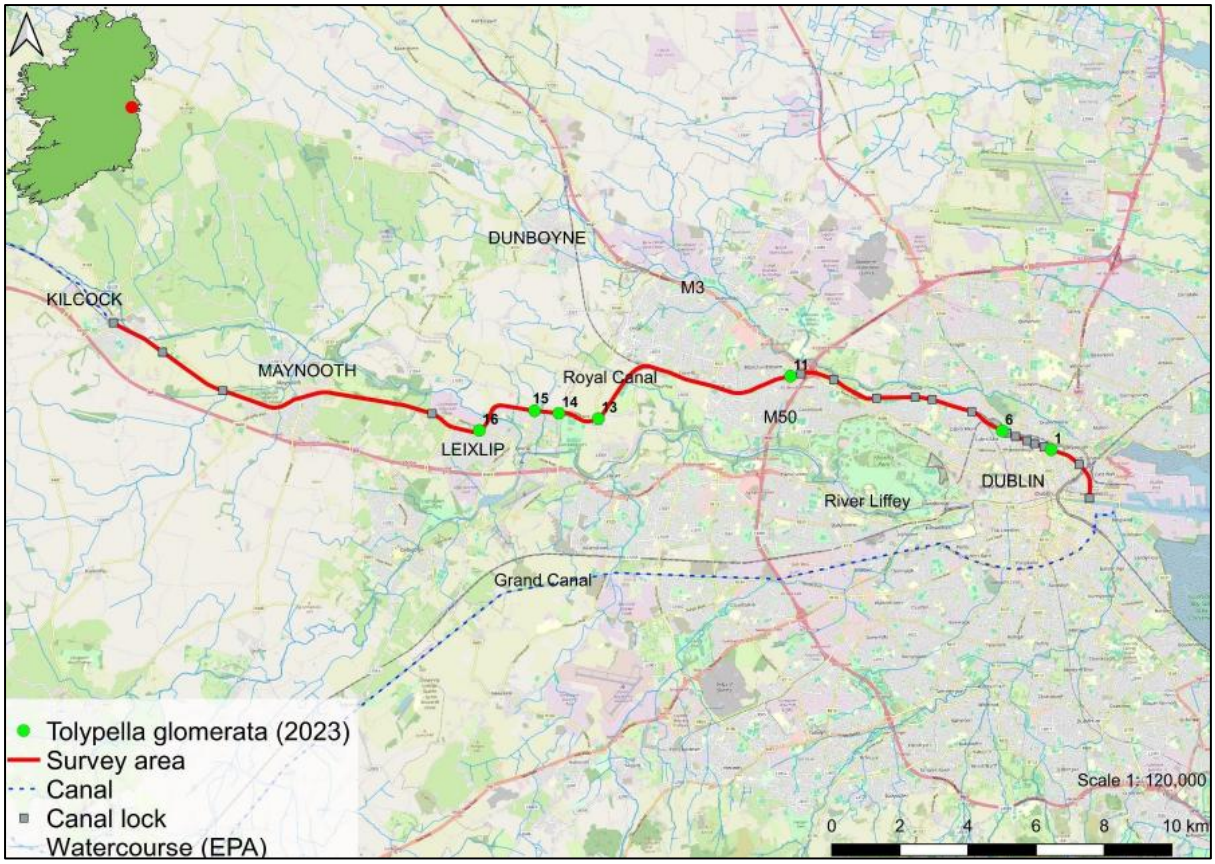


Figure 8-57: Positive Clustered Stonewort sites in the Royal Canal survey area, April-June 2023 (Triturus Environmental Ltd., 2024c)



Figure 8-58: The nationally rare (but not protected) Clustered Stonewort recorded from site 6 at Phibsborough, May 2023 (Triturus Environmental Ltd., 2024c)

In terms of macrophyte diversity, the species richness (number of species) at each survey site ranged from 7 (site 7) to 15 (sites 1 & 5) (mean 11.1 ±2.2SD, median 11). The species richness was typically similar across sites moving east to west, although slightly higher numbers of species were present between Croke Park and Phibsborough and Granard Bridge to Confey slipway. The frequency of charophytes typically increased west of Granard Bridge (Castleknock) (Figure 8-59).

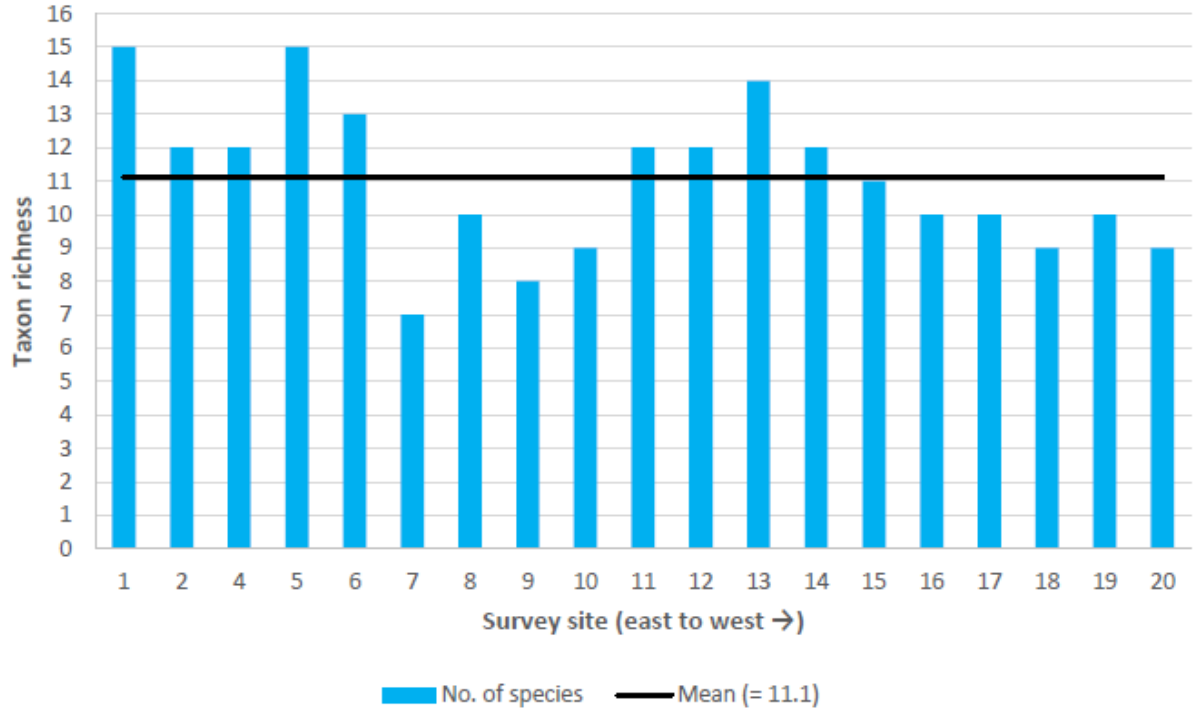


Figure 8-59: Longitudinal macrophyte species richness (no. species) per survey site, April-June 2023. Sites 11, 12, 13, and 14 are located within the Proposed Development (Triturus Environmental Ltd., 2024c)

Plotting the number of species against sampling effort (number of sampling sites = 19) the cumulative species richness curve (indicates the true number of species in the survey area may be slightly underestimated, i.e. the curve has not yet fully reached (but is approaching) its asymptote (Figure 8-60). The curve produced rises steeply and begins to plateau early as would be expected for study areas with a high proportion of relatively abundant and widespread species (Thompson & Withers, 2003).

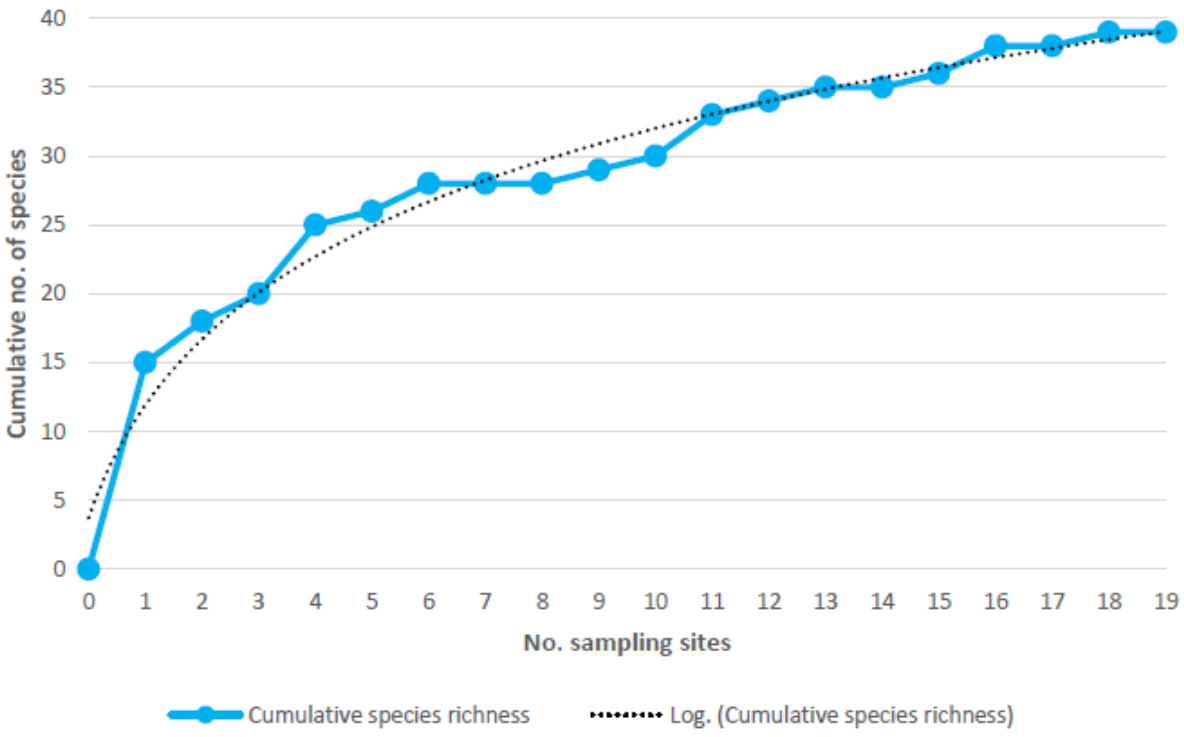


Figure 8-60: Cumulative macrophyte species richness curve (east to west) for the 2023 survey sites. Sites 11, 12, 13, and 14 are located within the Proposed Development (Triturus Environmental Ltd., 2024c)

8.6.2.2.2.2 2024 Surveys

During the 2024 surveys, a total of *n*=36 macrophyte species and *n*=1 aquatic bryophytes were recorded during the current survey. As per 2023, this included a low number of protected species, namely Opposite-leaved Pondweed and Pointed Stonewort. A detailed breakdown of the species recorded during the 2023 surveys is shown below in Table 8-18, which also shows the number of locations each species was recorded in.

Table 8-18: Summary of the macrophyte species recorded from the Royal Canal, April-June 2024 (Triturus Environmental Ltd., 2025d)

Common name	Species	Conservation status	No. sites	% occurrence in sampling sites
Submerged/floating Species				
Ivy-leaved duckweed	*Lemna trisulca*	Least Concern	18	95%
Canadian pondweed	*Elodea canadensis*	**Invasive species (S.I. 477/2011)**	17	89%
Mare's-tail	*Hippuris vulgaris*	Least Concern	17	89%
Yellow water lily	*Nuphar lutea*	Least Concern	16	84%
Nuttall's pondweed	*Elodea nuttallii*	**Invasive species (S.I. 477/2011)**	16	84%

Common water plantain	*Alisma plantago-aquatica*	Least Concern	14	74%
Amphibious bistort	*Persicaria amphibia*	Least Concern	11	58%
Whorled water-milfoil	*Myriophyllum verticillatum*	Least Concern	7	37%
Spiked water-milfoil	*Myriophyllum spicatum*	Least Concern	6	32%
Fennel pondweed	*Stuckenia pectinata*	Least Concern	5	26%
Arrowhead	*Sagittaria sagittifolia*	Least Concern	4	21%
Fan-leaved water-crowfoot	*Ranunculus circinatus*	Least Concern	2	11%
Horned pondweed	*Zannichellia palustris*	Least Concern	1	5%
Curled pondweed	*Potamogeton crispus*	Least Concern	1	5%
Opposite-leaved pondweed	*Groenlandia densa*	**Near threatened (Stewart & Church, 1992); FPO**	1	5%
Broad-leaved pondweed	*Potamogeton natans*	Least Concern	1	5%
Red pondweed	*Potamogeton alpinus*	Least Concern	1	5%
Water starwort	*Callitriche spp.*	Least Concern	1	5%
White water lily	*Nymphae alba*	Least Concern	1	5%
Emergent Species				
Reed sweet-grass	*Glyceria maxima*	Least Concern	16	84%
Branched bur-reed	*Sparganium erectum*	Least Concern	15	79%
Iris	*Iris psuedacorus*	Least Concern	13	68%
Common clubrush	*Schoenoplectus lacustris*	Least Concern	9	47%
Water mint	*Mentha aquatica*	Least Concern	7	37%
Bottle sedge	*Carex rostrata*	Least Concern	4	21%
Hemlock water-dropwort	*Oenanthe crocata*	Least Concern	4	21%

Lesser pond sedge	*Carex acutiformis*	Least Concern	2	11%
Bryophytes				
River moss	*Fontinalis antipyretica*	Least Concern	6	32%
Charophytes				
Common stonewort	*Chara vulgaris*	Least Concern	7	37%
Bristly stonewort	*Chara hispida*	Least Concern	6	32%
Clustered stonewort	*Tolypella glomerata*	Least Concern	4	21%
Rugged stonewort	*Chara subspinosa*	Least Concern	4	21%
Fragile stonewort	*Chara globularis*	Least Concern	4	21%
Pointed stonewort	*Nitella mucronata*	**Rare (Stewart & Church, 1992)**	4	21%
Opposite stonewort	*Chara contraria*	Least Concern	4	21%
Translucent stonewort e	*Nitella translucens*	Least Concern	2	11%
Dark stonewort	*Nitella opaca*	Least Concern	2	11%
Algae				
Filamentous algae	n/a	Least Concern	19	100%

As per 2023, the nationally rare, Red-listed Pointed Stonewort was recorded at site 2 (near Binn's Bridge) and site 17 (near Pike Bridge) (Figure 8-61). Whilst the species was frequent at site 2, being well scattered on exposed areas of silt throughout the 100m transect, it was rare at site 17, being confined to a large bay east of Pike Bridge (as per 2023 observations).

The near threatened and FPO species Opposite-leaved Pondweed was recorded at site 2, located between the 2nd and 3rd locks (Figure 8-62). The previously large patch of Opposite-leaved Pondweed identified near the 2nd lock in 2023 was restricted to only a few stands against the wall in 2024. Recently disturbed margins as part of Greenway works along the south bank also supported scattered stands of Opposite-leaved Pondweed. Additionally, only Clustered Stonewort was present within sites adjacent to the Proposed Development (11 and 13). The locations where these species were recorded are shown below in Table 8-19, which also compares these results with the 2023 findings.

Table 8-19: Summary of the macrophyte species recorded from the Royal Canal, April-June 2024 (Triturus Environmental Ltd., 2025d)

Common Name	Species	Conservation Status	Sites where recorded (DAFOR)	
			2024	2025
Opposite-leaved pondweed	*Groenlandia densa*	Near threatened (Wyse-Jackson et al., 2016); Flora (Protection) Order, 2022	2	1, 2
Pointed stonewort	*Nitella mucronata*	Rare (Stewart & Church, 1992)	2, 17	2, 17
Clustered stonewort	*Tolypella glomerata*	None (but nationally rare)	4, 6, 11, 13, 15, 19	1, 6, 11, 13, 14, 15, 16

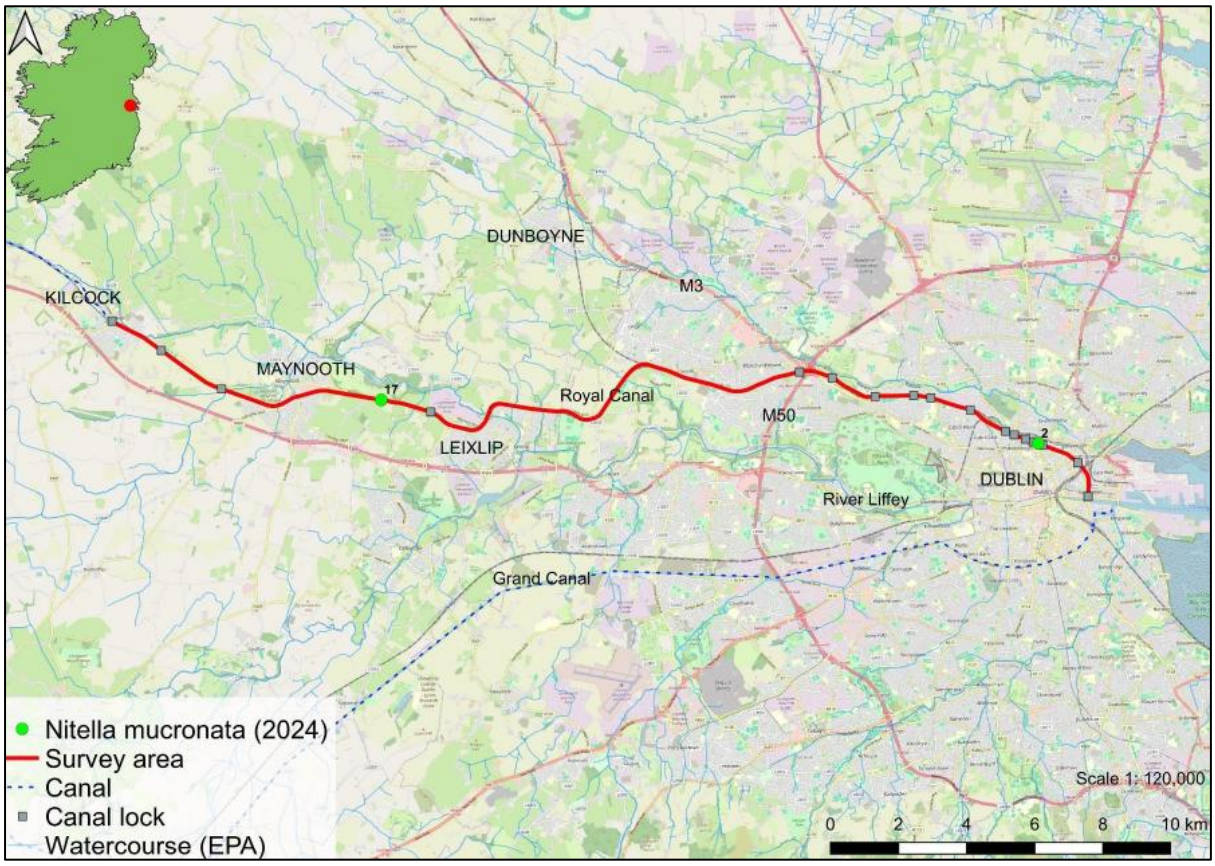


Figure 8-61: Positive Pointed Stonewort sites in the Royal Canal survey area, April-June 2024 (Triturus Environmental Ltd., 2025d)



Figure 8-62: Positive Opposite-leaved Pondweed sites in the Royal Canal survey area, April-June 2024 (Triturus Environmental Ltd., 2025d)

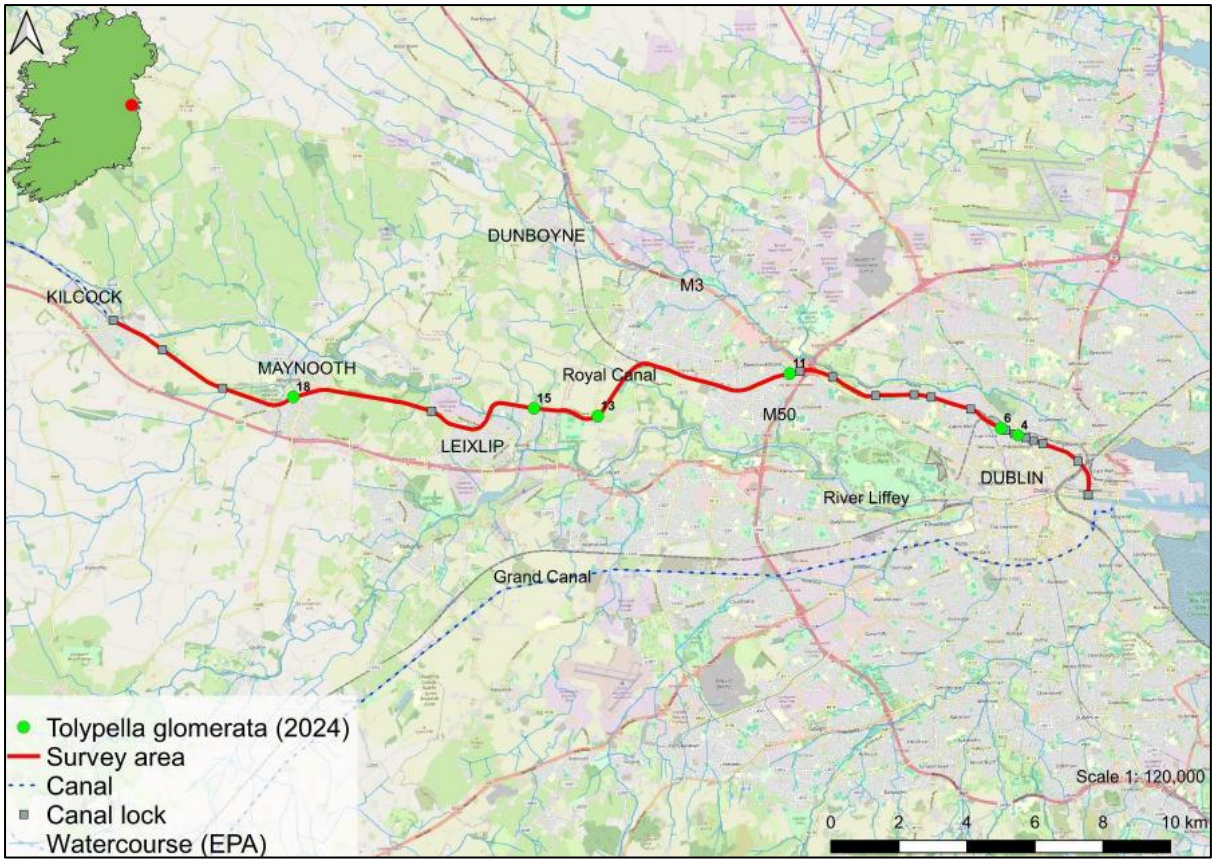


Figure 8-63: Positive Clustered Stonewort sites in the Royal Canal survey area, April-June 2024 (Triturus Environmental Ltd., 2025d)

In terms of macrophyte diversity, the species richness (number of species) at each survey site ranged from *n*=8 (site 5) to *n*=17 (sites 14, 17 & 20) (mean species richness 13.4 ±2.SD, median 14. Overall, the species richness was slightly higher than in 2023 (). As per 2023, the species richness was relatively similar across sites and typically increased moving east to west. Noticeably lower species diversity was present at sites 4 (*n*=10) and 5 (*n*=8) near Cross Gun's Quay, Phibsborough and site 9 near the R805 road crossing (*n*=9). The frequency and coverage of charophytes increased west of Collins Bridge (Westmanstown).

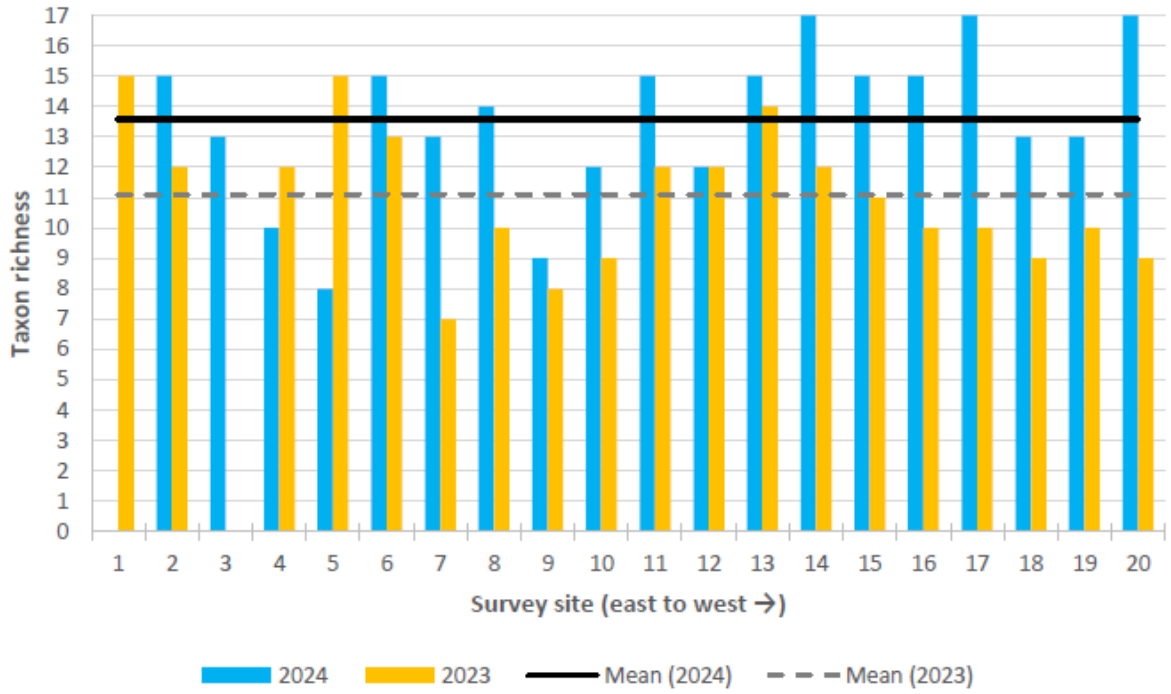


Figure 8-64: Longitudinal macrophyte species richness (no. species) per survey site, in 2023 and 2024. Sites 11, 12, 13, and 14 are located within the Proposed Development (Triturus Environmental Ltd., 2025d)

Plotting the number of species against sampling effort (19 no. sampling sites accessible in 2024) the cumulative species richness curve indicates the true number of species in the survey area may be slightly underestimated, i.e. the curve is non-asymptotic, and has not yet fully reached (but is approaching) its asymptote. The curve produced rises steeply and begins to plateau early as would be expected for study areas with a high proportion of relatively abundant and widespread species (Thompson & Withers, 2003).

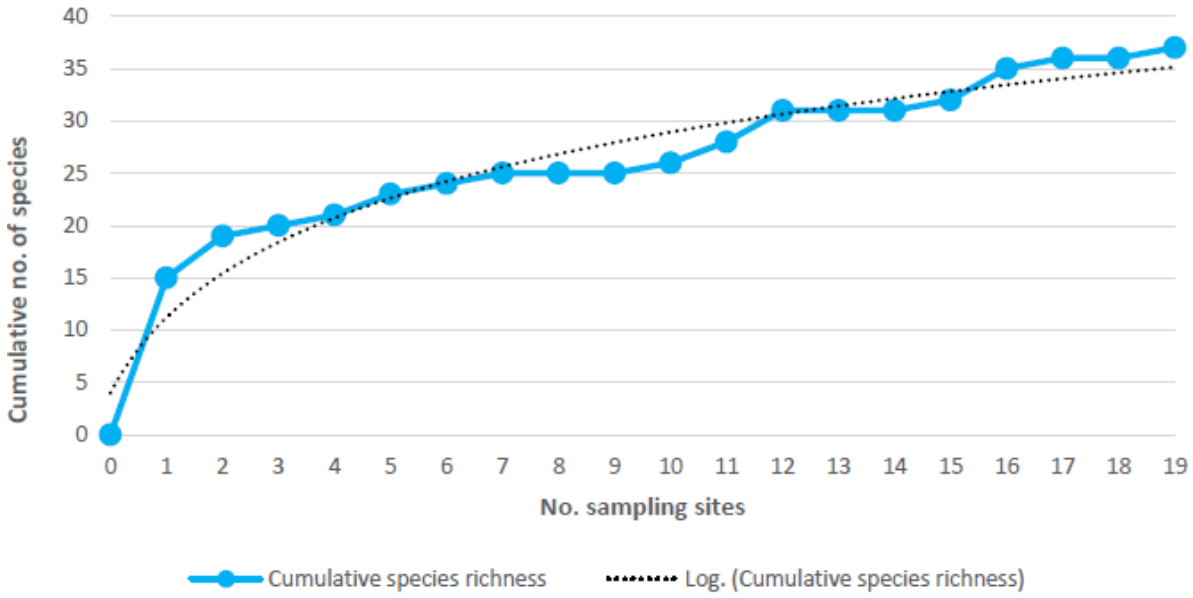


Figure 8-65: Cumulative macrophyte species richness curve (east to west) for the 2024 survey sites. Sites 11, 12, 13, and 14 are located within the Proposed Development (Triturus Environmental Ltd., 2025d)

8.6.2.2.2.3 Overall Site Valuation

No protected floral species were recorded during the ecological surveys within or adjacent to the Royal Canal along the Proposed Development. However, the FPO species Opposite-leaved Pondweed and Red-listed Pointed Stonewort were recorded within the Royal Canal, both upstream and downstream of the Proposed Development. Additionally, the nationally rare species Clustered Stonewort was recorded extensively within the Royal Canal, including within sections immediately adjacent to the Proposed Development. Previous BSBI records indicate the presence of additional flora, including Tassel Stonewort (Vulnerable) and Narrow-leaved Water-plantain (nationally uncommon) within the Royal Canal. While not recorded during the 2023 and 2024, this does not mean these species are not present within the Royal Canal, and under the precautionary principle are included alongside the recorded rare/protected flora. Therefore, the Royal Canal within the Proposed Development's ZoI (from the Dublin/Kildare border to the point where the Royal Canal discharges into the Liffey Estuary), is considered to be of **county ecological importance** for protected floral species.

8.6.2.3 Protected Fauna

8.6.2.3.1 Non-volant mammals

There were dedicated surveys of protected non-volant mammals including Otter and Badger for the Proposed Development conducted by other ecological consultancies, which identified both Otter Holts and Badger Setts along the Proposed Development. JBA did not conduct any non-volant mammal surveys, however ecologists recorded any signs of protected mammal species during the habitat, bird, and terrestrial invertebrate surveys along the Royal Canal.

8.6.2.3.1.1 **Badger**

NBDC Records

A search of the NBDC records within 2km of the Proposed Development and within downstream sections of the Royal Canal indicated records of Badger.

JBA Surveys

JBA did not carry out any dedicated Badger surveys. However, during a potential bat roost assessment survey conducted in February 2026 and during a habitat survey on 28/05/2026, there were signs of Badger activity, including digging and potential inactive sett entrances within the woodland area to the east of Coolmine Bridge (Chainages +6400 - +6700). Two of the inactive Badger setts recorded are shown in Figure 8-66 and Figure 8-67. This area is relatively undisturbed and provides foraging and refugia resources for Badger.



Figure 8-66: Inactive Badger sett recorded by JBA in 2026 within the woodland area to the east of Coolmine Bridge (Chainages +6400 - +6700)



Figure 8-67: Inactive Badger sett recorded by JBA in 2026, with excavated material present in the foreground, within the woodland area to the east of Coolmine Bridge (Chainages +6400 - +6700).

An inactive Badger sett entrance was also identified within the woodland habitat to the west of Dr Troy bridge, +5430 - + 5520.

Additionally, WI conducted a camera trap survey of a section of this woodland area near Roselawn (Chainages +7000 - +7100) in February 2026. No Badgers were recorded.

Badger Surveys by Triturus Environmental Ltd and Dr Chris Smal

During the initial Triturus Environmental Ltd. surveys conducted on 29th and 30th November 2021 and 17th January 2022, 71 signs of Badger were recorded along the Proposed Development, with the majority of these being snuffle holes, indicating foraging behaviour.

Additional surveys were conducted on the 31st March and 9th May 2022 by Triturus Environmental Ltd. and their purpose was to determine the location of foraging and commuting routes in the vicinity of identified setts to clarify the movement of Badgers between breeding areas and foraging habitats. Trail cameras monitoring was undertaken in the Sheepmore Lane area to identify site occupancy of setts in this area. Three main setts were identified, one of which was being actively used. 5 additional non-main setts were recorded, with only two of these showing signs of recent activity.

Further surveys of the Old School House, Porterstown were carried by Dr. Chris Smal as part of a separate development in January 2022 (Smal, 2022), after the initial 2022 surveys by Triturus. These surveys undertaken by Dr Chris Smal identified numerous Badger signs in addition to a non-main sett and probable (inaccessible) main sett not identified in this initial Triturus 2022 study.

Triturus returned in 2023 to survey the Old School House, Porterstown and the length of the development. 78 signs of Badger activity were recorded, and 11 setts identified. Three of these setts were identified as main setts, and 8 identified as non-main setts. Of these main setts, two were active at the time of surveying, with one inactive, while a single non-main sett was active at the time of surveying. Additionally, Badger breeding activity was recorded in March 2024 at a main sett within the Sheepmoor Lane area. Triturus conducted further surveys in 2025 along the Proposed Development

and recorded 38 badger signs and an artificial Badger sett. The artificial sett was not in use at the time of the survey.

The various Badger surveys and reports (Smal, 2022, Triturus Environmental Ltd, 2022, 2023a & 2025a) indicate Badger activity is concentrated to the woodland east of Hansfield Railway Bridge, as well as in the vicinity of Sheepmoor Lane and the Porterstown Old School House (Chainages +4600 - +5200). Activity was notably limited along the existing canal towpath where disturbance sources are high.

The detailed mapping of putative trails or paths strongly suggests that Badger are commuting between connecting areas of habitat at Sheepmore Lane, Glen Garbh (Porterstown) and the Old School House (Porterstown), using both woodland/scrub habitat and linear features such as lanes and roads (Triturus Environmental Ltd., 2025a). Key foraging areas, as indicated by snuffle hole density, trails and proximity to active setts, are present in grassland habitat to the north of Glen Garbh and in the vicinity of the Old School House, Porterstown. Connectivity for Badger (and other non-volant mammals) between and within these areas is already fragmented due to urbanisation (e.g. roads, fence lines). Other important Badger foraging areas are likely present south of the of the Proposed Development, such as near Luttrelstown, Beechpark and St. Catherine's Park and north of the Greenway on St. Mochta's National School grounds (these were outside the scope of the surveys) (Triturus Environmental Ltd., 2025a).

Despite some habitat suitability and good foraging opportunities throughout the survey area, there were large tracts of canal corridor and adjoining habitats where no Badger signs were recorded. For example, there was no evidence of badger usage at the time of survey between the Kildare/Fingal County boundary to arable fields opposite Westmanstown Sports Centre (2.3km canal distance), Hansfield to grassland near the Old School House at Porterstown (1km linear distance) or Sheepmore Lane to the 12th lock (2.3km) (Triturus Environmental Ltd., 2025a). This was considered to reflect the higher relative levels of human-related disturbance, poor/absent foraging habitats and separation between better-quality badger habitats.

Old Schoolhouse Masterplan

There were no signs of Badger recorded within the lands to the west of the Schoolhouse during the mammal survey and subsequent camera trap survey conducted as part of the Old Schoolhouse Masterplan (ORS, 2025).

Overall Site Valuation

Comprehensive site surveying shows that Badgers are using the habitats around the Proposed Development of the Greenway and within close proximity of the Proposed Development. Due to increasingly restricted ranges within urban confines of Dublin County, the site area is considered to be of **county level ecological importance for Badger**. The importance of local Badger habitat within urban environs of Co. Dublin is discussed further in the Triturus Environmental Ltd. Badger reports (Triturus Environmental Ltd., 2021a-2025a) and mentioned as a county wide priority in the FCC BAP 2023-2030 (FCC, 2023b).

8.6.2.3.1.2 Otter

NBDC Records

A search of the NBDC records within 2km of the Proposed Development and within downstream sections of the Royal Canal indicated records of Otter.

JBA Surveys

JBA did not carry out dedicated Otter surveys. However, during the JBA invertebrate survey in August 2024, an Otter spraint was incidentally recorded along the canal route, near to the Hansfield Railway Bridge. Incidental recordings of Otter spraint were recorded on the banks of the Royal Canal during the other JBA ecological surveys between 2022-2026, conducted by the JBA survey team (see sub-section 8.3.3.2.2.1).

Otter Surveys by Triturus Environmental Ltd

Triturus Environmental Ltd. conducted Otter surveys on 29th to 30th of November 2021 and on the 17th January 2022, with follow-up trail camera monitoring of identified potential holt areas undertaken between 5th April and 31st May 2022. Two holts were identified adjacent to the Proposed Development, both of which showed no signs of activity during camera trap monitoring. A total of 14 Otter signs were recorded within the survey area, including spraints, prints, and holts.

Follow-up Otter surveys were conducted by Triturus Environmental Ltd, who were commissioned to undertake additional surveying throughout January-April 2023 from the 1st lock to the 16th lock, an approximately 33km long stretch of canal. Throughout the length of the 33km stretch of the canal, a total of n=54 Otter signs were recorded. Spraint sites accounted for 36 of the signs recorded. A total of 8 holts were encountered along the 33km stretch of the canal: 5 couches, 2 slides, 2 latrines and one deposit of anal jelly. Of these findings, the stretch of the canal for the Greenway's works, a total of n=11 Otter signs were encountered, including n=7 spraint sites and n=4 holts, which remains similar to that of the result of the previous surveying in 2022.

Triturus returned to survey for Otter along the 33km stretch of the canal, from the 1st lock to the 16th lock, in 2024. A total of 28 spraints, 5 holts, 5 couches, 15 latrines, 5 slides and 1 record of anal jelly were found on the Royal Canal between the 1st and 16th Lock, with 8 spraint sites, 1 holt site and 1 couch site recorded in the area of the Proposed Development. In April 2025, Triturus surveyed just the 8.5km linear area between the county boundary and the M50, east of the 12th Lock. That year, there were 8 spraint sites, 1 holt, 2 latrines found within the area of the Proposed Development (Triturus Environmental Ltd. 2025b, Appendix 5.5.10a). Of the holts identified within 30m of the Proposed Development, 1 breeding holt was identified to the west of the development, while an additional 3 inactive holts were identified within a woodland area to the east of Coolmine Bridge. Triturus conducted additional surveys along the 33km stretch of the canal previously surveyed in 2023 and 2024 during the November – December 2025 period (Triturus Environmental Ltd, 2026, Appendix 5.5.10.2). A total of 63 otter signs were recorded within the survey area, including 39 spraints, 9 latrines, 5 holts, 5 couches, 5 slides, and 1 anal jelly site. This was an increase from the previous surveys in 2023 and 2024. Along the Proposed Development, 8 spraints, 1 latrine, and 1 holt were identified. No new holts were identified during these surveys, with the holt identified adjacent to the Proposed Development having been identified during the previous Triturus surveys.

The results of the surveys undertaken by Triturus Environmental Ltd. are summarized below in Table 8-20.

Table 8-20: Summary of Otter signs recorded along the Royal Canal survey area, November 2021 & January 2022 (Triturus 2022b), along the 33km of the Royal Canal of 2023, 2024, and 2025, (Triturus Environmental Ltd, 2024b, Triturus Environmental Ltd, 2026) and along the 8.5km stretch of the Proposed Development between the Kildare/Fingal County boundary and the M50, east of the 12th lock

Otter Sign	Proposed Development (2022).	Proposed Development (2023).	Total no. along the 33km of the canal (2023)	Proposed Development (2024)	Total no. along the 33km of the canal (2024)	Proposed Development (2025)	Total no. along the 33km of the canal (2026)
Spraint site	9	7	36	8	28	8	39
Holt	2	4	8	1	5	1	5
Couch	0	0	5	1	5	0	5
Latrine	1	0	2	0	15	2	9
Prey remains	1	0	0	0	0	0	0
Slide	1	0	2	0	5	0	5
Anal Jelly	0	0	1	0	1	0	1
TOTAL	**14**	**11**	**54**	**10**	**59**	**11**	**63**

Overall Site Valuation

There was widespread evidence of Otter along the Proposed Development, including spraints, couches, latrines, and inactive holts. Given the importance of this species and the significance of the canal as a commuting corridor, as well as it being listed a priority area for Action in the FCC Biodiversity Plan (FCC, 2022), the area around the Proposed Development is considered to be of **county level ecological importance.**

8.6.2.3.1.3 Other Non-volant Mammals

During the JBA ecological surveys 2022-2026, evidence of Fox *Vulpes vulpes* was present. There were no signs of any protected non-volant mammals, outside of Badger and Otter. The mammal survey conducted by ORS Consultants identified Hedgehog scatt to the west of the Schoolhouse Building (ORS, 2025). The wooded areas adjacent to the Royal Canal are likely refuges for European Hedgehog *Erinaceus europaeus* and Eurasian Pygmy Shrew *Sorex minutus*. Pine Marten *Martes martes* and Red Squirrel *Sciurus vulgaris* were not recorded during the site surveys. Additionally, these species, with the exception of Red Squirrel, are present within the NBDC records within 2km of the Proposed Development and within downstream sections of the Royal Canal. These species are protected under the Wildlife Acts 1976-2021 and the Wildlife (Amendment) Act 2023. The site is therefore considered to be of **local (higher value) ecological importance** for Hedgehog, Pygmy Shrew, Pine Marten, and Red Squirrel.

8.6.2.3.2 Bats

8.6.2.3.2.1 NBDC Records

A search of the NBDC records within 2km of the Proposed Development and within downstream sections of the Royal Canal indicated records of Brown Long-eared Bat *Plecotus auritus*, Common Pipistrelle *Pipistrellus pipistrellus sensu lato*, Daubenton's Bat *Myotis daubentonii*, Leisler's Bat *Nyctalus leisleri*, Nathusius's Pipistrelle *Pipistrellus nathusii*, Natterer's Bat *Myotis nattereri*, Soprano Pipistrelle *Pipistrellus pygmaeus*, and Whiskered Bat *Myotis mystacinus*.

8.6.2.3.2.2 JBA Surveys

During JBA's ecological walkover surveys, two potential roosting features were identified within Ivy within the mixed broadleaved woodland habitat between Coolmine Bridge and Roselawn Road (Ch 6300 - +7170). These features were of low roosting potential and were deemed to be only suitable as temporary roosting features during the core bat activity season (May – September inclusive). No other roosting features were identified within or adjacent to the Royal Canal.

8.6.2.3.2.3 Bat Surveys 2022 – 2026 (Bat Eco Services, 2026)

The bat surveys comprised several elements, including daytime inspections of structures and bat habitats, dusk/dawn emergence and return surveys, passive static detector surveys, walking transect surveys and bat roost potential (BRP) in trees. Full details of each can be found in the Royal Canal Bat Assessments (Bat Eco Services, 2026, see Appendix 8.5.8) which were completed for the Proposed Development. These surveys identified seven protected bat species across the length of the Proposed Development: Soprano pipistrelle, Common pipistrelle, Leisler's bat, Daubenton's bat, Nathusius' pipistrelle, Natterer's bat, and Brown long-eared bat. A full list of the surveys conducted along the Proposed Development are available in sub-section 8.3.3.2 and are listed again below in Table 8-21.

Table 8-21:Non-JBA project specific bat surveys conducted along Proposed Development 2022-2026

Company	Survey Type	Date(s)
Bat Eco Services (Dr Tina Aughney)	Daytime Roost Assessment	2nd May 2022
Bat Eco Services (Dr Tina Aughney)	Dawn Emergence Survey	2nd May 2022
Bat Eco Services (Dr Tina Aughney)	Dawn Emergence Survey	3rd May 2022
Bat Eco Services (Dr Tina Aughney)	Dawn Emergence Survey	5th May 2022
Bat Eco Services (Dr Tina Aughney)	Dawn Emergence Survey	10th May 2022
Bat Eco Services (Dr Tina Aughney)	Dusk Emergence Survey	6th May 2022
Bat Eco Services (Dr Tina Aughney)	Dusk Emergence Survey	11th May 2022
Bat Eco Services (Dr Tina Aughney)	Passive Static Bat Detector Survey	2nd May to 7th May 2022 (5-nights recording, 22:00 hours to 06:00 hours)
Bat Eco Services (Dr Tina Aughney)	Passive Static Bat Detector Survey	22nd September to 3rd October 2025 (10 nights recording, 22:00 hours to 06:00 hours)
Bat Eco Services (Dr Tina Aughney)	Bat Activity Survey	24th April 2026

Details of Bat Eco Services (2022, 2025, 2026) reports are summarised below and included within Appendix 8.5.8.

Daytime bridge inspection

Daytime inspections of bridges along the route were carried out on the 2nd of May 2022, using visual checks, torches and an endoscope to look for bats or signs such as droppings, staining and crevice use. All accessible bridges were assessed using the Billington & Norman (1997) roost-potential classification system. No bats or evidence of roosting were recorded during any of the inspections, and two bridges (Talbot Bridge and Kilpatrick Bridge) could not be accessed. Most structures were classed as Category 0-1, meaning there was low to no potential for the presence of roosting bats. Bridge 1 and Callaghan Bridge were classed as Category 2 meaning they have a high bat roost potential, but no bats or evidence of bats were recorded. The location of the bridge inspection surveys is shown below in Table 8-22 and Figure 8-68.

Table 8-22: Buildings / Structures inspection results (Bat Eco Services, 2026)

Bridge Code	Description	Grid Reference (ITM)	Roost Type / Suitability	Bat Species
Bridge 1	Stone bridge, single arch	709035, 738184	Category 2	None present

Bridge Code	Description	Grid Reference (ITM)	Roost Type / Suitability	Bat Species
	(pedestrian), crevices suitable.			
Bridge 2 – Talbot Bridge	Natural stone bridge, single arch, difficult to access (canal gates).	708707, 738166	Not fully assessed	Not applicable
Bridge 3 – R806 Road Bridge	Stone arch bridge, old pointing of crevices noted, small crevices.	708423, 738096	Category 1	None present
Bridge 4 Kilpatrick Bridge	Stone arch bridge with metal bridge extension – not accessible. Steep banks either side of canal.	706964, 738590	Not fully assessed	Not applicable
Bridge 5 Dr Troy Bridge	Modern bridge, no crevices suitable for roosting bats. High concrete bridge.	706282, 737706	Category 0	None present
Bridge 6 Porterstown Bridge	Natural stone, single arch (road bridge) – number of crevices. Recently pointed.	706081, 737773	Category 1	None present
Bridge 7 Callaghan Bridge	Natural stone, single arch (road bridge) – number of crevices.	704924, 738144	Category 2	None present
Bridge 8 Deep Sink	Modern bridge (Deep Sink area). No suitable roosts spaces.	704102, 738389	Category 0	None present
Bridge 9 Pakenham Bridge	Natural stone, single arch (road bridge) – small number of crevices.	703763, 738225	Category 1	None present
Bridge 10 Collins Bridge	Natural stone, single arch (road bridge L3005) – small number of crevices.	702679, 736809	Category 1	None present



Figure 8-68: Bridge locations along the survey route by Bat Eco Services Ltd. In 2022

Dusk and dawn surveys – bridges

Dusk and dawn detector surveys were carried out at four bridges (Bridge 1- In middle of M50 road complex, Clonsilla Bridge (7), Pakenham Bridge (9) and Collins Bridge (10)) between the 2nd-11th of May 2022 targeting structures with the highest likelihood of roosting crevices. No bat emergences or returns to roost were recorded at any bridge, confirming that none supported a roost. During the surveys, bats were detected in the wider area (Common and Soprano pipistrelle and Daubenton's bat), but these were commuting or foraging individuals rather than roosting. Lighting and vegetation varied between sites. The results of these surveys are shown below in Table 8-23.

Table 8-23: Results of the dusk and dawn emergence surveys carried out at Bridges 1, 7, 9, and 10 (Bat Eco Services, 2026)

Bridge Code	Location and Grid Reference	Bat Species (No of bats)	Access Points	Vegetation / Lighting Arrangement
Bridge 1	In middle of M50 road complex 709035, 738184	2/5/2022: Dusk Survey Start Time: 20:44 hrs Weather: 110C, calm, full cloud cover and dry. No	Not applicable Bats recorded during survey (not roosting): soprano pipistrelle, common pipistrelle, Daubenton's bat	Lighting along canal present on either side of the M50 road complex in this area. Lighting associated with buildings. LUX levels: 17 on canal, 72 from motorway lights. Vegetation on both sides of canal.

Bridge Code	Location and Grid Reference	Bat Species (No of bats)	Access Points	Vegetation / Lighting Arrangement
		bats emerged		
Bridge 7	Clonsilla 704924, 738144	5/5/22: Dusk Survey Start Time: 20:51 hrs Weather: 140C, calm, full cloud cover and dry. No bats emerged	Not applicable Bats recorded during survey (not roosting): soprano pipistrelle, common pipistrelle, Daubenton's bat	Lighting present at railway station and car parking area. LUX levels: 4-5 on canal, Vegetation on both sides of canal.
Bridge 9	703763, 738225	6/5/22: Dawn Survey Start Time: 03:54 hrs Weather: 140C, calm, full cloud cover and dry. No bats returned to roost	Not applicable Bats recorded during survey (not roosting): soprano pipistrelle, common pipistrelle,	No lighting along canal. Lighting associated with railway maintenance depot. Vegetation on tow path side of canal.
Bridge 10	702679, 736809	11/5/22: Dawn Survey Start Time: 03:51 hrs Weather: 140C, calm, full cloud cover and dry. No bats returned to roost	Not applicable Bats recorded during survey (not roosting): soprano pipistrelle, common pipistrelle,	No lighting along canal. Lighting associated with railway maintenance depot and private buildings. Vegetation on tow path side of canal.

Passive static bat detector survey

2022

Static bat detectors were placed at 12 locations between the M50 aquaduct to Confey (Table 8-24).

Static monitoring along the Royal Canal from the 2nd-6th of June 2022 showed clear variation in bat activity between locations, with Common pipistrelle emerging as the most frequently and consistently recorded species, particularly along the eastern area of the canal where nearby buildings were likely to support roosts. Soprano pipistrelle activity peaked at Static Location 2, in the Deep Sinking, suggesting a roost close to the canal, while Leisler's bat activity was highest at Location 8, matching observations of foraging during transect walks. Daubenton's bat was recorded in low numbers overall, with a peak at Location 1 near Bridge 1 (middle of M50 roundabout)), indicating a probable nearby roost used for dispersal rather than foraging. Brown long-eared bats were detected only in darker sections of the canal, and Nathusius' pipistrelle was recorded infrequently across the survey area. No data was obtained from Static 9 as it failed to record.

2025

Surveys were repeated in late September 2025 using 12 static detector locations that matched those surveyed in 2022 (Table 8-24). Because September falls outside the main bat activity season, detectors were deployed for 10 nights instead of the 5-night period used in June 2022 to ensure comparable coverage. Despite the seasonal difference, the full suite of species recorded in 2022 was detected again in 2025, along with one additional species, Natterer's bat, recorded at Static 5 and 6. Several locations showed small changes in species presence, including new detection of Daubenton's bat (Static 2), Brown long-eared bat (Static 4 and 6), and Leisler's bat (Static 4), while Static 9 successfully recorded data in 2025 for the first time. Activity patterns in 2025 showed Soprano pipistrelle as the most frequently recorded species, peaking at Statics 6 and 8, followed by common pipistrelle with highest activity at Static 7. Leisler's bat activity peaked at Static 3, Daubenton's bat at Static 6, and Brown long-eared bat remained low and confined to darker canal sections, while Nathusius' pipistrelle was only infrequently recorded. These results demonstrate the survey is sufficiently robust to accurately assess the baseline environment with regard to bats.

Table 8-24: Passive Static Detector Surveys conducted along the Proposed Development 22nd September – 3rd October 2025 (Bat Eco Services, 2026)

Static Code (AM code)	Location Description / Bat Habitat Type	Grid Reference (ITM)	Survey Period	Bat Species
2025 Static 1	Royal Canal bank Tall vegetation on both sides of the canal.	708751, 738159	22nd September 2025 (10 nights)	Soprano pipistrelle Common pipistrelle Leisler's bat Daubenton's bat
2025 Static 2	Royal Canal bank Tall vegetation on both sides of the canal.	707674, 737859	22nd September 2025 (10 nights)	Soprano pipistrelle Common pipistrelle Leisler's bat Daubenton's bat

Static Code (AM code)	Location Description / Bat Habitat Type	Grid Reference (ITM)	Survey Period	Bat Species
2025 Static 3	Royal Canal bank Tall vegetation on both sides of the canal.	707133, 737632	22nd September 2025 (10 nights)	Soprano pipistrelle Common pipistrelle Leisler's bat Daubenton's bat
2025 Static 4	Royal Canal bank Tall vegetation on both sides of the canal.	706185, 737755	22nd September 2025 (10 nights)	Soprano pipistrelle Common pipistrelle Leisler's bat Daubenton's bat Brown long-eared bat
2025 Static 5	Royal Canal bank Tall vegetation on both sides of the canal.	705645, 737897	22nd September 2025 (10 nights)	Soprano pipistrelle Common pipistrelle Leisler's bat Daubenton's bat Nathusius' pipistrelle Brown long-eared bat Natterer's bat
2025 Static 6	Royal Canal bank Tall vegetation on both sides of the canal.	705016, 738112	22nd September 2025 (10 nights)	Soprano pipistrelle Common pipistrelle Leisler's bat Daubenton's bat Brown long-eared bat
2025 Static 7	Royal Canal bank Tall vegetation on both sides of the canal.	704394, 738323	22nd September 2025 (10 nights)	Soprano pipistrelle Common pipistrelle Leisler's bat Daubenton's bat

Static Code (AM code)	Location Description / Bat Habitat Type	Grid Reference (ITM)	Survey Period	Bat Species
				Nathusius' pipistrelle Brown long-eared bat
2025 Static 8	Royal Canal bank Tall vegetation on both sides of the canal.	703452, 737866	22nd September 2025 (10 nights)	Soprano pipistrelle Common pipistrelle Leisler's bat Daubenton's bat Nathusius' pipistrelle Brown long-eared bat
2025 Static 9	Royal Canal bank Tall vegetation on both sides of the canal.	703233, 737556	22nd September 2025 (10 nights)	Soprano pipistrelle Common pipistrelle Leisler's bat Daubenton's bat Nathusius' pipistrelle
2025 Static 10	Royal Canal bank Tall vegetation on both sides of the canal.	703054, 737269	22nd September 2025 (10 nights)	Soprano pipistrelle Common pipistrelle Leisler's bat Daubenton's bat Nathusius' pipistrelle Brown long-eared bat
2025 Static 11	Royal Canal bank Tall vegetation on both sides of the canal.	702095, 736899	22nd September 2025 (10 nights)	Soprano pipistrelle Common pipistrelle Leisler's bat Daubenton's bat

Static Code (AM code)	Location Description / Bat Habitat Type	Grid Reference (ITM)	Survey Period	Bat Species
				Brown long-eared bat
2025 Static 12	Royal Canal bank Tall vegetation on both sides of the canal.	701394, 737014	22nd September 2025 (10 nights)	Soprano pipistrelle Common pipistrelle Leisler's bat Daubenton's bat Brown long-eared bat

Of the species recorded, Brown long-eared bat, Daubenton's bat, and Natterer's bat are the most sensitive to light pollution. Recordings of these species during the 2025 surveys are mapped in Figure 8-69.

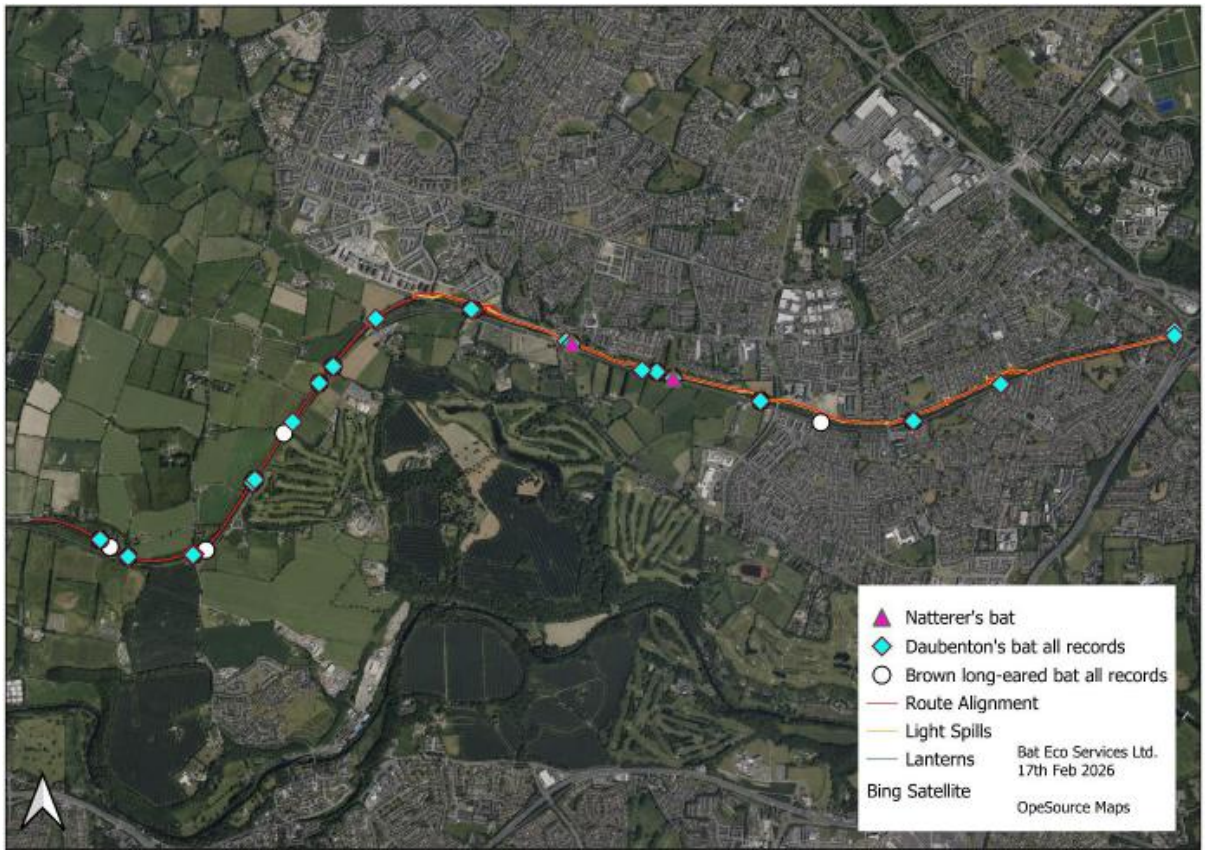


Figure 8-69: Light sensitive bat species bat encounters in survey area (Bat Eco Services, 2026)

Walking Transect Survey

2022

Transect surveys carried out on the 2nd and 3rd of May 2022 (Transect 1) and the 5th and 10th of May 2022 (Transect 2) recorded strong bat activity along the Royal Canal, with Soprano pipistrelle the most frequently encountered species on both routes. Transect 1 recorded four species: Soprano pipistrelle, Common pipistrelle, Leisler's bat and Daubenton's bat, while Transect 2 recorded six species, adding Nathusius' pipistrelle and Brown long-eared bat. In both transects, activity was consistently higher along the western, less urbanised and less brightly lit sections of the canal, indicating that reduced lighting and more natural habitat supported greater bat use of the corridor.

2026

Transect surveys were conducted for the length of the 8km route on 15th (transect 1) and 24th April (transect 2) 2026. During the first walking transect, three bat species were recorded, Common pipistrelle, Soprano pipistrelle, and Daubenton's bat. Most of the activity was recorded along the Dublin stretch of the canal with little bat activity recorded along the Kildare section, apart from the Daubenton's bat activity. This species was only recorded along the Kildare section of the canal (Figure 8-70). This may reflect that this section of the canal was surveyed in the latter half of the survey period and bat activity may have reduced at that time, due to seasonal conditions.

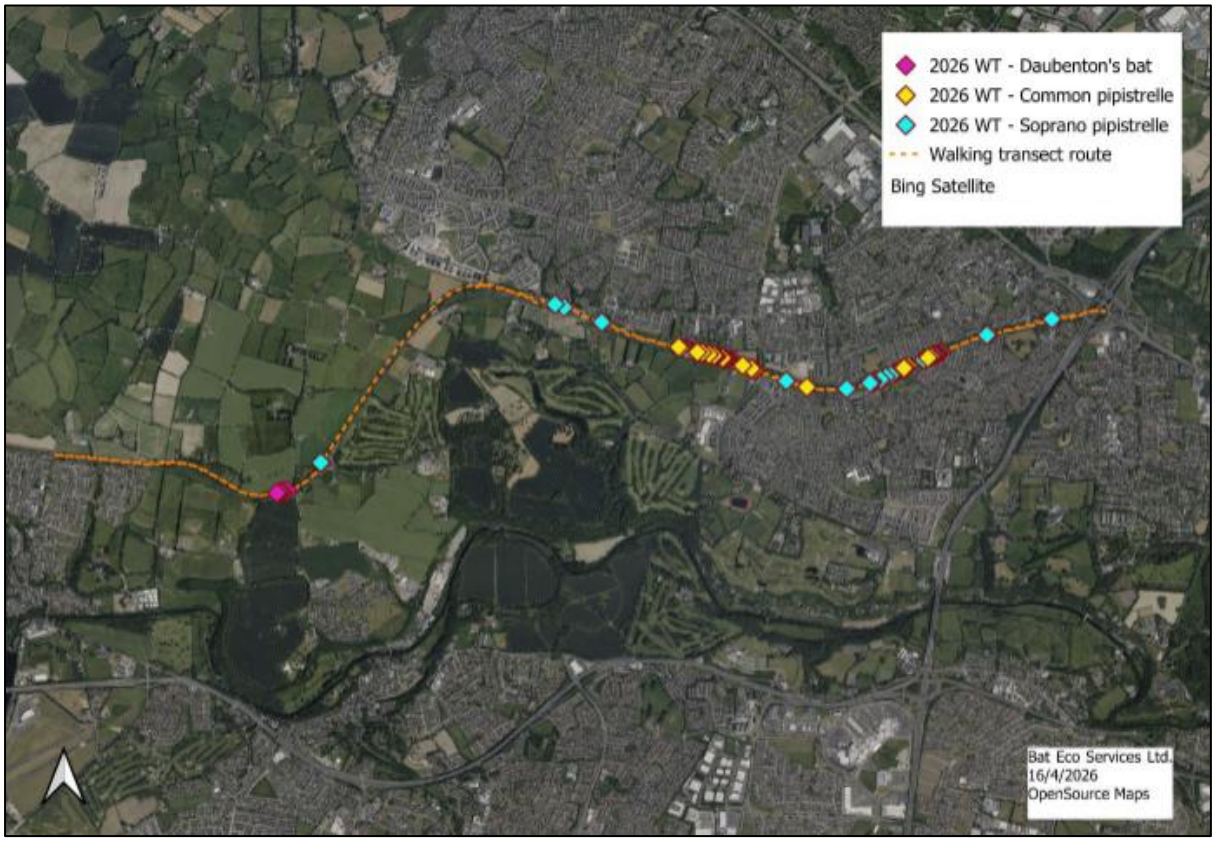


Figure 8-70: Results of bat transect carried out on 15th April 2026 (transect 1) (Bat Eco Services, 2026)

As such, a subsequent survey (transect 2) was carried out on 24th April 2026. Five bat species were recorded, including Leisler's bat, Soprano pipistrelle, Common pipistrelle, Brown Long-eared bat and Daubenton's bat. The level activity was higher during this walking transect and was recorded along the

entire length of the canal route (Figure 8-71). This reflects a week later walking transects with improving weather conditions.

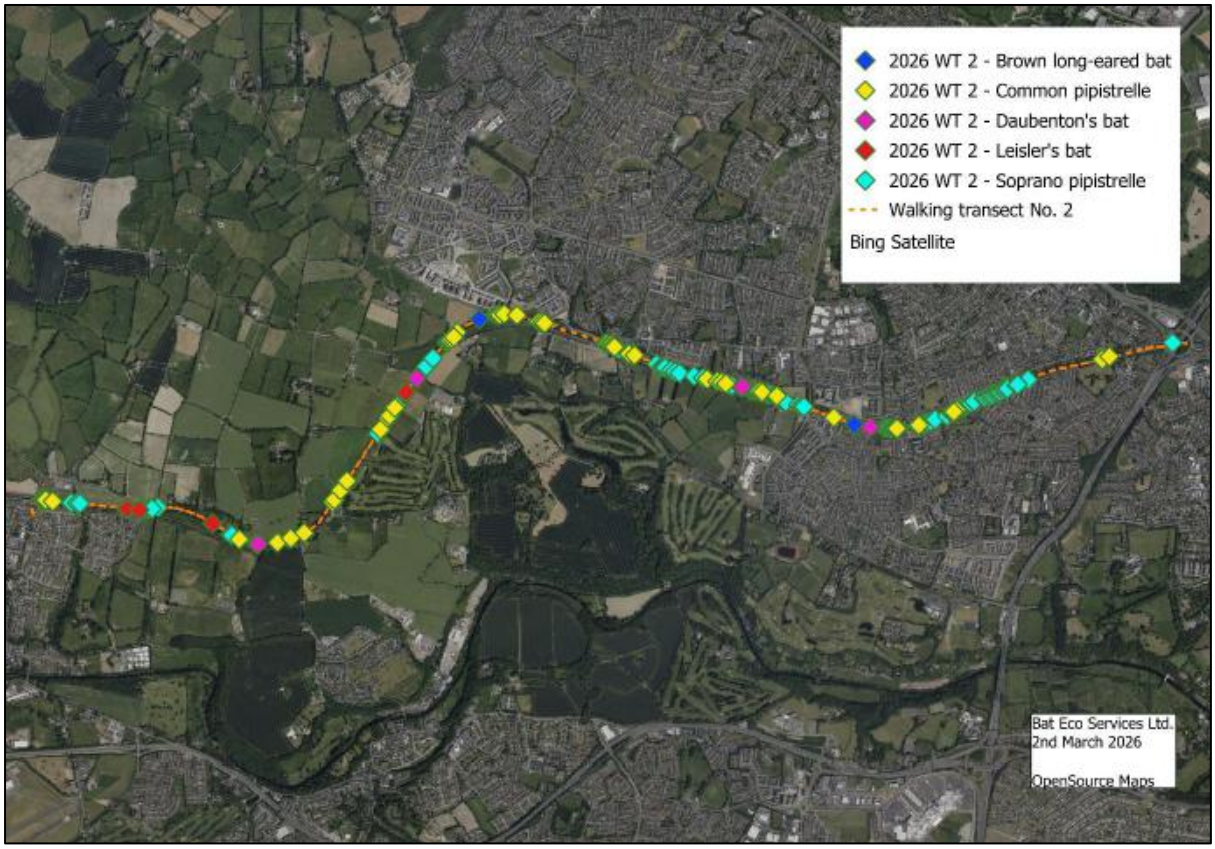


Figure 8-71: Results of bat transect carried out on 26th April 2026 (transect 2) (Bat Eco Services, 2026)

During both surveys, both Pipistrelle species were the most frequently recorded bat species, while the other three species were infrequently encountered. The weather conditions during both surveys were suitable for bat activity for the entire duration of the surveys.

8.6.2.3.2.4 Old Schoolhouse Preliminary Bat Roost Potential Survey

A Preliminary BRP Survey was conducted by ORS Consultants as part of the Old Schoolhouse ecological baseline assessment, which identified moderate to high bat activity potential, with the old schoolhouse and several mature trees offering high-suitability roost features (ORS, 2025). External inspection of the schoolhouse found cracks and crevices suitable for night-roosting, though no droppings, urine staining, or other signs of active use were detected. Ventilation gaps were present but too large to function as roosts. Mature and veteran trees, along with the adjacent canal and hedgerows, provide valuable foraging habitat, particularly for species such as Daubenton's bat.

8.6.2.3.2.5 Kellystown LAP Bat Surveys

The bat activity surveys conducted between July and August 2019, covering the Kellystown LAP area, including the treeline adjacent to the Royal Canal. During these surveys, low levels of bat activity were observed. Leisler's bats, Common pipistrelle, and Soprano pipistrelle were recorded during the surveys.

Numerous mature trees and several old farm buildings were assessed as potential roosts, with field signs confirming bat use of the upper floors of Kellystown House, however no bats emerged from the derelict building surveyed on the 19th of August 2019.

8.6.2.3.2.6 Overall Site Valuation

The area of the canal is considered to be of **county level ecological importance** for bats, given its importance as one of diminishing numbers of dark aquatic corridors within the Greater Dublin area.

8.6.2.3.3 Birds

8.6.2.3.3.1 NBDC Records

Protected bird species recorded within the NBDC records are shown below in Table 8-25.

Table 8-25: Protected bird species recorded within the NBDC records (NBDC, 2026)

Species	BoCCI listing	EU Birds Directive Annex
Arctic Tern *Sterna paradisaea*	Amber (B)	Annex I
Barn Owl *Tyto alba*	Red (B)	Annex I
Bar-tailed Godwit *Limosa lapponica*	Red (W)	Annex I
Black Guillemot *Cepphus grylle*	Amber (B)	N/A
Black-headed Gull *Chroicocephalus ridibundus*	Amber (B&W)	N/A
Black-tailed Godwit *Limosa limosa*	Red (W)	N/A
Brambling *Fringilla montifringilla*	Amber (W)	N/A
Common Guillemot *Uria aalge*	Amber (B)	N/A
Common Gull *Larus canus*	Amber (B&W)	N/A
Common Sandpiper *Actitis hypoleucos*	Amber (B)	N/A
Common Scoter *Melanitta nigra*	Red (B&W)	Annex II & III

Species	BoCCI listing	EU Birds Directive Annex
Common Tern *Sterna hirundo*	Amber (B)	Annex I
Coot *Fulica atra*	Amber (B&W)	Annex II & III
Cormorant *Phalacrocorax carbo*	Amber (B&W)	N/A
Curlew *Numenius arquata*	Red (B&W)	Annex II
Curlew Sandpiper *Calidris ferruginea*	Red (P)	Annex I
Dunlin *Calidris alpina*	Red (B&W)	N/A
Eider *Somateria mollissima*	Red (B&W)	Annex II & III
Fulmar *Fulmarus glacialis*	Amber (B)	N/A
Gadwall *Mareca strepera*	Amber (B&W)	Annex II
Gannet *Morus bassanus*	Amber (B)	N/A
Goldcrest *Regulus regulus*	Amber (B)	N/A
Golden Plover Pluvialis apricaria	Red (B&W)	Annex I, II & III
Goldeneye *Bucephala clangula*	Red (W)	Annex II
Great Crested Grebe *Podiceps cristatus*	Amber (B&W)	N/A

Species	BoCCI listing	EU Birds Directive Annex
Great Northern Diver *Gavia immer*	Amber (W)	Annex I
Greenfinch *Chloris chloris*	Amber (B)	N/A
Grey Plover *Pluvialis squatarola*	Red (W)	N/A
Grey Wagtail *Motacilla cinerea*	Red (B)	N/A
Herring Gull *Larus argentatus*	Amber (B&W)	N/A
House Martin *Delichon urbicum*	Amber (B)	N/A
House Sparrow *Passer domesticus*	Amber (B)	N/A
Kestrel *Falco tinnunculus*	Red (B)	N/A
Kingfisher *Alcedo atthis*	Amber (B)	Annex I
Kittiwake *Rissa tridactyla*	Red (B)	N/A
Knot *Calidris canutus*	Red (W)	N/A
Lapwing *Vanellus vanellus*	Red (B&W)	Annex II
Lesser Black-backed Gull *Larus fuscus*	Amber (B&W)	N/A
Linnet *Linaria cannabina*	Amber (B)	N/A

Species	BoCCI listing	EU Birds Directive Annex
Little Egret *Egretta garzetta*	Green	Annex I
Long-tailed Duck *Clangula hyemalis*	Red (W)	Annex II
Mallard *Anas platyrhynchos*	Amber (B&W)	Annex II & III
Manx Shearwater *Puffinus puffinus*	Amber (B)	N/A
Meadow Pipit *Anthus pratensis*	Red (B)	N/A
Mediterranean Gull *Ichthyaetus melanocephalus*	Amber (B)	Annex I
Mute Swan *Cygnus olor*	Amber (B&W)	N/A
Oystercatcher *Haematopus ostralegus*	Red (B&W)	N/A
Peregrine *Falco peregrinus*	Green	Annex I
Pheasant *Phasianus colchicus*	Green	Annex II & III
Pink-footed Goose *Anser brachyrhynchus*	Green	Annex II
Pintail *Anas acuta*	Amber (W)	Annex II & III
Pochard *Aythya ferina*	Red (B&W)	Annex II & III
Puffin *Fratercula arctica*	Red (B)	N/A

Species	BoCCI listing	EU Birds Directive Annex
Razorbill *Alca torda*	Red (B)	N/A
Red Kite *Milvus milvus*	Red (B)	Annex I
Red-breasted Merganser *Mergus serrator*	Amber (B&W)	Annex II
Redshank *Tringa totanus*	Red (B&W)	N/A
Red-throated Diver *Gavia stellata*	Amber (B&W)	Annex I
Redwing *Turdus iliacus*	Red (W)	N/A
Ringed Plover *Charadrius hiaticula*	Amber (B&W)	N/A
Rock Dove *Columba livia*	Green	Annex II
Ruff *Calidris pugnax*	Amber (P)	Annex I
Sand Martin *Riparia riparia*	Amber (B)	N/A
Sandwich Tern *Thalasseus sandvicensis*	Amber (B)	Annex I
Scaup *Aythya marila*	Red (W)	Annex II & III
Shag *Gulosus aristotelis*	Amber (B)	N/A
Shelduck *Tadorna tadorna*	Amber (B&W)	N/A

Species	BoCCI listing	EU Birds Directive Annex
Short-eared Owl *Asio flammeus*	Amber (B)	Annex I
Shoveler *Spatula clypeata*	Red (B&W)	Annex II & III
Skylark *Alauda arvensis*	Amber (B)	N/A
Smew *Mergellus albellus*	Amber (W)	Annex I
Snipe *Gallinago gallinago*	Red (B&W)	Annex II & III
Spotted Flycatcher *Muscicapa striata*	Amber (B)	N/A
Starling *Sturnus vulgaris*	Amber (B)	N/A
Stock Dove *Columba oenas*	Red (B)	N/A
Swallow *Hirundo rustica*	Amber (B)	N/A
Swift *Apus apus*	Red (B)	N/A
Teal *Anas crecca*	Amber (B&W)	Annex II & III
Tree Sparrow *Passer montanus*	Amber (B)	N/A
Tufted Duck *Aythya fuligula*	Amber (B&W)	Annex II & III
Turnstone *Arenaria interpres*	Amber (W)	N/A

Species	BoCCI listing	EU Birds Directive Annex
Turtle Dove *Streptopelia turtur*	Red (P)	N/A
Twite *Linaria flavirostris*	Red (B)	N/A
Wheatear *Oenanthe oenanthe*	Amber (B)	N/A
Whooper Swan *Cygnus cygnus*	Amber (B&W)	Annex I
Wigeon *Mareca penelope*	Amber (B&W)	Annex II & III
Willow Warbler *Phylloscopus trochilus*	Amber (B)	N/A
Woodcock *Scolopax rusticola*	Red (B)	Annex II & III
Yellowhammer *Emberiza citrinella*	Red (B)	N/A
Designated category within BOCCI; B = Breeding, W = Wintering, P = Passage		

8.6.2.3.3.2 JBA Breeding Bird Surveys

The Royal Canal is an important ecological corridor for birds, with a variety of species recorded on site during JBA consulting's Breeding Bird Surveys. JBA Consulting conducted breeding bird surveys in April, May and June of 2022, and additional surveys in June 2024, April, May, and June 2025. As outlined in sub-section 8.3.3.2, no wintering bird surveys were conducted due to the distance of the Proposed Development from Dublin Bay and a lack of traditional supporting terrestrial habitat (i.e. grass pitches) for migratory wintering bird species.

A total of 58 species were recorded on site. The species are listed in Table 8-26 along with their respective listing on the Birds of Conservation Concern Ireland (Gilbert et al., 2021).

Table 8-26: Birds recorded during 2022-2025 Breeding Bird Surveys

Species		BoCCI 2020-2026
Barn Swallow	*Hirundo rustica*	Amber (B)

Species		BoCCI 2020-2026
Black Redstart	*Phoenicurus ochruros*	Green
Blackbird	*Turdus merula*	Green
Blackcap	*Sylvia atricapilla*	Green
Blue Tit	*Cyanistes caeruleus*	Green
Bullfinch	*Pyrrhula pyrrhula*	Green
Buzzard	*Buteo buteo*	Green
Chaffinch	*Fringilla coelebs*	Green
Chiffchaff	*Phylloscopus collybita*	Green
Coal tit	*Periparus ater*	Green
Collared Dove	*Streptopelia decaocto*	Green
Common Snipe	*Galinnago gallinago*	Red (B&W)
Cuckoo	*Cuculus canorus*	Green
Dunnock	*Prunella modularis*	Green
Feral Pigeon	*Columba livia domestica*	Green
Garden Warbler	*Sylvia borin*	Green
Goldcrest	*Regulus regulus*	Amber (B)
Goldfinch	*Carduelis carduelis*	Green
Great Cormorant	*Phalocrocorax carbo*	Amber (B&W)
Great tit	*Parus major*	Green
Greater Whitethroat	*Sylvia communis*	Green
Greenfinch	*Chloris chloris*	Amber (B)
Grey Heron	*Ardea cinerea*	Green
Grey Wagtail	*Motacilla cinerea*	Red (B)
Hooded Crow	*Corvus cornix*	Green
House Martin	*Delichon urbicum*	Amber (B)
House Sparrow	*Passer domesticus*	Amber (B)
Jackdaw	*Corvus monedula*	Green
Linnet	*Linaria cannabina*	Amber (B)
Long-tailed Tit	*Aegithalus caudatus*	Green
Magpie	*Pica pica*	Green
Mallard	*Anas platyrhynchos*	Amber (B&W)
Mistle Thrush	*Turdus viscivorus*	Green
Moorhen	*Gallinula chloropus*	Green
Muscovy Duck	*Cairina moschata*	Green
Mute Swan	*Cygnus olor*	Amber (B&W)
Pheasant	*Phasianus colchicus*	Green
Pied Wagtail	*Motacilla alba*	Green
Reed Bunting	*Emberiza schoeniclus*	Green

Species		BoCCI 2020-2026
Reed Warbler	*Acrocephalus scirpaceus*	Green
Robin	*Erithacus rubecula*	Green
Rook	*Corvus frugilegus*	Green
Sparrow	*Passer domesticus*	Amber (B)
Song Thrush	*Turdus philomelos*	Green
Spotted Flycatcher	*Musciapa striata*	Amber (B)
Starling	*Sturnus vulgaris*	Amber (B)
Stock Dove	*Columba oenas*	Amber (B)
Swallow	*Hirundo rustica*	Amber (B)
Swift	*Apus apus*	Red (B)
Treecreeper	*Certhia familiaris*	Green
Willow Warbler	*Phylloscopus trochilus*	Amber (B)
Wood Pigeon	*Columba palumbus*	Green
Woodpecker	*Dendrocopus major*	Green
Wren	*Troglodytes troglodytes*	Green
Yellowhammer	*Emberiza citrinella*	Red (B)
Designated category within BOCCI; B = Breeding, W = Wintering		

Notably, Barn Swallow were recorded nesting under the M3 Parkway Rail Line crossing over the Royal Canal, Chainages +3270-3290. Additionally, the amber listed bird species Sparrow and Starling were recorded nesting along the Proposed Development. Heat maps of recorded birds are provided in Figure 8-72, Figure 8-73 and Figure 8-74. A heatmap is a two-dimensional representation of data, in this case bird recordings, with areas that have higher concentrations of bird recordings having higher heatmap gradient values. Higher values are visualised as darker areas within the heatmaps and represent hotspots of bird activity identified during the bird surveys.

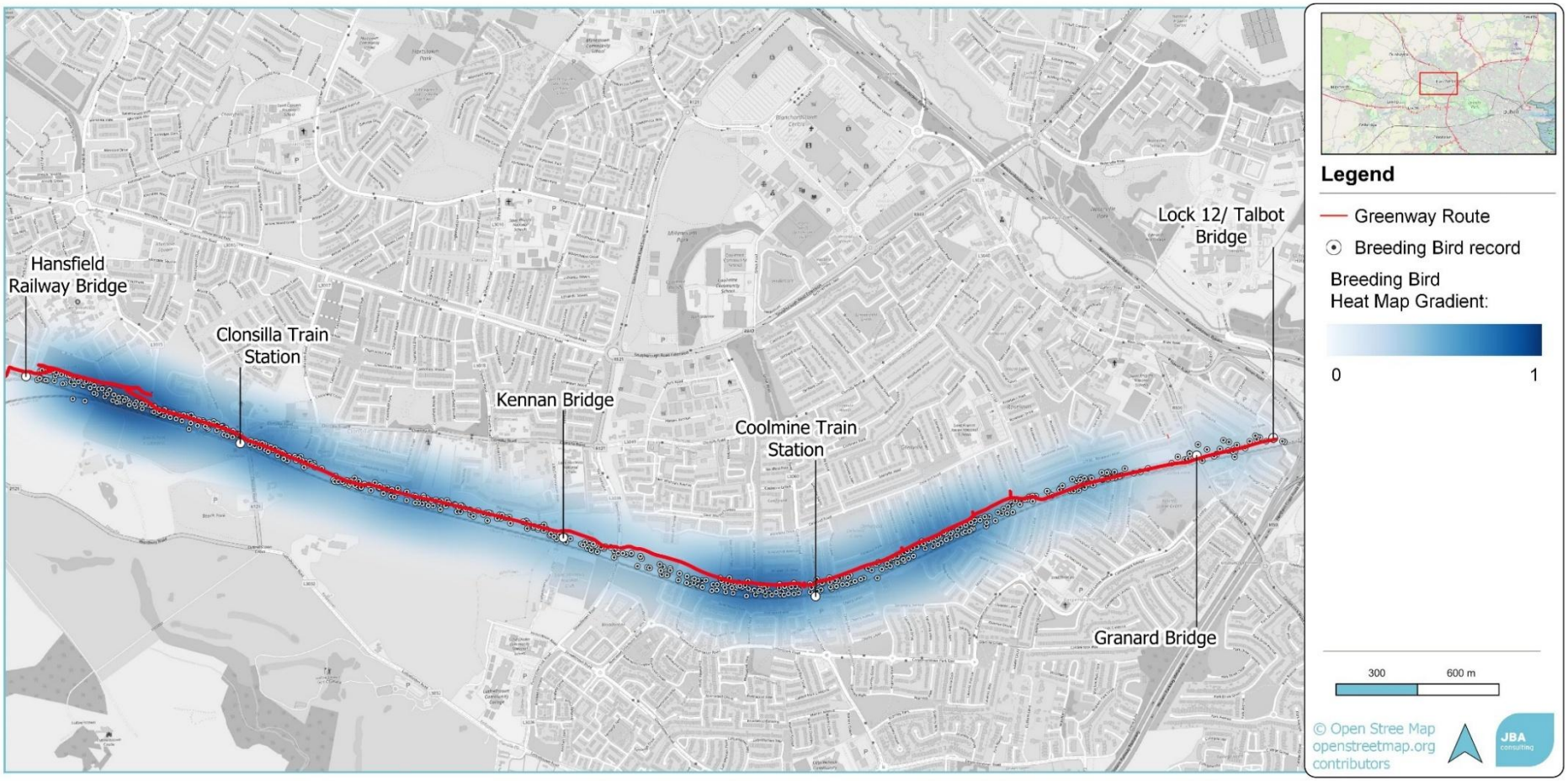


Figure 8-72: Heat map of breeding birds recorded on site (©OSM, 2026)

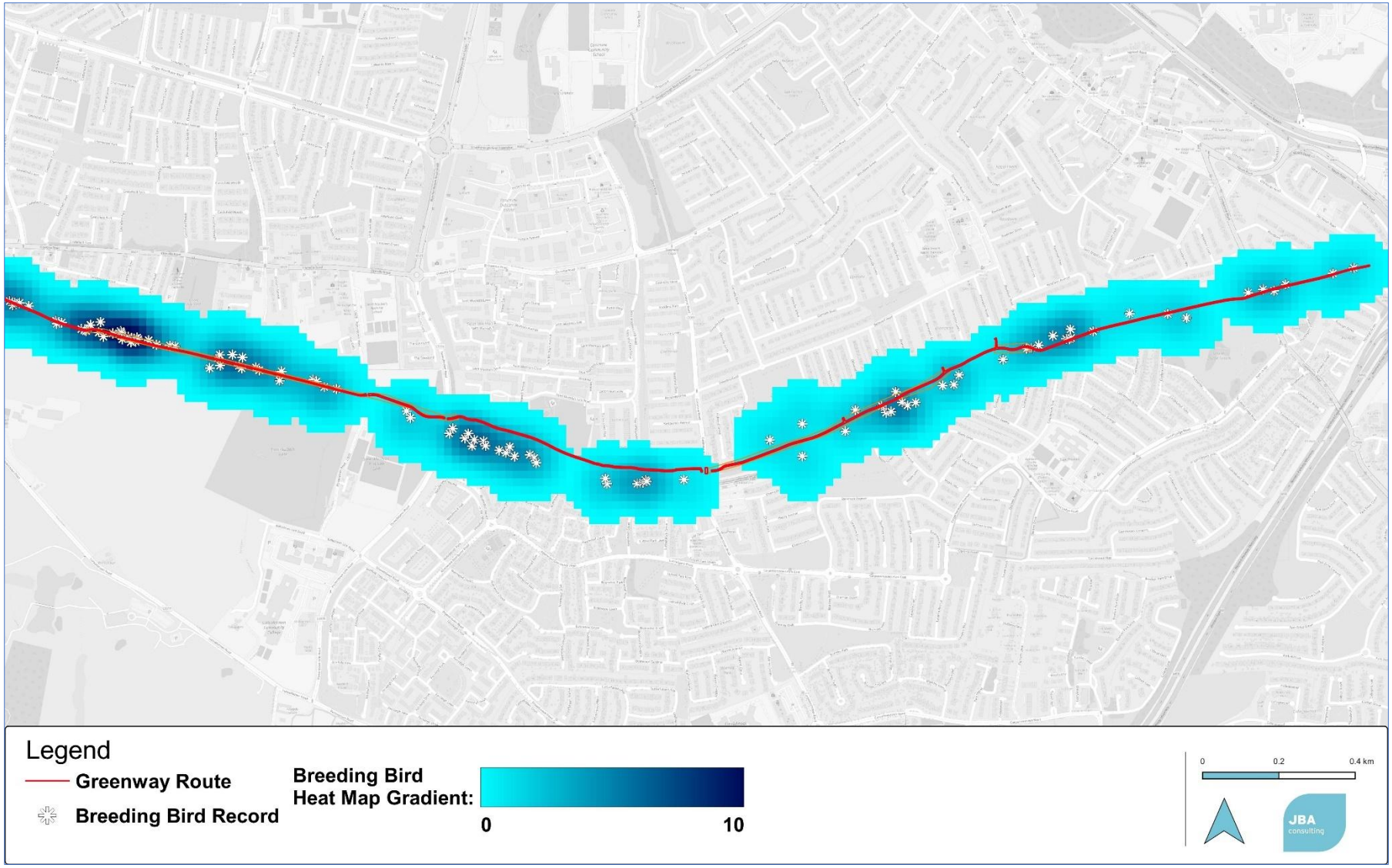


Figure 8-73: Heat map of bird species present during the 2024 surveys along the eastern half of the Greenway (©OSM, 2026)

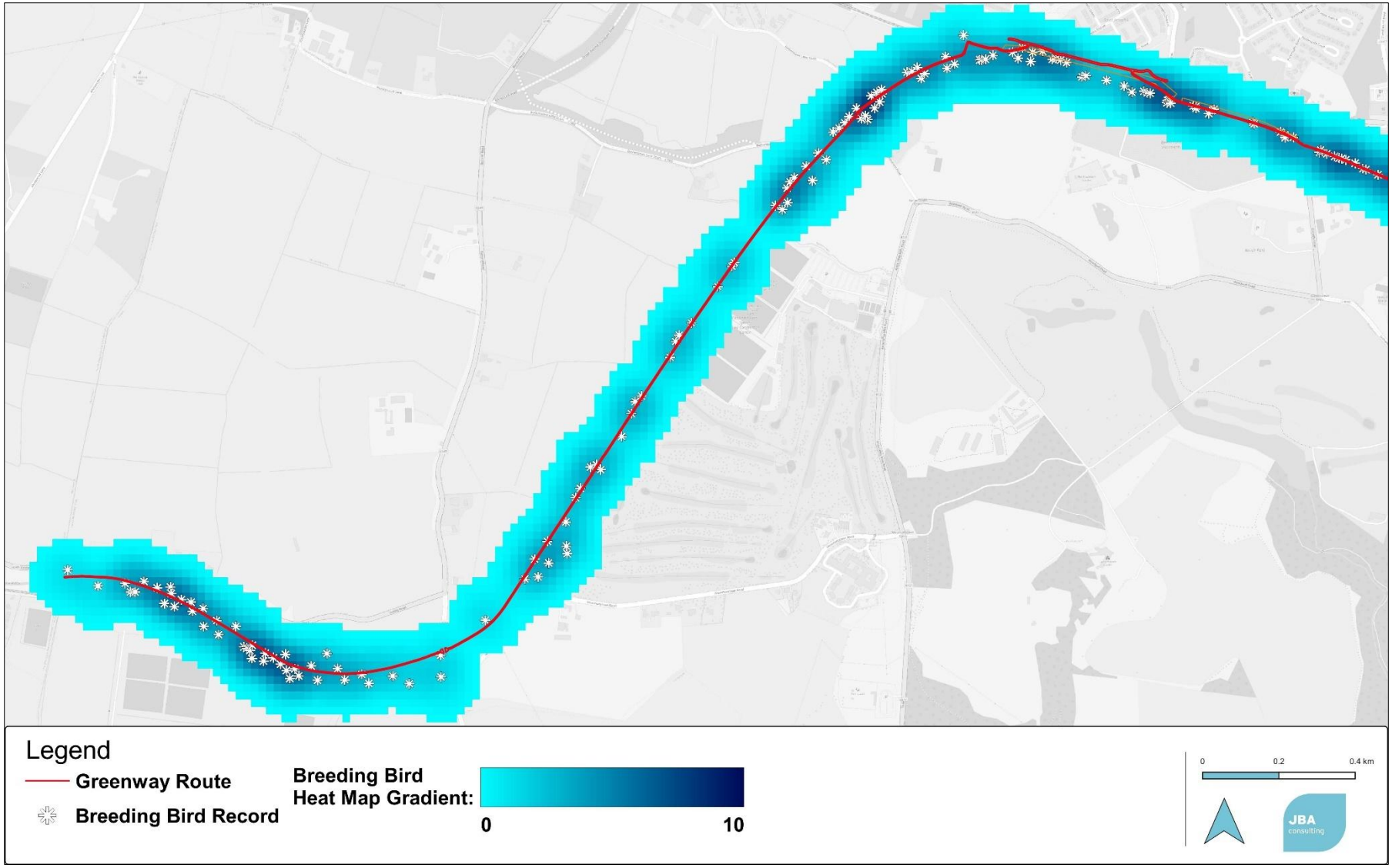


Figure 8-74: Heat map of bird species present during the 2024 surveys along the western half of the Greenway (©OSM, 2026)

8.6.2.3.3.3 JBA Riparian Bird Survey

JBA Ecologists conducted a Riparian Bird survey along the Royal Canal on the 16th of July 2024. Riparian birds recorded within this survey are listed in Table 8-27, and are displayed in Figure 8-75. Mallard was recorded nesting within the canal, and Moorhen chicks were recorded. Any riparian birds observed during the 2025 breeding bird survey were also noted.

Table 8-27: Birds recorded during 2024 Riparian Bird Surveys

Species		BoCCI 2020-2026
Great Cormorant	*Phalacrocorax carbo*	Amber (B&W)
Grey Heron	*Ardea cinerea*	Green
Little Grebe	*Tachybaptus ruficollis*	Green
Mallard	*Anas platyrhynchos*	Amber (B&W)
Moorhen	*Gallinula chloropus*	Green
Reed Bunting	*Emberiza schoeniclus*	Green
Tufted Duck	*Aythya fuligula*	Amber (B&W)
Designated category within BOCCI; B = Breeding, W = Wintering		



Figure 8-75: Riparian Birds recorded during the Breeding and Riparian Bird surveys (2024 - 2025) (©OSM, 2026)

Waterbird species were found along the canal, using reed beds as cover for nesting in (Figure 8-76 and Figure 8-77).



Figure 8-76: Mallard chicks recorded during JBA Bird Surveys



Figure 8-77: Mallard chicks recorded nesting within the canal banks during the July 2024 survey

Additionally, during the JBA habitat survey undertaken on 04/06/2026, JBA surveyors met a member of the public who mentioned seeing Kingfisher along the Royal Canal. They provided a photograph of a Kingfisher perching on a branch hanging over the Royal Canal earlier this year.

8.6.2.3.3.4 Old Schoolhouse Masterplan Bird Surveys

During the three bird surveys conducted in July 2024, a total of 29 species were recorded, of which only one Red-listed species, Swift, and nine Amber-listed species: House Sparrow, House Martin, Herring Gull, Swallow, Goldcrest, Sand Martin, Lesser Black-backed Gull, Willow Warbler, and Cormorant. The hedgerows to the west of the Schoolhouse were used as nesting habitat by several resident and migratory bird species, including Chiffchaff and the amber-listed Willow Warbler, while feral pigeons nested and roosted in the old schoolhouse building. Additional nesting species such as Blackbird, Dunnock, and Wren were also recorded across the site.

8.6.2.3.3.5 Kellystown LAP Bird Survey

The late-season bird survey at the Kellystown lands, carried out on the 19th of August 2019, recorded a typical assemblage of common farmland and hedgerow species, with Woodpigeon and Swallow being the most frequently observed. External building checks showed no active nests, while internal inspection revealed several older Swallow nests, two of which had been recently reworked, indicating current-year use. Twelve species were recorded in total, predominantly Green-listed birds such as Magpie, Jackdaw, Chaffinch, Song Thrush, and Blackbird, alongside two Amber-listed species, Swallow and House Sparrow. The Amber-listed species, Herring Gull, was also noted only in passing and is unlikely to use the site beyond flyovers. Overall, no rare or conservation-priority species were found, and the bird community reflects locally common populations.

8.6.2.3.3.6 Overall Site Valuation

Most breeding birds encountered are typical woodland and garden species, and favoured the wooded habitats on site, such as those near Coolmine Railway Station, and the wooded area east of Hansfield Railway Bridge. A number of nests belonging to a variety of species were recorded throughout the survey area. The vegetated areas along the Proposed Development are of considerable use to breeding birds for foraging and nesting. As such the site of the Proposed Development is considered to be of **local (higher value) ecological importance** for Birds.

8.6.2.3.4 Amphibians and Reptiles

No amphibians or reptiles were recorded during site surveys, or during the Old Schoolhouse survey conducted by ORS Consultants (ORS, 2025). However, the margins of the Royal Canal and some of the drainage ditches and wet habitats within the vicinity of the canal offer suitable habitat for Smooth Newt *Lissotriton vulgaris* and for Common Frog *Rana temporaria.* There are additional foraging and refugia resources for these species within the woodland, scrub, and grassland habitats adjacent to the Royal Canal. Common Lizard *Zootoca vivipara* may be present in drier, sunnier areas along the Proposed Development, however most of the habitat along the Proposed Development is considered less than optimal for this species. Smooth Newt and Common Frog were present within a search of the NBDC records within the last 10 years (NBDC, 2026). Common Frog is protected under Annex V of the EU Habitats Directive, and all three species are protected under the Wildlife Acts 1976 to 2022 and the Wildlife (Amendment) Act 2023. The site area is considered to be of **local (higher value) ecological importance** for amphibian species, and **local (lower value) ecological importance** to Common Lizard.

8.6.2.3.5 Terrestrial Invertebrates

Pollinator surveys were conducted by JBA ecologists in July 2022 and August 2024.

8.6.2.3.5.1 Bee species

White tailed bumblebee *Bombus lucorum* was the most common bee encountered during these surveys, with a presence across the three sections of the development. The Honeybee *Apis mellifera*, Common Carder bee

Bombus pascuorum, and Early Bumblebee were also highly recorded, with a preference for the grassy verges and flowering tall herbs of Section 1 of the Proposed Development. A single record of Buffed-tailed Bumble bee *Bombus terrestris* was made near Pakenham bridge, while Large Red-tailed Bumble bee was recorded twice on site, near Hansfield Railway bridge and within the confines of the Porterstown Old School Grounds. A Common Carder Bee nest was found in the GS2 dry meadow 20m from the Old Porterstown School House.

8.6.2.3.5.2 Ant Species

Ant colony burrowing holes were found in numerous banks across Section 2 of the Proposed Development, particularly in and around Callaghan Bridge and sections of the Porterstown School Grounds, while ant nest mounds were confirmed at four locations within the development. Ant species recorded throughout the development include Pharoh Ant *Monomorium pharaonis*, Red Ant *Solenopsis* spp. and Yellow Meadow Ant *Lasius flavus*.

8.6.2.3.5.3 Butterflies and Moths

A variety of species were recorded including Beautiful China-mark *Nymphula stagnata,* Small White, Large White *Pieris brassicae*, Painted Lady, Common Blue *Polyommatus icarus*, Meadow Brown *Maniola jurtina* and Speckled Wood *Pararge aegeria.* A single Comma *Polygonia c-album* butterfly was recorded among the flowering plants of the dry meadow verge near Collins Bridge (Figure 8-78). There were no signs of the Annex II listed species Marsh Fritillary *Euphydryas aurinia* recorded during the pollinator surveys, or within the NBDC records (NBDC, 2026)

All of these species, apart from the Speckled Wood, were recorded in Section 1 at the western end of the Proposed Development, among the grassy verges and flowering herbs of the canal's marginal vegetation. The Speckled Wood was recorded in Section 2 where woodland became more common.

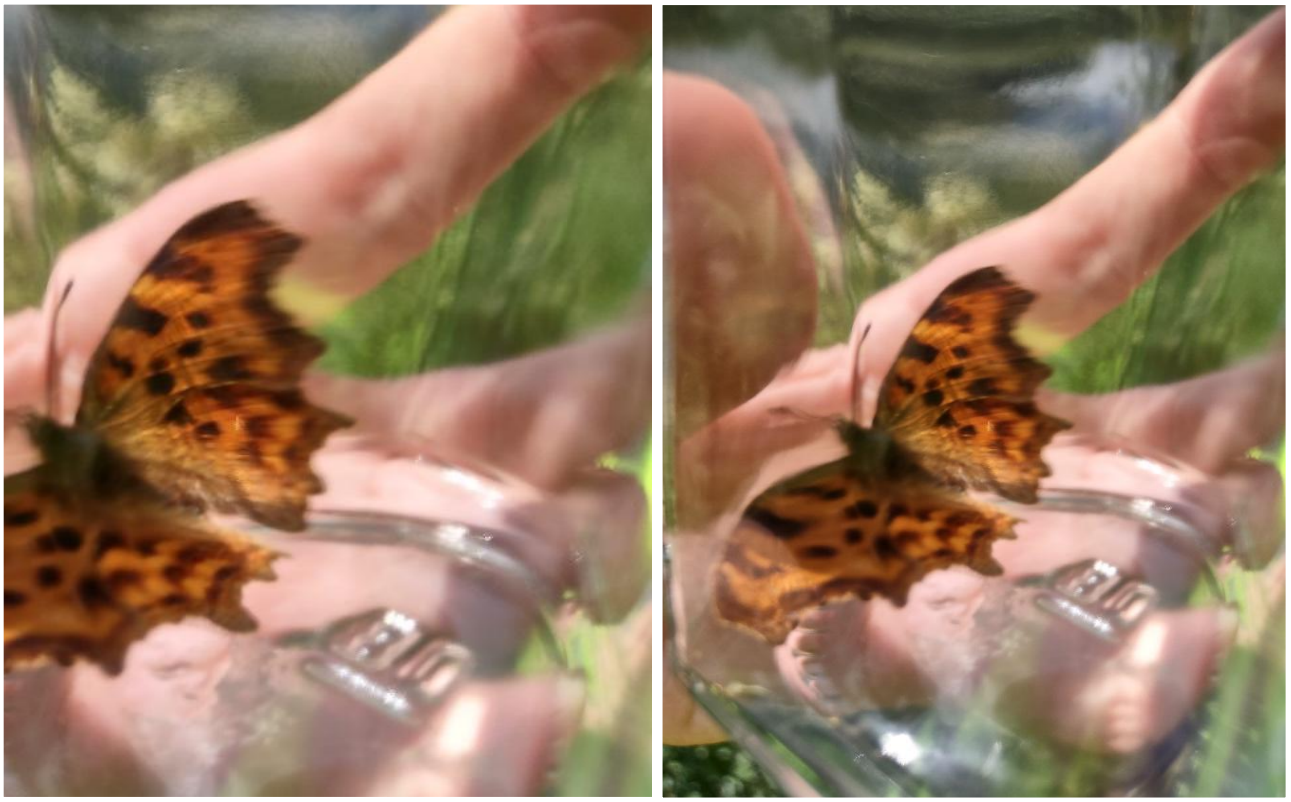


Figure 8-78: Comma butterfly recorded near Collins Bridge, July 2022

The area of the Proposed Development, particularly the flowering habitats of Section 1, is considered to be of **local (higher value) ecological importance** to bees and butterflies.

8.6.2.3.6 Aquatic Invertebrates (Odonanta)

Odonanta (dragonflies and damselflies) were recorded during habitat and pollinator surveys along the canal tow path. Brown Hawker *Aeshna grandis* and Emperor Dragonfly *Anax imperator* were recorded foraging along the canal in each section, including wooded areas. Banded Demoiselle *Calopteryx splendens*, Blue-tailed *Ischnura elegans* and Common Blue Damselflies *Enallagma cyathigerum* were frequently recorded in Section 1 of the development.

The entire length of canal along the Proposed Development is considered to be of **local (higher value) ecological importance** for Odonanta (dragonflies and damselflies).

8.6.2.3.7 Aquatic Macro-invertebrates

8.6.2.3.7.1 INVAS Biosecurity Ltd Report

A Water Framework Directive Compliance Report was completed by INVAS Biosecurity Ltd. in 2021. Aquatic macroinvertebrates were monitored as part of the overall assessment. A total of 15 different species were recorded. Composition and abundance corresponded to an Ecological Quality Ration (EQR) score of 0.62 at the Castleknock survey site. This indicates a 'Good' status for Macroinvertebrate potential at this point in along the canal.

8.6.2.3.7.2 Evelyn Mookens & Associates Surveys

A Molluscan Survey of potential *Vertigo* habitats was conducted by Evelyn Mookens & Associates in July 2016 (Moorkens, E., 2016). This molluscan survey was undertaken for Richard Nairn in order to assess the quality of the relevant potential habitats that could support Vertigo whorl snail species, in particular the three Annex II species *Vertigo moulinsiana, V. angustior* and *V. geyeri*. The survey was informed by an ecological study undertaken by BEC Consultants Ltd (BEC, 2013, see Appendix 8.5.1), which provided the locations of habitats that have the potential to support Vertigo species. During this survey, no Annex II *Vertigo* species were recorded. The near-threatened species Silky Snail *Ashfordia granulate* was recorded.

Evelyn Mookens & Associates conducted additional surveys of the Royal Canal for freshwater molluscs in May 2024 (Moorkens & Killeen, 2025, see Appendix 8.5.6). 20 sites were surveyed, 12 of which had been previously surveyed in 2003 by Evelyn Mookens & Associates. Glutinous Snail was recorded at 3 sites, 2 of which are along the Proposed Development. The Irish population of Glutinous Snail is considered to be globally important and makes up to 50% of the global population, and is considered to be an Endangered species, with the Royal Canal and Grand Canal being key areas for the Irish populations (Byrne. A, et al. 2009). Additionally, the endangered species False-orb Pea Mussel *Euglesa pseudosphaerium* was recorded at 5 sites, one of which is along the Proposed Development.

Due to the absence of evidence of any Rye Water Valley/Carton SAC QI *Vertigo* species, the section of the Royal Canal running adjacent to the site, as well as the downstream sections, **are not considered ex-situ supporting habitat for these QI species.**

8.6.2.3.7.3 Triturus Environmental Ltd Surveys

Triturus Environmental Ltd. conducted freshwater macro-invertebrate surveys between April-May 2023 (Triturus Environmental, 2024d). Two living Glutinous Snails were recorded near Collins' Bridge. Triturus Environmental Ltd. also conducted Glutinous Snail surveys on the 29th and 30th May 2025 of an approximate 3km survey area between Confey Slipway and Pakenham Bridge (see Appendix 8.5.7). A total of 158 live Glutinous Snails (mostly adults) were recorded along this 3km area of the Royal Canal. Around 3 empty shells and 3 egg masses were recorded between Confey Slipway and Collin's Bridge. No live Glutinous Snails, shells, or egg masses were

recorded within the vicinity of Callaghan's Bridge. In addition to Glutinous Snail, a low number of the Red listed Swan Mussel *Anodonta cygnea* were recorded during the surveys.

During the macro-invertebrate surveys completed by Triturus Environmental Ltd., a total of n=62 species across 37 families of macro-invertebrates were encountered. For the entirety of the canal, the sweeps were dominated by common species, including Freshwater Hoglouse; *Coenagrionidae* species Damselflies, *Leptoceridae* and *Limnephillidae* spp., Cased Cadis, Biting Midge larvae Non-*Chironomus* spp., while also having rarer and near threatened species Hydravore Crawler Water Beetle *Leptocerus tineiformis*. Caddis Fly *Leptocerus tinneiformis*. The results of these surveys are summarised in Table 8-28 and shown in Figure 8-79 overleaf.

8.6.2.3.7.4 Old Schoolhouse Masterplan Surveys

A survey was conducted on two sites within the Royal Canal showing poor ecological conditions adjacent to the Old Schoolhouse lands (Chainages +4580 - +5300), with macro-invertebrate communities dominated by pollution-tolerant taxa. Upstream (Site 1) was overwhelmingly composed of Group C taxa (97%), with only small numbers of Group D and E species, resulting in a Q-value of 3 and classification as 'Moderately Polluted' and unsatisfactory condition. Downstream (Site 2) showed a similar pattern, with Group C again dominant (94%) and Groupd D present in "fair numbers" (6%), also producing a Q-value of 3 and the same 'Poor' WFD status. Both sites lacked macrophytes, had uniform muddy substrates, and displayed slow-flowing glide conditions, all consistent with a degraded aquatic environment.

8.6.2.3.7.5 Overall Site Valuation

Given the high density 158 live Glutinous Snail, False-orb Pea Mussel and Swan Mussel, which are endangered and listed a Red Listed species, and the occurrence of additional macro-invertebrates through the waters of the Royal Canal, the area of the Proposed Development is considered to be of **national level ecological importance**.

Table 8-28: Summary of Glutinous Snail recorded in the Royal Canal survey area, May 29th - 30th 2025 (Triturus, 2025c)

Date	Location	Record	Abundance	Notes	ITM x	ITM y
29/05/2025	220m east of Confey slipway	Dead shell	n/a	Single dead/empty shell recorded from shallow sloping clay margin	701903	736987
29/05/2025	240m east of Confey slipway	*Myxas* eggs	n/a	*Myxas* egg mass recorded on small boulder in shallow sloping clay margin near moored boat with scattered hard substrata.	701924	736981
29/05/2025	Angling peg 45	Adult	1	Single *Myxas* adult attached to *Sparganium erectum* stem amongst *Nuphar lutea*	701943	736974
29/05/2025	Angling peg 50	Adult	3	3 x *Myxas* individuals on *Nuphar lutea* leaves among Chara, <75cm depth. Shallow, gently sloping with silt.	702030	736931
29/05/2025	425m east of Confey slipway	Adult	1	1 x *Myxas* on largest boulder in patch adjoining large stand of lily in 1-1.2m depth. Small area of exposed gravelly rocky slope with *Glyceria maxima* and *Nuphar lutea* with scattered small boulder. Only some localised *Chara* sp. Dead shell also recorded	702080	736900
29/05/2025	425m east of Confey slipway	Dead shell		Dead/empty shell recorded within above patch	702078	736899
29/05/2025	445m east of Confey slipway	Adult	1	1 x smaller adult *Myxas* recorded via snorkelling on tall *Nuphar lutea* stem along south bank lily fringe in 1.6m depth adjoining deep navigation channel. Atypical habitat	702096	736878
29/05/2025	490m west of Collin's bridge	Adult	100	Abundant *Myxas* adults (>100) along shallow sloping clay shelf between *Schoenoplectus lacustris* stands opposite old boat. Abundant *Chara hispida* below clay fringe, with frequent *Alisma-plantago aquatica* and *Nuphar lutea*. Snails grazing on shallow exposed soft bed (not plants) which was noticeably warmer than adjoining deeper areas. No snails in deep water	Start: 702180 Stop: 702196	Start: 736847 Stop: 736827
29/05/2025	460m west of Collin's bridge	Adult	10	Scattered low density of *Myxas* in small linear patch of exposed clay in upper littorals. More silt than clay with bedded substrata. Scattered *Chara hispida* with occasional *Nuphar lutea* and *Sparganium erectum*	702220	736814
29/05/2025	390m west of Collin's bridge	Adult	12	Low density of *Myxas* in short silty section dominated by *Chara hispida* with frequent *Nuphar lutea* (and decaying tree leaves)	702290	736782
30/05/2025	640m NE of Collin's Bridge	Adult	1	1 x *Myxas* adult on small calcified boulder at base of steep clay bank. Area of *Alisma-plantago aquatica*, *Nuphar lutea* and *Chara hispida* with some clay slopes in upper littorals between 50cm and 80cm deep.	703087	737323
30/05/2025	850m NE of Collin's Bridge	Adult	1	1 x *Myxas* grazing on small low gradient patch of exposed gravelly clay adjoining silt with *Elodea canadensis*, *Glyceria maxima*, *Chara hispida* and *Nuphar lutea*, <1m deep. Good quality habitat but only single adult present.	703204	737496
30/05/2025	South of Packenham Bridge	Adult	3	3 x *Myxas* adults grazing on angular limestone cobble in rocky clay area at base of bank adjoining *Nuphar lutea* and abundant *Sagittaria sagittifolia* and *Elodea canadensis*. Very few other snails present.	703711	738171
30/05/2025	Packenham Bridge	Adult	25	c.25 x adult *Myxas* grazing on sloping calcified retaining wall under & adjoining Packenham Bridge (west bank only), with some on adjacent *Nuphar lutea* at base. Adjoining deeper *Sagittaria sagittifolia* and *Nuphar lutea* with some *Chara* sp. in upper littorals near wall and scattered boulder/cobble at its base	Start: 703757 Stop: 703794	Start: 738216 Stop: 738251



Figure 8-79: Overview of the Royal Canal Urban Greenway Glutinous Snail records, May 2025 (Triturus Environmental Ltd, 2025c)

8.6.2.3.8 White-clawed Crayfish

A desk-based assessment of White-clawed Crayfish *Austropotamobius pallipes* was conducted which indicated the presence of this species within the Royal Canal along the route of the Proposed Development (NBDC, 2026). White-clawed Crayfish are listed on Annex II and Annex V of the Habitats Directive and the species is protected in Ireland under the Wildlife Acts. The species is known to breed in canals, using densely vegetated verges and large rocks as refuges during the day (Demers et al. 2005). During the surveys of other aquatic KERs, including of aquatic macrophytes and invertebrates, conducted by Triturus Environmental Ltd. and Evelyn Moorkens & Associates, as outlined in sub-sections 8.6.2.3.7.2 and 8.6.2.3.7.3, no evidence of White-clawed crayfish was recorded. Additionally, no evidence of Crayfish was recorded during any other surveys conducted for other projects within the Royal Canal (see sub-section 8.6.2.3.7).

However, given the presence of preferable habitat for White-clawed Crayfish, the canal is considered to be of **county level ecological importance** for White-clawed Crayfish.

8.6.2.3.9 Fish

A desktop review was carried out to identify the areas of importance for fish within the study area and ZoI. An electro-fishing survey took place in 2011 between Collins Bridge and the 13th Lock (Paul McLoone, IFI, referenced in Natura Environmental Consultants (2018). Fish within the canal were noted during the ecological surveys by Natura Environmental Consultants (2018). The fish community of the Royal Canal was entirely comprised of coarse fish, European Eel *Anguila anguila* and Pike *Esox lucius* (except for the occasional stray salmonid that may enter the system from nearby rivers), with six species and one hybrid recorded during an electro-fishing survey in 2011 between Collins Bridge and the 13th Lock (Paul McLoone, IFI, pers. comm.). Roach *(Rutilus rutilus)* completely dominated the fish community in this section, in terms of both numbers and biomass, followed by Perch *Perca fluviatilis,* Pike*,* Roach-Bream hybrid *R. rutilus x Abramis brama* and Eel. Small numbers of Tench *Tinca tinca* and Bream *A. brama* were also recorded. Roach, Perch, Pike and European Eel were all seen in the course of the 2013 survey, along with numerous shoals of juvenile fish.

Furthermore, eDNA samples were taken from the Royal Canal in August 2024 by JBA Consultants, with two of the samples taken from the Royal Canal being positive for traces of European Eel. Eel are a critically endangered species and are on the OSPAR list of threatened species and often use canals as foraging habitat before going back to sea for breeding. This canal is considered to be of **county level ecological importance**, within the Liffey and Dublin Bay WFD Catchment and the Royal Canal WFD Artificial Waterbody to European Eel.

The canal is considered a high-quality fishery for coarse fish and pike, particularly within County Dublin, with high recreational usage for angling. Shaded sections of the canal, such as the heavily vegetated verges and wooded sections, are important nursery habitats for species. The canal is therefore considered to be of **county level ecological importance** to coarse fish and pike within the Royal Canal WFD Artificial Waterbody.

8.6.2.3.10 Invasive Non-native Species (On-site)

8.6.2.3.10.1 Invasive Faunal Species

Sightings of Rabbit *Oryctolagus cuniculus* and Brown Rat *Rattus norvegicus,* as well as American Mink *Mustela vison* and Grey Squirrel *Sciurus carolinensis (*both invasive) were made during JBA Consulting walkover surveys and those surveys conducted by Triturus Environmental in 2021 and 2022, as well as previous surveys in 2013, 2014 and 2018. Of these species, American Mink and Grey Squirrel are listed on the Third Schedule throughout Ireland and are both high impact invasive species.

8.6.2.3.10.2 Invasive Floral Species

During the JBA surveys along the Royal Canal (2022-2026), eleven floral invasive non-native species were recorded along or in close proximity to the Proposed Development. These included Butterfly-bush*,* Winter

Heliotrope, Cotoneaster species, Three-cornered Garlic *Allium triquetrum*, Japanese Knotweed *Reynoutria japonica*, Cherry Laurel *Prunus laurocerasus*, Spanish Bluebell *Hyacinthoides hispanica*, Pheasant Berry *Leycesteria formosa*, Russian Vine *Fallopia baldschuanica*, Rhododendron *Rhododendron ponticum*, and Snowberry *Symphoricarpos albus*. The most commonly encountered invasive species were Winter Heliotrope and Three-cornered Garlic. The invasive floral species recorded along or in close proximity to the Proposed Development are mapped in Figure 8-80 through to Figure 8-85 inclusive.

Butterfly-bus, Cotoneaster species, Winter Heliotrope, Russian Vine, Snowberry, and Pheasant Berry are either medium to low impact invasive species and are not listed on the Third Schedule of European Communities (Birds and Natural Habitats) Regulations non-native species subject to restrictions under Regulations 49 and 50. Cherry Laurel is not listed on the Third Schedule either; however, this species is considered to be a high impact invasive species and is currently under review for inclusion within the Third Schedule.

Four species included on the Third Schedule of non-native species subject to restrictions under Regulations 49 and 50 were recorded. These include Three-cornered Garlic, Spanish Bluebell, Rhododendron, and Japanese Knotweed. Three-cornered Garlic was recorded at numerous locations along the Royal Canal. Spanish Bluebell and Rhododendron were recorded on the banks of the Royal Canal (Figure 8-80 and Figure 8-81). As these species are listed on the Third Schedule, they require an invasive species management plan and will be addressed further within the impact assessment.

Around 100m North of Clonsilla station, but not within the route of the Proposed Development, JBA Ecologists recorded Japanese Knotweed (Figure 8-83). While Japanese Knotweed is not located along the Proposed Development, it will be precautionarily considered within the invasive species management plan to prepare for the potential that it invades the habitats along the Proposed Development.

Additionally, during the Macrophyte surveys conducted by Triturus Environmental Ltd. in 2023 and 2024 (Triturus Environmental Ltd, 2024 and Triturus Environmental Ltd, 2025), the two invasive pondweed species Canadian Pondweed *Elodea canadensis* and Nuttal's Pondweed *Elodea nuttallii* were recorded at multiple sites within the Royal Canal, upstream and downstream of the Proposed Development. Canadian Pondweed had increased its distribution considerably in 2024 compared to 2023 (present in 16 survey sites in 2024 vs. 8 survey sites in 2023). Both of these widespread species are listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011-2021 (S.I. 477/2011) and are considered high-risk invasive species in Ireland (O' Flynn et al., 2014).

Whilst spreading rapidly on the adjacent Grand Canal (IFI, 2011), no stands of New Zealand Pigmyweed *Crassula helmsii* was recorded during the survey, in keeping with the known distribution of this species in Irish waters.

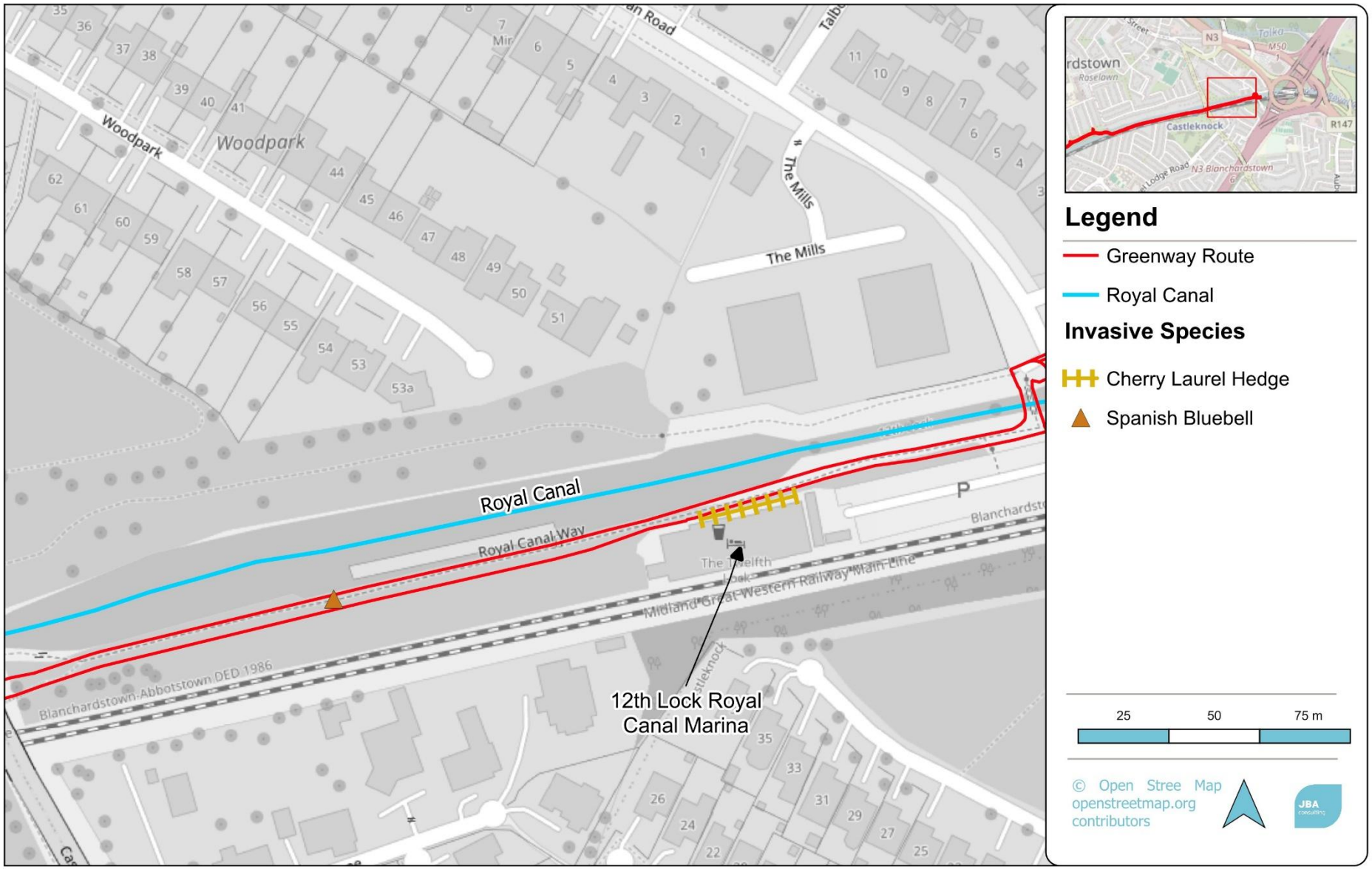


Figure 8-80: Overview of the invasive floral species recorded by JBA Consulting during the ecological surveys 2022-2026 near the 12th Lock (Chainages +7850 - +8050) (©OSM, 2026)

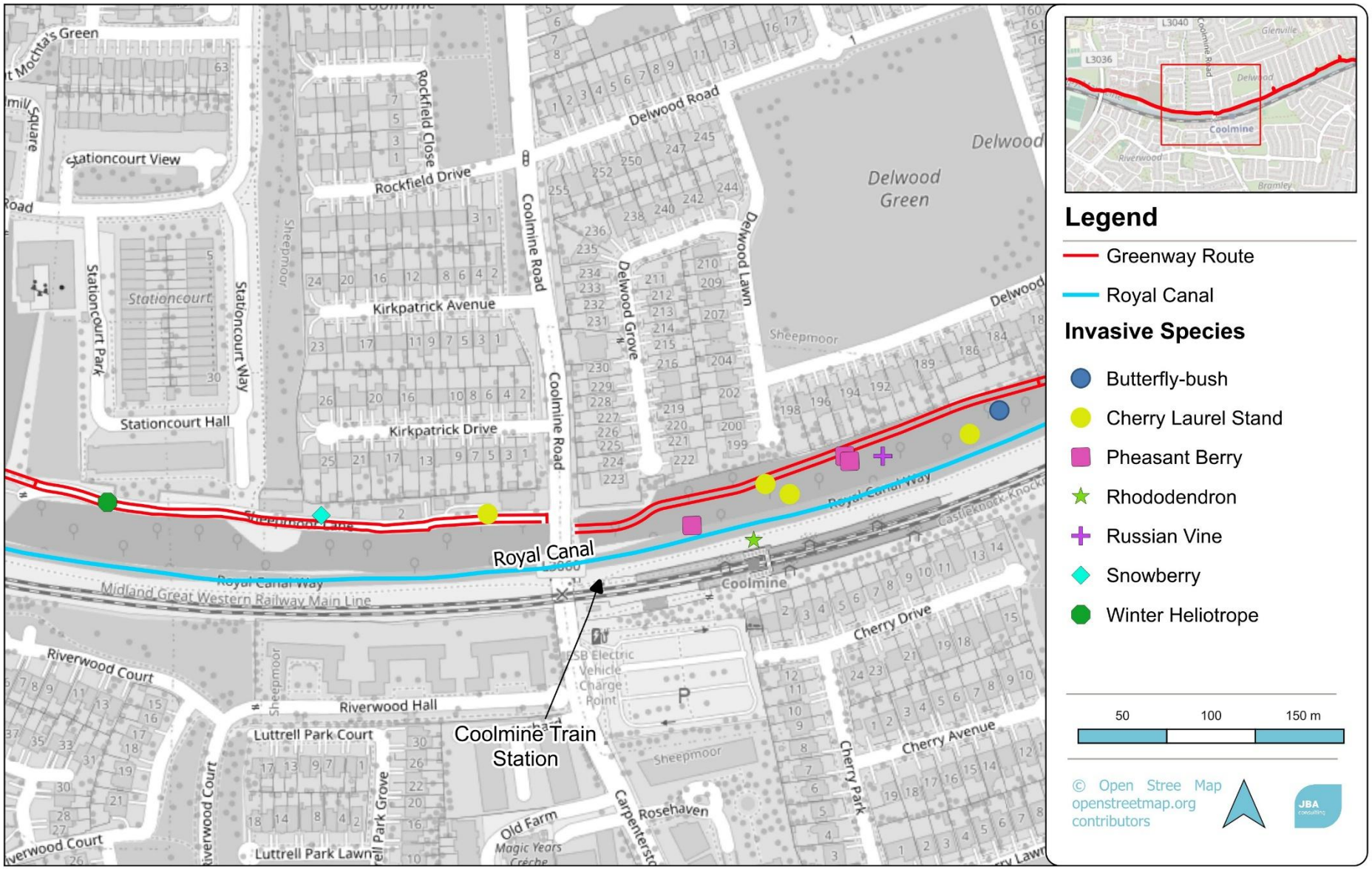


Figure 8-81: Overview of the invasive floral species recorded by JBA Consulting during the ecological surveys 2022-2026 around Coolmine train station (Chainages +5950 - +6500) (©OSM, 2026)

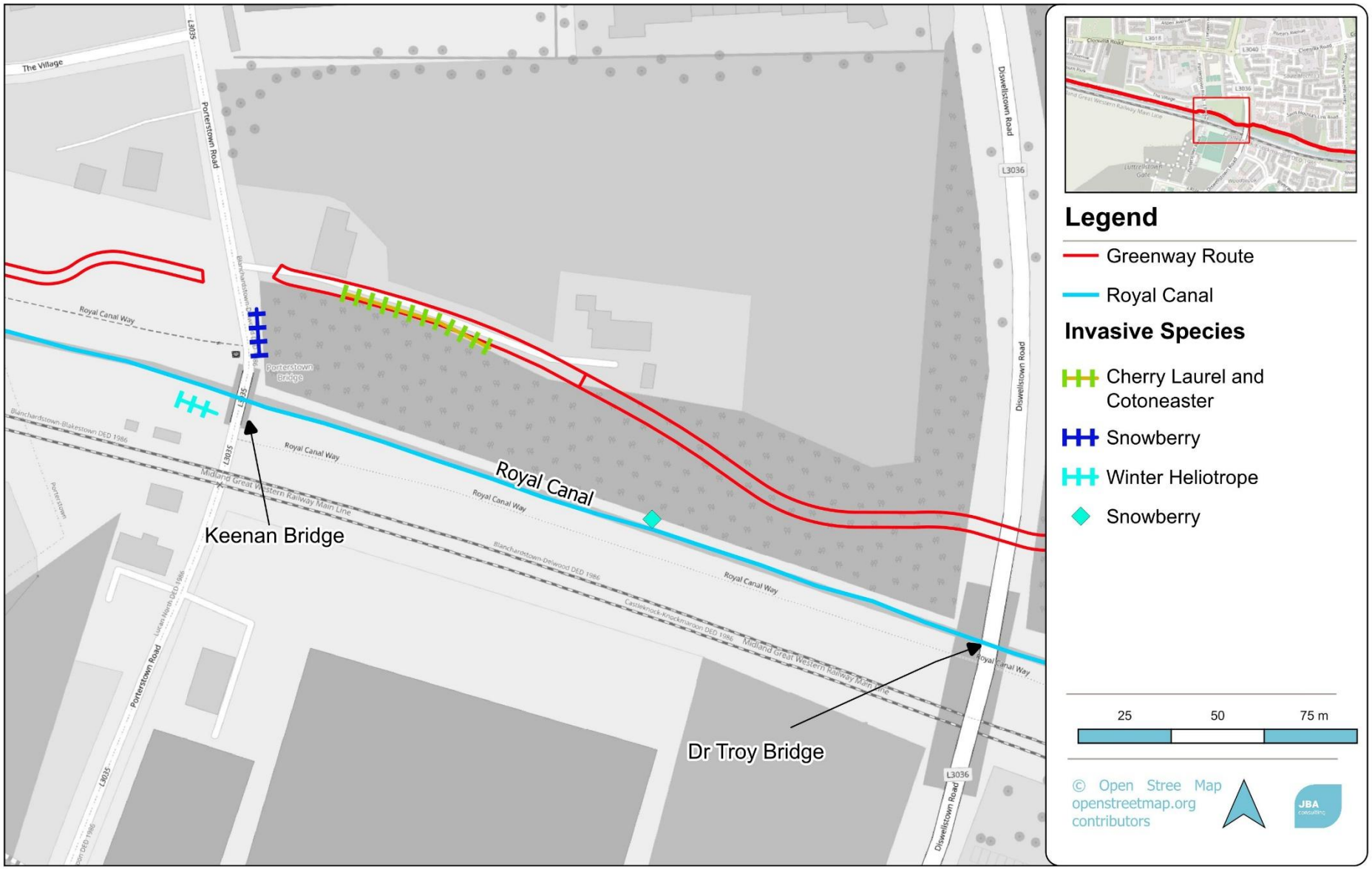


Figure 8-82: Overview of the invasive floral species recorded by JBA Consulting during the ecological surveys 2022-2026 near Porterstown Road (Chainages +5300 - +5550) (©OSM, 2026)

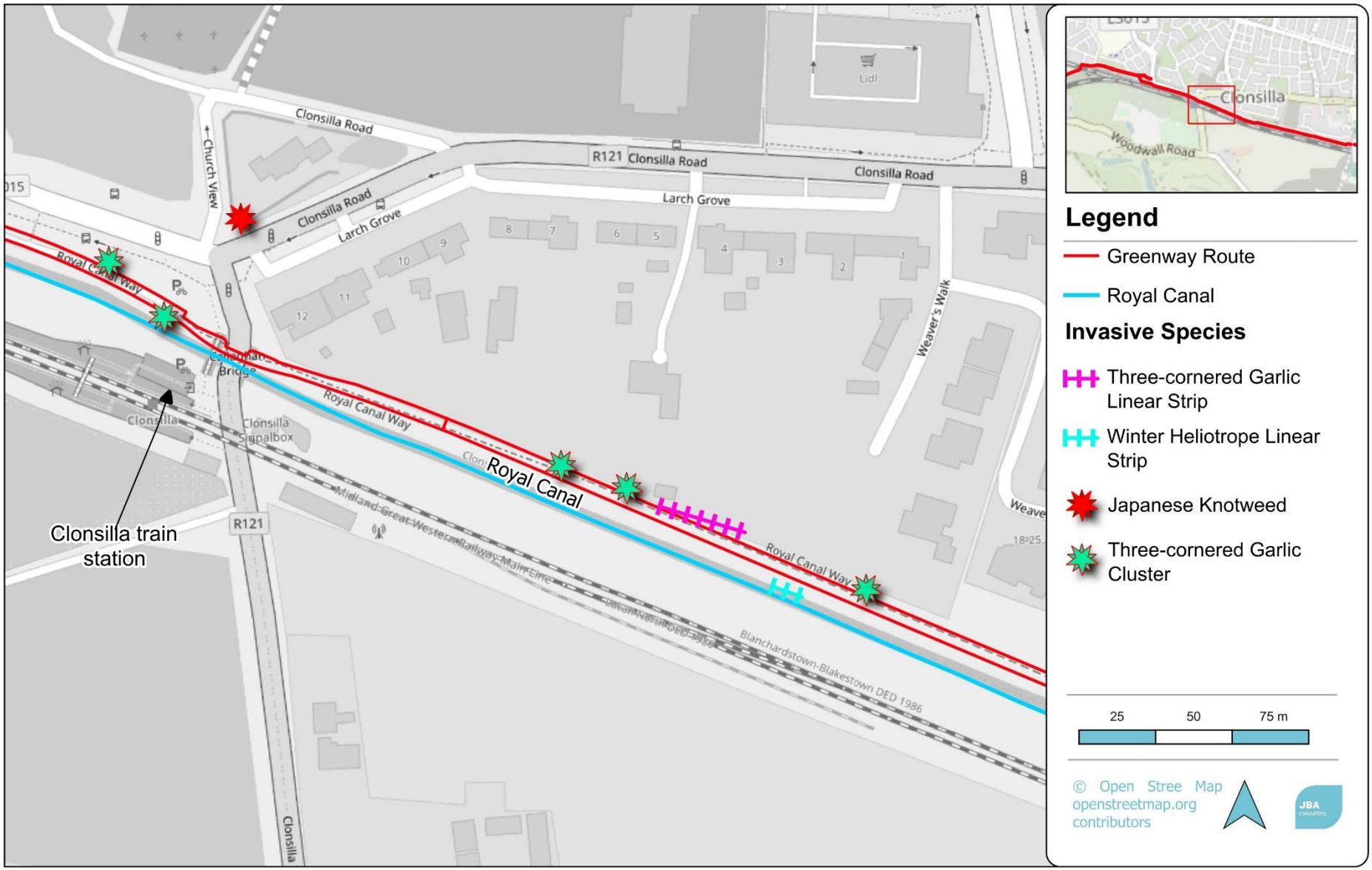


Figure 8-83: Overview of the invasive floral species recorded by JBA Consulting during the ecological surveys 2022-2026 near Clonsilla train station (Chainages +4000 - +4300) (©OSM, 2026)

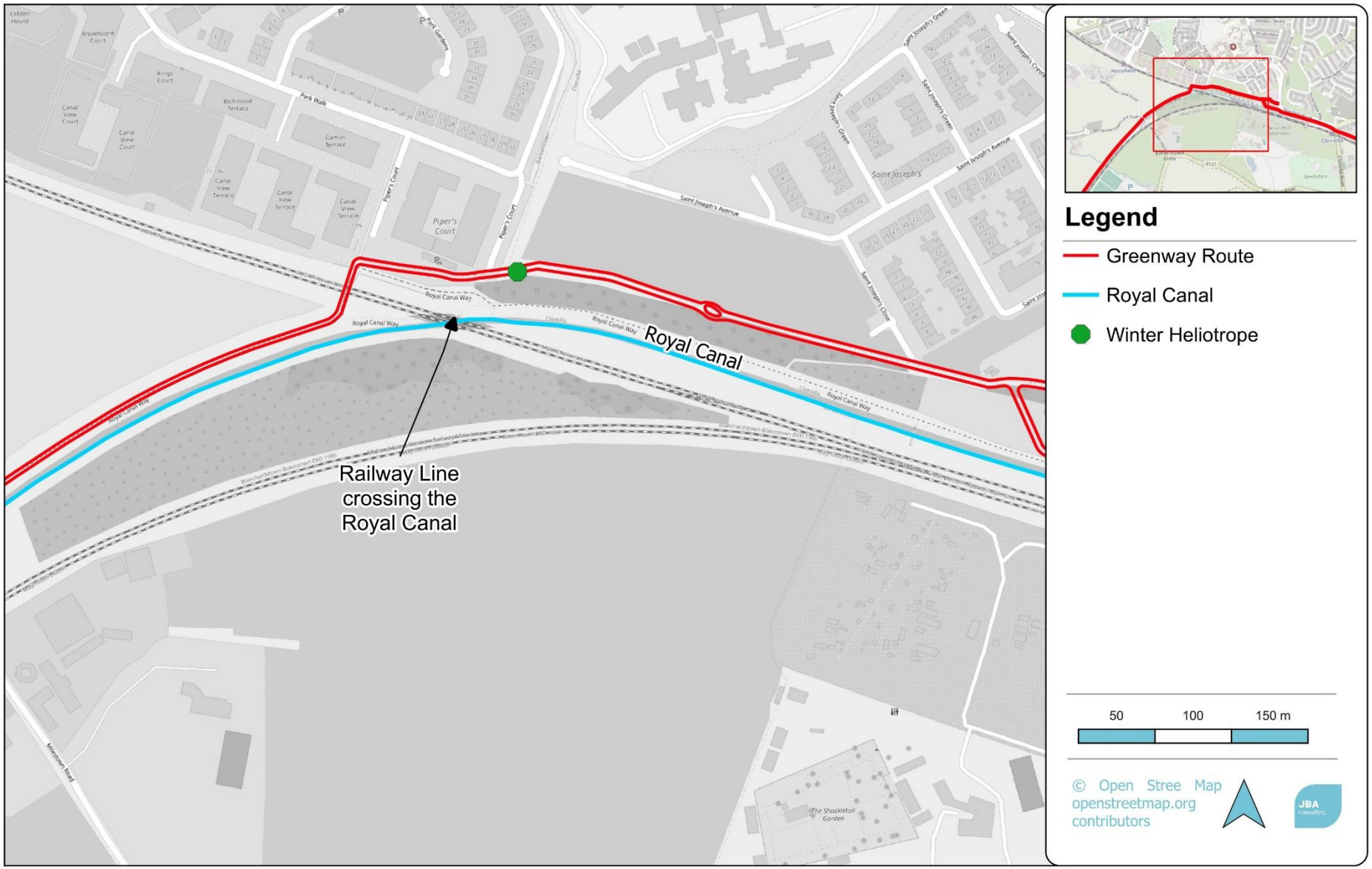


Figure 8-84: Overview of the invasive floral species recorded by JBA Consulting during the ecological surveys 2022-2026, Hansfield (Chainages +3050 - +3550) (©OSM, 2026)

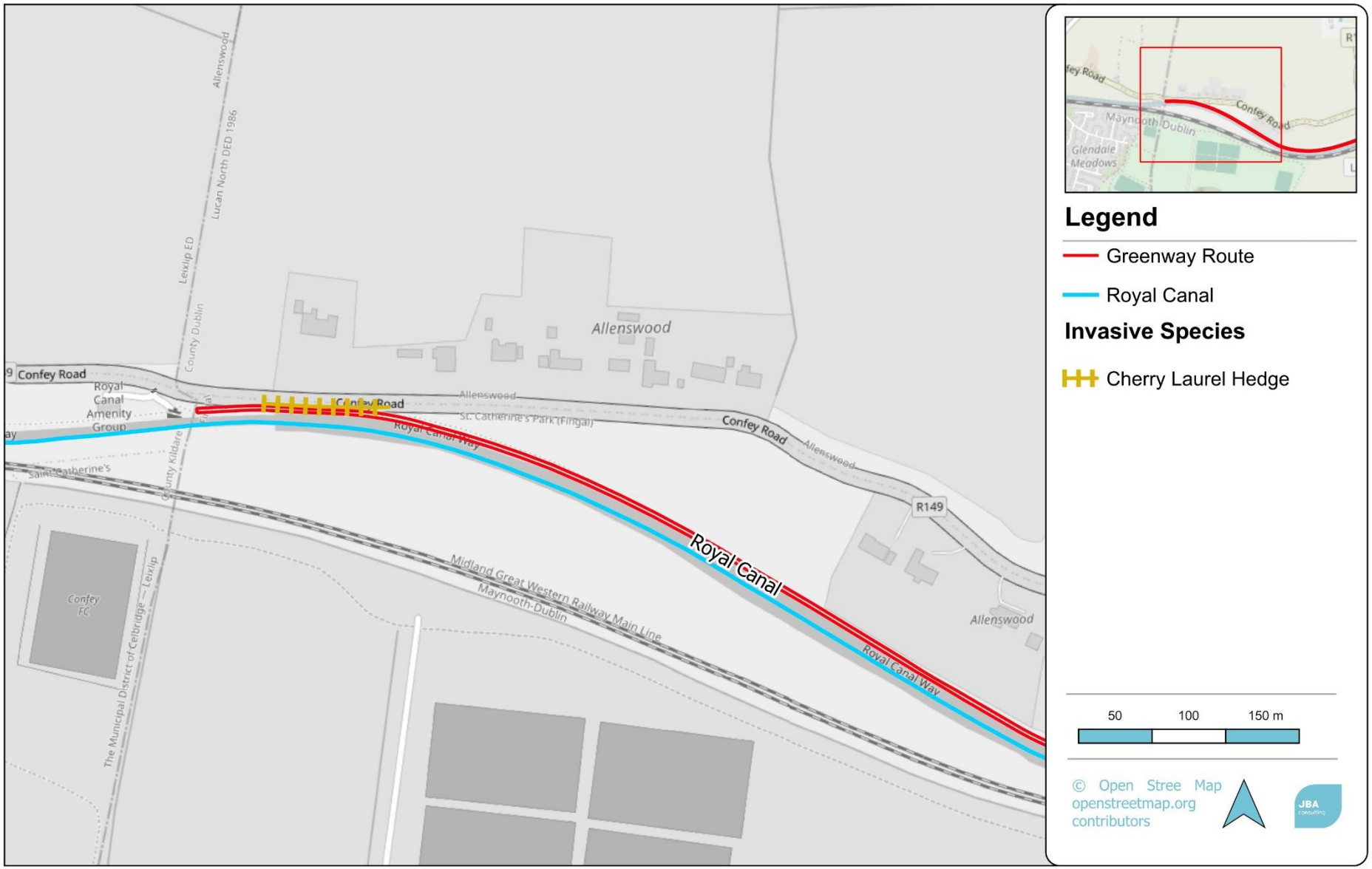


Figure 8-85: Overview of the invasive floral species recorded by JBA Consulting during the ecological surveys 2022-2026, Confey (Chainages +00 - +300) (©OSM, 2026)

8.6.3 Do Nothing Baseline Scenario

If the Proposed Development were not to go ahead, it is likely that the current use of the land along the Proposed Development would continue as it does today, with the banks of the canal unmanaged and not used by walkers, therefore remaining largely undisturbed in a do-nothing scenario. The existing pedestrian route along the Royal Canal is managed by WI who conduct surface maintenance works along the banks of the Royal Canal and vegetation and sediment maintenance within the canal itself. It is anticipated that areas facing high levels of erosion will be managed by WI which will minimise potential sediment input into the canal. Furthermore, the existing KERs identified within the Royal Canal ecological corridor, such as Otter, Badger, and Glutinous Snail, would remain unchanged under the existing baseline conditions. The INNS identified would continue to spread, which has the potential to adversely impact terrestrial habitats.

8.6.4 Ecological Receptors Considered for Further Assessment

The designated sites and ecological receptors identified during the desktop study and ecological surveys, that were deemed to require further examination within the impact assessment section are listed in Table 8-29. Designated sites and ecological receptors that have been excluded from further examination are also listed in the table below, along with the reasoning for their exclusion.

Table 8-29: Summary of ecological receptors and the rationale for their inclusion/exclusion within the impact assessment

Ecological Receptor	Value	Rationale for Inclusion / Exclusion
Rye Water Valley/Carton SAC (1398)	International	Excluded from impact assessment: This site has been excluded from the impact assessment due to the location of the Proposed Development, a lack of hydrological pathways, prevailing winds, underlying aquifer vulnerability (low), and due to a lack of ex-situ supporting habitat for QI *Vertigo* species.
Royal Canal pNHA	National	Included in impact assessment: Included within impact assessment due to this site's proximity to the Proposed Development.
Liffey Valley pNHA	National	Included in impact assessment: Included within impact assessment due to this site's proximity to the Proposed Development.
Rye Water Valley/Carton pNHA	National	Excluded from impact assessment: Associated Natura 2000 site excluded from impact assessment, significant impacts are not anticipated due to the location of the proposed site, prevailing winds, and underlying aquifer vulnerability (low).
BL1 - Stone walls and stonework	Local (higher value)	Included in impact assessment Stone bridges present adjacent to the Proposed Development have roosting potential for local bats and nesting potential for local breeding bids.
BL2 - Earth banks	Local (higher value)	Included in impact assessment: Adjacent to Proposed Development, important habitat for ants and mining bees
BL3 – Buildings and	Local (higher	Included in impact assessment:

Ecological Receptor	Value	Rationale for Inclusion / Exclusion
artificial surfaces (bridges and buildings)	value)	Nesting habitat for Swallows and roosting habitat for bats within bridges and buildings along one Proposed Development
ED3 – Recolonising bare ground	Local (lower value)	Included in impact assessment: Low floristic value, but the resources are available for a variety of invertebrates
FP1 - Calcareous springs	County level	Included in impact assessment: Rare habitat as one recorded occurrence of springs along the Proposed Development's route in the wider area.
FS1 - Reed and large sedge swamps	National level	Included in impact assessment: Important to the integrity of the pNHA
FW3 - Canals	National level	Included in impact assessment: Important to the integrity of the pNHA
FW4 - Drainage ditches	Local (higher value)	Included in impact assessment: Ditches on site provide habitats for Common Frog and Smooth Newt and offer a hydrological connection to other watercourses.
GA1 – Improved agricultural grassland	Local (lower value)	Excluded from impact assessment: Low value habitat
GA2 - Amenity grassland (improved)	Local (lower value)	Excluded from impact assessment: Low value habitat
GS1 - Dry calcareous and neutral grassland	County level	Included in impact assessment: Species criteria fall below Annex I but still offer valuable habitat.
GS2 - Dry meadows and grassy verges	Local (higher value)	Included in impact assessment: Species and habitat variability in the locality.
Mosaic: GS2/WS1 - Dry meadows and grassy verges/ Scrub	Local (higher value)	Included in impact assessment: Species and habitat variability in the locality.
WD1 - (Mixed) broadleaved woodland	County level	Included in impact assessment: Important wildlife corridor for various species
WL1 - Hedgerows	County level	Included in impact assessment: Important wildlife corridor for various species
Mixed: WL1/FW4 – Hedgerows over drainage ditches	County level	Included in impact assessment: Important wildlife corridor for various species
Mixed: WL1/WL2 – Hedgerows/Treelines	County level	Included in impact assessment: Important wildlife corridor for various species
WL2 - Treelines	County level	Included in impact assessment:

Ecological Receptor	Value	Rationale for Inclusion / Exclusion
		Important wildlife corridor for various species
Mixed: WL2/FW4 - Treelines over drainage ditches	County level	Included in impact assessment: Important wildlife corridor for various species
Mixed: WL2/GS2 – Treelines and dry meadows and grassy verges	County level	Included in impact assessment: Important wildlife corridor for various species
WS1 - Scrub	Local (higher value)	Included in impact assessment: Species and habitat variability in the locality.
Protected Flora	Local (higher value)	Included in impact assessment: The habitats present along the Royal Canal have the potential to support rare floral species, notably Opposite-leaved Pondweed which is present within Dublin.
Badger	County Level	Included in impact assessment: Protected species under Wildlife Acts with habitat availability reducing within Co. Dublin
Otter	County Level	Included in impact assessment: Annex IV species, the canal is an important habitat in Co. Dublin
Other Non-volant Mammals (Hedgehog, Pygmy Shrew, Pine Marten and Red Squirrel)	Local (higher value)	Included in impact assessment: Vegetated sections of the canal offer refuge, commuting and foraging habitat for these species
Bats	County Level	Included in impact assessment: Annex IV species with dark corridors reducing within Co. Dublin.
Birds	Local (higher value)	Included in impact assessment: Woods, hedgerows, and treelines offer nesting and foraging habitat
Amphibians (Common Frog, Smooth Newt)	Local (higher value)	Included in impact assessment: Suitable habitat present for this protected species group.
Reptiles	Lower local importance	Excluded from impact assessment: Lack of suitable habitat
Terrestrial invertebrates (bees ants, moths and butterflies)	Local (higher value)	Included in impact assessment: Supporting habitat for threatened species is present along the canal.
Odonata (dragonflies and damsel flies)	Local (higher value)	Included in impact assessment: Canal offers breeding and foraging habitat
Aquatic Mollusca	National Level	Included in impact assessment: No *Vertigo* species present but notable

Ecological Receptor	Value	Rationale for Inclusion / Exclusion
		presence of *Glutinous Snail*, False-orb Pea Mussel and Swan Mussel in the canal
White-clawed Crayfish	County importance	Included in impact assessment: Annex II and V species with a declining population within Ireland, known to inhabit canals.
European Eel	County importance	Included in impact assessment: Threatened species previously recorded within the Royal Canal.
Coarse Fish and Pike	County importance	Included in impact assessment: Royal Canal is an important habitat for a healthy population of these fish.
Invasive non-native species	N/A	Included in impact assessment: Impact on native habitats and species. Important to not spread 3rd Schedule INNS within or from the site

8.7 Predicted Impacts

8.7.1 Introduction

The potential impacts on the KERs are assessed here. The initial assessment considers the potential impact pathways and whether these apply to the KERs. The impact assessment considers the project and the anticipated effects in the absence of any mitigation. The descriptive terminology used to describe the characteristics (effects and significance) of these impacts is based on the terms provided within the EPA Guidelines (EPA, 2022), listed in the introductory and methodology sub-sections 8.1 and 8.2 respectively).

The key construction and operational impacts assessed are:

- Disturbance to habitats and species
- Habitat loss
- Impacts on water quality
- Increased urbanization (including visitation rates and lighting).

8.7.2 Do Nothing Scenario

If the Proposed Development were not to go ahead, it is likely that the current use of the land along the Proposed Development would continue as it does today, with the banks of the canal unmanaged and not used by walkers, therefore remaining largely undisturbed in a do-nothing scenario. The existing pedestrian route along the Royal Canal is managed by WI who conduct surface maintenance works along the banks of the Royal Canal and vegetation and sediment maintenance within the canal itself It is anticipated that areas facing high levels of erosion will be managed by WI which will minimise potential sediment input into the canal. As such, it is anticipated in the event the Proposed Development were not to go ahead, there would be a negligible increase in pollutants to the canal, with no loss of habitat and a negligible impact on the local and regional biodiversity.

8.7.3 Construction Phase Impacts

This sub-section describes the potential impacts on the KERs identified along the Proposed Development, as detailed in Table 8-29, in the absence of mitigation measures during the construction phase (including all pre-enabling works). However, the impact assessment takes into account mitigation by design (i.e. route alignment), which is detailed in sub-section 8.9.1.

8.7.3.1 Royal Canal pNHA [National importance] and Canals [National importance]

8.7.3.1.1 Overview of Potential Impact Pathways

The Proposed Development is 8km in length. Approximately 4.2km of the Proposed Development will travel directly within the Royal Canal pNHA. The works will largely be limited to the banks of the canal, with the exception of Landmark Bridge (Chainages + 7115 – 7350) which will cross the Royal Canal. The grassy verges flanking the canal will be within the footprint of the development and will be disturbed by the proposed works. A section of this habitat will be removed between Chainage +4235–4610 to create a 4m wide cantilevered boardwalk with an overhang. The Proposed Development will also lead to a loss of mixed broadleaved woodland within the pNHA, between chainages +5400 - +5460, +6300 - +6910, and +7070 - + 7115. There will also be a loss of scrub and meadow habitat within the pNHA

at other locations along the development. Additionally, the construction of the proposed 235m long Landmark Bridge (Chainages +7115 - +7350), 30m of which will be directly over the canal itself, has the potential to introduce pollutants into the canal as well as disturb the riparian habitats immediately adjacent to the canal.

As such, potential impacts on the Royal Canal pNHA may occur via surface water runoff of potential pollutants used on site (e.g. hydrocarbon leakage from machinery), sediment when works are carried out next to the canal, dust emissions, and the physical disturbance/removal of the riparian habitats adjacent to the canal, and grassland and woodland habitats within the pNHA.

8.7.3.1.2 Surface Water

8.7.3.1.2.1 Chemical Pollution of Water Environment

As outlined in Chapter 12 (Water), construction phase impacts on the Royal Canal can arise from the chemical pollution of the water environment via the surface water run-off of pollutants used on site. The temporary presence of chemicals, fuels, and other oils associated with construction activities on the site have potential to enter the water environment through accidental spillages, improper transport and refuelling, or inappropriate storage and disposal procedures, by gradual leakage or single failure of storage tanks or refuelling mechanisms. Additionally, temporary wastewater effluent from temporary construction phase welfare facilities has potential to enter surface water or shallow groundwater. Concrete, bentonite and other cement-based products will also be used during construction activities. These materials are highly alkaline and corrosive and can have significant negative effects on surface water quality if improperly handled. Cement based products can also be detrimental to waterbody environs by altering the waters pH.

The construction works may generate dust-based pollutants (e.g. cement-based dust), which have the potential to settle within the Royal Canal. During long dry periods dust can coat plant foliage adversely affecting photosynthesis and other biological functions. Furthermore, cement-based dust deposited on leaves can increase the surface alkalinity, which in turn can hydrolyse lipid and wax components, penetrate the cuticle, and denature proteins, finally causing the leaf to wilt. The Royal Canal pNHA associated habitats will be vulnerable to cement-based dust deposition impacts during the construction stage. This impact on floating and emerging flora will have a knock-on impact for protected bird species, particularly herbivorous species, which are supported by the Royal Canal's aquatic habitat. Additionally, alkaline cement-based dusts have the potential to affect the pH levels, potentially impacting pH-sensitive aquatic flora and fauna.

Certain areas along the canal will be particularly vulnerable to surface water polluting events, including all areas where works are due to take place on or immediately adjacent to the banks. This includes the stretch of the canal between the Dublin/Kildare border and Hansfield bridge (Chainages 0 - +3170) where a 2-3m wide unbound surface will be located, between Chainages +3640 - +4550 along the canal where a 4m wide route will run along the northern embankment, the proposed location of Landmark Bridge (Chainages +7115 to 7350), and the area to the east of this (Chainage +7250 – 8063) where the Proposed Development will continue along the south side of the canal. Due to the proximity of the works to the canal within these areas, the risk of adverse impacts will naturally be greater. Other locations, notably around Hansfield Bridge (Chainage +3170 - +3640), and between the Old Schoolhouse lands and the proposed Landmark Bridge location (Chainage +4550 – 7090) will be at lower risk due to the works taking place further back from the immediate banks of the canal. There will be as such a larger buffer space between the works in these areas and the canal, which will include a mixture of scrub, woodland, and treeline habitats which will partially intercept and retain surface water pollutants before

they can enter the canal. However, in the event of a large-scale event, such as the discharging of an entire fuel tank, pollutants have the potential to bypass these buffers and enter the canal, either by overland flow or via a surface-to-ground-to surface water pathway.

While the grassy verge habitat bordering the Royal Canal adjacent to the works will be retained, which will provide a buffer between the Proposed Development and the canal itself, this strip is narrow and surface water pollutants generated during the construction works have the potential to bypass it into the canal. Additionally, a small section of this habitat will be lost between Chainage +4235–4610 due to the construction of a cantilevered boardwalk which will overhang over the existing grassy verge habitat. This will ultimately decrease the width of this vegetative buffer within this area.

There is a historic quarry section (Chainage +6500m) within the Delwood woodland habitat within the pNHA. As part of the Proposed Development, a bridge structure crossing this quarry along the northern bank, which will consist of a 30m single-span composite steel beam and concrete deck bridge, incorporating some earth-retaining elements. To construct the Quarry Bridge, the Greenway will be constructed to base course from either side of the bridge via Coolmine Road (west) and Brompton. The constructed route will act as a haul road for the construction of the bridge. Mini-diggers will track to the bridge location and spoil will be removed by dumpers. The steel beams will be craned into position from both sides and bolted in-situ. Beam sections should ideally be installed in single-span sections. This will result in a loss of woodland habitat within this area, alongside the underlying ground floral species. The removal of spoil will also remove some of the existing seedbank present within this area.

Another area at particularly higher risk is the proposed location of Landmark Bridge, which is the only immediate area where works are due to take place over the canal itself. The steel bridge will be approximately 235m in length and will have a maximum single span of 30m across the Royal Canal itself. The bridge will be constructed using a steel superstructure, which will be fabricated off site and brought to site on a special vehicle and then craned into position from the northern bank once the raised approaches either side of the canal have been completed. The support foundation will involve piling, which has the potential to introduce pollutants into the groundwater body, which given the nature of the underlying aquifer and the proximity of these works to the canal, are likely to rapidly discharge into the Royal Canal. While the bridge methodology prevents the need to works within the canal itself, the vehicles used during the process of moving it into position, alongside constructing the Greenway approaches on either bank represent significant sources of hydrocarbon pollutants. The woodland habitat present on the northern bank is likely to provide a significant buffer in the event of a spill event from the crane on the northern bank. However, the works on the southern bank, including piling, will have no such buffer, with the exception of a thin grassy verge. Additionally, in the event of the collapse of the Greenway approach either side of the proposed bridge, cement-based pollutants will be released into the canal.

In the case of a pollutant spill event, in particular for the works area in close proximity to the canal, this is likely to degrade overall water quality, with associated effects to fish and aquatic ecology. Impacts have the potential to be extended from short to medium term due to the accumulation of these chemicals in the sediments within the canal, allowing them to persist in the waterbody for longer periods. Moreover, water pollution impacts have the potential to indirectly impact pNHA associated bird and mammal species by negatively impacting the populations of lower tropic levels of the food chain e.g. floral and freshwater invertebrate species. In addition, the consumption of food items containing polluting elements will impact on the health of mammal and bird populations, namely the local Otter population. Impacts will be most significantly locally; however, these will be translated downstream as the pollutants

are transported within the canal. Additionally, impacts on faunal species, including direct ingestion/absorption of pollutants, will be translated both upstream and downstream of a spill event.

Therefore, in the absence of mitigation measures, this is **likely to have a medium-term adverse impact that is significant** on the Royal Canal.

8.7.3.1.2.2 Pollution of watercourses by silt / suspended solids

Impact on water quality may also arise from sediment input into the canal during the construction phase, including silt/suspended solids. Temporary construction activities will require excavations, ground disturbance, stripping of soils, and temporary spoil deposition. Exposed soils have potential to release sediments into the adjacent Royal Canal. The construction of access tracks and other hard standing areas will require importing, handling, and placement of aggregate, with potential to release sediments in surface water. Construction plant movements across disturbed soils and access tracks have potential to release silts and sediments to surface water runoff. Temporary surface water or shallow groundwater gathering in significant excavations has the potential to be significantly polluted due to contact with excavated surfaces and aggregates. The discharging of untreated water by pump or gravity would cause release of potentially heavily polluted effluent to the canal. The input of these sediments and debris into the Royal Canal has the potential to adversely modify stream morphologies, smother habitats, harm aquatic flora and fauna; and increase risk of blockage to culverts and drainage channels. In the absence of mitigations, this is **likely to have a temporary adverse impact that is significant** on the Royal Canal.

8.7.3.1.2.3 Changes to runoff, and flow patterns

During the construction phase, there will be changes to the habitats on the banks of the Royal Canal, which will impact surface water runoff and flow patterns. Earthworks for the Greenway will result in cuttings, embankments or spoil heaps that have the potential to modify drainage routes. Changes in surfacing caused by vegetation stripping or gravel placement may also affect runoff or rates. Increases in surface water runoff rates and volumes can lead to increased effects of erosion and scour in down gradient watercourses. In the absence of mitigations, this **is likely to have a temporary adverse impact of slight significance** on the Royal Canal.

8.7.3.1.2.4 Impacts on Local Fauna (Disturbance and Habitat Loss)

The aforementioned sources of impact on the water quality of the Royal Canal can impact the ecological receptors within this waterbody. These include protected species such as Otter, fish and aquatic invertebrates including the critically endangered Glutinous Snail. This species is particularly vulnerable to changes in surface water quality, such as due to biodegradable pollution, (Mouthon and Charvet, 1999), high degree of water's hardness (Beriozkina et al., 1980), and low values of ambient pH (Vinarski et al., 2013). It is believed that this species' glutinous mantle allows for greater absorption, making it more susceptible to pollution and changes in water quality. Changes in water quality may also affect population dynamics of other freshwater snails which have higher tolerances to declines in surface water quality. Studies of captive snails have found that Glutinous Snail often outstripped their own food supply in constrained conditions, potentially a direct result of the snail's poor ability to slow its metabolism (aestivate) as other freshwater snails do during times of poor food supply and environmental stress (Hughes, 2016). This may make this species particularly susceptible to competition, as well as over-population by stripping out its own food supply and being robbed of it by species that can survive a dearth in food supply by going into diapause.

Fish species, including the protected species European Eel, are vulnerable to hydrocarbon and/or solvent pollution, and can be impacted through the consumption of contaminated prey, dermal uptake, and gill ventilation. Furthermore, species that predate on fish species i.e., Otter and Cormorant will be similarly impacted in the event they consume contaminated prey items. Hydrocarbon pollutants are also known to degrade the plumage of bird species associated with the pNHA, such as Kingfisher and Grey Wagtail. Moreover, water pollution impacts have the potential to indirectly impact pNHA associated bird and mammal species by negatively impacting the populations of lower tropic levels of the food chain e.g. floral and freshwater invertebrate species. In addition, the consumption of food items containing polluting elements will impact on the health of mammal and bird populations. All aquatic floral and faunal groups associated with the pNHA, that will be vulnerable to excessive nutrient-based pollution (eutrophication) generated through the introduction of sediment bound with nitrogen and phosphorus.

Increased vehicular presence adjacent to the Royal Canal during the construction phase will lead to local increases in nitrogen oxides (NOx) potential resulting in the minor acidification / change of pH of the surface water. Research has detailed how freshwater fish species have shown diminished abilities to respond to damage-released chemical alarm cues from other fish of the same species under weakly acidic conditions. This group of fish species includes Three-spined Stickleback (Peterson et al., 1989), which will likely suffer an increased mortality predation rate within the Royal Canal (Three-spined Stickleback) in the event that the Royal Canal becomes slightly acidic (pH~ 6.0) during the construction stage.

In the absence of mitigations, this is **likely to have a long-term significant adverse impact** on the local fauna within the Royal Canal, with this assessment reflecting the most sensitive receptors, i.e., Glutinous Snail, which are highly vulnerable to surface water pollution.

8.7.3.1.2.5 Groundwater

In the event of an accidental spill of deleterious substances, if in significant enough volumes, it has the potential to seep into the sub-surface / groundwater, leading to the degradation of the root systems of the flora within the terrestrial habitats of the Royal Canal pNHA, thus lowering overall health and biodiversity value of this important wildlife corridor habitat. Additionally, any pollutants entering the groundwater body are likely to discharge rapidly into the Royal Canal, leading to reductions in water quality. The location of the proposed Landmark Bridge will be at a higher risk of groundwater pollution due to the support foundation requiring piling, which will expose the underlying groundwater body directly to potential surface water pollutants.

In the absence of mitigations, this this is **likely to have a temporary adverse impact of slight significance** on the Royal Canal and its adjacent terrestrial habitats.

8.7.3.1.3 Physical Disturbance (Habitat Removal), Air (Chemical and Dust Emissions)

8.7.3.1.3.1 Habitat Removal

During the construction phase, there will be a direct loss of terrestrial habitats within the Royal Canal pNHA that border the canal waterbody, including woodland, scrub, grass verge and dry meadow habitat. There will be the direct removal of pNHA woodland between Chainages +5440 - +5490 and Chainages +6300 - +7170. The pNHA woodland area along Delwood Park (Chainages +6380 - +6590) where the Proposed Development will run has been disturbed by dumping and the extension of back gardens from the adjacent properties along Delwood Park. Between Brompton Grove and Brompton Green (Chainages +6940 - +7090), the Greenway will run into a green area to the north of the woodland habitat, before re-entering the woodland until the proposed Landmark Bridge (Chainages +7115 -

+7350). Additionally, between chainages +6590 - +6940, the route will pass through the northern area of a relatively undisturbed section of the woodland habitat. The area of woodland within the pNHA lost during the construction phase is estimated to be 6170m^2. A further 40m^2 of treeline habitat will be lost to the west of the Old Schoolhouse (Chainages +4550 - +4570). Additionally, the understorey vegetation, including scrub, within these sections will be lost.

Between Chainages +4630 - +5250, the Proposed Development will travel through sections of scrub and meadow and scrub mosaic habitats within the Old Schoolhouse lands. This will result in a loss of sections of scrub and meadow habitat within the pNHA, which includes Bramble and young Blackthorn. Scrub habitat is an important foraging and refuge resource for fauna utilising the Royal Canal pNHA, in particularly certain bird and invertebrate species which utilise scrub for nesting purposes (FACT, 2003). The estimated area of meadow and scrub mosaic and scrub habitats removed from the pNHA during the construction phase is 4000m^2. Between Chainages +4235–4610 of the towpath east of Callaghan Bridge, there will be removal of bankside dry meadow and grassy verge habitat high on the bank, although the habitat closest to the water will be retained. During the removal of these habitats, the retained sections of these habitats adjacent to the Proposed Development will still be impacted from construction activities due to the generation of dust and use of heavy machinery during construction.

In addition to the release of pollutants within the air, these terrestrial habitats within the Royal Canal pNHA will also be at risk of mechanical damage from construction vehicles which enter the root protection zones of trees which cause root compaction resulting in lowered survivability of the vegetation.

The presence of invasive species on-site creates the risk spreading of invasives species by the construction works into the habitat which would negatively impact this habitat. Furthermore, as identified during the surveys and within the Arboricultural Assessment Report (Charles McCorkell Arboriculture Consultancy, 2026), Ash dieback was recorded within several Ash trees within the pNHA. Ash dieback and any subsequent tree loss have implications for the biodiversity of the woodland, as these trees supply an important habitat for many insects, birds, and plants. However, the construction phase activities, including the felling of infected has trees, has the potential to spread this disease to Ash saplings as well as non-infected mature Ash trees within the pNHA, as well as remove Ash trees that potentially have partial/full genetic resistance to the disease. Dead trees also provide foraging and nesting resources for local fauna, and deadwood piles are important refuge habitats for non-volant mammals, amphibians, and terrestrial invertebrates. Therefore, the loss of dead and dying Ash trees will reduce foraging, nesting and refuge resources for local faunal groups.

There is the potential for accidental spills of deleterious substances, which have the potential to come in contact with and negatively impact the physiological health of the floral species within the wet woodland. If a notable volume of these deleterious substances is spilled, they have the potential to seep into the sub-surface / groundwater, leading to the degradation of the root systems of these floral species, potentially resulting in death, thus lowering overall health and biodiversity value of this important wildlife corridor habitat. Therefore, in the absence of mitigation during the construction stage, a **long-term permanent adverse impact that is significant is likely** on the terrestrial habitats of the Royal Canal pNHA.

8.7.3.1.3.2 Air (Chemical and Dust Emissions)

Dust may be generated during the proposed ground works, some of which will take place next to the canal. The main dust emitting construction-based activities identified within Chapter 5 (Air Quality)

include demolitions, earthworks, the construction of the Greenway itself, and trackout. However, with the exception of earthworks, the magnitude of these emissions is anticipated to be low. Dust emissions from earthworks are anticipated to be moderate. Additionally, the habitats along the canal, including various grasslands, woodlands, swamp and reed verges are not particularly sensitive to dust but may be negatively impacted if large quantities are released within a confined area. Dust-based pollution from the construction can have negative impacts on the habitats beyond the site boundary. Dust can affect vegetation through chemical means such as chemical changes like increased acidity in soils or watercourses. Physical effects include reduced photosynthesis, respiration and transpiration through smothering due to dust settlement on the leaves. Impacts will vary depending on the volume of dust generated; however, impacts on sensitive vegetation, i.e. the terrestrial habitats bordering the Royal Canal, can occur up to 50m from the source, as described in Chapter 5 (Air Quality).

There will be an increase in NOx emissions associated with traffic attending the site during construction, but this will be temporary in nature, and the total number of additional journeys within the area is considered negligible. In the absence of appropriate mitigation measures, airborne polluting events including the generation of dust (particularly from earthworks) and vehicular emissions is **likely to result in a temporary adverse impact of slight significance** on the Royal Canal.

8.7.3.1.3.3 Overall Anticipated Impact on Royal Canal pNHA

Due to the direct loss of terrestrial habitats from within the Royal Canal pNHA, and additional impacts via surface water and air pathways, a **long-term permanent adverse significant impact is likely** on this pNHA and its associated floral and faunal groups in the absence of mitigation, while a **short-term adverse impact of moderate significance is likely** on the Royal Canal surface waterbody itself due to surface water and air (dust and chemical) pollution impacts and potential knock-on impacts on the faunal species within the Canal.

8.7.3.2 Liffey Valley pNHA [National importance]

The Liffey Valley pNHA is located to the south of the of the Proposed Development. A tributary of the River Liffey, the Rusk Stream, crosses under the Royal Canal and the Proposed Development near to Westmanstown Sports Centre. This point is approximately 1.7km upstream of the Liffey Valley pNHA (Chainage +2500), and this watercourse eventually flows into this pNHA.

Similar to the Royal Canal pNHA, potential impacts on this site may occur via surface water runoff of potential pollutants used on site (e.g. hydrocarbon leakage from machinery) and sediment when works are carried out in the vicinity of the Rusk Stream. There will however be no direct loss of habitat from this pNHA and given the distance of this site from the Proposed Development, impacts via the air (dust and chemical) are not anticipated. Any dust and chemical emissions from the Proposed Development that enter the Rusk Stream will be diluted to non-deleterious levels before reaching the Liffey Valley pNHA.

8.7.3.2.1 Chemical Pollution of Water Environment

The chemical pollution of the Royal Canal upstream of the Rusk Stream crossing point has the potential to impact the Liffey Valley pNHA. This may arise due to the surface water run-off of pollutants used on site. The temporary presence of chemicals, fuels, and other oils associated with construction activities on the site have potential to enter the water environment through accidental spillages, improper transport and refuelling, or inappropriate storage and disposal procedures, by gradual leakage or single failure of storage tanks or refuelling mechanisms. In the event of an accidental spill of deleterious

substances, if in significant enough volumes, these have the potential to seep into the sub-surface / groundwater. Given the underlying aquifer, these will likely rapidly discharge to local surface watercourses, in this case the Royal Canal and Rusk Stream, leading to further impacts on water quality. Additionally, temporary wastewater effluent from temporary construction phase welfare facilities has potential to enter surface water or shallow groundwater. Concrete, bentonite and other cement-based products will also be used during construction activities. These materials are highly alkaline and corrosive and can have significant negative effects on surface water quality if improperly handled. Cement based products can also be detrimental to waterbody environs by altering the waters pH.

In order for pollutants to enter the River Liffey pNHA from the Royal Canal, they would have to travel approximately 2.7km within the Rusk Stream, which includes a downstream stretch of ponds/wetlands, spanning approximately 950m, within the Golf Course at Luttrellstown Castle. The complexity of the macrophyte cover within the stretch of the Rusk Stream within the Golf Course at Luttrellstown Castle is likely to increase the retention of hydrocarbons (Rovira et al., 2016). Additionally, any hydrocarbons or other chemicals absorbed by sediment, either by soils that leach into the canal or within sediment directly within the canal itself are likely to be trapped by this macrophyte network. The retention/trapping of any hydrocarbon laden sediment allows greater time for their removal from the water column via phytoremediation by aquatic microorganisms (Dhir et al., 2009). As such, any pollutants entering the Rusk Stream would undergo a degree of dilution, retention, and biodegradation prior to reaching the River Liffey. As such, potential surface water impacts on this pNHA will be reduced in their physical and temporal magnitudes.

Therefore, in the absence of mitigation measures, a **temporary adverse impact of slight significance is likely** on the water quality within the Liffey Valley pNHA via chemical pollution.

8.7.3.2.2 Pollution of watercourses by silt / suspended solids

Impact on water quality may also arise from sediment input into the canal upstream of the Rusk Stream, or directly into this stream, during the construction phase, including silt/suspended solids. Temporary construction activities will require excavations, ground disturbance, stripping of soils, and temporary spoil deposition. Exposed soils have potential to release sediments into the adjacent Royal Canal and Rusk Stream. The construction of access tracks and other hard standing areas will require importing, handling, and placement of aggregate, with potential to release sediments in surface water. Construction plant movements across disturbed soils and access tracks have potential to release silts and sediments to surface water runoff. Temporary surface water or shallow groundwater gathering in significant excavations has the potential to be significantly polluted due to contact with excavated surfaces and aggregates. The discharging of untreated water by pump or gravity would cause release of potentially heavily polluted effluent to the canal and Rusk Stream.

As outlined for the case of chemical pollution events, in order for any disturbed soils/sediments to enter the River Liffey pNHA from the Royal Canal, they would have to travel approximately 2.7km within the Rusk Stream, which includes a downstream stretch of ponds/wetlands, spanning approximately 950m, within the Golf Course at Luttrellstown Castle. Sediments are likely to be trapped and retained by the complex macrophyte cover present within the stretch of the Rusk Stream within the Golf Course at Luttrellstown Castle. As such, potential surface water impacts by silt and/or suspended solids on the Liffey Valley pNHA will be reduced in their physical and temporal magnitudes.

Therefore, in the absence of mitigation measures, a **temporary adverse impact of slight significance is likely** on the water quality within the Liffey Valley pNHA via silt / suspended solids.

8.7.3.2.3 Overall Anticipated Impact on Liffey Valley pNHA

In the event that oils and chemicals enter the water environment, this could have a negative impact on water quality within the Liffey Valley pNHA downstream of the works, and its ecological receptors such as the habitats on site, as well as protected species within the pNHA. Additionally, the input of sediment and debris into the Rusk Stream when it crosses under the Royal Canal has the potential to adversely modify stream morphologies, smother habitats, harm aquatic flora and fauna with particular risk to salmonid spawning areas; and increase risk of blockage to culverts and drainage channels. However, this is considered unlikely given the small zone of work where the development crosses the tributary, as well as the hydrological distance between the Proposed Development and the Liffey Valley pNHA. Furthermore, given the distance of the hydrological connection between the canal and Liffey Valley pNHA (2.7km), alongside the downstream stretch of ponds/wetlands spanning approximately 950m that the Rusk Stream passes through, any pollutants will undergo a degree of retention and dilution prior to reaching the River Liffey.

Therefore, in the absence of mitigation during the construction phase surface water runoff polluting events will **likely result in a temporary adverse impact of slight significance** to the Liffey Valley pNHA in the event of a pollution spillage event.

8.7.3.3 Habitats

8.7.3.3.1 Buildings and artificial surfaces (bridges) [Local (higher value)], and Stone walls and stonework [Local (higher value)]

The bridges located along the canal have the potential to support nesting for Barn Swallow and bat roosts. Barn Swallow were recorded nesting underneath the M3 Parkway Rail Line crossing over the Royal Canal, Chainages +3270-3290, during the 2024 and 2025 bird surveys. While these bridges will be retained and remain unaltered, construction-based activities have the potential to generate surface and airborne pollutants, as well as visual and audible disturbance making this habitat less suitable for nesting birds and bats. Construction based impacts on breeding birds are assessed further in sub-section 8.7.3.4.6 below. Additionally, a small area of tarmacked surface to the west of Coolmine Bridge along Sheepmoor Lane (Chainage +6130 - 6150) will be used a construction compound. This area has negligible ecological value and its temporary loss is not considered significant.

There will be additional clearance of houses to the west of the Hansfield Railway Bridge, between Chainages +3120 – 3600. This has the potential to have knock on effects on bats in terms of the availability of roosting features. The Old Schoolhouse, the highest value building in terms of roosting features, will be retained, although this habitat will be vulnerable to accidental damage from construction vehicles during the construction phase.

Therefore, in the absence of mitigation measures, a **temporary adverse impact of slight significance is likely** on the bridges as nearby construction phase impacts, such as the generation of noise or airborne pollutants, may reduce the suitability for the existing bridges to support the nesting activities of local bird species, namely Barn Swallow and roosting bats. Additionally, due to the clearance of the existing houses to the west of the Hansfield Railway Bridge, a **permanent adverse impact of slight significance is likely** on the buildings along the Proposed Development, as the Old Schoolhouse will be retained.

8.7.3.3.2 Earth Banks [Local (higher value)]

This habitat is important for the local invertebrate population, such as mining bees, which would burrow and create hives/nests within the bank. Ants were recorded burrowing within this habitat during the surveys. While the habitat is not envisaged to be directly impacted by the works, the inappropriate movement of machinery could damage these earth banks, or excavations in the vicinity of the earth banks could cause the generation of dust which could infiltrate burrowed nests.

In the absence of mitigation measures, a **medium term, adverse impact that is significant is likely** on this habitat type should the movement of machinery cause large physical destruction to the earth banks, while a **temporary adverse impact of slight significance is likely** for this habitat due to the creation of dust, as this could reduce the living quality of the existing holes.

8.7.3.3.3 Recolonising bare ground [Local (low importance)]

This habitat is anticipated to be removed in its entirety to make way for the Proposed Development to the east of the existing Old Schoolhouse building (Chainage +5180 - 5210). This will result in a loss of foraging resources for local fauna, as well as a loss in floral diversity due to the removal of the existing grassland scrub species present within this habitat.

Therefore, as this habitat is due to be removed in its entirety, a **permanent adverse impact of profound significance is likely** for this habitat type. However, given the low value of this habitat, this is not anticipated to be significant in a wider ecological context.

8.7.3.3.4 Calcareous springs [County importance].

The Calcareous Spring with tufa like deposits was recorded on the south side of the canal bank in the Deep Sinking area east of Kennan Bridge, located between chainages +5400 - +5450. The Calcareous Spring is located across the Canal from the area of works and is above the existing Canal water level.

It is unlikely that pollutants from works such as excavation or release of pollutants from machinery on the other bank will reach the calcareous spring through either surface or groundwater. The calcareous spring may still be vulnerable to the generation of dust in the vicinity. The treelines adjacent to this habitat will also partially buffer the spring from the impacts of dust pollution.

As such, in the absence of mitigation measures, a **temporary adverse impact of moderate significance is likely** to the Calcareous springs habitat.

8.7.3.3.5 Bankside Habitats: Reed and large sedge swamps [National level importance], Dry meadows and grassy verges [Local (higher value)]

Along the full western section of the Proposed Development (Chainages 0 - +3200), a 1m section of the existing grassy verge running along the bank of the Royal Canal will be retained, with the exception of the grassy verge habitat present between Chainage +4235–4610 due to the construction of an overhanging boardwalk. However, the reed and large sedge swamps will be undisturbed by the Construction of the Proposed Development. The majority of the works within the areas between Hansfield and the proposed Landmark Bridge (Chainages + 3200 - + 7200) will take place away from the Royal Canal. The works between the proposed Landmark Bridge and the development's end (Chainages +7250 - +8100) will also retain the existing grassy verge running along the bank of the

Royal Canal and reed and large sedge swamps. However, a 4m wide boardwalk will be present from approximately Chainage +4235–4610 of the Greenway east of Callaghan Bridge. The nature of this overhang will remove dry meadow and grassy verge bankside habitat high on the bank but will retain those habitats closest to the water, namely the reed and large sedge swamps. This walkway will not overhang the canal and will not require any works within the canal itself. In the absence of mitigation, the vegetation removal to accommodate the installation of this boardwalk is anticipated to be imperceptible, given that this section is one small area of this grassland habitat within the overall development.

Potential impacts may occur via surface water runoff of potential pollutants used on site (e.g. hydrocarbon leakage from machinery) and sediment when works are carried out next to the canal along the entirety of the Proposed Development. This could have a moderate impact on water quality within the canal and may impact the flora and fauna within these bankside habitats. In the absence of mitigations during the construction phase, it is **likely to lead to a short-term adverse impact of moderate significance** on this habitat type given the valuation and spread of these habitats along the development.

A section of dry meadow habitat to the east of the Hansfield Railway Bridge (Chainages +3550 – 3600) will be temporarily lost due to creation of a site compound within this area. The existing floral species within this area will be lost as a result of this compound. Additionally adjacent retained sections of meadow habitat within area will be vulnerable to surface water pollutants, such as due to the unforeseen leakage of hydrocarbons from machinery within the site compound. However, this area of meadow is away from the Royal Canal, separated by a treeline, and is considered to be of lower value due to tis limited floral diversity. Additionally, after the removal of the site compound at the end of the construction phase, this area will recover quickly and re-establish. Therefore, the impact of this site compound on the dry meadows and grassy verges habitat is **likely to lead to a short-term adverse impact of slight significance.**

Dust may be generated during the proposed groundwork adjacent to these habitats. Although these habitats are not particularly sensitive to airborne pollutants, they may be negatively impacted if large quantities are released within a confined area. There will be an increase in NOx emissions associated with traffic attending the site during construction, but this will be temporary in nature and the total number of additional journeys within the area is considered negligible. In the absence of appropriate mitigation measures during the construction phase, airborne pollution will **likely lead to a temporary adverse impact that is not significant** on these bankside habitats.

8.7.3.3.6 Drainage ditches [Local (higher value)], Hedgerows over drainage ditches [County], Treelines over drainage ditches [County]

In the absence of mitigation, the drainage ditches adjacent to the Royal Canal, were composed of species associated with overlapping habitats such as Hedgerows (WL1) and Treelines (WL2), may potentially be impacted via surface water runoff of potential pollutants used on site such as hydrocarbon leakage from machinery or run off of sediment from the proposed ground works. This could have a moderate impact on the water quality within the drainage ditches. Surface runoff may also contribute to a decline in the water quality within this habitat. In the absence of mitigation measures, this will **likely result in a temporary adverse impact of slight significance** to the quality of water in these drainage ditches. Without mitigation measures, airborne dust generated from the Proposed Development settling on the drainage ditches may also increase the nutrient load, and in turn reduce the water quality. The

impact of dust on the drainage ditch habitat is considered to be a **likely temporary adverse impact of slight to moderate significance**.

The hedgerow and treeline sections present on the banks of these drainage ditches are due to be retained. However, trees may experience accidental damage through the movement of machinery throughout the Proposed Development, either via accidental limb breakages or damage to their root systems via soil compaction. Furthermore, as identified during the surveys and within the Arboricultural Assessment Report (Charles McCorkell Arboriculture Consultancy, 2026), Ash dieback was recorded within several Ash trees along the Proposed Development. The construction phase activities, including the felling of infected Ash trees, has the potential to spread this disease to Ash saplings as well as non-infected mature Ash trees within these habitats. The treelines and hedgerows may be impacted by any potential degradation of the soil from pollutants, **likely resulting in a temporary adverse impact of slight significance**. These habitats may also be impacted by the release of airborne pollutants, with dust settlement on vegetation degrading the health of individual plants.

Therefore, in the absence of mitigation, a **temporary adverse impact of slight to moderate significance is likely** on the drainage ditches and their associated treelines and hedgerows.

8.7.3.3.7 Dry Calcareous Grassland [County level importance]

These habitats are present next to the Proposed Development, and in the absence of appropriate mitigation measures, heavy machinery may degrade this habitat while accessing the zone of works. This may result in the destruction of flora and compaction of soil within these areas resulting in the loss of these high-quality grassland areas. In the absence of mitigation measures to prevent the movement of machinery within these grassland areas, there will **likely be short-term adverse impacts of moderate significance** as the species within this habitat will recover quickly.

Other aspects of the Proposed Development, including the generation of dust through excavations or the release of hydrocarbon through pollutant spillage events which could potentially have significant impacts on these grassland habitats, degrading the underlying soil quality and disrupting microbial communities. In the absence of mitigation measures during the proposed work, the release of airborne pollutants or the spillage of hydrocarbons during works **will likely result in a short-term adverse impacts of moderate significance**.

8.7.3.3.8 Woodland and scrub habitats: (Mixed) broadleaved woodland [County level importance], Mosaic: Scrub / Dry meadows and grassy verges [Local (higher value)], and Scrub [Local (higher value)]

There are a number of sources of impact on these woodland habitats and scrub habitat during the construction phase, including via the physical disturbance/removal of these habitats, accidental spill events of pollutants used on site (e.g. hydrocarbon leakage from machinery) and dust emissions.

8.7.3.3.8.1 Physical Removal and Disturbance

There will be a direct loss of mixed broadleaved woodland, scrub and meadow mosaic, and scrub habitats as a result of the Proposed Development. There will be the direct removal of pNHA woodland between Chainages +5450 - + 5600 and Chainages +6300 - +7170. The woodland area along Delwood Park (Chainages +6380 - +6590) where the Proposed Development will run has been disturbed by dumping and the extension of back gardens from the adjacent properties along Delwood Park. Between Brompton Grove and Brompton Green (Chainages +6940 - +7090), the Greenway will run into a green

area to the north of the woodland habitat, before re-entering the woodland until the proposed Landmark Bridge (Chainages +7115 to 7350).

Furthermore, between Chainages +4550 - +5250, the Proposed Development will run through sections of scrub and meadow and scrub mosaic habitats at the Old Schoolhouse lands, which will result in a loss of scrub/scrub and meadow mosaic habitats adjacent to the treeline, which includes Bramble, as well as Blackthorn and Alder saplings.

The removal of these habitats will involve heavy machinery and groundwork, along with the removal of trees/vegetation along the Proposed Development. There will be the removal of some trees within the mixed broadleaved woodland east of Kennan bridge, either side of the Dr Troy overpass bridge (Chainages +5450 - + 5600) to accommodate the Proposed Development. Some vegetation, including trees along the northern extent of the mixed broadleaved woodland habitats between Kilpatrick Bridge and the proposed Landmark Bridge, will need to be removed to allow for groundworks and placement of new paving (Chainages +6300 - +7170). Further vegetation will also need to be removed to allow for the placement of the proposed Quarry Bridge in Section 3 of the Proposed Development. Sections of the scrub and scrub and meadow mosaic habitats west of the Old Porterstown School House will be removed to allow for landscaping and the placement of the paving (Chainages +4600 - +5200). In total, it has been estimated that the construction phase will lead to a loss of 6800m^2 of woodland habitats, including those within the Royal Canal pNHA. Of this total, it is estimated that for the mixed broadleaved woodland habitat between the Old Schoolhouse and Coolmine Bridge (Chainages +5340 - +6250), including within the Royal Canal pNHA, approximately 1023m^2 of this habitat will be removed during the construction phase. It is estimated for the mixed broadleaved woodland habitat between Coolmine Road and Roselawn Road (Chainages +6300 - +7170), the area lost will be approximately 5780m^2. Approximately 1150m^2 of the scrub and scrub and meadow mosaic habitats between Chainages +4600 - +5200 will be lost during the construction phase.

Individual trees and sections of woodland that are to be partially removed are shown in the Arboricultural Assessment Report for the Proposed Development (Charles McCorkell Arboriculture Consultancy, 2026). This includes six shrubs, 44 individual trees, and there will be twelve groups of trees that will be partially removed and 1 tree group that will be removed in its entirety. The tree groups include sections of woodland that were inaccessible and assessed from a distance, between the Old Schoolhouse and Coolmine Bridge (Chainages +5340 - +6250), and between Coolmine Road and Roselawn Road (Chainages +6300 - +7170).

The trees to be removed include a mix of healthy, young, and dead trees, as well as Ash trees that have been infected by Ash dieback. While the loss of dead and/or dying trees is considered to be less ecologically impactful than the loss of healthy trees, these features provide important nesting, foraging, and/or roosting resources for local faunal groups and are an important feature of any woodland habitat. The loss of young trees from the scrub habitat within the Old Schoolhouse will prevent the natural succession of this habitat from towards higher value woodland habitat. Additionally, there will be a loss of associated ground flora within the woodland habitats where clearance is due to take place, as well as sections of the seedbank due to the removal of topsoil.

For the retained sections of these habitats, the retained tree species will be vulnerable to mechanical damage from construction vehicles which enter their root protection zones which causes root compaction resulting in lowered survivability of the vegetation. The presence of invasive species on-site creates the risk spreading of invasives species by the construction works which would negatively impact these woodland habitats. Furthermore, as identified during the surveys and within the

Arboricultural Assessment Report (Charles McCorkell Arboriculture Consultancy, 2026), Ash dieback was recorded within several Ash trees within these habitats. The construction phase activities, including the felling of infected trees, has the potential to spread this disease to Ash saplings as well as non-infected mature Ash trees within these habitats. Ash dieback and any subsequent tree loss have implications for the biodiversity of the woodland, as these trees and deadwood supply an important habitat for many insects, birds, and plants.

In the absence of mitigation measures, the extent of vegetation removal along the Proposed Development will **likely have a permanent adverse impact that is significant** on the (Mixed) broadleaved woodland, and **a likely permanent adverse impact of moderate significance** on the scrub and scrub and meadow mosaic habitats, as a significantly smaller area of this habitat will be removed during the construction phase.

8.7.3.3.8.2 Accidental Spill Events

There is the potential for accidental spills of deleterious substances, which have the potential to come in contact with and negatively impact the physiological health of the floral species within the retained sections of the woodland habitats. If a notable volume of these deleterious substances is spilled, they have the potential to seep into the sub-surface / groundwater, leading to the degradation of the root systems of these flora, potentially resulting in death, thus lowering overall health and biodiversity value of this important wildlife corridor habitat. In the absence of mitigation measures, degradation of groundwater **is likely to cause a long-term adverse impact of slight significance** on the quality of the woodland and scrub habitats, given the value/sensitivity of the receptors.

8.7.3.3.8.3 Air (Dust)

The generation of dust and use of heavy machinery during construction has the potential to adversely impact these woodland habitats. Dust-based pollution from the construction phase can have negative impacts on the remaining habitat beyond the site boundary; cement-based dust will cause the degradation of vegetation within the woodland habitats. The woodland habitats are not particularly sensitive to dust but may be negatively impacted if large quantities are released within a confined area. In the absence of mitigation measures, dust-based pollutants are **likely to cause a short-term adverse impact of slight significance** on the quality of the woodland and scrub habitats.

8.7.3.3.8.4 Overall Anticipated Impact

In the absence of mitigation, the release of airborne pollutants next to the habitats may result in temporary minor impacts from dust settling on vegetation. These impacts are likely to extend beyond the immediate work zones and include sections of these habitats that are due to be retained. Additionally, accidental pollution spills may cause further degradation to the retained sections of the woodland and scrub habitats. The physical removal of sections of these habitat types will also lead to the fragmentation and loss of floral diversity. Under the worst-case scenario, where pollutant spills occur within these habitats, retained trees are impacted by mechanical damage, and Ash dieback is spread further, this will act cumulatively with airborne pollutant impacts as well as the physical removal of sections of these habitats. Under this scenario, in the absence of mitigation, a **likely permanent adverse impact that is significant** is anticipated for the mixed broadleaved woodland, while a **likely permanent adverse impact of moderate significance** is anticipated for the scrub and scrub and meadow mosaic habitats.

8.7.3.3.9 Linear habitats: Treelines [County], Mixed: Treelines/ Grassy verges [County], and Hedgerows [County]

There are a number of sources of impact on these woodland habitats and scrub habitat during the construction phase, including via the direct effect of physical disturbance/removal of these habitats, and indirect effects from accidental spill events of pollutants used on site (e.g. hydrocarbon leakage from machinery) and dust emissions.

8.7.3.3.9.1 Physical Removal and Disturbance

Sections of the hedgerow east of Hansfield railway bridge, and some of the trees east of Callaghan Bridge, will need to be removed during the Proposed Development. There will also be a loss of treeline habitat to the east of the Hansfield Railway Bridge. The Proposed Development will utilise the existing pedestrian and cycle facilities within St. Joseph's before diverting towards the canal towpath via a proposed pocket park, which forms part of this Proposed Development. Access to the pocket park and towpath will require the partial removal of treeline habitat between chainages +3270 - + 3290, and chainages +3600 - +3650. Tree removal within these sections will be minimal and the existing treelines will not suffer significant fragmentation. Furthermore, tree removal will occur between chainages +4550 - +4570 to the west of the Old Schoolhouse. The direct loss of trees from this habitat will partially fragment the treeline habitat which will have knock-on impacts for local faunal groups.

Individual trees and sections of woodland that are to be partially removed are shown in the Arboricultural Assessment Report for the Proposed Development (Charles McCorkell Arboriculture Consultancy, 2026, see Appendix 10.1). This includes a series of five hedges. The five hedges to be removed, labelled in the Arboricultural report as H6, H7, H8, H34, and H35, have a total estimated length of 98m. However, one hedgerow (H8) is entirely comprised of invasive Cherry Laural, while another two hedges, H6 and H7, are comprised of non-native Portugal Laurel *Prunus lusitanica*. The other two hedges for removal (H34 and H35) are comprised of non-native *Pyracantha* species. As such, the loss of these hedges is not expected to significantly impact local faunal groups as these hedges have limited foraging potential, and the removal of the Cherry Laurel hedge will help reduce the spread of this high impact invasive species.

Additional retained trees may experience accidental damage through the movement of machinery throughout the project. Furthermore, as identified during the surveys and within the Arboricultural Assessment Report (Charles McCorkell Arboriculture Consultancy, 2026), Ash dieback was recorded within several Ash trees within these habitats. The construction phase activities, including the felling of infected Ash trees, has the potential to spread this disease to Ash saplings as well as non-infected mature Ash trees within these habitats. Additionally, the removal of dead/dying trees will remove important foraging, nesting and roosting habitat for local faunal groups. In the absence of mitigation measures, the proposed removal or accidental damage of these trees and hedgerows will **likely have a long-term adverse impact of moderate significance** on these habitats.

8.7.3.3.9.2 Accidental Spill Events

There is the potential for accidental spills of deleterious substances, which have the potential to come in contact with and negatively impact the physiological health of the floral species within the retained sections of these linear habitats. If a notable volume of these deleterious substances is spilled, they have the potential to seep into the sub-surface / groundwater, leading to the degradation of the root systems of these flora, potentially resulting in death, thus lowering overall health and biodiversity value of this important wildlife corridor habitat. In the absence of mitigation measures, degradation of

groundwater **likely have a long-term adverse impact of slight significance** on the quality of the treelines, hedgerows, and mixed; treelines and grassy verges habitats, given the value/sensitivity of the receptors.

8.7.3.3.9.3 Air (Dust)

The generation of dust and use of heavy machinery during construction has the potential to adversely impact these linear habitats. Dust-based pollution from the construction phase can have negative impacts on the remaining habitat beyond the site boundary; cement-based dust will cause the degradation of vegetation within the woodland habitats. The floral species within the treelines, hedgerows, and mixed treelines and grassy verges habitats are not particularly sensitive to dust but may be negatively impacted if large quantities are released within a confined area. In the absence of mitigation measures, dust-based pollutants will **likely cause a short-term adverse impact of slight significance** on the quality of the treelines, hedgerows, and mixed; treelines and grassy verges habitats.

8.7.3.3.9.4 Overall Anticipated Impact

Like the adjacent woodlands, the treelines and hedgerows may be impacted by any potential degradation of the soil from pollutants, phsycial removal of habitats, accidental damage during construction, and airborne pollutants. Under the worst-case scenario, where pollutant spills occur within these habitats, retained trees are impacted by mechanical damage, and Ash dieback is spread further, this will act cumulatively with airborne pollutant impacts as well as the physical removal of sections of these habitats. Under this scenario, in the absence of mitigation, a **long-term adverse impact of moderate significance is likely** on the treelines, hedgerows, and mixed; treelines and grassy verges habitats.

8.7.3.4 Species

8.7.3.4.1 Protected Flora [Local (County level importance)]

The Floral Protection Order (FPO)d 2022 species Opposite-leaved Pondweed was recorded by Triturus Environmental Ltd. (Triturus Environmental Ltd, 2025c, see Appendix 8.5.4) downstream of the Proposed Development within the Royal Canal. Additionally, the Red-listed Pointed Stonewort and nationally rare Clustered Stonewort were also recorded by Triturus Environmental Ltd. within the Royal Canal, downstream of the Proposed Development and within the Proposed Development's surface water Zol. Opposite-leaved Pondweed was also previously recorded by JBA for a separate project (JBA, 2024) between the First and Third lock of the Royal Canal, approximately 5km downstream of the site, and was previously recorded between the 4th and 5th Lock (NPWS, 2009). As such, these rare and protected flora are vulnerable to any surface water impacts arising from the Proposed Development.

Any changes to the water quality of the Royal Canal along the Proposed Development has the potential to cause likely significant effects on rare and protected floral species within the Canal. In the event of the accidental spillage of deleterious substances (e.g., hydrocarbons, solvents and/or cement leachate), these have the potential to negatively impact on the Royal Canal's water quality; and in turn any Opposite-leaved Pondweed or rare floral species present within the canal. This will lead to the degradation of the plant's physiological health potentially resulting in death, resulting in a retraction of its range within the Royal Canal. Furthermore, Opposite-leaved Pondweed is also vulnerable to excessive nutrient-based pollution, i.e., eutrophication, sediment entering the canal via spills or dust

settlement during the construction works would also prove detrimental to this protected species. Pointed Stonewort and Clustered Stonewort are similarly vulnerable to nutrient-based pollution.

Therefore, in the absence of mitigation, in the event of accidental pollutant spills, a **medium-term adverse impact of moderate significance is likely** for protected floral species, namely Opposite-leaved Pondweed.

8.7.3.4.2 Bats [County level importance]

In the absence of mitigation measures, works associated with the construction of the Proposed Development and placement of infrastructure, such as the newly constructed bridge on site, will result in a loss of foraging, commuting, and potential roosting habitat for local bats due to direct habitat removal. Additionally, construction based lighting and accidental spills of deleterious substances has the potential to further impact local bat species during the construction phase. The magnitude and significance of these impacts are discussed below in sub-sections 8.7.3.4.2.1 to 8.7.3.4.2.5 inclusive.

8.7.3.4.2.1 Roosting

During JBA's ecological walkover surveys in February 2026, two low potential roosting features were identified within the mixed broadleaved woodland habitat between Coolmine Bridge and Roselawn Road (Chainages +6300 - +7170). These features are present directly adjacent to the Proposed Development. While these features were deemed to be only suitable as temporary roosting features during the core bat activity season (May – September inclusive), their loss during the construction phase will lead to a loss in roosting features for local bat species. Additionally, the removal of 32 individual trees as well as nine groups of trees that will be partially or fully removed, which will ultimately result in a short- to medium-term loss of potential future roosting features that may form within these trees in the next several years through the breakage of limbs during storms, peeling of bark, ivy growth and/or the hollowing out of limbs/trunks. The loss of dead/dying trees will also remove potential future roosting features.

No roosts were identified within the Proposed Development during the bat surveys (Bat Eco Services Ltd., 2025). Additionally, minimal potential roosting features were identified along the Proposed Development, including within the trees, bridges, and buildings along the Royal Canal, with the exception of the Old Schoolhouse which will be retained. However, while limited potential roosting features were identified, in the event any additional roosts are identified prior to the commencement of any pre-enabling works or the construction phase itself, derogation licenses will be required for any works in the vicinity of these roosts.

Therefore, in the absence of mitigation, a **short-medium term adverse impact of slight significance is likely** for roosting bats.

8.7.3.4.2.2 Foraging and Commuting

The Proposed Development's construction will lead to the direct removal of woodland, meadow, and scrub habitats, leading to a direct loss of foraging and commuting resources for local bat species. The loss of these habitats has the potential to make the existing ecological corridor along the Royal Canal less suitable for local bat species. In particular, *Myotis* bat species that specialize in clustered environments, such as woodland, have the potential to be impacted by the loss of tree cover between Coolmine Bridge and Roselawn Road (Ch 6300 - +7170), and between the Old Schoolhouse and

Coolmine Bridge (Chainages +5340 - +6250). This has the potential to reduce the suitability for the canal to support the commuting activities of these bat species. Additionally, the loss of small sections of treeline habitat will fragment these commuting features for local bats, although these gaps will be limited to a few metres in diameter (4-5m based on the width of the Greenway) preventing them from significantly fragmenting existing linear habitats for bats. As concluded within the bat report (Bat Eco Services Ltd, 2025), the impacts of vegetation loss on local bat species are **likely to cause a long-term adverse impact of slight significance**.

The introduction of additional artificial lighting during the construction phase has the potential to cause further disturbance to local bat species. Direct lighting impacts refers to compound or works areas lighting spilling into adjacent habitats that support the foraging and movements of local bat species. For example, the positioning of site compounds in proximity to the Royal Canal has the potential to increase light spillage into this commuting corridor. This light spillage will cause local bats to avoid excessively lit habitats, effectively reducing the total habitat available to them for both foraging and commuting within the existing Royal Canal ecological corridor. In some cases, light spillage during the construction phase has the potential to cut-off commuting routes along the Royal Canal, especially at pinch points along the canal such as to the east of the proposed location of Landmark Bridge (Chainages + 7200). The indirect lighting impacts have the potential to arise through influencing the distribution and frequency of the local bats prey items within habitats adjacent to areas within additional construction- / compound-based lighting, resulting in a negative impact on foraging activity, especially for bats which are extra sensitive to lighting, i.e., *Myotis* bat species. As these additional lights will attract nocturnal winged invertebrates towards them away from their usual host habitats (van Langevelde et al., 2018), local bat species will be left with the option to commute to new foraging grounds or pursue their prey. For some bat species who have adapted relatively well to urban landscapes, namely Common pipistrelle, Soprano pipistrelle, and Leisler's bat, the pursuit of prey items into light impacted areas is less impactful (Russ and Montgomery, 2002; Russ et al., 2003). Furthermore, studies have shown that pipistrelle species and Leisler's bat can congregate around urban street lighting feeding on the nocturnal winged insects attracted to the lower impact lighting (Rydell et al., 1993, Blake et al., 1994; Stone et al., 2015; Spoelstra et al., 2015; 2017). However, studies indicate Pipistrelle species prefer foraging in dark environments, and the preservation of dark corridors is important for protecting these bat species and their invertebrate prey species (Buddendorf, 2026).

The remaining less light tolerant bat species, namely Brown long-eared bat, Daubenton's bat, and Natterer's bat, will be less likely to forage within light impacted areas, which will result in affected individuals commuting further to new foraging grounds and expending additional energy reserves as result, a notable physiological impact for these small mammal species with limited fat reserves. Therefore, in the absence of mitigation, construction phase lighting has the potential to result in a **likely temporary to short-term adverse impact of slight significance**.

8.7.3.4.2.3 Pollution Spills

All identified bat species (Common pipistrelle; Soprano pipistrelle; Nathusius' pipistrelle; Leisler's bat*;* Brown Long-eared bat, Natterer's bat and Daubenton's bat) are at risk of potentially being adversely impacted through the direct ingestion of contaminated water during the construction phase. In the event a bat was to drink from a waterbody which had been accidentally contaminated with polluting substance (in particular a pollutant which floats on top of the water's surface e.g., hydrocarbons), the bat has the potential to fly over a slick of contaminated water with its mouth open, consuming water from the top of the waterbody's surface. The consumption of such water can potentially result in damaged lungs and/or carcinogenic effects for affected individual.

Of the bat species identified utilizing the Royal Canal, the local Daubenton's bat population will be particularly vulnerable to direct adverse surface water-based impacts during the construction phase, given that its unique hunting technique of catching invertebrates floating on top of waterbodies, resulting in an increased frequency of surface water contact. No other native Irish bat species has this foraging behaviour, and the other bat species recorded utilizing the Royal Canal only drink from the water's surface. In the event that hydrocarbon pollutants were accidentally introduced into the local surface water and groundwater (surface water recharge) networks, local Daubenton's bat may come in contact with the substance whilst hunting along the surface of a waterbody, with potential additional contact when considering the small splash created when catching prey.

A series of direct and knock-on impacts will occur as a result of this direct contact. The affected individual's feet/claws will be covered in the slick hydrocarbon substance reducing its ability to catch and hold prey items, reducing its foraging success. In the event that the individual manages to catch and consume a prey item, which is now partially coated with the hydrocarbon, the bat will physiologically suffer from the ingestion of the contaminated prey item. Furthermore, the act of bringing the prey item to its mouth may also result in the spread of the hydrocarbon to the bat's face, potentially affecting its breathing airways and eyes. Following direct contact with the hydrocarbon, the affected bat may return to its roost where it will hang from its claws, and orientation which will allow for the hydrocarbon to flow downwards, towards the bat's torso, where it will seep into its fur. Furthermore, these hydrocarbons can potentially be ingested by bats as they groom their affected fur, leading to further physiological stress.

The affected Daubenton's bat, with its fur now contaminated and its insulative qualities degraded as result of the disruption of its furs ability to trap air (heat) close to the body, will likely seek out other bats within the roost, if not already in a group, so that it may better achieve suitable thermoregulation whilst resting. This act has the potential to spread the hydrocarbon on to the furs of any other bats within the roost. While the volume of the hydrocarbon spread to the other bats at this point is likely be negligible, were several bats from the same roost to encounter a hydrocarbon slick within the Royal Canal over a short period of time the cumulative exposure to the hydrocarbon may prove detrimental to roost's overall health/fecundity status.

Any surface pollutants are likely to persist within the Royal Canal surface water for a short-term basis before discharging downstream. However, the duration of any impacts is likely to persist due to pollutants accumulating within the sediments within the canal. Furthermore, direct impacts on local bats in the worst-case scenarios have the potential to lead to mortality events and reductions in the fecundity of the local bat population. Therefore, in the absence of mitigation measures, pollution spill events have the potential to result in **a likely short-medium term adverse impacts of moderate significance** for local bat species.

8.7.3.4.2.4 Dust

Air (dust)-based construction emissions have the potential to lead to pollution impacts that will indirectly impact all local bat species via degradation of local habitats resulting in the deterioration of quality and decreased frequency in their terrestrial- and/or aquatic-based prey items in the food chain. This impact also has a knock-on effect as the consumption of prey items containing polluting elements may lead to bioaccumulation of toxic substances within the local bat populations, resulting in physiological stress and potential reduced fecundity.

Therefore, in the absence of mitigation measures, dust emissions have the potential to result in **a likely short-medium term adverse impacts of slight significance** for local bat species.

8.7.3.4.2.5 Overall Anticipated Impact

In the absence of mitigations, under the worst-case scenario where accidental pollutants spills occur and degrade both the terrestrial and aquatic habitats present along the Proposed Development, the cumulative impact of this with the direct removal of foraging and commuting habitats, including of semi- and fully mature trees, the impacts of artificial lighting, potential pollution spill impacts, and habitat degradation from dust generation, is **likely to result in a long-term adverse impact of moderate significance** for local bats.

8.7.3.4.3 Badger [County level importance]

The various Badger surveys and reports (Smal, 2022, Triturus Environmental Ltd, 2022, 2023a & 2025a) indicates Badger foraging, commuting, and refuge activities within the woodland east of Hansfield Railway Bridge, as well as in the vicinity of Sheepmoor Lane and the Porterstown Old School House (Chainage +4600 - +5200). These areas have consistently been found to be where Badger activity is concentrated, with the majority of Badger signs consisting of snuffle holes, indicative of foraging behaviour (Triturus Environmental Ltd, 2025a, Appendix 5.5.9). Activity was notably limited along the existing canal towpath where disturbance sources are high. Key foraging areas were identified within Glen Garbh and the Old School House. Connectivity between and within these areas is already fragmented due to urbanization (e.g. roads, fence lines). There were large tracts of canal corridor and adjoining habitats where no Badger signs were recorded, including between the Kildare/Fingal County boundary to arable fields opposite Westmanstown Sports Centre, Hansfield to grassland near the Old School House at Porterstown or Sheepmore Lane to the 12th lock (Triturus Environmental Ltd., 2025a). This was considered to reflect the higher relative levels of human-related disturbance, poor/absent foraging habitats and separation between better-quality badger habitats.

Three Badger setts were identified in the vicinity of Sheepmoor Lane and the Porterstown Old School House (Chainages +4600 - +5200), including one that is currently active. None of these setts are located within the Proposed Development, however they are all located within 30m of the Proposed Development. Eight Badger setts were also identified within the oak-hazel-ash woodland habitat to the east of the Kennan Bridge, three of which were identified as being in active use, and one of these was identified as a main sett. Similarly, none of these setts are located within the Proposed Development, however they are all located within 30m of the Proposed Development.

Additional signs of Badger activity were noted by JBA in the woodland between Coolmine Bridge and Roselawn Road (Chainages +6300 - +7170, where a number of inactive setts were identified near to the Proposed Development. This area is largely comprised of mixed broadleaved woodland, which is relatively shielded from disturbance, and is thus considered important refuge, commuting, and foraging habitat for Badger.

The local Badger population therefore has the potential to be impacted by habitat loss and further habitat fragmentation, in particular due to the loss of woodland habitat, as well as physiological and habitat degradation via pollutants, disturbance, and physical harm, and potential impacts to the existing active and inactive setts during the construction phase. The magnitude and timeframe of the anticipated impacts on the local Badger population, in the absence of mitigation, during the construction phase are detailed below in sub-sections 8.7.3.4.3.1 to 8.7.3.4.3.5 inclusive.

8.7.3.4.3.1 Habitat Loss and Fragmentation

The proposed development will lead to a loss in foraging and refugia resources for local Badger due to the removal of scrub, meadow, and woodland habitat. The removal of an estimated 5780m^2 of mixed broadleaved woodland between Coolmine Bridge and Roselawn Road (Ch 6300 - +7170) will impact local Badger populations. While this area was not noted as having significant activity during the previous Badger surveys (Triturus Environmental Ltd, 2022, 2023a, and 2025a), JBA identified inactive Badger setts within this area, and due to the area being currently largely inaccessible to the public due to the steep terrain and with the eastern extent of this habitat alongside the public green area by Roselawn fenced off (Chainage +6870 – 7310), it is largely shielded from disturbance and is suitable for Badger foraging, commuting, and refuge. The introduction of additional disturbance sources to this area has the potential to reduce its viability for supporting Badger foraging, commuting, and refuge activities. The loss of these habitats also has the potential to fragment suitable habitats along the Royal Canal.

As discussed in the Badger Reports conducted by Triturus Environmental Ltd (2022, 2023a, and 2025a), due to the urbanised nature of the area surrounding the Royal Canal from the Hansfield Railway Bridge onwards (Chainage +3160) and the high levels of human disturbance within these areas, local Badger populations are largely restricted to the Royal Canal ecological corridor. Construction work associated with the Proposed Development may result in the disconnection of the wildlife corridor present which could add pressures to the local Badger activity along the Royal Canal.

Therefore, in the absence of mitigation, a **long-term adverse impact of moderate significance is likely** for local Badger, given the importance of the Royal Canal riparian habitats for this species and a lack of supporting habitat outside of the canal ecological corridor.

8.7.3.4.3.2 Physiological and Habitat Degradation via Pollutants

Local Badger are at risk of potentially being adversely impacted through the direct ingestion of contaminated water during the construction stage. In the event that a Badger were to drink from a waterbody, which had been accidentally contaminated with polluting substance, (in particular a pollutant which floats on top of the water's surface e.g. hydrocarbons), this can potentially result in damaged lungs and/or carcinogenic effects for affected individual. Moreover, groundwater and air (dust)-based pollution impacts have the potential to indirectly impact this species via the deterioration in quality and population decline (availability) of prey items in their respective food webs, such as earthworms which make up a significant proportion of Badger diets. This impact also has a knock-on effect as the consumption of contaminated prey items may lead to bioaccumulation of toxic substance, increasing mortality risk.

Therefore, in the absence of mitigation, a **medium-term adverse impact that is significant is likely** for local Badger, with this reflecting the highest magnitude of impacts which includes excess mortality rates.

8.7.3.4.3.3 Disturbance and Physical Harm

The enabling and construction works will create disturbance in previously undisturbed habitat. In the event construction phase works are to take place at night, the use of lights will potentially disturb this species further due to their nocturnal nature. The Proposed Development also have the potential to disturb Badger activity through noise pollution forcing this species away from the area. The impacts of noise and vibration resulting from the Proposed Development is discussed in detail in Chapter 7 of this report. Additionally, disturbance may lead to potential loss of life in the case of accidents (e.g. accidental

trappings) within the construction site containing existing commuting and foraging habitats, after failure to exclude entry.

Therefore, in the absence of mitigation, a **medium-term adverse impact that is significant is likely** for local Badger, with this reflecting the highest magnitude of impacts which includes excess mortality events.

8.7.3.4.3.4 Impacts on Setts

The construction phase of the Greenway Proposed Development has the potential to disturb local Badger populations. This could lead to the abandonment or avoidance of setts by Badger, which in the case of the Royal Canal corridor includes 11 active and inactive setts, the active setts of which include 8 non-main setts and 3 main setts. Disturbance has the potential to also impact the breeding setts within the Sheepmoor Lane area, including the disruption of breeding activities and/or abandonment of the sett, including the removal of any cubs. Such events have the potential to force the local badger population to abandon their core territory situated along Sheepmoor Lane and Kennan Bridge. Further, disturbance and the physical works themselves may prevent Badger commuting between main and non-main setts, reducing connectivity between the existing setts present between Kennan Bridge and the Sheepmoor Lane woodland area. Additionally, other non-main active/inactive setts located along the Proposed Development, including within the Old Schoolhouse Lands and the wooded area within Roselawn may become less suitable for the local Badger population due to their proximity to the proposed works.

This has the potential to cause the temporary abandonment of the existing territory along the Royal Canal, which will lead to Badger searching for new territories. Given the constricted nature of the suitable habitats along the canal for Badger and the heavily urbanised surrounding area, this has the potential to lead to Badger taking high risk routes, such as over busy roads, while searching for alternative territory. Road traffic collisions are one of the single largest contributors to Badger mortality rates in Ireland.

Furthermore, without additional pre-enabling work surveys and appropriate mitigation, any inactive setts may become active or new setts maybe dug between the submission of this report and the commencement of construction. In this event, the construction phase could damage active setts and potentially lead to loss of life.

Therefore, in the absence of mitigation, a **long-term adverse impact that is significant is likely** for local Badger, in the event of abandonment of the existing setts and territory along the canal, and excess mortality rates as a result of this.

8.7.3.4.3.5 Overall Impact Assessment

In the absence of appropriate mitigation measures, construction work is likely to impact on this species through habitat removal and fragmentation, disturbance through increased noise and lighting, and the abandonment of 4 active setts, including where breeding activity has been previously recorded. Furthermore, an additional 7 non-main and main inactive setts may also become unviable to local Badger, due to a combination of increased disturbance, as well as habitat removal and fragmentation. The works have the potential to lead to the abandonment of the core Badger territory located between Kennan Bridge and the Sheepmoor Lane area, disrupting breeding activities and leading to the local population searching for new territory. However, habitat fragmentation and loss as well as disturbance has the potential to make non-core territories where Badger activity has been recorded previously,

including the Old Schoolhouse lands and the Roselawn wooded area, less viable. Ultimately these impacts in-combination in the worst-case scenario have the potential to lead to the local Badger population abandoning g the Royal Canal corridor and searching for alternative territory/habitats elsewhere. Given the highly urbanised nature of the surrounding area, such an event will significantly increase the risk to Badger from road-traffic collisions, increasing mortality events.

Therefore overall, in the absence of mitigation measures, a **medium to long-term adverse impact that is significant is likely** for local Badger due to the disruption and disturbance of this species, with these impacts becoming long-term in the worst-case scenario event of the abandonment of the existing core and supporting territories within the Royal Canal ecological corridor.

8.7.3.4.4 Otter [County level importance]

The presence of three historical holts and multiple spraints along the Proposed Developments highlight the use of the Royal Canal by Otter. The Proposed Development has the potential to disturb Otter activity via habitat removal and fragmentation, reduction of habitat quality through surface and ground water pollution, disturbance, and impacts upon the existing holts. While the majority of the holts identified along the Proposed Development were determined to be historical following camera trap surveillance, one holt to the far west of the Proposed Development is a breeding holt (Triturus Environmental Ltd, 2025b, Appendix 5.5.10.1), which is located within 30m of the Proposed Development, on the south side of the canal. The magnitude and timeframe of the anticipated impacts on the local Otter population, in the absence of mitigation, during the construction phase are detailed below in sub-sections 8.7.3.4.4.1 to 8.7.3.4.4.5 inclusive.

A separate Regulation 54 Derogation license for the disturbance of a breeding holt is being obtained from the National Parks and Wildlife Service (NPWS).

8.7.3.4.4.1 Habitat Loss and Fragmentation

During the construction phase, the Royal Canal itself will remain open for foraging and commuting, and the majority of the bankside habitats will be retained, with the exception between chainages +4235–4610 of the Greenway east of Callaghan Bridge. A 4m wide boardwalk will be constructed within this area, which will remove dry meadow and grassy verge bankside habitat high on the bank but will retain those habitats closest to the water. Surface water pollutants accidentally released during the construction phase that enter the Royal Canal also have the potential to result in temporary loss of Otter supporting habitat.

However, the removal of terrestrial habitats within the Royal Canal's riparian zone, namely woodland, scrub, and meadow will disrupt the foraging and commuting activities of local Otter. The provision and retention of riparian tree cover (buffers) is particularly important for Otter (Kim & Hong, 2024; Weinberger et al., 2019; Teresa et al., 2014; Remonti et al., 2011), especially in light of urbanisation and infrastructural developments (Hong & Joo, 2021). The retention of some undisturbed and poorly accessible areas of canal corridor is especially warranted, as these are invariably the areas where holts and couches have most frequently been recorded during the Otter surveys (Triturus Environmental Ltd, 2026, Appendix 5.5.10.2). As such, the loss of woodland from within two inaccessible areas adjacent to the canal, including either site of the Dr Troy overpass bridge (Chainages +5450 - + 5600) and between Coolmine Bridge and Roselawn Road (Ch 6300 - +7170), will reduce the available relatively undisturbed habitat for Otter.

Additionally, construction phase activities have the potential to disturb an existing breeding holt located on the opposite bank of the canal to the Proposed Development at the Kildare/Dublin County border (Ch 0). The removal of terrestrial habitats along the Royal Canal can have knock on effects on the local food web, reducing prey items for local Otter.

Therefore, in the absence of mitigation, a **medium-term adverse impact of slight significance is likely** for Otter as a result of habitat loss and fragmentation during the construction phase.

8.7.3.4.4.2 Surface and Ground Water Pollution

During the construction phase, several sources of potentially harmful pollutants will be present within the works areas and site compounds, including hydrocarbons within construction vehicles, concrete/bituminous mixtures in materials used in paving, and spoil generated from excavations/site clearance that leach into the Canal following rainfall events. In the event of an accidental hydrocarbon pollutant spill, these pollutants will be introduced into the local surface water (Royal Canal and Rusk Stream) and groundwater (surface water recharge) networks. Resultantly, local Otters may suffer from degraded furs notably impacting the furs' insulative qualities as result of a disruption to fur's natural water-proofing oils and its capacity to trap warm air close to the body, resulting in physiological stress for any affected Otter. Furthermore, these hydrocarbons can potentially be ingested by Otter as they groom their affected furs, leading to haemorrhagic gastroenteropathy, which will likely result in Otter mortalities (Baker et al. 1981). Moreover, surface water and groundwater-to-surface water-based pollution impacts could indirectly impact Otter via the deterioration of prey items in their food. This impact also has a knock-on effect as the consumption of prey items containing polluting elements may lead to bioaccumulation of toxic substances within the local Otter population. Accumulation of such toxic substances is known to result in pulmonary distress in the lungs of mammals, in addition to the general carcinogenic effects, extending the impact of surface water pollution events. These instances have the potential to lower fecundity as well as result in mortality incidents.

There are several sections of the Proposed Development where the potential for surface water pollutant spill events will be higher due to the proximity of the works to the canal. This includes the stretch of the canal between the Dublin/Kildare border and Hansfield bridge (Chainages 0 - +3170) where a 2-3m wide unbound surface will be located, between Chainages +3640 - +4550 along the canal where a 4m wide route will run along the northern embankment, the proposed location of Landmark Bridge (Chainages + 7090 – 7250), and the area to the east of this (Chainage +7250 – 8063) where the Proposed Development will continue along the south side of the canal. Of particular concern for Otter includes the area near the Dublin/Kildare border where a breeding holt was identified, as well as the proposed location of Landmark Bridge due to its proximity to three historical Otter holts.

Therefore, in the absence of mitigations, a **medium-term adverse impact that is significant is likely** for Otter, given the potential for pollution spills to occur during the construction phase, and the potential of such events to increase mortality rates and reduce fecundity within the local Otter population.

8.7.3.4.4.3 Disturbance

Construction phase works have the potential to disrupt the commuting and foraging activities of local Otter, especially if works were to take place at night, with construction-based lighting potentially disturbing Otter due to their nocturnal nature. The Proposed Development also has the potential to disturb Otter activity through noise pollution, including from piling that will take within 10m of the royal Canal as part of the construction of the Proposed Landmark Bridge (Chainage +7115 – 7350), forcing this species away from the area. Additionally, work sites along the Proposed Development may lead to

potential loss of life for individual Otters in the case of accidents within the construction site (e.g., accidental trappings), after failure to exclude entry.

Therefore, in the absence of mitigations, a **medium-term adverse impact that is significant is likely** for Otter, given the potential for construction phase activities to result in mortality in the case Otters enter work sites along the Proposed Development.

8.7.3.4.4.4 Holts

Three historical holts were identified along the Proposed Development, within the woodland area between Coolmine Bridge and Roselawn Road (Ch 6300 - +7170) in proximity to the Proposed Development (within 15m). None of these holts were located directly within the Proposed Development route. Trail camera monitoring of these holts in 2022 failed to identify any utilisation by Otter (Triturus, 2022b). These holts were resurveyed in April 2025 and there was no evidence Otter were actively using these holts (Triturus, 2025b). Additionally, these holts were partially infilling/overgrowing, and as such they were deemed to be historical (inactive for an extended period). However, this does not mean these holts will not become active in the future (i.e. become re-excavated).

These historical holts may be damaged during the construction works due to their proximity to the Proposed Development. In the event these holts become active, auditory disturbance impacts during the construction works would be anticipated, which would have the potential to discourage the use of this holt, potentially resulting in a temporary restriction in territory for local male and female Otter which reside within this stretch of the Royal Canal. Additionally, it cannot be anticipated whether the local Otters will establish new holts or couches (protected resting sites) in the time prior to the commencement of the construction phase along the Royal Canal, so there is the potential for more than one resting site to be impacted by disturbance along the canal. While these historical holts are currently inactive, in the event they become active prior or during the proposed works, a derogation licence will be required from NPWS in advance of the works.

Additionally, a breeding holt is present on the opposite bank of the Proposed Development to the west of the Proposed Development (Chainage +50 – 250). This holt is located within a 150m disturbance buffer of the Proposed Development. As such, construction works have the potential to cause audible disturbance to this holt, impacting the breeding behaviour of Otter and in the worst-case scenario resulting in abandonment. A separate Regulation 54 Derogation license for the disturbance of a breeding holt is being obtained from the National Parks and Wildlife Service (NPWS), where required.

Therefore, in the absence of mitigation, a **medium-term adverse impact that is significant is likely** for Otter holts, in the event the existing Otter breeding holt is abandoned due to disturbance during the construction phase.

8.7.3.4.4.5 Overall Impact Assessment

Overall, in the absence of mitigation measures, these impacts relating to the loss of supporting habitats, as well as the disruption and disturbance of Otter foraging and commuting activities has the potential to lead to local Otter avoiding the use of the Royal Canal adjacent to the Proposed Development during the construction phase. This reduced connectivity will impact the foraging behaviour of and genetic mixing between the Otter populations upstream and downstream of the Proposed Development. Therefore, in the absence of mitigation, **medium-term adverse impact of moderate significance is likely** for local Otter population.

In the worst cases scenario there could be the loss of a holt or the loss of life of individuals should they become trapped in excavation pits or construction material, if not properly managed during the Proposed Development. In these scenarios, the impact to local Otter would be considered more significant, and recovery from these impacts would be less likely than the disturbance-related impacts. In the absence of mitigation, the impacts relating to the loss of holts or the loss of Otter life are anticipated to **likely be medium-term significant and adverse** to the local population.

8.7.3.4.5 Other Terrestrial Mammals [Local (higher value)]

The local Hedgehog, Pygmy Shrew, Red Squirrel and Pine Marten populations will potentially be exposed to a range of construction emissions (surface water, groundwater and air-based pollutants), and visual and audible disturbance, which will be generated within the proposed project area. In the absence of appropriate mitigation measures, construction works may also reduce commuting and foraging habitat for these species, as well as the connectivity between these habitats. There is also a direct opportunity for mammals to be harmed by the works if they become trapped in excavation pits or construction material, if not properly managed during Proposed Development. Nocturnal mammals such as Hedgehogs may be impacted by lights if the works take place at night. The Proposed Development may also contribute to noise disturbance within proximity to these mammals which may result in abandonment of areas within the area.

In the absence of mitigation measures, a reduction in habitat connectivity and disturbance to foraging and commuting activities will **likely result in a temporary adverse impact of slight significance** to these species, while the direct loss in life will **likely result in a medium-term adverse impact of moderate significance.**

8.7.3.4.6 Birds (Breeding and Riparian) [local (higher value)]

There were consistent levels of activity by breeding and riparian birds across the majority of the route along the canal for the Proposed Development. In the absence of appropriate mitigation measures, breeding birds will be disturbed by any tree/hedgerow removal and/or cutting while machinery gain access during proposed construction works. This may impact on natural foraging behaviour within the locality, may interrupt the nesting occurrence along the canal habitats, and may cause the loss of life for fledging chicks if done within the breeding season. Additionally, the Proposed Development have the potential to cause audible and visual disturbances as well as impact habitat quality through surface and ground water pollution.

8.7.3.4.6.1 Habitat Loss and Fragmentation

Local breeding bird species will experience a reduction in current and potential nesting sites as result of the clearance of woodland habitats along the Proposed Development, in particular between Chainages +5440 - +5490 and Chainages +6300 - +7170. Additionally, the removal of scrub and scrub and meadow mosaic habitats (Chainages + 4500 - +5250) will lead to a loss of foraging and nesting resources for local breeding bird species. However, the Royal Canal itself will remain open during the construction phase, and the majority of the bankside habitats will be retained, with the exception between Chainages +4235–4610 of the Greenway east of Callaghan Bridge. A 4m wide boardwalk will be constructed within between Callaghan Bridge and the Old School House, which will remove dry meadow and grassy verge bankside habitat high on the bank but will retain those habitats closest to the water. This walkway however will not overhang the canal and will not require any works within the

canal itself. This loss is minimal, and along with the retention of the habitats within the Royal Canal itself will help to preserve the existing foraging resources for riparian and breeding birds.

The temporary and permanent habitat loss has the potential to result in habitat fragmentation within the Royal Canal ecological corridor. Potential degradation of habitats to be retained, through direct physical or pollutant-based impacts, also has the potential to increase the width of these habitat divisions along the canal. While the level of fragmentation in regard to movement is within acceptable range for standard commuting purposes for the local breeding and riparian bird species, the removal of cover/refugia from the riparian zone is problematic for any bird species which can be predated upon by local birds of prey. The increasingly likelihood of being predated can reduce the local populations of breeding bird species of conservation concern. The potential loss of juvenile and/or adult birds of conservation concern will result in short-term impact for local breeding bird species.

Therefore, in the absence of mitigation, a **long-term adverse impact of slight significance is likely** for breeding birds due to the loss of supporting habitats and potential for mortality events as a result of the proposed works.

8.7.3.4.6.2 Surface and Ground Water Pollution

Additionally, habitat loss and the general deterioration of retained habitats through surface water, groundwater or air-based pollutants have the potential to reduce and/or degrade the foraging grounds of local breeding bird species. The degradation of floral species in these habitats has the potential to negatively impact insectivorous bird species of conservation concern, who are reliant on healthy host flora supporting a range of invertebrate species, which feed on or frequent these flora for foraging purposes. Similarly, seed- and fruit/berry-eating bird species of conservation concern (i.e., Greenfinch and Yellowhammer) would be adversely impacted if pollutant-affected flora were unable to produce these reproductive products, or only produce low-quality and/or below average quantities of these food sources. A number of omnivorous bird species of conservation concern will be negatively impact by both of the above scenarios, such as Mallard; House Sparrow; and Starling. Riparian bird species of conservation concern, including Kingfisher, Grey Wagtail, Cormorant, Mallard, Tufted Duck, and Mute Swan will also be negatively impacted by the reduction in quantity and quality of their preferred grazing flora species. The potential polluting of the local waterbodies as a result of the accidental spillage of deleterious materials (i.e. hydrocarbons) also has the potential to negatively affect the local fish populations, which will in turn adversely impact piscivorous species of conservation concern, such as Cormorant and Kingfisher. Such impacts on foraging grounds and diet will range from temporary to short-term in regard to impact length.

All local breeding bird species are at risk of potentially being adversely impacted through the direct ingestion of contaminated water during the construction stage. In the event that a bird was to enter a temporary waterbody, which had been accidentally contaminated with a polluting substance, (in particular a pollutant which floats on top of the water's surface e.g. hydrocarbons), the bird could consume water from the upper (polluted) layers of the water column. The consumption of such water can potentially result in reduced egg production and hatching; increased clutch or brood abandonment; reduced growth and increased organ weights (Albers, 2006). Additionally, surface-and-groundwater pollution impacts, have the potential to indirectly impact upon breeding bird species via the deterioration of food / prey items in the food chain for the local bird species. This impact also has a knock-on effect as the consumption of prey items containing polluting elements may lead to bioaccumulation of toxic substances within the local breeding bird populations (Costa et al., 2013; Idan and Jazza, 2022; and Ding et al., 2023).

Therefore, in the absence of mitigation, a **short-term adverse impact of slight significance is likely** for breeding birds as a result of surface and groundwater pollution.

8.7.3.4.6.3 Disturbance

Breeding bird species that utilize the site for commuting or foraging purposes may be visually and/or audibly disturbed by the construction works and workers entering /exiting the works area, causing these breeding bird species to vacate the site during active work periods. Additionally, the clearance of vegetation within and adjacent to the works area will increase local breeding bird species alert distances as there will be less vegetation available for refuge (Fernández-Juricic et al., 2001). Noise generated by the construction works has the potential to effect egg production, incubation, brooding, predators, brood parasites, and abandonment, as well as the ability to find or attract a mate and the ability of parents to hear and respond to begging calls of their offspring. Any bird species that regularly experience fright–flight responses or failure to attract mates and defend territories (Slabbekoorn and Ripmeester, 2008) as a result of the excessive noise, will likely suffer from decreased fecundity of their local respective populations.

Additionally, dust-based air pollution impacts have the potential to indirectly impact upon breeding bird species via the deterioration of food / prey items in the food chain for the local bird species. This impact also has a knock-on effect as the consumption of prey items containing polluting elements may lead to bioaccumulation of toxic substances within the local breeding bird populations (Costa et al., 2013; Idan and Jazza, 2022; and Ding et al., 2023).

Therefore, in the absence of mitigation, a **short-term adverse impact of slight significance is likely** for breeding birds as a result of disturbance (visual and air pathways).

8.7.3.4.6.4 Overall Impact Assessment

In the absence of mitigations, local breeding and riparian birds will be impacted by the loss and fragmentation of the riparian and terrestrial habitats, potential impacts due to surface, ground and air pollutants, and disturbance along the Proposed Development during the construction phase. Under the worst-case scenario, where accidental pollutant spills occur and these pollutants come into contact with local birds, loss of life/fecundity has the potential to occur, impacting local bird populations. However, the Royal Canal will retain its function as an ecological corridor for birds and the loss of habitats will not significantly reduce foraging resources for bird populations. Furthermore, while construction phase disturbance has the potential to impact bird foraging, and commuting, and breeding behaviour, these impacts will ultimately be limited to the short-term. Therefore, the construction phase, in the absence of mitigation, is anticipated to result in a **likely short-medium term adverse impact of slight significance** on these bird populations, with medium-term impacts reflecting worst-case scenario events.

8.7.3.4.7 Amphibians [Local (higher value)]

Amphibians such as Common Frog and Smooth Newt are highly dependent on the water quality of standing pools of water, and that of the canal. While there were no amphibians recorded in any of the ditches or the canal during the ecological surveying, this does not ensure that they may not be present in these habitats during the time of works. This species group is thus highly sensitive to changes in water quality, which has the potential to occur during the construction phase due to the input of suspended sediment from earthworks adjacent to the Royal Canal and drainage ditches as well as

accidental pollution spills. Amphibians may also be physically disturbed during the construction works, and the removal of the sections of the habitats bordering the canal will impact their foraging and commuting activities, and winter refugia.

8.7.3.4.7.1 Habitat Loss and Fragmentation

The Royal Canal will remain open during the construction phase, and the habitats within and immediately adjacent to the canal will be retained in their entirety, with the exception of small section of bankside grassy verge (between chainages +4235–4610). This loss will be minimal and will not impact local amphibian species.

However, the removal of terrestrial habitats along the Royal Canal, namely woodland, scrub, and scrub and meadow mosaic habitats will disrupt the foraging and commuting activities of local Amphibians. While the canal itself will remain open for foraging and commuting, the banks will undergo a degree of vegetation removal, which in turn removes the safe commuting corridor for amphibians on the banks of the canal. Additionally, the removal of the woodland may disrupt hibernating amphibians. The removal of these habitats can have knock on effects on the local food web, reducing prey items for local amphibians.

Therefore, in the absence of mitigation, a **long-term adverse impact of slight significance is likely** for amphibians due to the loss of supporting habitats as a result of the proposed works.

8.7.3.4.7.2 Surface and Ground Water Pollution

In the absence of appropriate mitigation measures, the Proposed Development may result in a degradation of the local water quality of the canal and the nearby ditches, which will in turn lower the quality of potential breeding and foraging habitat for these species. Furthermore, surface water- and groundwater- and air(dust)-based pollution impacts could indirectly impact the local Common Frog and Smooth Newt population via the deterioration of food / prey items in the food chain for the local amphibian species. This impact also has a knock-on effect as the consumption of prey items containing polluting elements may lead to bioaccumulation of toxic substances within the local Common Frog and Smooth Newt population.

Therefore, in the absence of mitigation, a **short-term adverse impact of slight significance is likely** for amphibians due to potential surface and groundwater pollution.

8.7.3.4.7.3 Disturbance

Additionally, these two amphibian species (Common Frog and Smooth Newt) may also be subjected to disturbance-based impacts, which could negatively impact their foraging, spawning, commuting and hibernation activities, as well as potential loss of life for individuals within the construction site (e.g., accidental trappings), after failure to exclude entry.

Therefore, in the absence of mitigation, a **short-term adverse impact of slight significance is likely** for amphibians due to the potential for the works to result in excess mortality rates after failure to exclude entry to work sites.

8.7.3.4.7.4 Overall Impact Assessment

Impacts on local amphibians, in worst case scenarios, include surface water impacts due to the accidental spillage of deleterious substances, such as hydrocarbons, which have the potential to lead

to increased mortality rates and decreased fecundity rates within the local Common Frog and Smooth Next populations. The loss of habitats along the Royal Canal will also result in a long-term loss of foraging and refuge resources for both species. Therefore, in the absence of mitigation measures, these activities are anticipated to result in a **likely long-term adverse impact of slight-to moderate significance** for Amphibians, with the moderate significance representing worst-case scenarios where loss of life/fecundity occurs.

8.7.3.4.8 Terrestrial Invertebrates (bees, butterflies, moths and ants) [Local (higher value)]

There are 101 bee species in Ireland. Nineteen of these species are bumblebees, and more than half of these bumblebee species are in decline. Ireland has one native honeybee species. Most of the other 81 bee species in Ireland are solitary. Nearly half of these solitary species are in decline. A regional Red Data List of bees has been produced and indicates which bee species are in most danger in Ireland. Six species are critically endangered (CR), 7 are endangered (EN), 16 are vulnerable (VU) and 13 are near threatened (NT). These species are dependent on the flowering vegetation along the Proposed Development, while some listed bees and local ant populations would utilise the on-site earth banks present for nesting. The larval form of butterflies and moths are also dependent on a variety of vegetation in both the woodland, grassland and recolonising habitats. The loss of meadow and scrub mosaic, scrub, woodland, earth-banks, and recolonising bare ground habitats will therefore lead to a loss in nesting and foraging resources for these terrestrial invertebrate groups. The loss of meadow can additionally disrupt the life cycle of local terrestrial invertebrates, namely butterfly species. In addition to the physical removal of habitat adjacent to the Royal Canal, the accidental release of environmental pollutants as well as disturbance during the construction phase can have additional adverse impacts on terrestrial invertebrates.

8.7.3.4.8.1 Surface and Ground Water Pollution

In the event that environmental pollutants were accidentally introduced, via surface water, groundwater and air (dust) pathways, into the terrestrial and aquatic habitats present within and adjacent to the Proposed Development, local terrestrial invertebrates', including red-listed Moss Carder-bee, foraging resources may be notably degraded, potentially reducing their quality and frequency of occurrence within the affected habitat(s). Furthermore, a number of invertebrate groups (e.g., *Lumbricina* - earthworms) are known to bioaccumulate pollutants within the soils of these polluted habitats, damaging their physiological health, as well as introducing the toxin into the lowest trophic level of the local food web. Therefore, in the absence of mitigation, a **short-term adverse impact of slight significance is likely** for terrestrial invertebrates as a result of surface and groundwater pollution events.

8.7.3.4.8.2 Disturbance

Additionally, negative impacts may arise for local terrestrial invertebrates in the form of disturbance to foraging and commuting activities via temporary habitat loss and fragmentation along the Proposed Development during the construction phase. Therefore, in the absence of mitigation, a **short-term adverse impact of slight significance is likely** for terrestrial invertebrates as a result of disturbance during the construction phase of the Proposed Development.

8.7.3.4.8.3 Overall Impact Assessment

Impacts on local terrestrial invertebrates, in worst case scenarios, include surface water impacts due to the accidental spillage of deleterious substances, such as hydrocarbons, which have the potential to lead to increased mortality rates. The loss of habitats along the Royal Canal will also result in a long-term loss of foraging and nesting resources for terrestrial invertebrates. However, the loss of habitats

will not significantly reduce foraging resources for terrestrial invertebrates populations. Furthermore, while construction phase disturbance has the potential to impact terrestrial invertebrate foraging, and commuting, and breeding behaviour, these impacts will ultimately be limited to the short-term. Therefore, the construction phase, in the absence of mitigation, is anticipated to result in a **likely short-term adverse impact of slight significance** on communities of terrestrial invertebrates.

8.7.3.4.9 Glutinous Snail and other aquatic invertebrates [National level importance]

Glutinous Snail, and other aquatic invertebrates are highly sensitive to features such as water quality, light levels, water temperature and the associated quality of marginal habitats along the canal. Disturbance to these species could include the reduction of water quality through the spillage of pollutants or silt into the waters resulting in increased turbidity, or the removal of host vegetation which provide shade and suitable habitat along the canal banks which would impact on the life cycle and foraging activity of these species. As these species are aquatic in nature, the reduction of water quality of the canal would in all likelihood lead to the loss of life and reduction in population.

Research has suggested that Glutinous Snail has a particularly low tolerance to various environmental factors, particularly eutrophication (Donohue et al., 2009; and Carlsson 2000). Additionally, research has suggested that this red-listed snail species is susceptible to biodegradable pollution, (Mouthon and Charvet 1999), high degree of water's hardness (Beriozkina et al. 1980), and low values of ambient pH (Vinarski et al. 2013). It is believed that this species' glutinous mantle allows for greater absorption, making it more susceptible to pollution and changes in water quality. As such, studies have concluded that increases in freshwater pollution and eutrophic conditions in freshwater bodies has driven this species' decline. Therefore, were there to be scenario where a pollutant such as hydrocarbon, solvents or cement leachate; to enter the Royal Canal, this has the potential to result in the physiological harm and potential mortality of any present Glutinous snails. Additionally, the introduction of sediment into canal during the works has the potential to lead to increased eutrophication within the canal, given that the addition of sediment will increase the levels of the soil-bound nitrogen and phosphorus within the canal. This increase in eutrophication has the potential to negatively impact the downstream Glutinous snail population as documented by the above research.

In the absence of mitigation measures, it is anticipated that these impacts on Glutinous snail, and other aquatic invertebrates will **likely have a long-term adverse impact that is very significant** given the sensitivity/value of these receptors, the level of potential impact from worst-case scenario accidental hydrocarbon pollutants and deleterious sediment runoff, and the time that would be required for these species to repopulate the area.

8.7.3.4.10 Odonata [Local (higher value)]

Dragonflies and damselflies are dependent on the wet and aquatic habitats along the Proposed Development. They are dependent on the marginal habitats for breeding, and they forage on other invertebrates present along the canal. Any degradation of water quality will result in a decline in habitat quality and the species present. Any direct habitat removal will have a similar effect in reducing potential foraging and breeding.

In the absence of appropriate mitigation measures, the Proposed Development will **likely have a short-term adverse impact of slight significance**.

8.7.3.4.11 White-clawed Crayfish [County importance] and Fish (European Eel, Coarse fish and Pike) [County importance]

All local fish species and Crayfish are dependent on the Canal habitat next to the Proposed Development and are sensitive to changes in water quality. Changes to water quality would include the occurrence of pollutant spillage events, the infiltration of silt into the water, or the settlement of airborne pollutants on the water's surface. Any uncontrolled discharge of hydrocarbons or excessive sediments during the construction phase into the Royal Canal has the potential to directly impact fish species and Crayfish through substance toxicity or in the case of sediment input, the degradation of spawning habitat downstream. These polluting events also have the potential to indirectly impact local fish species through the depletion and/or degradation of the invertebrate trophic level (food supply).

In a scenario where hydrocarbons, solvents or lubricants have been accidentally introduced into a waterbody, the heavy metals within these substances have the potential to pass through the gills of local fish species or Crayfish. These metals may also enter these species through their digestive tract via ingestion of metal accumulated prey items. Metals such as cadmium, chromium, nickel, arsenic, copper, mercury, lead and zinc are the most notable metals that cause severe toxicity in fish species. White-clawed Crayfish are particularly vulnerable to pollution and are generally used as an indicator species of a higher water quality environment. The exposure to these metals results in the development of oxidative stress by affected fish, which weakens the immune system, causing tissue and organ degradation, as well as growth defects and a reduced fecundity (Garai et al. 2021). The longevity of this type of impact will vary depending on the quantity of the pollutant entering the waterbody and whether the waterbody is lotic (Rusk Stream) or lentic (Royal Canal) in nature.

Increased vehicular presence adjacent to the Royal Canal during construction will lead to local increases in nitrogen oxides (NOx) potential resulting in the minor acidification/change of pH of the Canal. Research has detailed how freshwater fish species have shown diminished abilities to respond to damage-released chemical alarm cues from other fish of the same species under weakly acidic conditions. Fish species may suffer an increased mortality predation rate within the Royal Canal in the event that the canal becomes slightly acidic (pH~ 6.0) during the construction phase of the Proposed Development. Additionally, acidification / low pH levels in combination high metal concentrations, which can be introduced to the surface waterbody via a hydrocarbon or solvent spill, have the potential to increase the mortality of fish eggs.

A number of fish species are sensitive to both noise and associated vibrations so there is the potential for high decibel/vibration activities located adjacent to the Royal Canal to cause adverse behaviour of local fish species, as well as potentially acting as a barrier to fish migration in the case of European Eel within the Royal Canal. However, European Eel have been deemed to be less sensitive to noise when compared to other fish species. This is due to their specific hearing mechanisms, and it has been observed that European Eel do not display avoidance behaviour in response to noise production (e.g., construction piling activities) (Hawkins and Johnstone 1978). Therefore, noise and vibration impacts are not anticipated to significantly impact European Eel during the construction phase. While there is limited existing information on the impact of noise disturbance on White-clawed Crayfish, studies on the other crayfish species indicates that the exposure to anthropogenic noise pollution has the potential to alter behaviours, including leading to increased inter-specific species aggression (De Vita et al., 2025). Therefore, under the precautionary principle, and given the nature of the works which will be limited to banksides of the canal, noise and vibration are anticipated to have a short-term adverse impact of slight significance on crayfish.

In the absence of appropriate mitigation measures the Proposed Development are anticipated to have a **likely short-term adverse impact of moderate significance** on these aquatic species, as their populations will require additional time to recover from habitat degradation.

8.7.3.4.12 Invasive species

The Third Schedule INNS, Three-cornered Garlic, has been recorded along the Proposed Development of the Greenway. There is a risk of the works causing further spread of this species along the canal and its associated habitats. There is also potential for plant material or seeds to get stuck on machinery and then be transferred to other sites when the machines move between sites. Additionally, the Third Schedule species Rhododendron and Spanish Bluebell were recorded along the Proposed Development, albeit in lower numbers. Japanese Knotweed was recorded in close proximity to the Proposed Development, adjacent to Clonsilla Train Station. These species may be similarly spread by construction-based machinery.

Given the extent of Three-cornered Garlic, and the presence of the additional Third Schedule invasive species Rhododendron, Spanish Bluebell, and Japanese Knotweed within/adjacent to the Proposed Development, in the absence of mitigation, the spread of these invasive species is anticipated, with **long-term adverse impacts that are significant likely** on local biodiversity as a result.

8.7.4 Operational Phase Impacts

This sub-section describes the potential impacts on key ecological receptors along the Proposed Development in the absence of mitigation measures during the operational phase. However, the impact assessment takes into account mitigation by design (i.e. drainage layout, lighting design).

8.7.4.1 Designated Sites – Proposed Natural Heritage Areas

8.7.4.1.1 Royal Canal pNHA [National importance], Canals [National importance],

While the existing towpath adjacent to the canal is already in use, the Proposed Development is anticipated to increase both pedestrian and cyclist numbers during the operational phase. As outlined in Chapter 14 (Material Assets – Traffic and Transport), the usage of the Proposed Development is anticipated to grow throughout the project's operational phase. While the Greenway will enhance the existing pedestrian and cyclist environment along the Royal Canal, the increased footfall within this important wildlife corridor will increase audible and visual disturbances. Additionally, an increase in pets, specifically Dog *Canis familiaris* will result in additional disturbance to local fauna and flora. These disturbances generated by human and/or pet have the potential to negatively impact canal flora through trampling, soil/root compaction and digging, and canal associated fauna through causing increased vigilance behaviour and subsequent increased frequency of flight away from the disturbance source. There is also the potential for increased predator pressures on all fauna, as a result of free-roaming domestic dogs.

Ongoing maintenance to the Greenway, including the trimming of vegetation and the fixing of any degradation to the pathway, will require the use of machinery. As with the construction phase, the use of machinery raises the risk of accidental pollutant spillage that could enter the water body of the canal, although at a much lower rate than during the construction phase. Additionally, during the operational phase, there may be impacts on the water quality within the Royal Canal. As outlined in Chapter 12 (Water), this relates to the completed Greenway, including final surface treatments, and all operation and maintenance activities of the Greenway and associated works including the Greenway drainage system. Identified impacts relate to the chemical pollution of the water environment, pollution of watercourses by silt / suspended solids, changes to stream channels, and changes to runoff and flow patterns. These impacts have been assessed within Chapter 12 (Water) and are assessed further here.

8.7.4.1.1.1 Chemical Pollution of Water Environment

Surface runoff can contain several contaminants, arising from the degradation of bituminous surfaces, tyres, and vehicle emissions. The primary contaminants known to occur in routine runoff include hydrocarbons and heavy metals. Additionally, plastic pollutants are ubiquitous in runoff, and car and bicycle tyres release microplastics due to wear and tear. The potential application of any salt to bituminous surfaces as part of winter Greenway maintenance can result in an increase in salinity, conductivity and total dissolved solid concentrations to the receiving aquatic system. The input of these pollutants into the Royal Canal has the potential to adversely affect water quality, with associated effects to fish and aquatic ecology. However, the impact of this during the operational phase is expected to be low as the Greenway will not be utilised by cars, with the exception of Waterways Ireland maintenance vehicles.

Therefore, in the absence of mitigation, a **permanent adverse impact that is not significant is likely** on the Royal Canal pNHA as a result of chemical pollution during the operational phase.

8.7.4.1.1.2 Pollution of watercourses by silt / suspended solids

Erosion associated with the drainage network or unvegetated areas may have the potential to release suspended solids. Any sediments and debris entering the canal has the potential to adversely modify stream morphologies, and smother habitats, harm aquatic flora and fauna. However, the potential for silt/suspended solids is greatly reduced when compared to the construction phase. There will be minimal unvegetated surface during the operational phase, with the proposed Landscape Plan (Appendix 8.4) incorporating the planting of grassland, tree, and shrub species adjacent to the Greenway.

Therefore, in the absence of mitigation, a **permanent adverse impact that is not significant is likely** on the Royal Canal pNHA as a result of pollution by silt / suspended solids during the operational phase.

8.7.4.1.1.3 Changes to runoff and flow patterns

Once the Proposed Development is constructed, the hardstanding surface area will be larger in some places than before construction due to the construction of the Greenway and associated infrastructure. This larger surface area will result in additional surface water runoff. Drainage upgrades and SuDS measures have been included as part of the design of the Proposed Development. The drainage layout allows recharge to groundwater at all filter trench and open channel / over the edge drainage locations. Piped drainage is not the primary mechanism chosen, and instead drainage types such as filter drainage and over the edge drainage has taken precedence. Increases in runoff and flows associated with climate change may lead to flows in excess of those designed for, which overwhelm drainage infrastructure. Changes to runoff patterns caused during construction will continue throughout operation phase along the 5km section of the route that borders the Royal Canal.

Therefore, in the absence of mitigation, a **permanent adverse impact that is not significant is likely** on the Royal Canal pNHA as a result of changes to runoff and surface water flow patterns during the operational phase.

8.7.4.1.1.4 Shading Impacts from Landmark Bridge

A section of the Proposed Development will run directly over the Royal Canal, specifically Landmark Bridge (Chainage +7115 – 7350). This bridge will have a maximum single span of 30m across the Royal Canal itself and will be 4m wide. This will create a narrow shading effect on the canal beneath and impact any aquatic macrophytes and riparian plants. However, given the scale of this area (approximately 120m^2) and the nature of this narrow shading impact, with light not cut out, this impact is not expected to significantly impact this vegetation. Shading effects will be limited to restricting the size/height of underlying vegetation when compared with vegetation outside of the bridge's shading zone.

Therefore, in the absence of mitigation, a **permanent adverse impact that is not significant is likely** on the Royal Canal pNHA and the canal itself as a result of the shading impact of Landmark Bridge.

8.7.4.1.1.5 Overall Impact Assessment for Royal Canal pNHA and Canals

As outlined in Chapter 12 (Water), the greatest risks to surface water quality within the Royal Canal are during the construction phase. Any effects unmitigated during the construction have the potential to extend into the operational phase as well. Operational phase impacts mainly relate to increased run-off rates due to the introduction of additional hard surfaces adjacent to the Royal Canal and changes in the local drainage network, which will have negligible impacts on water quality if unmitigated. Changes to

runoff patterns caused during construction will continue throughout the operational phase and may result in alterations to the water regimes of aquatic and marginal habitats.

As outlined in the Royal Canal pNHA site brief (NPWS, 2009), the ecological value of the canal lies more in the diversity of species it supports along its length. It crosses through agricultural land and therefore provides a refuge for species threatened by modern farming methods. Despite the removal of woodland habitat from this site, the overall structure of these habitats will be retained, preserving habitat to support the diversity of floral and faunal species present.

However, in total, 44 individuals individual trees will be lost, and there will be twelve groups of trees that will be partially removed and 1 tree group that will be removed in its entirety. The tree groups include sections of woodland that were inaccessible and assessed from a distance, between the Old Schoolhouse and Coolmine Bridge (Chainages +5340 - +6250), and between Coolmine Road and Roselawn Road (Chainages +6300 - +7170). In total an estimated 6800m^2 of woodland habitats, including those within the Royal Canal pNHA will be removed during the construction phase. Additionally approximately 1150m^2 of the scrub and scrub and meadow mosaic habitats between Chainages +4600 - +5200 will be lost during the construction phase.

The trees to be removed include a mix of healthy, young, and dead trees, as well as Ash trees that have been infected by Ash dieback. While the loss of dead and/or dying trees is considered to be less ecologically impactful than the loss of healthy trees, these features provide important nesting, foraging, and/or roosting resources for local faunal groups and are an important feature of any woodland habitat. Additionally the loss of young trees from the scrub habitat within the Old Schoolhouse will prevent the natural succession of this habitat from towards higher value woodland habitat. These impacts will ultimately be carried forward into the operational phase.

There will be a permanent loss of the specific mixed woodland habitat within the pNHA. Connectivity along the Proposed Development will however be largely be maintained as the Canal itself will be retained in its current condition, with the exception of minor shading impacts from Landmark Bridge. Additionally the elevation of the Greenway within the woodland habitat between Coolmine Road and Roselawn Road (Chainages +6300 - +7170), specifically for the Quarry Bridge (Chainage +6500 - 6530) and raised northern approach for Landmark Bridge (Chainages +7100 - 7150) will allow local fauna to safely commute beneath the Greenway structure.

Therefore, in the absence of appropriate mitigation during the operational phase, a **permanent adverse impact of moderate significance** is therefore **likely** for the Royal Canal pNHA, while a **permanent neutral impact that is not significant is likely** for the Royal Canal itself.

8.7.4.1.2 Liffey Valley pNHA [National importance]

Given the distance of the Liffey Valley pNHA to the Royal Canal, coupled with the minimal sources of significant operational pollution, in the absence of mitigation measures, impacts to the Liffey Valley pNHA are anticipated to be of **likely permanent imperceptible significance** during the operational phase given its distance from the route.

8.7.4.2 Habitats

8.7.4.2.1 Buildings and artificial surfaces (bridges) [Local (higher value)], and Stone walls and other stonework [Local (higher value)]

These receiving habitats are anticipated to receive minor ongoing impacts throughout the operational phase, given the necessities for on-site machinery required for ongoing maintenance, such as WI maintenance vehicles. The on-site machinery could result in damage to habitats, or low-level spillage of pollutants during operational works, however, these impacts are anticipated to be minimal. The loss of the houses to the east of the Hansfield Railway Bridge (Chainages +3120 – 3600) during the construction phase will be carried forward into the operaitonal phase. However, the Old Schoolhouse, which is considered the most valuable building along the proposed dEvelopment, in terms of its ability to support local fauna will be retained.

In the absence of mitigations during the operational phase, these receptors are anticipated to receive **likely long-term adverse impacts that are not significant** during the operational phase of the Proposed Development.

8.7.4.2.2 Earth Banks [Local (higher value)]

This habitat is anticipated to receive minor ongoing impacts throughout the operational phase, given the necessities for on-site machinery required for ongoing maintenance, such as WI maintenance vehicles. The on-site machinery could result in damage to habitats, or low-level spillage of pollutants during operational works, however, these impacts are anticipated to be minimal.

Therefore, in the absence of mitigations during the operational phase, this receptor is anticipated to receive **likely long-term adverse impacts that are not significant** during the operational phase of the Proposed Development.

8.7.4.2.3 Recolonising bare ground [Local (lower value)]

During the construction phase, this habitat will be removed in its entirety and replaced by a mix of artificial surfaces and tree/meadow planting.

Therefore, in the absence of mitigation measures during the operational phase, a **permanent adverse impact of profound significance is likely** for this habitat type. However, given its lower value and that sections of this habitat will be replaced by higher value meadow and treeline habitats, its loss is not considered significant in the wider context of the Royal Canal ecological corridor.

8.7.4.2.4 Calcareous Spring [County level importance]

Due to the Proposed Development being located on the opposite bank from the calcareous spring and the existing pathway, the reduced footfall and reduced potential for discarding of rubbish-litter above the spring will overall lead to a very minor, but positive impact to the spring for the duration of the Greenway's lifetime as it will no longer be under such pressures. However, this positive impact is anticipated to be imperceptible. Therefore, in the absence of mitigation measures, a **long-term neutral impact that is not significant is likely** for this habitat, as the Proposed Development is on the opposite side of the canal and there will be no negative pressures on the spring.

8.7.4.2.5 Bankside Habitats: Reed and large sedge swamp [National importance], Dry meadows and grassy verges [Local (higher value)], Mixed: Treelines/Dry meadows and grassy verges [County]

During the operational phase of the Proposed Development, it is likely that there will be increased accessibility along the canal, which may result in increased degradation of these habitats via trampling/disturbance, as the canal is used for activities such as angling, picnicking etc. Users of the water are likely to take the path of least resistance and are unlikely to frequently push through any dense stands of vegetation to access the water. In the absence of mitigation measures, the level of disturbance across the extent of these habitats is considered to be a **likely long-term adverse impact of imperceptible significant**, and that will be ongoing for the duration of the Greenway's lifetime. Additionally, an increase in pets, specifically dogs, will result in additional disturbance to this habitat. These disturbances generated by dogs have the potential to negatively impact canal flora through trampling, soil/root compaction and digging. In the absence of appropriate mitigation measures, the small decrease to water quality from surface run-off will **likely have a long-term adverse impact of imperceptible significance** to these habitats.

As outlined in Chapter 12 (Water), operational phase impacts mainly relate to increased run-off rates due to the introduction of additional hard surfaces adjacent to the Royal Canal and changes in the local drainage network, which will have imperceptible impacts on water quality if unmitigated. Ongoing maintenance to the Greenway, including the trimming of vegetation and the fixing of any degradation to the pathway, will require the use of machinery, such as mini excavators. As with the construction phase, the use of machinery raises the risk of accidental pollutant spillage that could enter the water body of the canal, although at a much lower rate than during the construction phase. The potential application of salt to bituminous surfaces as part of winter Greenway maintenance can result in an increase in salinity, conductivity and total dissolved solid concentrations to the receiving aquatic system. Changes to runoff patterns caused during construction will continue throughout the operational phase and may result in alterations to the marginal habitats.

Overall, in the absence of mitigation measures during the operational phase, these ongoing sources of disturbance are anticipated to have a **likely long-term adverse impact of slight significance** on these habitats.

8.7.4.2.1 Drainage Ditches [Local (higher value)], & Hedgerows over drainage ditches [County], Treelines over drainage ditches [County]

As outlined in Chapter 12 (Water), operational phase impacts mainly relate to increased run-off rates due to the introduction of additional hard surfaces adjacent to the Royal Canal and changes in the local drainage network, which will have negligible impacts on water quality if unmitigated. Ongoing maintenance to the Greenway, including the trimming of vegetation and the fixing of any degradation to the pathway, will require the use of machinery, such as mini excavators. As with the construction phase, the use of machinery raises the risk of accidental pollutant spillage that could enter the water body of the canal, although at a much lower rate than during the construction phase. The potential application of salt to bituminous surfaces as part of winter Greenway maintenance can result in an increase in salinity, conductivity and total dissolved solid concentrations to the receiving aquatic system. Changes to runoff patterns caused during construction will continue throughout the operational phase and may result in alterations to the marginal habitats.

The operational drainage layout utilizes over the edge drainage into the existing open channels, the Royal Canal as well as SUDs features such as filter drains which allow for groundwater recharge. Piped drainage is not the primary mechanism chosen, and instead drainage types such as filter drainage and over the edge drainage has taken precedence. Where filter drains and linear drainage channels are necessary, they will be sized accordingly for the area being drained, in accordance with the regulations e.g. Greater Dublin Strategic Drainage Strategy (GDSDS), taking account of flood exceedance e.g. for storms return periods over 1% AEP and incorporating 20% climate change. The drainage layout will help manage the increased operational surface water run-off associated with the increase in hard surface along the Royal Canal.

Overall, in the absence of mitigation measures during the operational phase, these ongoing sources of pollutants and increased surface water runoff are **likely to have a long-term adverse impact that is not significant** for the drainage ditches, their associated treelines and hedgerows during the operational phase.

8.7.4.2.2 Dry meadows and grassy verges [Local (higher value)], and Dry calcareous grassland [County level importance]

The operational phase of the Proposed Development will increase human disturbance along the Proposed Development and may result in these grasslands being degraded if trampled during increased human use. Additionally, an increase in pets, specifically dogs will result in additional disturbance to this habitat. These disturbances generated by dogs have the potential to negatively impact grassland flora through trampling, soil/root compaction and digging. These habitats are often resilient to low levels of this impact but can be degraded if the occurrence is frequent over a long time. In addition, inappropriate mowing regimes (overcutting) of the amenity areas along the Greenway may result in changes to the species composition of these habitats. Inappropriate planting plans within the existing grassland may also degrade these important habitats.

In the absence of appropriate mitigation measures and appropriate management of these grasslands, under the worst-case scenario for operational disturbance, a **likely long-term adverse impact of slight significance** for the dry calcareous grassland and dry meadows and grassy verges habitats during the operational phase.

8.7.4.2.3 Woodland habitats: (Mixed) broadleaved woodland [County level importance], Scrub [Local (higher value)], and Scrub / Dry meadow and grassy verge mosaic [Local (higher value)]

As outlined within the construction phase impacts, the design of the Proposed Development aimed to minimise disturbance to woodland habitats along the canal and maximise tree retention. Nevertheless, during the construction phase, it has been estimated that there will be a loss of 6800m^2 of woodland habitat, including those within the Royal Canal pNHA. It is estimated that for the mixed broadleaved woodland habitat between the Old Schoolhouse and Coolmine Bridge (Chainages +5340 - +6250), including within the Royal Canal pNHA, approximately 1023m^2 of this habitat will be removed during the construction phase. It is estimated for the mixed broadleaved woodland habitat between Coolmine Road and Roselawn Road (Chainages +6300 - +7170), the area lost will be approximately 5780m^2. Approximately 1150m^2 of the scrub and scrub and dry meadow mosaic habitats between Chainages +4600 - +5200 will be lost during the construction phase.

Following construction phase clearance, there will be a loss in terms of area of the mixed broadleaved woodland, scrub and scrub and dry meadows mosaic habitats. An estimated 6800m^2 of woodland habitats, including those within the Royal Canal pNHA is anticipated to be lost during the construction phase. It is estimated that for the mixed broadleaved woodland habitat between the Old Schoolhouse and Coolmine Bridge (Chainages +5340 - +6250), including within the Royal Canal pNHA, approximately 1023m^2 of this habitat will be removed during the construction phase. It is estimated for the mixed broadleaved woodland habitat between Coolmine Road and Roselawn Road (Chainages +6300 - +7170), the area lost will be approximately 5780m^2. Approximately 1150m^2 of the scrub and scrub and meadow mosaic habitats between Chainages +4600 - +5200 will be lost during the construction phase. It is anticipated that, in the absence of construction phase mitigation measures, the extent of vegetation removal along the Proposed Development will have a **likely permanent adverse impact that is significant** on the (Mixed) broadleaved woodland, and a **likely permanent adverse impact of moderate significance** on the scrub and scrub and meadow mosaic habitats. These impacts will therefore be carried forward into the operational phase.

Furthermore, with greater use of the Royal Canal corridor due to the operation of the Proposed Development, there is the potential there will be increased opportunity for members of the public to make their way into the woodland, despite the woodland been fenced off either side of the route. However, given the density of the vegetation within this habitat, which will remain unchanged in the areas adjacent to the Greenway, and the terrain constraints, this disturbance is not anticipated to be significant.

Therefore, in the absence of appropriate mitigation measures, a **long-term adverse impact of slight significance is likely** for the scrub and scrub and dry meadow mosaic habitats, due to the construction phase habitat removal, estimated at 1150m^2. For the mixed broadleaved woodland habitat, in the absence of appropriate mitigation measures, a **permanent adverse impact of moderate significance is likely** given the construction phase habitat removal, estimated to be 6800m^2.

8.7.4.2.4 Treelines [County] and Hedgerows [County]

During the construction phase, there will be a partial removal of treeline between chainages +3270 - +3290, and chainages +3600 - +3650. Tree removal within these sections will be minimal and the existing treelines will not suffer significant fragmentation.Furthermore, tree removal will occur between chainages +4550 - +4570 to the west of the Old Schoolhouse, which will include the removal of a 5m gap in the existing treeline. Additionally, five hedges will be removed during the construction phase, labelled in the Arboricultural report as H6, H7, H8, H34, and H35, have a total estimated length of 98m. However, one hedgerow (H8) is entirely comprised of invasive Cherry Laural, while another two hedges, H6 and H7, are comprised of non-native Portugal Laurel. The other two hedges for removal (H34 and H35) are comprised of non-native *Pyracantha* species. The loss of these hedges is therefore not expected to significantly impact local faunal groups as these hedges have limited foraging potential, and the removal of the Cherry Laurel hedge will help reduce the spread of this high impact invasive species.

Therefore, in the absence of operational mitigation measures, a **long-term positive impact of slight significance is likely** for the hedgerows habitat due to the removal of non-native species hedgerows, while a **long-term adverse impact of negligible significance is likely** for the treelines habitat, given the construction phase loss from within this habitat will be minimal.

8.7.4.3 Species

8.7.4.3.1 Protected Flora [County level importance]

The Floral Protection Order (FPO)d 2022 species Opposite-leaved Pondweed was recorded by Triturus Environmental Ltd. (Triturus Environmental Ltd, 2025c, see Appendix 8.5.5) downstream of the Proposed Development within the Royal Canal. Additionally, the Red-listed Pointed Stonewort and nationally rare Clustered Stonewort were also recorded by Triturus Environmental Ltd. within the Royal Canal, downstream of the Proposed Development and within the Proposed Development's surface water ZoI. Opposite-leaved Pondweed was also previously recorded by JBA for a separate project (JBA, 2024) between the First and Third lock of the Royal Canal, approximately 5km downstream of the site, and was previously recorded between the 4th and 5th Lock (NPWS, 2009). As such, these rare and protected flora are vulnerable to any surface water impacts arising from the Proposed Development.

The main operational emission of concern for any Opposite-leaved Pondweed present locally within the Royal Canal will be increased surface water run-off due to the addition of hard surface adjacent to the Canal. Other potential operational impacts on water quality include from the ongoing maintenance to the Greenway, including the trimming of vegetation and the fixing of any degradation to the pathway, will require the use of machinery, such as mini excavators. As with the construction phase, the use of machinery raises the risk of accidental pollutant spillage that could enter the water body of the canal, although at a much lower rate than during the construction phase.

The potential application of salt to bituminous surfaces as part of winter Greenway maintenance can result in an increase in salinity, conductivity and total dissolved solid concentrations to the receiving aquatic system. Changes to runoff patterns caused during construction will continue throughout the operational phase and may result in alterations to the marginal habitats. However, as outlined in Chapter 12 (Water), will have negligible impacts on water quality if unmitigated. Additionally, the Proposed Development's drainage layout, which includes filter trenches and open channels at over the edge drainage locations, will help manage increased operational surface water run-off. These drainage features will allow recharge to groundwater at the filter trenches.

A section of the Proposed Development will run directly over the Royal Canal, specifically Landmark Bridge (Chainages +7115 to 7350). This bridge will have a maximum single span of 30m across the Royal Canal itself and will be 4m wide. This will create a shading effect on the canal beneath and impact on any aquatic macrophytes, including protected flora such as Opposite-leaved Pondweed. However, given the scale of this area (approximately 120m^2) and the nature of this shading impact, with light not completely cut out, this impact is not expected to significantly impact underlying vegetation. Shading effects will be limited to restricting the size/height of underlying vegetation when compared with vegetation outside of the bridge's shading zone.

Therefore, it is **likely that there will be** a **long-term adverse impact that is imperceptible** for Opposite-leaved Pondweed.

8.7.4.3.2 Bats [County level importance]

The most significant impact to bats during the operational phase of the Proposed Development is the proposed lighting near the linear woodland habitats and the canal, as well as the construction phase loss of supporting habitat. In addition, changes to water quality have the potential to impact local bat species, in particular Daubenton's bat which forage over on the surface of watercourses.

8.7.4.3.2.1 Habitat Removal and Fragmentation

Following the removal of sections of the meadow, scrub, and woodland habitats during the construction phase there will be a loss of foraging and commuting habitats for local bat species. Of particular note is the (mixed) broadleaved) woodland habitat between Coolmine Road and Roselawn Road (Chainages +6300 - +7170), which an area of 5780m^2 will be lost during the construction phase. This woodland habitat has low level pre-existing disturbance levels as it is fenced off to the north and difficult to access and currently has no lighting present. Removal of tree cover across the Proposed Development also includes a section within the woodland habitat between Kennan Bridge and Dr Troy Bridge, which will lead to a loss in potential roosting features, as well as features which have the potential to support bat roosting in the future. The Proposed Development will also introduce additional sources of both audible and visual disturbance.

The loss of habitat will lead to the partial fragmentation of the habitats adjacent to the Royal Canal. This will also have knock on impacts for bat foraging activities, with the loss of habitats reducing foraging resources for invertebrate prey species. However, the existing ecological corridor along the Royal Canal will be retained, with the habitats bordering the Canal retained. Additionally, the woodland sections will retain their overall structure and despite the introduction of operational lighting, these areas will remain dark corridors alongside the Canal itself due to the proposed lighting design. The lighting design is discussed further in sub-section 8.9.3.5.2.

There will be a total loss of 6800m^2 of woodland habitat and removal of 44 trees, leading to a loss of foraging and potential future roosting features,

The preservation of the overall ecological corridor, alongside the Landscape Plan (Appendix 10.2) will limit the impacts of the habitat removal. However, the introduction of lighting and the replacement of sections of woodland between Chainages +6300 - +7170 will adversely impact commuting activities. Impacts will be more significant for light intolerant *Myotis* and *Plecotus* species. The construction of Landmark Bridge over the canal also has the potential to disrupt commuting bats, which will be forced to fly beneath the bridge, creating a potential narrowing of the Royal Canal ecological corridor between Chainages +7115 to 7350. However, overall the ecological corridor will retain its functionality. Therefore, in the absence of mitigation, due to this loss of woodland habitat during the construction phase and the knock on adverse impacts on bats in terms of foraging and future potential resources, a **long-term adverse impact of slight significance is likely** as a result of the removal of habitat during the construction phase.

8.7.4.3.2.2 Water Quality

As outlined in Chapter 12 (Water), operational phase impacts mainly relate to increased run-off rates due to the introduction of additional hard surfaces adjacent to the Royal Canal and changes in the local drainage network, which will have negligible impacts on water quality if unmitigated. Ongoing maintenance to the Greenway, including the trimming of vegetation and the fixing of any degradation to the pathway, will require the use of machinery, such as mini excavators. As with the construction phase, the use of machinery raises the risk of accidental pollutant spillage that could enter the water body of the canal, although at a much lower rate than during the construction phase. The potential application of salt to bituminous surfaces as part of winter Greenway maintenance can result in an increase in salinity, conductivity and total dissolved solid concentrations to the receiving aquatic system. Changes to runoff patterns caused during construction will continue throughout the operational phase and may result in alterations to the marginal habitats. These changes to the local surface water run-off

regime and potential sources of operational pollutants have the potential to impact local bat species, in particular Daubenton's bat which forage along the surface of water courses, either via the degradation of supporting habitats within the Royal Canal or direct physiological damage arising from contact with hydrocarbon spill. However, these impacts **are likely to be of low magnitude** and nonsignificant (see Chapter 12 for more information) and **will not significantly impact** local bat species.

8.7.4.3.2.3 Lighting Impacts and Disturbance

Artificial light at night may significantly change their natural behaviour in relation to roosting, commuting, and feeding. While bats are naturally exposed to only very low lighting levels produced by moonlight, starlight and low intensity twilight, light levels greater than natural light levels can impact on the lifestyle of bats. Bats are light sensitive species. Four bat species recorded commuting and foraging within the survey area are Light Tolerant or Semi-tolerant bat species (i.e. Leisler's bat, Nathusius' pipistrelle, Common pipistrelle and Soprano pipistrelle respectively). Three light sensitive bat species, Brown long-eared bat, Daubenton's bat, and Natterer's bat were recorded, and these three bat species would be more susceptible to introduced lighting.

There is currently some lighting along the section of the canal around the M50 interchange, with some light spill at existing bridges, and along Hansfield Road, however, the majority of the canal and its surrounding habitats are in darkness at night. The increased lighting along the areas of the Greenway could discourage commuting and foraging activity and, in the worst-case scenario, stop bats from potentially roosting along lit sections of the canal. The impacts of lighting are further discussed in the Bat Assessment Report (Bat Eco Services, 2025).

However, the proposed lighting plan has been created in consultation with Bat Eco Services and followed guidance provided by BCT (2023). Light spillover into the habitats adjacent to the Greenway will be limited, and estimated lux levels along the border of the route are between 1-2 lux. Lighting spillover from Landmark Bridge will also be limited, preserving the dark corridor and foraging habitat within the Royal Canal. This is significant given the presence of the light intolerant Daubenton's bat. However, while the lighting plan has been designed to minimise impacts on faunal species, the addition of lighting will invariably lead to a minor loss of the available foraging and commuting area within the Royal Canal ecological corridor for bats.

Therefore, in the absence of mitigation, a **long-term adverse impact of slight significance is likely** due to the introduction of lighting along parts of the Proposed Development.

8.7.4.3.2.4 Overall Impact Assessment

The proposed lighting design will limit impacts on local bat species, notably light sensitive *Myotis* and *Plecotus* species. The Royal Canal ecological corridor will retain its function for all local bat species during the Proposed Development's operational phase. The most significant operational impacts on bats will result from the loss of woodland habitat during the construction phase. There will be a loss in foraging and potential future roosting features due to the loss of 6800m^2 of woodland habitat. Therefore, in the absence of appropriate mitigation measures, lighting and the loss of potential future roosting habitat will have a **likely long-term adverse impact of slight significance** to the local bat population.

8.7.4.3.3 Badger [County level importance], Otter [County level importance] and other small mammals (Hedgehog, Pygmy Shrew, Pine Marten, Red Squirrel) [Local (higher value)]

During the operational phase, there are several impact sources for local non-volant mammals, including due to construction phase habitat removal and fragmentation, changes to surface water run-off, and operational disturbance.

8.7.4.3.3.1 Habitat Removal and Fragmentation

Following the removal of sections of the meadow, scrub, and woodland habitats during the construction phase there will be a loss of foraging and commuting habitats for non-volant mammals. While the Landscape Plan (Appendix 10.2) will partially offset this loss, the suitability of certain habitat sections for non-volant mammals will be altered during the operational phase. Of particular note is the mixed broadleaved woodland habitat between Coolmine Road and Roselawn Road (Chainages +6300 - +7170), which an area of 5780m^2 will be lost during the construction phase. The Proposed Development will introduce additional sources of both audible and visual disturbance, as well as lighting which is currently not present within this area.

The loss of habitat from will lead to the partial fragmentation of the habitats adjacent to the Royal Canal. However, the existing ecological corridor along the Royal Canal will be retained, with the habitats bordering the Canal retaining their overall structure. Despite the introduction of lighting and habitat loss, the woodland sections will still retain their overall structure and will remain as dark corridors. This is in part due to the proposed lighting design which minimises light spillover from the Greenway. The Landscape Plan (Appendix 10.2) will also partially offset the loss of foraging and commuting habitat, creating new foraging and commuting resources for local mammal species. The fencing off of the Greenway of the western area of the he woodland habitat between Coolmine Road and Roselawn Road (Chainages +6300 - +7170) will limit public access and reduce potential disturbance to the existing inactive Badger setts and historical Otter holts. As detailed in sub-section 8.6.2.1.14, the woodland there was evidence of old localised bonfires and other dumping between Chainages +6350 - 6550, which has led to sections of the understorey being cleared of vegetation. The woodland sections to the east of this, between Chainages +6600 - +7100, are inaccessible due to the steepness of the terrain and thickness of the understorey vegetation, and due to being fenced off along its northern extent bordering the public green area by Roselawn Avenue (Chainage +6870 – 7310), were of noticeably higher quality. As such, the introduction of fencing to the west of this woodland habitat during the operational phase will reduce disturbance within this woodland's western extent (between Chainages +6350 - 6550) increasing its viability to support local non-volant mammal foraging. This will also reduce potential disturbance to the existing inactive badger setts and otter holts within this area, increasing the potential for these to become active in the future. Furthermore, the approach to Landmark Bridge within this area (approximately Chainages +7115 to 7350) will be elevated, allowing non-volant mammals to commute beneath the Proposed Development. Therefore, despite the loss of woodland and introduction of lighting into this area, the woodland habitat between Coolmine Road and Roselawn Road (Chainages +6300 - +7170) will retain its function as a corridor for non-volant mammals, as well as continue to provide both foraging and potential refuge habitat.

Additional loss of woodland and introduction of operational lighting will impact non-volant mammal species utilising the mixed broadleaved woodland habitat between the Old Schoolhouse and Coolmine Bridge (Chainages +5340 - +6250). For both these woodland areas, elevated sections of the Greenway will allow non-volant mammals to pass through these habitats. In addition, the Royal Canal itself will remain unchanged, and its associated bankside vegetation will be retained during the operational

phase. There will be a total loss of 6800m^2 of woodland habitat and a loss of 1150m^2 of scrub and scrub and meadow mosaic habitats during the construction phase, leading to a loss of foraging resources for local Badger. There will also be minimal lighting impacts from the Proposed Development on the Royal Canal itself, with the exception of Landmark Bridge. However, the proposed lighting plan indicates that spillover into the canal below will be minimal and the expected lux levels will not cause significant disruption to commuting Otter. As such, the commuting and foraging resources for Otter within the Royal Canal will be preserved.

There will be fragmentation of the existing treelines along the Royal Canal due to the partial removal of treeline habitat between Chainages +3270 - + 3290, and chainages +3600 - +3650. Furthermore, tree removal will occur between Chainages +4550 - +4570 to the west of the Old Schoolhouse. However, tree removal within these sections will be minimal and the existing treelines will not suffer significant fragmentation. For the Old Schoolhouse lands, a treeline to the north will be retained, as well as the majority of the scrub and meadow mosaic habitat which will allow non-volant mammals to commute around the Proposed Development. Furthermore, the width of the Greenway within these areas will be limited to 4m, which will not provide a significant barrier to commuting non-volant mammals.

Nevertheless, there will still be a long-term loss of woodland habitat, as well as scrub habitat during the operational phase. While the increase in footfall associated with the Proposed Development during its operation will increase disturbance for local non-volant mammals, fencing to the west of the mixed broadleaved woodland habitat between Coolmine Road and Roselawn Road (Chainages +6300 - +7170) will create a new section of undisturbed woodland between Chainages +6350 – 6550. Additionally, the retained section of the woodland habitat between the Old Schoolhouse and Coolmine Bridge (Chainages +5340 - +6250) will remain undisturbed, allowing non-volant mammals to continue utilising this area for commuting, foraging, and refuge activities. Therefore, in the absence of appropriate mitigation measures, the loss of foraging and commuting habitat will **likely have a long-term adverse impact of moderate significance** to the local non-volant mammal population.

8.7.4.3.3.2 Water Quality

As outlined in Chapter 12 (Water), operational phase impacts mainly relate to increased run-off rates due to the introduction of additional hard surfaces adjacent to the Royal Canal and changes in the local drainage network, which will have negligible impacts on water quality if unmitigated. Ongoing maintenance to the Greenway, including the trimming of vegetation and the fixing of any degradation to the pathway, will require the use of machinery, such as mini excavators. As with the construction phase, the use of machinery raises the risk of accidental pollutant spillage that could enter the water body of the canal, although at a much lower rate than during the construction phase. The potential application of salt to bituminous surfaces as part of winter Greenway maintenance can result in an increase in salinity, conductivity and total dissolved solid concentrations to the receiving aquatic system. Changes to runoff patterns caused during construction will continue throughout the operational phase and may result in alterations to the marginal habitats. These changes to the local surface water run-off regime and potential sources of operational pollutants have the potential to impact Otter, either via the degradation of supporting habitats within the Royal Canal or direct physiological damage arising from contact with hydrocarbon spill. However, these impacts are anticipated to be of low magnitude and nonsignificant (see Chapter 12 for more information) and will not significantly impact Otter or any other non-volant mammal species. Additionally, the operational embedded design drainage layout, which includes filter trenches and open channels at over the edge drainage locations, will help manage increase operational surface water run-off. These drainage features will allow recharge to groundwater at the filter trenches.

Therefore, it is **likely there will be a long-term adverse impact that is imperceptible significance** on non-volant mammals due to operational impacts on water quality.

8.7.4.3.3.3 Disturbance

Human disturbance from increased footfall and lighting poses an impact to all mammals, particularly those that are predominantly nocturnal (Badger, Otter, Hedgehog etc.). There are Badger setts in the wooded areas along the Proposed Development and inactive Otter holts along the canal. The increased footfall anticipated during the operational phase has the potential to make these existing inactive holts/setts less suitable for future activity.

Some of these species, such as Hedgehog, forage in open grassland along the route and they will avoid areas that have a regular public presence or are open and well-lit at night. The majority of these mammals can commute and forage in lit areas if they have vegetated cover but will be discouraged from an area if a section of the existing corridor is made open and exposed. The proposed Landscape Plan (Appendix 10.2) includes the planting of tree, hedgerow and shrub species adjacent to the Greenway, in particular in an area to the west of the Old Schoolhouse, between Chainages +4600 - +5200, where the existing scrub will be lost during the construction phase. This will alleviate disturbance impacts on non-volant mammals. While trees planted as part of the Landscape Plan will take several years to reach maturity/semi-maturity, in the intermediate period they will still provide foraging resources and cover, alongside the planted shrub species, for non-volant mammal species.

An increase in public access accompanied by pets adjacent to the Royal Canal, specifically dogs, will result in additional disturbance to local fauna. These disturbances generated by humans and/or pets have the potential to negatively impact non-volant mammals through causing increased vigilance behaviour and subsequent increased frequency of fleeing from the disturbance source. There is also the potential for increased predator pressures on all fauna, as a result of free-roaming domestic dogs. Due to these operational sources of disturbance, and associated habitat fragmentation, non-volant mammals may be forced to choose alternative routes through the surrounding urban area, which has the potential to increase the risk of road traffic mortality events. Additionally, due to the use of the Greenway by cyclists, non-volant mammals in the locality may be vulnerable to increased collision risk along the Proposed Development.

As detailed in sub-section 8.6.2.1.14, the woodland there was evidence of old localised bonfires and other dumping between Chainages +6350 - 6550, which has led to sections of the understorey being cleared of vegetation. The woodland sections to the east of this, between Chainages +6600 - +7100, are inaccessible due to the steepness of the terrain and thickness of the understorey vegetation, and due to being fenced off along its northern extent bordering the public green area by Roselawn Avenue (Chainage +6870 – 7310), were of noticeably higher quality. As such, the introduction of fencing to the west of this woodland habitat during the operational phase will reduce disturbance within this woodland's western extent (between Chainages +6350 - 6550) increasing its viability to support local non-volant mammal foraging. This will also reduce potential disturbance to the existing inactive Badger setts and inactive Otter holts within this area, increasing the potential for these to become active in the future. Additionally, the retained section of the woodland habitat between the Old Schoolhouse and Coolmine Bridge (Chainage +5340 - +6250) will remain undisturbed, allowing non-volant mammals to continue utilising this area for commuting, foraging, and refuge activities.

Therefore, in the absence of appropriate mitigation measures, operational phase disturbance will **likely have a long-term adverse impact of moderate significance** to the local Badger population and will

likely have a long-term adverse impact of slight significance to the local non-volant mammal population of Otter, Hedgehog, Pygmy Shrew, Pine Marten, and Red Squirrel.

8.7.4.3.3.4 Overall Impact Assessment

In the absence of mitigation during the operation phase, due to construction-based habitat loss and operational disturbance sources, a **long-term adverse impact of moderate significance** to the local Badger population is likely and **a long-term adverse impact of slight significance is likely** to the local non-volant mammal population of Otter, Hedgehog, Pygmy Shrew, Pine Marten, and Red Squirrel.

8.7.4.3.4 Birds [Local (higher value)]

Breeding or riparian birds may be impacted by increased human disturbance on nesting birds within trees and hedgerows along the boundary of the Proposed Development. An increase in footfall and pets adjacent to the Royal Canal, specifically dogs, will result in additional disturbance to local fauna. These disturbances generated by human and/or pets have the potential to negatively impact birds through causing increased vigilance behaviour and subsequent increased frequency of flight away from the disturbance source. There is also the potential for increased predator pressures on local breeding birds, as a result of free-roaming domestic dogs.

As outlined in Chapter 12 (Water), operational changes to water quality are not anticipated to be significant. Additionally, the operational drainage layout, which includes filter trenches and open channels at over the edge drainage locations, will help manage increase operational surface water run-off. These drainage features will allow recharge to groundwater at the filter trenches. Alongside the retention of the bankside habitats within the Royal Canal, impacts from habitat loss and fragmentation are not anticipated to be significant on local riparian birds. However, the loss of woodland and scrub habitats during the construction phase will lead to a loss of nesting resources for local breeding bird species. However, while there will be a loss of 44 trees along the Proposed Development during the construction phase, an additional 190 trees will be planted along the Proposed Development, although these trees will take several years to reach semi-maturity and begin to fulfil their ecological role. Additionally, a total area of 9844m^2 will be replanted with trees, shrub, and native meadow as part of the Proposed Development's proposed Landscape Plan (Appendix 10.2) which will partially offset the loss of foraging and nesting resources, following an initial ecological lag period as the planted species will mature over a period ranging from months to several years.

In the absence of mitigation measures during the operation phase, the ongoing disturbance is **likely to have a long-term adverse impact that is not significant** on local bird populations.

8.7.4.3.5 Amphibians (Common Frog and Smooth Newt) [Local (higher value)]

As amphibians (Common Frog and Smooth Newt) are susceptible to changes in water quality and the presence of pollutants in the water, these species will be vulnerable to changes in the local surface water run-off regime. Ongoing maintenance to the Greenway, including the trimming of vegetation and the fixing of any degradation to the pathway, will require the use of machinery. As with the construction phase, the use of machinery raises the risk of accidental pollutant spillage that could enter the water body of the canal, although at a much lower rate than during the construction phase. However, as outlined in Chapter 12 (Water), operational changes to water quality are not anticipated to be significant.

Additionally, the operational drainage layout, which includes filter trenches and open channels at over the edge drainage locations, will help manage increase operational surface water run-off. These drainage features will allow recharge to groundwater at the filter trenches. Alongside the retention of the bankside habitats within the Royal Canal, this will preserve the commuting and foraging resources for amphibians.

Therefore, during the operational phase of the Proposed Development in the absence of appropriate mitigation measures, a **long-term adverse impact that is not significant is likely** for amphibians.

8.7.4.3.6 Terrestrial invertebrates (bees and butterflies), Odonata. [Local (higher value)]

Due to a loss of supporting habitat during the construction phase, including woodland, scrub, meadow, earth banks, and recolonising bare ground will lead to a loss of foraging resources for local invertebrates. As outlined in Chapter 12 (Water), operational changes to water quality are not anticipated to be significant. Additionally, the operational drainage layout, which includes filter trenches and open channels at over the edge drainage locations, will help manage increase operational surface water run-off. These drainage features will allow recharge to groundwater at the filter trenches. Alongside the retention of the bankside habitats within the Royal Canal, impacts from habitat loss and fragmentation are not anticipated to be significant on local *Odonata* species.

In the absence of mitigation measures, there may be a slight decrease in habitat quality as a result of the construction phase discussed above, however this decrease is unlikely to significantly affect the population of these species during the operational phase, therefore, any impact to terrestrial invertebrate and *Odonata* species is considered to be **a likely long-term adverse impact that is not significant**.

8.7.4.3.7 Aquatic invertebrates [National level importance]

As Glutinous snail and other aquatic invertebrates are susceptible to changes in water quality, light levels and the presence of pollutants in the water, this species will be vulnerable to changes in the local surface water run-off regime. Ongoing maintenance to the Greenway, including the trimming of vegetation and the fixing of any degradation to the pathway, will require the use of machinery. As with the construction phase, the use of machinery raises the risk of accidental pollutant spillage that could enter the water body of the canal, although at a much lower rate than during the construction phase. However, as outlined in Chapter 12 (Water), operational changes to water quality are not anticipated to be significant. Additionally, the operational drainage layout, which includes filter trenches and open channels at over the edge drainage locations, will help manage increase operational surface water run-off. These drainage features will allow recharge to groundwater at the filter trenches. Alongside the retention of the bankside habitats within the Royal Canal, this will preserve the foraging resources for Glutinous snail and other aquatic invertebrates.

A section of the Proposed Development will run directly over the Royal Canal, specifically Landmark Bridge (Chainages +7115 to 7350). This bridge will have a maximum single span of 30m across the Royal Canal itself and will be 4m wide. This will create a shading effect on the canal beneath and impact on any aquatic macrophytes and riparian plants. However, given the scale of this area (approximately 120m^2) and the nature of this shading impact, with light not completely cut out, this impact is not expected to significantly impact this vegetation. Shading effects will be limited to restricting the

size/height of underlying vegetation when compared with vegetation outside of the bridge's shading zone. This will therefore not cause any significant loss or disruption of habitat for aquatic invertebrates.

Therefore, during the operational phase of the Proposed Development in the absence of appropriate mitigation measures, a **long-term adverse impact that is not significant is likely** for Glutinous Snail and other aquatic invertebrates.

8.7.4.3.8 White-clawed crayfish [County level importance], Fish (European Eel, Coarse Fish and Pike) [County level importance]

As outlined in Chapter 12 (Water), operational changes to water quality are not anticipated to be significant. Additionally, the operational drainage layout, which includes filter trenches and open channels at over the edge drainage locations, will help manage increase operational surface water run-off. These drainage features will allow recharge to groundwater at the filter trenches. Alongside the retention of the bankside habitats within the Royal Canal, this will preserve the existing foraging and commuting resources for local fish species and White-clawed Crayfish.

The creation of a new bridge, Landmark Bridge, over the Royal Canal will lead to increased shading over the canal below (approximate Chainages +7115 to 7350). This bridge will have a maximum single span of 30m across the Royal Canal itself and will be 4m wide. This will create a slight shading effect on the canal beneath and impact on any aquatic macrophytes and riparian plants. However, given the scale of this area (approximately 120m^2) and the nature of this shading impact, this impact is not expected to significantly impact this vegetation. Shading effects will be limited to restricting the size/height of underlying vegetation when compared with vegetation outside of the bridge's shading zone. As such, knock on impacts for fish and other aquatic species will be limited.

Therefore, during the operational phase of the Proposed Development in the absence of appropriate mitigation measures, a **long-term adverse impact that is not-significant is likely** for fish species and White-clawed Crayfish.

8.7.4.3.9 Invasive Non-native Species

During the construction phase, the invasive species present on-site currently may be spread within the site and the surrounding area, which has the potential to impact the proposed Landscape Plan (Appendix 10.2) and the existing habitats along the Proposed Development. Therefore, in the absence of specific invasive species mitigation during the construction phase, a **short- to long-term invasive species impact of moderate significance is likely for the habitats present within the site during the operational phase.**

8.8 Other Relevant Plans and Projects

8.8.1 Cumulative Impact Assessment

As part of the impact assessment process, a cumulative assessment of the effects of the Proposed Development with the effects of other existing and / or approved projects. The list of plans and projects are outlined below.

8.8.2 Plans

- Fingal Development Plan 2023-2029
- Fingal Heritage Plan 2024-2030
- Fingal Biodiversity Action Plan 2023-2030
- Old School House, Clonsilla, Masterplan 2025
- Kellystown Local Area Plan 2021-2027
- Third Cycle River Basin Management Plan for Ireland 2022-2027

8.8.2.1 Fingal Development Plan 2023-2029

Fingal County Council has prepared the Fingal Development Plan 2023-2029 in accordance with the requirements of the Planning and Development Act, 2000 (as amended). Fingal County Council, as the competent authority, has undertaken an Appropriate Assessment (FCC, 2023a) of the said Plan pursuant to the requirements of Part XAB of the Planning and Development Act 2000 (as amended) taking into account, as appropriate, the matters set out in Section 177V (2) of the said Act in carrying out the Appropriate Assessment.

A Strategic Environmental Assessment was conducted which included recommendations to mitigate potential environmental impacts from the plan (Brady Shipman Martin, 2023). These recommendations have been integrated into the Fingal Development plan, and as such significant residual adverse environmental effects will not occur. The Plan was also created with the objectives to promote and enhance biodiversity within Fingal County.

Therefore, the Fingal Development Plan 2023 - 2029 is not anticipated to have any in-combination effects with the Proposed Development.

8.8.2.2 Fingal Heritage Plan 2024-2030

Fingal County Council (FCC) prepared the Fingal Heritage Plan 2024-2030 which sets out a vision for protecting the shared heritage of Fingal. The Draft Fingal Heritage Plan 2024-2030 is underpinned by the principle of shared responsibility for heritage. The Plan includes a framework set out under six themes to guide the community; the Council and all stakeholders working across Fingal to protect, share and celebrate the county's unique heritage.

The Fingal Heritage Plan sets out six strategic objectives and themes around which the plan focuses on between 2024-2030, with corresponding actions and desired outcomes for each. These themes were arrived at following a review of implementation of the previous heritage plan, and a process of consultation. The plan is focussed on inputs from the Fingal Heritage Forum, other relevant agencies, and the community in relation to priorities and key themes that should be addressed.

The SEA report concluded that the plan would not result in any significant effects on the environment Brady Shipman Martin, 2024).

"*The Fingal Heritage Plan (2024 – 2030) is a non-statutory land use plan. Having regard to the characteristics of the Plan and the characteristics of the effects and of the area likely to be affected as set out in Schedule 1 to S.I. 435/2004 as amended, it is considered, that the implementation of the Plan has no real likelihood of having likely significant negative effects on the environment. On the contrary, the implementation of the Heritage Plan is considered likely to have positive effects in relation to heritage aspects of the environment in the Fingal administrative area*."

Therefore, it is anticipated the Fingal Heritage Plan, in its current scope, will not act in-combination with the Proposed Development in impacting key ecological receptors of the Royal Canal, notably terrestrial faunal groups.

8.8.2.3 Fingal Biodiversity Action Plan 2023-2030

The Biodiversity Action Plan (BAP) puts forward an ambitious programme of a hundred actions to reverse the decline in biodiversity by 2030. The actions are based upon recommendations made in ecological studies and on proposals put forward by nature conservation NGO's, members of the public, the Public Participation Network, Strategic Policy Committee members and various Council Departments (FCC, 2022).

Annual reports will be prepared by the Biodiversity Officer reporting on progress in relation to implementing the Biodiversity Action Plan and achieving the targets set out in the plan. In 2027 a review will be carried out to assess the overall progress to date, and to make any amendments to the plan deemed necessary, taking into account any new developments in the county in terms of changes in legislation, policies or priorities.

8.8.2.3.1 BAP screening SEA conclusions

The Biodiversity Action Plan (BAP) puts forward an ambitious programme of a hundred actions to reverse the decline in biodiversity by 2030. The actions are based upon recommendations made in ecological studies and on proposals put forward by nature conservation NGO's, members of the public, the Public Participation Network, Strategic Policy Committee members and various Council Departments (FCC, 2022).

Annual reports will be prepared by the Biodiversity Officer reporting on progress in relation to implementing the Biodiversity Action Plan and achieving the targets set out in the plan. In 2027 a review will be carried out to assess the overall progress to date, and to make any amendments to the plan deemed necessary, taking into account any new developments in the county in terms of changes in legislation, policies or priorities.

8.8.2.3.2 BAP screening SEA conclusions

Brady Shipman Martin was appointed by FCC to carry out screening for SEA in respect of the Draft Fingal Biodiversity Action Plan 2022 – 2030 (the 'Draft Plan' hereafter) (Brady Shipman, 2022).

The SEA concluded that the implementation of the Draft Plan is considered likely to have positive effects in relation to at least the following aspects of the environment in the Fingal administrative area:

Biodiversity, including habitats, species and sites protected under national and European provisions;

- Water quality;
- Flood risk;

- Climate change (mitigation and adaptation);
- Population and human health (e.g. in relation to amenity and public health); and
- Soil quality.

FCC concluded that the Fingal BAP Plan is not likely to have significant negative effects on the environment.

8.8.2.3.3 Cumulative Impact Assessment

The key objectives/actions outlined within the Fingal BAP are broadly divided into the following six categories:

- Delivery of the Ecological Network across Fingal
- Building for Biodiversity
- Climate change adaption and mitigation
- Agri environment schemes and rewilding
- Research & monitoring
- Raising awareness

The Fingal BAP outlines direct actions for the Royal Canal, specifically actions 20 and 21 relating to the establishment of an ecological corridor link between the Royal Canal, the Tolka River, and the Liffey Valley, including the creation of two wetland corridors between the River Liffey and Royal Canal. The Proposed Development does not compromise the ability for the objectives to be achieved, nor will it act in-combination with these actions to adversely impact the local environment. Action 21 relating to the proposal to 'establish two wetland corridors between the River Liffey and the Royal Canal at Westmanstown' will crucially not be compromised, as the Proposed Development will only involve works on the western bank of the Royal Canal at Westmanstown, and will not narrow the existing corridor present along this section of canal.

Furthermore, while the Proposed Development will ultimately result in disturbance to the existing ecological corridor present along the Royal Canal, the corridor itself will retain its functionality for local fauna. As such, the development of the Proposed Development does not conflict with the broader BAP objective of delivering ecological network across FCC. Additionally, the Proposed Development aligns with the Fingal Climate Change Action Plan (action T12) and the Fingal BAP (action 36), relating to the development of Fingal's cycle network through Greenways, green belts, and cycling trails.

Therefore, the Proposed Development does not conflict with the policies / objectives of the Fingal BAP, nor act cumulatively with the plan in adversely impacting key ecological receptors of the Royal Canal, notably terrestrial faunal groups.

8.8.2.4 Old School House, Clonsilla, Masterplan 2025

A Masterplan has been prepared for the lands adjacent to the Old School House, Clonsilla, adjacent to the Royal Canal (FCC, 2025). This Masterplan has been prepared in accordance with Policy CSP7 'Masterplans' of the Fingal Development Plan 2023-2029 that provides for the preparation of masterplans. The focal point of the Masterplan is the former Old School House building which is a

Protected Structure (RPS Ref. 0700). The Masterplan includes a proposed layout for these lands, including the creation of residential properties, pedestrian routes, community facility, and green spaces.

While significant impacts on the Natura 2000 sites were ruled out based on the final determination of the Screening for AA Report (BSM, 2025), this project will have localised environmental impacts on the habitats adjacent to the Royal Canal, located between Chainages +4580 - +5300. The proposed plan will result in a loss in meadow and scrub habitat adjacent to the Royal Canal, as well as the loss of trees which will be replaced by a mix of amenity area, residential properties, roads, and lighting.

The lighting fixtures will adhere to bat-friendly lighting practices that align with guidelines from Bat Conservation Ireland and other authoritative sources (FCC, 2025). The key lighting recommendations within the plan are as follows:

- Minimise Light Spill: Direct lighting only to areas where absolutely necessary.
- Use Warm-Coloured Lights: Opt for lighting with a colour temperature of 2700K or lower. Warm white tones are less disruptive to bats compared to cooler, blue-rich lighting.
- Limit UV Emission: Choose light sources that emit minimal or no ultraviolet (UV) light, as UV can attract insects and consequently alter bat feeding patterns.
- Implement Adaptive Lighting Controls: Incorporate dimmers, timers, and motion sensors to ensure that lighting is used only when needed, reducing unnecessary illumination during periods of low human activity.
- Position Lights Thoughtfully: Install lighting at the lowest practical height and angle them downwards to decrease light trespass into natural habitats.
- Avoid Illuminating Key Bat Habitats: Refrain from lighting areas crucial to bats, such as waterways, hedgerows, and known roosting sites, to prevent habitat fragmentation and disturbance.

By integrating these recommendations into lighting design and implementation, it will significantly reduce the adverse effects of artificial lighting on local bats utilising the adjacent Royal Canal.

The plan includes objectives to promote local biodiversity, including:

- Ensuring the retention of existing trees and hedgerows where possible in order to protect the biodiversity value of the lands.
- Promoting the planting of native tree and shrub species to support local biodiversity and provide natural screening for future development.

While measures for the promotion of native tree and shrub planting, and the use of bat friendly artificial lighting will reduce the ecological impact of the plan in its current state, the Masterplan will lead to an overall loss of meadow and scrub habitat, as well as tree cover. This will lead to a narrowing of the existing ecological corridor running adjacent to the Royal Canal, as well as a loss of foraging resources for local fauna. Additionally, the introduction of residential properties and an access road will increase disturbance sources for local fauna.

Therefore, it is anticipated the Old Schoolhouse Masterplan, in its current scope, will act cumulatively with the Proposed Development in impacting key ecological receptors of the Royal Canal, notably terrestrial faunal groups.

8.8.2.5 Kellystown Local Area Plan 2021-2027

FCC has prepared the Kellystown Local Area Plan (LAP), which seeks to establish a land use strategy for the proper planning and sustainable development of lands at Kellystown, Dublin 15. The Kellystown Local Area Plan outlines key objectives for the sustainable development of these lands in relation to the following:

- New residential development;
- Infrastructural investment including the new Kellystown Link Road;
- Pedestrian, cyclist and vehicular movement;
- Development of a central civic square;
- Education and community uses;
- Public open space and recreation areas; and
- Water and drainage.

The Kellystown LAP will lead to a loss of arable fields and hedgerows/treelines to the south of the Royal Canal, Chainages +4580 - +5300. However, this plan was designed with several key environmental objectives aiming to promote and enhance the existing biodiversity (FCC, 2021). These include:

- Objective 8.1
  - Promote the conservation and enhancement of biodiversity having regard to the policies and objectives of the Fingal Development Plan, the Fingal Heritage Plan and the Fingal Biodiversity Plan while allowing for appropriate development, access arrangements and recreational activity.
- Objective 8.2
  - Ensure that proposals for the riparian corridor running along the Royal Canal/Rail Corridor make adequate provision for the protection of biodiversity and sustainable water management.
- Objective 8.3
  - Protect existing trees and hedgerows within the LAP lands which are of amenity or biodiversity value.
- Objective 8.4
  - Incorporate identified trees and hedgerows into future development proposals in order to maintain and contribute to the landscape character of the area, insofar as practicable.
- Objective 8.5
  - Conserve, protect and enhance existing trees and hedgerows within the LAP lands which form wildlife corridors and link habitats providing the stepping stones necessary for wildlife to flourish.

- Objective 8.6
  - Require all development proposals within 30 metres of the Canal Pond to be accompanied by an Ecological Impact Assessment. This shall be prepared by a qualified Ecologist and in line with Guidelines for Ecological Impact Assessment in the UK and Ireland, Terrestrial, Freshwater and Coastal (CIEEM 2nd Edition, 2016).
- Objective 8.7
  - Require all development proposals to demonstrate how the proposal will enhance biodiversity and avoid or minimise the loss of existing habitat and wildlife corridors.
- Objective 8.8
  - The retention of high value hedgerows/treelines, except in cases where required to facilitate the construction of the Kellystown Link Road.
- Objective 8.9
  - Retained hedgerows shall be maintained so that a diversity of hedgerow structure is provided, including tall and short section (≤3m) sections, with thick and dense cover at the base of the hedgerow. Gaps along hedgerows shall be minimised except to facilitate pedestrian access or visual permeability at appropriate locations.
- Objective 8.10
  - A Method Statement for the construction, planting regime and species selection of both 'dry' and 'wet' hedgerows shall be provided with all planning applications for development within 10m of existing hedgerows within the LAP lands.
- Objective 8.11
  - A new pedestrian/cycle bridge shall be provided over the Canal from the Central Development Area (DA2), subject to a future feasibility study and necessary environmental assessments and shall be provided at the developer's expense.
- Objective 8.12
  - Where new crossings of the Canal are proposed i.e footbridges/cycle bridges, they shall be designed so as to avoid fragmentation of linear habitats associated with the Royal Canal Corridor.
- Objective 8.13
  - Where hedgerows cannot be retained, or will be severed, a new hedgerow network composed of the same species shall be planted along roadways within future development proposals.
- Objective 8.14
  - The pond should be managed as a pond for wildlife and a buffer of 5m is recommended to protect the pond from any development proposals.

The current Kellystown LAP indicates that the riparian corridor along the southern bank of the canal will be retained which will preserve the existing ecological corridor. This area will also be maintained as a dark corridor, protecting bat species utilising the canal. Additional blue/green corridors throughout the Kellystown LAP lands where hedgerows/treelines are due to be removed will be created to maintain the area's ecological connectivity. Furthermore, while parts of the habitats within the Kellystown LAP area will be converted to buildings and other artificial surfaces, several neighbourhood parks will be created, and some of the existing hedgerows/treelines will be retained. This will preserve some of the existing foraging resources for terrestrial fauna currently utilising the site and the adjacent Royal Canal.

Therefore, as the riparian corridor will be retained in the current scope of the Kellystown LAP, and due to the outlined Landscape Plan and objectives of the LAP, it is not anticipated to have

any cumulative effects with the Proposed Development in impacting key ecological receptors of the Royal Canal, notably terrestrial faunal groups.

8.8.2.6 River Basin Management Plan for Ireland 2022-2027

Ireland's third River Basin Management Plan (RBMP) for Ireland - 'Water Action Plan 2024: A River Basin Management Plan' (DHLGH, 2024) sets out the measures that are necessary to protect and restore water quality in Ireland. The overall aim of the plan is to ensure that our natural waters are sustainably managed and that freshwater resources are protected so as to maintain and improve Ireland's water environment. The 3rd cycle Catchment Reports were published in 2024. The Catchment Reports provide a summary of the water quality assessment outcomes for respective catchments, including status and risk categories, significant threats and pressures, details on protected areas and a comparison between cycle 2 and cycle 3.

The third cycle Catchment Report for Liffey and Dublin Bay Catchment (EPA, 2024) indicates that 42% of surface waterbodies were at 'good' or 'high' ecological status, and 86% of groundwater bodies were at 'good' status. The overall change in quality between Cycles 2 and 3 include 2 are mixed. There has been neither an increase or decrease in the number of rive waterbodies valued at "Poor" or "Bad" status, remaining at 18% between cycles. There is an increase of river waterbodies reaching a "High" status from 9% to 10%, there was also a decrease in waterbodies from "Good" to "Moderate" value by approximately 3% of river waterbodies. The main significant pressures are aquaculture, anthropogenic, atmospheric, historically polluted sites and waste pressures followed by agriculture, urban run-off and forestry.

The RBMP is a high-level plan that does not determine the precise location of any development project or designate or allocate specific land uses. The plan specifically sets out the measures that are necessary to protect and restore water quality in Ireland. The overall aim of the plan is to ensure that natural waters are sustainably managed and that freshwater resources are protected so as to maintain and improve Ireland's water environment. Given the aims of the plan and its high-level nature, it is not anticipated to adversely impact the water quality of the Royal Canal. Therefore, the RBMP is **not anticipated to act cumulatively with the Proposed Development** to impact the water quality of the Royal Canal, and have subsequent adverse impacts on its associated KERs.

8.8.3 Projects

- Greater Dublin Drainage Strategy
- DART+ West - electrification of the train line to Maynooth from Conolly Station
- Residential Development at St Joseph' Clonsilla, Dublin 15
- Other Planning Applications (retrieved from Data.gov.ie - Planning Application Sites)

8.8.3.1 Greater Dublin Drainage Strategy

The Greater Dublin Drainage (GDD) Strategy (2018) sets out the strategic planning for the development of wastewater treatment in the Greater Dublin area in relation to the Ringsend Wastewater Treatment Plant (WWTP) Upgrade, Greater Dublin Drainage Project and associated wastewater network drainage projects (Uisce Éireann, 2025). The Ringsend WWTP Upgrade includes plans to expand the WWTP to its ultimate capacity, together with associated network upgrades required. The Greater Dublin Drainage Project is planned to relieve both the Ringsend WWTP and network loading by construction of a new

WWTP at Clonshaugh, an orbital sewer and provision of an outfall pipe discharging 1km northeast of Ireland's Eye.

The Ringsend WWTP upgrade is in progress and carried out in stages, with an increased capacity of 400,000 PE by Q1 2021 and the ultimate capacity of 2.4 million population equivalent to be in operation by 2025 (Uisce Éireann, 2025). The Greater Dublin Drainage Project is strategically important to the Dublin Region in that it will provide capacity for residential and commercial growth (Uisce Éireann, 2018).

The proposed outfall pipe will discharge 1km northeast of Ireland's Eye, over 20km away from the Proposed Development's easternmost extent. Cumulative impacts with the Proposed Development on the water quality within the Dublin Bay and the Royal Canal can therefore be ruled out.

Therefore, the Greater Dublin Drainage Strategy is not anticipated to have any cumulative effects with the Proposed Development.

8.8.3.2 DART+ West - electrification of the train line to Maynooth from Conolly Station.

The first of the infrastructural projects of the DART+ programme to be delivered will be the DART+ West project. DART+ West is seeking to significantly increase rail capacity on the Maynooth Line. This can be achieved by changing to electrified, high-capacity DART trains and increasing the frequency of trains. The project will serve all existing stations along the railway corridor between Maynooth Station and M3 Parkway Station to Connolly Station and Spencer Dock Station using electrical power that has a lower carbon footprint than the existing diesel trains. The electrification of the rail line will predominantly follow the existing railway corridor.

The following is a high-level summary of the key infrastructural elements of the DART+ West project:

- Electrification and re-signalling of the Maynooth and M3 Parkway line from City Centre to Maynooth (approximately 40km in length).
- Capacity enhancements at Connolly Station (to include modifications to platforms, junctions & the station) to facilitate increased train numbers.
- Capacity enhancements of Spencer Dock Station. This will take place at its current location, or the station will be relocated, to better serve all routes entering the city centre and to improve interchange with Luas (further studies required).
- Closure of existing level crossings & provision of replacement crossings where required.
- Construction of a new DART depot facility west of Maynooth Station for the maintenance and parking (stabling) of trains.
- Development of a DART MetroLink interchange station at Glasnevin.
- All civil and bridge works and ancillary works as necessary to accommodate the project.

The Dart + West project includes the construction of two new bridges over the Royal Canal, one at Porterstown to the immediate east of the Old School House (Chainages +5250 - +5350), and another crossing the canal from the R148 Kilcock Road (Chainages +4080 - +4120). The construction of these bridges will result in a loss of habitat within the Royal Canal pNHA and ecological corridor. Additionally, fencing and disturbance (audible from increased train movements and visual from lighting) will result in the potential fragmentation of the habitats immediately adjacent.

These impacts were outlined in an EIAR which accompanied this planning application completed by IDOM with Roughan & O'Donovan and the assistance of a team of competent experts (IDOM and Roughan & O'Donovan, 2022). The EIAR prescribes appropriate measures to prevent significant impacts on key ecological receptors, including the Royal Canal pNHA and ecological corridor. Measures included minimising the use of fencing between the railway line and the Royal Canal, appropriate lighting design which will minimise horizontal light spill into the Royal Canal to 0.5 lux or less, the installation of bat boxes including at Barberstown, bird deflectors on overhead lines, and measures to prevent the further spread of invasive species, including Japanese Knotweed (IDOM and Roughan & O'Donovan, 2022). As such, the EIAR concluded that, following the implementation of the mitigation measures outlined, the residual impacts on the Royal Canal pNHA would be limited to permanent slight negative impacts at the local level due to habitat loss and barrier effects. Additionally, disturbance was concluded to lead to a permanent slight negative impact at the local level for the Royal Canal pNHA.

While the impacts on the Royal Canal pNHA will be limited, there is a potential for these impacts to be exacerbated by the Proposed Development, which will similarly require direct habitat removal from the Royal Canal pNHA. Additionally, in conjunction, the Dart + West and the Proposed Development will improve both the access to and the pedestrian routes along the Royal Canal, which has the potential to lead to a long-term increase in disturbance levels within the Royal Canal pNHA.

Therefore, considering the potential operational impacts of the Dart + West project identified within the project's EIAR, it is considered that this project has the **likely potential to act cumulatively with the Proposed Development to adversely impact the Royal Canal pNHA and ecological corridor, alongside the associated faunal groups identified along the canal within this Chapter.**

8.8.3.3 Residential Development at St Joseph' Clonsilla, Dublin 15

This project relates to the development of lands (c. 3.06 Ha) located in Zone 6 as identified within the Hansfield SDZ Planning Scheme 2006, formerly part of St. Joseph's Hospital, Clonsilla, Dublin 15 bounded generally by the Hansfield Road to the east, St. Joseph's Avenue to the north, Pipers Court to the west and permitted canal side cycle/pedestrian path associated with St. Joseph's Phase 1 (FCC Reg. Ref. FW17A/0234) to the south, all in the Townland of Clonsilla, Dublin 15. The development will consist of 419no. residential apartment units, consisting of 167no. 1-bed units, 199no. 2-bed units and 53no. 3-bed units and residential amenity space (c. 359.6 sq. m) in 4no. Blocks ranging in height from 4 to 6 storeys.

An Ecological Impact Assessment Report accompanied this planning application. The EcIA indicated that no impacts are anticipated on the Royal Canal pNHA from the Proposed Development. The existing ecological corridor along the Royal Canal will be retained and will not be impacted by the Proposed Development.

The proposed development will critically not reduce the size of the existing Royal Canal ecological corridor. The treelines to south of the development within the Royal Canal corridor will be retained, preserving a buffer between the site and the Royal Canal. The operational phase of the development will result in increased footfall within the area, including along the existing Royal Canal towpath. However, this will likely result in a minor increase in the already high levels of disturbance locally. Furthermore, this increased footfall will not result in surface water impacts with the existing grassy verge bordering the Royal Canal acting as a buffer between the towpath and canal.

Considering there are no residual impacts on the Royal Canal ecological corridor or riparian zone expected from this project it is therefore considered that there will be no cumulative

impacts from this project in combination with the Proposed Development on the key ecological receptors of the Royal Canal.

8.8.3.4 Other Projects

Other projects dating back three years are listed in Table 8-30, which are not retention applications, home extensions and/or internal alterations, and have been granted planning permission in the locality (approx. 2km) of the site and those connected to the canal downstream of the locations of works of the Proposed Development

Table 8-30: Projects granted planning permission vicinity of proposed site (applications assessed 24/08/2026)

Planning Reference	Address	Application Status	Decision Date	Summary of Development	Cumulative Assessment
22784	Mariavilla Carton Demesne, Oldcarton Catherinestown Kellystown Ravensdale, Sion and Confey	Conditional	08/02/2024	Development at this site in the townlands of Mariavilla, Carton Demesne, Oldcarton, Catherinestown, Kellystown, Ravensdale, Sion and Confey. The development will traverse the administrative areas of both Kildare County Council and Meath County Council. The development within the Kildare County Council administrative area will consist of: (a) Permanent Mechanical, Electrical, Instrumentation, Control and Automation (MEICA) upgrade works, upgrade of the existing chemical dosing system and ancillary works at the Maynooth Wastewater Pumping Station (WWPS) site in the townland of Mariavilla; and, (b) Provision of approximately 7.9km new pipeline (approximately 9.8km total development length within Kildare and Meath) and associated infrastructure (air valves, scour valves, flow meter, ventilation columns etc.) between the Maynooth WWPS and existing Irish Water infrastructure along the R149 in the townland of Confey.	No EIA Screening, EcIA or EIAR accompanied this application. The project is small in scale and has no hydrological connection with the Proposed Development. **Therefore, due to the scale of the project, cumulative impacts with the Proposed Development and its adjacent habitats are not anticipated.**
4295/23	Luas Broombridge - Hamilton Deport, 7 Broombridge Road,	Permission granted	06/12/2023	Permission for the installation of solar photovoltaic array to the existing roofs of a tram depot and	No EIA Screening, EcIA or EIAR accompanied this

	Cabra West, Dublin 7, D07 A978			sanding shed, located within a solar safeguarding zone (SSZ), that will measure greater than 300 sqm in area and include all ancillary works and services.	application. This project will also not lead to any changes to the riparian corridor along the Royal Canal, nor adversely impact any of the local KERs. **Therefore, due to the scale of the project, cumulative impacts with the Proposed Development and its adjacent habitats are not anticipated.**
4585/23	A site generally bounded by Alexandra Road to the north, Branch Road No.1 and rail line to the west, Branch Road No.3 to the east and Alexandra Basin to the south, at Dublin Port, Dublin 1, which includes R&H Hall	Permission granted	18/04/2023	The development will consist of: A. Demolition and removal of existing quayside overhead bulk material conveyor system (2no. North/South and 1no. East/West), 2no. associated elevator/weighing towers, redundant transformer building and weighbridge and associated infrastructure to include site clearance of redundant walls, plinths and fences; B. Reinstatement of window opening to	No EIA Screening, EcIA or EIAR accompanied this application. Due to the distance between the two projects it is not anticipated that there will be any likely cumulative impacts. **Therefore, due to**

	Silo Building (a protected structure, re			the R&H Hall Silo Building, a protected structure, following removal of the elevated conveyor system (within its curtilage) together with internal and external repair works to the remainder of the building; C. Relocation of existing rail line northwards to a safe zone set further back from the quayside, existing crane rails along the quayside and existing 30m high mast lighting (HML) tower; D. Relocation of existing reefer gantries and 30m HML towers located at McCairn's Yard and provision of 2no. new reefer gantries; E. Quayside and yard pavement upgrades and reinforcement works and installation of new 30m HML towers; F. Construction of a new bulk product silo facility at McCairn's Yard, to include intake/outtake of bulk product from vessels to quayside storage and onward transport. The facility will consist of 6no. bulk product storage silo bins c.30.0m in height (c.1,701sq.m), below ground conveyor system from intake pit to silo bins (c.-7.5m), above ground conveyor system up to c.32.8m in height, bulk material out-loading building c.9.1m in height (c.234sq.m), weighbridge control	**the scale and location of the project, cumulative impacts with the Proposed Development and its adjacent habitats are not anticipated.**

				office c.4.0m in height (c.59sq.m), motor control centre and switch room c.5.080m in height (c.70sq.m), intake elevator tower and weighting tower c.41.11m in height (c.97sq.m), bulk material intake building c.11.66m in height (c.2,326sq.m), administration office and welfare building c.6.8m in height (c.164sq.m), workshop and covered external area c.6.9m in height (c.592sq.m), weighbridges, associated infrastructure, skip area, chemical storage area, diesel tank bunded area, ancillary lighting, and automated gate entry; G. Provision of a new substation c.2.97m in height (c.196sq.m); and; H. New access and egress onto Alexandra Road, provision of International Ship and Port Security (ISPS) fencing and gates to matching existing fencing, internal roads, ancillary car and bicycle parking, ancillary lighting, waste management facilities and all associated site development works including revised utilities/drainage arrangements and construction compound.	
4894/22	Site which extends from Promenade	Permission granted and retention permission granted	15/04/2023	Development at this site which extends from Promenade Road to	No EIA Screening, EcIA or EIAR

	Road to Alexandra Road, Dublin Port, Dublin 3			Alexandra Road and includes the western part of Circle K Fuel Terminal1, part of Promenade Road at its junction with Terminal 10 Link Road (T10 Link Road), T10 Link Road, part of Tolka Quay Road, No. 1 Branch Road North and part of Alexandra Road. It also incorporates land comprising parts of Terminal 4 and Terminal 4 North, all at Dublin Port, Dublin 1. 1. Retention permission is sought for development of part of a link road known as T10 Link Road connecting Promenade Road with Tolka Quay Road to the west of the Terminal 10 State Services yard. The road and associated infrastructure comprises of: - An approximately 125 metre long and 14.4 m wide two-way road (two northbound lanes and one southbound land), with 2 no. 3m wide footpaths. - A T-junction with Promenade Road; - A pedestrian zebra crossing at the northern end of the link road; and - A vehicular entrance to the Terminal 10 state services yard; - Revisions to fenceline previously permitted under Reg.Ref. 4483/19 at	accompanied this application. This project will also not lead to any changes to the riparian corridor along the Royal Canal, nor adversely impact the canal's water quality. **Therefore, it is concluded that this project will not act cumulatively with the Proposed Development on the Royal Canal and its adjacent habitats.**

				northeast corner of Terminal 4 North boundary; and - All associated ancillary works including site clearance, demolitions, earthworks, pavement construction, drainage services, diversion and installation of utility services, installation of road markings and signs, lighting, CCTV and associated boundary fencing. Permission is sought for development which will consist of a new link road from north of Tolka Quay Road to Alexandra Road. The new link road and associated infrastructure will comprise of: - An approximately 250m long two-way road (two north bound and two south bound lanes) with 3 m wide footpaths on either side of the road and two-way segregated cycleway on eastern side of road; - New roundabout, connecting proposed new link road with Tolka Quay Road; - New link road will incorporate a swept bend to integrate continuously with Alexandra Road to the west, a T-junction from Alexandra Road to the east to the proposed new link road, and closure of access to No. 2 Branch Road South;	

				- Closure and removal of No. 1 Branch Road North along with boundary walls to east and west, accommodating an extension of Terminal 4 including new yard surface into area of current Circle K Terminal 1; - Realigned port cycle network along Alexandra Road; - Upgrade of road and footpath connections on Tolka Quay Road and a zebra crossing on Tolka Quay Road to the east of the proposed roundabout; and - Revisions to fenceline previously permitted under Reg. Ref. 4483/19 at southeast corner of Terminal 4 North boundary. Permission is also sought for development comprising: - Relocation of 5 no. parking spaces within and provision of new 2.4 m western boundary wall to the Circle K Terminal 1; - Revisions to access from Circle K Terminal 1 to Alexandra Road as previously permitted under Reg. Ref. 3773/20 to now omit previous access arrangements and provide for two vehicular entrances and gateways to Alexandra Road and one vehicular entrances and	

				gateways to T10 Link Road; - The demolition/ breaking out of:- Existing T10 Link Road junction on Tolka Quay Road;-Section of Circle K Terminal 1 perimeter fence; and All associated ancillary works, including site clearance, demolitions, earthworks, pavement construction, drainage services, diversion and installation of utility services, installation of road markings and signs, lighting, CCTV and associated boundary fencing. Part of the site comprises of an establishment to which the Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015 (S.I.209 of 2015) applies.	
FW18A/0197	Lands at Hansfield, Dublin 15, being part of Zone 7 'Railway', of the Hansfield Strategic Developement Zone Planning Scheme 2006., The site is bunded by Station Road, to the East, Barnwell Grove and, Barnwell Heath to	Grant Permission	19/07/2019	The proposed development consists of the construction of 117 no. family houses comprising 101 no. two storey three-bedroom houses, 15 no. two storey four-bedroom houses and 1 no. three storey four-bedroom house and 83 no. apartments, comprising 29 no. 1 bedroom apartments and 54 no. 2 bedroom apartments. The apartments are arranged in 3 blocks ranging in height from 3 storeys plus	No EIA Screening, EcIA or EIAR accompanied this application. Furthermore, this development is located over 400m from the canal and has not impacted the habitats within or

	the North, and M3 Parkway Railway lin			penthouse to 4 storeys plus penthouse. The development includes the construction of a foul water pumping station, all associated site works and infrastructure including landscaped open space, internal roads, paths, public lighting, utilities, drainage and surface water attenuation. The development is wholly on lands within the boundaries of Hansfield Strategic Development Zone as defined by Statutory Instrument No. 273 of 2001.	immediately adjacent to the Royal Canal. Operational impacts are limited to increase footfall along the Canal. This increased footfall will not result in any significant surface water impacts with the existing grassy verge bordering the Royal Canal acting as a buffer between the towpath and canal. Additionally, the increased footfall will not significantly increase the already high levels of disturbance locally. **It is therefore**

					considered that there will be no cumulative impacts from this project in combination with the Proposed Development.
FW18A/0110	Zone 7 'Railway', Hansfield Strategic Development Zone, Barberstown, Hansfield, Dublin 15	Grant Permission	07/05/2019	618 no. apartments, comprised of 56 no. 1 bed apartments, 513 no. 2 bed apartments and 49 no. 3 bed apartments, crèche and 3 no. retail/commercial units, all accommodated in 10 no. blocks. Block A is comprised of 3 no. 4-5 storey buildings containing 106 no. units. Block B is comprised of 2 no. 4-5 storey buildings containing 76 no. units. Block C is comprised of 4 no. 6-7 storey buildings containing 135 no. units, along with crèche (334.84m²) and 3 no. retail / commercial units (596.06m²) at ground floor. Block D is a 5-6 storey building containing 24 no. units. Block E is a 4-5 storey building containing 41 no. units. Block F is a 4-5 storey building containing 35 no. units. Blocks G, H & I are 3-4 storey buildings containing 23, 23 & 30 no. units respectively. Block J is comprised of 3 no. 5-6 storey	An EIAR was completed which outlined mitigation measures to mitigate potential impacts to the local environment, which include the Royal Canal and the riparian habitats adjacent to it. **As such, cumulative impacts due to the construction phase of this development are not anticipated with the Proposed Development**. Additionally, the

				buildings, over a podium car park, containing 125 no. units. Access to the development will be via roads permitted under Reg. Ref.s FW16A/0123 & FW17A/0078 to the north/north-east and from Station Road to the west. The proposed development also includes for all associated site development works, car parking (at surface (197 no. spaces) and basement (538 no. spaces) levels), hard and soft landscaping, open spaces, public lighting, foul and surface water drainage / attenuation and water supply. The proposed development is located on lands within the boundaries of Hansfield Strategic Development Zone as defined by Statutory Instrument No. 273 of 2001. An Environmental Impact Assessment Report, which also constitutes an Environmental Impact Statement for the purposes of the Planning and Development Act 2000, as amended, and the Planning and Development Regulations 2001-2018, has been prepared in respect of the proposed development and accompanies this application.	proposed development is likely to increase footfall locally, including along the existing Royal Canal Greenway alongside the Proposed Development. However, this is not anticipated to adversely impact the water quality within the Royal Canal as the existing vegetative buffer strip between the existing towpath and the canal, as well as between the Proposed Development and the canal will be retained. Additionally, associated increases in audible and visual

					disturbance locally will not significantly increase the already high levels of disturbance along the canal to adversely impact local faunal groups. **It is therefore considered that there will be no cumulative impacts from this project in combination with the Proposed Development.**
FW17A/0234	Zone 6 Hansfiled, SDZ Lands, Dublin 15	Grant Permission	03/08/2018	155no. residential units comprising a mix of detached, semi-detached and terraced Houses, Duplex and Apartments, incorporating roof level solar panels. Houses to comprise: 22 no. 3-storey 4-bedroom houses (House Types: A1, A2, A2.1, A5, A5.1), 18 no. 2-storey 4-bedroom houses (House Types: A3, A3.1), 10 no. 2-storey 2-bedroom houses (House Type: C1), 66 no. 2-storey 3-bedroom houses (House Types:	No EIA Screening, EcIA or EIAR accompanied this application. Furthermore, the proposed works will not lead to a loss of riparian habitats along the Royal Canal,

				B1, B1.1, B2, B3, B4, L1, W1, W2, W2.1,) and, 19 no. 3-storey 3-bedroom houses (House Types: A4, A4.1, B5, B5.1, B5.2, B5.3). 1no. 4-storey apartment building comprising 10no. apartment units (3no. 1-bed, 6no. 2-bed and 1no. 3-bed), including balconies and terraces; 2no. 3-storey duplex blocks including balconies and terraces, comprising 4no. 2-bed and 1no. 3-bed units, with 5no. 3-bed units on the upper floors. The provision of 292no. parking spaces in a variety of on and off curtilage conditions; a single storey childcare facility (c.198 sq.m) and associated facilities. A new vehicular access onto the Hansfield Road which accommodates an east west road that links to the permitted road network to the west within the Hansfield SDZ; provision of a new pedestrian/cycle connections from the Hansfield Road at both the southeast and northeast corner of the site; All ancillary and associated site development and landscape works, including; public lighting, off road cycle/pedestrian paths, public open space and boundary treatments, the demolition of an existing structure on site (c.129	which will act as a buffer between the development and the canal. Additionally, the proposed development is likely to increase footfall locally, including along the existing Royal Canal Greenway alongside the Proposed Development. However, this is not anticipated to adversely impact the water quality within the Royal Canal as the existing vegetative buffer strip between the existing towpath and the canal, as well as between the Proposed Development and the canal will be retained.

				sq.m). Class 1 public open space (c.9,310 sq.m) is also being provided on separate lands at, Beechwood Park, Clonsilla Road, Dublin 15. The residential development will take place within the boundaries of the Hansfield Strategic Development Zone as defined by Statutory No. 273 of 2001.	Additionally, associated increases in audible and visual disturbance locally will not significantly increase the already high levels of disturbance along the canal to adversely impact local faunal groups. **It is therefore considered that there will be no cumulative impacts from this project in combination with the Proposed Development.**
FW16A/0030	Ongar Road to the North, Station Road, Hansfield, Dublin 15	Grant Permission	18/10/2016	The proposed development consists of the construction of 73 no. two and three storey family houses comprising 14 no. two storey two bed-room houses, 35 no. two storey three bed-room houses, 17 no. two	No EIA Screening, EcIA or EIAR accompanied this application. **No** impacts are expected from the development

				storey and 7 no. three storey four bed-room houses. The development includes access roads from Station Road, and all associated site works and infrastructure including landscaped open space, internal roads, paths, public lighting, utilities, drainage and surface water attenuation. The development is on lands within the boundaries of Hansfield Strategic Development Zone as defined by Statutory Instrument No. 273 of 2001.	on the Royal Canal, either the riparian habitats adjacent or the canal's water quality. **It is therefore considered that there will be no cumulative impacts from this project in combination with the Proposed Development.**
FW16A/0158	Lands at Glenwood House (Protected Structure), Barnhill Cross Roads, Coldblow, Lucan, Co. Dublin	Grant Permission	16/12/2016	The proposed development will consist of the demolition of 3 no. agricultural / storage sheds and later extensions / additions to Glenwood House (Protected Structure) (total demolition c. 902 sq.m.); the change of use and refurbishment of Glenwood House and associated outbuildings to accommodate the nursing home use; and the construction of a two-storey rear extension to Glenwood House consisting of 62 no. bedrooms with associated ancillary / common facilities and office / administration areas. The proposed development also provides 20 no. car parking spaces; 20 no. bicycle spaces; the	No EIA Screening, EcIA or EIAR accompanied this application. The nature of the development and the distance between the canal and the development, no impacts to the Royal Canal, either the water quality or the riparian habitat adjacent, are

				provision of 1 no. new vehicular access from the existing roundabout on the local road and associated upgrades to serve the development; reconfiguration of part of the front boundary wall; connection to existing services; landscaping; boundary treatments; and all associated site and engineering works necessary to facilitate the development.	anticipated. **It is therefore considered that there will be no cumulative impacts from this project in combination with the Proposed Development.**
FW23A/0013	Zone 6 within the Hansfield SDZ Planning Scheme 2006, Formerly part of St. Joseph's Hospital, Clonsilla, Dublin 15	Grant Permission	20/02/2024	The development will consist of 419no. residential apartment units, consisting of 167no. 1-bed units, 199no. 2-bed units and 53no. 3-bed units and residential amenity space (c. 359.6 sq. m) in 4no. Blocks ranging in height from 4 to 6 storeys including: - Block 1 comprises a 5 - 6 storey building accommodating 120no. apartments (55no. 1-bed, 46no. 2-bed and 19no. 3-bed) and residential amenity area (c. 100.9 sq. m) with part of the ground level accommodating an undercroft car parking area; - Block 2 comprises a 5 - 6	An EIAR was conducted which outlined measures to protect the local environment during the construction phase, including the Royal Canal. The proposed works will also not lead to a loss of riparian habitats along the Royal Canal, which will act as a buffer between the development and the canal. Additionally, the proposed development is likely to increase footfall

				storey building (with ground floor undercroft car parking) accommodating 108no. apartment (50no. 1-bed, 41no. 2-bed and 17no. 3-bed) and residential amenity area (c. 100.9 sq. m) with part of the ground level accommodating an undercroft car parking area; - Block 3 comprises a 4 - 5 storey building accommodating 51no. apartments (23no. 1-bed, 20no. 2-bed and 8no. 3-bed); - Block 4 comprises a 4 - 6 storey building accommodating 140no. apartment (39no. 1-bed, 92no. 2-bed and 9no. 3-bed) and residential amenity area (c. 157.8 sq. m); Private patios/terraces and balconies are provided for all apartment units. Upper-level balconies are proposed on elevations of all multi-aspect apartment buildings; A 2-storey childcare facility (c.	locally, including along the existing Royal Canal Greenway alongside the Proposed Development. However, this is not anticipated to adversely impact the water quality within the Royal Canal as the existing vegetative buffer strip between the existing towpath and the canal, as well as between the Proposed Development and the canal will be retained. Additionally, associated increases in audible and visual disturbance locally will not significantly increase the already high levels of disturbance along the canal to adversely impact local faunal groups.

				440 sq. m) (including associated children's play area and car and bicycle parking). And, all associated and ancillary site development and infrastructural works, including, hard and soft landscaping and boundary treatment works, including - Class 2 public open space (c. 2,535 sq. m) including small plaza to the north of Block 4 adjacent Hansfield Road; 5no. new vehicular access points from existing roads permitted under FCC Reg. Ref. FW17A/0234 including 4no. entrances from St. Joseph's Avenue and 1no. entrance from St. Joseph's Grove; 2no. pedestrian access points to the east of the site off Hansfield Road; 213no. car parking spaces (undercroft and on-street); 1,445no. bicycle parking spaces in total (1,209no. long-term spaces, 212no. short-term spaces and 24no. childcare facility parking spaces); 21no. motorcycle parking space; Communal bin storage and plant provided at ground floor/undercroft	**It is therefore considered that there will be no cumulative impacts from this project in combination with the Proposed Development.**

				and roof level and additional plant provided at roof level; 3no. ESB Sub-stations; Class 1 public open space (c. 8,500 sq. m) provided on separate lands at, Beechpark, Clonsilla Road, Dublin 15.	
FW21A/0244	The Lodge, Clonsilla Road, Clonsilla, Dublin 15	Grant Permission	26/05/2022	The proposed development will consist of; - Demolition of the existing house and outbuilding on site (c. 254.6sqm) - Construction of an apartment block comprising 59 no. units (23 no . 1 beds, 34 no. 2 beds, and 2 no. 3 beds), all with balconies/terraces facing nor/south/east/west. - Provision of car parking (undercroft and surface) and cycle parking, open spaces, and all associated site development works, landscaping, boundary treatments, bin stores, and services provision including ESB substation(s). - Vehicular/cyclist/pedestrian access from Clonsilla Road.	No EIA Screening, EcIA or EIAR accompanied this application. The proposed works will not lead to a loss of riparian habitats along the Royal Canal, which will act as a buffer between the development and the canal. The proposed development is likely to increase footfall locally, including along the existing Royal Canal Greenway alongside the Proposed Development. However, this is not anticipated to

					adversely impact the water quality within the Royal Canal or the existing vegetative buffer strip between the existing towpath and the canal, the vegetation strip between the Proposed Development and the canal will be retained. Additionally, increases in audible and visual disturbance locally will not significantly increase audio or visual impact from existing levels along the canal adversely impacting local faunal groups. **It is therefore considered that there will be no**

					cumulative impacts from this project in combination with the Proposed Development.
FW25A/0416E	Site at Porterstown Road, Porterstown, Dublin 15, D15 Y95T	Grant Permission	12/02/2026	Intend to apply for permission development at this c. 0.93 Ha site at Porterstown Road, Porterstown, Dublin 15, D15 Y95T. Works are also proposed to connect new wastewater and stormwater pipes to the existing sewer along Porterstown Road and the provision of a new pedestrian and cycle ramp between the north-east corner of the site and Diswellstown Road. The total site area including the development site and infrastructural works measures c. 0.97 Ha. The development will principally consist of: the demolition of a vacant dwelling and outbuildings (c. 207 sq m); and the construction of a creche (c. 275 sq m) and 87 residential units comprising 8 No. 3 No. storey houses (3-bed	An Ecological Impact Assessment (EcIA) was undertaken which outlined measures to protect the local environment, including the Royal Canal and its associated riparian habitat during the project's construction phase from surface water, dust, and visual and audible based disturbance. The EcIA also outlines measures to protect/enhance the local

				units) and 79 No. apartments (29 No. 1-bed units and 50 No. 2-bed units) in 2 No. blocks, whereby Block A is part 4 No. to part 5 No. storeys and Block B is 5 No. storeys. The development also proposes: a new vehicular access and pedestrian/cycle access off Porterstown Road; the provision of 49 No. car parking spaces; bicycle parking spaces; motorcycle parking spaces; bin stores & ancillary storage space; a single-storey facilities building; balconies and terraces; hard and soft landscaping; boundary treatments; ESB sub-station and switch room; green / blue roof; and all associated site works above and below ground. The total Gross Floor Area of the proposed development equates to c. 8,707 sq m.	environment using SUDS features, appropriate lighting design, and habitat creation within the landscape plan. The proposed development is likely to increase footfall locally, including along the existing Royal Canal Greenway alongside the Proposed Development. However, this is not anticipated to adversely impact the water quality within the Royal Canal as the existing vegetative buffer strip between the existing towpath and the canal, as well as between the Proposed Development and the canal will be

					retained. Additionally, associated increases in audible and visual disturbance locally will not significantly increase the already high levels of disturbance along the canal to adversely impact local faunal groups. **Therefore, there are no likely cumulative impacts from this project in combination with the Proposed Development.**
LRD0056/S3E	Winterwood, Carpenterstown Road, Dublin 15, D15YH4C	Grant Permission	27/05/2025	The development will consist of 175 no. residential units ranging in height from 2 to 6 storeys, a childcare facility, all boundary treatment and landscaping works, site services connections and all site development works to include: a) The demolition of the existing two storey house 'Winterwood' measuring	No EIA Screening, EcIA or EIAR accompanied this application.Given the distance of the site from the Royal Canal, impacts during the construction and operational phase are not

				approx. 1,102 sqm, and associated outbuildings to include a security hut approx. 8.7 sqm, Bin Store 22 sqm and external storage shed 7.5qm. b) The construction of 30 no. houses (A & B) over two to three storeys as follows: · 16 no. 4 bed semi-detached houses over three storeys; · 6 no. 2 bed mid terraced units over two storeys; · 4 no. 3 bed end terraced units over two storeys; · 4 no. 3 bed semi-detached units over two storeys. c) The construction of 145 no. apartment units in the form of 3 no. new apartment buildings as follows: · Block C (6 storeys) comprising 61 no. apartments (33 no. 1 bed and 28 no. 2 bed); · Block D (6 storeys) comprising 42 no. apartments (19 no. 1 bed and 23 no. 2 bed); · Block E (6 storeys) comprising 42 no. apartments	anticipated. **It is therefore considered that there will be no cumulative impacts from this project in combination with the Proposed Development.**

				(19 no. 1 bed and 23 no. 2 bed). d) 1 no. creche facility approx. 158 sq.m with associated outdoor play space of approx. 65 sq.m at ground floor level of Block C. e) Total Public Open Space (approx. 2,347 sqm) and Communal Open Space (approx. 967 sqm). Each residential unit is afforded with associated private open space in the form of a garden/terrace/balcony. f) The development will be served via a new vehicular entrance on Carpenterstown Road. g) A total of 111 no. surface car parking spaces is proposed for the development to include 57 no. for the apartment units, 54 no. for the houses of which 46 are within the curtilage of the houses, 12 no. EV charging spaces, 3 no. accessible spaces and 3 no. car share spaces (driveyou). In addition 6 no. motorcycle parking spaces are proposed.	

				h) A total of 387 bicycle parking spaces are proposed in the form of 291 long term secure spaces and 96 no. secure short term visitor spaces. i) 1 no. ESB substation at surface level. j) All associated site and infrastructural works to include provision for water services; foul and surface water drainage and connections; internal roads, attenuation proposal; permeable paving; all landscaping and boundary treatment works; green and blue roofs; plant areas; photovoltaic panels; footpaths; public lighting; and electrical services.	
FW25A/0233E	The townlands of Porterstown and Kellystown, Dublin 15	Refuse Permission	24/07/2025	The proposed development comprises 99 no. dwellings, in a mix of houses and duplex units/own-door apartments, ranging from 2-3 storeys in height, including 87 no. houses (66 no. 3-bed and 21 no. 4-bed), and 12 no. duplex/apartment units with balconies (4 no. 1-bed and 8 no. 2-bed); and all associated and ancillary site development, landscaping and boundary treatment	An EIAR was conducted which outlined measures to protect the local environment during the construction phase, including the Royal Canal. The proposed works will also not lead to a loss of riparian

				works, including: 132 no. surface car parking spaces; 158 no. bicycle parking spaces for mid-terrace and duplex units; Bin stores; Private, communal and public open space; Public lighting; Minor amendments to the permitted surface water attenuation pond. Vehicular access is provided off the existing Kellystown Link Road via the internal roads of Luttrellstown Gate (Phase 1).	habitats along the Royal Canal to the north of the development, which will act as a buffer between the development site and the canal. Additionally, the proposed development is likely to increase footfall locally, including along the existing Royal Canal Greenway alongside the Proposed Development. However, this is not anticipated to adversely impact the water quality within the Royal Canal as the existing vegetative buffer strip between the existing towpath and the canal, as well as between the Proposed Development and the canal will be retained.

					Additionally, associated increases in audible and visual disturbance locally will not significantly increase the already high levels of disturbance along the canal to adversely impact local faunal groups. While this planning application has been rejected, there is a possibility for re-submission in the future. In that event, based on the conclusions of the associated reports and the rationale outlined above, **this project would not act cumulatively with the Proposed Development to impact the Royal Canal pNHA.**
SHDW/004/20/ SHDW/004/21/C28/20	In the townlands of Kellystown, Porterstown and	Refuse Permission/In compliance	15/03/2021	the development will consist of a residential-led development comprising 360no. dwellings,	No EIA Screening, EcIA or EIAR accompanied this

	Diswellstown, Clonsilla, Dublin 15, Co. Dublin			1no. childcare facility and 1no. retail unit, in buildings ranging from 1 to 8-storeys. The breakdown of residential accommodation is as follows: 128no. own door detached, semi-detached and terraced houses (including: 104no. 3-bed 2-storey houses, of which 28no. have optional single storey extension to rear, and 24no. 4-bed 2 to 3-storey houses) and 232no. apartment units accommodated in 3no. blocks, including: - Block A: 1 to 8 storeys, accommodating 164no. apartments (62no. 1-beds and 102no. 2-beds) and a residential amenity area (c. 380 sq. m gfa); - Block B: 4 to 5 storeys, accommodating 41no. apartments (12no. 1-beds, 24no. 2-beds and 5no. 3-beds); - Block C: 4 to 6 storeys, accommodating 27no. apartments (11no. 1-beds and 16no. 2-beds), the childcare facility (c.278 sq. m gfa) and the retail unit (c. 98 sq. m gfa).	application. However, the proposed works will not lead to a loss of riparian habitats along the Royal Canal, which will act as a buffer between the development and the canal. Additionally, the proposed development is likely to increase footfall locally, including along the existing Royal Canal Greenway alongside the Proposed Development. It is not anticipated to adversely impact the water quality within the Royal Canal as the existing vegetative buffer strip between the existing towpath and the canal, as well as between the Proposed Development and the canal will be

				Private rear gardens are provided for all houses. Private patios/terraces or balconies are provided for all apartment units and feature on all apartment block elevations. All associated and ancillary site development, drainage and infrastructural works (including plant), hard and soft landscaping and boundary treatment works, including: - Road infrastructure works, including: The provision of new pedestrian and cycle facilities along the northern edge of an existing road, which extends c. 280m west from Diswellstown Road to a point west of the existing main vehicular entrance to Scoil Choilm Community National School (hereafter referred to as 'Kellystown Link Road') - A c. 160m new western extension of the 'Kellystown Link Road'. - The reconfiguration of a section of the 'Kellystown Link	retained. Additionally, associated increases in audible and visual disturbance locally will not significantly increase the already high levels of disturbance along the canal to adversely impact local faunal groups. **It is therefore considered that there will be no cumulative impacts from this project in combination with the Proposed Development.**

				Road' at its junction with the Diswellstown Road; - The realignment of a southern section of Porterstown Road at its junction with the 'Kellystown Link Road'; - Repositioning of existing vehicular site entrance to 'Abbey Cottage' on its eastern boundary to Porterstown Road; - New vehicular access to the site at 1no. new site entrance on the Porterstown Road to Block A and 1no. site entrance to the scheme via the 'Kellystown Link Road'; and - New internal residential road network including pedestrian and cycle links, a north-south pedestrian and cycle green route on the eastern side of Porterstown Road and new pedestrian and cycle access to the proposed public park to the south west. New dedicated public park (c. 2.1 Ha), smaller pocket parks and green links; Waste water infrastructure,	

				including; pumping station and pipe network to connect to a public watermain under the proposed 'Kellystown Link Road' and an associated pump station service road, and upgrade works to existing drainage infrastructure in the Riverwood Distributor Road; 435no. car parking spaces, including: 256no. spaces in-curtilage and on street for the houses; 58no. spaces at under croft level of Block A and 116no. spaces at surface level for the apartments; and 5no. spaces on-street for the proposed commercial units and to facilitate shared car club vehicles in the future; 12no. motorcycle car parking spaces, including: 4no. at surface level and 8no. at under croft level of Block A; 562no. bicycle parking spaces, including 401no. covered spaces and 161no. uncovered spaces; Bin stores; 3no. ESB sub-station units; Demolition of the existing	

				vacant house and agricultural buildings.	
FW25A/0033E	The townlands of Kellystown, and Porterstown, Dublin 15	Grant Permission	29/07/2025	The proposed development comprises new sportsground and clubhouse for a relocated St Mochta's Football Club, in accordance with Key Objective DA 1.1 of the Kellystown Local Area Plan, to lands south of the existing and permitted Kellystown Link Road, to include: · 6no. playing pitches, including 1no. 11-a-side (63m x 92m) grass turf, floodlit playing pitch (6no. 15m high floodlight columns); 1no. 11-a-side (63m x 92m) synthetic turf, floodlit playing pitch (6no. 15m high floodlight columns); 1no. 9-a-side (45m x 73m) synthetic turf, floodlit playing pitch (4no. 12m high floodlight columns)); 1o. 7-a-side (36m x 54m) grass turf, floodlit playing pitch (4no. 12m high floodlight columns); an and 2. 5-a-side (25m x 40m) synthetic turf pitches; · 1-2 storey clubhouse building (c. 533 sq m) with a	No EIA Screening, EcIA or EIAR accompanied this application. However, given the distance of the site from the Royal Canal, impacts during the construction and subsequent operational phase of this development are not anticipated. **It is therefore considered that there will be no cumulative impacts from this project in combination with the Proposed Development.**

				maximum parapet height of c. 8.1m, accommodating 4no. changing rooms, gymnasium, general purpose area, kitchen, toilets, meeting rooms, officials room, first aid room, office, storage and associated facilities, and including a first-floor terrace overlooking the main playing pitches; · All associated ancillary site development works, landscape, boundary treatments and signage, including: · Regrading of the pitch areas; · Associated 3m run-off areas, 1m high perimeter pitch fencing, dug-outs for the two 11-a-side pitches and 5m high ball-stop netting behind the goals of the 11-a-side pitches and along the southern boundary adjoining the cemetery site; · Boundary treatments, including native hedge, street trees and mixed woodland planting in areas of the site; a 1800mm high railing is	

				proposed at the northern site boundary along the permitted Kellystown Link Road (ABP-312318-21, as amended by LRD0034/S3 refers), at the western boundary adjoining the permitted Public Park (ABP-312318-21 refers) and at the eastern boundary along the existing Cemetery access road; and a 2m high wall with name plate at the proposed site entrance at the existing Cemetery Road; · 97no. car parking spaces (total), including 5no. universally accessible spaces; · 114no. bicycle spaces (total), including 6no. cargo bike spaces; · 5no. motorcycle spaces; · 1no. coach set-down space; · 1no. maintenance shed (c. 28sqm); · Vehicular access is proposed via the existing Cemetery Road, with 2no. access points providing a one way In-and-Out circulation	

				system; · A new 4.5m wide footpath and cycle path on the eastern side of existing Cemetery Road, to extend from its junction with Kellystown Link Road and provide the main pedestrian & cycle access point into St Mochta's Football Club. A new 3m wide cycle path to extend from this point to the southern boundary, on the eastern side of Cemetery Road. The existing 2m wide footpath on the western side of Cemetery Road will be maintained for the full length of Cemetery Road.	
FW22A/0288	Luttrellstown Road/Porterstown Link Road, Clonsilla, Dublin 15	Grant permission	02/08/2023	The development will consist of a Post Primary School with an overall floor area of 5376sq.m and 2 storeys in height. The proposed school will incorporate 18 general classrooms as well as 14 specialist classrooms in addition to all ancillary pupil and teacher facilities including external recreational areas that includes 4 no. ballcourts, external social spaces including a tiered seating area, covered bicycle parking facilities and car parking.	No EIA Screening, EcIA or EIAR accompanied this application. However, given the distance of the site from the Royal Canal, impacts during the construction and subsequent

				vehicular access to the development is provided via the existing access to Luttrellstown Community College off Porterstown Link Road. A new pedestrian/cyclist only access is also proposed off Porterstown Link Road. A non-vehicular access to the school, for use by emergency services only, is also provided along the southern site boundary off Luttrellstown Road. A temporary construction access is also proposed off Luttrellstown Road. The proposed development also provides for solar panels on roof, on-site external lighting, landscaping and boundary treatment in addition to all associated site development works including alterations to ground levels and the construction of retaining walls. The proposed development will also provide for upgrade works to the existing footpath network and to the pedestrian crossing on Porterstown Link Road and the provision of a new pedestrian crossing and upgrade works at the existing entrance to the school campus site also off Porterstown Link Road.	operational phase of this development are not anticipated. **It is therefore considered that there will be no cumulative impacts from this project in combination with the Proposed Development.**
4524/19	Leech Papers, 1A - 1C, Shamrock	Grant Permission	25/08/2020	Planning permission for the demolition of the existing "Leech	No EIA Screening, EcIA or EIAR

	Place, Dublin 1 D01 NV67			Papers" factory, site clearance and construction of a new six storey over partial basement apartment scheme. The scheme consists of: 33 one bedroom apartments; 8 two bedroom apartments; private balconies and 567 sqm of communal facilities (bulk storage area, meeting rooms, coffee lounge, laundry room & management suites) located on ground floor with storage for 41 bicycles. The development also includes an internal landscaped courtyard with communal bin storage, ESB substation, new boundary walls service connections and associated site development works at "Leech Papers" 1A-1C Shamrock Place, Dublin 1, D01 NV67.	accompanied this application. Furthermore, the proposed works will not lead to a loss of riparian habitats along the Royal Canal, which will act as a buffer between the development and the canal. Additionally, the proposed development is likely to increase footfall locally, including along the existing Royal Canal Greenway alongside the Proposed Development. However, this is not anticipated to adversely impact the water quality within the Royal Canal as the existing vegetative buffer strip between the existing towpath and the canal, as well as between the Proposed

					Development and the canal will be retained. Additionally, associated increases in audible and visual disturbance locally will not significantly increase the already high levels of disturbance along the canal to adversely impact local faunal groups. **It is therefore considered that there will be no cumulative impacts from this project in combination with the Proposed Development.**
WEB2389/26	80, Saint Ignatius Road, Dublin 7	Additional Information Required	27/07/2026	The proposed development consists of: demolition of all existing 1-2 storey light industrial buildings on the site (c. 2529 sq.m) and associated boundary fencing and gate along St. Ignatius Road and the construction of 39 no. 1 bed apartment units in 4 no. new blocks	No EIA Screening, EcIA or EIAR accompanied this application. However, the proposed works will not lead to a loss of riparian habitats

				ranging in height from 1-3 storeys (Block A 2 storeys, Block B, 1-3 Storeys, Block C 1-3 storeys, Block D 2 storeys). All units are intended to provide general needs age friendly homes for independent living residents. Block A provides 1 no. 1 bed apartment unit and a residents communal room with associated W/C (c. 36 sq.m), Block B provides 21 no. 1 bed apartment units, Block C provides 11 no. 1 bed apartment units and Block D provides 6 no. 1 bed apartment units. Pedestrian access to the development will be from the existing site access point along St. Ignatius Road. A new pedestrian access gate and associated boundary fencing will be provided at this location. The development also provides for c. 562 sq.m of communal open space, balconies/ terraces associated with individual apartment units, provision of an ESB substation within Block A, provision of a water tank room, meter room, cleaners storerooms, M&E room and secure bicycle storage area within Block B, provision of a meter room, cleaners storeroom and secure bicycle storage area within	along the Royal Canal, which will act as a buffer between the development and the canal. Additionally, the proposed development is likely to increase footfall locally, including along the existing Royal Canal Greenway alongside the Proposed Development. However, this is not anticipated to adversely impact the water quality within the Royal Canal as the existing vegetative buffer strip between the existing towpath and the canal, as well as between the Proposed Development and the canal will be retained. Additionally,

				Block C, access deck and external stairs associated with Block D, secure independent bin store area, hard and soft landscaping and proposed boundary treatment works, and provision of all other associated required site works and services above and below ground on an overall site area of c. 0.275ha.	associated increases in audible and visual disturbance locally will not significantly increase the already high levels of disturbance along the canal to adversely impact local faunal groups. **It is therefore considered that there will be no cumulative impacts from this project in combination with the Proposed Development.**
3288/21	P.V. Doyle House, Whitworth Road, Drumcondra, Dublin 9	Grant Permission	28/09/2021	PROTECTED STRUCTURE: Planning permission to construct a single storey building for gym use with glazed link corridor to the eastern side of the existing training building and all associated site works on the northern side of the existing site of P.V. Doyle House, Whitworth Road, Drumcondra, Dublin 9.	No EIA Screening, EcIA or EIAR accompanied this application. Furthermore, the proposed works will not lead to a loss of riparian habitats along the Royal Canal, which will act as a buffer between the

					development and the canal. Additionally, the proposed development is likely to increase footfall locally, including along the existing Royal Canal Greenway alongside the Proposed Development. However, this is not anticipated to adversely impact the water quality within the Royal Canal as the existing vegetative buffer strip between the existing towpath and the canal, as well as between the Proposed Development and the canal will be retained. Additionally, associated increases in audible and visual disturbance locally

					will not significantly increase the already high levels of disturbance along the canal to adversely impact local faunal groups. **It is therefore considered that there will be no cumulative impacts from this project in combination with the Proposed Development.**
4791/19	113, Phibsborough Road/ Royal Canal Bank, Dublin 7	Grant Permission	19/06/2019	The development will consist of construction of a mixed-use development of 9. No apartments comprising of 3 no. 2 bedroom and 6 no. 1 bedroom apartments, a ground level Café unit, part basement level to accommodate bike storage for 30 no. bicycles, refuse storage, surface water attenuation tank & all other plant and storage areas associated with apartments & Café unit. The develop comprises of 5 storeys from street level to Phibsborough Road and part 6 storeys to Royal Canal Bank, with pedestrian access to	No EIA Screening, EcIA or EIAR accompanied this application. Furthermore, the proposed works will not lead to a loss of riparian habitats along the Royal Canal, which will act as a buffer between the development and the canal.

				apartments off Phibsborough Road off Royal Canal Bank and 1 no. further access point for refuse collection only off rear McGuinness's Cottages Laneway. North-west facing balconies to be constructed on all levels above ground level on Phibsborough Road/ Royal Canal Bank corner & north-east facing balconies on all levels above ground level on Royal Canal Bank. All associated site development works above and below ground level including all boundary treatments, privacy screen balconies, third floor south facing balcony terrace, forth floor terrace garden & roof terrace garden, all hard & soft landscaping and connections to public sewer and watermain.	Additionally, given the scale of the proposed works, significant increases in operational disturbance along the Royal Canal are not anticipated. **It is therefore considered that there will be no cumulative impacts from this project in combination with the Proposed Development.**
4865/22	Lands at Broombridge Industrial Estate and Dublin Industrial Estate bounded by Broombridge Road, Royal Canal and Royal Canal Way, Dublin 11	Refuse Permission	10/11/2022	The development will consist of : (i) the demolition of all existing warehouse/factory/office buildings and all associated ancillary outbuildings and structures located on-site and the removal of the existing vehicular entrance via Broombridge Road; (ii) the construction of a mixed-use development comprising 14 no. retail /commercial units	This planning application was refused on the grounds it was considered to be premature pending the finalisation of the Luas Green line extension, concerns

				(2,899.66sq.m), a hotel (9,084.24sq.m), a creche (343.5sq.m.), office/remote working/co-working space (44,334.85sq.m.) and 304 no. residential apartments (71 no. one-bedroom, 130 no. two bedroom & 103 no. three bedroom) within 4 no. principle blocks (Blocks A-D) ranging in height from 2-16 storeys over basement level parking/plant area. Block A comprises a 12 storey over basement level (basement 1) building which includes 4 no. retail/commercial units at ground floor level and office space from first to eleventh floor level; Block B comprises a 2-10 storey over basement level (basement 1) building which includes 7 no. retail/commercial units at ground floor level with office space also included from ground to ninth floor level; Block C comprises a 8-11 storey over basement level (basement 2) building which includes 18 no. residential apartments 3 no. retail units and a creche at ground floor level with an additional 286 no. apartment s unit from first to tenth floor levels. Each apartment will benefit from access to private amenity space in the form of	surrounding the overdevelopment of the site, and the proposed development was considered to be premature pending the preparation of a feasibility study and local statutory plan for the Dublin Industrial Estate. There have been no further resubmissions for this project since the final decision on 10/11/2022. **It is therefore considered on the basis of its refusal that there will be no cumulative impacts from this project in combination with the Proposed Development.**

				a balcony on all elevations and communal amenity space at surface level. Block D comprises a 16 storey over basement level (basement 2) building which includes a hotel (100 no. rooms - inclusive of a double/triple/family rooms) from ground to sixth floor level and thirteenth to fifteenth floor level with restaurant, bar, reception area and ancillary services room at ground floor level and gym, meeting, conference room and staff rooms at first floor level and recreational areas (spa/pool/gamesroom/multi-purpose hall) at thirteenth to fifteenth floor level. Block D will also include office space from seventh to twelfth floor level. The entire basement level (basement 1 & 2), will comprise a total of 296 no. carparking spaces (inclusive of 16 no. accessible spaces), 44 no. motorcycle parking spaces, 848 no. bicycle parking spaces and 30 no. cargo bicycle parking spaces to serve the overall development together with plant, storage, refuse storage and ancillary rooms. Basement 1 is accessed via Broombridge Road and basement 2 is accessed via Boyne/Moyle Road, (iii) provision of a new undercroft	

				vehicular/pedestrian/cycle access from Broombridge Road, new pedestrian and cycle connections onto Broombridge Road through the western site boundary, new pedestrian connection onto the Royal Canal through the southern site boundary, a covered street providing an east-west connection through the site and continued use of the existing vehicular/pedestrian/cycle access from Boyne Road to the east; (iv) bicycle parking (192 no. visitor spaces) will be provided at surface level and a taxi area (for drop-off/pick-up) will be provided to the front of Block D; (v) all associated site and infrastructural works, including foul and surface water drainage; hard and soft landscaping, refuse stores and plant rooms, internal footpaths and roads, lighting, signage ESB substations; public and communal opens space, necessary to facilitate the development. The application is accompanies by two site layout plans, the first of which incorporates the emerging preferred route for the future Luas green line extension along the western boundary of the site, the	

				second shows the proposed development without the future Luas route included.	
FW24A/0261	Brady's Service Station, Ashtown, Castleknock, Dublin 15, D15 R26R	Grant Permission	0503/2025	The development will consist of the construction of a single storey(145sq.m.) extension to the north-east of the existing service station, 2no. detached single storey (317 sq.m.) restaurants with drive-thru facility, and a single storey (39 sq.m.)storage building associated with the restaurant units. The development will also comprise of the demolition of the existing storage building and car wash with the provision of new car wash facility; illuminated signage to the proposed extension to the service station and the proposed restaurant units; proposed signage above the existing service station canopy; additional hard standing and car parking ; bicycle parking; electric vehicle charging points; associated site servicing (foul and surface water drainage and water supply); ancillary plant; and all other site excavation and development works above and below ground.	No EIA Screening, EcIA or EIAR accompanied this application. However, despite the project's proximity to the Royal Canal, the scale and nature it is considered that there will be no adverse impact on the riparian habitats present along the Royal Canal or cause significant disturbance during the construction and operational phases, furthermore; localised environmental impacts are not anticipated.

					It is therefore considered that there will be no cumulative impacts from this project in combination with the Proposed Development.
FW17A/0226	Travelodge (Phoenix Park) Hotel, Navan Road, Castleknock, Dublin 15, D15 EW29	Grant Permission	02/02/2018	The construction of a four-storey hotel extension (1,684 sq m gross floor area, approximately) to the southeast of the existing hotel building; demolition and reinstatement of existing hotel floorspace (38sq m) in order to facilitate the physical connection of the proposed extension; installation of plant room and store room at ground floor lever; and hotel accommodation (55 no. new bedrooms) at ground, 1st, 2nd and 3rd floor levels, resulting in a combined overall total of 152 no. bedrooms (97 no. bedrooms existing). The proposed new extension will have an overall height of 13.8 metres, approximately, to top of	No EIA Screening, EcIA or EIAR accompanied this application. Furthermore, the proposed works will not lead to a loss of riparian habitats along the Royal Canal, which will act as a buffer between the development and the canal. Additionally, the proposed development is likely to increase footfall locally, including along the existing Royal Canal Greenway

				plant/staircore. The development will also include: a wall-mounted, internally-illuminated hotel signage panel at third floor level (4th storey) affixed to the south east, southwest and northwest elevations of the proposed hotel extension (3 no. in total); changes in level; drainage works; piped infrastructure and ducting, roof plant; bicycle parking (16 no. spaces); and all associated site excavation works above and below ground.	alongside the Proposed Development. However, this is not anticipated to adversely impact the water quality within the Royal Canal as the existing vegetative buffer strip between the existing towpath and the canal, as well as between the Proposed Development and the canal will be retained. Additionally, associated increases in audible and visual disturbance locally will not significantly increase the already high levels of disturbance along the canal to adversely impact local faunal groups. **It is therefore considered that there will be no**

					cumulative impacts from this project in combination with the Proposed Development.
2560877	Parson Street , Maynooth , Co. Kildare	Conditional	30/01/2026	for a Large-scale Residential Development (LRD) application of 195 no. apartments across 3 no. blocks ranging in height from 2 to 7 storeys, a childcare facility and café/commercial unit at this site of c.1.53 hectares to the rear of the former Maynooth Rectory which is a Protected Structure (RPS Ref.: B05-56) at Parson Street, Maynooth, Co. Kildare. The subject site is bound to the north and northeast by vacant lands to the rear of properties fronting onto Parson Street (with Maynooth Fire Station further beyond) and by the HSE Community Care Centre, to the east and south by the Royal Canal Greenway and to the west and northwest by the Maynooth Rectory Building and Parson Lodge residential housing estate. The development will consist of the construction of 195 no. apartments with a total Gross Floor Area of c. 17,809 sq.m, open space and ancillary infrastructure on this	An EcIA was submitted, which upon a further information request, was deemed satisfactory in regard to protecting the Royal Canal riparian corridor. Furthermore, while the proposed development will result in increased footfall along the Royal Canal. However, this is not anticipated to adversely impact the water quality within the Royal Canal as the existing vegetative buffer strip between the existing towpath and the canal, as well as between the

				site as follows: A) 195 no. apartments comprising 98 no. 1-bedroom, 91 no. 2-bedroom and 6 no. 3-bedroom units in 3 no. blocks including: i. Block A will provide for 46 no. apartment units and will include 25 no. 1-bedroom and 21 no. 2-bedroom apartments along with associated private amenity space in the form of balconies in a building ranging in height from 2 – 5 storeys with a maximum height of 16.7m; ii. Block B will provide for 70 no. apartment units and will include 36 no. 1-bedroom and 34 no. 2-bedroom apartment units along with associated private amenity space in the form of balconies in a 6-storey building with a maximum height of 20.5m; iii. Block C will provide for 79 no. apartment units and will include 37 no. 1-bedroom, 36 no. 2-bedroom and 6 no. 3-bedroom apartments along with associated private amenity space in the form of balconies in a 7-storey building with a maximum height of 25.6m; B) The construction of a childcare facility at ground floor level in Block C with a Gross Floor area of 176 sq.m, with an associated outdoor play area of 145 sq.m; C) The provision of 1 no. café/commercial unit at ground floor	Proposed Development and the canal will be retained. Additionally, associated increases in audible and visual disturbance locally will not significantly increase the already high levels of disturbance along the canal to adversely impact local faunal groups. **Therefore, it is concluded that this project will not act in-combination impacts with the Proposed Development.**

				level of Block C with a Gross Floor Area of 107 sq.m; D) The provision of 2,444 sq.m of Public Open space and 1,380 sq.m of Communal Open Space; E) The provision of 83 no. surface level car parking spaces including 4 no. EV spaces and 4 no. accessible car parking spaces; F) The provision of 419 no. bicycle parking spaces comprising 303 no. long stay/resident spaces located at ground floor levels of Block A, B and C, 106 no. Visitor spaces, 4 no. designated spaces for the	
SH306309/21872	Newtownmoyaghy , Kilcock , Co. Meath	Refused	16/04/2020	Construction of 575 No. residential units, all with private amenity space, with a cumulative Gross Floor Area of 60,326.9 square meters comprising: a. 43 No. 2-bedroom, 2-storey houses, b. 270 No. 3-bedroom, 2-storey houses, c. 45 No. 4-bedroom, 2-storey houses, d. 30 No. 4-bedroom, 3-storey houses, e. 3 No. apartment blocks ranging in height from 3-5 storeys providing for; i. 20 No. 1-bedroom apartment units,	The development was refused permission due to its direct conflict with zoning objectives outlined in the Meath County Development Plan, concerns around flooding over the proposed access roads, and the development being deemed contrary to the

				ii. 46 No. 2-bedroom apartment units, f. 121 No. duplex and corner block units 3-storeys in height providing for; i. 15 No. 1-bedroom duplex, ii. 21 No. 2-bedroom duplex units , iii. 6 No. 3-bedroom duplex units, iv. 29 No. 1-bedroom corner block units, v. 42 No. 2-bedroom corner block units, vi. 8 No. 3-bedroom corner block units. ii. Creche with a gross floor area of 623 square metres, an associated external play area and 14 No. car parking spaces; iii. The provision of 314 No. bicycle parking spaces, iv. New boundary walls and fences, open space, internal site roads, pavements, public lighting, tree planting, bin storage, ESB substations and all ancillary works; v. Provision of new GAA changing room facilities with a Gross Floor Area of 97 square meters, associated entrance road and 40 No. car parking spaces; vi. The erection of 2 No. 13m lattice masts in the southern section of the site together with the relocation underground of 2 No. 10kV and 2 No. 38kV overhead lines;	proper planning and sustainable development of the wider area. As of 2026, there have been no plans for this development to proceed. **Therefore, it is concluded that this project will not act in-combination impacts with the Proposed Development.**

				• vii. Infrastructure works including: Surface water from northern site will be discharged into 1 No. detention basin to the south of the proposed development site. Surface water from southern site will be discharged into 1 No. detention basin to the southeast of the development site. •SUDS measures. The application contains a statement setting out how the proposal will be consistent with the objectives of the Meath County Development Plan (2013-2019), and a statement indicating why permission should be granted for the proposed development, having regard to a consideration specified in Section 37(2)(b) of the Planning and Development Act, 2000, as amended, notwithstanding that the proposed development materially contravenes a relevant Development Plan or Local Area Plan other than in relation to the zoning of the land. An Environmental Impact Assessment Report and Natura Impact Statement have been prepared in respect of the proposed development	
211121	Kelly's Garage , The	Refused/Conditional on	24/09/2021	for the demolition of a car showroom	The proposed

	Harbour , Kilcock	appeal		and associated shed and the construction of 10 no. terraced houses (8 No. 3 Bed and 2 No. 4 Bed) and 65 No. apartments (21 No. 1 Bed, 40 No. 2 Bed and 4 No. 3 Bed) within 3 No. apartment Blocks ranging from 3 to 4 storeys in height. Additional works include the provision of a single vehicular access, 2 No. external bin stores, car and bicycle parking, ESB substation, relocation of electricity poles and undergrounding of electricity wire, telecoms infrastructure and solar panels at roof level of apartment blocks, all landscaping, boundary treatment works and all associated works above and below ground. A concurrent planning application is being made to Meath County Council which relates to a portion of lands to the north-west corner of the site which includes the demolition of a shed and the provision of 3 No. of the terraced houses and associated landscaping, boundary treatment works and all associated works above and below ground	development was granted planning permission on appeal to An Bord Pleanala following the submission of a Stage 2 AA (NIS) which outlined mitigation measures to prevent impacts on the Rye Water Valley/Carton via contaminated surface water. Ultimately, the measures outlined within the NIS and additional conditions set out will prevent adverse significant impacts to the local environment, including the water quality of

					the Royal Canal. Furthermore, while the proposed development will increase footfall along the Royal Canal, the retention of existing infrastructure along the canal within the vicinity of the development as well as the scale of the proposed development is not anticipated to have adverse impacts to the water quality of the Royal Canal. Additionally, associated increases in audible and visual disturbance locally will not significantly

					increase the already high levels of disturbance along the canal to adversely impact local faunal groups. **Therefore, it is concluded that this project will not act cumulatively with the Proposed Development.**
211108	Parklands Grove, Railpark, Maynooth	Conditional	17/06/2022	the demolition of a habitable house and the construction of 40 No. houses and 36 No. apartments, 1 No. vehicular link with the approved Maynooth Eastern Ring Road and all associated and ancillary site development works. Details of the dwelling types are as follows: 24 No. "Type A", 3-Bed, 2.5 Storey Houses; 8 No. "Type B", 3-Bed 2 Storey Houses; 1 No. "Type B1", 3-Bed, 2 Storey House; 3 No. "Type C", 3-Bed, 2 Storey Houses; 2 No. "Type C1", 3-Bed, 2 Storey Houses; 2 No. "Type D", 3-Bed, 2 Storey Houses; 20 No. "Type E", 2-Bed Apartments; 10 No. “Type F”, 1-Bed Apartments;	No EIA Screening, EcIA or EIAR accompanied this application. It is anticipated that the proposed works will not lead to a loss of riparian habitats along the Royal Canal, which will act as a buffer between the development and the canal. Additionally, the proposed development is

				1 No. “Type H”, 1-Bed Apartment; 2 No. “Type I”, 1-Bed Apartments; 3 No. “Type J”, 2-Bed Apartments. The application contains a statement setting out how the proposal will be consistent with objectives of the relevant development plan or local area plan	likely to increase footfall locally, including along the existing Royal Canal Greenway alongside the Proposed Development. However, this is not anticipated to adversely impact the water quality within the Royal Canal as the existing vegetative buffer strip between the existing towpath and the canal, as well as between the Proposed Development and the canal will be retained. Additionally, associated increases in audible and visual disturbance locally will not significantly increase the already high levels of disturbance along the canal to

					adversely impact local faunal groups. **It is therefore considered that there will be no cumulative impacts from this project in combination with the Proposed Development.**
191296	Bridge Street , Kilcock , Co. Kildare.	Granted with conditions	19/08/2020	for development on site area of 0.445ha, located at Church Street and Bridge Street, Kilcock, Co. Kildare. The site is occupied by The Lion House (former public house) which is a Protected Structure (RPS Ref. No. B05-20) on Church Street. The proposed development site fronts onto Church Street to the north-east, is bounded to the rear (south-west) by the Royal Canal and to the east by Bridge Street. There are 5 no. existing outbuildings/sheds on the site that are proposed to be demolished, as is an extension to the rear of The Lion House. The proposed development will be a long term 'Build-to-Rent' residential development. It is proposed to build a new 2 storey extension to the rear of the existing Lion House building	Given the location of the proposed development and the distance between it and any Natura 2000 sites, the development was determined to not result in likely significant effects on any Natura 2000 site. Additionally, the proposed development was determined to not result in likely significant

				and to convert same into a build-to-rent shared accommodation comprising 18 no. bedspaces in 9 no. bedrooms at first floor level, with communal living facilities provided at ground floor level. The proposed development also consists of 39 no. studios and apartments, comprised of 2 no. studios, 7 no. 1 bed apartments, 26 no. 2 bed apartments & 4 no. 3 bed apartments, accommodated in 4 no. 3-4 storey buildings. Block A, fronting onto Bridge Street, is a 3 storey building accommodating reception, communal living area, gym, and cinema at ground floor level with 6 no. 1 & 2 bed apartments and 2 no. studios overhead. Block B located at the western boundary of the site is a 3 storey building with 4th floor setback accommodating 18 no. 1, 2 & 3 bed apartments. Block C to the rear of the site is a 3 storey building with 4th floor setback accommodating 11 no. 1 & 2 bed apartments, over an undercroft car park. Block D fronting onto Bridge Street is a 3 storey building that will contain concierge & laundry facilities at ground floor level with 2 no. 2 bed apartments overhead. The proposed	effects to the water quality of the Royal Canal due to the retention of the riparian habitats and erection of 2m high screen walls for the delivery of boundary treatment within the curtilage of the site in proximity to the banks of the canal. Operational increases in disturbance due to increased footfall along the existing towpath along the Royal Canal will not significantly increase high pre-existing disturbance levels or are likely to lead to the

				development will be accessed off Bridge Street via a new vehicular entrance, with proposed pedestrian/cyclist access into the adjoining site to the west (concurrent planning application). Bicycle and car parking will be provided for at surface level and in an undercroft car park at Block C. The proposed development provides for all associated site development works, open spaces, landscaping, boundary treatments & bin storage. Revised by Significant Further Information	degradation of the existing infrastructure and subsequently impact water quality within the canal. **It is therefore considered that there will be no cumulative impacts from this project in combination with the Proposed Development.**
2560690	Site to the south of R148 , east of R158 abutting the M4 Junction 8 roundabout at Boycetown , Kilcock	Conditional	09/10/2025	for the construction of a foul pumping station and all associated site and infrastructural works including: An underground wastewater pump station (a wet well 7.2m below ground); A welfare building of 6.25 sq.m and 3m in height; 472m of 125mm OD rising main along the R148, 250m of gravity sewer along the R148, Gravity sewer connection to the south of the site, Watermain connection, An underground emergency storage tank, with capacity of approximately 132m3,	A screening for EIAR was conducted which concluded that an EIAR was not required. Furthermore, the proposed project will not lead to the loss of riparian habitats along the Royal Canal or result in adverse impacts to the

				7.2m below ground, Above ground lifting gantry, Valve and flowmeter chambers, A chemical dosing facility for odour control, Passive carbon unit, Kiosks, Above ground surge vessel (<13 m3), Perimeter Landscaping, fencing and re use of the existing vehicular access off the R148. All associated site development works. The proposed development includes all necessary ancillary pipework and manholes, diversion of existing utilities; new power supply and water connection for the pump station, ducting, mechanical and electrical services, plant, instrumentation, automation, controls and equipment. It also includes all associated site development works, hard standing areas and access and site drainage. The proposed development includes works on lands owned by Kildare County Council to facilitate access and drainage infrastructure.	canal's water quality. **It is therefore considered that there will be no cumulative impacts from this project in combination with the Proposed Development.**
2560544	Church St, Kilcock, Co. Kildare	Refused	15/07/2025	for a residential development of 19 dwellings comprising as follows:- 4 no. 3-storey, 4-bedroom end-of-terrace houses; 9 no. 2-storey, 3-bedroom mid-terrace houses; 2 no. 2-storey, 3-bedroom end-of-terrace houses & 2 no. maisonette units	The case is currently under appeal, and a final decision is subject to the applicant submitting a

				containing 2 no. 1 Bedroom dwellings in each; together with new vehicular & pedestrian entrance from Church St, new ramped pedestrian connection to the Royal Canal Greenway to the south of the site, 9no. additional carparking spaces, covered short-term bicycle parking area for 10no. bicycles, site landscaping including all boundary works & walls, site services & drainage	formal EIA Screening. In its current condition the plan would have direct impacts to the water quality of the Royal Canal through the direct discharge of surface water into the canal, as well as impacts on the riparian habitats adjacent. However, given Waterways Ireland (WI), the authority in charge of canals and towpaths, Waterways Ireland does not permit the discharge of any kind into the canal either during or after the development of any site.

					While the case is ongoing, if the development was to go ahead in its current state, there would be the potential for adverse in-combination impacts with the Proposed Development on the water quality within the canal, and on local KERs.
2360204	The former Corscaddens Hotel , associated outbuildings and lands to the rear at Church Street , Kilcock	Conditional	13/08/2024	will consist of the demolition of existing disused buildings (including 1 no. former dwelling and non-original extension to the hotel building) on part of the site (total of c. 667 sqm), the extension and conversion of the former Corscaddens Hotel (3 storeys), Church Street, Kilcock for 2 no. retail units at ground floor level accessed from Church Street (c. 145sqm) and 2 no. residential apartments (1 no. 2-bed, 1 no. 3-bed) on upper floors, provision of a single storey Aldi discount food store retail and off-licence use (c.	No EIA Screening, EcIA or EIAR accompanied this application. Furthermore, the proposed project will not lead to the loss of riparian habitats along the Royal Canal or result in adverse impacts to the canal's water quality,

				1,842 sqm gross floor area, c. 1,315 sqm net floor area), car parking (114 spaces) and loading bay, with vehicular and pedestrian access from Church Street. All associated works to facilitate the development including landscaping, lighting, boundary treatments and retaining walls, internally illuminated signage (c. 10.44 sqm at northeast and northwest elevation of Aldi building, c. 10.22 sqm at double sided pole sign 6 metres in height at entrance and c. 4 sqm signage zone at northern elevation of former hotel), external plant, single storey substation and switch room (c. 21 sqm) and 24 cycle parking spaces within 2 no. covered storage areas in the car parking area. A Natura Impact Statement has been prepared and will be submitted to the Planning Authority with the application	with no water discharging into the canal from the proposed development. **It is therefore considered that there will be no cumulative impacts from this project in combination with the Proposed Development.**
23734	Enfield Business Park, Trim Road, Enfield Co. Meath	Conditional	12/09/2023	the construction of 1,105m2 of single storey pitched roof general purpose warehousing, a detached monopitch open sided checking shed of 120m2, 168m2 of administrative offices and staff facilities in a temporary modular structure, and uncovered hard	No EIA Screening, EcIA or EIAR accompanied this application. Additionally, the site is not directly connected to the

				standing yard space of 17,550m2. Proposals also include vehicle access road, boundary fencing, access gates, soft landscaping, site lighting, all associated drainage infrastructure including storm attenuation, water infrastructure and services connections, traffic control barriers, and associated car and bike parking spaces	Royal Canal, nor comprises of any critical supporting habitat for any KERs present along the canal. Cumulative impacts with the Proposed Development on the water quality within the Royal Canal and on local KERs are therefore not anticipated. **It is therefore considered that there will be no cumulative impacts from this project in combination with the Proposed Development.**
231064	Site B Enfield Business Park , Trim Road , Enfield Co. Meath	Conditional	14/06/24	permission will consist of: 1) The construction of a detached single storey pitched roofed general purpose warehouse building for the storage of steel and other	No EIA Screening, EcIA or EIAR accompanied this application.

				construction industry related products, 2) A detached single storey pitched roofed machinery store, 3) A hard surfaced vehicle and bicycle parking area and 4) Non-illuminated indemnification signage. The development for retention permission consists of: 5) The boundary metal fencing and metal entrance gates, 6) A detached single storey prefabricated flat roofed building for staff uses and, 7) The use of the site for the storage of steel products	Additionally, the site is not directly connected to the Royal Canal, nor comprises of any critical supporting habitat for any local KERs. Cumulative impacts with the Proposed Development on the water quality within the Royal Canal and its KERs are therefore not anticipated. **It is therefore considered that there will be no cumulative impacts from this project in combination with the Proposed Development.**
22784	Mariavilla Carton Demesne , Oldcarton	Conditional	13/01/2023	development at this site in the townlands of Mariavilla, Carton Demesne, Oldcarton,	No EIA Screening, EcIA or EIAR

	Catherinestown Kellystown Ravensdale , Sion and Confey			Catherinestown, Kellystown, Ravensdale, Sion and Confey. The development will traverse the administrative areas of both Kildare County Council and Meath County Council. The development within the Kildare County Council administrative area will consist of: (a) Permanent Mechanical, Electrical, Instrumentation, Control and Automation (MEICA) upgrade works, upgrade of the existing chemical dosing system and ancillary works at the Maynooth Wastewater Pumping Station (WWPS) site in the townland of Mariavilla; and, (b) Provision of approximately 7.9km new pipeline (approximately 9.8km total development length within Kildare and Meath) and associated infrastructure (air valves, scour valves, flow meter, ventilation columns etc.) between the Maynooth WWPS and existing Irish Water infrastructure along the R149 in the townland of Confey. A Natura Impact Statement accompanies the subject application.	accompanied this application. Furthermore, the proposed project will not lead to the loss of riparian habitats along the Royal Canal or result in adverse impacts to the canal's water quality, with no water discharging into the canal from the proposed development. **It is therefore considered that there will be no cumulative impacts from this project in combination with the Proposed Development.**

8.8.4 Summary of Likely Cumulative Effects

The identified Projects and Plans are not anticipated to act cumulatively with the Proposed Development to impact the KERs identified within Table 8-29, with the exception of the Old Schoolhouse Masterplan, in its current scope, and the Dart + West Project. Likely cumulative effects between the Proposed Development and the Old Schoolhouse Masterplan and the Dart + West Project on the identified KERs include increased disturbance within the Royal Canal as a result of lighting, and the loss and fragmentation of habitat within the Canal ecological corridor. These cumulative effects have the potential to increase the magnitude of construction and operational impacts from the Proposed Development identified within sub-section 8.7, specifically for bats and non-volant mammals.

8.9 Mitigation Measures

From the assessment of potential impacts during construction and operational phases of the Proposed Development, the following key issues have demonstrated the potential to result in significant effects on KERs and so require particular attention for mitigation and management:

- Pollution of aquatic habitats by silt/suspended solids and chemical pollution.
- Pollution of groundwater and alterations to local flow regimes.
- Pollution of various habitats from airborne pollutants.
- Habitat degradation and disconnect.
- Loss of habitats (grassland, individual trees and woodland)
- Disturbance of species on site from noise, light, habitat disconnect and loss of life.
- Operational management of Proposed Development
- Spread of INNS.

The greatest risk to the habitats on site is during the construction phase, coinciding with the greatest amount of activity on site. Furthermore, effects unmitigated during construction have the potential to extend into the operational phase. This section describes the mitigation measures required to prevent or reduce impacts generated during construction and operation phases of the proposed project on the KERs identified within sub-section 8.6.4. All prescribed mitigation measures will be strictly adhered to throughout the length of the construction and operational phases.

The measures outlined follow the mitigation hierarchy, with avoidance identified as the preferred approach before reduction, mitigation, restoration, or compensation. The Proposed Development has been designed to keep works away from the Royal Canal to minimise surface water impacts. However, due to the narrow nature of the Royal Canal corridor, the Greenway will result in a loss of riparian habitats, including woodland within the Royal Canal pNHA. As such, the mitigation measures outlined aim to reduce, mitigate, and restore adverse impacts to these habitats, and where appropriate compensatory measures are incorporated. Avoidance measures incorporated during the design process of the Proposed Development are outlined below in 8.9.1, and were made following consultation between DBFL, FCC, and WI.

8.9.1 Avoidance by Design

Following the mitigation hierarchy, with avoidance identified as the preferred approach before reduction, mitigation, restoration, or compensation, the Proposed Development has been designed to keep works away from the Royal Canal to minimise surface water impacts. The Proposed Development has also been designed to minimise the impact on the existing trees and maximise tree retention (Charles McCorkell Arboriculture Consultancy, 2026).

Specific mitigations by design considerations are outlined below and are split based on their respective chainages.

8.9.1.1 Chainages +4235 to +4610 (East of Callaghan Bridge)

Between chainages +4235–4610, east of Callaghan Bridge, a 4m boardwalk will be present as part of the Proposed Development. The nature of this overhang will remove dry meadow and grassy verge bankside habitat high on the bank but will retain those habitats closest to the water, namely the reed and large sedge swamps. This walkway will not overhang the canal and will not require any works within the canal itself. This design solution was considered the most appropriate for minimising impacts on local ecology, specifically within the canal itself.

8.9.1.2 Chainages +4550 - +5220 (Old Schoolhouse Lands)

Between chainages +4550 - +5250, the route has been aligned to travel through sections of scrub and meadow and scrub habitats through the Old Schoolhouse lands, preserving the existing treeline within this section, with tree removal limited to between chainages +4550 - +4570. This diversion will result in a loss of sections of scrub and meadow habitat within the Royal Canal pNHA, which includes Bramble and young Blackthorn. Scrub habitat is an important foraging and refuge resource for fauna utilising the Royal Canal pNHA, in particularly certain bird and invertebrate species which utilise scrub for nesting purposes (FACT, 2003). However, the majority of the semi-mature/mature trees within the adjacent treeline within the Royal Canal pNHA will be retained, with this habitat considered to be of greater ecological importance.

8.9.1.3 Chainages +6250 - +7170 (Roselawn Woodland)

The Proposed Development is due to pass through a section of woodland between chainages +6250 - +7170, within the Royal Canal pNHA. The route has been aligned along the northernmost sections of this woodland habitat to reduce the risk of direct impacts on the water quality of the canal. Additionally, the Greenway will run through a section of the pNHA woodland that has been disturbed by dumping and the extension of back gardens from the properties along Delwood Park (Chainages +6380 - +6590), which is less sensitive to disturbance than the surrounding woodland habitat. Between Brompton Grove and Brompton Green (Chainages +6910 - +7070), the Greenway will run into a green area to the north of the woodland habitat, before re-entering the woodland until the proposed Landmark Bridge (Chainage +7115). The main body of the woodland habitat within this habitat will thus be retained, with the proposed design reducing disturbance and fragmentation impacts to this habitat.

8.9.1.4 Design Considerations for Glutinous Snail

The vulnerability of Glutinous Snail has been considered within the design of the Proposed Development, which in particular includes where the highest population of Glutinous Snail were recorded along the Proposed Development, between the Dublin/Kildare County border and Collins Bridge (Chainage 0 - +1050). Additionally, sections where the existing pathway is narrowest and the width of the Proposed Development would be constrained, including between the Proposed Landmark bridge and the 12th Lock (Chainage +7350 – 8100) was also given additional consideration.

The following measures have been incorporated within the design methodology for the Proposed Development:

- Canal side – Maintain the riparian strip/corridor (1m from towpath edge) along the towpath bank.
- Ditch side – Maintain the riparian strip/corridor (0.5m from towpath edge), the biodiversity habitat, the tree line for bats and the nature of the existing open drainage system which provides a natural habitat.
- Given the environmental constraints on both sides of the towpath the following widths are proposed:
    - To provide WI green riparian strips either side of the Greenway without impacting on the Glutinous Snail the Greenway width has been reduced from 4m and will range from 2-3m between Confey slipway and Collins Bridge (Chainages +00 - +1090).

The Proposed Development has therefore been designed specifically to avoid removing/damaging the riparian habitats along the Royal Canal and reducing the risk of impacts on the sensitive Glutinous Snail population.

8.9.2 Construction Phase

8.9.2.1 Pre-enabling Works

8.9.2.1.1 Site Investigations

Detailed design will require additional site investigations along the entirety of the Proposed Development. The extent of the impacts of any site investigation works has been included within sub-section 8.7.3. Additionally, no vegetation will be cleared without an Ecological Clerk of Works (ECoW) being present. The appointed ECoW will have a minimum of 5 years ECOW experience, in particular having overseen large scale infrastructure projects in vicinity of surface watercourses, will have direct experience performing surface water monitoring testing including Q-value assessment, and will have received accreditation from CIEEM. The experience and roles of the ECoW are described further in sub-section 8.9.2.2.2.

8.9.2.1.2 Ecological Surveys and Monitoring

In addition to ecological surveys that have been carried out to inform this report, a number of pre-enabling work ecological surveys will be undertaken for the most sensitive ecological receptors within the project's ZoI. In the case of Badger setts and Otter holts, continued monitoring will be required for the duration of the construction phase.

The ecological surveys to be conducted prior to the pre-enabling works along the Proposed Development include:

- Updated habitat survey along the entirety of the Proposed Development to record any changes in the existing habitats.
- Additional potential roost assessment of the treelines and adjacent properties present between Chainage +3600 - +3650. In the event that any new medium to high potential roosting features are identified, these will require three additional emergence surveys. These surveys will also identify suitable locations along the Proposed Development for the installation of 12 bat boxes, as further detailed in sub-section 8.9.3.5.1.
- Additional grassland relevé surveys of plots 1-4 inclusive during the spring/summer period to flag the potential presence of any rare or protected flora and assess the current condition of these grassland areas. In the event that any protected or rare floral species are recorded, the ECoW will update the Construction Environmental Management Plan (CEMP) accordingly.
- Updated Otter survey along the Proposed Development, including camera trap survey of the inactive holts identified previously and of the breeding holt identified to the west of the site to see if their respective activity statuses have changed.
    - An additional survey including camera trapping of the three historic Otter holts within the woodland area between Coolmine Road and Roselawn Road (Chainages +6300 - +7170). This survey will be conducted within 2 weeks of the commencement of pre-enabling works in this area.
- Badger survey, including camera-trap survey of existing sett entrances. These will ideally be conducted between October and March when vegetation cover will be a less significant obstacle to surveyors. The survey will be conducted no more than 10-12 months prior to the commencement of works;

  - An additional Badger survey and camera-trapping will be undertaken within 2 weeks of the commencement of any pre-enabling work between Coolmine Road and Roselawn Road (Chainages +6300 - +7170).

- Updated potential bat roost assessment survey of all trees to be felled, and all trees within the woodland areas either side of Dr Troy Bridge (Chainages +5340 - +6250) and between Coolmine Road and Roselawn Road (Chainages +6300 - +7170) (winter period is optimum for examining potential roost features);
- Additional bat emergence surveys of Old Schoolhouse building (Chainage +5190 - 5210) and the buildings to the east of the Hansfield Railway (Chainage +3630 - 3700). Three emergence surveys will be conducted for each building;
- Breeding bird nest check, with a particular focus on any location where trees are being relocated, felled or trimmed back, in particular the woodland areas either side of Dr Troy Bridge (Chainages +5340 - +6250) and between Coolmine Road and Roselawn Road (Chainages +6300 - +7170). Additionally, the breeding nest checks will also include the checks for nesting Barn Swallow under any of the existing bridges over the Royal Canal adjacent to the Proposed Development; and
- Updated Glutinous snail survey along the Proposed Development as part of the long-term monitoring of this species. Adverse impacts during the construction phase, under the worst-case scenario where accidental pollution spills occur, were identified as being very significant and long-term in nature. Additionally, due to this species' critically endangered status, and in order to provide the most robust monitoring plan, obtaining as much data about the population prior to, during, and after the construction phase is critical.
- An updated invasive species survey to track the potential spread of invasive flora present on-site, with a particular focus on the four Third Schedule species of the Birds and Natural Habitats Regulations identified along the Proposed Development, namely Rhododendron, Spanish Bluebell, Japanese Knotweed, and Three-cornered Garlic. This is outlined in more detail in sub-section 8.9.2.2.17.

In the event that these surveys indicate any significant changes in the baseline ecology, such as an inactive Badger sett becoming active, an identified new sett, or the presence of any new potential roosting features, the project's construction environmental management plan (CEMP), which the appointed contractor will strictly adhere to at all times throughout the duration of the construction phase, will have to be updated by the ECoW. All the results of the pre-construction surveys will be provided to the appointed ECoWs, EnvCoW (ECoWs and EnvCoW detailed in sub-section 8.9.2.2.2), WI Environmental team, and Fingal Biodiversity Officer. Instances of changes to the baseline ecology are assessed further in the following sub-sections alongside relevant mitigation measures.

8.9.2.1.3 Derogation Licenses

The Proposed Development will require a derogation license due to the presence of an active Otter holt to the west of the Proposed Development within 30m of the construction works. A derogation license for the active Otter holt will be submitted with this application.

Any additional holts or active resting places identified along the Proposed Development during pre-enabling works/construction works will require additional derogation licenses, following Annex IV derogation licence application process and in line with current guidelines for Annex IV species, and Annex IV licencing requirements guidelines.

Any new holts identified within the Proposed Development or in close to proximity to the Proposed Development will require exclusionary mitigation measures, which are outlined in sub-section 8.9.2.2.16. Any additional derogation licenses required in the event any new holts are identified/existing inactive holts become active must be applied for immediately and any/all works in close vicinity temporarily stopped.

Additionally, in the event any bat roosts are identified within or in close proximity to the Proposed Development, a derogation license will be required to conduct works in the vicinity of these roosts. Any additional derogation licenses required in the event an active bat roost is identified must be applied for immediately and any/all works in close vicinity temporarily stopped until the license is approved by NPWS.

8.9.2.2 Construction Phase Mitigation

8.9.2.2.1 Outline and Final Construction Environmental Plans

A site-specific Outline Construction and Environment Management Plan (OCEMP) and Construction Method Statement (CMS) will be submitted along with the EIAR to the competent authority. The appointed contractor will prepare a detailed Construction and Environment Management Plan (CEMP), which will be informed by the submitted OCEMP, CMS, and include the mitigation measures outlined within this Chapter of the EIAR, as detailed in sub-section 8.9.2.

The CEMP will incorporate the mitigation measures listed here and will be produced, implemented and maintained by the Proposed Development's principal contractor, in order to facilitate the integration of environmental issues into the projects' planning, construction and operation. The principal contractor, as well as all other construction contractors, will be required to comply with all the mitigation details outlined within the OCEMP, CMS, and within sub-section 8.9.2 of this Chapter of the EIAR, which will be incorporated into the final CEMP.

The CEMP will be designed to assist the main contractor in preventing, managing and/or minimizing significant environmental impacts during the construction phase. Project environmental mitigation will be detailed in the final CEMP in accordance with the OCEMP. The final CEMP will provide a framework for compliance auditing and inspection to ensure that these construction practices and mitigation measures are adhered to. A project environmental manager will be appointed to the site for duration of construction works.

The OCEMP has set a number of requirements for the control and management of potential vectors of impact, such as a requirement for the preparation of a Construction Waste Management Plan for the appropriate storage, use and/or disposal of waste product from construction. This will include contact names of Fingal County Council Biodiversity Officer, NPWS, IFI and WI who will be immediately contacted following a pollution or spillage incident. This plan will incorporate the following measures, which are outlined and include within sub-sections 8.9.2.2.3 to 8.9.2.2.17 inclusive of this Chapter of the EIAR, as well as the measures outlined in Chapter 15 (Material Assets – Waste Management) of this EIAR:

- Relating to the site compounds (detailed in sub-section 8.9.2.2.5):
    - A separate container will be located in the contractor's compound to store absorbents used to contain spillages of hazardous materials. The container will be clearly labelled, and the contents of the container will be disposed of by a licenced waste contractor at a licenced site. Records will be maintained of material taken off site for disposal.

- Construction material (supplies and waste) will be stored in appropriate containers that are not accessible by any local fauna; large materials which may provide an opportunity for entrapment, such as upturned culverts and basins will be covered to prevent accidental entrapment of species.
- All construction waste is to be removed from site on completion of the construction phase by appropriately licensed waste collectors, who will transport all waste to appropriately licensed waste facilities.

- Relating to surface water quality (as detailed in sub-section 8.9.2.2.6):
  - Control of water during construction forms part of the mitigation strategy for the Proposed Development. Where dewatering is required, it shall be temporary, localised and limited to the period strictly necessary to complete the relevant works. Dewatering shall be undertaken in a controlled manner to prevent drawdown outside the excavation, instability of excavation faces, mobilisation of fines, erosion, and adverse effects on adjacent ground, groundwater and surface water receptors. All water arising from excavation, dewatering, concrete works, wheel wash activities and other construction processes shall be treated as construction wastewater. Construction wastewater shall not be discharged directly to ground, surface water, drainage systems or the Royal Canal. Concrete wash water, cementitious runoff, fuels, oils and any other contaminated liquids shall be contained separately and removed from site by appropriately authorised contractors. No such material shall be permitted to enter soil, subsoil, bedrock, groundwater, drainage infrastructure or the canal. Temporary drainage, dewatering and wastewater management measures shall be specified in the Construction Environmental Management Plan and implemented for the full duration of the works. These measures shall prevent pollution, sediment release and adverse indirect effects on the receiving environment;
  - Washout of concrete plant will occur at a designated impermeable area offsite away from any KERs under the guidance of the EnvCOW with waste control facilities;
- Relating to topsoil and invasive species (as detailed in sub-sections 8.9.2.2.10 and 8.9.2.2.17):
  - Approximately 80% of stripped topsoil will be reused on site (incorporated into landscaping) with remaining topsoil disposed of at a licensed waste receiving facility (subject to the approval of the facility operator in accordance with their facility permit or license).
  - Disposing of invasive species at a landfill site without first informing the landfill site (that is licensed under Number 10 of 1996 - Waste Management Act, 1996 (as amended) (hereafter referred to as the Waste Management Act, as amended) to take such material (plant or soil) that the waste contains invasive species material (this action requires an appropriate license);
  - Moving soil which contains First Schedule of the Invasive Alien Species Regulations or Third Schedule of the Birds and Natural Habitats Regulations -specific non-native invasive species in the Republic of Ireland, unless under license from the National Parks and Wildlife Service (NPWS) (this license is separate from and does not discharge any person being in receipt of other necessary waste permits/ licenses etc.); and
  - The installation of industry-rated non-native invasive species-proof membrane before infilling construction of road / paths surface may be required. All waste arising out of this process which has been in contact with the excavated ground shall be treated as contaminated waste and disposed of at a facility that is authorized to accept such waste; and
  - Where the movement of any non-native invasive species listed on the First Schedule of the Invasive Alien Species Regulations or Third Schedule of the Birds and Natural Habitats

Regulations is required off site, a license will be required from NPWS in advance of any movement to a site / facility licensed to accept such waste, as per the Birds and Natural Habitats Regulation. This license is separate too and does not negate the need for licenses / permits / authorizations required under waste legislation.

- Where any INNS related material is collected and is required to be disposed of, it is essential to dispose of said material in a manner that does not afford the potential to spread further either within the Proposed Development or in the Royal Canal corridor;
- The movement of invasive plant material, off site, requires a license from the NPWS, as per the Birds and Natural Habitats Regulations. Invasive species (particularly roots, flower heads or seeds) must be disposed of at licensed waste facilities or composting sites, appropriately buried, or incinerated having regard to relevant legislation (e.g. Waste Management Act, as amended, Section 4 of Number 6 of 1987 - Air Pollution Act, 1987, relevant local authority bylaws and any other relevant legislation). All disposals must be carried out in accordance with the relevant waste management legislation, as per guidance Guidelines for the Management of Waste from National Road Construction Projects (TII, 2017); and
- It is important to note that some invasive species plant material or soil (vector material) containing residual herbicides may be classified as either ‘hazardous waste’ or ‘non-hazardous waste’ under the terms of the Waste Management Act, as amended, and both categories may require special disposal procedures or permissions. Advice will be sought from a suitably qualified waste expert regarding the classification of waste and the suitability of different disposal measures.

This Plan will incorporate these measures relating to construction waste, which will be strictly adhered to by the appointed contractor.

A Construction Methodology Report has been prepared as part of this application and the mitigation measures and best practice policies set out therein are to be implemented during the construction phase. Mitigation measures will address all Project Elements as set out in detailed design. Site inductions will include reference to the procedures and best practice as outlined therein. This will include an Emergency Response Plan detailing procedures to be undertaken in the event of a spill of chemical, fuel or other hazardous wastes, a fire, or non-compliance incident with any permit of license issues. This Plan will incorporate all the measures relating to emergency response outlined within sub-sections 8.9.2.2.6 and 8.9.2.2.9 inclusive of this Chapter of the EIAR, which will be strictly adhered to by the appointed contractor.

The construction phase mitigation sections below will cover all the construction elements of the Proposed Development:

- Standard environmental best practice;
- Compound environmental management;
- Mitigation management plans ensuring the protection of surface water, groundwater and air quality and prevention of invasive species spread throughout the Proposed Development site; and
- Mitigation measures which address key ecological receptors.

The final CEMP will also incorporate the mitigation measures outlined within this EIAR, which are outlined below in sub-sections 8.9.2.2.2 through to 8.9.2.2.16 inclusive.

8.9.2.2.2 Ecological and Environmental Clerk of Works

For all periods of work as part of the Proposed Development both an Environmental Clerk of Works (EnvCoW) and two Ecological Clerk of Works (ECoW) will be appointed and will be on site to ensure the mitigation measures set out in this report are followed. This includes the following during active construction works; daily inspections of works next to the canal, of site compounds, of the storage of material, of the pollution control measures and any works in close proximity to active and potential Badger setts, potential Otter holts and trees. An ECoW will also inspect all mature trees that require removal for potential bat roosting features, in addition to an on-site arborist who will inspect all trees for their health.

The Construction Methodology (DBFL Consulting) outlines the following regarding the construction program and phasing:

"Given the complexity of the works in the Delwood area, including both the Quarry Bridge and the Landmark Bridge (Chainage +6500 to +7350), it is envisaged that these works will commence at the beginning of the construction programme and will largely continue independently of the main greenway works until such time as the tie-ins are required. Given the likelihood of a long lead-in time for the manufacture and delivery of the superstructure elements, early engagement with the supplier will be critical. The existing towpath on the southern bank of the canal will remain operational to allow the greenway to function during construction, unless temporary closures are required at a particular stage of the bridge installation"

"In tandem with this, it is envisaged that the main works will commence on the western end of the scheme, working eastwards towards the Hansfield rail bridge. This is considered appropriate to complete the rural portion of the greenway early in the programme. Subject to agreement by Irish Rail and Waterways Ireland, these works will likely require the incremental closure of sections of the existing greenway to the general public. This is due to the works required in constructing the new surface directly on and/or immediately adjacent to the existing towpath. Space shall be provided for emergency towing of barges as necessary"

As the construction phase will involve works occurring simultaneously at the western edge of the Proposed Development and within the Delwood area (Chainage +6500 to +7350) two ECoWs will be present, one covering the works to the west and the other covering the Delwood area. In addition to these two ECoWs, an EnvCoW will also be appointed. Their responsibility will be to ensure the surface water monitoring plan detailed in sub-sections 8.9.2.2.6 and 8.9.2.2.7 is strictly followed.

The full requirements, roles, and qualifications for the appointed ECoWs and EnvCoW are shown below in Table 8-31 and will be included within the final CEMP.

Table 8-31: Summary of the roles, responsibilities, and minimum qualifications for the appointed ECoWs and EnvCoW

Role	Responsibilities	Frequency on site	Minimum qualifications
Main route ECoW	Oversee works of the Proposed Development for its entirety which includes between the Dublin/Kildare	Duration of the construction phase of the main route between the	5 years ECOW experience, in particular having overseen large scale infrastructure

Role	Responsibilities	Frequency on site	Minimum qualifications
	County Border to the west of Coolmine Bridge (Chainages 0 - + 6220). The works beyond this point will be overseen by the woodland ECoW, which include the measures outlined in sub-section 8.9.2.2.8. This ECoW will ensure strict adherence to the CEMP, which include the mitigation measures outlined fully within this Chapter, including sub-sections 8.9.2.2.3 to 8.9.2.2.17 inclusive. This ECoW will be specifically responsible for ensuring adherence to the site compound mitigation as detailed in sub-section 8.9.2.2.5, and the flood emergence response procedures detailed in sub-section 8.9.2.2.9. These include measures pertaining to the clearance of woodland habitats and protocols around dealing with protected mammals, specifically Otter and Badger. This ECoW will only be responsible for conducting the visual assessment measures relating to surface water monitoring as outlined in sub-section 8.9.2.2.7.3. The EnvCoW will be responsible for the full surface water monitoring plan. The ECoW will maintain an open line of communication with the WI Environment Team for the duration of the construction phase, including informing them of any failures to adhere to the mitigation measures outlined within the CEMP.	Dublin/Kildare County Border to the west of Coolmine Bridge (Chainages 0 - + 6220). **No works will take place without the presence of this ECoW.**	projects in vicinity of surface watercourses, demonstratable experience monitoring Otter and Badger, demonstratable experience overseeing the clearance of woodland, and will have received accreditation from CIEEM

Role	Responsibilities	Frequency on site	Minimum qualifications
Woodland ECoW	Oversee works of the Proposed Development for between the east of Coolmine Bridge and the 12th Lock (Chainages +6230 – 8100). The works prior to the Coolmine Bridge will be overseen by the main route ECoW. This ECoW will ensure strict adherence to the CEMP, which include the mitigation measures outlined fully within this Chapter, including sub-sections 8.9.2.2.3 to 8.9.2.2.17 inclusive. These include measures pertaining to the clearance of woodland habitats and protocols around dealing with protected mammals, specifically Otter and Badger. This ECoW will be specifically responsible for ensuring adherence to the adherence to the bridge construction mitigation outlined in sub-section 8.9.2.2.8. This ECoW will only be responsible for conducting the visual assessment measures relating to surface water monitoring as outlined in sub-section 8.9.2.2.7.3. The EnvCoW will be responsible for the full surface water monitoring plan. The ECoW will maintain an open line of communication with the WI Environment Team for the duration of the construction phase, including informing them of any failures to adhere to the mitigation measures outlined within the CEMP.	Duration of the construction phase of the works beyond Coolmine Bridge. (Chainages +6230 – 8100). **No works will take place without the presence of this ECoW.**	5 years ECOW experience, in particular having overseen large scale infrastructure projects in vicinity of surface watercourses, demonstratable experience monitoring Otter and Badger, demonstratable experience overseeing projects involving bridge construction elements, demonstratable experience overseeing the clearance of woodland, and will have received accreditation from CIEEM
EnvCoW	Oversee surface water monitoring plan, including the installation and	Present on site to conduct equipment checks and surface	5 years EnvCoW experience with demonstrable experience

Role	Responsibilities	Frequency on site	Minimum qualifications
	maintenance of monitoring equipment and collection for surface water samples as detailed in sub-section 8.9.2.2.7. The EnvCoW will also be responsible for checking the bridge construction mitigation measures in conjunction with the woodland ECoW, as outlined in sub-section 8.9.2.2.8. The EnvCoW will maintain an open line of communication with the WI Environment Team for the duration of the construction phase, including informing them of any failures to adhere to the mitigation measures outlined and providing the team with all data from the surface water monitoring plan outlined within the CEMP.	water samples as detailed in sub-section 8.9.2.2.7. Will be required to respond promptly to the ECoWs in the event any visual assessment of the canal during the works indicates surface water pollution events have occurred. Will also be available to respond promptly in the event surface water monitoring indicates declines in the quality of the surface water in the Royal Canal	overseeing large scale infrastructure projects in vicinity of surface watercourses, demonstratable experience, demonstratable experience monitoring surface water quality, and will have received accreditation from CIEEM

8.9.2.2.3 Standard Environmental Guidance

The CEMP will strictly adhere to the following legislation and best practice guidance: -

- Water Framework Directive (2000/60/EC);
- European Communities Environmental Objectives (Surface Waters) Regulations, 2009 (S.I. No. 272 of 2009;
- Local Government (Water Pollution) Acts 1977-1990
- CIRIA Guidance C532: Control of water pollution from construction sites. Guidance for consultants and contractors. (CIRIA, 2019 - www.ciria.org);
- CIRIA Guidance C741: Environmental good practice on site guide (Charles & Edwards, 2015; CIRIA, 2019 - www.ciria.org);
- CIRIA Guidance C750D: Groundwater control: design and practice (Preene et al., 2016; CIRIA, 2019 - www.ciria.org);
- CIRIA (C512): Environmental Handbook for Building and Civil Engineering Projects (CIRIA, 2000);
- CIRIA (C697): The SUDS Manual (CIRIA, 2023);
- CIRIA (C649) Control of water pollution from linear construction projects: Site guide (CIRIA 2006a);
- CIRIA (C848): Control of water pollution from linear construction projects: Technical guidance (CIRIA, 2006b);

- Inland Fisheries Ireland, 2016. Guidance on Protection of Fisheries During Construction Works In and Adjacent to Waters;
- Inland Fisheries Ireland, 2020. Planning for Watercourses in the Urban Environment. A Guide to the Protection of Watercourses through the use of Buffer Zones, Sustainable Drainage Systems, Instream Rehabilitation, Climate / Flood Risk and Recreational Planning

8.9.2.2.4 TII and NRA Guidance

In addition to the guidance included within sub-section 8.9.2.2.3, the CEMP will also strictly adhere the following legislation and best practice guidance:

- TII DN-DNG-03065: Road Drainage and the Water Environment (formerly NRA HD 45)
- TII DN-DNG-03066: Design of Earthworks Drainage, Network Drainage, Attenuation and Pollution Control.
- TII / NRA Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes (CC-ENV-01101)
- NRA/TII Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan (EOP)
- TII Environmental Planning of National Road and Greenway Projects (RE-ENV-07008
- TII Landscape Plan. October 2023 (TII, 2023).
- NRA Guidelines for Treatment of Badgers Prior To Construction of National Road Schemes, (NRA, 2005);
- NRA Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes, (NRA, 2006a);
- NRA Guidelines for the Treatment of Bats during the Construction of National Road Schemes, (NRA, 2006b);
- NRA Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes, (NRA, 2006c);
- NRA Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub prior to, during and post Construction of National Road Schemes. (NRA, 2006d).
- NRA Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads, (NRA, 2010);
- NRA Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads, (NRA, 2010);

Construction method statements are to be submitted to FCC and Waterways Ireland for agreement prior to site works commencing.

8.9.2.2.5 Compound Selection and Design

Temporary construction compound space will be required to provide stores, offices, material storage, parking and welfare facilities for the contractor and employers representatives. Three compound locations have been selected, as outlined in the OCEMP (DBFL, 2026). These locations are outlined below in Figure 8-86 and in sub-sections 8.9.2.2.5.1 to 8.9.2.2.5.3 inclusive. These locations have been specifically chosen to minimise impacts to the environment and on KERs, being chosen at locations

separated from the Royal Canal by substantial buffers and in areas of lower ecological value. As detailed in the construction phase impacts, these compounds will impact GS2 and BL3 habitats, which are considered of lower local value as detailed within sub-sections 8.7.3.3.1 and 8.7.3.3.5. The appointed contractor will strictly adhere to the compound locations outlined, and no other compound location will be used.

In addition, the site compounds will be located outside any designated tree protection zone. No excavation works within tree root protection areas will be permitted to install temporary services for site cabins and facilities. Any temporary services within tree root protection areas will be above ground and protected accordingly. No operating generators or toxic liquids will be stored within the tree root protection areas of retained trees during construction. Overhanging tree canopies will be avoided when transporting, installing and removing site cabins near tree crowns. A banksman will be present during this process to ensure that all operations are carried out in a controlled manner, and no part of the cabin meets overhanging tree crowns.

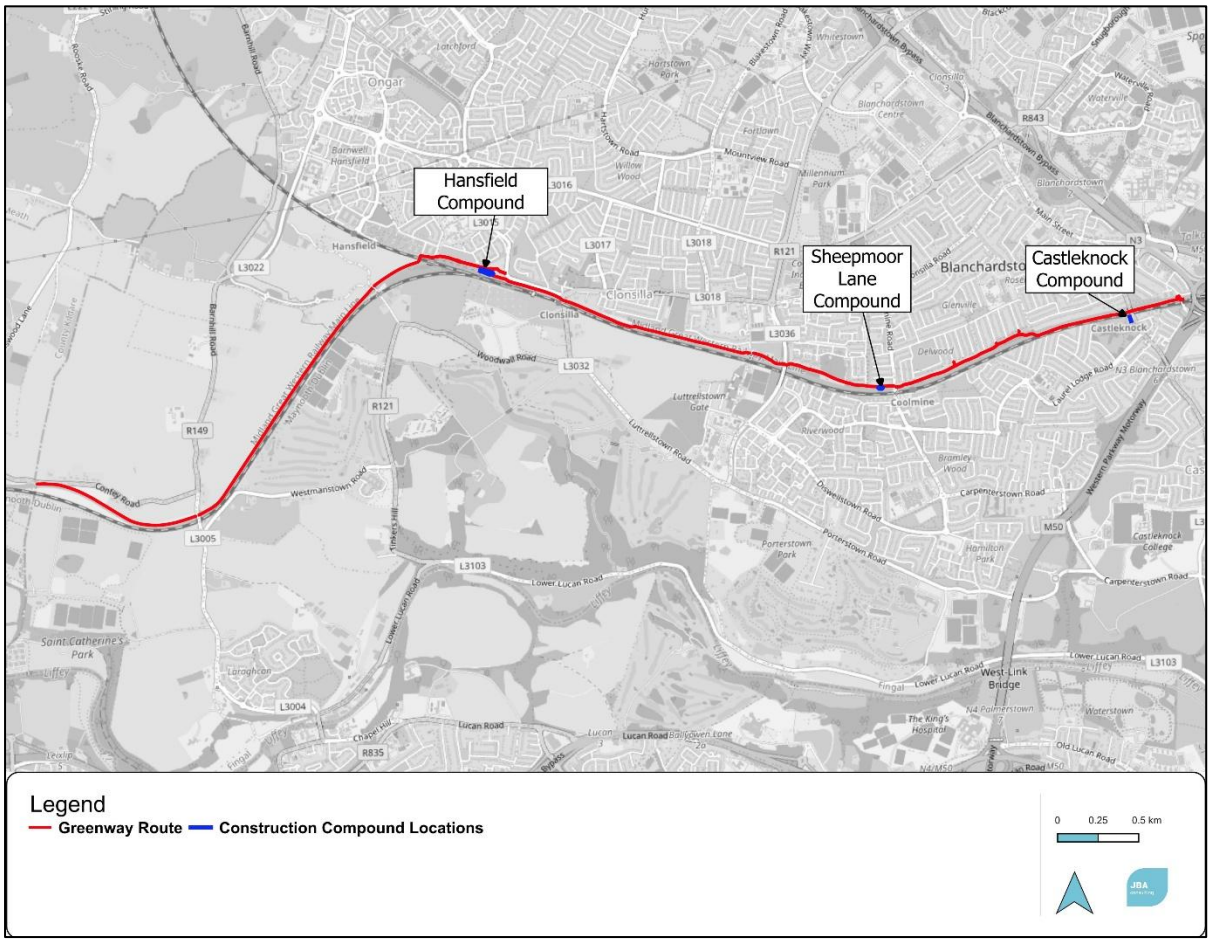


Figure 8-86: Overview of proposed compound locations along the Royal Canal (©OSM, 2026)

8.9.2.2.5.1 Hansfield area

An existing grassed / planted area between the existing towpath and the adjacent lands has been acquired by FCC (Figure 8-87). The area is to be cleared and excavated to facilitate the Proposed Development works. The area can be accessed from Hansfield Road and will require the demolition of

the existing properties proposed as part of the works to be carried out prior to full establishment of the compound. Once established this will likely operate as the main compound for the remaining works.

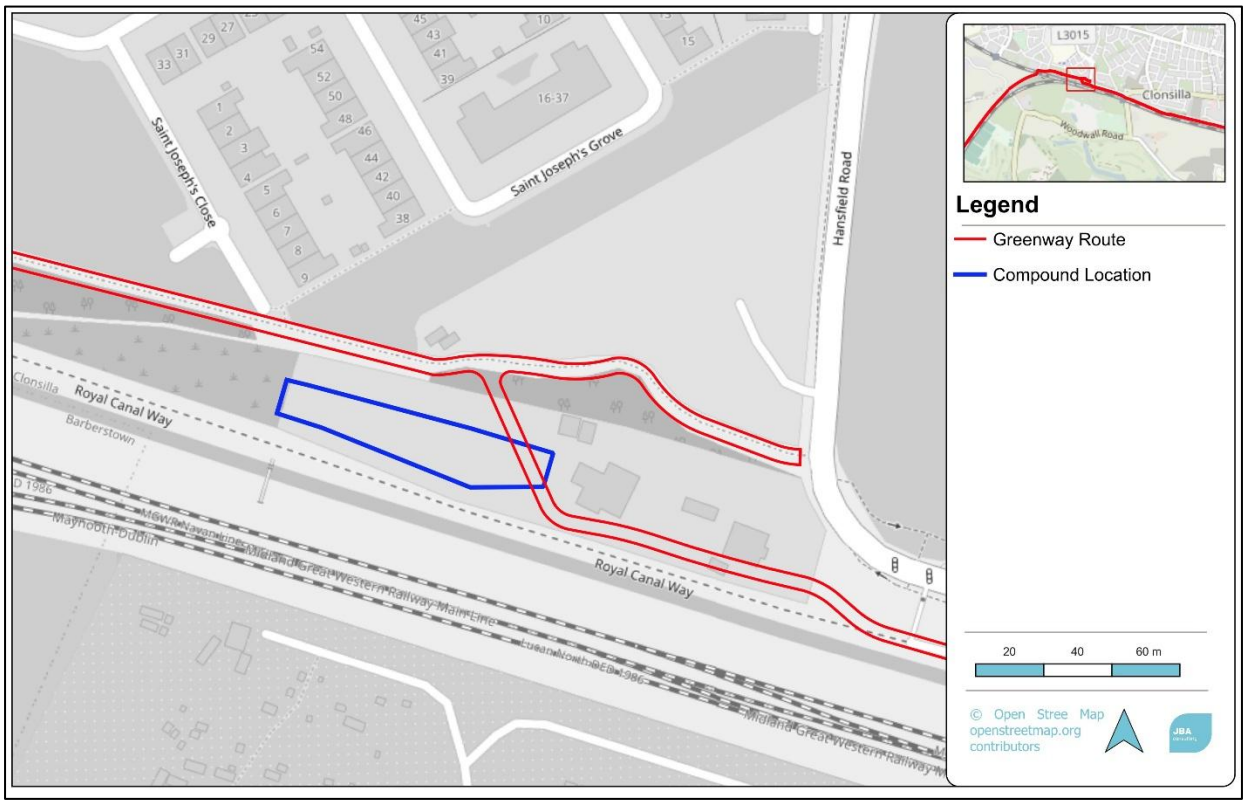


Figure 8-87: Hansfield Site Compound Location (©OSM, 2026)

8.9.2.2.5.2 Sheepmoor Lane

An open grassed area has been acquired by FCC for the intent of using this space for maintenance and storage (Figure 8-88). During the construction phase this area may be used as a satellite compound / storage area.

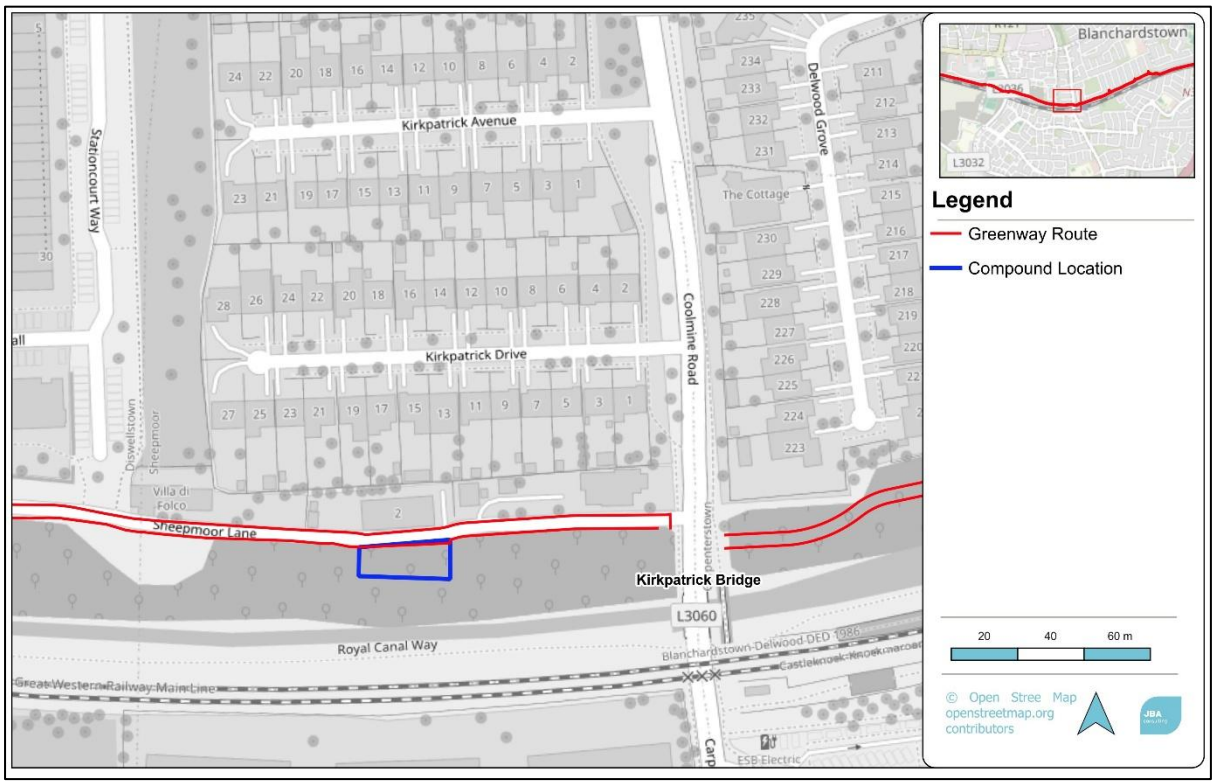


Figure 8-88: Sheepmoor Lane Site Compound Location (©OSM, 2026)

8.9.2.2.5.3 Castleknock area

A grassed section of the Laurel Lodge Park, accessed via Park Lodge (Figure 8-89). Due to its setting this will likely only act as a satellite compound for storage of materials associated with the adjacent works and access for HGVs and large plant will be limited.

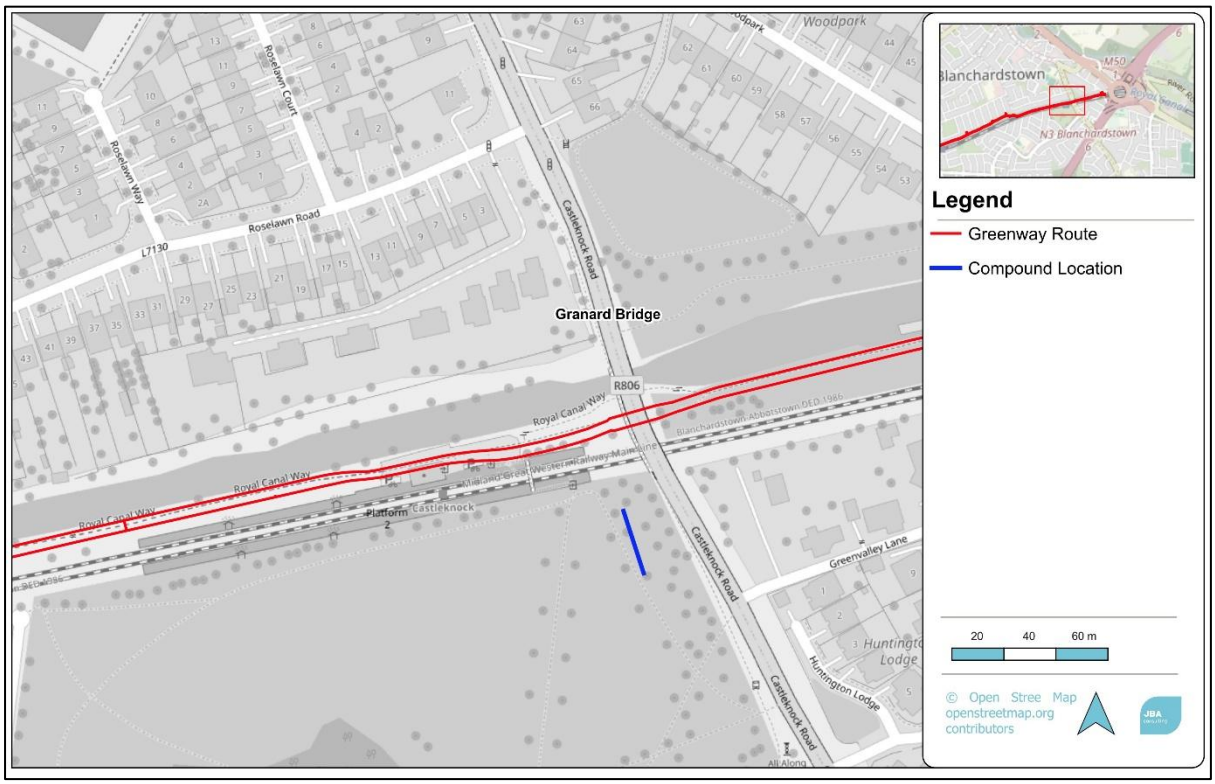


Figure 8-89: Castleknock Site Compound Location (©OSM, 2026)

The ECoWs will be required to regularly conduct site compound checks (see Table 8-31) to ensure they are adhering to ecological safeguarding protocols, which are outlined below in sub-section 8.9.2.2.5.4. Following completion of construction these areas will be cleared and reinstated, and all construction materials will be removed.

8.9.2.2.5.4 Site Compound Protocols

The proposed location of the compounds have been chosen to avoid any potential degradation of valuable habitats on site, with the proposed locations as outlined above situated on amenity grassland and/or existing artificial surfaces such as car parking. The site compound must make provisions for the following:

- Only plant and materials necessary for the construction of the works will be permitted to be stored at the compound location.
- Site Security to restrict unauthorized entry;
- Bunded storage of fuels and refuelling area. Bunds shall be 110% capacity of the largest vessel contained within the bunded area.
- A separate container will be located in the contractor's compound to store absorbents used to contain spillages of hazardous materials. The container will be clearly labelled, and the contents of the container will be disposed of by a licenced waste contractor at a licenced site. Records will be maintained of material taken off site for disposal.

- A maintenance programme for the bunded areas will be managed by the site environmental manager. The removal of rainwater from the bunded areas will be their responsibility. Records will be maintained of materials taken off site for disposal.
- The site environmental manger will be responsible for maintaining all training records.
- Ensuring a drainage collection system is present at a designated washing area and monitor throughout the construction phase to ensure it is adequate to prevent run-off into local surface watercourses/infrastructure.
- Refuelling will take place in a designated bunded area away from surface water gullies, drains and water bodies, and in the event of refuelling outside of this area, fuel will be transported in a mobile double skinned tank;
- All machinery and plant used will be regularly maintained and serviced and will comply with appropriate standards to ensure that leakage of diesel, oil and lubricants is prevented.
- All temporary construction compounds and site entrances are to be removed upon completion of the construction phase. Such areas are to be reinstated in accordance with the landscape architects' plan and engineer's drawings.
- Construction material (supplies and waste) will be stored in appropriate containers that are not accessible by any local fauna; large materials which may provide an opportunity for entrapment, such as upturned culverts and basins will be covered to prevent accidental entrapment of species.
- All construction waste is to be removed from site on completion of the construction phase by appropriately licensed wate collectors, who will transport all waste to appropriately licensed waste facilities.
- Oil / fuel storage areas are to be decommissioned on completion of the construction phase. Any remaining liquids are to be removed from site and disposed of at an appropriate licensed facility. Fingal County Council's Environmental Control Section is to be notified of the proposed destination for disposal of any liquid fuels.

8.9.2.2.6 Water Quality – Surface water

Specific mitigation measures for impacts on surface water are detailed in Chapter 12. A drainage strategy has also been devised for the Proposed Development within this chapter and the OCEMP, which will be strictly adhered to by the appointed contractor and incorporated into the final CEMP, which describes appropriate measures, the following of which are relevant to the protection of aquatic and groundwater dependent habitats on site:

- The OCEMP details procedures for the control, treatment and disposal of potentially contaminated surface water including monitoring systems and oversight required throughout the construction phase.

- The contractor will be required to implement industry best practice pollution prevention measures in accordance with guidance documents (for example CIRIA Guideline Document C532 Control of Water Pollution from Construction Sites), during both construction and operation in order to control the risk of pollution to surface waters. In addition, pollution of aquatic systems during the construction phase will be reduced by the implementation of the protection measures as outlined in the OCEMP.

- Routine practice and procedures to prevent pollution of the environment will apply. These include:
    - During the construction stage, standard construction and site management practices will be implemented by the contractor that adhere to the following CIRIA Guidance documentation;
        - CIRIA Guidance C741: Environmental good practice on site guide (Charles & Edwards, 2015; CIRIA, 2019 - www.ciria.org);
        - CIRIA (C512): Environmental Handbook for Building and Civil Engineering Projects (CIRIA, 2000);
        - CIRIA (C649) Control of water pollution from linear construction projects: Site guide (CIRIA 2006a);
        - CIRIA (C848): Control of water pollution from linear construction projects: Technical guidance (CIRIA, 2006b);
        - TII DN-DNG-03065: Road Drainage and the Water Environment (formerly NRA HD 45)
        - TII DN-DNG-03066: Design of Earthworks Drainage, Network Drainage, Attenuation and Pollution Control.
        - TII / NRA Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes (CC-ENV-01101)
        - NRA/TII Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan (EOP)
        - TII Environmental Planning of National Road and Greenway Projects (RE-ENV-07008
        - NRA Guidelines for the Treatment of Bats during the Construction of National Road Schemes, (NRA, 2006b);
        - NRA Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes, (NRA, 2006c);
        - NRA Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub prior to, during and post Construction of National Road Schemes. (NRA, 2006d).
        - NRA Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads, (NRA, 2010);
        - NRA Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads, (NRA, 2010);
    - Control of water during construction forms part of the mitigation strategy for the Proposed Development. Where dewatering is required, it shall be temporary, localised and limited to the period strictly necessary to complete the relevant works. Dewatering shall be undertaken in a controlled manner to prevent drawdown outside the excavation, instability of excavation faces, mobilisation of fines, erosion, and adverse effects on adjacent ground, groundwater and surface water receptors. All water arising from excavation, dewatering, concrete works, wheel wash activities and other

construction processes shall be treated as construction wastewater. Construction wastewater shall not be discharged directly to ground, surface water, drainage systems or the Royal Canal. Concrete wash water, cementitious runoff, fuels, oils and any other contaminated liquids shall be contained separately and removed from site by appropriately authorised contractors. No such material shall be permitted to enter soil, subsoil, bedrock, groundwater, drainage infrastructure or the canal. Temporary drainage, dewatering and wastewater management measures shall be specified in the Construction Environmental Management Plan and implemented for the full duration of the works. These measures shall prevent pollution, sediment release and adverse indirect effects on the receiving environment;

- Stockpiles will be tightly compacted to reduce runoff and graded to aid in runoff collection. This will prevent any potential negative impact on watercourses, and the material will be stored away from any surface water.

- Excavations will remain open for as little time as possible before the placement of fill. This will help to minimise the potential for water ingress into excavations.

- Silt fences and grassed swales/catchment ditches will be constructed around the perimeter of work areas, compounds, storage yards and stockpile areas.

- Concrete batching (for use in in situ concrete pours) will take place off site and wash down and wash out of concrete trucks will take place off site (at authorized concrete batching plant in full compliance with relevant planning and environmental consents).

- Weather conditions and typical seasonal weather variations will also be taken account of when planning stripping of topsoil and excavations with an objective of minimizing soil erosion;

- The construction compound(s) will include adequate staff welfare facilities including foul drainage and potable water supply. Foul drainage discharge from the construction compound(s) will be tankered off site to a licensed facility;

- The construction compound(s)'s potable water supply shall be protected from contamination by any construction activities or materials;

- All material including oils, solvents and paints will be stored within temporary bunded areas or dedicated bunded containers;

- Refuelling will take place in a designated bunded area away from surface water gullies, drains and water bodies, and in the event of refuelling outside of this area, fuel will be transported in a mobile double skinned tank;

- All machinery and plant used will be regularly maintained and serviced and will comply with appropriate standards to ensure that leakage of diesel, oil and lubricants is prevented;

- Clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage;

- All machinery and plant used will be regularly maintained and serviced and will comply with appropriate standards to ensure that leakage of diesel, oil and lubricants is prevented;
- Spill kits and hydrocarbon absorbent packs will be available and drip trays will be used during refuelling;
- Drainage wardens/silt socks will be placed around drainage gullies connected to the live network;
- Ongoing monitoring of the water receptors throughout the works;
- Excavated material will be segregated into inert, non-hazardous and/or hazardous fractions; and
- The excavation and handling of inert material will be carefully managed in such a way as to prevent any potential negative impact on the receiving environment.
- Incorporate procedures for environmental awareness training for the main contractor's staff;
- Incorporate monitoring procedures and responses to monitoring results, where contractually required;
- Provide for a system of audit with regard to the effectiveness of the EOP during the construction life cycle of the project;
- Include an emergency response plan (ERP) detailing the procedures to be undertaken in the event of a spillage of chemical, fuel or hazardous wastes, fires or flood events. This should include contact names of County Council Biodiversity Officer, NPWS, IFI and WI which should be immediately contacted following a pollution or spillage incident

The OCEMP also includes the following additional mitigation measures relating to the protection of water quality which will apply:

- As set out in the OCEMP prepared alongside this EIAR, the CEMP to be prepared by the contractor shall detail procedures for the control, treatment and disposal of potentially contaminated surface water including monitoring systems and oversight required throughout the construction phase.
- A Construction Methodology Report has been prepared as part of this application and the mitigation measures and best practice policies set out therein are to be implemented during the construction phase. Site inductions will include reference to the procedures and best practice as outlined therein.
- The contractor will be required to implement industry best practice pollution prevention measures in accordance with guidance documents (for example CIRIA Guideline Document C532 Control of Water Pollution from Construction Sites), during both construction and operation in order to control the risk of pollution to surface waters. In addition, pollution of

aquatic systems during the construction phase will be reduced by the implementation of the protection measures as outlined in relation to biodiversity.

- Water quality monitoring requirements, monitoring locations, trigger levels and corrective actions shall be established by the Contractor, in consultation with the EnvCoW, prior to commencement of works and incorporated into the Construction phase Environmental Management Plan. The surface water monitoring plan is detailed in full in sub-section 8.9.2.2.7, which will be incorporated into the final CEMP.

The CEMP once finalised by the contractor, will be provided to FCC and the WI Environmental Team prior to the commencement of any works. Construction will only go ahead once the CEMP has been deemed acceptable by WI and the Fingal Biodiversity Officer.

Routine practice and procedures to prevent pollution of the environment will apply. These include:

- Silt fences and grassed swales/catchment ditches will be constructed around the perimeter of work areas, compounds, storage yards, stockpile areas and adjacent to the banks of the canal and any drainage ditches in order to prevent the infiltration of adjacent habitats by water run off that could be contaminated by silt, dust or pollutants. The silt fencing will follow the additional guidance:
  - Due to the length of the Proposed Development, silt fencing will only be installed along the bank of the canal and any drainage ditches immediately adjacent to the works. Fencing will cover the immediate work areas, which is defined in the construction program as sections of the existing public Greenway which will be incrementally closed.
  - Silt fencing will also be installed within the Delwood work areas (Chainage +6500 to +7350), covering a 50m buffer from the immediate works area. The silt fencing will be erected on the canal side of the works and will be installed at the nearest possible distance to the works, i.e. a suitable buffer distance that enables construction vehicles to work without colliding with the fencing.
  - Works will only take place once the silt fencing has been erected and checked by the onsite ECoWs. Silt fencing will also only be taken down from sections adjacent to completed work sites following permission from the onsite ECoWs.
  - The only specified area which will differ in terms of the erection of silt fencing along the Proposed Development is the location of the Proposed Landmark Bridge. This will require additional surface water mitigation measures, as detailed in sub-section 8.9.2.2.8.
- If sustained heavy rainfall (> 10mm) occurs during the stripping of topsoil and excavations, work must be suspended and not restarted until the ground has had at least a full dry day (DEFRA, 2009) with the objective of minimizing soil erosion;
- All material including oils, solvents and paints will be stored within temporary bunded areas or dedicated bunded containers within the designed site compounds;
- Refuelling will take place in the designated site compounds away from surface water gullies, drains and water bodies, and in the event of refuelling outside of this area, fuel will be transported in a mobile double skinned tank;
- All machinery and plant used will be regularly maintained and serviced and will comply with appropriate standards to ensure that leakage of diesel, oil and lubricants is prevented;

- The contractor will ensure compliance with environmental quality standards specified in the relevant legislation, namely European Communities (Environmental Objectives (Surface Waters)) Regulations, 2009 (S.I. No. 272 of 2009 and amendments);
- Oil booms and oil soakage pads will be maintained on-site to enable a rapid and effective response to any accidental spillage or discharge. These shall be disposed of correctly and records will be maintained by the environmental manager of the used booms and pads taken off site for disposal;
- Management of silt-laden water on-site, including procedures for accidental leaks / spills to ground, as well as water quality monitoring, as detailed in sub-section 8.9.2.2.7 which will be overseen by the EnvCoW, to ensure compliance with environmental quality standards specified above;
- At no point during the construction phase will treated-water be discharged to local surface water network without the water quality meeting the statutory limits as set under the environmental quality standards specified above;
- Fail-safe site drainage and bunding through drip trays on plant and machinery will be provided to prevent discharge of chemical spillage from the sites to surface water;
- To prevent the spread of any accidental discharge into the surface water network, oil booms will be on hand when construction activities are located beside aquatic habitats in order to control and minimise the spread of the spill;
- Washout of concrete plant will occur at a designated impermeable area offsite away from any KERs under the guidance of the main route ECoW with waste control facilities;
- As detailed within the Construction Methodology, the steel superstructure for the Landmark Bridge will be fabricated off site and brought to site on a special vehicle and then craned into position.
- Concrete delivery, concrete pours and related construction methodologies will be part of the procedure agreed with the contractor to mitigate any possibility of spillage or contamination of the local environment and will take place offsite away from any KERs under the guidance of the main route ECoW. Particular attention will be paid during the pouring process in order to avoid leakages or spills of concrete;
- Temporary stockpiles will be monitored for leachate generation. These stockpiles will be placed within designated areas (C649 – CIRIA, 2006b) and not located within 20m of any watercourses and wetlands or within 10m artificial surface water drainage features;
- Spill kits and hydrocarbon absorbent packs will be available and drip trays will be used during refuelling;
- Drainage wardens/silt socks will be placed around drainage gullies connected to the live network;
- Ongoing monitoring of the surface water receptors throughout the works, as detailed below in sub-section 8.9.2.2.7;
- Excavated material will be segregated into inert, non-hazardous and/or hazardous fractions;
- The excavation and handling of inert material will be carefully managed in such a way as to prevent any potential negative impact on the receiving environment. This includes the following;
    - For the construction of Quarry Bridge (Chainage +6500), as detailed 8.9.2.2.8, which will require the ground level to be lowered from existing levels, all excavated topsoil and associated waste material will be removed and stored off-site, away from any KERs. As detailed in sub-section 8.6.2.1.14, this section of woodland has been disturbed due to dumping or inorganic/organic waste, spread of INNS/Garden escape species, and by bonfires

and other human activities. As such, this material will be disposed of at a suitably disposed of at a licensed waste receiving facility (subject to the approval of the facility operator in accordance with their facility permit or licence).

- Incorporate procedures for environmental awareness training for the main contractor's staff;
- Incorporate pre-construction and construction phase ecological monitoring (8.9.2.2.2) and surface water monitoring procedures (8.9.2.2.7) and responses to these monitoring results as detailed in sub-sections 8.9.2.2.7, where contractually required;
- Provide for a system of audit with regard to the effectiveness of the environmental operating procedures during the construction life cycle of the project; and
- Include an emergency response plan (ERP) detailing the procedures to be undertaken in the event of a spillage of chemical, fuel or hazardous wastes, fires or flood events.

8.9.2.2.7 Surface Water Monitoring

8.9.2.2.7.1 Background

This section defines the minimum surface water monitoring requirements for the Proposed Development. Before relevant works commence, the Contractor shall prepare a detailed Surface Water Monitoring Plan, including the final station schedule, parameter matrix, monitoring methods and incident-response arrangements, for approval by WI and FCC in consultation with the appointed ECoWs, and the EnvCoW who will oversee the implementation of the surface water monitoring plan.

Previous Assessments of the Royal and Grand Canals in 2023 as part of the WFD monitoring program assessed a range of metrics for determining the ecological potential of both artificial waterbodies (INVAS, 2023). These assessments have been used to inform the metrics outlined within this sub-section that will be recorded as part of the surface water monitoring plan. These parameters include the following:

- pH - measure in situ during field visits and continuously at stations exposed to concrete, grout, cement washout, or dewatering risk.
- Temperature - measure in situ with pH and dissolved oxygen; retain temperature with all continuous water-quality records.
- Specific conductance: report in µS/cm, temperature-compensated to 25°C, and retain the measured temperature and raw conductivity where available.
- Biochemical oxygen demand (BOD5): laboratory analysis only where risk assessment identifies a credible organic or foul-water pathway.
- Selected metals or other contaminants: add only where bridge, piling, demolition, imported materials, or soil results identify a credible source.
- Dissolved oxygen: measure in situ and report both mg/L and percentage saturation; review high-frequency data for daily variation.
- Total suspended solids (TSS): analyze paired laboratory samples and use them to develop and periodically check any site-specific turbidity relationship.
- Ammoniacal nitrogen: report as mg/L N; where toxicity is relevant, assess un-ionised ammonia using concurrent pH and temperature.

- Nitrate: report consistently as mg/L N and retain where required for baseline comparison or justified by the source-risk assessment.
- Total phosphorus: report as mg/L P and retain where required for baseline comparison or justified by the source-risk assessment.
- Reactive phosphorus: specify filtered or unfiltered status, analytical method, and reporting basis as mg/L P; confirm whether this duplicates MRP/SRP reporting.
- Turbidity: use continuous monitoring at priority risk locations, with a defined logging interval, cleaning regime and paired TSS samples.
- Hydrocarbons: define the laboratory TPH fractions and include PAHs where the site/materials risk warrants them; treat visual sheen as an incident trigger, not a quantitative result.
- Biological quality: agree canal-appropriate aquatic plant or other biological methods and survey timing with WI and the competent ecologist; do not assume a river Q-rating is suitable.

8.9.2.2.7.2 Monitoring Plan

Given the findings of previous assessments and the project relevant threats to the Royal Canal's surface water quality, i.e. hydrocarbons, excess sediments, the surface water monitoring plan will be conducted prior to, during, and post construction. Suitable locations for this monitoring plan are shown below in Figure 8-90. This includes points within the Royal Canal that will be particularly vulnerable during the construction phase due to the proximity of the works to the canal and/or the nature of the works adjacent to these locations.

The fixed network shown in Figure 8-22 will represent background and impact conditions across the canal reaches affected by the works. Canal connectivity, lock operations, feeders, abstractions, pumping and likely travel time will be confirmed before assigning upstream or downstream status and the 11th Lock must not be assumed to be a pollutant-accumulation point without supporting hydraulic evidence. Prioritise reaches near Collins Bridge, Callaghan Bridge, the proposed Landmark Bridge and the 12th Lock, and add source/discharge stations for high-risk works such as piling, concrete placement and dewatering. The core stations will be retained for comparability but allow temporary stations to follow active work fronts or investigate alarms. WI and the EnvCoW will approve changes and record the reason, coordinates, period of use and relationship to the relevant activity. The detailed Surface Water Monitoring Plan shall include a station schedule identifying each station's reference, coordinates, monitoring purpose, associated construction risk, parameters, monitoring frequency and period of operation.

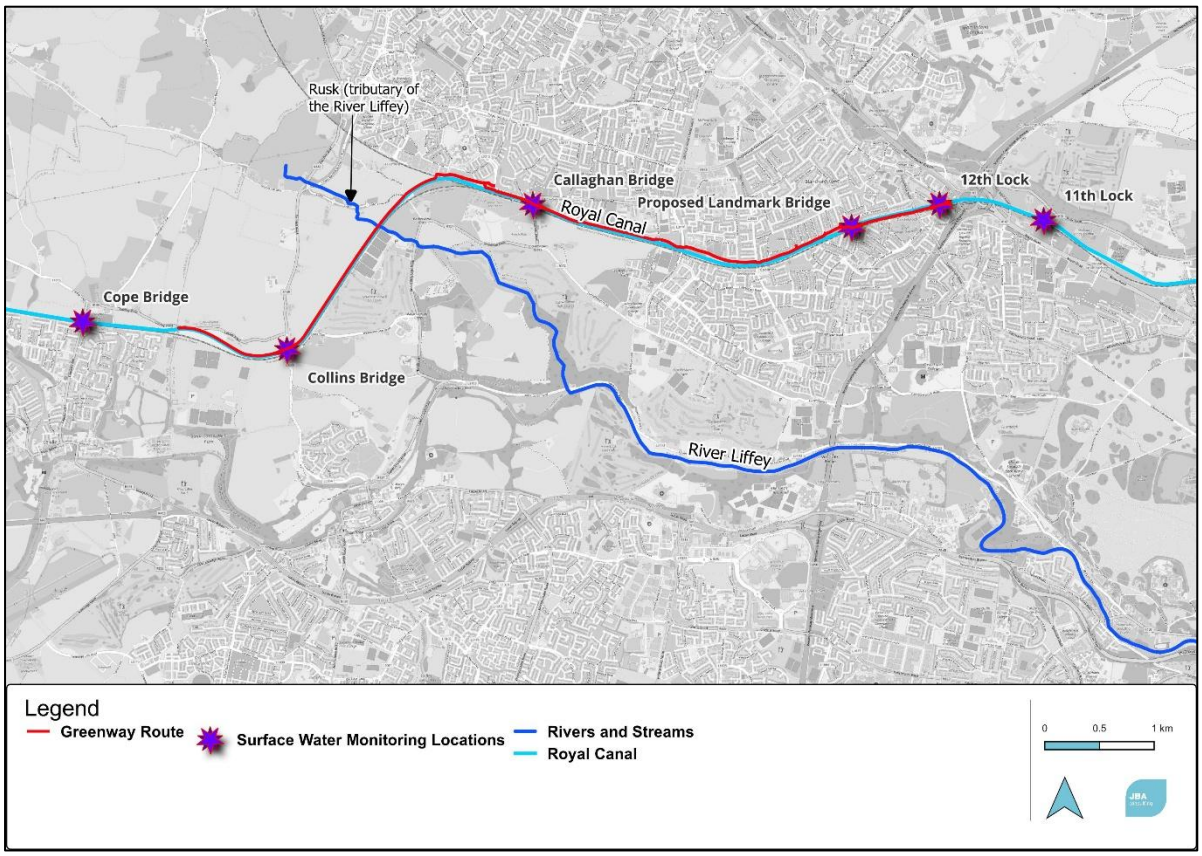


Figure 8-90: Surface water monitoring locations prior, during, and after the construction phase (©OSM, 2026)

Baseline and laboratory monitoring Laboratory samples will be collected monthly at the fixed stations for 12 months before construction, during construction and for the first year after completion, subject to the approved project programme. Where a complete 12-month project-specific baseline cannot be obtained, the Contractor shall prepare a data-gap assessment and proposed alternative baseline approach for approval by WI and FCC. This shall consider seasonal representativeness, available historical monitoring data and the uncertainty associated with any data gaps.

Samples will be taken at a consistent, documented depth and location, and record time, weather, recent rainfall, canal level, lock/feeder operations, visible conditions and nearby construction activity. Monthly results will support trend and baseline assessment but are not an event-response system. Use the pre-construction year to characterise seasonal and station variability, data gaps and differences between control and impact locations. Compare results with applicable waterbody objectives and the European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I. No. 272/2009), as amended; do not treat a broad baseline range as a safe limit or apply annual-average standards as instantaneous alarms.

A laboratory accredited to ISO/IEC 17025 will be used for the relevant methods. The sampling procedure will define containers, filtration, preservation, holding times, chain of custody, field blanks/duplicates, reporting limits, urgent turnaround and how non-detects or invalid results are treated. The final laboratory suite and reporting basis shall be confirmed with WI and FCC before monitoring

begins. Potential duplication between Total Nitrogen and individual nitrogen species, and between orthophosphate, MRP and SRP, shall be resolved within the approved parameter matrix.

- The suite of determinants requested for analysis from the laboratory will include: pH;
- Total Petroleum Hydrocarbons (TPH);
- Temperature;
- Total Phosphorus;
- Chloride;
- Nitrate;
- Nitrite;
- Total Nitrogen;
- Orthophosphate;
- Ammonia N;
- Biochemical Oxygen Demand;
- Total Suspended Solids.

Before construction, WI, FCC and the Contractor will approve an exceedance and incident-response matrix with parameter-specific alert, action and stop-work criteria. A validated alert will trigger prompt inspection, confirmatory field checks and targeted sampling; an action threshold will trigger source control and notification; an acute risk, visible pollution or stop threshold will suspend the relevant activity or discharge. Define who may stop work, who authorises restart, and how the event and corrective actions are recorded.

Project-specific thresholds will be set from the completed baseline, applicable standards, control-station behaviour and receptor sensitivity; document the rationale and obtain WI/client approval before works start. The matrix will include persistence rules for continuous readings, confirmation steps, notification deadlines and restart authority.

Continuous and field monitoring

Continuous monitoring will be deployed at selected high-risk stations alongside weekly field verification and monthly laboratory sampling. Continuous sensors will measure turbidity, pH, specific conductance, temperature and dissolved oxygen; install level sensors only where water-level records have a defined interpretive use. Select stations based on source risk, ability to detect a change before it travels beyond the control point, safe access, power and communications, rather than assuming identical equipment is needed at all six locations.

Additional event-based monitoring shall be undertaken where triggered by significant rainfall, piling, concrete placement, dewatering, excavation of potentially contaminated material, a spill, visible pollution or a continuous-monitoring alarm. The detailed monitoring plan shall define the relevant triggers, response times and sampling requirements.

Specify a logging interval appropriate to event response (for example, 5–15 minutes subject to sensor performance and station risk), telemetry latency, local backup, time synchronisation and data-completeness targets. A Campbell Scientific CR6 or equivalent logger may be considered where compatible with the selected sensors and communications system.

Candidate equipment includes a wiper-equipped YSI EXO2 or In-Situ Aqua TROLL 800 sonde, or equivalent, at priority water-quality stations; use a portable YSI ProDSS or equivalent for independent weekly checks. Treat these as performance-based examples, not a sole-source specification.

A Teledyne ISCO 6712 or equivalent autosampler may be appropriate at selected discharges or event stations where sample intake, trigger logic, power, security and bottle preservation can be managed. Level options such as an OTT PLS 500 require a surveyed datum; continuous flow measurement needs a separate canal-specific feasibility and calibration assessment.

- pH (continuous at priority stations and checked in the field)
- Specific conductance (µS/cm at 25°C, with temperature retained)
- Temperature (°C)
- Dissolved oxygen (mg/L and percentage saturation)
- Turbidity (with paired TSS samples for site-specific interpretation)
- Water level (only where useful to interpret canal operations or water-quality records; surveyed datum required)

The approved incident-response matrix will be applied to continuous alarms as well as laboratory results. Sensor alarms require rapid validation, but protective action must not be delayed where there is visible pollution or an acute risk to the canal. Provide WI, FCC, the EnvCoW and the Contractor with timely access to validated monitoring results and alarm records. Monitoring data shall be managed through a secure and auditable system capable of displaying validated time-series data, quality flags, alarms, maintenance records and data gaps. An existing WI platform shall be used where required and compatible with the monitoring equipment and project data requirements.

In addition, an instrument deployment and maintenance plan covering secure mounting, anti-fouling, cleaning, calibration checks, pre/post-clean readings, drift limits, servicing frequency, spare sensors, outage alarms and data correction/flagging is required. If a critical station fails during high-risk work, provide a defined alternative monitoring measure or pause the associated activity. The plan shall also define pre-deployment checks, independent field-verification requirements, acceptable instrument drift, validation of data affected by fouling or equipment failure, and the retention of both raw and validated records.

8.9.2.2.7.3 Additional Visual Assessment

In addition to the surface water monitoring plan involving water quality testing outlined in sub-section 8.9.2.2.7.2, the ECoW(s) will carry out visual monitoring inspections of the Royal Canal adjacent to the works sites during construction. Periodic visual observations will be made with specific reference to the following potential indicators that water pollution may have occurred:

- Change in water colour;
- Change in water transparency;
- Increases in the level of silt in the water;
- Oily sheen to water surface; and
- Floating detritus, or scums and foams.

In addition, photos will be taken to support visual observation, and inspection sheets including visual observation results and photographic records will be kept on site. Visual observations will also be

completed after major rainfall events along with photographs which will be collected and assessed by the EcoW. The elements which will be included in the visual checklist are as follows:

- Appropriate period visual inspection of the Royal Canal adjacent to active work sites by the ECoW(s)
- All elements of the surface water mitigation measures outlined in sub-section 8.9.2.2.6 will be monitored including silt fencing, and grassed swales/catchment, construction compounds etc;
- Corrective action will be carried out if there is a visual indication of discolouration, oily sheen, odour or litter.
- Event based visual inspections by the ECoW of the sections of the Royal Canal immediately adjacent to the active work sites as follows:
    - Following a high intensity localised rainfall event (10mm/hr);
    - Heavy rainfall within a day (25mm in a 24-hour period);
    - Higher than monthly rainfall within a week period.

If hydrocarbons are observed or other water quality parameters are suspected to have been exceeded, an investigation will be carried out to determine whether any element of the construction of the Proposed Development could be causing contamination. If any potential sources of contamination are observed, appropriate actions will be taken (depending on the source and nature) to prevent further contamination and the incident shall be recorded and investigated in more detail to prevent a recurrence.

The WI Environmental Team will be informed immediately in the event of any surface water pollution event.

8.9.2.2.8 Landmark Bridge Construction Mitigation

8.9.2.2.8.1 Mitigation for Sedimentation and Pollutant Events

As detailed in the construction methodology report, Landmark Bridge will be approximately 230m in length and will have a maximum single span of 30m across the Royal Canal itself (Chainages +7115 to 7350). The steel superstructure for the Landmark Bridge will be fabricated off site and brought to site on a special vehicle and then craned into position. The approaching Greenway will be initially constructed on either side of the canal, therefore providing an access route to construct the abutments and crane the steel beams into position. No in-stream works will be required for the construction of the bridge.

The foundation arrangement shall comprise appropriately sized piled foundations to the dense sands and gravels or bedrock where available. A geological fault is noted in a direction skew to the canal in this area, however, it is not viewed as a significant geotechnical risk item as the sands and gravels overlying the variable bedrock are considered to be sufficiently dense to facilitate a piled foundation.

The main source of potential impact is from the construction of the Greenway approaches and the installation of support columns in proximity to the Royal Canal itself. As such, in addition to the surface water guidance and mitigation measures outlined in sub-sections 8.9.2.2.3, 8.9.2.2.4, and 8.9.2.2.6, additional specific surface water run-off control measures are required to ensure that construction-based pollutants do not enter the Royal Canal.

To prevent pollution during the construction of the Greenway approaches, including the installation of the support columns, prior to any works, geotextile sandbag barriers and silt fencing will be installed between the location of the proposed support columns and the Royal Canal.

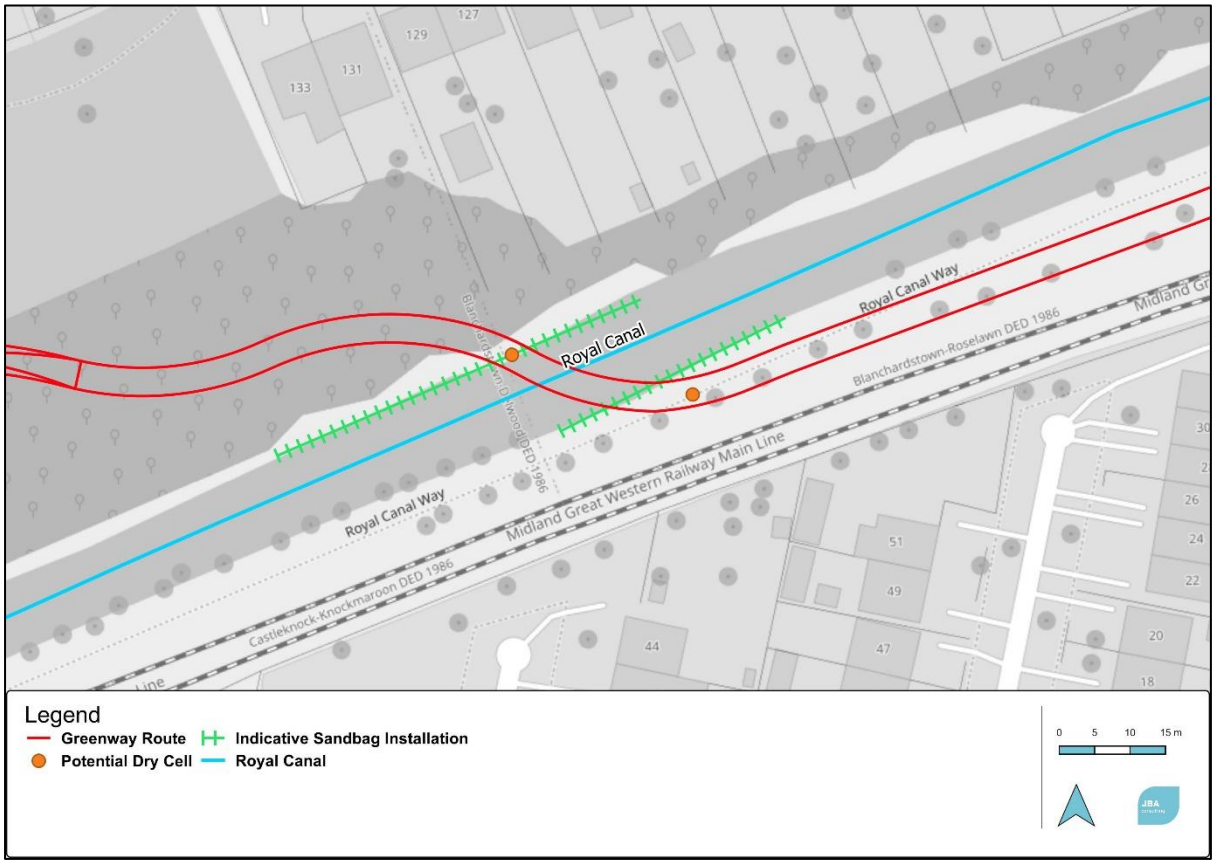


Figure 8-91 show the indicative locations of where the proposed geotextiles sandbag barriers will be placed. These geotextile sandbags and silt fencing will be installed under supervision of the woodland ECoW overseeing the works between Coolmine Bridge and the 12th Lock (Chainages +6230 – 8100). Once installed works can only proceed once the EnvCoW has done an additional check and approved the geotextile sandbag placement.

The locations shown in Figure 8-91 will be strictly adhered to, and the final determination on any changes to these locations will only be made by the onsite EnvCoW in consultation with the WI Environment Team in the event that the woodland ECoW indicates there is acceptable rationale backing their relocation, as well as assurance that the functional integrity of the mitigation measures is not compromised. The woodland ECoW will be present for the duration of the Landmark Bridge construction works and inform the EnvCoW and WI Environment team of any failures in the outlined surface water mitigation measures. The EnvCoW will also perform additional weekly checks of the geotextile sandbags to ensure their structural integrity. No construction works will occur without the presence of the woodland ECoW. These geotextile sandbags will remain in place until the construction of Landmark Bridge has been completed. Their removal will also be overseen by the woodland ECoW.

8.9.2.2.8.2 Installation of Sheet Piling (dry cell area); Cement Pours; and Silt Fence Functionality Checks

In addition to the geotextile sandbags, during the construction of foundations of the Greenway approaches, specifically the support columns, sheet piling will be used to create a temporary wall around the base of the area where the support columns will be erected. This will take place for the two columns closest to the Royal Canal, on either bankside, following the excavations required to install the columns. Sheet piling will line the excavated areas and will then be inspected by the woodland ECoW and EnCoW prior to the installation of the column.

Due to the proximity of the works to the Canal, there is potential for the excavations required for the support columns to encounter a significant volume of water, requiring the creation of bankside dry cells prior to the installation of the Greenway support columns. Potential locations for these dry calls are shown in

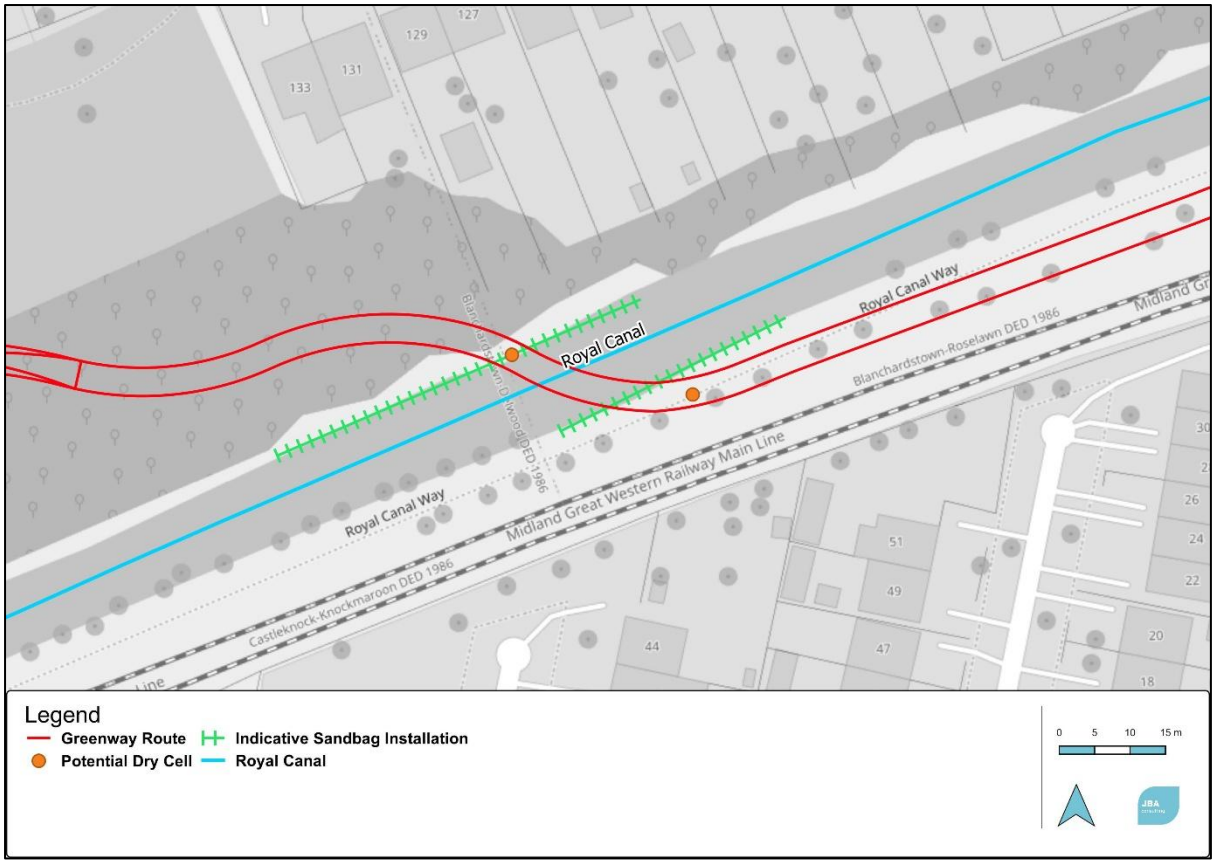


Figure 8-91. In this event, dewatering of the excavated area will be required, and these waters will be pumped off-site away from the Royal Canal, and discharged via a silt bag to a discharge point. No water will be pumped into the Royal Canal.

The discharge point will consist of a circle of triple silt fences surrounding a circle of straw bales wrapped in Terram geotextile. All waters pumped from the excavation will filter though the silt bag, straw bales and silt fences before diffusely discharging to the ground. The discharge points will be constructed precautionarily prior to commencement of construction works and will be monitored on a daily basis when in use to ensure that the release of any polluting material is mitigated. This monitoring will take

place until the installation of the pile caps. The location of the discharge points will be determined by the onsite woodland ECoW and EnvCoW prior to the commencement of any of the Landmark Bridge works and will be located at least 30m away from the Royal Canal. Following the dewatering and creation of a dry cell, sheet piling will then be installed, before the construction of the support columns commences. All sheet piling will be inspected by the woodland ECoW and EnCoW prior to the installation of the column for approval prior to the pouring of any concrete/construction of the support columns.

Should any aquatic fauna enter the dewatering system or become trapped in the dry cell area, the woodland ECoW will be there to secure them and ensure their return to the Royal Canal. All dewatering works will require oversight from the EnvCoW, who will perform daily checks on the process. The woodland ECoW will be present on site for the duration for these works, that will not commence without their presence.

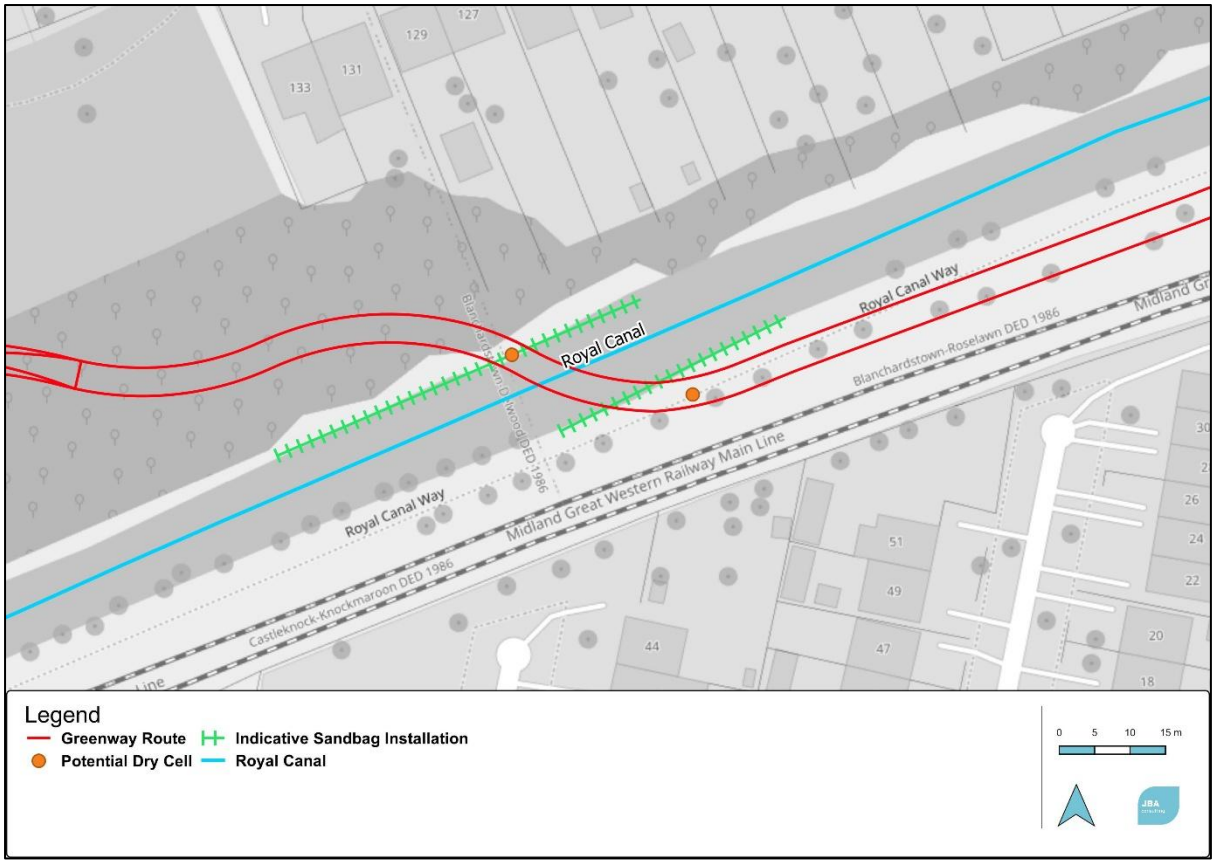


Figure 8-91: Locations for additional surface water mitigation measures for the construction of Landmark Bridge (©OSM, 2026)

8.9.2.2.9 Flood Event Mitigation

A previous strategic flood risk assessment conducted by JBA Consulting (JBA, 2025) mapped Flood Zone B (flood event with an annual exceedance probability (AEP) of between 0.1 to 1%) of the Rusk Stream. This is shown in Figure 8-92. For the duration of works, additional consideration of weather conditions will be made, with stormy conditions (orange weather warnings and above) and heavy

continuous rainfall (25mm in a 24-hour period) leading to the immediate stop to all works in the Flood Zone B area. Any exposed works surfaces will be covered using tarp under the supervision of the ECoW, and all potential sources of pollution, including construction vehicles will leave the works area. Works will only recommence following approval from both the main route ECoW and EnvCoW.

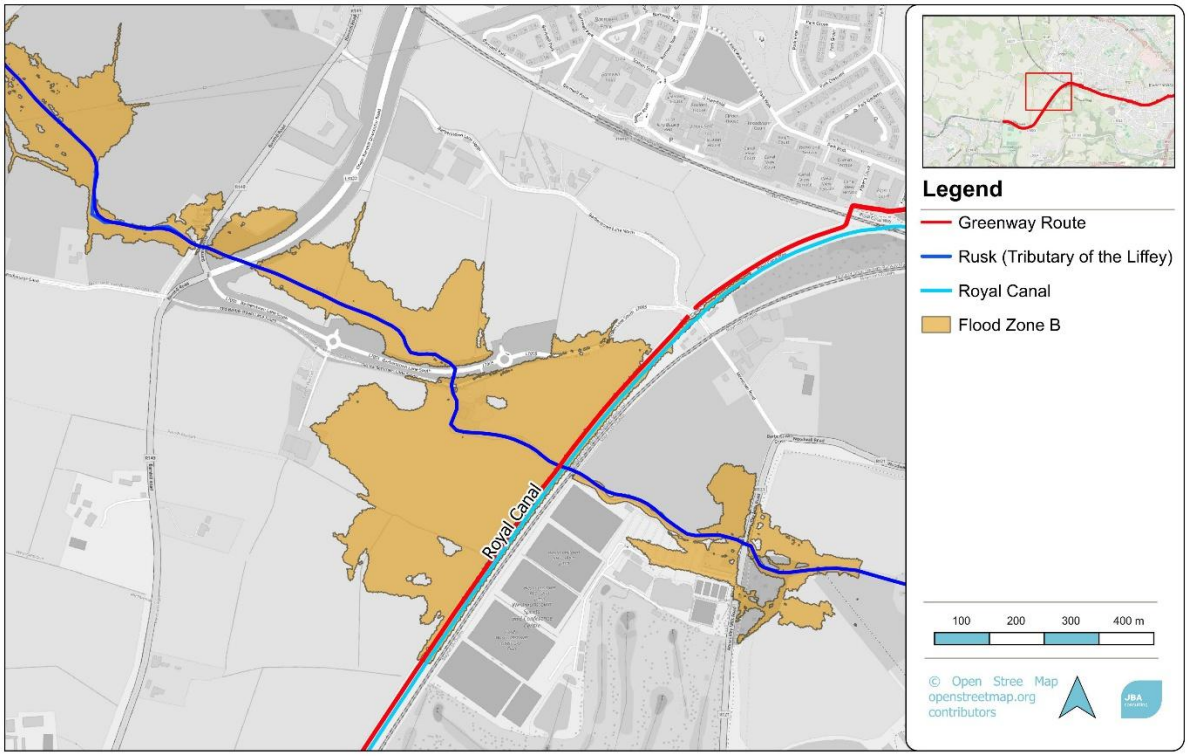


Figure 8-92: Rusk Stream flood zone B in the vicinity of the Royal Canal to the west of the Hansfield Railway Bridge (approximate chainages +3120 – 3600) (JBA, 2025) (©OSM, 2026)

In the event of a high magnitude flood event (between 0.1 to 1% AEP) during the construction of the Proposed Development within flood zone B, flood protection will be focussed on the pinch point of the flooding extent maps. The drainage ditch lining the current pathway alongside the Royal Canal has the ability to retain a large volume of water. However, as a preventative measure there should be sandbags lining the ditch in the vicinity of the area at risk of flood. The following measures will be followed in the event of a flood event:

- Remove all possible pollutants in work areas near area at risk of flooding.
- Pre-emptively remove equipment and chemicals from the work area when heavy rain is forecast or is ongoing whilst staff are on site. Under the current flood zone B extents, flood water it is unlikely to reach the pathway, however; due to the constrictions of protection if flooding does occur, removal of pollutants is the most prudent mitigation for accidental pollution events.
- Add additional geotextile sandbags around any exposed work surfaces to ensure floodwaters are kept out of these areas. Extra geotextile bags will be stored precautionarily within the site compound to the east of the Hansfield Railway Bridge, which will be checked prior to the commencement of works by the main route ECoW.
- For sedimentation mitigation during a flood event, silt curtain will be installed lining the Royal Canal on the side closest to the works under the supervision of the main route ECoW and

EnvCoW, as shown in Figure 8-93. This will allow for removal of any accidental sediment input. This silt curtain will remain in place, if deployed, until the flooding conditions have subsided. This determination will be made by the onsite EnvCoW and main route ECoW. This silt curtain will be available on-site and will be available within the site compound to the east to the Hansfield Railway Bridge, which can be accessed quickly. The main route ECoW will ensure this is present prior to the commencement of the works.



Figure 8-93: Example of silt curtain installed in canal to prevent impacts from sedimentation

8.9.2.2.10 Water Quality –Groundwater

Specific mitigation measures for impacts on groundwater are detailed in Chapter 12. Mitigation measures to prevent surface water contamination outlined above will also mitigate against groundwater contamination. Ground Investigation surveys were conducted by Ground Investigations Ireland Ltd between February and June 2020 (Ground Investigations Ireland, 2020). The results of these surveys have been taken into account during the design phase of the project as potential constraints to avoid any disruption to the aquifer underlying the site. Stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development. Approximately 80% of stripped topsoil will be reused on site (incorporated into landscaping) with remaining topsoil disposed of at a licensed waste receiving facility (subject to the approval of the facility operator in accordance with their facility permit or licence). At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas.

The need to excavate existing subsoil layers has been minimized as the proposed pavement levels have been designed to follow the natural topography of the site as much as practicable. Disturbed subsoil layers will be stabilised as soon as practicable, e.g. backfill of service trenches, construction of pavement capping layers, construction of foundations, and completion of landscaping. The duration that subsoil layers are exposed is to be minimized in order to mitigate against weather effects. Measures will be implemented to capture and treat sediment laden surface water runoff, e.g. surface water inlet protection.

8.9.2.2.11 Airborne pollutants

The contractor is required to implement the following measures in relation to air quality and climate during construction:

- The coordination, implementation and ongoing monitoring of dust produced by site activities. The dust monitoring will strictly adhere to the monitoring measures outlined in Chapter 5 (Air Quality) of this EIAR, which include the following:
    - Undertake daily on-site and off-site inspections, where receptors (including roads) are nearby, to monitor dust, record inspection results in the site inspection log. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary.
    - Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
    - Monitoring of construction dust deposition along the site boundary during the construction phase of the Proposed Development is recommended to ensure mitigation measures are working satisfactorily. Given the length of the construction site, monitoring locations should be close to nearby sensitive receptors, where prolonged construction activity is taking place or at construction compounds. This can be carried out using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2 m above ground level. The TA Luft limit value is 350 mg/m^2/day during the monitoring period of 30 days (+/- 2 days). Monitoring shall ensure that the dust mitigation measures are working satisfactorily as construction works progress.

The key aspects of controlling dust are listed below:

- The development of a documented system for managing site practices with regard to dust control, which will include the mitigation measures outlined in Chapter 5 (Air Quality) of this EIAR as well as the following;
    - Spraying of exposed earthwork activities and site haul roads during dry weather;
    - Provision of wheel wash at exit points, which will be located away from the canal;
    - Covering of stockpiles, which will be routinely inspected by the ECoW(s) for their respective work areas, the EnvCoW and Site Environment Manager (SEM);
    - Control of vehicle speeds, speed restrictions and vehicle access; and
    - Sweeping of hard surfaced roads.

- Erection of a 2.4m high hoarding will be provided around work areas where allowable to minimise the dispersion of dust from working areas.
- Stockpiles will be located as far away as possible from sensitive ecological receptors and covered/dampened during dry weather;
- Generators will be located as far away as practicable from sensitive ecological receptors;
- To prevent the harmful emissions from vehicle exhausts, on-site and delivery vehicles will be prevented from leaving engines idling, even over short periods.
- Where Asbestos Contaminated Material (ACM) is uncovered on site during construction, the ACM will be double-bagged and removed from site by a competent contractor and disposed of in accordance with the relevant procedures and legislation.
- At all times, the measures used to control dust will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust will be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

To minimise effects to the climate through harmful emissions, the following controls shall be put in place:

- On-site and delivery vehicles will be prevented from leaving engines idling, even over short periods.
- Material wastage due to poor timing or over ordering on site will be minimised to reduce the embodied carbon footprint of the site.
- The travel distance required to complete the delivery of material and supplies shall be taken into account during procurement and minimised. An outline of the specific travel and transport accommodations for this Proposed Development are outlined in Chapter 14.

8.9.2.2.12 Clearance and Protection of Vegetation

The seasonal restriction on the removal of vegetation is in place from March till August (inclusive), in order to safeguard breeding bird species utilising scrub and wooded vegetation for nesting purposes. The clearance of all trees and scrub will be conducted outside of this window under the supervision of one of the ECoWs. More details pertaining to nesting birds are described in sub-section 8.9.2.2.18.

Additionally, in order to avoid damage and compaction of the roots of retained trees along the Proposed Development, the following measures will be strictly adhered to;

- Machinery will avoid areas in rooting zones or areas occupied by the woods or standalone trees that are to be retained.
- An appropriate buffer zone around trees and vulnerable vegetation will be implemented using Heras fencing in order to reduce the risk of accidental root or limb damage. This will be done along the Proposed Development, in the immediate vicinity of the works areas. This will also be done for any trees in the vicinity of the site compounds. Due to the length of the Proposed Development, this fencing will be removed once works in their vicinity have been completed and reused in the next works areas. This can be done for the length of the Proposed Development with the exception of the woodland area between Coolmine Bridge and Proposed Landmark Bridge (Chainage +6300 – 7170). All retained trees within a 2m radius of the proposed works will have heras fencing erected at their base.

- In order to mitigate for dry, windy days, exposed soil will be dampened during periods of dry weather in order to minimise the generation of dust that would damage local vegetation.

8.9.2.2.13 General Avoidance Measures on the prevention of species mortality

General avoidance measures that will be incorporated by the contractors working on site include:

- Contractors will ensure that no harm comes to wildlife by maintaining the site efficiently and clearing away materials which are not in use, such as wire or bags in which animals can become entangled; and
- Any pipes will be capped when not in use (especially at night) to prevent local fauna becoming trapped. Any excavations will be covered overnight to prevent animals from falling and getting trapped. If that is not possible, a strategically placed plank will be placed to allow animals to escape.

8.9.2.2.14 General Measures on the disturbance of species on site from noise, light and habitat disconnection.

Construction works have the potential to impact the connectivity of the wildlife corridor that is the Royal Canal. This wildlife corridor exists as a series of linked areas of habitat offering variability in foraging and refuge opportunities for a variety of species occurring along the Royal Canal, including Otter and bat species that would utilise the waters of the canal for commuting, or Badger and other terrestrial mammals (such as Hedgehog) who may use the grasslands and woodlands for commuting. While the measures outlined above in sub-sections 8.9.2.2.3 to 8.9.2.2.13 inclusive measures to protect the local environment, including air, surface and groundwater quality, additional measures for the prevention of disturbance on species through noise, light and habitat disconnection are outlined in Chapter 7 of this report. These include:

- The implementation of a quiet plan, where the least noisy tools will be selected in consultation with the ECoW, and units be supplied with manufacturers' proprietary acoustic enclosures where available.
- The use of machinery for lifting bulky items, dropping, and loading of materials within work areas will be restricted to normal working hours.
- For mobile plant items such as dump trucks, excavators and loaders, the installation of an acoustic exhaust and or maintaining enclosure panels closed during operation can reduce noise levels by up to 10dB. Mobile plant will be switched off when not in use and not left idling.
- For compressors, generators, and pumps, these can be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation.
- Demountable enclosures will also be used to screen operatives using hand tools and will be moved around site, as necessary. This will specifically be carried out, under the supervision of the onsite ECoW, for the loudest operations which include piling and excavations during the construction of Landmark Bridge (chainages +7115 - 7300), and the excavations for Quarry Bridge (Chainage +6500).
- All items of plant will be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures.

- Care will be taken when cleaning augers of piling rigs. Shaking and banging of the auger to loosen earth will be avoided.
- Use of pneumatic hand tools will be avoided at night-time, and fixings will be manually tightened.
- Prior to construction, a survey will be carried out along the Royal Canal within the 150m disturbance buffer to check for signs of Otter to ensure no breeding holts are disturbed. This survey, and any subsequent follow ups shall follow the most up to date guidelines and /or methods described in The Otter Field Survey & Monitoring Handbook.
- A specialist sub-contractor shall also be engaged by the main contractor to monitor, collate and report on noise and vibration results for the duration of critical work activities, as part of a Noise and Vibration Management Plan (NVMP).

To reduce the opportunity for light pollution across the area of proposed work, works will be limited to daylight hours whenever possible. If works are required to take place at night, lights with the shortest column height will be used. These lights will be LEDs, oriented in a manner and highly cowled with hoarding around the proposed areas of works erected so that any light spill is reduced to levels no higher than a lux level of five.

8.9.2.2.15 Proposed Development-wide Habitat Mitigation

8.9.2.2.15.1 Woodland and scrub habitats - (Mixed) broadleaf woodland, Treelines, Hedgerows, Scrub, and Scrub and Dry meadow and grassy verge mosaic:

General Measures

Some trees need to be removed or pruned to facilitate construction works, while others are considered a safety risk due to poor quality and need to be removed. Trees to be retained will be protected by the erection of protective fencing under the supervision of a Site Arborist prior to construction, and no works are to be undertaken within the tree root protection zone, as specified in the Arborist Impact Statement and Arboricultural Method Statement (Charles McCorkell Arboricultural Consultancy, 2026). The protection fencing will line the Proposed Development and prevent works encroaching within the root protection zones. No materials or equipment other than those required to erect protective fencing will be delivered to the site before the fencing is installed. Signs will be fixed to every third panel stating, ‘Tree Protection Area Keep Out – Any incursion into the protected area must be with the agreement of the local authority or the site ECoWs’. The main contractor will inform the local authority and that tree protection is in place before site clearance works commence, which will be overseen by the relevant ECoW. No alteration, removal or repositioning of the tree protection will take place during construction without the prior consent of the ECoW. The ECoW will monitor tree protection during construction. Further, the regeneration of young trees needs to be safe guarded and young/early mature trees of high quality will be retained.

The planting of new vegetation will take place during construction in tandem with the construction of the Greenway. To offset the removal of trees, hedgerows and vegetation along the Proposed Development, a variety of native/naturalized species have been selected to enhance and increase woodland cover as part of the Proposed Developments Landscape Plan (Appendix 10.2). 619 linear metres of native hedgerow will be planted. Hedgerows and dense scrub have been strategically placed to lessen disturbance within the woodlands and to act as natural screening.

Trees will be planted at various stages of maturity from 2.5m to 5m in height. The Landscape Plan (Appendix 10.2) includes native species such as Scots Pine *Pinus sylvestris*, Common Oak, Sessile

Oak *Quercus petraea*, Wild Cherry *Prunus Avium*, Rowan *Sorbus aucuparia*, Alder, Silver Birch *Betula pendula*, Downy Birch *Betula pubescens*, Bird Cherry *Prunus padus*, Common Hazel and European Crab Apple. Hedgerows will be made up of mainly Hawthorn (60%) and other native species such as Common Hazel and Elder. A proportion of the trees that are to be removed for the Proposed Development are poor quality Ash with dieback infection. These trees have limited long-term potential due to this disease and will be replaced by various species that have better long-term prospects, as specified above.

Woodland Clearance Works: (Mixed) broadleaved woodland - Coolmine Road to Roselawn Road (Chainages +6300 - +7170) and Kennan Bridge to Dr Troy Bridge (Chainages + 5450 - +5550)

Due to terrain constraints and the thickness of the underlying vegetation, surveying of the section of woodland between Coolmine Road and Roselawn Road was naturally limited in comparison to other sections of the Proposed Development. While inactive Badger setts and Otter holts, alongside low potential BRP were identified, given the challenges associated with surveying this area the possibility of additional sensitive ecological receptors being identified cannot be ruled out. Additionally, for the woodland area between Kennan Bridge to Dr Troy Bridge, specifically where tree removal is planned (Chainages + 5450 - +5550), the same precautionary approach will be applied due to natural limitations when surveying dense woodland habitats.

Therefore, prior to and as clearance work happens within these sections, a dynamic approach has been proposed, which must be overseen by the woodland ECoW (see Table 8-31). The ECoW will be present at all times and assess the work as it goes on. If any additional sensitive ecological receptors are identified during the works, such as additional Badger sett entrances, the works will be stopped and an additional assessment of the receptors made. These works must be conducted outside the nesting bird season, March till August (inclusive). If a scenario presents itself where vegetation must be cleared within the breeding bird season, the appointed woodland ECoW will be required to undertake an additional breeding bird nest-check survey to identify if any nests are present.

The following must be followed in the event sensitive faunal receptors are identified during the works:

- In the event that additional Badger setts are found, see sub-section 8.9.2.2.16.1
- In the event that additional Otter holts are found, see sub-section 8.9.2.2.16.2
- In the event additional bat roosting features are found, see 8.9.2.2.16.3
- In the event bird nests are identified, see sub-section 8.9.2.2.16.4

In addition to these measures, the retained sections of the woodland between Coolmine Road and Roselawn Road (Chainages +6300 - +7170) and between Kennan Bridge and Dr Troy Bridge (Chainages + 5450 - +5550) will be fenced off to prevent incursion by machinery, operating staff or the public during construction phase. Small gaps should be made at the base of these fences in consultation with the on-site ECoW to facilitate the movement of non-volant mammal species such as Badger through these fences during construction.

In regard to the management of invasive species and protecting these woodland habitats, the on-site ECoW will follow the measures outlined within the invasive species management plan, which is outlined in sub-section 8.9.2.2.17 The plan includes specific guidance for the works between Coolmine Road and Roselawn Road (Chainages +6300 - +7170) and between Kennan Bridge and Dr Troy Bridge (Chainages + 5450 - +5550).

In addition to these measures, the woodland clearance works must avoid using large excavators and other large construction vehicles. The works will be conducted with small and handheld machinery. The machinery and equipment used must be agreed upon prior to the works with NPWS and the site appointed ECoW. This will be outlined in the OCEMP, which will strictly adhered to by the appointed contractor who will integrated the OCEMP into the final CEMP which they will provide to the WI Environmental Team and the Fingal Biodiversity Officer for approval prior to the commencement of any works.

8.9.2.2.15.2 Grassland habitat – Dry meadows and grassy verges and Dry calcareous and neutral grassland

An area of formerly Annex I grassland is located in proximity to sections of the works west of the Hansfield Railway Bridge (**Error! Reference source not found.**). Although this grassland was not of Annex I quality during the most recent surveys of the area, the seed bank is still present. Therefore, this grassland area has the potential to return relatively quickly to Annex quality.

To avoid any physical disturbance to this grassland area during the construction phase there will need fencing erected to surround the grassland, this fencing will also require clear signage that this is a no go zone due to ecological value. This will clearly indicate to construction personnel that the area is not to be disturbed, regular checks from the designated main route ECoW to determine the adherence to these measures will be required during the construction phase.

The exclusion from this area includes both machinery and pedestrian access, this will ensure no disturbance to the grassland or the existing seedbank is disrupted during the construction phase. A toolbox talk to personnel working on the site to outline excluded areas will be undertaken by the main route ECoW.

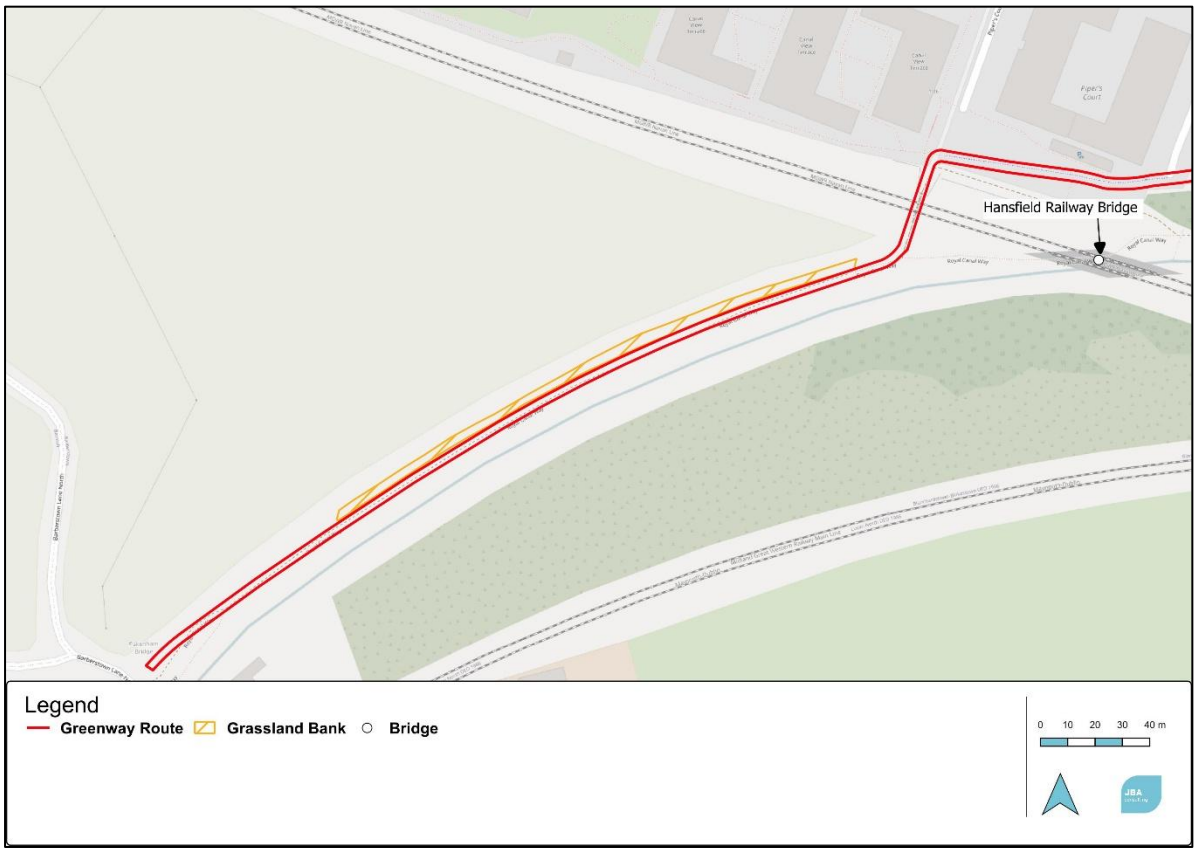


Figure 8-94: Area of the former Annex I - Lowland hay meadows [6510] to be fenced off for during all construction phase work to the west of the Hansfield Railway Bridge

The two plots of former Annex I grassland habitat will be noted in the OCEMP and included within the final CEMP and will be fenced off during works. It is the responsibility of the Environmental Manager and on site ECoW to ensure that works do not encroach on this habitat during the construction phase. Suitable management or mowing of the fenced off area of grassland must take place to prevent growth of rank vegetation during the fenced off period under the guidance of the main route ECoW.

8.9.2.2.16 Proposed Development-wide Species Mitigations

8.9.2.2.16.1 Badger

General Mitigation

General mitigation measures are detailed in the Stage 2 Badger Survey Report completed for this Proposed Development (Triturus Environmental Ltd, 2025a) available in Appendix 5.5.9. These measures are summarised as:

- No heavy machinery will be used within 30m of any inactive/active Badger setts;
- During Badger breeding season (December to June) No works will be undertaken within 50m of active badger setts with a 150m exclusion for pile-driving works;
- Temporary timber hoarding will be installed 30m from sett areas in a partial arc as a means of screening the Badgers and the vegetation they utilize from indirect disturbance. This only applies to Glen Garbh, where important foraging habitat is located to the north of the Proposed Development;
- Adjoining areas of Badger habitat to always remain accessible. Contractor to install temporary Badger passes, underpasses and tunnels to allow Badger access if needed.
- As detailed in sub-section 8.9.2.1.2, pre-construction Badger survey will be undertaken no more than 10-12 months prior to works commencement.
- The appointed ECoW would ensure the Badger mitigation measures are implemented.
- The landscape masterplan will include planting choices which provide varied habitats for Badger foraging and will be laid out in such a way as to screen certain sections of the Greenway from Badger setts and commuting zones. This is discussed further in the operational phase mitigations in sub section 8.9.3.2.1.

Mitigation for Inactive/Disused Setts within 30m of the Proposed Development

As detailed in the impact assessment, the Proposed Development between Coolmine Road and Roselawn Road (Chainages +6300 - +7170) will occur within 30m of two inactive Badger sett entrances. The work has the potential to damage these setts due their proximity to the Proposed Development, as well as cause any physical harm if these setts become active. These setts will be surveyed prior to construction, as detailed in sub-section 8.9.2.1.2. In the event that no new activity is identified, the NRA Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes (NRA, 2005) will be strictly adhered to for instances when sett entrances are located within 30m of the Proposed Development, but not immediately within the Proposed Development boundary. This will be done in consultation with NPWS, and all works in the vicinity (30m) of any of the identified inactive Badger setts will only commencement following approval from NPWS.

The specific guidance on the treatment of inactive Badger setts within 30m of construction works outlined within the NRA guidelines (NRA, 2005) includes the following;

- To prevent their reoccupation, the entrances may be lightly blocked with vegetation and a light application of soil (soft blocking). The purpose of soft blocking is to confirm that an apparently inactive sett is not occupied by badgers.
- If all entrances remain undisturbed for approximately five days, the sett will be hard blocked immediately, under the supervision of the licensee and a suitably qualified ECoW. Hard blocking

is best achieved using buried fencing materials and compacted soil with further fencing materials laid across and firmly fixed to blocked entrances and surrounds. The entrances must not be infilled completely as once construction is complete; these sett entrances will once again be suitable for Badger to utilize.

The outlined measures will be agreed upon prior to the commencement of construction with the Fingal County Council Biodiversity Officer, in consultation with members of NPWS.

In addition to the setts identified between Coolmine Road and Roselawn Road (Chainages +6300 - +7170), further active and inactive setts were identified in the woodland area between Kennan Bridge and Dr Troy Bridge (Chainages + 5450 - +5550) and the west of the Old Schoolhouse. These setts were identified within 50m of the Proposed Development. However, these setts will be screened from the works by tree cover which will partially buffer disturbance from the Proposed Development. However, these setts may still be disturbed due to vibrations from construction-based vehicles. These setts will therefore need continuous camera trap monitoring before and during construction, in consultation with the Fingal Biodiversity Officer and NPWS. In the event that significant disturbance is anticipated, the work methodology and the design of the Proposed Development will require further assessment in order to minimise impacts.

Mitigation for Active Setts

In the event that any of the identified Badger Sett entrances within 30m of the Proposed Development, most significantly between Coolmine Road and Roselawn Road (Chainages +6300 - +7170), shows any indication of current or recent badger activity, further consultation with Fingal County Council and NPWS will be made. If approved for temporary evacuation, the recommended guidance for evacuation procedures (NRA, 2009) will be followed. Notably any sett entrances in close proximity, such as between Coolmine Road and Roselawn Road, will be treated as a single sett and both entrances will require evacuation procedures. In this event, the Fingal County Council Biodiversity Officer, alongside NPWS will be notified and consulted throughout the implementation of any exclusionary mitigation measures.

Measures are outlined within the NRA guidance (2005) for the treatment of active Badger setts, and are outlined below:

- Inactive entrances may be soft and then hard-blocked, but any active entrances will have one-way gates installed (plus proofing around sides of gates as shown in 8.9.2.1.2 to allow Badgers to exit but not to return.
- The gates will be tied open for three days prior to being set to exclude. Sticks will be placed at arm’s length within the gated tunnels to establish if Badgers remain within the sett. Gates will be left installed, with regular inspections, over a minimum period of 21 days (including period with gates tied open) before the sett is deemed inactive.
- Any activity at all will require the procedures to be repeated or additional measures taken.
- Gates might be interfered with by other mammals or members of the public - hence the importance of regular exclusion monitoring visits.

Additional Measures

In the event that during the pre-enabling work surveys and subsequent construction phase monitoring additional Badger setts are identified directly within the Proposed Development, works in that area must be temporarily stopped. The new setts must be surveyed to determine their relative activity level, and the Fingal Biodiversity Officer and NPWS must immediately be notified. Design alternatives must then be considered alongside updates to the CEMP to minimize potential impacts on these setts.



Figure 8-95: Examples of one-way gates in place over Badger sett entrances included within the NRA guidance (2005) on the treatment of Badgers

While the surveys did not indicate the presence of any extensive setts within the project's Zol, in the event that new sett entrances are identified prior to construction, and where there is significant excavation, an alternative method for exclusion is outlined below (NRA, 2005):

- Where an extensive sett is involved, an alternative method of evacuating badgers is to erect electric fencing around the sett (ensuring all entrances are included) with one-way badger-gates installed within the electric fence at points where the fence crosses badger paths leading to and from the sett.
- The exclusion will again take place over a minimum period of 21 days before construction within 50m of the sett; this monitoring period would be contingent upon no badger activity being observed within the fenced area. Fencing may not be practical in many situations due to the topography, scrub vegetation or the terrain – and can be difficult to install effectively, such as is the case between Coolmine Road and Roselawn Road.

The requirement of these alternative measures will be determined by the on-site ECoW, in consultation with the Fingal County Council Biodiversity Officer, alongside members of NPWS.

8.9.2.2.16.2 Otter

General Mitigation Measures

Specific mitigation measures are detailed in the Otter Report completed for this Proposed Development by Triturus Environmental Ltd (2025b) (see Appendix 8.5.4), and are outlined below:

- As the Proposed Development are likely to disturb a breeding holt given its close proximity of <30m to the site, a separate Regulation 54 Derogation license for the disturbance of a breeding holt is being obtained from the National Parks and Wildlife Service (NPWS). No works can take place within 150m of a holt until a derogation license has been granted. This is required before the project goes to planning, and the associated derogation license will only cover this specific holt. Any other holts, should they become active will require their own derogation licenses and additional mitigation, which is outlined below.
- Furthermore, a pre-construction Otter survey of these potential holts will be required to determine if the areas have become active in the interim period between initial surveys and the construction phase of the Greenway.

- Areas that have previously been identified as a latrine, while not requiring a derogation license, will be avoided or minimally impacted

Otter Holt Mitigation Measures

Alongside the derogation license, to prevent disturbance to the breeding holt at the western end of the Proposed Development, works will be appropriately screened through the use of timber hoarding. As this breeding holt is located on the opposite bank of the Proposed Development and is already partially screened by trees, the proposed timber hoarding will be placed between the Proposed Development and the nearest bank of the Royal Canal. An appointed ECoW will oversee the implementation of this hoarding.

In addition to the breeding holt, three historical/inactive holts were identified between Coolmine Road and Roselawn Road (Chainages +6300 - +7170), within close proximity of the Proposed Development. The works have the potential to disturb these holts. These holts will be surveyed prior to construction, as detailed in sub-section 8.9.2.1.2. In the event that any of these holts shows any indication of current or recent otter activity, the holt will require thorough evacuation procedures, which will follow the guidance outlined in the NRA Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes (NRA, 2006).

In this event, the Fingal County Council Biodiversity Officer, alongside members of NPWS will be notified and consulted throughout the implementation of any exclusionary mitigation measures, and an additional derogation license application must be immediately submitted to NPWS. No works can take place within 150m of that holt until the derogation license has been granted. Otters do not tolerate disturbance at or near holts that are in active use by them.

Measures for the treatment of active Otter holts outlined within the NRA Guidelines (NRA, 2006) includes the following:

- To evacuate Otters from non-breeding holts, general disturbance (e.g. vegetation clearance) and use of approved chemical deterrents is recommended.
- After a period of monitoring, the holt entrances may be lightly blocked - as for inactive holts.
- Whilst the use of one-way gates is normally a procedure adopted in relation to the exclusion of badgers from setts, and not a standard procedure for the exclusion of otters from holts, this method may be used, in some circumstances, with gates being left in place for a period of 21 days as advised in relation to badgers.
- However, where breeding Otter females or cubs are present, it is imperative that no evacuation procedures of any kind will be undertaken until the Otters have vacated the holt (this will be established by the Otter surveyor undertaking Otter monitoring operations). Otter breeding may take place at any season of the year, so breeding activity at holts will need to be determined on a case-by-case basis. The period over which pregnant females and cubs are present in a holt can be up to 21 or more weeks. The gestation period is nine weeks, and the cubs remain inside the holt for about seven weeks before venturing into the open. The cubs are weaned when aged three to four months. Once the female and her cubs have vacated the breeding holt, the holt will be monitored and the Otters then temporarily excluded from the holt following the procedures already outlined.

Once again, in the event that breeding females or cubs are present, a new derogation license will be required, and an application must be made immediately with NPWS. No works will take place within 150m of the newly identified breeding holt until the derogation license has been received. The onsite ECoW will clearly demarcate this 150m buffer and ensure no works encroach within this area.

Additional Measures

In the event that during the pre-enabling work surveys and subsequent construction phase monitoring additional Otter holts are identified directly within the Proposed Development, works in that area must be temporarily stopped. The new holts must be surveyed to determine their relative activity level, and the Fingal Biodiversity Officer and NPWS must immediately be notified. Design alternatives must then be considered alongside updates to the CEMP to minimize potential impacts on these holts. Additional derogation licenses will be required for any works near these holts.

8.9.2.2.16.3 Bats

Construction-based Lighting

The following mitigation measures, outlined in the accompanying Bat reports (Bat Eco Services (2022, & 2025)) (see Appendix 8.5.8) will be followed for all construction-based lighting and monitored by the onsite ECoWs for their respective work sections (see Table 8-31) to ensure compliance:

- If additional construction-based lighting is required, the lighting poles will be installed on the boundary of the Proposed Development and will face inwards (i.e. away from the Royal Canal and the habitats adjacent to the Greenway). This will ensure that lighting is not directed onto sensitive habitats.
- No lighting will be in operation outside of working times.
- All lights around the Proposed Development's boundary will be fitted with directional hoods and/or luminaires to direct the light downwards onto targeted areas and to prevent unnecessary light-spill into the Royal Canal.
- The intensity of lighting will be kept to the minimum level required for safety and security.
- Low-UV LEDs or low / high pressure sodium lamps will be the preferred bulb type, as they have least adverse effect on bats. Mercury, metal halide or high-UV LED bulbs will not be used.
- The site lux levels within suitable foraging habitat and within important dark corridors for local bat species, which includes directly along the Canal itself as well as any and all treelines, hedgerows, and woodland habitat, will not be increased above 1lux as a result of construction activities within the Proposed Development's work area.
- Works will only be carried out in daylight hours in order to reduce the need for lighting on site (outside of the three proposed compound areas).
- The construction of Landmark Bridge must be carried out within the daylight hours to reduce the need for construction-based lighting that would impact commuting bats and Otter within the Royal Canal.

The appointed ECoW will be present when site lighting is initially set up in a works area and will regularly monitor the lux levels to ensure that they are not impacting dark corridors or secondary foraging locations. The ECoW will also familiarise themselves with the following best practice documentation in order to ensure that they are correctly fulfilling their role in respect to lighting mitigation:

- Bats and Artificial Lighting at Night – Guidance Note 08/23 (BCT, 2023);
- Bats & Lighting – Guidance Notes for Planners, Engineers, Architects and Developers (BCI, 2010); and
- The reduction of Obstructive Light – Guidance Note GN01/21 (ILP, 2021).

These measures will apply both to temporary lighting during the construction of the proposed development, and to permanent lighting during the operation of the development.

Roosting Features

In the event a roosting feature/active root is identified, the following mitigation derived from those in the Bat Reports (Bat Eco Services (2022, & 2025) (see Appendix 8.5.8) will be followed:

- Any mature trees subject to removal will be surveyed for Potential Bat Roost value before felling by an appropriately qualified ecologist. If a bat roost is found, felling will be reconsidered. If felling is unavoidable, an endoscopic survey must be conducted and if roosting bats are found, a derogation license from NPWS will be required for the removal of bats by a suitably qualified ecologist.

8.9.2.2.16.4 Birds

The seasonal restriction on the removal of vegetation is in place from March till August (inclusive), in order to safeguard breeding bird species utilising scrub and wooded vegetation for nesting purposes. If a scenario presents itself where vegetation must be cleared within the breeding bird season, the appointed ECoW will be required to undertake an additional breeding bird nest-check survey, on top of the pre-enabling work nesting survey outlined in sub-section 8.9.2.1.2, in advance of the works to ensure that there will be no impacts on nesting birds. If nests are found, they will be safeguarded, with the nests' tree left untouched by trimming or removal works, until the chicks have successfully fledged. If no nests are identified, works will recommence immediately under supervision of the onsite ECoW.

Additionally, any works occurring in the vicinity of the existing bridges, within a 30m buffer, namely the railway line crossing where Barn Swallow have been previously recorded nesting, will be checked for nests prior to construction works by the appointed ECoW. In the event that nests are identified, works within a 30m buffer will not occur within the nesting season, March till August (inclusive). In the event that no nests are identified, construction works can commence within this period.

8.9.2.2.16.5 Aquatic Species (Macroinvertebrates and Fish)

During the construction phase, the habitats within the Royal Canal will be retained. As outlined in Chapter 12 (Water), the Proposed Development layout has evolved in order that the design avoids conflict with the water environment. Design evolution to minimise environmental impact has been prioritised throughout the various design stages. This is also detailed in Chapter 4 Consideration of Alternatives, as well as the Route Options Assessment Report and has been continued throughout the planning stage and design phases. The alignment of the Greenway at the new watercourse crossing (the Landmark Bridge, Chainage +6300 – 7170) is such that it facilitates the construction of the crossing structures outside the active canal channel by utilising a clear span crossing (bridge) which can be constructed while maintaining the canal banks.

The main potential impacts on the canal and its associated aquatic floral and faunal species are surface water polluting events, such as due to the accidental spill of hydrocarbons. Measures to protect the

Royal Canal and its aquatic species from construction phase surface water polluting events are outlined in sub-sections 8.9.2.2.6 to 8.9.2.2.9 inclusive and will be strictly adhered to. As noted in the impact assessment, the levels of shading anticipated as a result of the proposed works, which includes the Landmark Bridge structure which will be erected over the Royal Canal, are predicted to have non-significant impacts on aquatic flora and fauna, and therefore not impact Glutinous snail and Fish populations.

8.9.2.2.17 Invasive Species Management Plan

Due to the presence of a number of invasive species along the Proposed Development, including three Third Schedule invasive Species, namely Rhododendron, Spanish Bluebell, and Three-cornered Garlic, an Invasive Species Management Plan (ISMP) is required to manage and prevent the spread of these species during the construction and initial operational phases. This plan is outlined below in sub-sections 8.9.2.2.17.1 to 8.9.2.2.17.14 and will be incorporated into the CEMP which will be completed by appointed contractor.

8.9.2.2.17.1 Legislative Context

The Third Schedule of the Birds and Natural Habitats Regulations 2011 (S.I No. 447/2011) and the First Schedule of the Invasive Alien Species Regulations 2024 (S.I. No. 374/2024) contain specific provisions that govern control of listed invasive species. It is an offence to release or allow to disperse or escape, to breed, propagate, import, transport, sell or advertise species listed on the First Schedule of the Invasive Alien Species Regulations or Third Schedule of the Birds and Natural Habitats Regulations without a License.

The two regulations that deal specifically with this scheduled list of species are:

- Regulation 49: Prohibition of introduction and dispersal of certain species; and
- Regulation 50: Prohibition on dealing in and keeping certain species.

Following on from that, the following are strictly prohibited:

- Dumping invasive species cuttings anywhere other than in facilities licensed to accept them;
- Planting or otherwise causing to grow in the wild - hence the landowner (in respect of the Proposed Development, this being Fingal County Council and the appointed contractor) should be careful not to cause further spread;
- Disposing of invasive species at a landfill site without first informing the landfill site (that is licensed under Number 10 of 1996 - Waste Management Act, 1996 (as amended) (hereafter referred to as the Waste Management Act, as amended) to take such material (plant or soil) that the waste contains invasive species material (this action requires an appropriate license);
- Moving soil which contains First Schedule of the Invasive Alien Species Regulations or Third Schedule of the Birds and Natural Habitats Regulations -specific non-native invasive species in the Republic of Ireland, unless under license from the National Parks and Wildlife Service (NPWS) (this license is separate from and does not discharge any person being in receipt of other necessary waste permits/ licenses etc.); and
- Regulation (EU) No. 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species (hereafter referred to as the IAS Regulation) lists specific Species of Union Concern, some of which

overlap with the species of the First Schedule of the Invasive Alien Species Regulations or Third Schedule of the Birds and Natural Habitats Regulations.

The IAS Regulation conveys the rules to prevent, minimize and mitigate the adverse impacts of the introduction and spread (both with and without intention) of IAS on biodiversity and the related ecosystem services, as well as other adverse impacts on human health or the economy.

National Policies, frameworks and plans also govern INNS species in Ireland. One such plan is 'Ireland's 4th National Biodiversity Action Plan 2023-2030' (NPWS, 2023). Specifically in this plan, Objective 2H: "Invasive alien species (IAS) are controlled and managed on an all-island basis to reduce the harmful impact they have on biodiversity, and measures are undertaken to tackle the introduction and spread of new IAS to the environment". While these targets are at a national level, with such ambition in mind, they may still be relevant to the management of INNS species along the Proposed Development and underline the importance for controlling the species from a biodiversity protection perspective as well as the legal perspective described above. These targets include:

- By 2030, IAS are controlled, managed and where possible, eradicated (2H1, 2H2, 2H3);
- By 2030, IAS are controlled, managed and where possible, eradicated within Protected Areas and effectively controlled in urban, peri-urban areas, the wider countryside and marine and coastal areas (2H4, 2H5, 2H6, 2H7, 2H8);

Other national policies, frameworks and plans pertinent to INNS include the following:

- The *Biodiversity Climate Change Sectoral Adaptation Plan* (DHLGH, 2025) whereby;

  Action 1.2.4: NPWS will establish an Invasive Alien Species unit to expedite implementation of the legislative and policy framework, including specific resources for enforcement.

  Action 3.8.4: NPWS and other relevant stakeholders will deliver on the National Invasive Species Management Plan (forthcoming) and continue to cooperate with NI authorities on identifying and delivering on all-island actions to control and manage IAS.

The Water Framework Directive (WFD) (Directive 2000/60/EC) whereby in Ireland, invasive species are considered a significant pressure on waterbodies. INNS species have been identified as a significant issue for water management.

In relation to the invasive species Cherry Laurel, which is not listed on either of the schedules, nor included on the European list of invasive species of European Union concern, NPWS has undertaken a risk assessment for this species and identified it as a high-risk invasive species in Ireland (NBDC, 2026b). It is of national concern as it can have a detrimental impact on native habitats and species, it will outcompete and shade any flora in woodland habitats. This will result in a loss of the ground flora, shrub layer and recruitment of tree saplings as none of them will be able to grow, this will eventually lead to the loss of woodland habitat.

The process of adding any species to the list of invasive alien species of national concern requires a risk assessment of that species to be undertaken to ensure that the scientific evidence demands its inclusion. Once completed, a Statutory Instrument to amend the First Schedule to the European Union (Invasive Alien Species) Regulations 2024 and the Third Schedule to the European Union (Birds and Natural Habitats) Regulations 2011 would also be required.

In the meantime, Regulation 12 of the European Union (Invasive Alien Species) Regulations 2024 provides for emergency measures for species that are not included on the Union list. The National Parks and Wildlife Service will consider options for the control of Cherry Laurel, including legislative solutions, informed by the ongoing risk assessment. A new partnership between the National Parks and Wildlife Service (NPWS) and the National Biodiversity Data Centre (NBDC) was established in 2026 as the Invasive Species Bureau (DHLGH, 2026). The bureau will support implementation of EU regulations on invasive species that threatened native species and habitats in Ireland.

It should be noted that any decision on the efficacy of chemical treatments can only be provided by a registered pesticides advisor. A suitably qualified specialist will be engaged by the appointed contractor to monitor the treatment of non-native invasive species. This Invasive Species Management Plan will be updated as necessary by the specialist.

8.9.2.2.17.2 Best practice management guidance documents for Invasive Species Management

The following measures utilize the best practice management guidance documents listed below, where relevant:

- The Management of Invasive Alien Plant Species on National Roads – Technical Guidance (TII, 2020a);
- The Management of Invasive Alien Plant Species on National Roads – Standard (TII, 2020b);
- Inland Fisheries Ireland - Biosecurity Protocol for Field Survey Work (IFI, 2010);
- Managing Invasive Non-Native Plants in or near Freshwater (EA, 2010);
- Managing Invasive Alien Plants in Ireland (2016-NC-MS-7) EPA Research Report, 2022
- Best Practice Management Guidelines; Rhododendron (*Rhododendron ponticum*) and Cherry Laurel (*Prunus laurocerasus*) (Maguire et al., 2008).

Additionally, due to the presence of Japanese Knotweed in the vicinity of the Royal Canal at Clonsilla, the following guidance documents are also included:

- Invasive Species Ireland (ISI) Best Practice Management Guidelines for Japanese Knotweed (ISI, 2008);
- Good Practice Management Guide for Japanese knotweed (*Fallopia japonica*), (Rapid Life, 2018)

8.9.2.2.17.3 Pre-construction Survey

As mentioned in sub-section, an updated invasive species baseline survey shall be conducted prior to the commencement of any of the Proposed Development's pre-enabling works. This updated baseline is required as invasive species may have spread within and adjacent to the Proposed Development since the last invasive habitat survey was conducted onsite. The survey will be conducted by a suitably qualified ecologist with a minimum of 5 years' experience, with demonstrably experience surveying for INNS and authoring INNS management plans.

As per TII guidance (TII, 2020a), this additional invasive species survey will include detailed maps of the precise location of each individual invasive species plant, as well as photos of these specific locations.

This updated survey will determine whether the existing stands of non-native invasive species on the First Schedule of the Invasive Alien Species Regulations or Third Schedule of the Birds and Natural Habitats Regulations may have expanded (if unmanaged); or decreased (if there is an active management regime in place); or that newly established non-native invasive species may have become established within the footprint of the Proposed Development. A confirmatory pre-construction survey will be undertaken by a suitably qualified specialist, arranged by the contractor(s), to confirm the absence, presence and / or extent of all non-native invasive species on the First Schedule of the Invasive Alien Species Regulations or Third Schedule of the Birds and Natural Habitats Regulations within the footprint of the Proposed Development. Where an infestation is confirmed / identified within the footprint of the Proposed Development, this will require the implementation of the final invasive species management plan.

8.9.2.2.17.4 General Measures to Avoid the Spread of INNS

The unintentional spread of INNS during construction works (within the Proposed Development, originating from outside the Proposed Development, such as through the importation of materials, poor biosecurity practices regarding plant and machinery or natural processes) can be a significant issue, and if not managed properly, can result in the spread of non-native invasive species to non-infested areas (within or adjacent to works areas). This will potentially increase the future cost and effort required to control the species and has the potential to pose further public health and safety risks (Japanese Knotweed can cause damage to weaknesses in built environment).

Listed below is a brief detailing of necessary measures to be undertaken to ensure biosecurity within the various sections of the Proposed Development:

- The adherence to a set of biosecurity measures, including:
    - the fencing off / demarcating of the individual invasive species;
    - identifying dedicated access points into and out of fenced-off areas;
    - the installation of designated decontamination facilities (where appropriate);
    - protocols around the removal of contaminated soils; and
    - seed and fragment checks on boot, tyres and tracks entering and leaving the work site.
- Best practice measures for the treatment of soils contaminated with invasive species (including potential seeds and fragments of mature plants) to prevent the accidental spread of INNS;
- As required by law, licences for the disposal of contaminated materials will be obtained, as well as the utilisation of licensed facilities;
- In regard to the importation of soil and other materials, the principal contractor will only utilise traceable topsoil for landscaping that has been cleared of any invasive species material;
- Measures to be implemented during the application of herbicides – Commitment to the appointment of a suitably qualified /registered/ licensed pesticides advisor for any works requiring the use of pesticides, and safety precautions for consideration in the use of pesticides near watercourses; and
- Areas which contained invasives species, where invasives were treated on-site or removed, prior to the enabling and construction works will require an on-going post-construction monitoring programme to ensure that there is no reestablishment of any invasive species within these areas.

8.9.2.2.17.5 Biosecurity Mitigation

Prior to commencement of the enabling works along the Proposed Development, a series of biosecurity measures will have to be undertaken to prevent spread of Third Schedule invasive species, namely

Spanish Bluebell, Rhododendron, and Three-cornered Garlic. Furthermore, these measures will also have to prevent the spread of the locally present Japanese Knotweed.

While not listed on Third Schedule list of the First Schedule of the Invasive Alien Species Regulations or Third Schedule of the Birds and Natural Habitats Regulations, the invasive Butterfly-bush, Winter Heliotrope, Cotoneaster species, Cherry Laurel, Pheasant Berry, Russian Vine, and Snowberry present in the areas of works will also be removed in the interest of the site's native floral composition.

Unwashed construction equipment, plant and vehicles, and footwear can provide a vector for the spread of non-native invasive species within the Proposed Development and from areas outside the Proposed Development where INNS are present or where vector material potentially containing seed / root material is attached to plant or personnel. The following hygiene measures shall be undertaken for the Proposed Development:

- Known or potentially infested areas within the working area of the Proposed Development shall be clearly demarcated and fenced off in advance of works and access restricted until such time that treatment has commenced and / or construction works are monitored in accordance with the ISMP in the area. In relation to Japanese Knotweed, in the event this species is identified present within the working area of the Proposed Development, the guidance recommends an exclusion buffer of 7m (metres) in all directions (within the works area and 3m vertically underground);
- The implementation of clear signage in accordance with TII standards will be erected at compounds, and at the boundary of the exclusion fencing;
- During site induction, and subsequent toolbox talks, all onsite operatives are to be briefed in the procedures for handling the invasive species that have been identified on site after commencement of construction works. Additionally, operatives will be briefed on how to identify the invasive species previously recorded within the Proposed Development, any additional invasive species recorded during the pre-construction survey, and Japanese Knotweed which has been recorded in proximity to the Proposed Development at Clonsilla;
- Biosecurity awareness training will be conducted on site as part of the site induction and subsequent toolbox talks for any staff working on site and if any INNS is uncovered during the construction, works are to cease in the vicinity and the presence will be reported to the onsite ECoWs who will consult with an appropriately qualified ecologist for guidance on its management/removal. These signs will be explained at toolbox talks specific to each INNS to personnel on site;
- Identify and create access points into exclusion areas for INNS. These are only to be used by specialist personnel for the removal of INNS and are not to be used by general site workers until such a time as all contaminated material has been removed from site and it is safe to enter;
- Where it is practicable, wheel and footwear washing facilities will be provided to ensure biosecurity measures are preventing the further potential spread of INNS. These locations are to be provided by the contractor. Where a dedicated / bespoke wheel wash cannot be installed owing to space limitations, the appointed contractor will ensure that no excavated loose material is allowed off site from within an exclusion zone;
- Where plant is used to excavate soils, it shall be visually checked for loose soil before movement to another part of site (where possible, the movements of tracked machinery will be restricted within the non-native invasive species exclusion zone). Loose soil shall be scraped off and disposed of, and a solution of Virkon© (or similar approved disinfectant) applied to machinery to ensure that no

obscured seed / root material remains viable. Vehicular movements within the exclusion area shall be minimized as far as is practical;

- Unless in exceptional circumstances that direction is given by the onsite ECoW(s), no storage of contaminated soil on site. Instead, being disposed of in a licensed soil waste facility; and
- Where there are small volumes (e.g. volumes capable of being double bagged in quarantine bags such as cut plants, bulbs or loose soil occur), it may be practical to bag the material and bring it to a clearly demarcated and dedicated quarantine area within the Construction Compounds until such time that the material is disposed of to an authorized facility, similar to the process of disposing of bulk excavated contaminated soil.

8.9.2.2.17.6 Soil Excavation

- No excavation or removal of soil within areas demarcated as having INNS present is to be permitted unless under strict supervision by the onsite ECoW and strictly adhered to. Guidance regarding Japanese Knotweed recommends a buffer of 7m from the plant due to its expansive rhizomes;
- Where mechanical means of removal are required to dispose of INNS (treated or un-treated by chemicals) a suitably qualified ecologist or INNS specialist will be present to supervise and provide support to the contractor(s) for the duration of the operation;
- There will be no temporary storage on-site of bulk excavated contaminated material. Where the final ISMP calls for shallow / deep burial, this material shall be removed from the excavated area and transported immediately to approved receptor area on-site. Furthermore, the temporary storage of non-contaminated material will not occur within a European or National designated site nor within 20m of any watercourse / wetland and any land within an identified flood zone;
- Plant and machinery used in the control, excavation and transport of contaminated material shall also be subject to the recommendations described in the above Biosecurity Mitigations sub-section (8.9.2.2.17.5);
- The installation of industry-rated non-native invasive species-proof membrane before infilling construction of road / paths surface may be required. All waste arising out of this process which has been in contact with the excavated ground shall be treated as contaminated waste and disposed of at a facility that is authorized to accept such waste; and
- Where the movement of any non-native invasive species listed on the First Schedule of the Invasive Alien Species Regulations or Third Schedule of the Birds and Natural Habitats Regulations is required off site, a license will be required from NPWS in advance of any movement to a site / facility licensed to accept such waste, as per the Birds and Natural Habitats Regulation. This license is separate too and does not negate the need for licenses / permits / authorizations required under waste legislation.

8.9.2.2.17.7 Disposal of Waste

- Where any INNS related material is collected and is required to be disposed of, it is essential to dispose of said material in a manner that does not afford the potential to spread further either within the Proposed Development or in the Royal Canal corridor;
- The movement of invasive plant material, off site, requires a license from the NPWS, as per the Birds and Natural Habitats Regulations. Invasive species (particularly roots, flower heads or seeds) must be disposed of at licensed waste facilities or composting sites, appropriately buried, or incinerated having regard to relevant legislation (e.g. Waste Management Act, as amended, Section 4 of Number 6 of 1987 - Air Pollution Act, 1987, relevant local authority bylaws and any

other relevant legislation). All disposals must be carried out in accordance with the relevant waste management legislation, as per guidance Guidelines for the Management of Waste from National Road Construction Projects (TII, 2017); and

- It is important to note that some invasive species plant material or soil (vector material) containing residual herbicides may be classified as either 'hazardous waste' or 'non-hazardous waste' under the terms of the Waste Management Act, as amended, and both categories may require special disposal procedures or permissions. Advice will be sought from a suitably qualified waste expert regarding the classification of waste and the suitability of different disposal measures.

8.9.2.2.17.8 Measures to be Implemented During the Application of Herbicides

- If the application of herbicides is the expert advice given and then implemented during the lifespan of the Proposed Development then a suitably qualified pesticides advisor, registered with the Department of Agriculture, Food and the Marine must be employed;
- The appointed contractor is required to refer to the appropriate guidance documents, including but not limited to those listed at the beginning of sub-section 8.9.2.2.17.2, which provide detailed recommendations for the control of invasive species and noxious weeds; and
- It is important to note that where a chemical treatment is to be used, there is a risk of contaminating a watercourse. The choice of herbicide is typically limited to formulations of Glyphosate or 2,4-D amine that are approved for use near water. Full details of any chemical used, where required and as advised by a registered pesticides advisor, will be included in the final ISMP prepared in advance of construction of the Proposed Development.

8.9.2.2.17.9 Woodland Clearance Works Guidance: Coolmine Road to Roselawn Road (Chainages +6300 - +7170) and Kennan Bridge to Dr Troy Bridge (Chainages + 5450 - +5550)

For the woodland clearance works between Coolmine Road and Roselawn Road (Chainages +6300 - +7170) and between Kennan Bridge and Dr Troy Bridge (Chainages + 5450 - +5550), specific measures will be followed as part of the invasive species management plan. Existing invasive species information for both areas has been limited due to terrain constraints and the density of the understory vegetation. As such, the following measures will be strictly adhered to by the appointed contractor and the onsite ECoWs (see Table 8-31 for details on the area of works covered by each of the ECoWs) in relation to both these areas:

- Identify any invasive non-native species which will be appropriately disposed of;
- In the event any additional Third Schedule species are identified during the works, they will be removed following the methodology outlined within sub-section 8.9.2.2.17.12;
- The ECoWs will also identify garden escape species and other non-natives which are not listed as invasive. These species will be removed to allow for the planting of native species following the completion of the construction phase;
- The ECoWs will identify trees due for removal that can be temporarily stored at a suitable location during the construction phase. A storage location and methodology will be agreed to prior to commencement of works. These will then be replanted at agreed locations and under ECoWs supervision within the woodland area as soon as possible;
- In areas where invasives and other non-native species have been removed, locally sources native tree and shrub planting will be carried out under the supervision of the woodland ECoW.

- All topsoil and plant material to be removed will be stored at appropriate locations, which will be agreed on prior to the start of the construction phase and outlined clearly in the CEMP. All soil removal will be supervised by the onsite ECoW(s); and
- With regard to Sycamore, which is considered a Medium Risk invasive species in Ireland and is now widespread across both native and plantation woodlands, there are mixed views on the species, with some viewing it as an aggressive colonizer and a threat to native biodiversity, and by others as a contributor to high levels of biodiversity (Stroh et al., 2023). However, the negative impact is likely only readily observable when the right conditions allow for this species to dominate. Considering that the mixed broadleaved woodland between Coolmine Road to Roselawn Road (Chainages +6300 - +7170) and the mixed broadleaved woodland between Kennan Bridge to Dr Troy Bridge (Chainages + 5450 - +5550) are not ancient woodland, it is likely not necessary for mature Sycamore trees to be removed, especially if they form a significant part of the canopy. Provided that the canopy cover of the other native tree species is maintained, Sycamore should not dominate. This is due to Sycamore requiring high light values and will typically only succeed in gaps in the woodland. Hence if the current woodland cover persists, this should naturally limit Sycamore. However, any seedlings or saplings will be controlled by hand pulling, following their identification by the ECoWs and under their subsequent supervision.

8.9.2.2.17.10 Assessment of Management Options for Scheduled Non-native Invasive Species

The general measures included in the sub-sections above are required to ensure good on-site practices in respect of known or potential First Schedule of the Invasive Alien Species Regulations or Third Schedule of the Birds and Natural Habitats Regulations; The following sub-sections (8.9.2.2.17.11 to 8.9.2.2.17.13 inclusive) further identify practical management controls. It is acknowledged that more than one potential control measure exists and that a single or combination of measures may be required; and the use of chemical treatments is recognized as a potential treatment option. However, the services of a registered herbicide advisor must be employed in the specifying of named chemicals including those rated for use adjacent to aquatic environments where required, treatment type, dosage, and timing etc., and / or use of pesticides in the management of potential Third Schedule non-native invasive species within the Proposed Development.

8.9.2.2.17.11 Selected Management Controls

The selected management control to be defined for each non-native invasive species stand within the Proposed Development will depend on:

- Results of the pre-construction survey;
- Construction requirements – timing of works at specific locations, level of infestation and practical considerations such as reducing disturbance to road users / homeowners; and
- Feasibility of control measures, where possible the most practicable method (with regards to the environmental impact and human health) will be used e.g.; if mechanical methods of removal are not feasible due to access. Then a step back and assessed approach will be employed to remove INNS.

8.9.2.2.17.12 First or Third Schedule Species Specific Management Controls (Spanish Bluebell, Rhododendron, Three-cornered Garlic, and Japanese Knotweed)

Spanish Bluebell

Spanish Bluebell is a woodland specialist like our native Bluebell, it can be differentiated by the thicker leaves, more upright stem, with stamens that are the same colour as the petals which is different from the cream stamens of the native bluebell. The native and Spanish Bluebell will hybridise readily; this can be easily spotted as all hybrids will have blue stamens like the Spanish Bluebell.

For effective treatment of Spanish Bluebell, it is possible to physically remove the Spanish Bluebell if in small patches. If there are areas of dense Spanish Bluebell establishment it may be best to chemically treat the plants as removal may leave roots in the ground which would come back. For a full table on the recommended timetable for chemical treatments of Spanish Bluebell, see Table 8-32.

Table 8-32: Recommended timetable for the chemical treatment of Spanish Bluebell

Month	Treatment	Herbicide Type	Herbicide Rate	Considerations
March - April	Early-Stage Foliar Application Growth	Glyphosate-based herbicide (e.g., Roundup ProActive)	3-4 L/ha of 360g/L formulation	Apply when leaves are fully expanded but before flowering. Ensure full coverage of foliage, avoiding native bluebells. Repeat applications may be needed.
May - June	Mid-Growth Stage foliar Application	Glyphosate or Triclopyr (e.g., Garlon 4)	Glyphosate: 4-5 L/ha; Triclopyr: 3-4 L/ha	Apply after flowering and before seed set. Use a surfactant to improve herbicide adherence on waxy leaves. Avoid spraying native bluebells.
July - August	Cut & Paint Method	Glyphosate or Triclopyr	10-15 ml of 360g/L solution per cut stem	Cut flowering stems close to the ground and immediately apply herbicide to the cut surface. Suitable for small patches near native bluebells.
September - October	Late Season Foliar Application	Glyphosate	4-5 L/ha	Apply to any regrowth or new shoots before dormancy. This is the most effective period for translocation to bulbs.
November – February	Physical Removal & Site Maintenance	N/A	N/A	Remove dead plants, bulbs, and any remaining debris. Monitor for regrowth and follow up as needed. Avoid soil disturbance to prevent bulb spread.

Rhododendron

Combined treatment for Rhododendron is a frequently used method. This method typically involves physical cutting of the stems back to the stumps, followed by the application of a more concentrated solution of Glyphosate (20% Glyphosate solution) to the cut stumps immediately after cutting. Manufacturer guidelines typically recommend a 20% Glyphosate solution for this treatment method. This method is best achieved when the stump is cut as low to the ground as possible (i.e. 2-4cm). Application of herbicide to the cut surface should be immediate (within minutes) and the entire above ground surface of the plant should be thoroughly wetted with herbicide. Dye should be added to the herbicide solution to make it clear which plants have been treated. Treatment must be undertaken in dry weather. If cutting must take place in wet weather, the shrub may be cleared using a high cut during initial clearance, followed by subsequent re-cutting of the stump to the 3-4cm marks and application of herbicide during dry weather.

Once the stump is dead, it may be grubbed out and disposed of if clearance is required for construction of the Proposed Development.

This method could be limited in its application in areas where the ground is stony or where Rhododendron is rooted among boulders. The close proximity of the cut to the ground can result in damage to the chains of the chainsaws if they were to strike the stony earth.

Three-cornered Garlic

There are no specific management guidelines in Ireland, however, there are recommendations on websites such as www.downgardenservices.org.uk. Three-cornered Garlic may be controlled by excavation or herbicidal application. It may also be controlled by continuous cutting over a number of years to exhaust the bulbs and seedbank. The excavated material may be buried on site or removed off site to a licensed facility to be destroyed.

Until the proposed development is planned for commencement, Three-cornered Garlic should be left in-situ and subjected to an ongoing chemical treatment program where possible, during this preliminary design stage. Herbicide Treatment by an invasive species specialist contractor with demonstrated experience in treating and managing invasives as follows or subject to their advice:

Where material that contains this species needs to be excavated, this material must be removed to an EPA licensed waste facility by an invasive species specialist contractor with demonstrated experience in treating and managing invasives. Strict biosecurity procedures should be adhered to in order to minimize the risk of spreading.

The infestation and an area of up to ca. 2m around and to a depth of 0.5m may contain Three-cornered Garlic seeds and/or bulbs. Soils that are to be removed for the proposed development must be disposed of at an EPA licensed waste facility and not mixed with general spoil.

Japanese Knotweed

Guidance on the control for Japanese knotweed is included precautionarily here due to its presence in the vicinity of the Proposed Development and the potential for it to spread during the construction phase.

Japanese Knotweed is a high impact non-native invasive species that is particularly effective at colonizing disturbed ground (e.g. construction sites) and can spread by the re-growth of cut fragments or root material, Therefore, if it is broken up during site clearance or other earthworks, it can readily re-grow in new areas to which contaminated soil is moved. Japanese Knotweed reproduces asexually (in Ireland insofar as only female plants have been recorded) and regrowth can occur from plant material weighing as little as 0.7g (grams) of viable material. It is acknowledged to be very difficult to effectively control and even more difficult to fully eradicate.

Given the nature of Japanese Knotweed, chemical treatments are often preferred over physical methods as they can, if implemented properly, reduce the disturbance of the plant / population, thus reducing the chances of its spread. If herbicide is applied as the treatment option, it will need to be reapplied for up to five years after the first application to ensure the plant control measures have been effective or monitored for a minimum of two years during which no regrowth is recorded. However, physical removal may be necessitated when timely interventions are required.

Table 8-33 assessed the potential management methods for Japanese Knotweed with color coding of the potential to implement on the Proposed Development.

Table 8-33: Assessment of Management Methods for Japanese Knotweed

Approach	Treatment Options	Comment	Potential for Implementation on the Proposed Development
Physical	Dig and dispose offsite, under licence	This option requires that all plant material (above and below ground) is excavated along with soil and disposed of to a facility authorized to accept it. In addition to waste permits / authorizations, a wildlife licence issued by NPWS is required for the transport of Scheduled non-native invasive species offsite. Depending on the nature of the excavation the proximity of services etc, the use of root barrier membrane may be required.	Likely – given the nature of the Proposed Development, there may be a need to excavate soil and plant material to enable construction works to go ahead in timely manner.
	Dig and dispose onsite. - Shallow burial - Deep burial	Wildlife licence from NPWS is not ordinarily required if the burial of collected material is proposed for within the consented Proposed Development. Shallow burial in a constructed pit such as a dedicated sealed cell at a minimum depth of 2m within a constructed berm will allow for periodic monitoring and of easy chemical treatment of any regrowth. The construction of the cell must be monitored and supervised to ensure that there are no punctures, as well as installation of protective layers all around the root barrier membrane.	Unlikely – given the lack of suitable lands within the largely developed metropolitan area.

Approach	Treatment Options	Comment	Potential for Implementation on the Proposed Development
		Deep burial entails a dedicated sealed cell within a constructed excavation, that is at least 5m below the surface of the ground. The landscaping regime will specify trees or scrub must not be planted above. Either shallow or deep options will require the use of root barrier membrane. The use of chemical pretreatment of deep / shallow cells may also be required (Knotweed.ie)	
	Screen on site – remove fragments offsite and reuse soil.	A control option that can be used to reduce the volume of soil / sediment to be moved elsewhere on-site for burial, this option requires suitable plant, adequate space and volumes of soil to make the operation at a location cost effective. This option requires the use of root barrier membrane due to reuse of screened soil. The use of chemical pre-treatment of deep / shallow cells will also be required (knotweed.ie)	Possible as an addition to on-site burial, must not be used as a standalone remedial method for Japanese Knotweed within the site
	Cutting and / or strimming	Not recommended and will not diminish vigour of plants over time. Temporarily cosmetic reduction in plant cover, will result in considerable spread of viable vegetative material that will readily regenerate in most conditions (knotweed.ie)	Not Recommended

Approach	Treatment Options	Comment	Potential for Implementation on the Proposed Development
Chemical	Stem injections	Spray of Japanese Knotweed is no longer recommended; it will result in chemical drift and impact surrounding vegetation. Stem Injection is considered very effective, if the injection is timed appropriately for growth phase. However, it is labour-intensive (sometimes) requiring specialised equipment, however; it is recommended along waterbodies. Chemical treatments for infestations near water will be rated for use at or near aquatic locations (knotweed.ie)	Due to the proximity to waterbodies inherent with the Proposed Development stem injections is the only recommended chemical treatment. Stem injections can be effective within 2 years if carried out effectively. However, given the nature of the Proposed Development, the use of chemical treatment alone is unlikely to be adequate unless treatment regime begins a number of years before construction commencement.

Root Barrier Membrane

Following the excavation of Japanese knotweed, there may be a need to install a root barrier membrane. These are specialised products that can provide protection to structures / services etc. from regrowth from within or outside a site, if suitably rated and properly installed. Thereafter, any small adjacent infestation can be more readily treated with chemical treatment for example. This durable material can be used to line spoil pits and prevent rhizome lateral root spread or effective growth in the plant and can keep it contained to an area where suitable chemical treatment can be undertaken.

Reseeding Following Eradication

This is not strictly a control method. However, where treated ground is not being built upon, planting or resowing mixtures of native grass species helps to restore the original vegetation and aids post-control management of affected sites. A grass sward established in autumn will compete with germinating Japanese knotweed seedlings in the following spring.

8.9.2.2.17.13 Non-First-or-Third-Schedule Species (Butterfly-bush, Cherry Laurel, Winter Heliotrope, Cotoneaster species, Pheasant Berry, Russian Vine, and Snowberry)

Butterfly-bush

For physical control, hand-picking of young plants is feasible but should be undertaken with care to avoid soil disturbance which can give rise to a flush of new seedlings (NRA, 2010). For larger stands, mechanical excavation/ cutting may be employed. Deadhead specimens should be handled with great care as seeds can rapidly germinate and grow in different habitats.

Cherry Laurel (Maguire et al., 2008)

Treatment of Cherry Laurel can be divided into three main stages: initial removal, control of stems and roots, and follow-up. Stems shall be cut and removed by hand or chainsaw, cutting as close to the ground as possible. The cut material shall be chipped or removed from the area to prevent regrowth.

After the initial cut, there are four management options; 1) dig out the stumps and remove all viable roots and place upside down to avoid regrowth; 2) Painting of spot spraying of freshly cut stumps with an herbicide (glyphosate, tryclopyr or ammonium sulphate) immediately after been cut. If vegetable dye is used it should be painted on all stumps; 3) Stem injection of glyphosate by drilling a hole into the main stem of the plant; 4) Stump regrowth and seedlings can be effectively killed by spraying with suitable herbicide, e.g., glyphosate. This is generally not as effective as stump spot treatment.

Follow-up seedling removal work may be necessary.

Winter Heliotrope

As with other plants that have the potential to spread from small root fragments, disposal of material should be undertaken with due caution to prevent accidental spread of the plant. Winter Heliotrope can be treated using a Glyphosate-based weedkiller or may be excavated and buried on site. Herbicide is best applied in mid to late summer (NRA, 2010) before foliage dies back. Methods of foliar spray, wiper applicator, or spot treatment may be employed. The treated area should be monitored for regrowth in subsequent years.

Cotoneaster

There are currently no specific management guidelines for Cotoneaster in Ireland however, recommendations from previous studies suggest that the plant should be cut by hand secateurs or hedge trimmers at ground level and then treated by hand with glyphosate and dye to the cut areas by paint brush. The only herbicide to be used is glyphosate with the most appropriate herbicide currently available for this treatment being Roundup™ Biactive (≡ Roundup™ Probiactive). Stem treatment will be the method used whereby a solution of glyphosate will be applied to the cut or broken stems of the plant. While it may take as long as up to 7 months for the herbicide to take full effect and for the plants to fully die, the treated areas will be inspected by trained personnel to ensure correct methodologies are being applied by visual inspection of treated plants (DHLGH, 2023).

Pheasant Berry

Pheasant Berry, also known as Himalayan Honeysuckle, is considered a medium risk invasive species (NBDC, 2026). The species is widespread but more common in the southeast and is often used as a hedging plant as well as cover for pheasants. There are no documented impacts recorded; however, it forms dense thickets that can exclude native vegetation.

There are no specific management guidelines in Ireland, however, there are recommendations on websites such as https://www.weedbusters.org.nz/what-are-weeds/weed-list/himalayan-honeysuckle/. Pheasant Berry can be dug out and left on site to rot down.

It can also be cut down and treated with stump paint or herbicidal application (e.g., glyphosate-based). Herbicidal treatment by spraying can be carried out during spring/summer.

Russian Vine

Russian Vine is similar in appearance to Japanese Knotweed, with heart shaped leaves and white flowers, however; it is a climbing plant and will wrap around trees and shrubs whereas Knotweed stands independently.

The best treatment for Russian Vine is a mixture of physical and chemical treatments, it is advised to cut it back during the winter to the roots, then regularly apply glyphosate herbicide directly to the plants during the winter or early spring months, this can be timed with other invasive species treatments in the proposed route as others are treated in April / May.

Snowberry

Snowberry is a low impact invasive species that can be managed either physically or chemically treated in different sites. The steep nature of the site along the proposed route creates the conditions that chemical treatment of the Snowberry is preferential as physical removal would result in loose sediment entering the Royal Canal below.

Snowberry can be treated with spraying of the leaves or drilling into the stem as the base and applying herbicide into the holes. Both treatments should be carried out in April / May, the treatment must be repeated on a yearly basis for 4-5 years.

8.9.2.2.17.14 INNS Monitoring

Following completion of works, a monitoring program will be established to ensure no additional spread of invasive species has occurred, and that ongoing treatment of invasive species has been effective. FCC shall engage a qualified specialist to verify if the invasive species recorded in this report are still present following construction works. This will be carried out for a minimum of 5 years post–construction in the event the ISMP control measures are effective during the construction phase. The length of the program will however be ultimately depend on the effectiveness of the treatment measures, and any monitoring will have to be extended in the event that measures are ineffective to control the INNS during the initial operational phase or additional INNS are identified along the Proposed Development.

A copy of any records of the plant shall be lodged with the National Biodiversity Data Centre (www.biodiversityireland.ie). If invasive species are found/have spread further, they shall be treated as per the measures outlined in the ISMP (sub-sections 8.9.2.2.17.12 and 8.9.2.2.17.13).

This monitoring plan will adhere to the following guidance:

- Following the construction of the Proposed Development, there will be an ongoing treatment program which extends for a number of years (length of program is dependent on the effectiveness of treatment) into the Operational Phase. In the Operational Phase, the management of the infrastructure will be the responsibility of WI and the local authority, and the control of invasive species will be as per their plans and procedures, and responsibilities under The Birds and Natural Habitats Regulations;
- The above measures are important for all First or Third Schedule non-native invasive species, where they occur, as maintenance works associated with landscaping, such as mowing and hedge cutting have the potential to spread invasive plant species via the dispersal of very small amounts of shredded plant material; and
- If invasive plants are found, then they shall be treated as per the measures outlined in sub-sections 8.9.2.2.17.12 and 8.9.2.2.17.13.

8.9.2.2.18 Habitat and Specific Species Monitoring

For the duration of the construction phase, to assess the efficacy of the outlined mitigation and management measures, monitoring plans will be followed for the most sensitive ecological receptors key along the Royal Canal. All construction monitoring will be devised and conducted by a suitably qualified ecologist(s) in consultation with the WI Environmental team, NPWS, the onsite ECoWs, and the Fingal County Biodiversity Officer. These monitoring plans are outlined below:

Grassland habitat – Dry meadows and grassy verges and Dry calcareous and neutral grassland.

Monitoring of the identified former Annex I quality grassland habitats, labelled in this report as Plot 1 and 4, will be conducted yearly for the duration of the construction phase and will follow JBA's relevé survey methodology outlined within this report. These surveys will also identify any rare or protected floral species within these grassland areas, as well as note the emergence of any orchid species. In the event any protected floral species are identified, the CEMP will be updated with their location, and appropriate mitigation measures will be devised in consultation with the on-site ECoW and Fingal biodiversity Officer.

(Mixed) broadleaved woodland - Coolmine Road to Roselawn Road (Chainages +6300 - +7170) and Kennan Bridge to Dr Troy Bridge (Chainages + 5450 - +5600)

Monitoring of the woodland sections between Coolmine Road and Roselawn Road (Chainages +6300 - +7170) and between Kennan Bridge and Dr Troy Bridge (Chainages + 5450 - +5600) will be conducted annually for the duration of the construction phase by an Ecologist with suitable experience in woodland ecology and management. These surveys will assess the condition of these woodlands, signs of any protected floral and faunal species, and if any invasive species have spread further in these areas. The CEMP will be updated with the results of these surveys should any additional sensitive ecological receptors be identified, and the mitigation measures outlined in this report followed.

Badger and Otter

To assess and ensure efficacy of mitigation and management measures with regards to Badger, the Royal Canal Urban Greenway survey area will be monitored for the duration of the construction phase to ensure Badger populations are still extant and active, as described in Triturus Environmental Ltd 2025a).

Otter monitoring will also take place to ensure the Proposed Development have not impacted the local population and to resurvey potential holts. Surveys will be completed once per year for duration of the construction works.

Bats

Monitoring of bats will be conducted yearly for the duration of the construction phase with measurements of light spill onto the canal recorded. This will be completed during the summer seasons as per best practice (Marnell et al 2022 & Reason, P.F. and Wray, S. (2025)). The features to monitor include ensuring commuting routes are still being used, specified lighting levels are followed, that the increased level of human activity along the route is not displacing the bats.

Birds

Monitoring of birds will be conducted yearly for the duration of the construction phase taking place during the bird nesting period (March to August inclusive) as per best practise guidance. Monitoring will identify any new nests along the Proposed Development, as well as activity levels within previously identified nests. Monitoring surveys will also include the inspection of trees that will be removed/are damaged during the construction phase to ensure no new nests have been created.

Glutinous Snail

As outlined within the latest Triturus Environmental Ltd (2025c) survey report, Glutinous snail are known for periodic population declines, sudden recoveries and range fluctuations. Long-term monitoring is therefore critical for this species long-term conservation. Given the short lifespan of this species, (1-1.5 years) (Willing et al., 2014), and its sensitivity to changes in surface water quality, monitoring surveying will be conducted quarterly (every 3 months) for the duration of the construction phase, and follow the methodology utilised within the previous Triturus Environmental Ltd surveys.

8.9.3 Operational Phase

During the operational phase the main considerations are mitigating for inappropriate planting and vegetation management, habitat disconnection, human disturbance, light pollution and the small level of increased surface water runoff.

8.9.3.1 Increased surface water run-off

As stated in Chapter 12 (Water) of this report, mitigation to lessen the impact of surface water run-off will be achieved through design. The surface water drainage design has been carried out in accordance with the GDSDS and SuDS methodologies being implemented as part of a treatment train approach, impacts on the water and hydrogeological environment arising from the operational phase are considered imperceptible. The drainage design across the Proposed Development is detailed and outlined below in Table 8-34.

Table 8-34: Detailed drainage design across the Proposed Development

Location	Chainage	Description
Section 1		
West of Collins Bridge	+0000 to +0200	No existing piped drainage. Over-the-edge from unbound surface to northern edge.
West of Collins Bridge	+0200 to +1080	No existing piped drainage. Over the edge from unbound surface to existing ditch to northern edge.
Collins Bridge	+1080 to +1090	Roadway run off to existing gullies on roadway. Footpaths graded away from roadway to Greenway drainage due to geometry.
Collins Bridge to Pakenham Bridge	+1090 to +2870	No existing piped drainage. Over the edge from unbound surface to existing ditch to northern edge.
Pakenham Bridge	+2870 to +2880	Roadway run off to existing roadside verge. Footpaths graded away from roadway to Greenway drainage due to geometry.
Pakenham Bridge to railway underpass	+2880 to +3200	No existing piped drainage nor drainage ditch. Over the edge from unbound surface to southern edge to Royal Canal. Cross section and contour constraints precludes filter drain as treatment.
Railway Underpass	+3200 to +3300	Existing underpass drainage in the form of linear drainage channel at low point.
Section 2		
Railway Underpass to Hansfield	+3300 to +3760	No existing piped drainage nor drainage ditch. Filter drain on southern edge of bituminous pavement surface.
Hansfield to Callaghan Bridge	+3760 to +4100	No existing piped drainage nor drainage ditch. Over the edge from bituminous pavement surface to southern edge

		to Royal Canal. Cross section and contour constraints precludes filter drain as treatment.
Callaghan Bridge Underpass	+4100 to +4140	Existing regime of over the edge to Royal Canal.
Callaghan Bridge to ramped Greenway	+4140 to +4540	No existing piped drainage nor drainage ditch. Filter drain on northern edge of precast concrete boardwalk.
Ramped Greenway section	+4540 to +4610	No existing piped drainage nor drainage ditch. Over the edge from bituminous pavement surface to southern edge to surrounding vegetation.
Old Schoolhouse Lands	+4610 to +5320	No existing piped drainage nor drainage ditch. Over the edge from bituminous pavement surface to southern edge to surrounding vegetation.
Section 3		
Kennan Bridge	+5320 to +5340	Roadway run off to existing gullies on roadway. Footpaths graded towards roadway draining to existing gullies.
Kennan Bridge to Sheepmoor Lane	+5340 to +55950	No existing piped drainage nor drainage ditch. Over the edge from bituminous pavement surface to southern edge to surrounding vegetation.
Sheepmoor Lane	+5950 to +6240	Existing road drainage regime to be replicated.
Kirkpatrick Bridge	+6240 to +6260	Roadway run off to existing gullies on roadway. Footpaths graded towards roadway draining to existing gullies.
Kirkpatrick Bridge to 'Quarry Bridge'	+6260 to +6470	No existing piped drainage nor drainage ditch. Levels/contours preclude over the edge flow. Filter drain on southern edge of bituminous pavement and concrete surfaces.
'Quarry Bridge'	+6470 to +6540	Run off falling from bridge to existing soils and vegetation below.
'Quarry Bridge' to Raised Boardwalk	+6540 to +6650	No existing piped drainage nor drainage ditch. Levels/contours preclude over the edge flow. Filter drain on southern edge of concrete surface.
Raised Boardwalk	+6650 to +6750	Run off falling from boardwalk to existing soils and vegetation below

Raised Boardwalk to 'Landmark Bridge'	+6750 to +7120	No existing piped drainage nor drainage ditch. Over the edge from bituminous pavement surface to northern edge to surrounding grassed area.
'Landmark Bridge'	+7120 to +7290	Run off falling from bridge to existing soils, vegetation, and canal below.
Landmark Bridge' to Castleknock Station	+7290 to +7690	No existing piped drainage nor drainage ditch. Over the edge from bituminous pavement surface to southern edge to surrounding vegetation.
Castleknock Station to Granard Bridge	+7690 to +7740	Existing drainage regime to be utilised including linear drainage channels.
Granard Bridge underpass	+7740 to +7830	Filter drain on southern edge of bituminous pavement surface from east end of underpass. Concrete channel on of bituminous pavement through underpass falling west to east, draining to filter drain. Aco drains provided at low point connecting to filter drain.
Granard Bridge underpass to 12th Lock	+7830 to +7960	No existing piped drainage nor drainage ditch. Over the edge from bituminous pavement surface to southern edge to surrounding vegetation.
12th Lock area	+7960 to +8090	Existing drainage regime to be utilised
Talbot Bridge	+8090 to +8100	Roadway run off to existing gullies on roadway. Footpaths graded towards roadway draining to existing gullies.

The proposed drainage design allows recharge to groundwater at all filter trench and open channel / over the edge drainage locations. Piped drainage is not the primary mechanism chosen, and instead drainage types such as Filter Drainage and Over the Edge Drainage has taken precedence. Where filter drains and linear drainage channels are necessary, they will be sized accordingly for the area being drained, in accordance with the regulations e.g. Greater Dublin Strategic Drainage Strategy (GDSDS), taking account of flood exceedance e.g. for storms return periods over 1% AEP and incorporating 20% climate change.

8.9.3.2 Habitat Disconnection and Human Disturbance

8.9.3.2.1 Mammal Underpasses

Throughout the operational phase of the Proposed Development the Greenway will remove a percentage of habitat within a valuable wildlife corridor. Local fauna, namely bats and Badger, will still be able to commute through the corridor, with several underpasses within the Proposed Development enabling crossing. Smaller mammals such as Hedgehog also move throughout these habitats for foraging. Badger use a number of routes along the canal as free passage between breeding areas and

key foraging habitats identified, such as the grasslands located at Glen Garbh, near the Old School House, Porterstown and St. Joseph's, Hansfield. However, in order to reduce the impacts of habitat loss and partial fragmentation within the Royal Canal corridor, additional operational mitigation measures are proposed.

As discussed in the latest Triturus Environmental Ltd Badger report (Triturus Environmental Ltd., 2025a) (Appendix 8.5.3), given the high development pressures along the north bank of the Royal Canal within the vicinity of the proposed Royal Canal Urban Greenway, it is imperative to maintain habitat connectivity and free badger passage between breeding areas and key foraging habitats identified, such as the grasslands located at Glen Garbh (Porterstown), near the Old School House (Porterstown) and St. Joseph's, Hansfield. Should badgers be forced to alter their territorial and foraging ranges due to changes in access resulting from the Greenway, the risk of road traffic mortality will increase and there may be considerable demographic changes over time due to population segregation.

In light of the proposed design, the provision of access routes for badgers will be required where barriers to migration are predicted due to the installation of steel and timber palisade fencing along the Greenway route. This is of particular significance at natural bottlenecks, such as St. Joseph's, Hansfield. The design of the Proposed Development has incorporated a number of underpasses with appropriate planting to reduce the impacts of habitat fragmentation, resulting from the construction of the Proposed Development through the Royal Canal ecological corridor. An underpass will be installed to provide passage between Sheepmore Lane and Stationcourt, linking potential badger foraging areas (Table 8-35). An additional 4 underpasses will be installed in the vicinity of St. Joseph's, Hansfield to provision north-south and east-west connectivity to badger foraging habitats (Table 8-35). This will include maintaining access to the foraging area south of the Deep Sinking rail bridge on the south side of the Royal Canal which badgers appear to traverse the rail line (under Harris fencing) to access.

Table 8-35: Location of the recommended badger underpasses (presented east to west)

Location	ITM x	ITM y	Orientation
Sheepmore Lane	706674	737640	North-south
Hansfield	704600	738266	North-south
Hansfield	704484	738334	North-south
Hansfield	704237	738411	North-south
Hansfield	704149	738420	North-south

While Badger and other non-volant mammals will be able to cross under the Greenway at certain points where it is elevated, the installation of five underpasses to the east of Kennan Bridge, at the junction of Glen Garbh and Sheepmore Lane (chainages +5250 - +5550) will ensure connectivity within the corridor is maintained (8.9.3.2.1). The use of underpasses has appropriately mitigated against Badger disturbance during road construction (Gaughran et al, 2021). The design of these underpasses is set out in the stage 2 Badger report (Triturus Environmental ltd., 2025a) and has been incorporated into the Landscape Plan (Appendix 10.2) for the Proposed Development. Badger underpasses will be

present at key locations such as to the east of the Hansfield Railway Bridge and are incorporated into the design of the Proposed Development.

These underpasses have been designed following the guidance outlined in the NRA (2005) guidelines for the treatment of badgers prior to the construction of national road schemes. This includes the following:

- 600mm concrete pipes will be installed at the five identified locations to create the underpasses.
- Badgers and other fauna will be guided into the underpass using mesh fencing, which will recess the underpass entrances on both sides. This will discourage Badgers from crossing the Greenway at other points. To prevent Badgers bypassing the fencing, the following measures will be followed to ensure that the fencing is Badger-resistant:
    - The lower part of the fence will be buried to prevent Badgers digging underneath the fence.
    - The fencing will be installed symmetrically on both sides of the Greenway.
    - The fencing will have no gaps or weak points.
    - The fencing will be erected immediately following the construction of the proposed underpass to encourage Badger use.
    - Fencing will be properly maintained and checked regularly during operation.
- The entrance points to the tunnel will be flush with badger-proof fencing and the invert set at ground level. A concrete surround will provide a solid connection to the uprights of the fence and inhibit efforts to dig.
- Drainage will be adequate to prevent waterlogging within the underpass and at its entrances.
- The underpass will be installed at the earliest possible stage in construction, along with the associated fencing outlined above.
- The entrances to the underpass will be planted with appropriate hedgerow species, such as Blackthorn, Hawthorn and Holly, to encourage Badgers use. This planting must not obscure the entrances to the underpass.
- The underpass will be checked periodically during the construction phase and within the first two years of the Proposed Development's operational phase to ensure that it remains clear of debris and has not become waterlogged.

It should be noted that the preservation of free badger passage should not rely solely on underpasses and should also be encouraged by other means (e.g. open fence lines) near core territories (i.e. areas supporting main setts). It is understood that no fences will be installed along the Greenway in the Old School House (Porterstown) area and this will help to maintain free Badger passage. A single point mammal access will also be installed at a location near St. Joseph's/Porter's Gate (i.e. a gap in fencing at ITM 705275, 738008) to ensure continued access to the existing canal towpath where the Greenway alignment would otherwise result in barriers to movement.

Additionally, the construction of an elevated boardwalk section of the Greenway at Glen Garbh, with ≥700mm clearance on the up-slope side, will facilitate the free passage of Badger along existing commuting/foraging routes, negating the requirement for underpasses in this area (Figure 6.1). Given the presence of an existing palisade fence between Glen Garbh and Sheepmore Lane (along the Diswellstown Road), it is anticipated that the elevated boardwalk in this area will improve habitat connectivity and Badger passage.

8.9.3.2.2 Hedgerow Planting & Management

The planting of native hedgerow associated with these underpasses has also been included in the design, which will enhance foraging potential in the form of berries from fruiting species, provide enhanced cover along the route, and will screen the route from any human disturbance at key points. Screening will also reduce accessibility into woodland areas, reducing the possibility of human disturbance towards other smaller species of mammals and birds. Whilst earthworms (in grasslands) form a major component of their diet, badgers are generalist and opportunistic feeders, with fruits and berries (such as blackberries, elderberries & sloes) a seasonally important dietary item in Ireland (O'Sullivan et al., 2019; Elliot et al., 2015; Byrne et al., 2012; Cleary et al., 2011; Boyle & Whelan, 1990) and elsewhere (Kurek, 2022, 2015; Balestrieri et al., 2015; Rosalino et al., 2005). This is particularly the case in more urban environments where grassland and other foraging habitats are becoming scarcer due to development pressures (Gomes et al., 2020). Furthermore, badgers are known to excavate their setts and latrines in hedgerows (preferring dense basal & shrub vegetation) and use hedgerows for over-ground movement around more rural landscapes (O'Brien et al., 2016), inclusive of the Royal Canal corridor.

The management of planted hedgerows as part of Greenway maintenance will aim to maximise their fruit-bearing capacity. This would involve the cutting/coppicing of only the Greenway side of the planted hedgerows, leaving the far side of each uncut, given that uncut hedgerows (such as Hawthorn) are significantly more prolific in terms of berry production. This would have the benefit of increasing available foraging for mammals and also for local breeding birds and allow for improved nesting conditions. Operational maintenance of the planted hegderows will be intermittent and managed through operational arrangements to be made between FCC and WI, including through a memorandum of understanding for the Greenway.

The planting and maintenance of these hedgerows, alongside the mammal underpasses will maintain connectivity between habitats within the Royal Canal corridor, preventing impacts to commuting Badger. Furthermore, continuous connections between habitats will also serve useful for local Otter, as ongoing commuting corridors will prevent the need for Otter to enter areas along the Greenway with higher numbers of cyclists/higher footfall/dog walking, which will reduce potential disturbance.

8.9.3.2.3 Earthen Berms

An additional Badger habitat enhancement measure is the installation and maintenance of earthen berms planted with native grass and wildflower mix. These berms have been incorporated into the Landscape Plan (see Chapter 10, Landscape and Visual and Appendix 10.2)). This will increase the surface area of available grassland foraging habitat and will have the added benefit of allowing areas for mining bees to burrow and create nests. The arthropod density will also increase in these areas. This is of particular relevance in areas where the Proposed Development will require land-take from existing Badger foraging habitat, e.g. Old School House grassland.

This grassland will be appropriately managed by WI to encourage Badger foraging activity. Herbicides will not be used during Greenway maintenance or near badger foraging habitats (e.g. grasslands), thus in keeping with a more environmentally conscious approach and Fingal County Council's wider policy to phase out the use of herbicides and implement alternative control methods. Enhancement of foraging areas will also include the conversion of some areas of secondary or marginal habitat to primary badger foraging habitat, e.g. introduce grazing or mowing to rough grassland areas (as per Highland Council, 2006).

8.9.3.3 Aquatic Invertebrates & Fish

8.9.3.3.1 General Measures

As a continuation of the Construction Phase, the levels of shading and vegetation cover along the banks of the canal in the areas of high Glutinous Snail and fish populations will remain unchanged, as this will maintain the existing level of shade cover that has contributed to optimal living conditions for the snails. While the Proposed Landmark Bridge will add additional shading along the Royal Canal given the size of the bridge the impact of this shading on the canal and aquatic KERs will be negligible. The habitats within the Royal Canal will be retained during the operational phase. The outlined drainage plan has been designed to direct surface water away from the Royal Canal towards adjacent drainage and filter ditches where possible in order to maintain the consistency of the canal waters during the operational phase. This is particularly important given that there are existing ideal conditions for Glutinous Snail, and due to their sensitivity for change.

8.9.3.3.2 Glutinous Snail

In addition to the measures outlined to protect local surface waters, specific mitigation measures for the protection and enhancement are detailed in the Glutinous Snail survey report by Triturus Environmental Ltd. (2025c) (see Appendix 8.5.5). This report along with the previous freshwater macroinvertebrate surveys, identified a paucity of suitable rocky refugia for Glutinous Snail within the survey area (i.e. a soft sediment bed). The placement of artificial refugia (after Hughes, 2017) inclusive of other viable alternative (e.g. reef balls, shown in 8.9.3.3.2.1) will be installed to create long-term refugia for the species. Additionally, the removal of locally excessive macrophytic vegetation in gently sloping canal littorals will be carried out in conjunction with the placement of artificial refugia. The aim of these actions is to improve conditions for grazing *Myxas*, allowing for meta-population expansion. These actions will be carried out at the end of the construction phase by an Ecologist with specific expertise of Glutinous Snail surveying and habitat preferences, in consultation with WI Environment Team, NPWS, and the Fingal Biodiversity Officer.

The rationale behind this is precautionary: although suitable mitigations to protect this species during the construction phase are outlined, given its sensitivity and ongoing decline, it is critical that consideration be made for improving its existing habitat within the canal in order to safeguard the future of this internationally important population. This includes measures to enhance this species as well as annual monitoring throughout the duration of the construction and operational phases of the Proposed Development. While the current surveys are considered comprehensive in mapping the distribution of Glutinous Snail throughout the study area, the species is known for periodic population declines, sudden recoveries and range fluctuations (Bichain & Ryelandt, 2023; Carlsson, 2001b). This exemplifies the importance of regular monitoring to inform targeted species management measures, inclusive of conservation evidence where habitat enhancement has been undertaken or following significant construction works that may impact local glutinous snail populations.

8.9.3.3.2.1 Artificial Refugia and Macrophyte Management

The placement of artificial refugia within the Royal Canal would protect Glutinous Snail *from* predation while also providing a substrate for periphyton proliferation. The chosen locations for such artificial refugia would be subject to careful consideration and must be completed in consultation with an aquatic ecology expert. Artificial refugia will be installed in conjunction with localised thinning of noxious macrophytes. Locally excessive macrophytic vegetation in gently sloping canal littorals will be removed. Additionally, dense reed lines of common club-rush or an equivalent high density of submerged macrophytes that can became invasive of the canal inclusive of whorled water-mifoil (*Myriophyllum*

verticillatum), Mares tail (*Hippurus vulgaris*), Elodea species and Arrowhead (*Sagittaria sagittifolia*), can also restrict light niche space for *Myxas* grazing habitat. Nationally scarce charophytes inclusive of *Tolypella* species also occupy the same gently sloping niche space as Glutinous Snail and therefore the thinning of reeds with root zone removal (to restrict regrowth) could significantly benefit both rare Glutinous Snail and *Tolypella* species.

Examples of artificial refugia are shown below in Figure 8-96. The artificial refugia used and the methodology proposed for their installation must be first approved by WI, the Fingal County Biodiversity Officer and NPWS.



Figure 8-96: Example of a refugia used in marine environments known as 'reef balls'. Such structures could act as viable Glutinous Snail refugia in Irish Canal environments where marginal boulders can be scarce. It can provide both refuge from predators and act an ideal grazing substrate once periphyton establishes (Triturus Environmental Ltd., 2025c)

8.9.3.4 Planting Plans and Management

As part of the Proposed Landscape Plan (Appendix 10.2), a total of 190 trees will be planted and approximately 2456m$^{2.}$ of woodland area created along the Proposed Development. These trees will take several years to reach semi-maturity. Additionally, within the Landscape Plan, a total of 6841m^2 of meadow and shrub planting is planned along the Proposed Development. This will offset the loss of scrub and scrub and meadow mosaic habitats during the construction phase, which totals an estimated 1150m^2, after an initial period of ecological lag.

While the proposed woodland planting area 2456m^2 will still be significantly less than estimated woodland loss as a result of the Proposed Development (6800m^2), an additional 7000m^2 of woodland will be planted outside the Proposed Development within a field to the east of St Catherines Park adjacent to the Royal Canal. This will offset the loss of woodland from along the Proposed Development, as well as strengthen ecological connectivity between the Royal Canal pNHA and Liffey Valley pNHA

to the south. This area is shown below in Figure 8-97. A planning stage note is provided in Appendix 8.6 to qualitatively assess the Proposed Development's expected Biodiversity Net Gain (BNG) drawing on the EIAR, ecological surveys and landscape proposals.

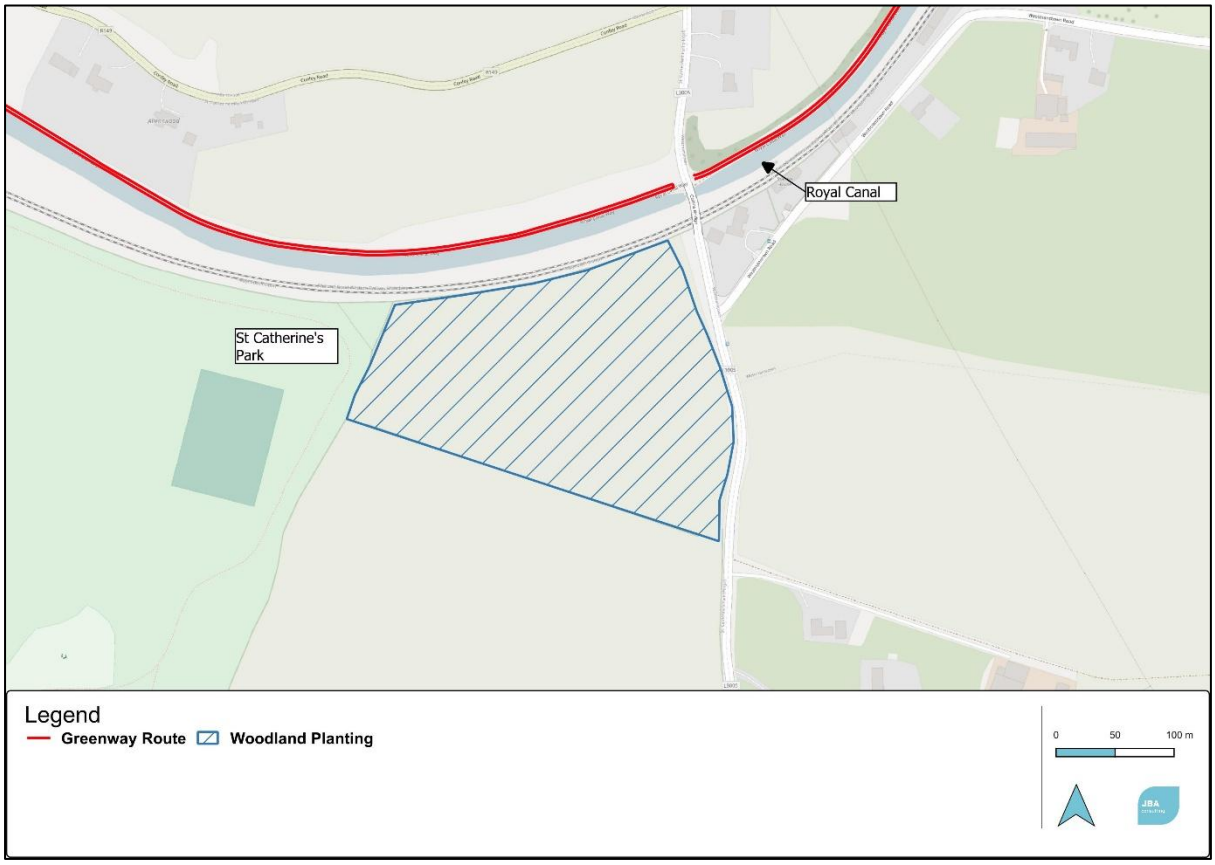


Figure 8-97: Area of proposed woodland planting adjacent to the Royal Canal to the east of St Catherine's Park

Planting across the Proposed Development will be limited to native and habitat specific species. Trees within 3m of the Royal Canal will be restricted to riparian species such as Willow, Alder, Silver and Downy Birch and Pedunculate Oak. During the construction of the Proposed Development through the woodland areas, an ECoW/ woodland Ecologist will be present, and will ascertain the retention and translocation of any suitable trees and understory plants to areas cleared of non-native species. Species such as Bird Cherry, Wild Cherry, Wild Apple *Malus sylvestris*, Rowan, Sessile Oak, Common Hazel and Scots Pine will also be planted in these higher sections of woodland away from the Royal Canal to replace invasive or non-native species (see woodland management section below), as deemed appropriate. There will be no planting of non-native species within the pNHA woodlands.

Non-native night scented flowers must only be planted as perennials in containers and any non-native planting in open borders will be limited to amenity park areas. The provision of night scented flowers will attract invertebrates to the area which will encourage foraging of bats. Hedgerows will be made up of mainly Hawthorn (60%) and other native species such as Common Hazel and Elder *Sambucus nigra,* which will provide cover and screening for commuting mammals as well as an important alternative food source for Badger.

WI will not use herbicides during Greenway maintenance or near potential mammal foraging habitats thus in keeping with a more environmentally conscious approach and FCCs wider policy to phase out the use of herbicides and implement alternative control methods. Appropriate signage will be placed to inform the public of biodiversity enhancement areas to increase awareness and reduce impact of trampling. Mowing regimes will follow a seasonal patter to allow for diverse growth in annual and perennial species. The existing scrub and meadow area to the west of the Old Schoolhouse (Chainages +4600 - +5200) will be left as is and will not be mowed/cut.

In addition to the measures outlined above, and below in the sub-sections 8.9.3.4.1 and 8.9.3.4.2, the management of the habitats on-site will follow the All-Ireland Pollinator Plan guidance for the pollinator-friendly management of transport corridors (available online at: Transport Corridors » All-Ireland Pollinator Plan). This guidance broadly covers measures for roads, railways, and Greenways, and the recommended actions are briefly summarised below:

- A: Identify and protect existing areas that are good for pollinators
    - Action 1: Protect existing sources of food and shelter for pollinators
    - Action 2: Limit habitat loss during project or maintenance works
    - Action 3: Protect embankments and rock cuttings for pollinators
    - Action 4: Protect boundary walls for pollinators
    - Action 5: Protect 'Habitat islands' at junctions and interchanges for pollinators
    - Action 6: Consider transport corridors for nocturnal pollinators

- B: Reduce the frequency of mowing of grassy areas
    - Action 7: Manage immediate verge for pollinators
    - Action 8: Manage wider verge area for pollinators

- C: Pollinator-friendly planting
    - Action 9: Incorporate new native hedgerows into planting for new transport corridor landscape schemes
    - Action 10: Avoid commercial wildflower seed mixes
    - Action 11: Incorporate ornamental pollinator friendly trees and shrubs into planting for new linear infrastructure landscape schemes (only where native planting is unsuitable)
    - Action 12: Plant pollinator-friendly trees along streets in towns and villages
    - Action 13: Plant pollinator-friendly seasonal beds
    - Action 14: Plant pollinator-friendly bulbs
    - Action 15: Make the area around service stations/ Luas stops/train stations/Park and Ride stops pollinator friendly.

- D: Provide wild pollinator nesting habitat: hedgerows, earth banks, bee hotels
    - Action 16: Manage native hedgerows as nesting habitat
    - Action 17: Protect embankments and rock cuttings for solitary bees
    - Action 18: Include shelter for solitary bees at train stations and service stations

- E: Reduce the use of pesticides
    - Action 19: Reduce the use of Pesticides (Herbicides, fungicides, insecticides)

- F: Promote the aims of the All-Ireland Pollinator Plan in planning of new infrastructure and make staff aware of management actions for pollinators
    - Action 20: Promote the aims of the All-Ireland Pollinator Plan when designing new linear transport schemes, and make staff aware of management actions for pollinators
    - Action 21: Log your actions

Operational maintenance of the Greenway and the associated landscaped areas will be intermittent and managed through operational arrangements to be made between FCC and WI, including through a memorandum of understanding for the Greenway. More detailed management measures for certain grassland and woodland areas are described in detail below in sub-sections 8.9.3.4.1 and 8.9.3.4.2.

8.9.3.4.1 Grassland Management

In order to mitigate the loss of grassland habitat due to the construction of the Proposed Development, specifically within the scrub meadow mosaic habitat within the Old Schoolhouse lands (Chainages +4610 to +5320), the enhancement of the existing dry calcareous grassland habitats will be carried out through appropriate management measures.

There are three sections of dry calcareous grassland along the route that have the future potential to meet the criteria for the Annex I habitat Lowland hay meadows [6510]. These include the area around Plots 1 and 2, located north of Pakenham Bridge (Plot 1: ITM 703860 738310, Chainages +2950, and Plot 2: ITM 703953 738362, Chainages +3100) and Plot 3, located near Callahan Bridge- Railway bridge (Plot at ITM: 704596 738273, Chainages + 3770). Dry calcareous grassland has been identified as a priority habitat within the Fingal Biodiversity Action Plan (BAP) 2022-2030 (FCC, 2023b), and as such, the appropriate operational management of these areas is a priority. Management will focus on preventing these areas from transitioning into scrub mosaic habitat.

The management of these areas are outlined below. The measures described are informed by Chapter 6 of the Lowland Grassland Management Handbook (Natural England, 2007) which describes ideal mowing and cutting regimes for hay meadows:

- Due to the steep terrain present both areas will require trimming by hand as opposed to mowing using machinery. Given the small size of these areas, this is also an appropriate measure. The alternative would be a low intensity graze which given the size of these areas is not cost effective. The grassland trimming will follow the below:
    - Cutting dates for hay made from semi-natural swards without the use of artificial fertilisers will be outside the main flowering period (May through to July inclusive) in the late summer or early autumn.
    - Mowing will occur once a year and will be undertaken following a period of 2-3 days without rainfall.
    - Once mowing is completed, the cut biomass will be lifted and removed.
- Any scattered scrub/woody plant species, including Bramble, will be removed from this habitat once identified.
- No pesticides or fertilisers will be used within these areas.

8.9.3.4.2 Woodland Management

Of particular note is the (mixed) broadleaved) woodland habitat between Coolmine Road and Roselawn Road (Chainages +6300 - +7170), which an area of 5780m^2 will be lost during the construction phase.

It is estimated that the construction will lead to a loss of approximately of 5780m^2 mixed broadleaved woodland between Coolmine Road and Roselawn Road (Chainages +6300 - +7170) and 1023m^2 of the mixed broadleaved woodland habitat between Chainages +5350 - +6240. As discussed in sub-section 8.9.2.2.17.9, during the construction phase, invasive and other non-native species will be removed from the woodland areas between Coolmine Road and Roselawn Road (Chainages +6300 - +7170) and between Kennan Bridge and Dr Troy Bridge (Chainages + 5450 - +5550). Furthermore, in the newly planted woodland area within St Catherines park (Figure 8-97), FCC will ensure INNS do not establish within this area to prevent negative impacts to the newly planted woodland habitat here.

The removal of INNS and other non-native species, including garden escapees, from across the Proposed Development will reduce pressure on native species and improve the quality of the retained woodland sections. While these habitats will experience an overall loss despite these measures, as defined within the synopsis of the Royal Canal pNHA (Table 8-14), the ecological value of the canal lies more in the diversity of species it supports along its linear habitats than in the presence of rare species. The ecological value of the Royal Canal will be retained, including within these woodland sections, and it will continue to support the species outlined in the site synopsis and within this report. Additionally, the creation of a new woodland area within St Catherines Park adjacent to the Royal Canal will offset the loss of woodland during the Proposed Development.

Prior to construction, these areas are largely undisturbed by the public due to their steep terrain and thick foliage and scrub which naturally limits access. It is therefore critical that during the operational phase, disturbance levels within these habitats remains minimal. The long-term management of these woodland areas will therefore leave these areas as undisturbed as possible, and their monitoring will be continued throughout the operational phase. In the event that significant sources of disturbance are identified, such as public access especially during sensitive nocturnal periods, measures to prevent further disturbance must be considered. Any methods for public exclusion during the operational phase must be discussed with WI Environmental Team, FCC and the Fingal County Biodiversity Officer.

A woodland management plan is recommended which would cover woodland condition assessment and enhancement, long term monitoring of sensitive species and invasives, and review of public access. There is potential for woodland habitat improvement, particularly to the understory which is dominated by Bramble and Ivy in places. However, any decrease in scrub in the woodland would allow easier access by the public and dogs, and result in increased disturbance to sensitive species like Badger and Otter.

The measures outlined above pertaining to the woodland habitat will be conducted through operational arrangements to be made between FCC and WI, including through a memorandum of understanding for the Greenway.

8.9.3.5 Bats

8.9.3.5.1 Bat Boxes

Due to the loss of trees, and therefore future potential roosting features, bat boxes are recommended here and within the Bat Report conducted by Bat Eco Services Ltd (2025). The aim of this measure is to provide alternative roosting features for all seven species of bats recorded utilising the Royal Canal corridor during the initial operational phase following the clearance of trees during the construction phase. During the construction phase, a total of 44 individual trees will be lost with twelve groups of trees being partially removed and 1 tree group that will be removed in its entirety. The woodland area lost across the Proposed Development is estimated at 6800m^2. This includes trees with that have low potential roosting features for bats (i.e. gaps between trunks and Ivy cover). The installation of bat boxes follows the guidance outlined in the NRA Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes (NRA, 2005).

Whilst 2456m^2 of new woodland habitat along the Proposed Development, as well as an additional 7000m^2 of woodland to be planted outside the Proposed Development within a field to the east of St Catherines Park adjacent to the Royal Canal, there will be an initial ecological lag as these trees will take several years to reach maturity and begin to start developing features that have the potential to support roosting features. As such, this step aims to address this period of ecological lag between the end of the construction phase and the point at which the planted trees reach maturity.

Within the Irish context, the Vincent's Wildlife Trust's reporting on Irish Bat Box schemes highlighted that 1FF Schwegler boxes are recommended for use by Pipistrelle spp., whereas Leisler's Bat displayed no preference for bat box type (McAney and Hanniffy, 2015). Additionally, Schwegler 2FN boxes are recommended for use by Brown Long-eared Bat, Natterer's Bat, and Daubenton's Bat. These three species were identified along the Proposed Development. A mix of these two bat boxes will be utilised along the Proposed Development to provide alternative roosting for all seven of the bat species identified utilising the Royal Canal.

In relation to the number of bat boxes recommended to be erected, Lintott & Mathews (2018) found that the greater the number of bat boxes deployed, the greater the probability of at least one of the boxes becoming occupied and that the odds of bats occupying at least one box increased by approximately 7% with each additional bat box that was deployed. As such, based on the number of trees and area of woodland to be cleared during the construction phase of the Proposed Development, it is recommended that a total of 12 bat boxes be installed along the Proposed Development.

Suitable locations along the Proposed Development will be identified during the bat pre-construction surveys. Bat Eco Services Ltd (2025) identified two areas suitable for bat boxes, including a row of semi-mature trees between Collins Bridge & Pakenham Bridge, and on a treeline between Kilpatrick Bridge to R806 Road Bridge. Bat boxes will be erected under supervision of a bat specialist to ensure that they are erected correctly. Schwegler woodcrete bat boxes (x4 units – 1FF design) are recommended, with 1FF designs preferred as this box is open at the bottom which reduces build-up of droppings (i.e. it is a self-cleaning bat box). Both McAney & Hannify (2015) and Collins et al. (2020) demonstrated this bat box design is utilised by bat species such as those recorded during the bat activity surveys (Bat Eco Services Ltd, 2025).. To increase occupancy of bat boxes by bats it is important to erect bat boxes 4m or higher (to ensure that bat boxes are out of reach from disturbance by humans and predation by other mammals) and that they should be located where bats have been documented foraging and commuting. The aspect of the bat box is not an influencing factor in relation to occupancy.

These recommendations have all been included within the Bat Report conducted by Bat Eco Services Ltd (2025).

8.9.3.5.2 Lighting

Inappropriate lighting will have a significant impact on nocturnal and crepuscular species as described in Section 8.12.4.3, with particularly high impact on light sensitive bat species such as Brown long-eared bat and Daubenton's bat. Artificial Light at Night (ALAN) may significantly change their natural behaviour in relation to roosting, commuting and feeding. The presence of these two light sensitive bat species have influenced the design of the outdoor lighting program along the canal. It is important that strict lighting guidelines are followed to reduce the potential impact of the proposed development on local bat populations as standard best practice. Luminaire design is extremely important to achieving appropriate lighting regimes. Luminaires come in a myriad of different styles, applications and specifications which a lighting professional can help to select.

The following measures and guidance have been outlined in the Proposed Developments bat survey reports (Bat Eco Services (2022, & 2025) (Appendix 8.5.8) and follow the most recent BCT Lighting Guidelines (BCT, 2023).

The following measures will be incorporated into the installation and operation of the Proposed Lighting Plan:

- All luminaires will lack UV elements when manufactured. Metal halide, compact fluorescent sources will not be used.
- LED luminaires will be used where possible due to their sharp-cut-off, lower intensity, good colour rendition and dimming capability,
- A warm white light source (2700 Kelvin or lower) will be adopted to reduce blue light component of luminaires. A 2700 Kelvin luminaire appears as a warm yellow due to the reduction in the stark blue light associated with higher Kelvin values (e.g. 4000 Kelvins). The "warmer" the light, the less of an impact on nocturnal wildlife. The progression of LED technology means that most luminaires are available at 2700 Kelvins and lower. Therefore, it is recommended that such luminaires are used for "biodiversity areas" and as LED technology develops, 2200 Kelvins may become more commonly available in future years.
- Light sources will feature peak wavelengths higher than 550nm to avoid the short blue wave component of light most disturbing to bats.
- Waymarking inground markers (low output with cowls or similar to minimised upward light spill) to delineate path edges, if required, for pedestrian zones within the proposed development area will be used.
- Column heights will be carefully considered to minimise light spill and glare visibility. This will be balanced with the potential for increased numbers of columns and upward light reflectance as with bollards.
- Only luminaires with a negligible or zero Upward Light Ration, and with good optical control, will be considered.
- Luminaires will always be mounted horizontally, with no light output above 90o and/or no upward tilt.

- Where appropriate, external security light will be set on motion sensors and set to as short a possible a timer as the risk assessment will allow (e.g. 1–2-minute timer).
- Only if all other options have been explored, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed.

Any external lighting for the proposed development will strictly follow the above guidelines and these will be strictly implemented during construction and operation phase of the proposed development.

Extensive consultation was undertaken with the lighting engineers. Consequently, the proposed public lighting has taken into consideration the BCT (2023) guidelines and the bat survey results. The lighting design report states the following:

"*The Greenway was designated as being ecologically sensitive largely due to the presence of bats using the canal as a feeding ground or a commuting route. From an ecological point the preferred option was for no lighting however this conflicted with the requirement for the provision of a safer environment and the encouragement of use of the greenway. A compromise between all interested parties was reached; this was a warm white colour temperature selected, the addition of louvres fitted to the luminaires to minimise light spill onto the canal and the addition of an intelligent motion detection and control system ensuring only occupied sections of the greenway to be achieving full designed to lux levels.*

Due to the potential low foot fall and the more rural nature of the Hansfield Railway Bridge to Kildare/Fingal County Boundary section of the greenway public lighting was not justified and as such not proposed. The lighting class was selected as pre the methodology of EN13201-1:2014 and in conjunction with Fingal County Councils' Public lighting specification. EN13201-2:2015 Category P4 was selected for the greenway."

The report continues to state:

"*2700K LEDs were selected as these are the warmest colour temperature LEDs acceptable to Fingal County Council at time of design. Cooler LEDs were considered; however, it was determined the increased energy efficiency benefit did not outweigh the potential additional negative ecological impact. It is accepted that warmer colour temperature LEDs have less negative ecological impact due to lower amounts of light in the blue spectrum emitted by them. All proposed luminaires were selected on their optical and energy performance as well at their robustness.*

To achieve the required lux levels on the greenway the lighting configuration was carefully designed to achieve recommended illuminance levels whilst minimising light spill. This was achieved by a combination of optimised column height, luminaire Wattage, optical setting and column location. All luminaires proposed have high performance optics designed to get the light onto the target area thus minimising spill light. The Upward Light Ratio (ULR) is 0%. The colour temperature of the LEDs are 2700K.

Additionally, louvres are fitted as required to further minimise the amount spill light. The lighting calculation takes into account the effect of any louvres proposed."

In relation to the proposed canal pedestrian bridge, the following was implemented into the design:

"*At CH7200 the greenway crosses the canal, to achieve compliant lux levels on the bridge without light spill onto the canal the bridge was lit via a LED module that fits into the handrail of the bridge. Due to the low mounting height and the bridge acting as a barrier, minimal light spill is expected onto the canal. The LED modules are to be electrical class III (Extra low voltage)*."

The Lighting system proposed is as follows:

"*Lighting Layout: Proposed Luminaire:*

- *Greenway section – Urbis Axia 2.1 fitted with 2700K colour temperature LEDs. Front, rear or front & rear louvres available as retrofittable option. Impact resistance rating of IK10 and Ingress Protection rating of IP66.*
- *Canal bridge crossing Urbis Alinea lighting module to be mounted into the bridge handrail. Impact resistance rating of IK10 and Ingress Protection rating of IP66.*
- *All luminaires have a design life of 25 years (100,000h LED & driver burn life)*."

Therefore, the following conditions, to meet BCT (2023), have been included in the public lighting design:

- 2700 Kelvin luminaires
- LED luminaires, no UV elements
- Minimum height of lamp poles: these have been set to 5m to reduce light spill (standard pole height is 6m)
- Luminaires will feature peak wavelengths higher than 550nm
- Luminaires will be mounted horizontally
- Shields have been factored into each luminaire to reduce lighting spill
- Existing luminaires will be changed to match the new design (as above)
- Passive Infrared (PIR) sensors will be erected along the length of the public lighting scheme

These mitigation measures will reduce the potential impact of the proposed lighting on local bat populations. A pedestrian bridge is proposed, and lighting is designed into the handrails of the bridge. The lighting design also meets the BCT (2023) guidelines.

A dynamic approach will be taken for the future management of lighting along the Royal Canal. This will be informed by ongoing monitoring during the operational phase (see sub-section 8.9.3.6).

Any changes to the lighting design or regime during the operational phase must be made in consultation with FCC, the Fingal County Biodiversity Officer, and the WI Environment Team, and will be subject to an additional ecological assessment.

8.9.3.6 Monitoring

During the operational phase, to assess the efficacy of the outlined mitigation and management measures, long-term monitoring plans will be followed for the most sensitive ecological receptors along the Royal Canal. Ecologists with specific expertise in each ecological receptor outlined will be appointed

by FCC to conduct these monitoring plans. All long-term monitoring will require coordination with the WI Environment team, and the results of these surveys will be made available to WI and the Fingal Biodiversity Officer. Monitoring will be part of the operational maintenance of the Greenway, and the associated landscaped areas will be intermittent and managed through operational arrangements to be made between FCC and WI, including through a memorandum of understanding for the Greenway.

Operational maintenance will also require the assessment of the results of these monitoring surveys to assess the effectiveness of the construction and operational phase mitigations. The effectiveness of the mitigation measures will be conducted through comparison of the operational phase monitoring survey results with the existing baseline for the Royal Canal. Any comparisons will consider additional non-project related changes, such as extreme weather events and pollution events upstream of the Proposed Development. These considerations will be used alongside expert opinion of the specific surveyors on whether the mitigation measures have been implemented effectively/have been sufficient to address the impacts of the Proposed Development. In the event that measures have been deemed inadequate, suggestions will be made by the appointed surveyor(s) to FCC and WI to provide additional measures to ensure a return to baseline conditions for the affected ecological receptor(s). Any proposed additional measures/changes to the existing mitigation measures will be made in coordination with the WI Environmental and FCC. This will be covered as part of the operational arrangements to be made between FCC and WI.

The specific long-term monitoring plans are outlined below in sub-sections 8.9.3.6.1 to 8.9.3.6.6 inclusive.

8.9.3.6.1 Grassland habitat – Dry meadows and grassy verges and Dry calcareous and neutral grassland

Monitoring of the formerly Annex I quality grassland habitats, labelled in this report as Plot 1 and 4, will be conducted yearly for 5 years following the completion of the construction phase and will follow the guidance outlined below:

- Irish Wildlife Manual No. 78 The Irish semi-natural grasslands survey 2007-2012 (O'Neill et al. 2013)
- Irish Wildlife Manual No. 102 The monitoring and assessment of three EU Habitats Directive Annex I Grassland Habitat (Martin et al. 2018)

The methodology from these manuals will be used to determine if any relevé passes the criteria used to assess the condition of the following Annex I habitats:

- Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) [6210]; important orchid sites [*6210]
- Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) [6510]

These surveys will also identify any rare or protected floral species within these grassland areas, as well as note the emergence of any orchid species.

8.9.3.6.2 (Mixed) broadleaved woodland - Coolmine Road to Roselawn Road (Chainages +6300 - +7170) and Kennan Bridge to Dr Troy Bridge (Chainages + 5450 - +5600)

Monitoring of the woodland sections between Coolmine Road and Roselawn Road (Chainages +6300 - +7170) and between Kennan Bridge and Dr Troy Bridge (Chainages + 5450 - +5600) will be conducted

annually for 5 years following the completion of the construction phase by an Ecologist with suitable experience in woodland ecology and management. These surveys will assess the condition of these woodlands, signs of any protected floral and faunal species, and if any invasive species have spread into these areas following their removal during the construction phase.

8.9.3.6.3 Badger and Otter

To assess and ensure efficacy of mitigation and management measures with regards to Badgers, the Royal Canal Urban Greenway survey area will be monitored (re-surveyed) annually for the first 5 years to ensure Badger populations are still extant and active, as described in Triturus Environmental Ltd 2022a. If an absence of Badger is noted, additional measures must be considered in consultation with NPWS and the Fingal Biodiversity Officer to improve the suitability of the habitats and reduce disturbance along the Proposed Development for Badger.

Otter monitoring will also take place to ensure the Proposed Development have not impacted the local population and to resurvey potential holts. Surveys will be completed once per year for two years after the construction works are complete.

8.9.3.6.4 Bats

Monitoring of bats will be conducted during the operational phase with measurements of light spill onto the canal recorded. This will be completed over five consecutive summer seasons post construction works, as per best practice (Marnell et al 2022 & Reason, P.F. and Wray, S. (2025)). The features to monitor for this consecutive summer monitoring includes: check new bat boxes are being utilised, commuting routes are still being used, specified lighting levels are followed, that features to increase value for bat activity has been successful or if the increased level of human activity along the route is displacing the bats. Some features, such as bat boxes, have a delay in their uptake in utilisation, which will be reflected in the initial years of bat monitoring.

8.9.3.6.5 Glutinous Snail

As outlined within the latest Triturus Environmental Ltd (2025c) survey report, Glutinous Snail are known for periodic population declines, sudden recoveries and range fluctuations. Long-term monitoring is therefore critical for this species long-term conservation. Monitoring will take place yearly for 5 years after the construction phase, and follow the methodology utilised within the previous Triturus Environmental Ltd surveys. These surveys will also assess the use of the artificial refugia by Glutinous snail and other freshwater macro invertebrates and identify any areas where additional management of macrophytic vegetation may be required.

8.9.3.6.6 Invasive Non-native Species

Following the completion of construction, invasive non-native species will be monitored for the duration of the site's operational phase, with a particular emphasis on Third Schedule list species. The invasive species management plan will outline the long-term management and monitoring of these listed species. Additionally, non-listed invasive species such as Cherry Laurel will be appropriately managed if their spread is identified during the operational phase.

All post construction monitoring will be devised and conducted by a suitably qualified ecologist in consultation with NPWS and the Fingal County Biodiversity Officer.

8.10 Residual Impacts

Residual ecological impacts are those that remain once the Proposed Development has been constructed and the mitigation measures outlined here implemented for both the construction and operational phases. The main aim of ecological mitigation, compensation, and enhancement is to minimize or eliminate residual impacts. The anticipated impacts and mitigation measures, alongside the residual impacts outlined below in sub-sections 8.10.1.1 to 8.10.4 inclusive are summarised in sub-section 8.10.4.

8.10.1 Designated Sites

8.10.1.1 Royal Canal pNHA [National level importance], Canals (FW3) [National level importance]

The Royal Canal pNHA will retain its function as an important ecological corridor for local faunal groups. While there will be an overall loss of woodland habitat from this pNHA, the mitigation measures outlined, including the lighting design and mammal underpasses will prevent the fragmentation of the terrestrial habitats associated with this pNHA, allowing the existing diversity of species present to continue utilising this ecological corridor. As stated in the site brief for this pNHA, the ecological value of the canal lies more in the diversity of species it supports along its linear habitats than in the presence of rare species. It crosses through agricultural land and therefore provides a refuge for species threatened by modern farming methods. Additionally, the construction phase mitigations alongside the operational drainage design will prevent adverse impacts to the water quality of the Royal Canal itself.

As such, following the implementation of the construction and operational stage ecological mitigation measures and temporary ecological lag (maturation of landscape habitats), a **permanent adverse residual impact of slight significance is likely** on the Royal Canal pNHA, and a **long-term neutral residual impact is likely** on the Royal Canal itself.

8.10.1.2 Liffey Valley pNHA [National level importance]

The construction phase mitigations and operational drainage design will prevent adverse impacts to the water quality of the Royal Canal and nearby Rusk Stream. Furthermore, given the significant barriers, including woodland and scrub habitat which will be retained, in place between the Proposed Development and the Rusk Stream, which represents the only hydrological pathway to the Liffey Valley pNHA, adverse effects are not anticipated to this pNHA.

Therefore, following the implementation of the construction and operational stage ecological mitigation measures and temporary ecological lag (maturation of landscape habitats), **no residual impacts are** likely on the Liffey Valley pNHA.

8.10.1.3 Buildings and artificial surfaces (bridges) [Local (higher value)], and Stone walls and other stone works [Local (higher value)]

There will be no losses from the stone wall habitats during the construction phase, and all the existing bridges along the Proposed Development will be retained. Two buildings to the east of the Hansfield Railway bridge will be lost, leading to a loss of potential roosting features for local bats. However, the Old Schoolhouse which is considered the highest value building in terms of its ability to support potential bat roosting will be retained. Additionally, the construction phase mitigation measures will minimise disturbance to nay fauna utilising these habitats for roosting/nesting purposes. Furthermore, the construction phase impacts outline detailed pre-construction, construction phase, and post construction phase monitoring of these areas, meaning any changes from the existing baseline will be identified prior to the works.

as a result of the Proposed Development. Furthermore, the construction phase mitigation measures will reduce the likelihood of significant effects on these receptors as a result of pollution events.

Therefore, following the implementation of the construction and operational stage ecological mitigation measures, a **long-term adverse residual impact that is not significant is likely** for these habitat types.

8.10.1.4 Earth Banks [Local (higher value)]

During the construction phase, this habitat will be retained, and the construction phase mitigations will reduce the likelihood of any impacts via airborne, groundwater, or surface water pollutants.

Therefore, following the implementation of the construction and operational stage ecological mitigation measures and temporary ecological lag (maturation of landscape habitats) likely long term neutral residual impact that is not significant on this habitat.

8.10.1.5 Recolonising bare ground [Local (lower value)]

During the construction phase, this habitat will be lost in its entirety.

Therefore, following the implementation of the construction and operational stage ecological mitigation measures and temporary ecological lag (maturation of landscape habitats), a **permanent adverse residual impact of profound significance is likely** for this habitat. However, given the low value of this habitat, and that part of its area will be replaced with higher value habitats as detailed in the Landscape Plan (Appendix 10.2), this is not likely to be significant in a wider ecological context, and as such the loss of this habitat will have a **likely permanent adverse residual impact of imperceptible significance** for local biodiversity.

8.10.1.6 Calcareous Springs (FP1) [County level importance]

There will not physical disturbance to this habitat due to its location on the opposite bank to the Proposed Development, and the construction phase mitigations will reduce the likelihood of any impacts via airborne, groundwater, or surface water pollutants. The drainage layout will reduce the likelihood of adverse impacts to the water quality of the Royal Canal during the operational phase.

Therefore, following the implementation of the construction and operational stage ecological mitigation measures, **likely long term neutral residual impact that is not significant** on the Calcareous Spring habitat.

8.10.1.7 Bankside Habitats: Reed and large sedge swamps (FS1) [County level importance], Dry meadows and grassy verges (GS2) [Local (higher value)], and Mixed: Treelines / Dry meadows and grassy verges (Mixed: WL2/GS2) [Local (higher value)]

During the construction phase, there will be minimal losses from the bankside habitats, and no losses from the reed and large sedge swamps habitats, as a result of direct physical removal. The construction phase mitigation measures will reduce the likelihood of any adverse impacts via airborne or surface water pollutants to these habitats. The drainage layout will reduce the likelihood of adverse impacts to the water quality of the Royal Canal during the operational phase.

Therefore, following the implementation of the construction and operational stage ecological mitigation measures, a **long-term adverse residual impact that is not significant is likely** for these habitat types.

8.10.1.8 Drainage ditches (FW4) [Local (higher value)], Hedgerows over drainage ditches (Mixed: WL1/FW4) [Local (higher value]), Treelines over drainage ditches (Mixed WL2/FW4) [Local (higher value)]

During the construction phase, there will be no losses from these habitats as a result of direct physical removal. The construction phase mitigation measures will reduce the likelihood of any adverse impacts via airborne or surface water pollutants to these habitats, or from accidental damage to tree/shrub species. The drainage layout will reduce the likelihood of adverse impacts to the water quality of the drainage ditches during the operational phase.

Therefore, following the implementation of the construction and operational stage ecological mitigation measures, a **long-term adverse residual impact that is not significant is likely** for drainage ditches and **likely long-term neutral impact that is not significant** for Hedgerows over drainage ditches and Treelines over drainage ditches habitat types.

8.10.1.9 Dry meadows and grassy verges [Local (higher value)] (GS2) and Dry calcareous grassland [County level importance] (GS1)

During the construction phase, there will be minimal losses from these habitats as a result of direct physical removal. The construction phase mitigation measures will reduce the likelihood of any adverse impacts via airborne or surface water pollutants to these habitats. The operational grassland management measures will improve the quality of the retained GS1 grassland habitat to the west of Hansfield railway Bridge.

Therefore, following the implementation of the construction and operational stage ecological mitigation measures and temporary ecological lag (maturation of landscape habitats), a **long-term adverse residual impact that is not significant is likely** for these habitat types.

8.10.2 (Mixed) broadleaved woodland (WD1) [County level importance]

During the construction phase, there will be an estimated loss of 6800m^2 of woodland habitat. This will offset by the creation of 7000m^2 of woodland habitat adjacent to the Royal Canal to the east of St Catherines Park. Additionally, within the Landscape Plan (Appendix 10.2) another 2456m^2 of woodland will be planted along the Proposed Development. The removal of invasive species during the construction and operational phase, as well as their long-term monitoring and management as detailed within the invasive species management plan will improve the health of the retained woodland sections. Furthermore, the construction phase mitigation measures will reduce the likelihood of any adverse impacts via airborne or surface water pollutants to the retained sections of these habitats. However, there will still be an overall loss of woodland habitat from the direct Royal Canal ecological corridor.

Therefore, following the implementation of the construction and operational stage ecological mitigation measures and temporary ecological lag (maturation of landscape habitats), a **permanent adverse residual impact of slight significance is likely** for this habitat type.

8.10.2.1 Scrub (WS1) [Local (higher value)], and Mosaic: Scrub / Dry meadows and grassy verges (Mosaic: WS1/GS2) [Local (higher value)]

During the construction phase, an estimated 1150m^2 of these habitats will be removed. However, as part of the Landscape Plan (Appendix 10.2), 6841m^2 of meadow and shrub planting will be undertaken which will offset this loss. Furthermore, the construction phase mitigation measures will reduce the

likelihood of any adverse impacts via airborne or surface water pollutants to the retained sections of these habitats.

Therefore, following the implementation of the construction and operational stage ecological mitigation measures and temporary ecological lag (maturation of landscape habitats), a **long-term adverse residual impact of imperceptible significance** is likely for these habitat types.

8.10.2.2 Linear Woodland: Treelines (WL2), and Mixed: Treelines / Dry meadows and grassy verges (Mixed: WL2/GS2) [Local (higher value)]

During the construction phase, several sections of treeline will be removed to enable the construction of the Greenway route. However, this loss will be minimal, and the likelihood of adverse effects to the retained treelines via airborne, groundwater, or surface water pollutants, or from mechanical damage will be reduced significantly by the construction phase mitigation measures.

Therefore, following the implementation of the construction and operational stage ecological mitigation measures and temporary ecological lag (maturation of landscape habitats), a **long-term adverse residual impact that is not significant is likely** on these linear habitats.

8.10.2.3 Hedgerows (WL1)

During the construction phase, five hedges will be removed. However, these hedges are mainly comprised of ornamental/invasive species, and their loss is no considered significant. Additionally, the likelihood and the likelihood of adverse effects to the retained hedgerows via airborne, groundwater, or surface water pollutants, or from mechanical damage will be reduced significantly by the construction phase mitigation measures. Furthermore, any loss will be offset by the planting of 619 linear metres of hedgerow along the Proposed Development, as detailed in the Landscape Plan (Appendix 10.2).

Therefore, following the implementation of the construction and operational stage ecological mitigation measures and temporary ecological lag (maturation of landscape habitats), a **long-term positive residual impact of slight significance** is likely for Hedgerows habitat.

8.10.3 Protected Species

8.10.3.1 Protected Flora [Local (higher value)]

As detailed in the baseline environment section, the protected flora identified within the site are limited to the Royal Canal itself. During the construction phase, there will be no losses from the habitats within the canal as a result of direct physical removal. The construction phase mitigation measures will reduce the likelihood of any adverse impacts via airborne, groundwater, or surface water pollutants to the canal. The drainage layout will reduce the likelihood of adverse impacts to the water quality of the Royal Canal during the operational phase.

Therefore, following the implementation of the construction and operational stage ecological mitigation measures, a **long-term neutral residual impact that is not significant is likely** for protected floral species.

8.10.3.2 Bats [County level importance]

Impacts on bats include the loss of habitat, include low potential roosting features, and lighting impacts. The likelihood of direct physical impacts via pollutants will be reduced significantly via the construction phase mitigation measures. Furthermore, the loss of an estimated 6800m^2 of woodland habitat during

the construction phase will offset by the creation of 7000m^2 of woodland habitat adjacent to the Royal Canal to the east of St Catherines Park. Additionally, within the Landscape Plan (Appendix 10.2) another 2456m^2 of woodland will be planted along the Proposed Development. These habitats will take several years to reach maturity and begin to support the foraging/potential roosting activities of local bats. The installation of bat boxes along the Proposed Development will provide alternative roosting resources during this period. Furthermore, the implementation of a bat friendly lighting approach following BCT guidelines will prevent significant adverse effects to local bat species during the operational phase.

These mitigation measures are likely to result in a **long-term imperceptible adverse impact through the operational phase** for most bat species, however, the impact on light sensitive bat species such as the Brown long-eared bat and Daubenton's bat will remain a **long-term adverse impact of slight significance through the operational phase**.

Therefore, overall, for this key ecological receptor, following the implementation of the construction and operational stage ecological mitigation measures and temporary ecological lag (maturation of landscape habitats), a **long-term adverse residual impact of slight significance is likely**.

8.10.3.3 Non-volant Mammals: Badger [County level importance], Otter [County level importance], Other Mammals (Hedgehog, Pygmy Shrew, Pine Marten, Red Squirrel) [Local (higher value)]

Impacts on local non-volant mammals will include the loss of habitat, and operational lighting impacts. The likelihood of direct physical impacts via pollutants, physical disturbance during construction works, and accidental trappings will be reduced significantly via the construction phase mitigation measures. Furthermore, the loss of an estimated 6800m^2 of woodland habitat during the construction phase will offset by the creation of 7000m^2 of woodland habitat adjacent to the Royal Canal to the east of St Catherines Park. Additionally, within the Landscape Plan another 2456m^2 of woodland will be planted along the Proposed Development. These habitats will take several years to reach maturity and begin to support the foraging, commuting, and refuge activities of local non-volant mammals. Furthermore, the installation of five underpasses will preserve the existing commuting routes within the Royal Canal ecological corridor for non-volant mammals Additionally, the implementation of a wildlife friendly lighting approach following BCT guidelines will prevent significant adverse effects to local crepuscular/nocturnal mammal species during the operational phase. However, due to increased footfall along the Proposed Greenway, there will likely be an increase in operational disturbance sources along the Royal Canal.

Therefore, following the implementation of the construction and operational stage ecological mitigation measures and temporary ecological lag (maturation of landscape habitats), a **long-term adverse residual impact of slight significance** is anticipated for Badger and a **likely long-term neutral residual impact that is not significant** for Otter, and **likely long-term adverse residual impact that is not significant for** other local non-volant mammal species including Hedgehog, Pygmy Shrew, Pine Marten and Red Squirrel.

8.10.3.4 Birds [Local (higher value)]

Impacts on birds include the loss of foraging and nesting habitat. The likelihood of direct physical impacts via pollutants, physical disturbance during construction works, and accidental trappings will be reduced significantly via the construction phase mitigation measures. Furthermore, the loss of an estimated 6800m^2 of woodland habitat during the construction phase will offset by the creation of 7000m^2 of woodland habitat adjacent to the Royal Canal to the east of St Catherines Park. Additionally,

within the Landscape Plan (Appendix 10.2) another 2456m^2 of woodland will be planted along the Proposed Development. These habitats will take several years to reach maturity and begin to support the foraging/nesting activities of local birds. The installation of bird boxes along the Proposed Development will provide alternative nesting resources for breeding birds during this period.

Therefore, following the implementation of the construction and operational stage ecological mitigation measures and temporary ecological lag (maturation of landscape habitats), a **long-term adverse residual impact that is not significant is likely** for local bird species.

8.10.3.5 Amphibians [Local (higher value)]

Impacts to local amphibians will be limited to the loss of supporting habitats. The likelihood of direct physical impacts via pollutants, physical disturbance during construction works, and accidental trappings will be reduced significantly via the construction phase mitigation measures. The loss of an estimated 6800m^2 of woodland habitat during the construction phase will offset by the creation of 7000m^2 of woodland habitat adjacent to the Royal Canal to the east of St Catherines Park. Additionally, within the Landscape Plan (Appendix 10.2) another 2456m^2 of woodland will be planted along the Proposed Development. This will be further offset by the creation of 6841m^2 of meadow and shrub area along the Proposed Development. Additionally the drainage layout will reduce the likelihood of adverse impacts to the water quality of the Royal Canal during the operational phase. The construction phase mitigations alongside the operational drainage design will prevent adverse impacts to the water quality of the Royal Canal itself.

Therefore, following the implementation of the construction and operational stage ecological mitigation measures and temporary ecological lag (maturation of landscape habitats), a **long-term neutral impact that is not significant is likely** for local amphibians.

8.10.3.6 Terrestrial invertebrates (Bees, ants, moths and butterflies) [Local (higher value)], Odonata [Local (higher value)]

Impacts to local terrestrial invertebrates will be limited to the loss of supporting habitats. The likelihood of direct physical impacts via pollutants and physical disturbance during construction works will be reduced significantly via the construction phase mitigation measures. The loss of an estimated 6800m^2 of woodland habitat during the construction phase will offset by the creation of 7000m^2 of woodland habitat adjacent to the Royal Canal to the east of St Catherines Park. Additionally, within the Landscape Plan (Appendix 10.2) another 2456m^2 of woodland will be planted along the Proposed Development. These habitats will take several years to reach maturity, although young trees will still support the foraging and nesting activities of terrestrial invertebrates. Furthermore, the grassland management measures will enhance areas of the existing grassland habitats providing improved foraging resources for terrestrial invertebrates.

Therefore, following the implementation of the construction and operational stage ecological mitigation measures and temporary ecological lag (maturation of landscape habitats), a **long-term neutral residual impact that is not significant is likely** for local terrestrial invertebrates and *Odonata* species.

8.10.3.7 Glutinous Snail and other Aquatic Molluscs [National level importance]

During the construction phase, there will be no losses from the supporting habitats for aquatic molluscs within the Royal Canal. bankside habitats. The construction phase mitigation measures will reduce the likelihood of any adverse impacts via airborne, groundwater, or surface water pollutants to these habitats. The drainage layout will reduce the likelihood of adverse impacts to the water quality of the

Royal Canal during the operational phase. The addition of Glutinous Snail refugia will also provide enhancements to the Royal Canal for this critically endangered species.

Therefore, following the implementation of the construction and operational stage ecological mitigation measures, a **long-term adverse residual impact that is not significant is likely** for Glutinous Snail and other aquatic molluscs.

8.10.3.8 White-clawed Crayfish [County level importance], Eel, Coarse Fish and Pike [County level importance]

During the construction phase, there will be no losses from the supporting habitats for fish species and White-clawed Crayfish within the Royal Canal bankside habitats. The construction phase mitigation measures will reduce the likelihood of any adverse impacts via airborne, groundwater, or surface water pollutants to these habitats. The drainage layout will reduce the likelihood of adverse impacts to the water quality of the Royal Canal during the operational phase.

Therefore, following the implementation of the construction and operational stage ecological mitigation measures, a **long-term adverse residual impact that is not significant is likely** for White-clawed Crayfish, European Eel, Pike, and coarse fish species.

8.10.4 Summary of Residuals

The Proposed Development's lighting design will minimize disturbance on local bat species and nocturnal/crepuscular non-volant mammals, preserving the existing ecological corridor along the Royal Canal. The proposed Landscape Plan (Appendix 10.2) will minimize the loss of foraging and commuting resources from the construction of the Proposed Development for all local terrestrial fauna. The habitats within the Royal Canal will be retained during the construction and operation phases. Invasive species within these habitats will also be removed and replaced with native species. Additionally, the site's operational drainage will minimize surface water run-off into the canal, leading to imperceptible impacts on its water quality. The Royal Canal pNHA will retain its primary function of supporting local floral and faunal species during the Proposed Developments operation. While there will be an overall loss of woodland habitat within the Royal Canal ecological corridor, this will be offset by the creation of 7000m^2 of woodland habitat adjacent to the Royal Canal to the east of St Catherines Park.

The outlined species-specific mitigation measures, and the outlined monitoring plans to dynamically assess their effectiveness will further minimize the impacts of habitat loss during the construction phase.

A planning stage note is provided in Appendix 8.6 to qualitatively assess the Proposed Development's expected Biodiversity Net Gain (BNG) drawing on the EIAR, ecological surveys and landscape proposals.

Therefore, following the implementation of the construction and operational-stage ecological mitigation measures and short to medium-term ecological lag (maturation of the landscaped habitats), it is anticipated that the proposed development will have a **long-term adverse residual ecological impact of slight significance on local biodiversity.**

8.10.5 Cumulative Impacts

As outlined in the summary of the cumulative impacts of the Proposed Development with other plans and projects in sub-section 8.8.4, cumulative adverse impacts are likely between the Proposed Development and the Old Schoolhouse Masterplan, as well as the Dart + West development. The

mitigation measures outlined within this Chapter will result in long-term slight adverse residual impacts to local ecologicy. These measures address the primary concerns relating to the cumulative impacts with the Dart + West project and the Old Schoolhouse Masterplan, particularly on disturbance from lighting and the fragmentation and loss of habitat within the Royal Canal ecological corridor. The Proposed Development will offset losses with the creation of new woodland habitat to the east of St Catherines Park, adjacent to the Royal Canal, Additionally the bat friendly lighting approaches and mammal underpasses embedded the in the Proposed Development's design will prevent the fragmentation of the northern bank of the Royal Canal ecological corridor. As such cumulative impacts are not anticipated to be significant with the Dart + West Project. However, while these mitigation measures will lessen the cumulative impact between the Proposed Development and the Old Schoolhouse Masterplan, it has still been determined that the Masterplan, in its current scope, would have **cumulative adverse impacts of moderate significance** with the Proposed Development. This is specifically relating to bats and Badger, as the removal of scrub and treeline habitat will remove foraging, commuting and potential roosting/refuge habitat for both and still result in the narrowing of the ecological corridor between Chainages +4580 - +5300.

8.11 Summary of impact assessment

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
Royal Canal pNHA	National	**Construction Phase:** Direct loss of the natural habitats along the banks of the canal (woodlands, scrub and grasslands) during the construction of the Greenway. Physical degradation of these habitats through the movement of machinery. Surface water run-off pollution from silt/suspended solids and/or hydrocarbons may infiltrate the natural habitats along the banks of the canal (woodlands, grasslands and sedge swamps) or deteriorate the quality of the water in the main canal body.	**Construction Phase:** Likely long-term permanent adverse significant impact **Operational Phase:** Likely permanent adverse impact of moderate significance	**Pre-enabling works:** The pre-enabling work surveys outlined in sub-section **Error! Reference source not found.**. **Construction Phase:** Appropriate measures to reduce direct habitat impact and degradation from the locations of the site compound and associated materials outlined in sub-sections 8.9.2.2.5, 8.9.2.2.12, & 8.9.2.2.15. Appropriate surface water and groundwater quality control measures set out in sub-sections	Permanent adverse residual impact of slight significance

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		Air (dust) pollution has the potential to negatively impact habitats, adversely impacting photosynthesis and the biological functions of valued flora. **Operational Phase:** Slight habitat degradation from increased footfall – trampling and ongoing maintenance Removal of trees from the proposed scheme area will likely result in long-term adverse impact of slight significance		8.9.2.2.6, 8.9.2.2.7, 8.9.2.2.9 & 8.9.2.2.10. A series of measures are proposed to reduce air pollution within the vicinity of construction works i.e., hoarding to reduce the spread of dust, appropriate timing of works, control of vehicles etc. These are set out in detail in sub-sections 8.9.2.2.11 & 8.9.2.2.13. Adherence to the measures outlined in sub-sections 8.9.2.2.15.1 pertaining to the clearance of woodland habitats.	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		Ecological lag due to time taken for planted tree and shrub species to reach semi-maturity/maturity Surface water impacts will be non-significant due to the design of appropriate surface water infrastructure outlined in Chapter 9 of this report.		The construction phase monitoring plan outlined in sub-section 8.9.2.1.2. Adherence to mitigations outlined in the Surface Water Management Plan in sub-section 8.9.2.2.7. **Operational Phase:** Mitigation through design of appropriate surface water infrastructure outlined in detail in Chapter 9 of this report and described in sub-section 8.9.3.1. Biodiversity enhancement	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				measures as set out in the Landscape Plan (Appendix 10.2), which includes compensatory planting of wildflower/grass mix meadow, native trees and woodland cover along the Proposed Development where habitat removal has taken place. Additionally, the measures outlined in sub-section 8.9.3.4 relating to future planting plans and the management of landscaped habitats must be strictly adhered to. The measures outlined in sub-section 8.9.3.4.1	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				relating to the management of woodland habitats along the Royal Canal. The monitoring plans for the woodland habitat within this pNHA outlined in sub-section 8.9.3.6.2.	
Liffey Valley pNHA	National	**Construction Phase:** Surface water run-off pollution from silt/suspended solids and/or hydrocarbons may infiltrate local river waterbodies and flow downstream where they may deteriorate the quality of the water in the Liffey Valley pNHA. **Operational Phase:**	**Construction Phase:** Likely temporary adverse impact of slight significance **Operational Phase:** Likely permanent impact of imperceptible significance	**Construction Phase:** Appropriate surface water and groundwater quality control measures set out in sub-sections 8.9.2.2.6, 8.9.2.2.7, 8.9.2.2.9 & 8.9.2.2.10. **Operational Phase:** Mitigation through design of appropriate	Likely long term neutral residual impact that is not significant

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		None anticipated due to the design of appropriate surface water infrastructure outlined in Chapter 9 of this report.		surface water infrastructure outlined in detail in Chapter 9 of this report and described in sub-section 8.9.3.1.	
Building and artificial surfaces (BL3) (bridges)/ Stone walls and other stonework (BL1)	Local (higher value)	**Construction Phase:** The bridges located along the canal have the potential to support nesting for Barn Swallow. Barn Swallow were recorded nesting underneath the M3 Parkway Rail Line crossing over the Royal Canal, Chainages +3270-3290, during the 2024 and 2025 bird surveys. While these bridges will be retained and remain unaltered, construction-based activities have the potential to generate	**Construction Phase:** Likely temporary adverse impact of slight significance Operational Phase: Likely long-term adverse impact that is not significant	**Pre-enabling works** The pre-enabling work surveys outlined in sub-section 8.9.2.1.2. **Construction Phase:** Works in the vicinity of bridges will not take place during the breeding bird season in order to prevent the disturbance of nesting Swallows, as per sub-section 8.9.2.2.16.4.	Likely long-term adverse residual impact that is not significant

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		surface and airborne pollutants, as well as visual and audible disturbance making this habitat less suitable for nesting birds. Construction based impacts on breeding birds are assessed further in sub-section 8.7.3.4.6 below. Additionally, a small area of tarmacked surface to the west of Coolmine Bridge along Sheepmoor Lane (Chainage +6130 - 6150) will be used a construction compound. This area has negligible ecological value and its temporary loss is not considered significant. There will be additional clearance of houses to the west of the Hansfield		Adherence to mitigations outlined in the Invasive Species Management Plan sub-sections 8.9.2.2.17. **Operational Phase:** None required	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		Railway Bridge. This has the potential to have knock on effects on bats in terms of the availability of roosting features. The Old Schoolhouse, the highest value building in terms of roosting features, will be retained, although this habitat will be vulnerable to accidental damage from construction vehicles during the construction phase. **Operational Phase:** No predicted impacts during operational phase			
Earth banks (BL2)	Local (higher value)	**Construction Phase:** The natural earth bank habitats along sections of the Proposed	**Construction Phase:** Likely medium term adverse impact that is significant	**Pre-enabling works** The pre-enabling work surveys outlined	Likely long term neutral residual impact that is not significant

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		Development have the potential to be degraded through the movement of machinery, and destruction through the footprint of the Greenway. Air (dust) pollution has the potential to negatively impact habitats, adversely impacting its provisions for foraging and nesting for local invertebrates. **Operational Phase:** No predicted impacts during operational phase	**Operational Phase:** Likely long-term adverse impact that is not significant	in sub-section 8.9.2.1.2. **Construction Phase:** Appropriate measures to reduce direct habitat impact and degradation from the locations of the site compound and associated materials outlined in sub-sections 8.9.2.2.5, 8.9.2.2.12 & 8.9.2.2.15. A series of measures are proposed to reduce air pollution within the vicinity of construction works i.e., hoarding to reduce the spread of dust, appropriate	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				timing of works, control of vehicles etc. These are set out in detail in sub-section 8.9.2.2.11. **Operational Phase:** An increased number of vegetated earth banks are proposed as part of the biodiversity enhancement measures described in the Landscape Plan (Appendix 10.2). Additionally, the measures outlined in sub-section 8.9.3.4 relating to future planting plans and the management of landscaped habitats must be strictly adhered to.	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
Recolonizing bare ground (ED3)	Local (lower value)	**Construction Phase:** The removal and deterioration of this habitat type will reduce the available foraging resources for invertebrates **Operational Phase:** No predicted impacts during operational phase	**Construction Phase:** Likely permanent adverse impact of profound significance **Operational Phase:** Likely permanent adverse impact of profound significance. However, given its lower value and that sections of this habitat will be replaced by higher value meadow and treeline habitats, its loss is not considered significant in the wider context of the Royal Canal ecological corridor	**Pre-enabling works** The pre-enabling work surveys outlined in sub-section 8.9.2.1.2. **Construction Phase:** Appropriate measures to reduce direct habitat impact and degradation from the locations of the site compound and associated materials outlined in sub-sections 8.9.2.2.5, 8.9.2.2.12, & 8.9.2.2.15 Adherence to mitigations outlined in the Invasive Species Management Plan	Likely permanent adverse residual impact of imperceptible significance.

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				sub-sections 8.9.2.2.17. **Operational Phase:** None required	
Calcareous Springs (FP1)	County level	**Construction Phase:** Air (dust and chemical) pollution has the potential to negatively impact habitats, adversely impacting the quality of this locally rare habitat type. **Operational Phase:** Due to the higher quality Greenway located across the canal from the calcareous spring, the rate of utilisation of the pathway above the	**Construction Phase:** Likely temporary adverse impact of moderate significance during the construction phase **Operational Phase:** Likely long-term neutral impact that is not significant	**Pre-enabling works** The pre-enabling work surveys outlined in sub-section 8.9.2.1.2. **Construction Phase:** Site investigation works have informed the construction methodology to avoid negative impacts on local groundwater regimes A series of measures are proposed to	Likely long term neutral residual impact that is not significant

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		calcareous spring is anticipated to be lower. This will overall stabilise the bank of the calcareous spring and its condition will remain stable.		reduce air pollution within the vicinity of construction works i.e., hoarding to reduce the spread of dust, appropriate timing of works, control of vehicles etc. These are set out in detail in sub-section 8.9.2.2.11. Adherence to mitigations outlined in the Invasive Species Management Plan sub-sections 8.9.2.2.17. **Operational Phase:** Mitigation through design of appropriate surface water	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				infrastructure outlined in detail in Chapter 9 of this report and described in sub-section 8.9.3.1.	
Bankside Habitats: Reed and large sedge swamps (FS1), Dry meadows and grassy verges (GS2),	National level	**Construction Phase:** Surface water run-off pollution from silt/suspended solids and/or hydrocarbons may infiltrate the canal or the adjacent bankside habitats and deteriorate the quality and health of local water and soil, reducing overall habitat quality Air (dust) pollution has the potential to negatively impact habitats, adversely impacting photosynthesis and the	**Construction Phase:** Likely short-term adverse impact of slight significance **Operational Phase:** Likely long-term adverse impact of slight significance	**Pre-enabling works** The pre-enabling work surveys outlined in sub-section 8.9.2.1.2. **Construction Phase:** Appropriate surface water and groundwater quality control measures set out in sub-sections 8.9.2.2.6, 8.9.2.2.7, 8.9.2.2.9 & 8.9.2.2.10 A series of measures are proposed to reduce air pollution	Likely long-term adverse residual impact that is non-significant

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		biological functions of valued flora. The habitats along the banks of the canal have the potential to be degraded through the movement of machinery, and direct removal through the footprint of the Greenway. **Operational Phase:** Slight habitat degradation from increased footfall – trampling and ongoing maintenance Surface water impacts will be non-significant due to the design of appropriate surface		within the vicinity of construction works i.e., hoarding to reduce the spread of dust, appropriate timing of works, control of vehicles etc. These are set out in detail in sub-sections 8.9.2.2.11. Adherence to mitigations outlined in the Invasive Species Management Plan sub-sections 8.9.2.2.17. **Operational Phase:** Mitigation through design of appropriate surface water infrastructure outlined in detail in Chapter 9	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		water infrastructure outlined in Chapter 9 of this report.		of this report and described in sub-section 8.9.3.1.	
Canals (FW3)	National level	**Construction Phase:** Surface water run-off pollution from silt/suspended solids and/or hydrocarbons may the canal and deteriorate its water quality, reducing its potential for local flora and fauna Air (dust and chemical) pollution has the potential to negatively impact the canal body, deteriorating its water quality, reducing its potential for local flora and fauna **Operational Phase:**	**Construction Phase:** Short-term adverse impact of moderate significance **Operational Phase:** Likely permanent neutral impact that is not significant	**Pre-enabling works** The pre-enabling work surveys outlined in sub-section 8.9.2.1.2. **Construction Phase:** Appropriate surface water and groundwater quality control measures set out in sub-sections 8.9.2.2.6, 8.9.2.2.7, 8.9.2.2.8, 8.9.2.2.9 & 8.9.2.2.10. A series of measures are proposed to reduce air pollution within the vicinity of	Likely long-term neutral residual impact that is not significant

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		Surface water impacts will be non-significant due to the design of appropriate surface water infrastructure outlined in Chapter 9 of this report.		construction works i.e., hoarding to reduce the spread of dust, appropriate timing of works, control of vehicles etc. These are set out in detail in sub-sections 8.9.2.2.11. Adherence to mitigations outlined in the Invasive Species Management Plan sub-sections 8.9.2.2.17. **Operational Phase:** Mitigation through design of appropriate surface water infrastructure outlined in detail in Chapter 9	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				of this report and described in sub-section 8.9.3.1.	
Drainage ditches (FW4)	Local (higher value)	**Construction Phase:** Surface water run-off pollution from silt/suspended solids and/or hydrocarbons may enter the canal and deteriorate its water quality, reducing its potential for local flora and fauna **Operational Phase:** Surface water impacts will be non-significant due to the design of appropriate surface water infrastructure outlined in Chapter 9 of this report.	**Construction Phase:** Likely temporary adverse impact of slight significance **Operational Phase:** Likely long-term adverse impact that is not significant	**Pre-enabling works** The pre-enabling work surveys outlined in sub-section 8.9.2.1.2. **Construction Phase:** Appropriate surface water and groundwater quality control measures set out in sub-sections 8.9.2.2.6, 8.9.2.2.7, 8.9.2.2.9 & 8.9.2.2.10. A series of measures are proposed to reduce air pollution within the vicinity of construction works	Long-term adverse residual impact that is not significant

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				i.e., hoarding to reduce the spread of dust, appropriate timing of works, control of vehicles etc. These are set out in detail in sub-section 8.9.2.2.11. Adherence to mitigations outlined in the Invasive Species Management Plan sub-sections 8.9.2.2.17. **Operational Phase:** Mitigation through design of appropriate surface water infrastructure outlined in detail in Chapter 9 of this report and	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				described in sub-section 8.9.3.1.	
Hedgerows over drainage ditches (Mixed:WL1/FW4) and Treelines over drainage ditch (Mixed: WL2/FW4)	County level	**Construction Phase:** Surface water run-off pollution from silt/suspended solids and/or hydrocarbons may infiltrate the drainage ditches and the associated treelines and may deteriorate the quality and health of local water and soil, reducing overall habitat quality Air (dust) pollution has the potential to negatively impact habitats, adversely impacting photosynthesis and the biological functions of valued flora.	**Construction Phase:** Likely temporary adverse impact of slight significance **Operational Phase:** Likely long-term adverse impact that is not significant	**Pre-enabling works** The pre-enabling work surveys outlined in sub-section 8.9.2.1.2 **Construction Phase:** Appropriate measures to reduce direct habitat impact and degradation from the locations of the site compound and associated materials outlined in sub-section 8.9.2.2.5, 8.9.2.2.12, 8.9.2.2.15. Appropriate surface water and groundwater quality	Likely long-term neutral impact that is not significant

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		Operational Phase: Surface water impacts will be non-significant due to the design of appropriate surface water infrastructure outlined in Chapter 9 of this report.		control measures set out in sub-sections 8.9.2.2.6, 8.9.2.2.7, 8.9.2.2.9 & 8.9.2.2.10. A series of measures are proposed to reduce air pollution within the vicinity of construction works i.e., hoarding to reduce the spread of dust, appropriate timing of works, control of vehicles etc. These are set out in detail in sub-section 8.9.2.2.11. Adherence to mitigations outlined in the Invasive Species Management Plan	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				sub-sections 8.9.2.2.17. **Operational Phase:** Mitigation through design of appropriate surface water infrastructure outlined in detail in Chapter 9 of this report and describe in sub-section 8.9.3.1. Biodiversity enhancement measures as set out in the Landscape Plan (Appendix 10.2), which includes compensatory planting of grass mix meadow. Additionally, the measures outlined in sub-section 8.9.3.4	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				relating to future planting plans and the management of landscaped habitats must be strictly adhered to.	
Dry calcareous and neutral grassland (GS1)	County level	**Construction Phase:** The habitats in the vicinity of the canal have the potential to be degraded through the movement of machinery, and direct removal through the footprint of the construction of the Greenway. Surface water run-off pollution from silt/suspended solids and/or hydrocarbons may infiltrate the nearby grassland habitats and	**Construction Phase:** Likely short-term adverse impacts of moderate significance **Operational Phase:** Likely long-term adverse impact of slight significance	**Pre-enabling works** The pre-enabling work surveys outlined in sub-section 8.9.2.1.2. **Construction Phase:** Appropriate measures to reduce direct habitat impact and degradation from the locations of the site compound and associated materials outlined in sub-section 8.9.2.2.5,	Likely long-term adverse residual impact that is not significant

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		deteriorate the quality and health of local water and soil, reducing overall habitat quality Air (dust and chemical) pollution has the potential to negatively impact the canal body, deteriorating its water quality, reducing its potential for local flora and fauna **Operational Phase:** Continuous habitat degradation from increased footfall along route – trampling. The implementation of inappropriate mowing regimes		8.9.2.2.12, & 8.9.2.2.15. Appropriate surface water and groundwater quality control measures set out in sub-sections 8.9.2.2.6, 8.9.2.2.7, 8.9.2.2.9 & 8.9.2.2.10. A series of measures are proposed to reduce air pollution within the vicinity of construction works i.e., hoarding to reduce the spread of dust, appropriate timing of works, control of vehicles etc. These are set out in detail in sub-section 8.9.2.2.11.	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				Adherence to mitigations outlined in the Invasive Species Management Plan sub-sections 8.9.2.2.17. The construction phase monitoring plan outlined in sub-section 8.9.2.1.2. **Operational Phase:** Biodiversity enhancement measures as set out in the Landscape Plan (Appendix 10.2), which includes compensatory planting of grass mix meadow. Additionally, the measures outlined	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				in sub-section 8.9.3.4 relating to future planting plans and the management of landscaped habitats must be strictly adhered to. The measures regarding grassland management outlined in sub-section 8.9.3.4.1. The grassland monitoring plan outlined in sub-section 8.9.3.6.1.	
Dry meadows and grassy verges (GS2)	Local (higher value)	**Construction Phase:** The habitats in the vicinity of the canal have the potential to be degraded through the movement of	**Construction Phase:** Likely permanent adverse impact of moderate significance **Operational Phase:**	**Pre-enabling works** The pre-enabling work surveys outlined in sub-section 8.9.2.1.2.	Likely long-term adverse residual impact that is not significant

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		machinery, and direct removal through the footprint of the construction of the Greenway. Surface water run-off pollution from silt/suspended solids and/or hydrocarbons may infiltrate the nearby grassland habitats and deteriorate the quality and health of local water and soil, reducing overall habitat quality. Air (dust and chemical) pollution has the potential to negatively impact the canal body, deteriorating its water quality, reducing its potential for local flora and fauna.	Likely long-term adverse impact of slight significance	**Construction Phase:** Appropriate measures to reduce direct habitat impact and degradation from the locations of the site compound and associated materials outlined in sub-section 8.9.2.2.5, 8.9.2.2.12, & 8.9.2.2.15. Appropriate surface water and groundwater quality control measures set out in sub-sections 8.9.2.2.6, 8.9.2.2.7, 8.9.2.2.9 & 8.9.2.2.10. A series of measures are proposed to reduce air pollution	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		Operational Phase: Continuous habitat degradation from increased footfall along route – trampling. The implementation of inappropriate mowing regimes		within the vicinity of construction works i.e., hoarding to reduce the spread of dust, appropriate timing of works, control of vehicles etc. These are set out in detail in sub-section 8.9.2.2.11. The construction phase monitoring plan outlined in sub-section 8.9.2.1.2. Adherence to mitigations outlined in the Invasive Species Management Plan sub-sections 8.9.2.2.17. **Operational Phase:**	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				Biodiversity enhancement measures as set out in the Landscape Plan, which includes compensatory planting of grass mix meadow. Additionally, the measures outlined in sub-section 8.9.3.4 relating to future planting plans and the management of landscaped habitats must be strictly adhered to. The grassland monitoring plan outlined in sub-section 8.9.3.6.1.	
(Mixed) broadleaved woodland (WD1)	County level	**Construction Phase:** The woodlands along the routing of the	**Construction Phase:** Likely permanent adverse impact that is significant	**Pre-enabling works** The pre-enabling work surveys outlined	Likely permanent adverse residual impact of slight significance

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		Proposed Development are scheduled to have some removal of trees in order to facilitate the Proposed Development. In addition to this, there is the potential for the trees not scheduled for removal to be degraded through the movement of machinery within their vicinity. Surface water run-off pollution from silt/suspended solids and/or hydrocarbons may infiltrate the nearby grassland habitats and deteriorate the quality and health of local water and soil, reducing overall habitat quality Air (dust and chemical) pollution has the	**Operational Phase:** Likely permanent adverse impact of moderate significance	in sub-section 8.9.2.1.2. **Construction Phase:** Appropriate measures to reduce direct habitat impact and degradation from the locations of the site compound and associated materials outlined in sub-section 8.9.2.2.5, 8.9.2.2.12, & 8.9.2.2.15. Appropriate surface water and groundwater quality control measures set out in sub-sections 8.9.2.2.6, 8.9.2.2.7, 8.9.2.2.9 & 8.9.2.2.10.	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		potential to negatively impact the local woodlands, reducing the potential for local flora and fauna Operational Phase: Habitat degradation from increased footfall along route – trampling/vandalism		A series of measures are proposed to reduce air pollution within the vicinity of construction works i.e., hoarding to reduce the spread of dust, appropriate timing of works, control of vehicles etc. These are set out in detail in sub-section 8.9.2.2.11. Trees have been assessed by an Arborist and a schedule of tree works and tree protection measures are outlined in the Arborist Impact Assessment and Landscape Plan (Appendix 10.2), such as root protection	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				zones, on-site supervision of an Arborist, specific protection of young trees on site, planting of native trees and woodland cover, with some offset from the site. Additional measures for the clearance of woodland habitats are outlined in sub-section 8.9.2.2.15.1. The construction phase monitoring plan outlined in 8.9.2.1.2. Adherence to mitigations outlined in the Invasive Species Management Plan sub-sections 8.9.2.2.17.	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				Operational Phase: Biodiversity enhancement measures as set out in the Landscape Plan (Appendix 10.2) and futher planting of woodland in St Catherine's Park. Additionally, the measures outlined in sub-section 8.9.3.4 relating to future planting plans and the management of landscaped habitats must be strictly adhered to. The measures outlined in sub-section 8.9.3.4.1	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				relating to the management of woodland habitats along the Royal Canal. The monitoring plans for this woodland habitat outlined in sub-section 8.9.3.6.2.	
Linear Woodland: Hedgerows (WL1), Treelines (WL2), and Mixed: Treelines/Dry meadows and grassy verges (Mixed: WL2/GS2)	County level	**Construction Phase:** The linear woodland features (hedgerows and treelines) and scrub along the routing of the Proposed Development are scheduled to have some removal of trees and hedges in order to facilitate the Proposed Development. In addition to this, there is the potential for the trees not scheduled for	**Construction Phase:** Likely long-term adverse impact of moderate significance **Operational Phase:** Likely long-term adverse impact of negligible significance (treelines)	**Pre-enabling works** The pre-enabling work surveys outlined in sub-section 8.9.2.1.2. **Construction Phase:** Appropriate measures to reduce direct habitat impact and degradation from the locations of the site compound and	Likely long-term adverse residual impact that is not significant (treelines) Likely long-term positive residual impact of slight significance (hedgerows)

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		removal to be degraded through the movement of machinery within their vicinity. Surface water run-off pollution from silt/suspended solids and/or hydrocarbons may infiltrate the nearby grassland habitats and deteriorate the quality and health of local water and soil, reducing overall habitat quality Air (dust and chemical) pollution has the potential to negatively impact the local linear woodland features, reducing the potential for local flora and fauna **Operational Phase:**	Likely long-term positive impact of slight significance (hedgerows)	associated materials outlined in sub-section 8.9.2.2.5, 8.9.2.2.12, & 8.9.2.2.15. Appropriate surface water and groundwater quality control measures set out in sub-sections 8.9.2.2.6, 8.9.2.2.7, 8.9.2.2.9 & 8.9.2.2.10. A series of measures are proposed to reduce air pollution within the vicinity of construction works i.e., hoarding to reduce the spread of dust, appropriate timing of works, control of vehicles etc. These are set out	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		No impact		in detail in sub-section 8.9.2.2.11. Trees have been assessed by an Arborist and a schedule of tree works and tree protection measures are outlined in the Arborist Impact Assessment and Landscape Plan (Appendix 10.2), such as root protection zones, on-site supervision of an Arborist, specific protection of young trees on site, compensatory planting of native hedgerows, trees and woodland cover. Additional measures for the clearance of	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				woodland habitats are outlined in sub-section 8.9.2.2.15.1. Adherence to mitigations outlined in the Invasive Species Management Plan sub-sections 8.9.2.2.17. **Operational Phase:** Biodiversity enhancement measures as set out in the Landscape Plan (Appendix 10.2), which includes compensatory planting of grass mix meadow and woodland. Additional woodland will be planted to offset loos	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				in St Catherine's Park. Additionally, the measures outlined in sub-section 8.9.3.4 relating to future planting plans and the management of landscaped habitats must be strictly adhered to.	
Scrub (WS1), Mosaic: Scrub / Dry meadows and grassy verges (Mosaic: WS1/GS2)	Local (higher value)	**Construction Phase:** Sections of the scrub habitat along the routing of the Proposed Development are scheduled to be cleared in order to facilitate the Proposed Development. In addition to this, there is the potential for the scrub not scheduled for removal to be degraded through the movement of machinery within their vicinity.	**Construction Phase:** Likely permanent adverse impact of moderate significance **Operational Phase:** Likely long-term adverse impact of slight significance	**Pre-enabling works** The pre-enabling work surveys outlined in sub-section 8.9.2.1.2. **Construction Phase:** Appropriate measures to reduce direct habitat impact and degradation from the locations of the site compound and	Likely long-term adverse residual impact that is not significant

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		Surface water run-off pollution from silt/suspended solids and/or hydrocarbons may infiltrate the nearby scrub and grassland habitats and deteriorate the quality and health of local water and soil, reducing overall habitat quality Air (dust and chemical) pollution has the potential to negatively impact the local woodlands, reducing the potential for local flora and fauna **Operational Phase:** Habitat degradation from increased footfall		associated materials outlined in sub-sections 8.9.2.2.5, 8.9.2.2.12, & 8.9.2.2.15. Appropriate surface water and groundwater quality control measures set out in sub-sections 8.9.2.2.6, 8.9.2.2.7, 8.9.2.2.9 & 8.9.2.2.10. A series of measures are proposed to reduce air pollution within the vicinity of construction works i.e., hoarding to reduce the spread of dust, appropriate timing of works, control of vehicles etc. These are set out	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		along route – trampling/vandalism		in detail in sub-section 8.9.2.2.11. Adherence to mitigations outlined in the Invasive Species Management Plan sub-sections 8.9.2.2.17. **Operational Phase:** Biodiversity enhancement measures as set out in the Landscape Plan (Appendix 10.2), which includes compensatory planting of shrub and grass mix meadow. Additionally, the measures outlined in sub-section 8.9.3.4 relating to future	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				planting plans and the management of landscaped habitats must be strictly adhered to.	
Rare & Protected Flora	National	**Construction Phase:** Surface water run-off pollution from silt/suspended solids and/or hydrocarbons may infiltrate the drainage ditches and the associated treelines and may deteriorate the quality and health of local water and soil, reducing overall habitat quality Air (dust) pollution has the potential to negatively impact habitats, adversely impacting	**Construction Phase:** Likely medium-term adverse impact of moderate significance **Operational Phase:** Likely long-term adverse impact that is of imperceptible significance	**Pre-enabling works** The pre-enabling work surveys outlined in sub-section 8.9.2.1.2. **Construction Phase:** Appropriate measures to reduce direct habitat impact and degradation from the locations of the site compound and associated materials outlined in sub-sections 8.9.2.2.5, 8.9.2.2.12, & 8.9.2.2.15.	Likely long-term neutral residual impact that is not significant

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		photosynthesis and the biological functions of valued flora. **Operational Phase:** Surface water impacts will be non-significant due to the design of appropriate surface water infrastructure outlined in Chapter 9 of this report.		Appropriate surface water and groundwater quality control measures set out in sub-sections 8.9.2.2.6, 8.9.2.2.7, 8.9.2.2.9 & 8.9.2.2.10. A series of measures are proposed to reduce air pollution within the vicinity of construction works i.e., hoarding to reduce the spread of dust, appropriate timing of works, control of vehicles etc. These are set out in detail in sub-section 8.9.2.2.11. Adherence to mitigations outlined in	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				the Invasive Species Management Plan sub-sections 8.9.2.2.17 **Operational Phase:** Mitigation through design of appropriate surface water infrastructure outlined in detail in Chapter 9 of this report and described in sub-section 8.9.3.1.	
Badger	County Level	**Construction Phase:** Adverse impacts to Badger as a result of the direct and indirect removal or degradation of habitats that provide foraging and commuting resources	**Construction Phase:** Likely medium to long-term adverse impact that is significant **Operational Phase:**	**Pre-enabling works** The pre-enabling work surveys outlined in sub-section 8.9.2.1.2. **Construction Phase:**	Likely long-term adverse residual impact of slight significance

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		Adverse impacts to Badger may arise in the form of disturbance to foraging and commuting activities from light and noise pollution Potential loss of life or damage to setts in the case of accidents within the construction site **Operational Phase:** Loss of foraging and commuting resources due to partial removal of grassland, scrub, and woodland habitat types. Ecological lag due to time taken for planted tree and shrub species to reach semi-maturity/maturity	Likely long-term adverse impact of moderate significance	General measures on the prevention of species mortality within active construction sites are outlined in sub-section. Appropriate protection measures such as screening and timing of works around potential setts. Preferred route avoids setts as outlined in sub-section 8.9.3.2 Biodiversity enhancement measures as set out in the Landscape Plan (Appendix 10.2).	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		Introduction of lighting fixtures along the canal will increase light levels at night, reducing the overall foraging activities of the local badger population. Increased disturbance to Badger foraging and commuting activities due to higher footfall along the canal as a result of the new Greenway. Additional disturbance expected due to increased presence of local pets, namely dogs, along the Royal Canal during the operational phase.		General noise and light reduction mitigation set out in section 8.9.2.2.14 such as the use of noise reducing equipment and screening. Works should take place during daylight hours. If this is not possible a preference for highly directional LED lighting which is screened around the area of works. Appropriate protection measures such as screening and timing of works around potential setts. Preferred route avoids setts as outlined in Sub-section 8.9.2.2.16.1	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				The construction phase surveys outlined in sub-section 8.9.2.1.2. **Operational Phase:** Biodiversity enhancement measures as set out in the Landscape Plan, which includes compensatory planting of trees hedgerows and grass mix meadow. Additionally, the measures outlined in sub-section 8.9.3.4 relating to future planting plans and the management of landscaped habitats	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				must be strictly adhered to. Appropriate measures to limit disturbance on local fauna as well as the implementation of Badger underpasses beneath the Proposed Development are outlined in sub-section 8.9.3.2. The measures outlined in sub-section 8.9.3.4.1 relating to the management of woodland habitats along the Royal Canal. Appropriate measures incorporated into the scheme's lighting	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				design to limit spillover into the royal Canal riparian corridor are outlined in sub-section 8.9.3.5.2. The operational phase monitoring plans outlined in sub-section 8.9.3.6.	
Otter	County Level	**Construction Phase:** Adverse impacts to Otter as a result of the direct and indirect removal or degradation of habitats that provide foraging and commuting resources Adverse impacts during the construction chase may arise in the form of disturbance to foraging,	**Construction Phase:** Likely medium term, adverse impact of moderate significance **Operational Phase:** Likely a long-term adverse impact of slight significance	**Pre-enabling works** The pre-enabling work surveys outlined in sub-section 8.9.2.1.2 **Construction Phase:** Regulation 54 Derogation license for the disturbance of a breeding holt.	Likely **long-term neutral residual impact that is not significant**

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		resting (holt) and commuting activities through increased noise and visual disturbances or even the loss of life. Operational Phase: Loss of foraging and commuting resources due to partial removal of grassland, scrub, and woodland habitat types. Ecological lag due to time taken for planted tree and shrub species to reach semi-maturity/maturity Introduction of lighting fixtures along the canal will increase light levels at night, reducing the overall foraging		Appropriate protection measures such as screening and timing of works around potential holts. Preferred route avoids holt and resting areas, as outlined in Sub-section 8.9.3.4.4. Biodiversity enhancement measures as set out in the Landscape Plan (Appendix 10.2). General noise and light reduction mitigation set out in section 8.9.2.2.14 such as the use of noise reducing equipment and screening. Works should take place	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		activities of the local otter population. Introduction of pollutants to the Royal Canal during operational management of the Greenway, such as hydrocarbon pollutants from maintenance vehicles and bituminous salts. Increased disturbance to otter foraging and commuting activities due to higher footfall along the canal as a result of the new Greenway. Additional disturbance expected due to increased presence of local pets, namely dogs, along the		during daylight hours. If this is not possible a preference for highly directional LED lighting which is screened around the area of works. The construction phase surveys outlined in sub-section 8.9.2.1.2 Adherence to mitigations outlined in the Surface Water Management Plan **Operational Phase:** Mitigation through design of appropriate surface water infrastructure outlined in detail in Chapter 9	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		Royal Canal during the operational phase.		of this report and described in sub-section 8.9.3.1. Biodiversity enhancement measures as set out in the Landscape Plan (Appendix 10.2), which includes compensatory planting of trees, hedgerow and grass mix meadow. Additionally, the measures outlined in sub-section 8.9.3.4 relating to future planting plans and the management of landscaped habitats must be strictly adhered to. Appropriate measures to limit disturbance on	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				local fauna are outlined in sub-section 8.9.3.2. The measures outlined in sub-section 8.9.3.4.1 relating to the management of woodland habitats along the Royal Canal. Appropriate measures incorporated into the scheme's lighting design to limit spillover into the royal Canal riparian corridor are outlined in sub-section 8.9.3.5.2. The operational phase monitoring	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				plans outlined in sub-section 8.9.3.6.	
Other Mammals (Hedgehog, Pygmy Shrew, Pine Marten, Red Squirrel)	Local (higher value)	**Construction Phase:** Adverse impacts to other mammals as a result of the direct and indirect removal or degradation of habitats that provide foraging and commuting resources Adverse impacts to other mammals may arise in the form of disturbance to foraging and commuting activities from light and noise pollution Potential loss of life in the case of accidents within the construction site	**Construction Phase:** Likely medium-term adverse impact of moderate significance **Operational Phase:** Likely a long-term adverse impact of slight significance	**Construction Phase:** Biodiversity enhancement measures as set out in the Landscape Plan for the Proposed Development. General noise and light reduction mitigation set out in section 8.9.2.2.14 such as the use of noise reducing equipment and screening. Works should take place during daylight hours. If this is not possible a preference for highly directional LED lighting which is	Likely long-term adverse residual impact that is not significant

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		Operational Phase: Loss of foraging and commuting resources due to partial removal of grassland, scrub, and woodland habitat types. Ecological lag due to time taken for planted tree and shrub species to reach semi-maturity/maturity Introduction of lighting fixtures along the canal will increase light levels at night, reducing the overall foraging activities of the local mammal populations. Increased disturbance to mammal foraging		screened around the area of works. General measures on the prevention of species mortality within active construction sites are outlined in sub-section 8.9.2.2.13. Adherence to mitigations outlined in the Surface Water Management Plan **Operational Phase:** Biodiversity enhancement measures as set out in the Landscape Plan (Appendix 10.2), which includes compensatory	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		and commuting activities due to higher footfall along the canal as a result of the new Greenway. Additional disturbance expected due to increased presence of local pets, namely dogs, along the Royal Canal during the operational phase.		planting of trees, hedgerow and grass mix meadow. Additionally, the measures outlined in sub-section 8.9.3.4 relating to future planting plans and the management of landscaped habitats must be strictly adhered to. Appropriate measures to limit disturbance on local fauna are outlined in sub-section 8.9.3.2. The measures outlined in sub-section 8.9.3.4.1 relating to the management of woodland habitats	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				along the Royal Canal. Appropriate measures incorporated into the scheme's lighting design to limit spillover into the Royal Canal riparian corridor are outlined in sub-section 8.9.3.5.2.	
Bats	County Level	**Construction Phase:** Degradation of roosting, foraging and commuting habitat through the direct and indirect degradation of woodland, grassland and canal habitats throughout the construction	**Construction Phase:** Likely long-term adverse impact of moderate significance **Operational Phase:**	**Pre-enabling works** The pre-enabling work surveys outlined in sub-section 8.9.2.1.2 **Construction Phase:** Before trees are felled, they should be inspected by an	Likely long-term adverse residual impact of slight significance

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		Direct and indirect impacts likely to occur on foraging and commuting bats located within the scheme, resulting from the artificial light/noise/vibration pollution during the construction phase. **Operational Phase:** Introduction of lighting fixtures along the canal will increase light levels at night, reducing the overall foraging activities of the local bat species. Loss of foraging and commuting resources due to partial removal of	Likely long-term adverse impact of slight significance	ECoW for Bat Roosting Potential, appropriate derogation will follow if roosting bats are found to be present as outlined in Sub-section 8.9.2.2.16.3 Measures to limit the impacts of construction phase lighting are outlined in sub-section 8.9.2.2.14 Biodiversity enhancement measures as set out in the Landscape Plan. General noise and light reduction mitigation set out in section 8.9.2.2.14	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		grassland, scrub, and woodland habitat types. Loss of features that have the potential to support roosting bats in the future (trees). Ecological lag due to time taken for planted tree and shrub species to reach semi-maturity/maturity		such as the use of noise reducing equipment and screening. Works should take place during daylight hours. If this is not possible a preference for highly directional LED lighting which is screened around the area of works. **Operational Phase:** Mitigation through design of appropriate surface water infrastructure outlined in detail in Chapter 9 of this report and described in sub-section 8.9.3.1.	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				Biodiversity enhancement measures as set out in the Landscape Plan, which includes compensatory planting of grass mix meadow. Additionally, the measures outlined in sub-section 8.9.3.4 relating to future planting plans and the management of landscaped habitats must be strictly adhered to. The measures outlined in sub-section 8.9.3.4.1 relating to the management of woodland habitats along the Royal Canal.	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				Appropriate measures incorporated into the scheme's lighting design to limit spillover into the Royal Canal riparian corridor are outlined in sub-section 8.9.3.5.2. The operational phase monitoring plans are outlined in sub-section 8.9.3.6.	
Birds	Local (higher value)	**Construction Phase:** Inappropriate timing of works may cause a disruption to breeding bird species using the site for nesting Audible and visual disturbance may also disturb breeding bird	**Construction Phase:** Likely short-medium term adverse impact of slight significance **Operational Phase:** Likely long-term adverse impact that is not significant	**Pre-enabling works** The pre-enabling work surveys outlined in sub-section 8.9.2.1.2. **Construction Phase:** Ensure that works on vegetation will not	**Likely long-term adverse residual impact that is not significant**

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		species, causing them to vacate the site during works. **Operational Phase:** Loss of supporting foraging and nesting habitat due to removal of sections of scrub and woodland habitats along the Royal Canal. Ecological lag due to time taken for planted tree and shrub species to reach semi-maturity/maturity Increased disturbance to bird foraging and nesting activities due to higher footfall along the canal as a result of the new Greenway.		take place during the breeding bird season (March-August inclusive) in order to prevent the disturbance of nesting Birds, as per Sub-section 8.9.2.2.17.4 ECoW must survey first if this is not possible, and any nest and chicks must be safeguarded. Noise reduction mitigation set out in section 8.9.2.2.14, such as the use of noise reducing equipment and screening. The construction phase surveys	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		Additional disturbance expected due to increased presence of local pets, namely dogs, along the Royal Canal during the operational phase.		outlined in sub-section 8.9.2.1.2 **Operational Phase:** Mitigation through design of appropriate surface water infrastructure outlined in detail in Chapter 9 of this report and described in sub-section 8.9.3.1. Biodiversity enhancement measures as set out in the Landscape Plan, which includes compensatory planting of woodland, trees, hedgerow and grass mix meadow. Additionally, the measures outlined in	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				sub-section 8.9.3.4 relating to future planting plans and the management of landscaped habitats must be strictly adhered to. The measures outlined in sub-section 8.9.3.4.1 relating to the management of woodland habitats along the Royal Canal. The operational phase monitoring plans outlined in sub-section 8.9.3.6.	
Amphibians	Local (higher value)	**Construction Phase:** Degradation to supporting habitats,	**Construction Phase:**	**Construction Phase:** Appropriate surface water and	Likely long-term neutral residual impact that is not significant

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		such as the drainage ditches or the canal, may reducing their potential for local amphibian foraging and spawning. **Operational Phase:** Loss of foraging, commuting, and refugia resources due to removal of sections of scrub, woodland, and grassland habitats. Ecological lag due to time taken for planted tree and shrub species to reach semi-maturity/maturity Introduction of pollutants to the Royal Canal during	Likely long-term adverse impact of slight-to moderate significance **Operational Phase:** Likely long-term adverse impact that is not significant	groundwater quality control measures set out in sub-sections 8.9.2.2.6, 8.9.2.2.7, 8.9.2.2.9 & 8.9.2.2.10. **Operational Phase:** Mitigation through design of appropriate surface water infrastructure outlined in detail in Chapter 9 of this report and described in sub-section 8.9.3.1. Biodiversity enhancement measures as set out in the Landscape Plan, which includes compensatory planting of trees, hedgerow and grass	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		operational management of the Greenway, such as hydrocarbon pollutants from maintenance vehicles and bituminous salts.		mix meadow. Additionally, the measures outlined in sub-section 8.9.3.4 relating to future planting plans and the management of landscaped habitats must be strictly adhered to. The measures outlined in sub-section 8.9.3.4.1 relating to the management of woodland habitats along the Royal Canal.	
Terrestrial invertebrates (Bees, ants, moths and butterflies)	Local (higher value)	**Construction Phase:** Degradation of the earth banks or the loss of vegetation that provide resources for	**Construction Phase:** Likely short-term adverse impact of slight significance	**Construction Phase:** Appropriate measures to reduce direct habitat impact and degradation from the	Likely long-term neutral residual impact that is not significant

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		breeding and foraging will reduce the suitability of the route of the Greenway for terrestrial invertebrates Operational Phase: Loss of foraging, commuting, and refugia resources due to removal of sections of scrub, woodland, and grassland habitats. Ecological lag due to time taken for planted tree and shrub species to reach semi-maturity/maturity	**Operational Phase:** Likely long-term adverse impact that is not significant.	locations of the site compound and associated materials outlined in sub-sections 8.9.2.2.5, 8.9.2.2.12, & 8.9.2.2.15. Biodiversity enhancement measures as set out in the Landscape Plan, which includes compensatory planting of woodland, trees, hedgerow and wildflower and grass mix meadow. **Operational Phase:** Biodiversity enhancement measures as set out in the Landscape	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				Plan (Appendix 10.2). Additionally, the measures outlined in sub-section 8.9.3.4 relating to future planting plans and the management of landscaped habitats must be strictly adhered to. The measures outlined in sub-section 8.9.3.4.1 relating to the management of woodland habitats along the Royal Canal.	
Odonata	Local (higher value)	**Construction Phase:** Degradation of the canal and its vegetative banksides may cause a loss of resources for	**Construction Phase:** Likely short-term adverse impact of slight significance	**Construction Phase:** Appropriate surface water and groundwater quality control measures set	Likely long-term neutral residual impact that is not significant

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		breeding and foraging which will reduce the suitability of the route of the Royal Canal for Odonata **Operational Phase:** Introduction of pollutants to the Royal Canal during operational management of the Greenway, such as hydrocarbon pollutants from maintenance vehicles and bituminous salts.	**Operational Phase:** Likely long-term adverse impact that is not significant	out in sub-sections 8.9.2.2.6, 8.9.2.2.7, 8.9.2.2.9 & 8.9.2.2.10. **Operational Phase:** Mitigation through design of appropriate surface water infrastructure outlined in detail in Chapter 9 of this report and described in sub-section 8.9.3.1. Biodiversity enhancement measures as set out in the Landscape Plan. Additionally, the measures outlined in sub-section 8.9.3.4 relating to future planting plans and the	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				management of landscaped habitats must be strictly adhered to.	
Glutinous Snail and other Aquatic Molluscs	National	**Construction Phase:** Degradation of aquatic habitats and vegetative resources **Operational Phase:** Introduction of pollutants to the Royal Canal during operational management of the Greenway, such as hydrocarbon pollutants from maintenance vehicles and bituminous salts.	**Construction Phase:** Likely long-term adverse impact that is very significant **Operational Phase:** Likely long-term adverse impact that is not significant	**Pre-enabling works** The pre-enabling work surveys outlined in sub-section 8.9.2.1.2 **Construction Phase:** Appropriate surface water and groundwater quality control measures set out in sub-sections 8.9.2.2.6, 8.9.2.2.7, 8.9.2.2.9 & 8.9.2.2.10. The construction phase surveys outlined in sub-section 8.9.2.1.2	Likely long-term adverse residual impact that is not significant

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				Operational Phase: Mitigation through design of appropriate surface water infrastructure outlined in detail in Chapter 9 of this report and described in sub-section 8.9.3.1. The measures outlined in sub-section 8.9.3.4 relating to future planting plans and the management of landscaped habitats must be strictly adhered to. The measures out lined in sub-section	

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
				8.9.3.3.2 relating to the addition of artificial refugia for *Glutinous Snail* to the Royal Canal. The operational phase monitoring plans are outlined in sub-section 8.9.3.6.	
White-clawed Crayfish, Eel, Coarse Fish and Pike	County Importance	**Construction Phase:** Adverse impacts may arise from the accidental introduction of pollutants, such as hydrocarbons, into the local surface water network, which can cause mortality of aquatic fauna. **Operational Phase:**	**Construction Phase:** Likely short-term adverse impact of moderate significance **Operational Phase:** Likely long-term adverse impact that is not significant	**Construction Phase:** Appropriate surface water and groundwater quality control measures set out in sub-sections 8.9.2.2.6, 8.9.2.2.7, 8.9.2.2.9 & 8.9.2.2.10. **Operational Phase:** Mitigation through design of appropriate surface water	Likely long-term adverse residual impact that is not significant

Key Ecological Receptor(s)	Ecological Valuation	Potential Impact	Significance of Impact Without Mitigation	Mitigation	Significance of Residual Impacts
		Introduction of pollutants to the Royal Canal during operational management of the Greenway, such as hydrocarbon pollutants from maintenance vehicles and bituminous salts.		infrastructure outlined in detail in Chapter 9 of this report and described in sub-section 8.9.3.1. The measures outlined in sub-section 8.9.3.4 relating to future planting plans and the management of landscaped habitats must be strictly adhered to.	

8.12 Difficulties Encountered

The majority of the route was easily accessible for all the surveys, due to the presence of the existing towpath. However, certain wooded sections were largely inaccessible, including the woodland area along the north bank east of Coolmine Train Station between Chainages +6300 - +7170, due to the density of the ground storey vegetation and the underlying steep topography. While surveyors were able to enter this area, surveyors were unable to travel past a point roughly around Chainages +6900. Additionally, within this area, surveyors' viewpoint of the surrounding area was limited due to the density of the vegetation. For areas where survey information is limited, the precautionary principle has been applied.

8.13 Interactions

The interactions below have been incorporated into anticipated likely impact on KERs during the construction and operational phases. Furthermore, construction and operational phase mitigation addresses and reduces the likelihood of the impacts of the describes interactions between Biodiversity and other receptors.

Interactions among Biodiversity; Water; Land, Soils and Geology; Climate (Climate Change); and Material Assets (Waste)

Construction Stage

There are potential interactions between waste management and water environment which can have a potential impact on key ecological receptors during construction, as outlined in Chapter 8 Biodiversity. This includes the removal of invasive species during the construction stage, which involves collected waste biomass (pulled stems/roots and bagged flower heads). If this biomass is not disposed of appropriately at a facility authorized to accept such waste, it has the potential to enter adjacent habitats and the Royal Canal and be spread further downstream. Such spreading events can have adverse impacts on high value habitats, displacing native species. These potential interactions also include the removal of topsoil during the construction phase, which if not removed/stored effectively, has the potential to enter the Royal Canal, increasing water turbidity which can hinder light penetration and negatively affect macrophytes.

Operational Stage

The operational stage interactions are due to the potential for surface water run-off due to the introduction of additional artificial surfaces along the canal. The use of filer drains will help manage run-off, although overtime these drains will likely become partially clogged by debris, such as silt, meaning run-off from the long-term run-off rates will be higher during the operational phase. Climate change is projected to lead to an increase in extreme precipitation events, which will further increase long-term surface water run-off rates during the project's operation.

Interactions among Biodiversity; Air (Noise and Vibration); and Material Assets (Transport)

Construction Stage

During the construction stage, the biodiversity assessment has examined how key ecological receptors, such as species and habitats, interact with various environmental factors. Specifically, there is an interaction between traffic and transport and mortality risk for species. Airborne noise from construction activities, including vehicles, can interact with biodiversity as any increase in noise levels has the potential to impact on sensitive ecological receptors. An example of this interaction is the direct and indirect impacts likely to occur on the foraging and commuting activities of local mammals (Badger, Otter, Hedgehog), bats and birds located within the locality of the Royal Canal, resulting from the temporary noise and vibration pollution during this stage. Further, noise generated by the construction works has the potential to effect breeding bird species egg production, incubation, brooding, predators, brood parasites, and abandonment, as well as the ability to find or attract a mate and the ability of parents to hear and respond to begging calls of their offspring.

Operational Stage

Operational interaction impacts among Biodiversity, Noise and Vibration, and Traffic and Trasport are likely to occur given the increase usage of the canal by pedestrians and vehicles (bikes, e-scooters, TII maintenance vehicles). All faunal species will be subjected to increase noise levels (disturbance), as well as ground-dwelling fauna, and some less agile and/or reactionary bird species also seeing their risk of collision injuries and fatalities increase as a result of the Greenways operation and the anticipated increase in vehicles locally (bikes, e-scooters, TII maintenance vehicles).

Interactions among Biodiversity; Water; Air (Sunlight & Daylight); Climate (Air Quality); and Landscape and Visual

Construction Stage

There is an interaction between water, air quality and biodiversity, as any reduction in the quality of surface water or in air quality can contribute to habitat degradation. Air (emissions and dust) pollution generated during the construction stage has the potential to adversely impact watercourses (airborne emissions), photosynthesis and the biological functions (dusts) of valued flora. Additionally, air (sunlight & daylight) interacts with biodiversity during the construction stage as a result of changes to landscape (trees removal, creation of earth mounds etc.) will ultimately change the (sun) lighting regime for flora within the retained habitats on-site. This will have a slight impact on a subset of the more light/shading sensitive flora.

Operational Stage

During the Operational Phase, there will be an interaction between landscape and biodiversity. As outlined in Chapter 10 (Landscape & Visual), the proposed project will include replanting with native species, where possible. Air (sunlight & daylight) will interact with biodiversity during the operational stage as a result of changes to landscape (removal of scrub and trees, along with the planting of new trees and shrub, and the installation of raised sections of the Greenway) will change the (sun) lighting regime for flora within the habitats adjacent to the Proposed Development. This will have a slight impact on a small proportion of the more light/shading sensitive flora. Development pl

Interactions between Biodiversity, Land, Soils and Geology, and Material Assets (Utilities)

Construction Stage

The impact of earth works, land take (habitat loss) and tree removal for the Proposed Development on the local biodiversity along the Royal Canal will be the most notable impact on biodiversity as a result of the proposed development. Loss of soil value from construction activities and use of unsuitable soil material may affect biodiversity. There is an interaction between soils and geology and biodiversity, as non-native invasive plant species can be spread through soils and can also contribute to habitat degradation. There will be an interaction between utilities and biodiversity, with the provision of construction-based lighting impacting on light-sensitive fauna. Temporary connections with the local surface and foul water drainage networks for construction compounds and the connection of operational lighting fixtures to the electricity network will require excavations, which can spread non-native invasive plant species, contributing to habitat degradation.

Operational Stage

Given the long-term nature of the land take (habitat loss) this negative impact / interaction is carried forward to the operational stage of the Greenway. There will also be a long-term negative impact / interaction between biodiversity and utilities, with the provision of operational lighting along the Greenway adversely impacting local light-sensitive fauna.

Interactions between Biodiversity and Cultural Heritage (Archaeological & Architectural)

Construction Stage

The impact of interactions between Biodiversity and Cultural Heritage (Archaeological & Architectural) will be imperceptible during the construction stage of the Greenway, unless archaeological remains are identified during the stripping of topsoil along the Proposed Development or within proposed compound areas that have not been formerly developed. If this scenario arises, the significance of effect on biodiversity would be determined by the nature and extent of works required.

Operational Stage

In the event that the discovery of archaeological remains results in further investigation into habitats that are set to be retained, this will lead to additional ecological lag, limiting ecological functionality within the sites, as a result of the required reinstatement of habitats following archaeological investigations.

8.14 References

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