

ECOLOGICAL IMPACT ASSESSMENT

FOR

PART A (PHASE 1) OF PROPOSED TRIOGUE BLUEWAY (CYCLEWAY SCHEME)

AT

PORTLAOISE, COUNTY LAOIS

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Section 1 Introduction

CAAS Ltd. were commissioned by Laois County Council (LCC) to produce an Ecological Impact Assessment (EcIA) to inform Part A (including Phase 1) of a proposed cycleway scheme (hereafter referred to as the “proposed development” or “proposed scheme”) known as the Triogue Blueway located at Portlaoise, Co. Laois. The scheme encompasses three different sections or phases (Phase 1, Phase 2 and Phase 3) along a 2.8 km route within the urban environs of Portlaoise town. Part B of the proposed cycleway scheme (Phase 2 and 3) is assessed in a separate standalone EcIA report. This report specifically assesses Phase 1 of the scheme and describes the ecology of the receiving environment and assesses the potential effects of the proposed development to impact on biodiversity (i.e. flora and fauna). The assessment defines the study area; the methodology used for developing the baseline and impact assessment, provides a description of the baseline environment in relation to biodiversity and presents the findings of the impact assessment and mitigation. Particular attention has been paid to species and habitats of ecological importance. These include species and habitats with national and international protection under the Wildlife Acts 1976-2012; European Communities (Birds and Natural Habitats) Regulations 2011 (as amended); EU Birds Directive 2009/147/EC and EU Habitat Directive 2009/147/EC, among other relevant legislation.

1.1 Legislation

Legislation, policy and guidelines relevant to the assessment of biodiversity are outlined in the following subsections.

1.1.1 Relevant Guidance

The following guidance documents have informed the preparation of the EcIA:

- Guidelines for Ecological Impact Assessment in the UK and Ireland (Chartered Institute of Ecology and Environmental Management (CIEEM), 2018 (updated September 2019));
- NRA (2009) Guidelines for Assessment of Ecological Impacts of National Roads Schemes; and,
- NRA (2008) Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes

1.1.2 European Union Habitats Directive

The Habitats Directive (Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna) is the main legislative instrument for the protection and conservation of Biodiversity within the EU. The Habitats Directive lists habitats and species that must be protected within SAC on Annexes I and II, respectively. Additionally, the Habitats Directive identifies plant and animal species on Annex IV which are subject to strict protection anywhere they occur. The Habitats Directive sets out the protocol for the protection and management of SAC.

1.1.3 European Union Birds Directive

The Birds Directive (Council Directive 2009/147/EC on the Conservation of Wild Birds) provides a network of sites in all member states to protect birds at their breeding, feeding, or roosting areas. The Birds Directive identifies Annex I species that are rare, in danger of extinction or vulnerable to changes in habitat and which require special protection (so-called ‘Annex I’ species). SPA is designated under the Birds Directive to protect a range of bird populations including those of Annex I species.

Together, SACs and SPAs form a European network known as European sites for nature conservation (also formerly known as Natura 2000 sites). The European Communities (Birds and Natural Habitats) Regulations 2011 transposes Directive 2009/147/EC (Birds Directive) and Directive 2009/147/EC, 92/43/EC (Habitats Directive) into Irish law.

1.1.4 European Union Water Framework Directive

The WFD 2000/60/EC provides a framework for the protection and improvement of rivers, lakes, marine and ground waters in addition to water-dependent habitats. The aim of the WFD is to prevent any deterioration in the existing status of water quality, including the protection of 'good' and 'high' water quality status where it exists.

The WFD requires member states to manage their water resources on an integrated basis in order to achieve at least 'good' ecological status. In Ireland this is achieved through the River Basin Management Plan for Ireland 2018-2021 (DoHGLP, 2018; 'the RBMP'). The RBMP outlines all the actions required to improve water quality, with county councils and Irish Water playing an important role in the implementation of the plan. The site lies within the Barrow catchment and hydrometric area in the south-eastern region and is hydrologically linked to the River Barrow and River Nore SAC located downstream.

1.1.5 National Legislation

The primary domestic statutes in the Republic of Ireland providing for wildlife protection are the Wildlife Acts of 1976 and 2000, as amended (Irish Wildlife Act). A revised and updated version to 1 January 2017 has been published by the Law Reform Commission, which provided a useful reference source for this report.

All bird species are protected under the Wildlife Act from offences including intentional killing or injury, and disturbance during the breeding season. The protection extends to the eggs, young, and nests of birds. The Wildlife Acts provide protection to species not protected by the Habitats Directive (e.g. badger *Meles meles*, hedgehog *Erinaceus europaeus*, two amphibian species and common lizard *Zootoca vivipara*). These species are all similarly protected from intentional killing or injury. The breeding or resting sites of all these species are also protected (from wilful disturbance).

Fisheries and fish habitats are protected under the Fisheries Consolidation Act 1959 (No. 14 of 1959), as amended, the Inland Fisheries Act 2010 (No 10 of 2010) as amended, and the Local Government (Water Pollution Acts) 1977-1990, as amended.

Where used in this report, the term invasive species refers to those species scheduled to the European Communities (Bird and Natural Habitat) Regulations 2011 (S.I. No. 477) and 2015 (S.I. No. 355) (hereafter referred to as the Regulations) and species listed as 'high impact' under the National Biodiversity Data Centre's (NBDC) 'Invasive Species in Ireland Prioritisation Risk Assessment'. The Regulations make it an offence to "plant, disperse, allow or cause to disperse, spread or otherwise cause to grow" any of the scheduled species.

A range of vascular (i.e. flowering plants) and non-vascular plant species (i.e. non-flowering or lower plants) are afforded legal protection under the Flora (Protection) Order, 2015 S.I. No. 356/2015 (hereafter 'The Flora Protection Order'). It is an offence to cut, pick, collect, uproot or otherwise take, injure, damage, or destroy any specimens of the species listed under the Flora Protection Order.

1.1.6 Policy Context

This report has been prepared with respect to the following planning policies and strategic guidance documents:

- Laois County Development Plan 2017-2023 (Natural Heritage policies and objectives with regard to Biodiversity and designated sites) (LCC, 2017)
- The National Biodiversity Action Plan 2017-2021 (Department of Culture Heritage and the Gaeltacht, 2017) which includes overarching policies for nature conservation across the island of Ireland; and,
- Local Biodiversity Action Plan for Portlaoise, Co. Laois (McGowan, 2015)

1.2 Professional Competence

This report was prepared by Mr Barry O'Loughlin, BSc, MSc, MCIEEM (Independent Ecologist). Barry holds over ten years professional experience in the preparation of Ecological Impact Assessments, Biodiversity and Ornithology chapters for Environmental Impact Assessment Reports (EIARs), Appropriate Assessment documentation. Barry has prepared EcIA's and Biodiversity chapters for EIARs for a range of commercial development projects including overhead powerlines and underground grid connections, national road schemes, renewable projects (wind farm and solar farm developments), residential developments, transport projects, local biodiversity action plans, quarry and ancillary developments, wastewater supply schemes and waste remediation projects. He is a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM).

The Bat Survey Technical Report (technical appendix to this report) was prepared by Dr Emma Boston (MRSB, MCIEEM) (Independent Ecologist). Emma has over 14 years' professional experience in the survey of bats for research, conservation and consultancy. Emma has expertise in using of a range of survey methods, techniques and equipment, including acoustic call analysis. She has carried out bat surveys for small and large scale developments and infrastructure schemes and has been involved in many projects where she has had to design and prescribe specific mitigation for bats. She has held licences in Northern Ireland, the Republic of Ireland and Scotland to disturb or catch bats for development, education, and research purposes.

Section 2 Description of the Proposed Development

2.1 Background

Laois County Council has prepared a Walking and Cycling Strategy with the aim of providing sustainable travel patterns within Portlaoise town to achieve objectives set out in the low carbon town scheme. The scheme extends from the Ballyfin Road (western end) as far as the South Circular Ring Road (eastern end) navigating through urban environments into public parks and woodland areas for a total length of approximately 2.8 km (refer to Appendix 1; Map of Triogue Blueway). Due to the diverse range of the receiving environment, the scheme will be split into 3 phases with the level of ecological investigations applied being appropriate to the surrounding environments. This report encompasses Phase 1 of the scheme (Part A of the application) which extends from the south circular road near Portlaoise Industrial Park to the south-east and terminates at the footway of the public park at Páirc an Phobail (People's Park) Ballyfin Road to the north-west (approximately 400 m in length; see Figure 1).

2.2 Overview (Phase 1 of the scheme)

Phase 1

Phase 1 consists of works concentrated towards the eastern end of the scheme starting at the South Circular Road and ending at "Páirc an Phobail (People's Park) Public Park where the proposed cycle track links to the existing footway and transitions to Phase 2. This section of the scheme (Phase 1) is approximately 400 m in length (refer to Figure 1). The existing environs consist of broadleaved woodland with an existing gravelled laneway (known as "Down's Lane") which was previously an access road to a former dwelling house which is now demolished. Recent developments in the area have now rendered this laneway abandoned as there are no access requirements at this location. The laneway has fallen into disrepair over a period of time. There is evidence of regular human presence such as anti-social behaviour linked to dumping and burning of rubbish; and graffiti recorded within wooded sections of the scheme. The majority of Phase 1 is located within the Ridge of Portlaoise pNHA (site code: 000876) which was designated on a non-statutory basis in 1995 but has not since been statutorily designated. The proposed development does not traverse any watercourse crossings associated with Phase 1 of the scheme; consequently there will be no requirement for instream works.

2.3 Proposed development

Phase 1 of the scheme will comprise the construction of a cycle track, installation of line marking, ducting and public lighting; and all associated site works (e.g. removal of woodland debris and foliage, tree trimmings).

Phase 1

The proposed works associated with Phase 1 of the scheme will comprise the following elements:

- Engage with an arborist to assess the stability and condition of the surrounding woodlands for Health and Safety Concerns in both the laneway and park areas. Remove any windblown / dead trees from the access lane. Store any off-cut logs onsite in woodland areas to enhance bug life and pollinator friendly habitats;
- Clear any debris and foliage off the existing lane to assess its bearing capacity and condition. There will be a requirement to fell trees that are unsafe in the woodland area; the extent of this cannot be fully confirmed at this time until an arborist assesses the condition of the existing windblown/ dead trees to ascertain their stability.
- The most easterly end of the scheme (South Circular Road) has a manmade embankment composed of glacial tills. The embankment will need to be adjusted in elevation to allow

uniformity in the cycle track (embankment was most likely constructed during the construction of the adjacent retail park as evident by the difference in ground levels at this location between the existing laneway and the embankment);

- Import granular fill to create 100mm deep formation layer for the proposed cycle lane;
- The Cycle track will be constructed of 40mm depth AC20 (asphalt concrete) Dense bitumen macadam with a final 20mm deep wearing course of 10mm AC closed surface macadam. The proposed width of the cycle track is 3.0m. A drawing of Section B-B (refer to Appendix 2) illustrates the proposed construction build-up of the track. There is no surface water drainage proposal for this area. Surface water will cross fall off the track and soak off into the environs as is currently in place. There will be no mechanical propelled vehicles associated with the scheme. The proposed works will be undertaken to accommodate pedestrians and cyclists;
- Line marking will be installed to delineate walking and cyclist areas; and,
- Install ducting and appropriate public lighting.

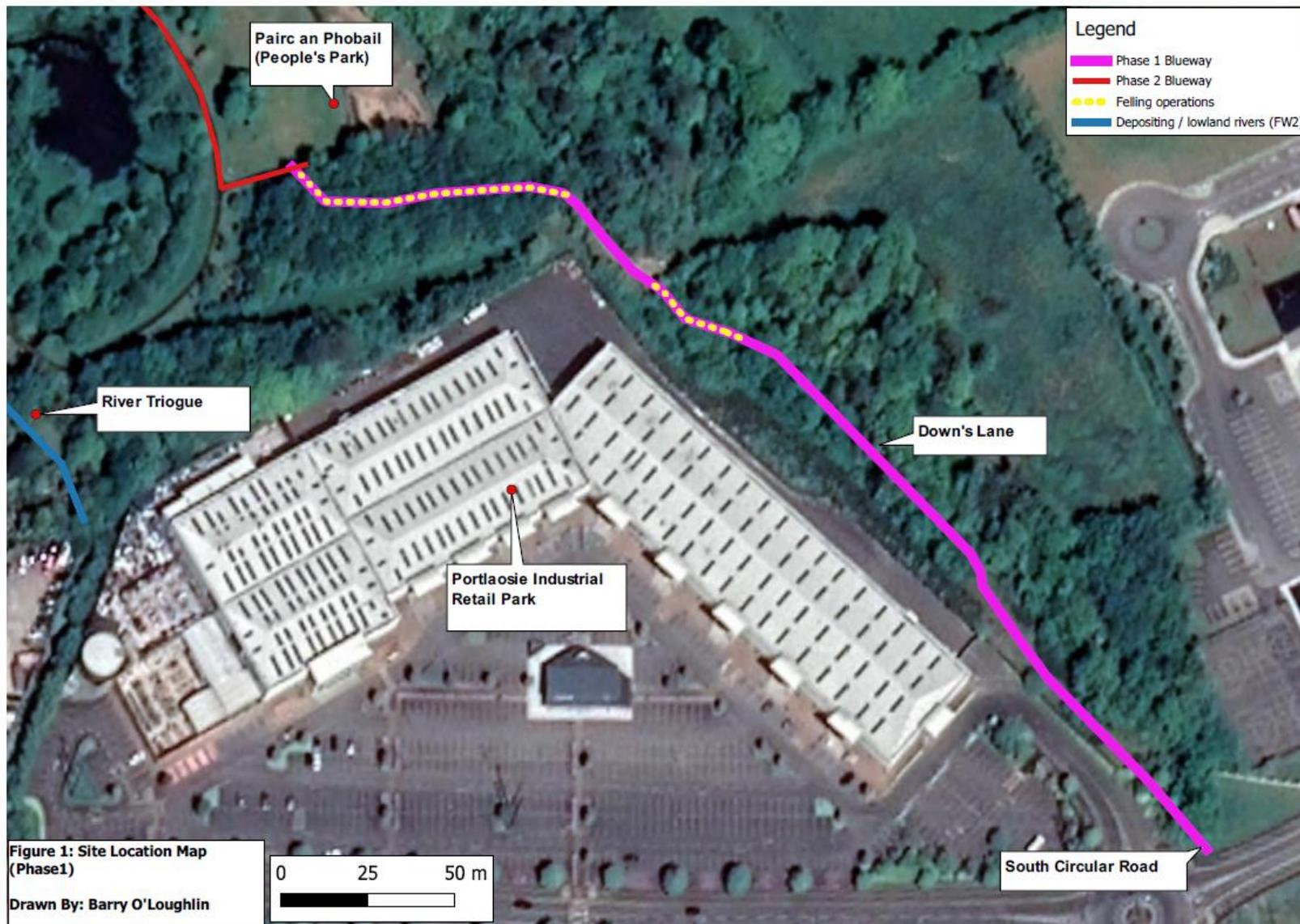


Figure 1 Site location map (phase 1)

Section 3 Methodology

This section of the report describes the methods employed to inform the EcIA including consultation with statutory and non-statutory organisations, desk study and field surveys. The various methodologies employed adhere to best practice guidelines to inform the baseline environment in relation to biodiversity and an assessment rationale for potential impacts associated with the proposed development on the receiving environment.

3.1 Nomenclature

Vascular plant nomenclature for vascular plants follows '*New Flora of the British Isles*' (Stace, 2019), while mosses and liverworts nomenclature follows '*Mosses and Liverworts of Britain and Ireland - a field guide*' (British Bryological Society, 2010).

3.2 Defining the Study Area

The zone of influence (ZoI) for a project (or "spatial extent of the impact" as described in Annex III (3) of EIA Directive 2014/52/EU) is the area whereby ecological features may be subject to impacts as a result of a proposed development and its associated activities. As recommended by CIEEM (2018), professionally accredited or published studies are used to determine and inform the ZoI. Ecological receptors within the ZoI should be identified initially by desk studies and consultation and then by site inspections and field surveys, as appropriate. The ZoI is likely to extend beyond the boundary of a proposed development, for example, where hydrological links exist beyond the proposed development footprint or where the proposed development occurs within the core foraging and breeding range for ornithological receptors of conservation concern. The ZoI will vary for different ecological receptors depending on their sensitivity to environmental change. It is therefore appropriate to identify different ZoIs for different features. The features affected could include habitats, species and the ecological processes on which they depend. ZoIs will vary taking into consideration the nature, scale and location of the proposed development (i.e. activities) and impact type. Therefore, the study area is defined by the ecological sensitivities and ecological features that could be impacted as a result of the proposed development. In the case where hydrological features have been identified with potential to give rise to pollution effects associated with the proposed development, the ZoI takes into consideration impacts on ecological features in the downstream catchment.

For mobile species (e.g. birds, fisheries and mammals), the ZoI takes into consideration the core foraging and breeding ranges for mobile species based on best scientific knowledge and relevant guidance documents.

3.3 Determination of Baseline Environment

Methodologies to inform the ecological characteristics of the baseline environment involved consultation with statutory and non-statutory consultees, conducting desk studies and undertaking field surveys for the various ecological receptors within and surrounding the proposed development.

3.3.1 Consultation

Consultation with statutory and non-statutory organisations was conducted to obtain ecological records within and adjacent to the site. Written and telephone correspondence in relation to the proposed development was carried out in July 2020. In all cases, consultees were invited to make observations and provide comments in relation to the proposed development in the context of biodiversity and to raise any ecological sensitivities that should be taken into consideration during

the preparation of the Ecological Impact Assessment. Table 3.1 provides a list of organisations consulted regarding biodiversity and details in relation to observations and responses received.

Table 3.1 Consultation Response Summary for Phase 1

Consultee	Consultation Summary	Response Received (Yes/No)	Comments Addressed in EcIA
Development Applications Unit (DAU)	A letter in relation to the proposed development was issued to the DAU by email on the 16 July 2020. The letter was furnished with a description of the proposed development and accompanied with a map of the proposed cycleway scheme.	No formal consultation response has been received to date.	N/A
Inland Fisheries Ireland (IFI)	A letter in relation to the proposed development was issued to the IFI by email on the 16 July 2020. The letter was furnished with a description of the proposed development and accompanied with a map of the proposed cycleway scheme.	No formal consultation response has been received to date.	N/A
Bat Conservation Ireland (BCI)	A letter in relation to the proposed development was issued to the BCI by email on the 16 July 2020. The letter was furnished with a description of the proposed development and accompanied with a map of the proposed cycleway scheme.	Yes. BCI responded by email on the 29 July 2020. BCI made the following observations: <ul style="list-style-type: none"> - Highlighted that the organisation has limited resources and do not comment on any proposed planning applications or engage in any planning consultations. - Recommended using a suitably qualified bat surveyor to carry out any bat surveys (if required). 	Concerns in relation to bats are addressed in Section 6.1.1 and Section 6.1.2 of the Ecological Impact Assessment (EcIA).
Laois County Council (LCC) (Heritage Officer and LCC Horticulturist)	A letter in relation to the proposed development was issued to LCC by email on the 16 July 2020. The letter was furnished with a description of the proposed development and accompanied with a map of the proposed cycleway scheme.	Yes. LCC responded by email on the 20 July 2020. <ul style="list-style-type: none"> - LCC's Heritage Officer provided links to background reports in relation to previous ecological studies undertaken within the confines of Portlaoise town. This included Laois Esker Survey, 2005, Audit of Geology in Laois 2016, Survey of Bats in LCC Properties 2008; and Local Biodiversity Action Plan for Portlaoise 2015. - LCC's Heritage Officer recommended consulting with the Irish Wildlife Trust (Laois-Offaly branch) to inform them of the proposed development and any ecological information they may have in relation to the study area. - LCC's Horticulturist provided background reports in relation to previous ecological studies completed at Pairc an Phobail (Biodiversity Assessment) and the artificial pond (AA Screening Assessment). The Horticulturist also provided information in relation to a tree survey previously completed by Atkins within the confines of the park. 	Consultation carried out with the Irish Wildlife Trust (Laois/Offaly) branch in July 2020. Information provided has been incorporated to inform the desktop review of the EcIA in Section 4.1.

Consultee	Consultation Summary	Response Received (Yes/No)	Comments Addressed in EcIA
Irish Wildlife Trust (IWT) (Laois/Offaly Branch)	A letter in relation to the proposed development was issued to the IWT by email on the 25 July 2020. The letter was furnished with a description of the proposed development and accompanied with a map of the proposed cycleway scheme.	<p>Yes. The IWT responded by email on the 28 July 2020. IWT made the following observations in relation to the proposed development:</p> <ul style="list-style-type: none"> - Highlighted concerns in relation to the selection of tree removal and impacts on the presence of a rookery and winter roost using mature trees in woodland habitat at Down's lane (Phase 1 of scheme) which encompasses the Ridge of Portlaoise pNHA. Recommended undertaking minimal tree removal and delimiting in line with public safety requirements and to avoid any additional tree felling where there are no safety concerns - Highlighted a survey of the eastern end of the schemes boundary (presence of gravel bank which supports orchid rich area in Phase 1 of scheme) - Recommended that all new public lighting in wooded and natural riparian zones should be designed to suit and fitted with bulbs which are bat-friendly. - Recommended various biodiversity enhancement measures which could aid the ecological value of the scheme such as creation of Bee-Banks (potentially at the eastern end glacial till bank), installing interpretation panels). - Overall, the local IWT branch is less concerned with potential impacts provided the construction of the proposed scheme adopts best practice. The organisation is of the opinion that the scheme has good potential to enhance biodiversity value of Portlaoise. 	Impacts with potential to result in adverse effects associated with artificial lighting (public lighting) on the River Triogue and fisheries, bats and non-volant mammals are addressed in Section 6.1.1 and 6.1.2 of this assessment. Similarly, impacts associated with the proposed development to result in disturbance and dispersal of invasive species are addressed in Section 6.1.1

3.3.2 Desk Study

A desk study was carried out to inform this assessment and a review of available information in relation to biodiversity (ecological records that overlap the ZoI). The desk study involved a review of available ecological records with reference to the following information sources:

- OSI (Ordnance Survey of Ireland) historical mapping and ortho-base maps¹;
- Conservation status of vascular plants, amphibians, reptiles, freshwater fish, butterflies, and terrestrial mammals, as per the Irish Red Lists;
- Records from online portals and web-maps including the National Biodiversity Data Centre's (NBDC)² (search of 10 km grid square overlapped by the proposed development). The NBDC compiles data from various sources such as the National Vegetation Database, the Online Atlas of Vascular Plants 2012-2020, the Irish Butterfly Monitoring Scheme, and the National Bat Database of Ireland), WFD Water Maps³ and IFI Interactive Map Viewer⁴;

¹ <https://www.osi.ie/> Accessed September 2020

² <https://maps.biodiversityireland.ie/> Accessed September 2020

³ <http://www.wfdireland.ie/maps.html> Accessed September 2020

⁴ <https://www.fisheriesireland.ie/Projects/interactive-gis-map.html> Accessed September 2020.

- Review of published and unpublished literature sources (e.g. Inland Fisheries Ireland) publications, peer reviewed scientific research journals and papers, NPWS Irish Wildlife Manual publications, species threat response plans, NPWS site synopsis and conservation objectives for designated sites, breeding and winter bird atlas records (Balmer et al., 2013);
- Data including surface water features, catchments and water quality status, available from Environmental Protection Agency (EPA)⁵ online database;
- Boundaries for catchments with confirmed or potential freshwater pearl mussel (FWPM) *Margaritifera margaritifera* populations available online from the NPWS;
- Data on the extent and vulnerability of local groundwater bodies⁶;
- National survey of native woodlands 2003-2008' report (Perrin et al., 2008);
- The Irish semi-natural grasslands survey 2007-2012 (O'Neill et al. 2013);
- River Barrow Catchment Survey: Fish Stock Assessment of the River Barrow Catchment 2015 (Delanty et al., 2017);
- Habitats and species identified in the Local Biodiversity Action Plan for Portlaoise 2015;
- Locations of rare/threatened and scarce vascular plants in Local Biodiversity Action Plan for Portlaoise 2015;
- Review of Laois County Development Plan 2017-2023;
- Interpretation Manual of European Union Habitats (EC, 2013);
- Map of Irish Wetlands⁷ (Wetland Surveys Ireland);
- Laois Esker Survey 2005 Volume 1: Report Text (Report Prepared for Laois Heritage Forum (Tubridy and Associates, 2005);
- Documentation and datasets available from NPWS online⁸ (NPWS Map Viewer, site synopsis reports, conservation objective documents, supporting documents, Natura 2000 Standard Data forms and Species Action Plans);
- Review of Appropriate Assessment Screening Report for Phase 1 of a Proposed Cycleway Scheme (CAAS, 2020a);
- Review of Ecological Impact Assessment for Part B (Phases 2 and 3) of a Proposed Triogue Blueway (Cycleway Scheme) at Portlaoise, County Laois (CAAS, 2020b);
- Review of Appropriate Assessment Screening and Natura Impact Statement in support of the Appropriate Assessment for Part B (Phases 2 and 3) of Proposed Triogue Blueway (Cycleway Scheme) at Portlaoise, Co. Laois (CAAS, 2020c);
- Review of "Páirc an Phobail Biodiversity Assessment" prepared for Laois County Council by Atkins Engineering Consultants (Atkins, 2018a);
- Review of "Bat Survey of County Laois; Surveys of Selected Laois County Council Properties for Bats 2008" prepared by Scott Cawley (2008);
- Information on "favourable reference ranges" of QI mobile species in Volume 1 and Volume 3 of NPWS' Status of EU Protected Habitats and Species in Ireland (NPWS, 2019a and NPWS, 2019c);
- Information on threats to, conservation condition, and habitat characteristics of Annex I habitats in Volume 2 of NPWS Status of EU Protected Habitats and Species in Ireland (NPWS, 2019b) and species assessments (NPWS, 2019b);
- Review of Ecology Technical Note in relation to the Portlaoise Cycleway prepared for Laois County Council by Atkins Engineering Consultants (Atkins, 2018b); and,
- Review of online planning applications⁹

Designated sites within the ZoI were identified using relevant datasets (i.e. designated sites available from www.npws.ie, hydrological features such as rivers and streams available from www.epa.ie, groundwater features available from www.gsi.ie). The most up to date spatial datasets for designated sites were downloaded from the NPWS website (www.npws.ie) and potential pathways within the ZoI were identified. Furthermore, various desktop records and online databases

⁵ <https://gis.epa.ie/EPAMaps/> Accessed September 2020

⁶ <https://www.gsi.ie/en-ie/data-and-maps/Pages/default.aspx> Accessed September 2020

⁷ <https://www.wetlandsurveysireland.com/> Accessed September 2020

⁸ <https://www.npws.ie/> Accessed September 2020

⁹ My Plan www.myplan.ie, Laois County Council Online Planning <https://laois.ie/departments/planning/carry-out-a-planning-search/> and An Bord Pleanála <http://www.pleanala.ie/search/index.php>. Accessed October 2020

were consulted to identify sites within the ZoI. This review takes into consideration the ecological characteristics of designated sites that have been identified within the ZoI.

3.3.2.1 Previous Environmental Studies

A number of reports and studies have been carried out which encompass sections of Phase 1 of the scheme, both prior to and contributing to this present assessment. The following is a list of the relevant previous environmental studies carried out that were consulted when establishing the baseline:

- Laois Esker Survey 2005 Volume 1: Report Text (Report Prepared for Laois Heritage Forum (Tubridy and Associates, 2005);
- Review of "Páirc an Phobail Biodiversity Assessment" prepared for Laois County Council by Atkins Engineering Consultants (January, 2018a);
- Review of Ecology Technical Note in relation to the Portaoise Cycleway prepared for Laois County Council by Atkins Engineering Consultants (Atkins, 2018b); and,
- Review of "Bat Survey of County Laois; Surveys of Selected Laois County Council Properties for Bats 2008" prepared by Scott Cawley (2008)

3.3.3 Field Surveys

Multi-disciplinary field surveys for flora and fauna at the proposed development and surrounding environs were carried out on the 6th of March, 17th and 31st of July; and 1st of August 2020. Field surveys were carried out by Independent Ecologists Mr. Barry O'Loughlin (BSc, MSc, MCIEEM) and Dr. Emma Boston (MRSB, MCIEEM). A summary of the various field survey techniques employed during the survey period are provided. This section of the report also provides a rationale for the exclusion of other specialised surveys (e.g. fisheries, birds), however, were nonetheless considered to inform the assessment. In the absence of such surveys, desktop information sources were consulted to inform the assessment.

3.3.3.1 Habitats and Flora

Habitat surveys were carried out on the 6th of March and 17th of July 2020. Habitats were classified in accordance with the Heritage Council's classification system, *A Guide to Habitats in Ireland* (Fossitt, 2000). Habitats were mapped in accordance with Smith et al., (2011). Field surveys were carried out during the optimal time of year (growing season) when plant species were readily identifiable and concentrated within the proposed development site and surrounding environs. The surveys included the identification of protected species, species of conservation concern, or species/habitats associated with designated sites (if present). The information gained from the survey was used to ascribe a value to habitat features, and to direct further habitat and species-specific survey work to inform this report (if required). Habitats considered to be of ecological importance and in particular, having the potential to correspond to those listed in Annex I of the EU Habitats Directive 92/43/EEC were also considered.

3.3.3.2 Invasive Species

A search for invasive alien species (including plants and animals) listed on the 'Third Schedule' of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2015) and species listed as 'high impact' under the NBDC's 'Invasive Species in Ireland Prioritization Risk Assessment' was carried out for along all phases of the proposed development. Surveys for scheduled invasive species were carried out in accordance with Regulation 49 of the European Communities Regulations 2011 and includes legislative measures to deal with the dispersal and introduction of invasive alien species. Ecologists completed a walkover survey of the site on 6th of March and 17th of July 2020 to identify the potential presence of invasive species (i.e. those scheduled to the 2011 Regulations). Searches were concentrated in areas with potential to support invasive species such as disturbed ground, aquatic habitats and roadside verges.

3.3.3.3 Non-volant Mammals

Habitats identified as providing potentially suitable habitat for non-volant mammals such as otter and badger was subject to a targeted survey. Special attention was paid to species listed under the Wildlife (Amendment) Act and species listed on Annex II and/or IV of the EU Habitats Directive. The

search effort put an emphasis on otter, badger and pine marten due to the aforementioned species sensitivity to development and associated impacts. Evidence for the potential presence of other protected species such as pygmy shrew *Sorex minutus* and red squirrel *Sciurus vulgaris* were also noted and suitable habitat mapped. All signs and tracks (Bang and Dahlstrom 2004) were assessed as they were encountered in the field. Surveys for non-volant mammals were conducted on the 6th of March and 17th of July 2020.

The site and wider ZoI up to 150 m from the proposed works footprint were systematically searched (where possible) for evidence of badger. The badger survey was carried as per NRA (2006a) guidelines and in line with methods that follow Harris et al. (1989). This involved a search for signs of badger activity including the presence of main, annex, subsidiary and outlier setts, foraging evidence, access runs, hairs caught on wires and bushes, tracks and prints.

Searches for otter were carried out as per NRA (2008 and 2006b) guidelines. A targeted survey was carried out to determine if any sensitive areas for otter such as holts/natal dens in proximity to the proposed development and wider ZoI (up to 150 m in areas of suitable habitat where access could be gained) were assessed. Evidence of tracks and signs recorded in the field including spraints, footprints, holts or feeding remains were marked onto mobile mapping devices and maps in the field.

3.3.3.4 Amphibians

Where noted in areas comprising suitable habitat, amphibians such as common frog *Rana temporaria* were noted during walkover surveys.

3.3.3.5 Bats

As the proposed development will potentially require some felling of trees to accommodate the cycle track, a targeted bat survey (Preliminary Roost Assessment (PRA) and bat activity surveys) was conducted on the night of the 31st of July and 1st of August 2020 to determine the presence of bats along the proposed development. A separate technical report for bat surveys carried out at the site is presented in Appendix 3. This provides a description of the species background ecology, the various field survey methodologies employed, weather conditions, field survey results and maps illustrating survey locations and points of interest. The following sections provide a brief overview of field survey methods and equipment used during bat surveys carried out along Phase 1 of the route (for ease of survey analysis it should be noted that the bat survey encompassed all three phases (Phase 1, 2 and 3) of the Triogue Blueway).

Preliminary Roost Assessment Survey

A ground level assessment of trees at sections concentrated along Phase of the proposed development was carried out on 1st of August 2020. This survey focused on trees and built structures which have the potential to be impacted (earmarked for felling and demolition) as a result of widening existing pathways to accommodate the proposed route. This assessment was conducted during daylight hours from ground level, using binoculars where necessary and identified any potential roost features or evidence of use by bats (e.g. droppings or staining). The results were used to grade any features as having Negligible, Low, Moderate, or High suitability for roosting bats in accordance with Bat Conservation Trust guidelines (Collins, 2016).

Bat Activity Surveys

Two surveyors carried out all surveys on pre-determined transect routes. A bat activity survey was conducted within the site on the 31st of July and the 1st of August 2020. The site was walked using a hand-held continuously recording bat detector to record echolocation calls of bats encountered along the route of the proposed development. The transect route is outlined in Figure 1 of the Bat Survey Technical Report (Appendix 3). Taking into consideration the length of the route, the transect was walked in two parts concentrated in habitats identified as potentially suitable to support foraging, commuting and roosting bats. The first part of the survey started at sunset 21:23 on the South Circular Road, passing through Phase 1 and into Phase 2 of the proposed development at Pairc an Phobail (People's Park) (refer to Figure 1 of Appendix 3). The second part of the survey was concentrated at phase 2 and phase 3 of the scheme.

A Batlogger M detector (Elekon, AG) was used during the survey. Upon aural registrations of a bat species, surveyors recorded the bat's location, the direction and height of the bat's flight and any notable behaviour (e.g. foraging or commuting) where possible. Recorded calls were analysed using Kaleidoscope Pro version 5.1.0 (Wildlife Acoustics, Inc.) software to confirm species identification in the field. In addition to observations on bat activity and behaviour, notes were compiled on the levels of illumination (public lighting/artificial lighting) along the proposed development (emphasis on Phase 1 and Phase 2).

3.3.3.6 Other Survey Considerations

The requirement to conduct a suite of targeted surveys for more specialised groups such as invertebrate communities and birds was not considered necessary. The proposed development occurs outside the core ranges for special conservation interests (birds) associated with SPAs in the wider surroundings and within the urban environs of Portlaoise town (unsuitable supporting habitat). Consequently, no targeted bird surveys were undertaken. There will be no requirement for any in-stream works associated with the proposed development and no watercourses occur within or immediate proximity to Phase 1 of the scheme. Given an absence of suitable habitat in the form of ponds and natural watercourses, no specialised surveys for fish or aquatic ecology were carried out. Therefore, surveys for other specialised groups such as birds, fisheries and invertebrates were not carried out as part of this assessment.

3.4 Determination of Ecological Receptors/Features

3.4.1 Ecological Evaluation

The methodology used to value ecological features should be considered within a defined geographical context. Ecological evaluation assessment follows criteria outlined in NRA (2009) guidelines. The guidelines set out the context for the determination of value on a geographic basis with a hierarchy assigned in relation to the importance of an ecological receptor. The guidelines provide a basis for determination of whether any particular site is of importance on the following scales:

- International
- National
- County
- Local Importance (Higher Value)
- Local Importance (Lower Value)

The NRA (2009) guidelines set out a range of ecological criteria whereby ecological receptors can be assigned into the different geographic scales. For example, internationally important receptors will contain ecological features deemed to be of international significance such as designated European sites i.e. SAC, SPA, resident or regularly occurring populations (assessed to be important at the national level) (i.e. 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), etc. In contrast, locally important (lower value) receptors contain habitats and species that are typically widespread and of low ecological value and deemed to be important only in a local context. In conjunction with relevant terminology from CIEEM guidance (2018), the geographic frames of reference employed by the NRA (2009) (presented in Appendix 4) are employed in this report when defining ecological value of features. The (NRA 2009) geographic frames of reference provide useful examples of features at each geographic scale and incorporate a quantitative element (i.e. use of '1% thresholds') in an attempt to standardise valuations and inform ecological evaluation and significance.

Significant ecological features are those valued at local importance (higher value) or above as per the examples in Appendix 4. Features below this value are not carried forward to impact assessment.

3.4.2 Identifying Ecological Resources and Requirements for Detailed Assessment

In order to assign a value of a particular ecological resource within an appropriate geographic frame of reference, it is beneficial to review the distribution and abundance of a particular ecological receptor on an international, national, county or local basis. The identification of likely significant effects (direct and indirect) on ecological receptors will facilitate in the selection of "Key Ecological Receptors" (KER) (NRA, 2009) or 'Important Ecological Features' (CIEEM, 2018) for which detailed assessment is described. NRA (2009) states that 'in the context of national road projects, ecological resources of below 'local importance (higher value)' should not be selected as 'KER for which detailed assessment is required'. Whilst the proposed development, subject to this assessment is not a national road scheme, the general principles for the selection of KERs or 'Important Ecological Features' have been adopted to inform the impact assessment. All habitats and species recorded within and surrounding the proposed development were assigned a level of significance on the above rationale.

3.5 Describing Potential Effects

3.5.1 Guidance

The methodology used to assess the potential impact of the proposed development on ecological features and develop relevant mitigation measures has regard for the CIEEM's *Guidelines for Ecological Impact Assessment in the UK and Ireland* (CIEEM, 2018). Whilst drafted in the context of transport infrastructure, the National Roads Authority's (NRA) *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (NRA, 2009) also provide useful guidance in the context of impact assessment, particularly in relation to the valuation of significant ecological features. Other guidance is referenced throughout this report as relevant.

3.5.2 Assessment of Effects

Potential impacts and resultant effects of the proposed development (both positive and negative) are predicted for all important ecological features. As already stated, in the context of the NRA's (2009) valuation criteria, important ecological features are those valued at local importance (higher value) or above as per the examples in Appendix 4. The assessment of effects has regard to CIEEM (2018) and NRA (2009) guidelines. Where types of potential impact are not predicted to result in likely significant effects, these are not included. Having regard to CIEEM (2018) guidelines, potential impacts for effects are characterised in Table 3.2. As defined by CIEEM (2018), an impact is the "actions resulting in changes to an ecological feature, an effect is the "outcome to an ecological feature from an impact".

The impact assessment process involves the following steps:

- Identifying and characterising impacts;
- Incorporating measures to avoid and mitigate (reduce) these impacts;
- assessing the significance of any residual effects after mitigation;
- Identifying appropriate compensation measures to offset significant residual effects (if required); and,
- Identifying opportunities for ecological enhancement.

In accordance with CIEEM (2018) criteria, when describing impacts, reference has been made to the following characteristics, as appropriate: positive or negative; extent; magnitude; duration; timing; frequency; and reversibility. Potential impacts are characterised by considering the criteria presented in Table 3.2.

Table 3.2: Criteria for describing potential impacts (CIEEM, 2018)

Impact Criterion	Description
Positive or Negative	<p>positive – a change that improves the quality of the environment e.g. by increasing species diversity, extending habitat or improving water quality. This may also include halting or slowing an existing decline in the quality of the environment.</p> <p>negative – a change which reduces the quality of the environment e.g. destruction of habitat, removal of foraging habitat, habitat fragmentation, pollution.</p>

Impact Criterion	Description
Extent	The extent is the spatial or geographic area over which the impact/effect may occur under a suitably representative range of conditions
Magnitude	Magnitude refers to size, amount, intensity and volume. It should be quantified if possible and expressed in absolute or relative terms e.g. the amount of habitat lost, percentage change to habitat area, percentage decline in a species population.
Duration	Duration should be defined in relation to ecological characteristics (such as the lifecycle of a species) as well as human timeframes (refer to NRA, 2009 criteria in relation to duration)
Timing	The timing of an activity or change may result in an impact if it coincides with critical life-stages or seasons e.g. bird nesting season.
Frequency	The number of times an activity occurs will influence the resulting effect
Reversibility	An irreversible effect is one from which recovery is not possible within a reasonable timescale or there is no reasonable chance of action being taken to reverse it

The impact assessment process considers both direct and indirect effects: direct effects result from impacts that are directly attributable to an activity, e.g. the physical loss of habitat as a result of the construction footprint of a development. Indirect effects are attributable to an action which is a 'by-product' of a project activity such as run-off of pollutants to a nearby watercourse or alteration to the hydrological regime of a nearby wetland without any physical loss of the wetland habitat.

In addition to the above guidance, the NRA's (2006) definitions of duration of effects have been employed and are presented in Table 3.3.

Table 3.3: Description of duration of effects (NRA, 2006)

Duration of Effects	
Temporary	Effects lasting less than one year
Short-term	Effects lasting on to seven years
Medium-term	Effects lasting seven to fifteen years
Long-term	Effects lasting fifteen to sixty years
Permanent	Effects lasting > sixty years

3.5.2.1 Significant Effects

The emphasis in EcIA is on 'significant effects' rather than all ecological effects. CIEEM (2018) sets out guidance in paragraphs 5.24 through to 5.28, of the document, in relation to concept of ecological significance. For the purposes of EcIA, CIEEM (2018) guidelines defines 'significant effect' as an effect that "*either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general*". Effects can be considered significant using geographic scales ranging from local to international importance. In broad terms, significant effects encompass impacts on the structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, distribution and abundance). The nature of the identified impacts on each assessed feature is characterised. Where it is concluded that an effect would be likely to reduce the importance of an assessed feature, it is described as significant. The degree of significance of the effect takes into account the geographic context (i.e. local, county, national and international importance) of the feature's importance and the degree to which its interest is judged to be affected. CIEEM (2018) guidelines state that "*when seeking mitigation or compensation solutions, efforts should be consistent with the geographic scale at which as effect is significant*". For the purposes of this assessment, the geographic scale follows NRA (2009) evaluation criteria (refer to Appendix 4 which can be applied readily to an Irish context). Once avoidance and mitigation measures have been applied, along with any necessary compensation measures, and opportunities for enhancement incorporated, residual impacts are considered.

3.5.2.2 Cumulative Effects

Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. Cumulative effects can occur where a proposed development results in individually insignificant impacts that, when considered in-

combination with impacts of other proposed or permitted plans and projects, can result in potential cumulative significant effects. More than one potential impact acting on an ecological feature simultaneously can result in cumulative effects that are greater than when the same potential impacts acting in isolation. Cumulative effects can result from individually insignificant, but collectively significant, actions taking place over time or concentrated in a location. Cumulative effects are important in the context of biodiversity impacts, as many ecological features are already exposed to background levels of threat or pressure and could be close to critical thresholds where further impact could cause irreversible decline.

3.5.2.3 Residual Effects

After assessing the impacts of the proposal, all attempts should be made to avoid and mitigate ecological impacts. Once measures to avoid and mitigate ecological impacts have been finalised, assessment of the residual impacts should be undertaken to determine the significance of their effects on ecological features.

3.5.2.4 Precautionary Principle

In instances where it is not possible to robustly justify a conclusion of no significance; or where reasonable scientific doubt exists, CIEEM (2018) guidelines state: "*The evaluation of significant effects should always be based on the best available scientific evidence. In cases of reasonable doubt, where it is not possible to robustly justify a conclusion of no significant effect, a significant effect should be assumed. Where uncertainty exists, it must be acknowledged in the EcIA*".

Therefore, a precautionary approach has been adopted in some instances for assessing potential significant effects and prescribing mitigation.

3.6 Limitation and Assumptions

The information provided in this report accurately and comprehensively describes the baseline environment and species composition recorded within and surrounding the proposed development. Sources of information are not exhaustive, and every effort was made to obtain ecological data in the public domain to inform the baseline and impact assessment. All surveys were carried out during the appropriate season having regard for NRA (NRA, 2008) and CIEEM (2018) guidelines. Taking into consideration the scale and location of the proposed development surrounding the urban environs of Portlaoise town, the suite of walkover surveys was adequate to address the potential for protected species to occur. The specialist studies, analysis and reporting have been carried out in accordance with the appropriate guidelines. Access to third party lands to conduct a mammal survey up to 150 m (in the case of badger and otter) was identified as a survey constraint. In such instances, desktop sources of information such as aerial photography to identify habitat suitability and previous ecological records were reviewed to inform information gaps. A binocular survey was also carried out of adjoining lands to inform the assessment. Overall, no significant limitations in the scope, scale or context of the survey assessment have been identified.

Section 4 Baseline Environment

This Section provides details on the findings of the desk study and field surveys conducted at the site of the proposed development.

4.1 Desk Study

This section describes the findings of desktop sources of information that were consulted to inform the baseline environment in the context of biodiversity. This includes a review of desktop data sources, datasets, published and scientific reports. As no watercourses occur within or in proximity to Phase 1 of the proposed development, a desk study for fisheries and aquatic ecology has not been carried out on this basis.

4.1.1 Sites Designated for Nature Conservation

This section identifies national and international designated sites within the potential ZoI of the proposed development. The proposed development does not occur within any statutory site designated for nature conservation. However; the proposed development occurs within the Ridge of Portlaoise pNHA which is designated on a non-statutory basis and overlaps the majority of Phase 1 of the scheme.

4.1.1.1 Internationally Important Designated Sites (European Sites)

An Appropriate Assessment (AA) Screening report has been prepared to provide the competent authority with the necessary information to carry out an AA for the proposed development. Potential pathways to result in significant effects on European sites within the ZoI of the project were screened out due to an absence of a source-pathway-receptor chain with any European site. The AA Screening report has been prepared as a standalone document and should be viewed as a separate assessment (CAAS, 2020a).

As part of this assessment, the potential for the proposed development to give rise to significant effects on European sites was considered and the findings of the AA Screening were consulted. The AA Screening concluded:

"Through an assessment of the pathways for effects and an evaluation of the project characteristics, there is no likelihood of significant effects on the qualifying interests, special conservation interest or the conservation objectives of any designated European site. In view of best scientific knowledge and on the basis of objective information, it is concluded that Phase 1 of the scheme, whether individually or in combination with other plans or projects, beyond reasonable scientific doubt will not have significant effects on European sites identified during the AA Screening process".

Therefore, due to a lack of connectivity (e.g. hydrological, species core range, unsuitable habitat or otherwise), Phase 1 of the proposed development does not have any potential to give rise to significant effects on any European site.

4.1.1.2 Nationally Important Designated Sites

The locations of nationally designated sites are presented in Table 4.1. This includes a review of all designated sites of national importance (i.e. Natural Heritage Areas (NHA) and proposed Natural Heritage Areas (pNHA)) that have been identified within the ZoI of the project. Designated sites with no links to the proposed development have been excluded from this review and are deemed to be outside the ZoI of the proposed development. The location and distribution of nationally important designated sites within the ZoI of the project is presented in Figure 2 (restricted to the Ridge of Portlaoise pNHA). The majority of Phase 1 of the scheme lies within the Ridge of Portlaoise pNHA. There were no other nationally important sites identified within the ZoI (connected hydrologically or otherwise) of the project.

Table 4.1 Designated Sites within the ZoI of the Proposed Development (Phase 1)

Designated Site Name	Distance to Proposed Development (Km)	Qualifying Features / Ecological Features of Interest	ZoI of the Proposed Scheme
Ridge of Portlaoise pNHA (000876)	<p>The majority of phase 1 of the scheme lies within the pNHA.</p> <p>The site has been identified as occurring within the likely ZoI of Phase 1 of the scheme</p>	<p>The Ridge of Portlaoise pNHA is designated on a non-statutory basis (Proposed Natural Heritage Area) but has not since been formally designated. pNHAs are subject to limited protection, sometimes in the form of recognition of the ecological value of pNHAs by Planning and Licencing Authorities.</p> <p>The NPWS site synopsis indicates that the Ridge of Portlaoise pNHA has primarily been proposed for protection due to the presence of two rare plant species, the nettle-leaved bellflower <i>Campanula trachelium</i> and blue fleabane <i>Erigeron acer</i>. The former is found in open woodland, and the latter on open gravelly areas. Nettle-leaved bellflower is a nationally rare species, which was protected under the Flora Protection Order 1987 (S.I. No. 274/1987), but was removed from this list when the revised Flora (Protection) Order 1999 (S.I. No. 94/1999) was drafted and this has remained unchanged with the more recent Flora (Protection) Order 2015 (S.I. No. 356/2015). Both plant species are listed as "Least Concern" under Ireland's most recent red list for vascular plants (Wyse Jackson et al., 2016). As defined by Wyse Jackson et al., (2016), a taxon is of 'Least Concern' when it has been evaluated against the criteria that do not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in the category. Nettle-leaved bellflower and blue fleabane were both listed as "Vulnerable" in Ireland's previous red data book list of vascular plants (Curtis and McGough, 1988) but have since been removed and are now classified as "Least Concern" (Wyse Jackson et al., 2016). Therefore, the conservation importance of rare flora associated with the pNHA has been downgraded since the site was originally proposed as a pNHA in 1995. The NPWS site synopsis for the Ridge of Portlaoise pNHA is presented in Appendix 5.</p>	Within ZoI of the scheme

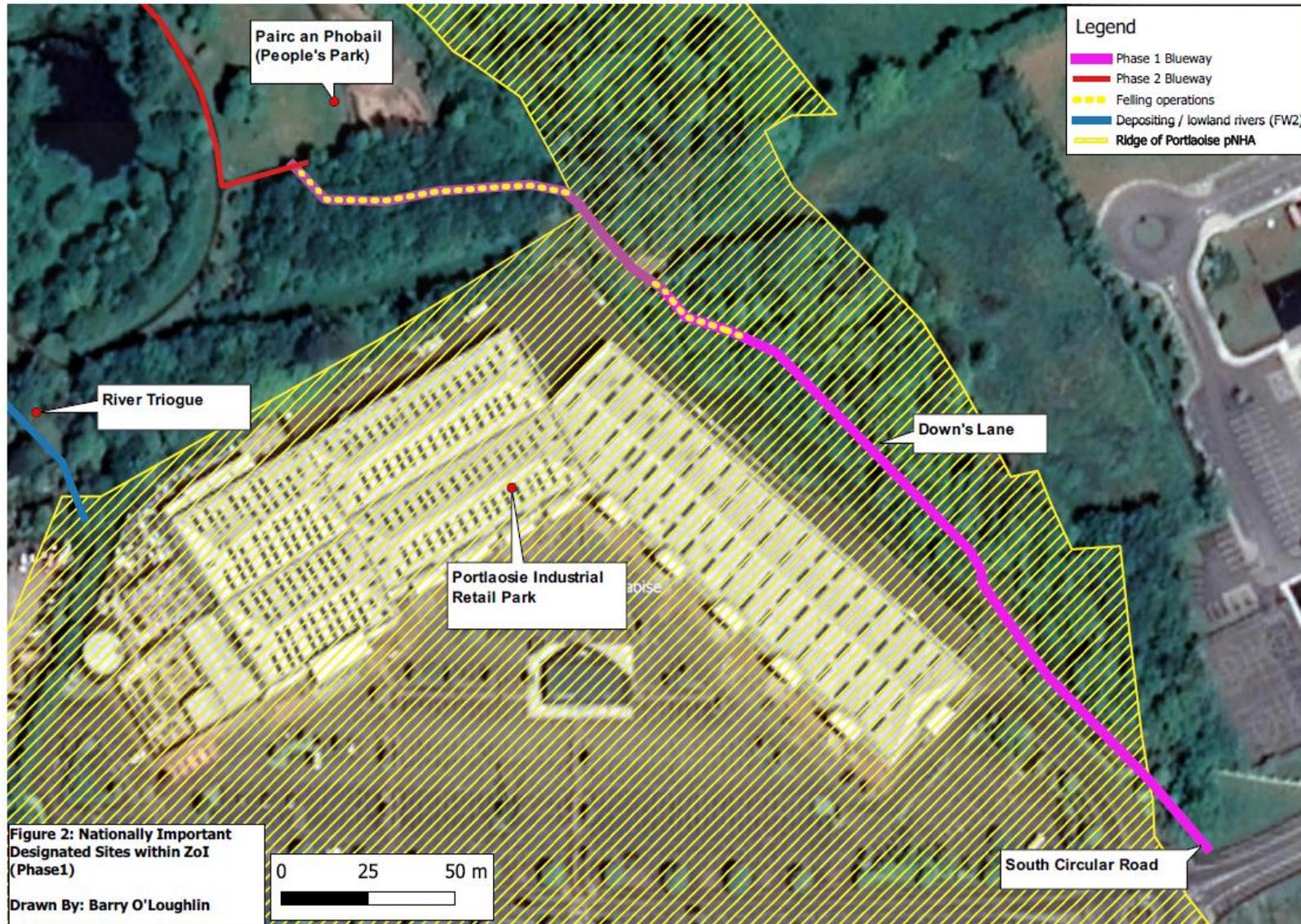


Figure 2 Nationally important designated sites within ZoI (phase 1)

Applying the precautionary ZoI for habitat loss and disturbance effects, the designated sites which are listed in Table 4.1 and presented in Figure 2 are within the ZoI of the project, with potential to result in impacts and effects on this ecological feature/receptor.

4.1.2 Protected and Rare Species

Protected and rare flora and fauna within the relevant 10 km grid square (S49) in which the proposed development (Phase 1) overlaps is presented in Table 4.2 (refer to table footnotes¹⁰ for key). Plant species deemed to be of 'Least Concern' have been omitted. As defined by Wyse Jackson et al., (2016), a taxon is of 'Least Concern' when it has been evaluated against the criteria and does not qualify for 'Critically Endangered', 'Endangered', 'Vulnerable' or 'Near Threatened' status. No fish species were returned from the search.

Table 4.2 Protected and rare flora and fauna (excluding birds) returned from NBDC and NPWS search within the 10 km grid square (S49) in which the proposed development overlaps

Group	Common Name	Scientific Name	Legally Protected	Red-List (Excluding Least Concern)	Habitat Preferences
Amphibian	Common Frog	<i>Rana temporaria</i>	✓ b	-	Freshwater habitats, ponds, wet grassland, marsh, wet heath and other peatlands, woodland and scrub, dune slacks, and machair
Crustacean	Freshwater White-clawed Crayfish	<i>Austropotamobius pallipes</i>	✓ a, b	-	Found in freshwater habitats such as rivers, canals and lakes
Invertebrates	Dark Green Fritillary	<i>Argynnis aglaja</i>	-	✓ VU	Found in calcareous grassland, coastal sand dunes and woodland habitats. The main food plant of adults includes thistles <i>Cirsium</i> sp. And <i>Carduus</i> sp., carline thistle <i>Carline vulgaris</i> and knapweed <i>Centurea</i> sp.

¹⁰ Table Footnotes

Key to Red Lists: CR Critically Endangered, EN Endangered, VU Vulnerable, NT Near Threatened, DD Data deficient. Marnell et al., 2010_b, Fitzpatrick et al., 2006, _c Regan et al., 2010, Byrne et al 2009, _r King et al., 2011).

-Key to Legally Protected Species: a) Habitats Directive, b) Wildlife Acts,

-Habitat preferences: Butterfly habitats from <https://www.ukbutterflies.co.uk/> (accessed September 2020). Bee habitats from <https://www.bwars.com/> (accessed September 2020). Mammals (except lesser horseshoe bat), amphibian, and invertebrate habitats (except non-marine molluscs, bees and butterflies) from relevant Red Lists and professional judgement. Non-marine mollusc habitats from <http://www.habitas.org.uk/molluscireland/species.asp?ID=91> (Accessed September 2020)

Group	Common Name	Scientific Name	Legally Protected	Red-List (Excluding Least Concern)	Habitat Preferences
	Dingy Skipper	<i>Erynnis tages</i>	-	✓ NT	Occurs in a range of habitats including woodland rides and clearings, coastal habitats such as dunes and under cliffs, heath, old quarries, railway lines and waste ground. Main food plant includes bird's-foot trefoil <i>Lotus corniculatus</i> , vetches and buttercups <i>Ranunculus</i> sp.
	Large Heath	<i>Coenonympha tullia</i>	-	✓ VU	Found in lowland raised bogs, upland blanket bogs and damp acidic moorland.
	Marsh Fritillary	<i>Euphydryas aurinia</i>	✓ a	✓ VU	Found in sand dunes, calcareous grassland, fens, bogs and upland heaths and damp grasslands. The main larval food plant is devils bit scabious <i>Succisa pratensis</i>
	Small Heath	<i>Coenonympha pamphilus</i>	-	✓ NT	Occurs in a wide range of habitats including unimproved dry grassland, coastal grey dunes and machair. Adults favour areas of grassland with low sward height and abundant flowers and isolated scrub. Adult primary food plants include bramble and buttercups. Larval food plants, bent <i>Agrostis</i> sp. and fescue grasses <i>Festuca</i> sp.
	Wall Brown	<i>Lasiommata megera</i>	-	✓ VU	Found in unimproved grassland and hedgerows. Adult food plants include daisy <i>Bellis perennis</i> , knapweeds, thistles and yarrow <i>Achillea millefolium</i> . Larval food plants are grasses including cock's-foot <i>Dactylis</i> sp., and Yorkshire fog <i>Holcus lanatus</i>
	Buffish Mining Bee	<i>Andrena (Melandrena) nigroaenea</i>	-	✓ VU	Found in various habitats including parks and gardens
	Large Red Tailed Bumble Bee	<i>Bombus (Melanobombus) lapidarius</i>	-	✓ NT	Widespread habitats including grasslands, heathland, woodland and gardens

Group	Common Name	Scientific Name	Legally Protected	Red-List (Excluding Least Concern)	Habitat Preferences
	Brown Snail	<i>Zenobiella subrufescens</i>	-	✓ VU	Found in woodlands with ravines in association with <i>Luzula sylvatica</i> .
	Desmoulin's Whorl Snail	<i>Vertigo (Vertigo) moulinsiana</i>	✓ a	✓ EN	Found in floodplain wetland in areas with a calcareous bedrock
	English Chrysalis Snail	<i>Leiostryla (Leiostryla) anglica</i>	-	✓ VU	Found in wet, natural, hazel woods on limestone or basalt, and old plantation woods
	Field Slug	<i>Deroceras (Deroceras) agreste</i>	-	✓ DD	Riparian areas
	Heath Snail	<i>Helicella itala</i>	-	✓ VU	Found in calcareous grassland and sand dunes
	Lake Orb Mussel	<i>Musculium lacustre</i>	-	✓ VU	Mostly found in freshwater habitats such as swamps, ponds and marsh drains
	Lesser Bulin	<i>Merdigera obscura</i>	-	✓ EN	Found in shady and rocky habitats in deciduous forests and walls.
	Marsh Whorl Snail	<i>Vertigo (Vertigo) antivertigo</i>	-	✓ VU	Commonly found in wetland, marshes and fen habitats
	Moss Bladder Snail	<i>Aplexa hypnorum</i>	-	✓ VU	Mostly found in small freshwater waterbodies such as ponds
	Moss Chrysalis Snail	<i>Pupilla (Pupilla) muscorum</i>	-	✓ EN	Found in coastal pastures and calcareous habitats
	Plated Snail	<i>Spermodea lamellata</i>	-	✓ EN	Found in broadleaved woodlands
	Point Snail	<i>Acicula fusca</i>	-	✓ VU	Common in long established woodland and limestone scrub in Ireland
	Prickly Snail	<i>Acanthinula aculeata</i>	-	✓ NT	Prefers shrub and woodland habitats
	Striated Whorl Snail	<i>Vertigo (Vertigo) substriata</i>	-	✓ NT	Found in stream banks with rich herb vegetation, meadows, marshy grasslands, fens
Bats	Brown Long-eared Bat	<i>Plecotus auritus</i>	✓ a, b	-	Found in woodland, hedgerows and parkland habitats. Hibernates in caves, mines and buildings

Group	Common Name	Scientific Name	Legally Protected	Red-List (Excluding Least Concern)	Habitat Preferences
	Daubenton's Bat	<i>Myotis daubentonii</i>	✓ a, b	-	Forages over waterbodies close to woodland and scrub. Roosts in trees
	Lesser Noctule	<i>Nyctalus leisleri</i>	✓ a, b	-	Uses hedgerows and treelines, woodlands, parklands for foraging and commuting. Hibernates in buildings and trees
	Natterer's Bat	<i>Myotis nattereri</i>	✓ a, b	-	Uses mature hedgerow and pasture habitats. Uses tree holes, old stone buildings such as churches and barns and under bridges for roosting.
	Pipistrelle	<i>Pipistrellus pipistrellus sensu lato</i>	✓ a, b	-	Uses hedgerows and treelines, woodlands, parklands
	Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	✓ a, b	-	Uses hedgerows and treelines, woodlands, parklands
Non-volant Mammals	Eurasian Badger	<i>Meles meles</i>	✓ b	-	Prefers woodland, scrub, hedgerows and grassland. Creates setts in free draining slopes and under hedgerows
	Eurasian Pygmy Shrew	<i>Sorex minutus</i>	✓ b	-	Only shrew native to Ireland, found in woodland, hedgerows and field margins
	Eurasian Red Squirrel	<i>Sciurus vulgaris</i>	✓ b	-	Demonstrates a preference for coniferous woodland in Ireland, present across mixed and deciduous woodland
	European Otter	<i>Lutra lutra</i>	✓ a, b	✓ NT	Found in a range of habitats including lakes and ponds, watercourses, riparian woodland, estuaries, sea inlets and bays, saltmarshes, swamps, riparian corridors
	Fallow Deer	<i>Dama dama</i>	✓ b	-	Found in habitats primarily consisting of mature deciduous or mixed woodlands close to open grassland
	Western European Hedgehog	<i>Erinaceus europaeus</i>	✓ b	-	Found in gardens, parkland and woodland

Group	Common Name	Scientific Name	Legally Protected	Red-List (Excluding Least Concern)	Habitat Preferences
Plants and Mosses	Common Extinguisher-moss	<i>Encalypta vulgaris</i>	-	✓ NT	Broad distribution found on base-rich substrates in lowland areas
	Large White-moss	<i>Leucobryum glaucum</i>	✓ a	-	Found in bogs, heaths and poor fen and wet and dry acidic woodlands.
	Red-neck Forklet-moss	<i>Dicranella cerviculata</i>	-	✓ NT	Found in peatlands; and gravel and sand substrates
	Alder Buckthorn	<i>Frangula alnus</i>	-	✓ VU	Found in wet soils and open woods, thriving in scrub, hedgerows, wet heathland, river banks and bogs

In addition to the data provided in Table 4.2; a bat survey for Co. Laois was carried out at selected sites in 2008 by Scott Cawley. One of the sites selected for survey included Pairc an Phobail (People's Park) which occurs adjacent to Phase 1 of the proposed development. The survey detected common pipistrelles and daubenton's bat during surveys.

Bird and bat boxes have been erected on numerous trees in the park. As reported by Atkins (2018a), thirty boxes were constructed by the Portlaoise Men's Shed group and installed with the assistance of the Irish Wildlife Trust. The boxes include 20 bird nest boxes and 10 bat roost boxes. The locations of these are illustrated in Figure 3 and are located within habitats associated with Phase 1 of the proposed development. Kildare bat group have monitored these boxes and 6 of the 10 bat roost boxes had at least one bat present during the monitoring visits undertaken since 2015.



Figure 3 Location of bird (nest) and bat (roost) boxes¹¹

4.1.3 Breeding and Winter Bird Atlas Records

The Bird Atlas 2007-11: The Breeding and Wintering Birds of Britain and Ireland (Balmer et al., 2013) is the most recent comprehensive bird atlas census for wintering and breeding birds in Ireland. The results present a list of bird species of high conservation concern (emphasis on BoCCI red-list and Annex I; EU Birds Directive). Previous wintering (Lack et al., 1986) and breeding (Sharrock, 1976; and Gibbons et al., 1993) atlas census records have been omitted due to the length of time elapsed and landuse changes in the intervening period. Table 4.3 presents a list of species of high conservation concern returned from the relevant NBDC 10km grid square, S49 (Phase 1 of the proposed development).

¹¹ distributed throughout Pairc an Phobail (People’s Park) and which encompass habitats associated with Phase 1 of the proposed development (Atkins, 2018a).

Table 4.3 Breeding and Wintering Bird Atlas Data (10km Grid Square S49)

Common Name	Scientific Name	2007-2011 Breeding Census	2007-2011 Winter Census	Conservation Status and Legal Protection	Habitat Preferences
Hen Harrier	<i>Circus cyaneus</i>	-	✓	Annex I EU Birds Directive; BoCCI red-list; Wildlife Acts	Breeding birds are confined largely to heather moorland and young forestry plantations. Wintering birds are found in coastal and lowland areas throughout Ireland
Northern Lapwing	<i>Vanellus vanellus</i>	-	✓	BoCCI red-list; Wildlife Acts	Widespread distribution, found in major wetlands (including estuarine habitats), pasture, rough grassland and industrial cutaway bogs Will feed and roost in intertidal areas during winter months along the coastline.
Yellowhammer	<i>Emberiza citrinella</i>	✓	✓	BoCCI red-list; Wildlife Acts	Found in hedgerows in association with lands managed for cereal crop production

It should be noted that general casual observations of birds of high conservation concern were submitted to the NBDC (through the on-line data submission form) and are available for the 10 km grid square, S49. The following bird was submitted to NBDC on a casual basis; however, has been omitted from Table 4.3 as the species was not detected during a breeding or wintering atlas census survey: European Golden Plover *Pluvialis apricaria* (Annex I; Birds Directive and BoCCI red-list).

4.1.4 Invasive Species

A search of the NBDC biodiversity maps for invasive alien species (including plants and animals) listed on the 'Third Schedule' of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2015) and species listed as 'high impact' (considered to be more problematic in terms of eradication and spread as opposed to 'medium' or 'low' impact invasive species for example) under the NBDCs 'Invasive Species in Ireland Prioritization Risk Assessment' was carried out for the relevant 10 km grid square (S49) in which all three phases of the proposed development overlap. A list of invasive species generated from the 10 km grid square (S49) are presented in Table 4.4.

Table 4.4 Invasive Species (10km Grid Square S49)

Common Name	Scientific Name	Third Schedule (European Communities (Birds and Natural Habitats) Regulations 2011)	High Impact Invasive Species
Japanese Knotweed	<i>Fallopia japonica</i>	✓	✓
Rhododendron	<i>Rhododendron ponticum</i>	✓	✓
Spanish Bluebell	<i>Hyacinthoides hispanica</i>	✓	-

4.1.5 Hydrology

The proposed development is located within the "Barrow" WFD catchment. The nearest watercourse, River Triogue is located over 70 m – 90 m to the west of Phase 1 of the proposed development. The proposed scheme along phase 1 is buffered from this area by Pairc an Phobail (People's Park) dominated by amenity grassland (GA2) and scattered trees and parkland (WD5). There are no watercourse crossings or wetland habitats located within Phase 1 of the proposed development. Portlaoise town is set on limestone bedrock. The south-east area of the town is underlain by a regionally important karstified aquifer. Páirc an Phobail is situated on a locally important gravel aquifer, which has 'High' groundwater vulnerability. There are no karst features within or adjacent to Páirc an Phobail (People's Park). An artificial pond (approximately 0.8 acres in extent) occurs to the west of the proposed development adjacent to the River Triogue. The inflow for the lake at Páirc an Phobail (People's Park) is fed from the River Triogue. The main channel of the River Triogue runs along the western boundary of Páirc an Phobail (People's Park), from south to north, and thus, the lake is off-line from the main channel of the River Triogue. The outflow of the lake re-joins the River Triogue within Páirc an Phobail. The River Triogue is a tributary of the River Barrow main channel approximately 12.5 km until its confluence with the main channel of the River Barrow. There is no hydrological connectivity or otherwise linking Phase 1 of the proposed development to any surface water features.

4.1.5.1.1 Water Quality

According to datasets available on the EPA's online map portal, the "River Waterbody WFD Status 2010-2015" and the "River Water Quality Status: 2010-2012" categorises the River Triogue as being of "poor status". Datasets relating to "WFD River Waterbody Approved Risk" assigns the River Triogue as being "at risk". Upstream of Portlaoise town, the River Triogue is classified as 'Good' status under the Water Framework Directive (WFD).

4.2 Field Surveys

This section of the report describes the findings of the field surveys carried out within and surrounding the proposed development.

4.2.1 Habitats (Phase 1)

This section of the report provides an inventory and description of the habitats recorded within and immediately surrounding the proposed development for Phase 1 of the proposed development and assigns an ecological value in line with NRA (2009). A habitat map for phase 1 of the scheme is presented in Figure 4. Habitats are denoted by corresponding habitat code in accordance with Fossit (2000). It should be noted that some habitats recorded and classified in the field are too small to map as individual polygons on GIS (as per guidelines issued by Smith et al. 2011); however, all habitats are described in this section of the report. A full species list of plants recorded is presented in Appendix 6. In addition to field surveys carried in March and July 2020, the habitat descriptions are also informed by field surveys conducted by Atkins Engineers on the 21st of June and 8th of August 2018. The habitats described are reflective of site conditions as of July 2020, the most recent optimal period to carry out habitat assessments.

The habitats associated with Phase 1 of the scheme extend from the south circular road near Portlaoise Retail Park to Pairc an Phobail (People's Park), located approximately 400 m to the north-west (refer to Figure 1 and Figure 4). The eastern section of Phase 1 comprises the remnants of an old esker and comprises steep slopes to suggest that that the esker may have been regraded. The mid and western sections largely comprise mixed broadleaved woodland consisting of mature and semi-mature trees dominated by beech *Fagus sylvatica*. An existing worn path used by walkers traverses the entire section of Phase 1 of the proposed development. The habitats recorded within the footprint of the proposed development and surroundings along Phase 1 of the scheme are described in the following paragraphs:

4.2.1.1 Ornamental/non-native shrub (WS3) and scrub (WS1) mosaic

This habitat category includes planting that can be found in formal beds and borders in gardens, parks and other landscaped areas. Ornamental/non-native shrub (WS3) and scrub (WS1) mosaic

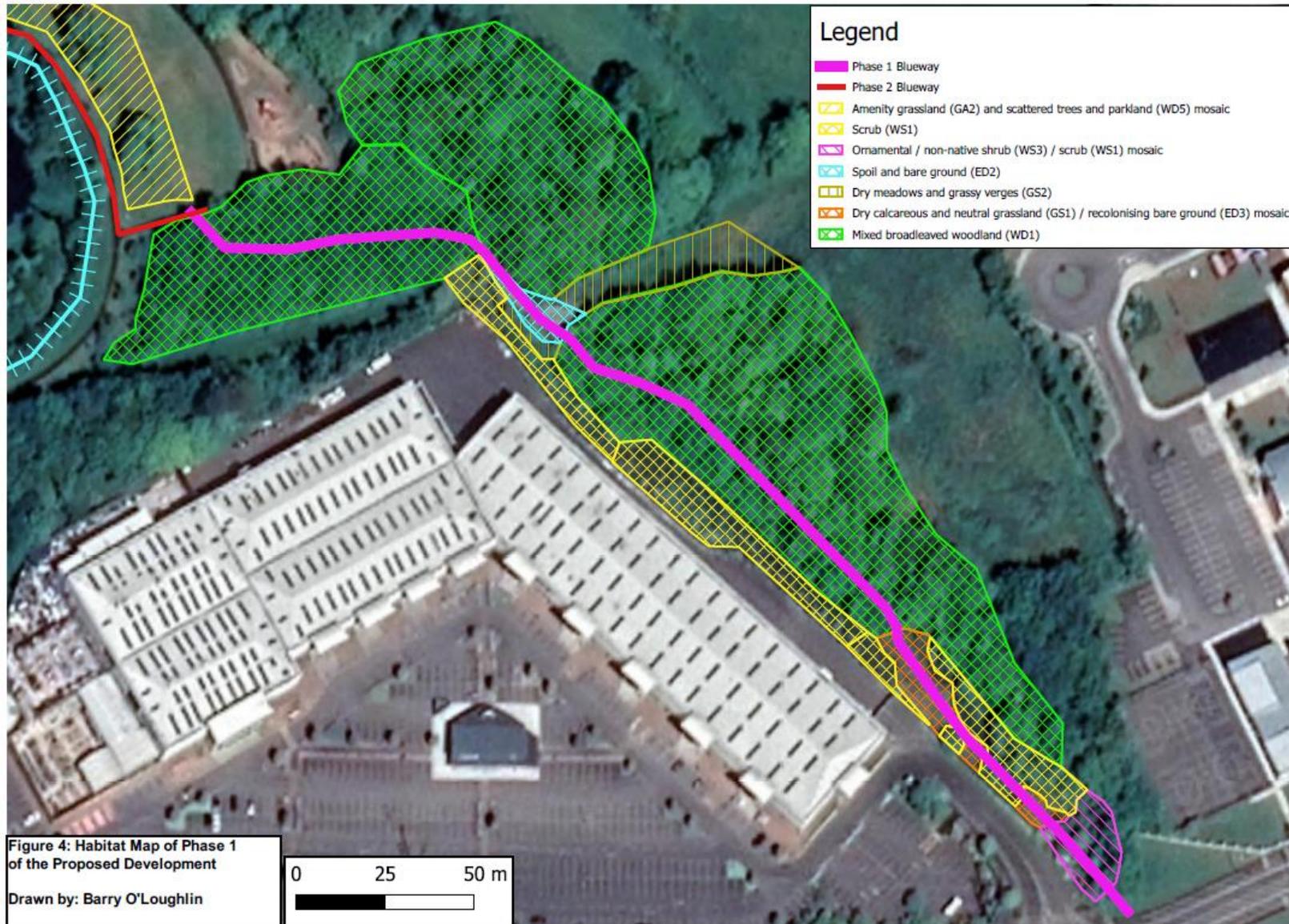


Figure 4 Habitat map of phase 1 of the proposed development

occurs at the eastern section of phase 1 from the south circular road and comprises a landscaped border dominated by non-native shrubs and ornamental garden plants comprising red robin *Photinia fraseri*, golden privet *Ligustrum oval*, ornamental holly "Golden King" *Ilex altaderensis*, Bamboo sp. *Phyllostachys* sp., cherry laurel *Prunus laurocerasus*, and Larch *Larix* sp. recorded in March and July 2020 (refer to Appendix 7; Plate 1 and Figure 4). This area also grades into scrub (WS1) and comprises an abundance of common gorse *Ulex europaeus*. With the exception of scrub (WS1), the habitat has limited potential from a botanical perspective. A worn narrow path traverses approximately 20 m of this habitat. It should be noted that a colony of blue fleabane plants surrounds this area and were recorded in August 2018 and July 2020 on the northern and southern side of the worn path (off the path with some specimens noted within 1 m of the track). This habitat lies outside the Ridge of Portlaoise pNHA. The habitat ranges from local importance; lower value (ornamental/non-native shrub) to local importance; higher value (scrub).

4.2.1.2 Dry calcareous and neutral grassland (GS1) and Recolonising bare ground (ED3) mosaic

The path opens up into an area of dry calcareous and neutral grassland (GS1) and recolonising bare ground (ED3) mosaic (refer to Appendix 7; Plate 2 and Figure 4). The western side of the esker is dominated by common gorse and Japanese rose *Rosa rugosa*. Plant species recorded include bird's-foot trefoil *Lotus corniculatus*, yarrow *Achillea millefolium*, self-heal *Prunella vulgaris*, ox-eye daisy *Leucanthemum vulgare*, red clover *Trifolium pratense*, centaury *Centaureum erythraea*, bush vetch *Vicia sepium*, knapweed *Centaurea nigra*, ribwort plantain *Plantago lanceolata*, common Knapweed *Centaurea nigra*, cat's-ear *Hypochoeris radicata*, colt's-foot *Tussilago farfara*, perforate St. John's-wort *Hypericum perforatum*, fairy flax *Linum catharticum*, ivy *Hedera helix*, common ragwort *Jacobaea vulgaris*, pignut *conopodium majus*, spear thistle *Cirsium vulgare* and field horsetail *Equisetum arvense*. There was some encroachment of bramble *Rubus fruticosus* agg., downy birch *Betula pubescens* and beech *Fagus sylvatica* saplings, common gorse, ivy, herb robert *Geranium robertianum* and common nettle *Urtica dioica*. A single bee orchid *Orphys apifera* was recorded in June 2018 and pyramidal orchids *Anacamptis pyramidalis* (five orchids in total in 2018 and two orchids (flowering plants) were recorded in July 2020). Bee orchid was not recorded during surveys conducted in July 2020 (possibly no longer in flower). A worn path (footprint of the proposed cycleway) traverses approximately 70m of this habitat type. A colony of blue fleabane (>50 plants) was recorded in this area and surroundings in August 2018 (Atkins, 2018b). There were some records confirmed in July 2020; however, it is considered that the survey was early and not all plants were readily identifiable in the field. Blue fleabane is listed as "Least Concern" under Ireland's most recent red list for vascular plants (Wyse Jackson et al., 2016). Scrub in the form of common gorse, bramble, Japanese rose and immature birch is encroaching and establishing at this location. Graminoids have taken over areas that were previously devoid of vegetation towards the eastern section of this habitat. The habitat onsite is highly modified and does not conform to any Annex I habitat listed on the EU Habitats Directive. Due to the diversity of plant species recorded, this habitat is considered to be of local importance; higher value. This habitat partially lies within the Ridge of Portlaoise pNHA. Given the presence of this habitat within a pNHA, the overall site integrity is considered to be of national importance.

4.2.1.3 Mixed broadleaved woodland (WD1)

This general category includes woodland areas with 75-100% cover of broadleaved trees, and 0-25% cover of conifers. Phase 1 of the scheme uses an existing worn path through approximately 125 m of this habitat (refer to Appendix 7; Plate 3 and Plate 4 and Figure 4). The eastern side of the esker grades steeply (embankment) to an area of mixed broadleaved woodland comprising mature trees. The woodland canopy comprises mixed broadleaved tree stands dominated by mature beech with some occasional mature stands of scots pine *Pinus sylvestris* that corresponds to mixed broadleaved woodland (WD1). Tree stands attain heights of approximately 25 m. Other occasional trees recorded include hazel *Corylus avellana*, ash *Fraxinus excelsior*, elder *Sambucus nigra*, holly *Ilex aquifolium* and Hawthorn *Crataegus monogyna*. Aspen *Populus tremula*, willow *Salix* sp. and sweet chestnut *Castanea sativa* were rare. The existing laneway, known as "Down's Lane" (approximately 1-2 wide) bisects the woodland where several windblown/fallen trees (predominantly beech) traverse the existing laneway. The laneway conforms to the habitat, spoil and bare ground (ED2). The eastern side of the woodland track comprises a gradual slope. The shrub and ground layer is dominated by woodland plants comprising ivy, Atlantic ivy *Hedera hibernica*, bluebell *Hyanthoides non-scripta*, sanicle *Sanicula europaea*, meadow sweet *Filipendula ulmaria*, cleavers *Galium aparine*, herb Robert, bramble,

honeysuckle *Lonicera periclymenum*, lords-and-ladies *Arum maculatum*, daffodil sp. *Narcissus* sp., lesser cellandine *Ranunculus ficaria*, hart's-tongue fern *Asplenium scolopendrium*, hard fern *Blechnum spicant*, and common dog-violet *Viola riviniana*. Wild angelica *Angelica sylvestris* is present in sections where the woodland canopy opens up. There is evidence of anti-social behaviour such as dumping and burning of rubbish; and graffiti recorded at locations within the woodland (southern side of path).

There will likely be a requirement for some minor felling of trees (largely comprising beech) that are unsafe in the woodlands area, the extent of this cannot be fully confirmed at this time until an arborist assesses the condition of the existing windblown/ dead trees to ascertain their stability. Tree felling will be required to facilitate the construction of the cycle track at a localised section where the proposed development footprint deviates off Down's Lane at the northern section of the woodland (see Figure 1, Figure 2 and Appendix 7; Plate 4). The woodland also supports a large rookery. The habitat recorded onsite does not correspond to any Annex I habitat under the EU Habitats Directive. The habitat recorded onsite is of local importance; higher value; however, as the proposed development associated with Down's Lane lies entirely within the Ridge of Portlaoise pNHA, the overall site integrity is considered to be of national importance.

4.2.1.4 Spoil and bare ground (ED2), Recolonising bare ground (ED3), Dry meadows and grassy verges (GS2) and Mixed broadleaved woodland (WD1)

Emerging from the woodland, the laneway merges onto an existing gravel track (spoil and bare ground (ED2)) surrounded by dry meadows and grassy verges (GS2) and recolonising bare ground (ED3) (refer to Figure 4 and Appendix 7; Plate 5) comprising roadside plants such as ox-eye daisy, yarrow, Yorkshire fog *Holcus lanatus*, field scabious *Knautia arvensis*, pignut, cock's foot *Dactylis glomerata* and ribwort plantain. The proposed scheme continues along the gravel track for approximately 40 m before deviating off the gravel track. The proposed scheme exits the gravel track onto a worn pathway (used by members of the public) that traverses a small section of mixed broadleaved woodland (refer to Appendix 7; Plate 6) (adjacent to Pairc an Phobail (People's Park)) comprising semi-mature stands of beech and hazel for approximately 70 m where Phase 1 of the scheme links to the existing footway and ends at the "Peoples Public Park (Páirc an Phobail)". The semi-mature woodland at this section of the scheme is located outside the Ridge of Portlaoise pNHA and there will be a requirement to fell some semi-mature trees comprising beech and hazel to facilitate widening of the proposed cycle track, the extent of this cannot be fully confirmed at this time until an arborist assesses the condition of the existing windblown/ dead trees to ascertain their stability. Sessile oak *Quercus petraea* occurs in the wider surroundings. The mixed broadleaved woodland described in this section is of local importance; higher value. The habitats spoil and bare ground (ED2), Recolonising bare ground (ED3), Dry meadows and grassy verges (GS2) are considered to be of local importance; lower value.

4.2.1.5 Scrub (WS1)

This habitat surrounds the proposed development along the eastern section of Phase 1. The dominant species recorded comprised of common gorse *Ulex europaeus* and bramble *Rubus fruticosus* agg. Scattered stands of immature birch were occasionally recorded intermixed with common gorse. Scrub has started to encroach from the margins into areas of Dry calcareous and neutral grassland (GS1) / recolonising bare ground (ED3) mosaic. The habitat onsite ranges from local importance; lower value to local importance; higher value.

4.2.2 Invasive Species

There were no invasive species listed on the "Third Schedule" under Regulation 49 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2015) recorded along phase 1 of the scheme.

Cherry Laurel was the only high impact invasive species recorded during field surveys. Cherry laurel was recorded beside the south circular road at phase 1 (refer to Figure 5) in an area of Ornamental/non-native shrub (WS3). There were stands of cherry laurel recorded within the footprint of the proposed development (refer to Figure 5). Cherry laurel is considered to be problematic at the local scale.

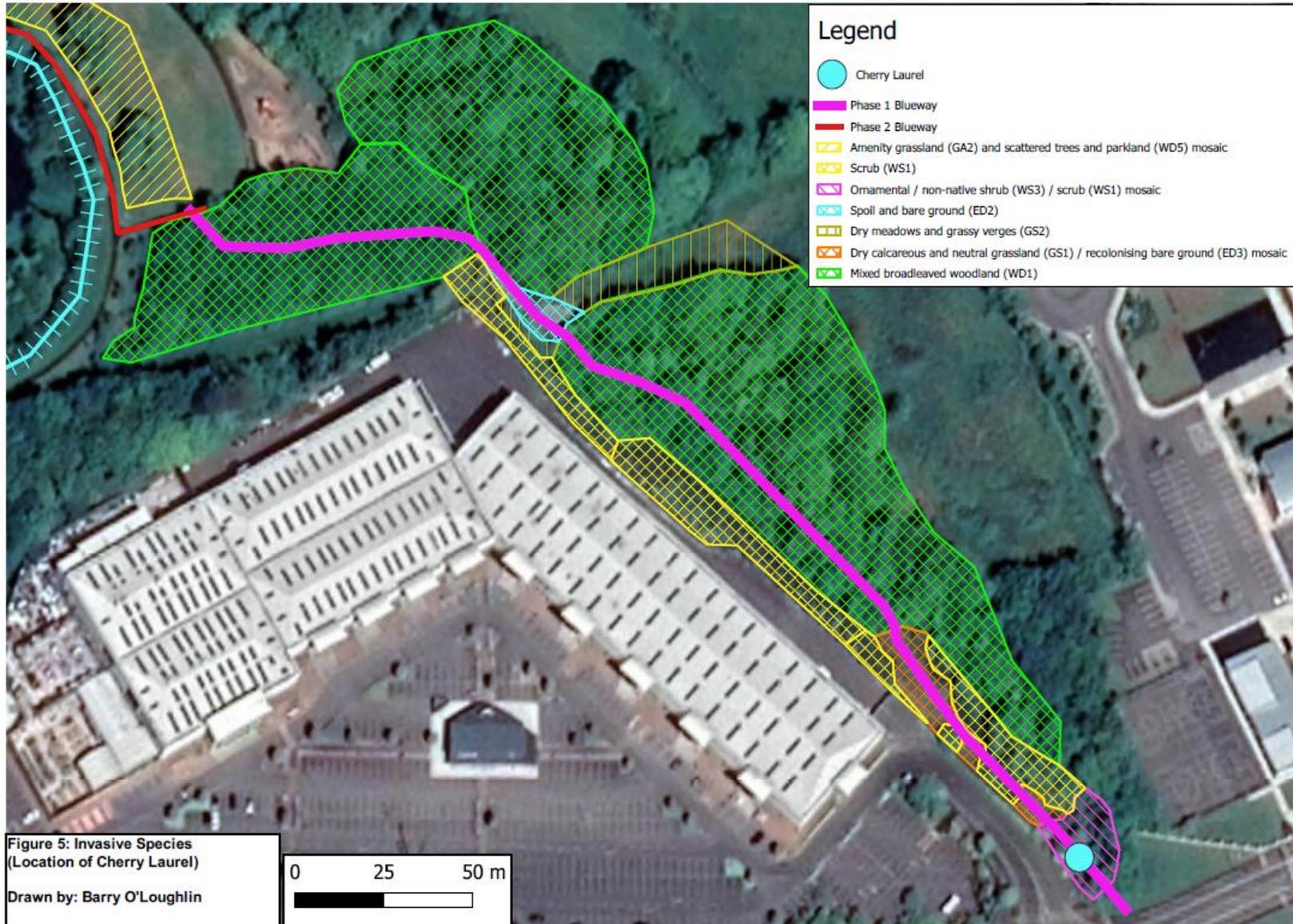


Figure 5 Invasive species (location of Cherry Laurel)

4.2.3 Protected flora and plant species of conservation concern

No protected plants listed under the Flora Protection Order were identified within the proposed development site or surrounding environs. Plants of 'Least Concern' on the Irish Red List (Wyse Jackson et al., 2016) were only recorded along Phase 1 of the scheme near the south circular road in habitats comprising dry calcareous and neutral grassland (GS1) / recolonising bare ground (ED3) mosaic. As defined by Wyse Jackson et al., (2016), a taxon is of 'Least Concern' when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened status. Plants of 'Least Concern' recorded during field surveys in July 2020 and June and August 2018 (Atkins field visits) are presented in Table 4.5.

Table 4.5 Notable plant species recorded within and adjacent to the proposed development

Common Name	Scientific Name	Description and distribution within the site	Red Listed Status	Protected under FPO
Blue Fleabane	<i>Erigeron acer</i>	Blue fleabane was recorded at Phase 1 (refer to Figure 6; Appendix 7; Plate 7) located to the north of the south circular road in habitats comprising dry calcareous and neutral grassland (GS1) and Recolonising bare ground (ED3) in July 2020 and August 2018. In August, 2018 two plants were recorded in a small area of open ground along the pathway immediately north of the south ring road (within proximity to ornamental shrubs). The plants were recorded within 1 m of the track (located north and south of track). Moving west, the vegetation cover open up and comprises dry calcareous and neutral grassland (GS1) and Recolonising bare ground (ED3). This area supported a high abundance of blue fleabane on either side of the path. The majority of plants were located just off the path in areas characterised by low and open vegetation (ca. 50 plants were noted in August 2018) (refer to Figure 6). The presence of blue fleabane was confirmed during surveys conducted in July 2020, albeit the numbers of flowering plants were low in comparison and it is considered that not all species present were readily identifiable at the time of survey (mid-July) and plants are considered to be immature at this time.	Least Concern	No
Pyramidal Orchid	<i>Anacamptis pyramidalis</i>	Phase 1 (refer to Figure 6 and Appendix 7; Plate 8) located in an area of Dry calcareous and neutral grassland (GS1) / recolonising bare ground (ED3) mosaic. Two flowering stems were recorded approximately 2-3m north of the proposed cycle track in July 2020. Five flowering stems were previously recorded in 2018.	Least Concern	No
Bee Orchid	<i>Ophrys apifera</i>	A single bee orchid was recorded at Phase 1 in June 2018 at the eastern section in habitats comprising dry calcareous and neutral grassland (GS1) and Recolonising bare ground (ED3). Bee orchid was not recorded during surveys conducted in July 2020 (possibly no longer in flower at the time of surveys in mid-July).	Least Concern	No

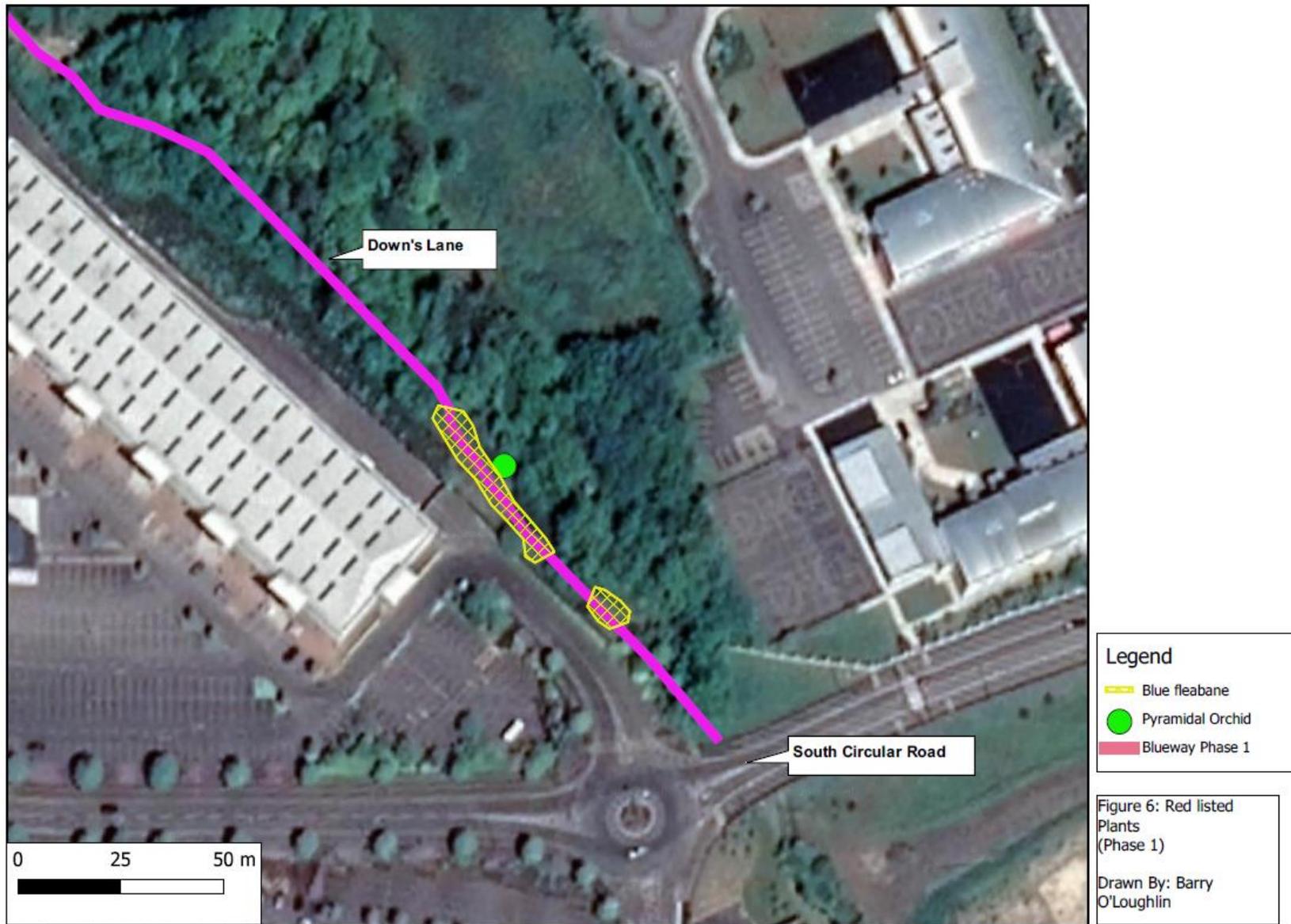


Figure 6 Red listed plants (Phase 1)

4.2.4 Bats

The Wildlife Act, 1976 and the Wildlife (Amendment) Act, 2000 are collectively known as the 'Wildlife Acts'. All bats in Ireland are afforded protection under the Wildlife Acts, which make it an offence to injure bats (or their young), or to wilfully interfere with or disturb bat breeding or resting places. The results of the field surveys carried out for bats are described in this section of the report with full details of the survey findings presented in the Bat Survey Technical Report in Appendix 3.

4.2.4.1 Preliminary Roost Assessment Survey

The results of the PRA are detailed in Table 1 and Figure 1 of the Bat Survey Technical Report. Of the trees surveyed, only one tree had suitable features for roosting bats (mature horse-chestnut considered to be of moderate suitability and located outside of the footprint of the proposed development). In addition, four bat boxes were observed in Pairc an Phobail (People's Park) (refer to Figure 2 of the Bat Survey Technical Report (Appendix 3)). There were no obvious signs of use by bats noted during the PRA for phase 1 of the scheme.

4.2.4.2 Bat Activity Survey

Phase 1

A single bat species, common pipistrelle *Pipistrellus pipistrellus* was identified during the survey.

The transect commenced along Phase 1 of the scheme at sunset and returned through this section 50 minutes after sunset. No bats were recorded at sunset, while later in the evening common pipistrelle was recorded foraging along the pathway between Pairc an Phobail (People's Park) (Phase 2) and the Ridge of Portlaoise pNHA (Phase 1 section), and another at the beginning of the transect on the edge of Portlaoise Retail park adjacent to Phase 1 (refer to Figure 2 of the Bat Survey Technical Report; Appendix 3).

4.2.5 Non-volant mammals

There was no evidence of badger setts, latrines or tracks in areas of suitable habitat identified within 50 to 150 m of the scheme (ZoI defined by NRA, 2006). Suitable foraging habitat such as mixed broadleaved woodland and scrub occurs adjacent to the proposed development along phase 1 of the proposed development. In addition, territories of mammals susceptible to development in general such as pine marten dens were not observed. There was no evidence of otter including resting places, natal dens/holts or couches during the course of field surveys. In addition, no paths, slides or spraints were observed within 50 to 150 m of the scheme (Phase 1) (ZoI defined by NRA, 2006a). The habitats associated with Phase 1 are largely unsuitable for otter with no natural corridors in the form of natural watercourses linking the species to the proposed development site. Otter are likely to use stretches of the River Triogue for commuting and foraging purposes given the presence of suitable habitat adjacent to the proposed development (i.e. River Triogue) and are considered to be restricted along Phase 2 of the scheme (subject to separate EcIA (CAAS, 2020c)).

Other protected mammals such as the western European hedgehog and Eurasian pygmy shrew are considered present given the presence of suitable habitat adjacent to the track (e.g. treelines, mixed broadleaved woodland, scrub). The Wildlife Acts provide protection to mammal species not protected by the Habitats Directive (e.g. badger, hedgehog, pygmy shrew). These species are protected from intentional killing or injury. The breeding or resting sites of all these species are also protected from wilful disturbance.

4.2.6 Birds

Incidental records of birds were recorded during walkover surveys in March and July 2020. The following birds were recorded along the proposed scheme:

Phase 1: Green listed bird species (low conservation concern (Colhoun and Cummins, 2013)) such as wren *Troglodytes troglodytes*, chaffinch *Fringilla coelebs*, blackbird *Turdus merula*, wood pigeon *Columba palumbus* and the amber-listed robin *Erithacus rubecula* (medium conservation concern) were recorded in habitats comprising mixed broadleaved woodland and scrub. It should be noted that a large rookery was recorded in the mature woodland (mixed broadleaved woodland) recorded at Down's Lane. Rooks *Corvus frugilegus* were recorded in large numbers during bat surveys conducted on the night of the 31st of July/1st of August 2020. This has also been corroborated by the Irish Wildlife Trust (Laois-Offaly) branch in their consultation response (refer to Section 3.3.1).

No other birds of high conservation concern (i.e. BoCCI red-list and Annex I; EU Birds Directive) such as hen harrier, northern lapwing, yellowhammer and golden plover were observed onsite. The habitats of the proposed development surrounding the urban environs of Portlaoise are unsuitable for the aforementioned species breeding, roosting and feeding requirements. Overall, the number of birds of conservation concern recorded on the site was found to be low. Habitat homogeneity appears to be an important factor in the recorded species abundance and diversity within the site. The level of bird activity recorded at the site is consistent with what would be expected from the habitats on the site for this particular time of year (spring and summer months).

4.2.7 Amphibians and Reptiles

There was no suitable habitat such as ponds, lakes, rivers (riparian and aquatic zones) or other wetlands identified along phase 1 of the scheme. Therefore, amphibians and reptiles are considered to be absent from the proposed development site on this basis.

4.2.8 Invertebrates

No butterflies, bees, or other conspicuous invertebrates of high conservation concern (i.e. Annex II; EU Habitats Directive; Red List Species, etc.) were recorded along the proposed development. Incidental records of butterflies such as ringlet, common blue and peacock were recorded during field surveys in July 2020. There were no records of Grayling within the Ridge of Portlaoise pNHA.

4.3 Summary evaluation of ecological features/receptors (sensitivity of ecological features/receptors)

As per the impact assessment methodology outlined in Section 3.5, significant ecological features (or KER) are considered to be those valued at 'Local Importance (Higher Value)' or higher as per TII (2009) criteria. Ecological features valued at Local Importance (Lower Value) or of negligible value are not considered features and are not carried forward for impact assessment. Table 4.6 summarises all ecological features identified within the ZoI of proposed development and provides a rationale for ecological features/receptors 'scoped in' or 'scoped out' on the basis of scientific data collated in the field and a review of published literature sources.

Table 4.6 Summary Evaluation of all Significant Ecological Features Identified within the ZoI of the Proposed Development (Phase 1)

Ecological Category	Ecological Feature/Receptor	Ecological Evaluation	Potential Risk for Significant Impact	Scoped In/Scoped Out for Impact Assessment
Designated Sites	<u>Nationally Important Sites (i.e. NHA and pNHA):</u> - Ridge of Portlaoise pNHA	National Importance	Yes – The proposed development footprint overlaps the pNHA (refer to Figure 2). Potential exists for disturbance and loss of habitats and flora in adjoining areas	Scoped In
Habitats and Flora (within development footprint)	- Ornamental/non-native shrub (WS5) and scrub (WS1) mosaic	Local Importance; Lower Value	Yes – habitats of Local Importance; Higher Value and national importance. Potential impacts associated habitat loss, disturbance (i.e. artificial light and noise), habitat deterioration (i.e. introduction and/or spread of invasive species).	Scoped In – habitats of Local Importance; Higher Value to National Importance.
	- Dry calcareous neutral grassland (GS1) and recolonising bare ground (ED3) mosaic	Local Importance; Higher Value to National Importance (partially overlaps Ridge of Portlaoise pNHA)		
	- Mixed broadleaved woodland (WD1)	Local Importance; Higher Value to National Importance (partially overlaps Ridge of Portlaoise pNHA)		
	- Spoil and bare ground (ED2)	Local Importance; Lower Value		
	- Rare flora (red list species i.e. blue fleabane, pyramidal orchid)	Local Importance; higher Value	Yes – potential for loss of red list plant species identified as 'Least Concern'; however, are nonetheless important for maintaining the overall ecological integrity of the Ridge of Portlaoise pNHA	Scoped In
Fauna	- Otter	Local Importance; Higher Value	No – no records of breeding territories or signs such as holts/natal dens, couches, spraints identified during field surveys. No natural watercourses within or in the immediate surrounding environs of phase 1 of the scheme.	Scoped Out
	- Badger	Local Importance; Higher Value	Yes – suitable habitat occurs in the form of mixed broadleaved woodland and scrub. Potential impacts associated with disturbance and habitat loss (applying the precautionary principle)	Scoped In
	- Pygmy shrew, hedgehog (refer to findings of desktop study for non-volant mammals)	Local Importance; Higher Value	Yes – potential impacts associated with habitat loss and disturbance (applying the precautionary principle)	Scoped In
	- Bats (Annex IV species; EU Habitats Directive) – foraging, roosting and commuting populations)	Local Importance; Higher Value	Yes – Potential impacts associated with habitat loss and disturbance (i.e. noise, artificial light, construction personnel).	Scoped In
	- Birds: Nesting bird assemblage (red, amber and green listed species of conservation concern species). Presence of rookery at Down's Lane within area of mixed broadleaved woodland.	Local Importance; Higher Value	Yes – Potential impacts associated with habitat loss and disturbance (i.e. noise, artificial light, construction personnel).	Scoped In

Ecological Category	Ecological Feature/Receptor	Ecological Evaluation	Potential Risk for Significant Impact	Scoped In/Scoped Out for Impact Assessment
	- Invertebrates presumed to be associated with vegetated areas	Local Importance (Lower Value)	No – Proposed works are small in scale and largely confined to existing tracks and habitats of local importance; lower value	Scoped Out
	- Amphibians	Local Importance; Higher Value	No – absence of suitable habitat along phase 1 of the scheme.	Scoped Out

Section 5 Assessment of Impacts

This section should be read in conjunction with the impact assessment methodology in Section 3.5 which defines the categories adopted in this report to characterise duration and significance of impacts, etc. in line with NRA, (2009) and CIEEM (2018). These guidelines set out the context for the determination of value on a geographic basis with a hierarchy assigned in relation to the importance of ecological features/receptors. The assessment of impacts outlined in this section has carried out in the absence of mitigation measures in line with guidelines issued by CIEEM (2018). Mitigation measures may need to be applied on consideration of the results of the impact assessment. All mitigation measures are detailed in Section 6.

5.1 Do Nothing Scenario

The footprint of Phase 1 of the proposed development is largely restricted to habitats comprising existing laneways and worn paths within habitats comprising mixed broadleaved woodland (WD1), dry calcareous neutral grassland (GS1) / recolonising bare ground (ED3) mosaic, ornamental/non-native shrub (WS5) and scrub (WS1) mosaic and spoil and bare ground (ED2). If the proposed development does not go ahead, it is to be assumed that the character of the landscape and its landuse will remain much as it is at present. The existing habitats on the site will remain unaltered; however, this is dependent on the continuation of the current habitat management regime. Natural colonisation and succession of woodland and scrub from open habitat in the eastern section of Phase 1 is considered to be a likely scenario and the site continued to be left largely abandoned. It is considered that the area of mixed broadleaved woodland at Down's Lane will continue to be used by occasional walkers and for anti-social behaviour (e.g. dumping and burning of rubbish).

5.2 Types of Impacts

The proposed development could have a range of potential impacts (direct and/or indirect) upon significant ecological features during the construction and operational phases of the proposed development. Direct impacts occur where the changes to an ecological feature are directly attributable to an action associated with the proposed development, such as habitat loss. Indirect impacts usually arise as a knock-on effect of a proposed development and would include aspects such as light spill associated with artificial lighting on woodland habitat and disturbance associated with noise from construction works that could result in species becoming displaced from nearby habitats.

In the absence of mitigation, the proposed development works could have a range of potential effects on ecological features/receptors within the ZoI. Significant effects associated with the proposed works could include habitat loss and degradation, habitat fragmentation, disturbance and displacement (i.e. visual, vibration and noise; visual presence of machinery and site personnel; and artificial light), loss of rare flora and habitat deterioration (i.e. introduction and/or dispersal of scheduled and high impact invasive species).

A range of factors influence the potential significance of impacts including vulnerability of individual receptors (e.g. condition of habitats, national population trends, etc.) time of year (seasonal factors), lifecycle stage of a species impacted, introduction and/or dispersal of invasive species. In the absence of mitigation measures, construction and operational phase impacts associated with Phase 1 of the scheme has the potential to disturb a range of habitats and protected species throughout the duration of the project. The following potential impacts on ecological features/receptors are summarised below:

- Habitat loss and fragmentation
- Potential disturbance to breeding birds: the effect of disturbance on breeding birds

- Potential Disturbance to mammals (e.g. badger, hedgehog, bats): the effect of disturbance on mammals concentrated at phase 1 of the proposed development
- Invasive Species: the potential for the introduction and spread of invasive species
- Loss of rare flora: the potential loss of flora such as red listed species of 'Least Concern' (e.g. blue fleabane)

5.2.1 Description of individual elements of the proposed development with potential to give rise to effects

The construction and operational phases of the proposed development has the potential to give rise to significant effects on ecological features/receptors. As detailed in Section 2.3, the proposed development involves the construction of a cycle track and associated site works. Elements of the project that could give rise to potential significant effects include:

Phase 1

- Remove any windblown / dead trees from the access lane;
- Fell trees that are unsafe in the woodland area (subject to arborist assessment of the condition of the existing windblown/ dead trees to ascertain tree stability);
- Embankment works in the most easterly section of the scheme (South Circular Road has a manmade embankment composed of glacial tills);
- Import granular fill to create 100mm deep formation layer for the proposed cycle lane;
- Construct 40mm depth AC20 (asphalt concrete) Dense bitumen macadam with a final 20mm deep wearing course of 10mm AC closed surface macadam (to a proposed width of 3.0m);
- Install line marking to delineate walking and cyclist areas; and,
- Install ducting and appropriate public lighting.

5.3 Sensitivity of the environment

As per criteria for evaluation of habitats (CIEEM, 2018 and NRA, 2009) and outlined in Appendix 4, all ecological receptors identified within the site range from local importance to national importance (refer to Table 4.6). Phase 1 of the proposed development largely occurs within the Ridge of Portlaoise pNHA, which is considered to be of national importance.

5.4 Effects on designated sites

The proposed development lies outside sites that are statutorily designated for nature conservation (e.g. SACs, SPAs, NHAs). Phase 1 of the scheme overlaps the Ridge of Portlaoise pNHA which is designated on a non-statutory basis. At the time of its proposal for an NHA, the site was of conservation importance for two rare plants, nettle-leaved bellflower (formerly listed on Flora Protection Order 1987 (S.I. No. 274/1987), which was removed from the Flora (Protection) Order 1999 (S.I. No. 94/1999) and its status has remained unchanged in the most recent Flora (Protection) Order 2015 (S.I. No. 356/2015)) and blue fleabane. Nettle-leaved bellflower and blue fleabane were both listed as "Vulnerable" in Ireland's previous red data book list of vascular plants (Curtis and McGough, 1988) but have since been removed and are now classified as "Least Concern" (Wyse Jackson et al., 2016).

There are no designated European sites identified within the ZoI of phase 1 of the scheme due to an absence of pathways to result in significant effects on European sites (i.e. absence of hydrological pathways, proposed development outside the core range for mobile species associated with SPAs and SACs in the wider surroundings and absence of suitable supporting habitat). A standalone AA Screening report (AECOM, 2020a) has been prepared to provide the competent authority with the necessary information to complete an Appropriate Assessment for phase 1 of proposed development in compliance with Article 6(3) of the Habitats Directive. As

part of this assessment, the potential for the proposed development to have a significant effect on any European sites was considered. Screening for the AA concluded:

“Through an assessment of the pathways for effects and an evaluation of the project characteristics, there is no likelihood of significant effects on the qualifying interests, special conservation interest or the conservation objectives of any designated European site. In view of best scientific knowledge and on the basis of objective information, it is concluded that Phase 1 of the scheme, whether individually or in combination with other plans or projects, beyond reasonable scientific doubt will not have significant effects on European sites identified during the AA Screening process. There is therefore no requirement to proceed to Stage 2, Appropriate Assessment. In summary, there is no potential for significant effect as a result of the proposed works on the conservation objectives or overall integrity of the River Barrow and River Nore SAC and the Slieve Bloom Mountains SPA or any European site”.

5.4.1 Potential impacts on key ecological features/receptors of designated sites

In relation to assessment of impacts on designated sites, CIEEM (2018) guidance states:

“Consideration of functions and processes acting outside the formal boundary of a designated site is required, particularly where a site falls within a wider ecosystem”. The following potential sources of impacts to result in effects on ecological features are described in the following paragraphs.

5.4.1.1 Ridge of Portlaoise pNHA

Potential impacts and resultant effects on the Ridge of Portlaoise pNHA are assessed in Section 5.5.

5.5 Effects on Habitats and Flora (Local and National Context)

5.5.1 Habitats and Flora (Local and National Context)

Permanent localised loss of ornamental non-native shrub (WS3)/scrub (WS1) mosaic, dry calcareous and neutral grassland (GS1) / recolonising bare ground (ED3) mosaic, mixed broadleaved woodland (WD1), spoil and bare ground (ED2) is predicted along phase 1 of the scheme. Some of these habitats occur within the Ridge of Portlaoise pNHA. Table 5.1 presents the respective habitat loss associated with the proposed development.

Table 5.1 Predicted habitat Loss associated with the proposed development along phase 1 of the scheme

Habitat	Indicative Area (ha) of Habitat Loss by the Proposed Development	Proposed Scale of Impact Significance
Ornamental/non-native shrub (WS3) and scrub (WS1) mosaic	<1 ha	Permanent direct negative effect predicted to be significant at the local geographic scale
Dry calcareous and neutral grassland (GS1) / recolonising bare ground (ED3) mosaic (partially located within pNHA)	<1 ha	Permanent direct negative effect predicted to be significant at the local to national geographic scale
Mixed broadleaved woodland (WD1) (located within pNHA)	<1 ha	Permanent direct negative effect predicted to be significant at the national geographic scale
Spoil and bare ground (ED2) and Mixed broadleaved woodland (WD1)	<1 ha	Permanent direct negative effect predicted to be significant at the local geographic scale

The degree of effect in relation to habitat loss, in the absence of mitigation is assessed as a likely permanent, direct, negative effect predicted to be significant ranging from the local scale to the national scale. Where habitats overlap the Ridge of Portlaoise pNHA, the effect is considered to

be significant at the national geographic scale whereas habitats located outside the pNHA are considered to be significant at the local scale. The proposed works along Phase 1 are largely confined to existing laneways and paths. Habitat loss in this regard is not considered to be significant. There are no Annex I habitats listed on the EU Habitats Directive present along phase 1 of the scheme. There will be a loss of marginal habitat adjacent to paths and laneways such as ornamental/non-native shrub (WS3)/scrub (WS1) mosaic, dry calcareous and neutral grassland (GS1) / recolonising bare ground (ED3) mosaic, mixed broadleaved woodland (WD1) and spoil and bare ground (ED2) associated with construction of the proposed cycle track.

The proposed works will require some minor felling of trees (predominantly beech) in localised areas in line with health and safety requirements and where the proposed route deviates through a small section of mixed broadleaved woodland off Down's Lane (located within pNHA) (refer to Figure 2) and possible minor felling associated with works on the embankment. In addition, there will be some minor tree felling of beech and hazel adjacent to an existing worn path at the section of mixed broadleaved woodland adjacent to Páirc an Phobail (People's Park) (outside of Ridge of Portlaoise pNHA and assessed as local importance; higher value – refer to Figure 2).

Records of the red listed plant species, blue fleabane was recorded within a section of Dry calcareous and neutral grassland (GS1) / recolonising bare ground (ED3) mosaic located in the eastern section of Phase 1 of the scheme. Potential impacts in relation to loss of rare flora (red listed plant species are further assessed in Section 5.5.3). Taking into consideration the nature, scale and footprint of the proposed development, the overall magnitude of habitat loss is considered to be low. All peripheral vegetation will be retained as much as possible. With respect to habitat loss, mitigation has been prescribed (refer to Section 6) to offset negative effects associated with potential tree felling along Phase 1 of the scheme.

5.5.2 Habitat Fragmentation

Taking into consideration the footprint of the proposed works along existing paths and laneways, effects in relation to habitat fragmentation are not considered to be significant. The paths and laneway are used by walkers and members of the public and the footprint of the proposed works is largely restricted to areas of spoil and bare ground (ED2). Fragmentation of habitats is not considered to be significant. However, there are areas which will result in some minor fragmentation where tree felling is required in a localised section of mixed broadleaved woodland off Down's Lane (within pNHA) (refer to Figure 2) and this is considered to be a permanent, direct negative effect on ecological features ranging from the local to the national geographic scale. Potential indirect effects on bats, birds and mammals associated with artificial lighting to disrupt flight paths and foraging patterns is assessed in Section 5.6.2 and addressed in Section 6. Mitigation will be required with regard to artificial lighting and potential habitat fragmentation on foraging and commuting bat populations (refer to Section 6).

5.5.3 Loss of Rare Flora

There will be no loss of, or significant effects on any protected plants (e.g. Flora Protection Order). Vascular red data book plants including blue fleabane, pyramidal orchid (and historical record of bee orchid) recorded in the eastern section of phase 1 of the proposed development comprised species categorised as "Least Concern" on the Irish Red List (Wyse Jackson et al., 2016). As defined by Wyse Jackson et al., (2006), a taxon is of 'Least Concern' when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. There were no records of pyramidal orchid or bee orchid within the footprint of the proposed development (recorded within 2-3 m of the proposed cycle track). Both species are evaluated as being of local importance; higher value. It should be noted that potential for impact exists associated with side casting and stockpiling of excavated material which could result in smothering of vegetation in adjoining areas and loss of plant species. While pyramidal orchid and bee orchid have been classified as "Least Concern", both plants add to the local diversity of the site and Portlaoise town. The degree of effect in relation to loss of pyramidal orchid and potentially bee orchid, in the absence of mitigation is assessed as a likely permanent, indirect, negative effect predicted to be significant at the local scale.

Similarly, blue fleabane has been classed as "least concern". The conservation importance of blue fleabane has been downgraded from "Vulnerable" (Curtis and McGough, 1988) to "Least

Concern" (Wyse Jackson et al., 2016) on the Irish red list. The species is not listed for protection under the Flora Protection Order; however, as the plant species is one of the primary conservation interests of the Ridge of Portlaoise pNHA, the species has been evaluated as being of local importance; higher value and is important in maintaining the overall ecological integrity of the pNHA. Populations of this species are considered likely to be directly affected during the construction phase of the development. Up to 50 individual plants were recorded during previous field surveys (Atkins, 2018b); however, the majority of plant species were recorded off the existing grass track (footprint of the proposed development). Indirect effects such as side casting and stockpiling of excavated material has the potential to result in further losses of the plant species during construction works. The degree of effect in relation to loss of blue fleabane (in the absence of mitigation) is assessed as a likely permanent, direct and indirect negative effect predicted to be significant at the local scale. Applying best practice, mitigation in Section 6 has been prescribed to safeguard populations of red listed plant species listed on Ireland's red list (Wyse Jackson et al., 2016).

5.5.4 Invasive Species

In the absence of mitigation measures and appropriate biosecurity control measures, there is the potential for the introduction of scheduled invasive species (e.g. Japanese knotweed within the site). Furthermore, the high impact invasive species, cherry laurel was recorded at the far eastern section of phase 1 (adjacent to south circular road; refer to Figure 5) and will result in direct disturbance as a result of the construction of the proposed development. There is potential for the proposed development to result in the dispersal of this species to other areas of the site or beyond including the adjacent Ridge of Portlaoise pNHA. Dispersal is possible where tyre treads or other construction related machinery and personnel act as a vector during construction works. This impact within phase 1 of the scheme is assessed as a long-term, direct, negative effect on ecological receptors at the local and national geographic scale. Therefore, mitigation has been prescribed in Section 6 to address this potential impact.

5.6 Effects on Fauna

5.6.1 Bats - Loss/Disturbance Features with Suitability for Roosting

No trees with bat roost suitability were found along phase 1 of the scheme. The trees identified at the section of mixed broadleaved woodland at Down's Lane and adjacent to Páirc an Phobail (People's Park) subject to some localised felling did not comprise any suitable bat roost features (e.g. cracks, crevices). No significant impacts on bat roost habitat are anticipated. The preliminary roost assessment survey identified a single mature horse-chestnut tree with low suitability for roosting bats. This structure is located to the west of phase 1 of the scheme and is outside the proposed development footprint, consequently no felling is required (refer to Appendix 3). The loss of bat roost habitat in this regard is deemed to be insignificant. There are, however, bat boxes installed on trees within the area of mixed broadleaved woodland adjacent to Páirc an Phobail (refer to Figure 3) and potential tree felling could result in disturbance of bat boxes and loss of roost features for bats. In addition, there is potential for impacts associated with artificial lighting sited in proximity to bat boxes. In the absence of mitigation, disturbance to bat roosts (e.g. tree felling) is assessed as a short-term, direct, negative effect predicted to be significant at the local scale. Mitigation is prescribed in Section 6 to address disturbance effects on roosting bats.

5.6.2 Bats - Potential Impacts to Foraging Populations

Potential impacts on local bat populations are foreseen where artificial lighting is proposed within areas comprising suitable bat habitat including mixed broadleaved woodland habitat at Down's Lane (within pNHA) and mixed broadleaved woodland adjacent to Páirc an Phobail (Peoples Park). Potential effects may also arise should artificial lighting be required during the construction phase of the project. Artificial light can disrupt natural patterns of light and dark and disturb invertebrate feeding, breeding and movement and may result in a reduction and fragmentation of invertebrate populations. This may have indirect consequences further up the food chain on birds and mammals (including bats). The impacts of artificial lighting can include missed feeding opportunities for foraging bats due to impacts on invertebrates as previously described. Such

impacts can result in a reduction of bat activity. Continued lighting along semi-natural habitats can act as a barrier which some bats cannot cross (Stone et al. 2009). Bat Conservation trust (2018) reports that light falling on a roost access point will at least delay bats from emerging and this shortens the amount of time available to them for foraging. In addition, the associated flight path to and from roost sites is just as valuable and vulnerable to the roost itself. Severing a key flight path some distance from the roost could cause desertion of a roost in its own right (Bat Conservation trust (2018)).

The woodlands associated with phase 1 of the scheme provide optimum habitat for commuting and foraging bats. The Bat Survey Technical Report (refer to Appendix 3) found that overall the habitats on site, based on the field survey findings, are of local ecological importance for both commuting and foraging bats. The findings suggest there may be roosting habitat for common pipistrelle within the vicinity of the proposed route, but no significant roosting features were noted during the survey, with the exception of the bat boxes installed in Pairc an Phobail (People's Park) (refer to Figure 3). As such, the implications of this proposed development on local roosting bat populations are small scale along phase 1 of the scheme except where bat boxes are erected in the area of mixed broadleaved woodland adjacent to Pairc an Phobail (Peoples Park) (refer to Figure 3). Both common pipistrelle and soprano pipistrelle were observed foraging in sections close to lighting at the edge of Portlaoise Retail Park (refer to Appendix 3).

The bat survey technical report (refer to Appendix 3) states that the installation of public lighting proposed along phase 1 of the scheme (parts of which are not currently illuminated) has the potential for increased illumination to disrupt bat activity. The majority of Phase 1 of the scheme is completely dark and devoid of artificial lighting. The bat survey found that both common pipistrelle and soprano pipistrelle were observed foraging in sections close to lighting at the edge of Portlaoise Retail Park (refer to Appendix 3). However, the bat survey states that there are stretches of the proposed scheme that are at present completely dark, including the majority of phase 1 of the proposed development. In the absence of mitigation, light spill onto adjoining areas of suitable habitat (woodland and scrub) during the construction and operational phases has the potential to disrupt foraging behaviour of bats (common pipistrelle and soprano pipistrelle) particularly along unlit stretches of the proposed scheme. This is considered to be a temporary, indirect negative effect predicted to be significant at the local geographic scale (construction phase) to a Long-term indirect negative effect predicted to be significant at the local geographic scale (operational phase). In order to maintain the quality of this habitat for both foraging and commuting bats, it is recommended that the public lighting is designed in such a way as to minimise the impact on bats. Therefore, mitigation is required to offset any negative effects associated with artificial lighting on local bat populations (refer to Section 6). In addition, there will be a requirement for tree felling of beech and hazel within localised sections of mixed broadleaved woodland at Down's lane (within pNHA) and mixed broadleaved woodland adjacent to Pairc an Phobail (People's Park). In the absence of mitigation, this will result in a potential loss of bat foraging habitat and possible roost habitat (bat boxes) and is considered to be a short-term, direct, negative effect predicted to be significant at the local scale. Mitigation in relation to loss of foraging habitat is prescribed in Section 6.

5.6.3 Non-Volant Mammals

5.6.3.1 Disturbance to non-volant mammals - Noise and Artificial Light

Mammals such as badger, otter, pine marten and their territories are particularly susceptible to disturbance and commercial development. There were no breeding or resting territories such as setts, couches, holts, dens recorded within and surrounding Phase 1 of the proposed development and significant effects in this regard are not anticipated. However, given the presence of suitable habitat in the form of mixed broadleaved woodland for badger, it is possible the species could take up residence or establish new territories within or in the immediate surroundings of the proposed development footprint (150 m) during the period from the most recent field surveys completed (July 2020) and the commencement of construction work (subject to planning consent). Noise emanating from construction works could impact on mammal species particularly where suitable badger habitat has been identified in the form of woodland and scrub surrounding the proposed development.

A second factor affecting mammals is the temporary requirement for artificial light during the construction and operational phases. Artificial light can disrupt natural patterns of light and dark and disturb invertebrate feeding, breeding and movement and may result in a reduction and fragmentation of invertebrate populations. This may have indirect consequences further up the food chain on mammals (including badger). Artificial illumination can also impact upon and upset the foraging activities of nocturnal mammals. In the absence of mitigation, light spill onto adjoining areas of suitable habitat (woodland and scrub) during the construction and operational phases has the potential to disrupt foraging behaviour of mammals (e.g. badger) particularly along unlit stretches of the proposed scheme. This is considered to be a temporary, indirect negative effect predicted to be significant at the local geographic scale (construction phase) to a Long-term indirect negative effect predicted to be significant at the local geographic scale (operational phase). Applying the precautionary principle, best practice measures have been prescribed in Section 6 relating to potential disturbance effects on the potential presence of badger and pre-construction surveys.

5.6.4 Other Protected Mammals

While not recorded during field surveys, pygmy shrew, hedgehog and other small mammals are presumed present (as breeding and/or hibernating populations) within treelines and woodland habitats concentrated along the peripheral margins of the proposed development. Potential tree felling within localised sections of mixed broadleaved woodland could result in mortalities to these species and a loss of breeding and/or resting sites. However, taking into account the location of the proposed development footprint along existing paths and laneways for the majority of phase 1 of the scheme, effects are not considered to be significant. The aforementioned species have a widespread distribution and the affected habitat small in extent. The potential impact of tree felling on small mammals is considered to be a short-term, direct negative effect predicted to be significant at the local geographic scale. Mitigation in relation to tree felling (if required) has been prescribed in Section 6.

5.6.5 Invertebrates

No rare or protected invertebrate communities of high conservation concern (including Annex II species of the EU Habitats Directive) were encountered during field surveys. No significant effects as a result of Phase 1 of the proposed development on invertebrate populations are anticipated.

5.6.6 Birds

5.6.6.1 Disturbance to Breeding Birds

There is potential for the proposed tree felling operations in areas comprising mixed broadleaved woodland to result in direct disturbance and habitat loss to affect breeding birds. In addition, potential exists to impact on the rookery present with the area of mixed broadleaved woodland at Down's Lane. The proposed development utilises existing paths and laneways and significant effects with regard to substantial habitat loss is not anticipated. The majority of birds observed comprised of common passerines. Passerines are typically short-lived with high reproduction rates and are not generally considered to be particularly sensitive to construction effects (Langston et al., 2013). In the absence of mitigation, where potential tree felling is required in woodland at Down's Lane (pNHA) and adjacent to Pairc an Phobail (People's Park) (refer to Figure 1), the proposed works could potentially disturb breeding territories and where bird boxes have been installed on trees at the northern section of Phase 1 (adjacent to Pairc an Phobail (People's Park) (refer to Figure 3 and Figure 4)). Potential impacts could include disturbance and injury to eggs, young and nests, and permanent loss of potential nest sites and roost sites. Any potential impacts to result in effects are deemed to be a short-term, direct and indirect negative effect predicted to be significant at the local geographic scale. There is suitable woodland habitat adjoining felling operations to support corvids associated with the rookery. In relation to artificial lighting, inappropriate lighting has the potential to cause light to spill onto adjoining suitable nest habitat such as woodlands, watercourses and treelines that could potentially deter birds (including rookery) from using habitats surrounding the proposed development during the construction and operational phases of the proposed development. Artificial lighting has the potential to impact on the body mass regulation of birds causing sleep deprivation (Pollard 2009). The potential impact on birds as a result of artificial lighting is considered to be a temporary, indirect negative effect predicted to be significant at the local geographic scale (construction

phase) to a long-term, indirect negative effect predicted to be significant at the local geographic scale (operational phase). Therefore, mitigation has been prescribed in Section 6 to address potential impacts associated with disturbance (including habitat loss and artificial lighting) on this ecological feature/receptor.

5.7 Post-Operational Phase Impacts

No significant effects on ecological receptors are anticipated following completion of phase 1 of the proposed development.

Section 6 Mitigation

This section describes the measures that are in place to mitigate any potentially harmful or negative effects associated with the proposed development on identified key ecological features as described and assessed in Section 5. This section prescribes the mitigation measures and appropriate controls to block pathways with the potential to result in negative ecological effects; thereby protecting features of conservation concern during the construction and operational phases of the proposed development. The measures outlined in this section shall be implemented as a minimum by the appointed contractor (in consultation with the appointed Environmental Clerk of Works where relevant to biodiversity).

6.1 Prescribed Mitigation Measures

6.1.1 Construction Phase

The prescribed mitigation measures to be adhered to during the construction phase of the project are described in this section of the report.

6.1.1.1 Habitat Loss

6.1.1.1.1 Tree Felling (Ridge of Portlaoise pNHA, birds, bats and non-volant mammals of local importance)

Where the proposed development requires felling of trees within a localised area of mixed broadleaved woodland at Down's Lane (within the Ridge of Portlaoise pNHA) and in mixed broadleaved woodland adjacent to Pairc an Phobail, tree planting will be carried out to mitigate for tree felling operations. Landscaping will involve planting replacement trees at suitable locations within woodland habitat. Consideration will be given towards native tree species to be planted in areas where the woodland canopy is open (east of the proposed cycle track AT Down's Lane) and to provide suitable foraging opportunities for bats and nesting and foraging opportunities for birds. Native trees such as scots pine will be retained wherever possible and felling will be kept to a minimum as much as possible to avoid any unnecessary removal of trees. The following mitigation measures are prescribed in relation to tree felling:

- Trees, which are to be removed, will be felled during autumn to coincide with the months of September, October or November (felling during autumn months avoids periods when birds and bats are most active). Prior to tree removal, a resurvey of the trees proposed to be felled will be undertaken in consultation with the arborist (refer to Section 6.1.1.5);
- Consideration will be given towards the planting of replacement native Irish trees such as oak, hazel and holly (emphasis on native species) to be planted in suitable areas within mixed broadleaved woodland at Down's Lane. There are open areas within the woodland canopy to the east of Down's Lane and areas at Pairc an Phobail (People's Park). This will provide suitable foraging and roosting opportunities for bats and birds;
- The trees used in planting as a result of clearings will be obtained from registered nursery sources that will guarantee native provenance. Oak, hazel and holly will be the main species planted. Planting of ash is not appropriate due to the prevalence of 'ash dieback' disease in Ireland;
- Should any replacement trees fail, these specimens will be replaced;
- In relation to bats, a pre-construction roost survey will be carried out prior to felling operations to confirm the presence/absence of roosting bats (should bats take up residence within tree structures in the interim) and potential roosting bats at the arch railway bridge (refer to Section 6.1.1.5). Should roosting bats be detected during pre-construction surveys, a derogation licence will be sought from NPWS licencing unit to disturb roosting bats;
- A bat box scheme will to be erected prior to any tree felling. The number of bat boxes will be calculated according to the number of trees felled. The bat boxes will be erected prior to felling at suitable locations within areas of suitable habitat comprising mixed

broadleaved woodland. Currently, there are no bat boxes installed within mixed broadleaved woodland at Down's Lane (Ridge of Portlaoise pNHA). Trees comprising bat boxes within areas adjacent to Pairc an Phobail (Peoples' Park) (refer to Figure 3 for bat box locations) will be avoided during felling operations and retained;

- In relation to birds, vegetation removal will be carried out outside the bird nesting period (bird nest season is 1st of March to 31st of August inclusive). If for any reason tree felling works should coincide with the breeding season, a pre-construction breeding bird survey will be carried out prior to felling operations to confirm the presence/absence of breeding territories and nest sites (refer to Section 6.1.1.5). Bird boxes will be installed at tree structures within areas of suitable habitat comprising mixed broadleaved woodland (Down's Lane) along phase 1 of the scheme where there are currently no bird boxes at present;
- Store some off-cut logs onsite in woodland areas to enhance bug life which will serve as a micro-habitat; and,
- Any requirement for tree felling will be carried out under licence (if applicable)

6.1.1.2 Invasive Species ((Ridge of Portlaoise pNHA and local biodiversity associated with Phase 1 of the scheme)

Mitigation measures relating to the treatment, eradication and control of invasive species shall be implemented to avoid the potential introduction and/or spread of invasive species during the construction phase of the proposed development.

6.1.1.2.1 Scheduled invasive species

There are no scheduled invasive species within the footprint of the proposed development and wider surroundings along phase 1 of the scheme. Prior to the commencement of any works, a pre-construction survey will be carried out during the growing season (i.e. from May to September) to assess if any new stands of scheduled invasive species have become established since the most recent surveys were completed in July 2020. Should any new stands become established within the proposed development footprint, an Invasive Species Management Plan (ISMP) will be prepared with input from an experienced and qualified Ecologist.

Developing codes of practice aims to reduce the risk from, and impacts and effects of, invasive species and to safeguard habitats of local importance and sites of national importance such as the Ridge of Portlaoise pNHA and the relevant. Should any scheduled species become established in the interim, the proposed works will adopt best practice control measures to avoid the potential for cross-contamination with infested areas. The project will have regard to the relevant biosecurity measures throughout all phases of the project:

- Clearly identify and mark out the infested areas of scheduled invasive species to inform construction personnel and operating machinery. Infested areas will be fenced off (where possible) and signage will be installed to highlight the location of invasive species;
- Create dedicated exclusion zone entry and exit points for operators on foot and for mobile equipment in the vicinity of infested areas comprising stands of scheduled species (should new stands establish);
- Wheel washing facilities will be provided. All washing must be carried out in areas with no potential to result in the spread of invasive species;
- All earthwork machinery will be thoroughly pressure-washed prior to arrival on site and prior to their further use elsewhere;
- Care will be taken not to disturb or cause the movement of fragments of invasive species, either intentionally or accidentally;
- All plant machinery and construction personnel will be restricted to the footprint of the proposed works area and will avoid unnecessary crossings in adjoining areas;
- Should any new specimens become established in the interim, stands will be clearly demarcated by temporary fencing and machinery tracking or otherwise within infested areas will be strictly avoided;

- All contractors and staff will be briefed about the potential introduction of invasive species, identification and significance of scheduled species (e.g. Japanese knotweed, Himalayan balsam) prior to the commencement of works;
- For any material entering or imported to the site (e.g. granular fill), the supplier must provide an assurance that it is free of scheduled invasive species (e.g. Japanese knotweed);
- Good construction site hygiene will be employed to prevent the spread of these species with vehicles thoroughly washed prior to leaving any site with the potential to have supported invasive species. All plant and equipment employed on the construction site (e.g. excavator, footwear) will be thoroughly cleaned down using a power washer unit prior to arrival on site to prevent the spread of invasive plant species such as Japanese knotweed;
- The machinery must be thoroughly pressure-washed in a designated area at least 25 metres from any watercourse before moving on to an area that is not yet infected; and,
- The treatment and control of invasive alien species will follow guidelines issued by the National Roads Authority *The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads* (NRA 2010) and the Property Care Association (PCA) (2018) – *Practical Management of Invasive Non-Native Weeds in Britain and Ireland*.

6.1.1.2.2 High Impact Invasive Species: Cherry Laurel

Cherry Laurel is a high impact invasive species that is unpalatable and likely toxic to mammals and invertebrates due to the presence of cyanogenic glycosides and amygdalin. Cherry laurel is avoided by grazing animals, thus giving the species significant advantages over native species. The treatment, control and eradication of cherry laurel will follow guidelines issued by Maguire et al., (2008), *Best Practice Management Guidelines Rhododendron Rhododendron ponticum and Cherry Laurel Prunus laurocerasus* prepared for NIEA (Northern Ireland Environmental Agency) and NPWS as part of Invasive Species Ireland. There are no specific legal provisions relating to the dispersal of cherry laurel as at the time of writing such provisions apply to scheduled invasive species under Regulation 49 of the European Communities (Birds and Natural Habitat Regulations) 2011. The control of cherry laurel within and surrounding the proposed development footprint (Figure 5) recorded near the south circular road will have regard for the general best practices in relation to biosecurity measures that have been prescribed for scheduled invasive species (Section 6.1.1.2.1). The approach to the treatment and eradication of cherry laurel will be as follows:

- Initially, cutting and removing stems by hand or chainsaw. The cuts should be as close to the ground as possible. The cut material is then chipped or removed to allow access for follow-up work and prevent regrowth. Flailing is an alternative to cutting if the growth is younger

The cutting will not prevent regrowth however as cut stems/stumps will regenerate. These need to be addressed and there are three main ways of achieving this as follows:

1. Digging the stumps out. The effectiveness of this technique is increased by removing all viable roots. This can be achieved manually or with machinery. To avoid regrowth, stumps should be turned upside down and soil should be brushed off roots.
2. Direct stump treatment by painting or spot spraying stumps with a herbicide immediately after being cut. This is best undertaken using a handheld applicator to avoid herbicide killing non-target species. This should only be undertaken during dry (for next 12 hours) and frost-free conditions.
3. Alternatively stump treatment can be undertaken through stem injection, where the stem is drilled and herbicide poured into it

All cut and brush material should be disposed of appropriately and safely to avoid regrowth. Herbicide treatment if employed should be applied away from natural watercourses. Follow up treatment is also likely to be necessary to treat any further regrowth and particularly to

treat/remove the growth of any seedlings. This can be achieved through spraying (although care needs to be taken to avoid damage to other vegetation) or hand-pulling whilst regrowth is small.

6.1.1.3 Loss of Rare Plants (Red Listed Plants)

Two species of rare plant were recorded in the vicinity of the proposed development, blue fleabane, pyramidal orchid and possibly bee orchid located in an area comprising dry calcareous grassland (GS1) and recolonising bare ground (ED3) (refer to Figure 6). To ensure the protection of these species, the appointed Environmental Clerk of Works in consultation with an Ecologist will review all construction works in the vicinity of these plants and will implement appropriate measures to protect them. In all instances, the priority will be to leave the plants in-situ in order to avoid or minimise disturbance, but where this is not feasible, the plants may be translocated. It is proposed that the species blue fleabane which comprises some individual plants growing within the footprint proposed development site, will be translocated to areas with suitable habitat conditions for the plants to successfully grow and establish. A suitable receptor site occurs adjacent to the west of the proposed cycle track in habitats comprising dry calcareous grassland (GS1) and recolonising bare ground (ED3) mosaic. Receptor areas selected for translocation will not comprise any existing records of blue fleabane, pyramidal orchid and possibly bee orchid to minimise disturbance and damage of plants in the wider surroundings. The number of affected plants to be translocated will be very small in extent and scale. The approach employed should be as follows:

- Prior to the commencement of construction works, an Ecologist will carry out two surveys (early and mid-August) of the affected area during the growing season (optimal survey period) to mark out and map locations of blue fleabane and pyramidal orchid within and surrounding the development footprint when the plants are readily identifiable (refer to Figure 6);
- Devise pre-defined routes in advance of construction works from the proposed development footprint to the receptor site to avoid smothering and/or trampling of existing records of blue fleabane and pyramidal orchid in surrounding areas;
- Ensure the machine operator is aware of all ecological sensitivities prior to commencement of works;
- Where possible, plants will be left in-situ and protected during construction works; Robust measures will be taken to protect plants in the surroundings, including establishing exclusion zones by installing temporary fences or other similar measures;
- Where such impacts are unavoidable, plants will be translocated in Autumn when soils are warm and moist and new root growth is possible before the onset of winter;
- The vegetated topsoil (known as turves) will be dug to a depth of 300 mm in discrete block sections (to minimise the soil particles breaking up) using an excavator bucket and side-cast for translocation. Careful attention should be made not to sidecast the vegetated topsoil/turves where existing records of blue fleabane and pyramidal orchid occur in the immediate surroundings to avoid smothering of vegetation;
- Shallow excavations (ca. 300 mm depth) with an excavator bucket will be carried out at the receptor area to facilitate translocation of blue fleabane specimens;
- The vegetated turves containing blue fleabane specimens will be carefully translocated in blocks (vegetation side up) and placed within the recently dug out receptor area and reinstated with excavated material to ensure that the translocated turves are firmly in place and that the plant specimens are facing vegetation side up;
- Subsequent watering of the translocated turves should be carried out during periods of dry weather in Autumn;
- In addition to the above, avoid side casting and stockpiling of excavated material in adjacent areas which could result in smothering and loss of red listed plants in the surroundings including blue fleabane and pyramidal orchid;
- Assign designated areas for stockpiling of excavated material during construction works in consultation with an Environmental Clerk of Works to avoid disturbance and loss of any red listed plant specimens; and,
- Ensure that the works are carried out during periods of dry weather.

Monitoring, Aftercare and Management

Monitoring should be carried out in the subsequent weeks following reinstatement and the onset of the growing season in the following spring and again during the flowering period in June/July. Relevés should be employed to monitor vegetation recovery over time to inform if translocation was successful. Targeted habitat management measures to avoid further scrub encroachment on areas of dry calcareous grassland (GS1) and recolonising bare ground (ED3) should be carried out to maintain populations of blue fleabane and pyramidal orchid associated with the esker in the short to medium term. Grassland management will be essential to maintaining orchid populations and areas of recolonising bare ground for blue fleabane. Aftercare and maintenance work could be carried out in conjunction with local interest groups and voluntary wildlife organisations associated with Portlaoise town and County Laois.

6.1.1.4 Disturbance

6.1.1.4.1 Pre-construction surveys

At least two months in advance of commencing any construction works, the Environmental Clerk of Works (with input from an Ecologist) will oversee the design and implementation of pre-construction surveys or checks having regard for best available scientific knowledge and best practice including the specifications in the NRA Environmental and Construction Guidelines (2005-2011) (which promote pre-construction survey requirements). The objective of the surveys will be to determine if any new breeding or resting sites of protected species, or new invasive species stands have become established since surveys were completed in July 2020. The pre-construction surveys will minimise any potential disturbance effects should species take up residence or establish territories in the interim. The surveys will involve the following:

- Survey to confirm presence/absence of badger territories. Survey for badger breeding or resting sites within 150 m of proposed piling works and 50 m of all other works (where reasonably possible). If a badger sett is found, a buffer distance of 10 m from sett entrances should be employed in instances where light work such as digging by hand or in the event of vegetation clearance; a buffer distance of 20 m from badger sett entrances should be incorporated where light machinery (generally wheeled vehicles) is in operation within the site; and a buffer distance of 30 m from badger setts should be employed where heavy machinery is in operation within the site;
- Survey to confirm presence/absence of bird nest sites. The proposed tree felling operations will be timed outside the bird nesting season (bird nesting season is 1st of March to 31st of August inclusive). If for any reason tree felling operations are required during the breeding season; pre-construction surveys will be required to identify bird nest territories and check bird boxes in area of mixed broadleaved woodland adjacent to Pairc an Phobail (People's Park). Appropriate mitigation measures will be taken to safeguard bird nests and their territories and licences and advice sought from NPWS;
- Survey to confirm presence/absence of roosting bats. Survey to carry out roost inspections of trees earmarked for felling and bat boxes in areas of mixed broadleaved woodland adjacent to Pairc an Phobail (People's Park); and,
- Survey to confirm the establishment of any new stands of invasive species along phase 1 of the proposed development.

Badgers, birds and bats are protected under the provisions of the Wildlife Acts. Bats are also listed under Annex IV of the EU Habitats Directive. Should any new territories become established in the interim and within proximity of the proposed development to result in potential significant effects on ecological receptors, this information will be communicated to NPWS and advice sought. In the event breeding territories require removal, any destruction or exclusion of setts for example must be conducted under licence by experienced experts or other suitably qualified personnel. An application for a wildlife licence should be submitted to the NPWS. Temporary fencing will be installed to limit and restrict movements of construction personnel and machinery in relation to the establishment of any new territories where deemed sensitive to the characteristics of the proposed construction works.

6.1.1.4.2 Noise Impacts

The construction phase of the proposed development will result in increased levels of noise and activity around the proposed cycle track during the works period in particular stripping topsoil, excavations and surface finishing requirements. The following best practice measures during construction works will apply in relation to noise and potential disturbance:

- During the construction phase, noise control measures such as hours of operation (e.g. daylight hours) will be considered in relation to disturbance of key ecological species (e.g. bats, birds, mammals);
- Construction activity will be suspended during hours of darkness;
- All plant machinery and equipment used will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations (SI 359/1996);
- All noise producing equipment will comply with S.I. No. 632 of 2001 European Communities (Noise Emission by Equipment for use Outdoors) Regulations 2001 or the most recent regulations available at the time of construction;
- Operating machinery will be restricted to the proposed development site boundary; and,
- No works will be undertaken outside the construction works footprint

6.1.1.4.3 Artificial Lighting (Ridge of Portlaoise pNHA, bats, birds and non-volant mammals)

Should the construction phase of the project require temporary artificial lighting, light spill onto adjoining woodland areas during hours of darkness has the potential to result in disturbance and disrupt the natural patterns of birds, nocturnal mammals (i.e. badger, bats). Turning lights off during periods of darkness throughout the construction phase will eliminate any risk of impacts to sensitive ecological receptors outside of work hours. The risk of disturbance effects associated with artificial lighting on woodland and scrub habitat will be minimised by restricting lighting to the footprint of the proposed development and avoiding any unnecessary light spill onto adjoining areas. In all cases, the contractor in consultation with the Environmental Clerk of Works will make retrospective amendments to light cowls to restrict light spillage.

6.1.1.5 Timing of Works

Prescribed timing of construction works has regard to the following ecological sensitivities and timeframes to minimise disturbance effects:

Bats and Birds: Tree felling will be carried out during the months of Autumn (September, October and November) to avoid periods when birds and bats are most active. Tree felling will be conducted at periods outside the bird nesting season (1st of March to 31st of August inclusive)

Badger and other non-volant mammals: Should badger establish breeding territories (e.g. setts) in suitable habitat (e.g. mixed broadleaved woodland) in the interim, the proposed works will be timed outside the breeding season for badger (December to June inclusive) and that of other protected mammals species (e.g. hedgehog and pygmy shrew).

Translocation of rare plants: In order to maximise success rates of translocation of red listed plants, translocation should be carried out in September when soils are warm and moist and new root growth is possible before the onset of winter.

6.1.2 Operational Phase

The mitigation measures to be adhered to during the operational phase of the project are outlined in this section of the report.

6.1.2.1 Disturbance (birds, bats and non-volant mammals)

The project has been designed to accommodate pedestrians and cyclists. No significant disturbance effects associated with increased noise levels are anticipated during the operational phase of the proposed development given that the proposed development is confined to existing paths and laneways periodically used by walkers. It is expected that the proposed development during project operation will result in a higher number of people using phase 1 of the scheme compared to current levels. Taking into consideration the nature of the proposed development (proposed cycle track), the impact associated with noise emissions is considered to be low. The

provision of cycle track will have a positive impact on the urban environs of Portlaoise town by reducing the dependency on automobiles and other modes of diesel powered vehicles which may have the potential to contribute to greenhouse gas emissions. Noise emissions associated with cyclists during the operational phase is considered to be low. The proposed development has been designed not to accommodate motorised vehicles and disturbance effects associated with noise in this regard will be avoided. Any resident fauna associated with phase 1 of the proposed development are considered to have already habituated to this daily occurrence and other anthropogenic factors associated with the urban environs of Portlaoise town in the surroundings.

6.1.2.1.1 Artificial lighting

A range of mitigation measures are prescribed to minimise artificial lighting on bats, non-volant mammals and birds. Following recommendations outlined in the Bat Survey Technical Report, artificial lighting requirements follows guidelines issued by Bat Conservation Trust (BCT), *Bats and lighting in the UK – bats and the built environment series* (BCT, 2018) and Bat Conservation Ireland (BCI) guidance, *Bats and Lighting: Guidance Notes for Planners, Engineers, Architects and Developers* (BCI, 2010). It is important that lighting installed along Phase 1 of the proposed development is completed with sensitivity for local wildlife while still providing the necessary lighting for human usage. The following measures will be adhered to when installing public lighting:

- Artificial lights shining on potential bat roosts (e.g. bat boxes), their access points and the flight paths away from the roost must always be avoided (e.g. areas of mixed broadleaved woodland throughout phase 1 and bat boxes installed on trees (mixed broadleaved woodland) adjacent to Pairc an Phobail (People's Park) (refer to Figure 3).
- Lighting design will be flexible and be able to fully take into account the presence of protected species. Therefore, appropriate lighting will be restricted to within the proposed development footprint (i.e. cycle track) and adjacent areas with more sensitive lighting regimes deployed in wildlife sensitive areas.
- Buffer zones will be adopted to protect Dark buffer zones and rely on ensuring light levels (levels of illuminance measured in lux) within a certain distance of a feature do not exceed certain defined limits. The buffer zone can be further subdivided in to zones of increasing illuminance limit radiating away from the feature or habitat that requires to be protected.
- Baseline, pre-development lighting surveys will be required where proposed lighting is suspected to be acting on key habitats and features of ecological interest and inform proposed lighting design and illuminance lux limits. The data will be used to help isolate which luminaires might need to be removed or establish a new illuminance limit reduced below existing levels;
- Luminaire design is extremely important to achieve an appropriate lighting regime. Luminaires come in different styles, applications and specifications which a lighting professional can help to select. The following will be considered when choosing luminaires (BCT Lighting Guidelines (2018)):
 - All luminaires used will lack UV/IR elements to reduce impact.
 - LED luminaires will be used due to the fact that they are highly directional, lower intensity, good colour rendition and dimming capability.
 - A warm white spectrum (<2700 Kelvins is achieved to reduce the blue light component of the LED spectrum).
 - Luminaires will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
 - The use of specialist bollard or low-level downward directional luminaires should be considered in bat sensitive areas to retain darkness above.
 - Column heights will be carefully considered to minimise light spill. The shortest column height allowed should be used where possible.
 - Only luminaires with an upward light ratio of 0% and with good optical control will be used.
 - Luminaires will always be mounted on the horizontal, i.e. no upward tilt.
 - Accessories such as baffles, hoods or louvres will be used to reduce light spill and direct it only to where it is needed.

Artificial lighting requirements will also have regard to the following considerations:

- The location of lighting along the proposed route will be designed to maximise the setback distance from semi-natural habitats (e.g. mixed broadleaved woodland (WD1) within and outside Ridge of Portlaoise pNHA and taking into account ecological sensitivities such as bats, birds and non-volant mammals;
- Artificial lighting along the proposed cycle track will be provided by means of low-rise lighting system equipped with appropriate hoods, shields and cowls in order to avoid light spill onto the adjacent habitats used by birds, bats and non-volant mammals;
- Light spill shall be strictly directed onto the footprint of the proposed cycle track;
- A suitably experienced ecologist in consultation with the Environmental Clerk of Works and lighting specialist will be present to oversee and ensure that the proposed lighting will not result in additive light spill on adjoining habitats.
- In particular, lighting shall not shine onto important commuting and foraging areas identified for local bat populations (e.g. woodlands) and avoid effects associated with potential fragmentation of habitats.
- In some cases, it may be appropriate to install temporary fencing or other light barriers to minimise light spill onto adjoining sensitive features and to provide physical screening to minimise effects

The lighting requirements prescribed for bats above will apply to other ecological sensitive features that could potentially be affected by artificial lighting such as birds, bats and non-volant mammals. The Environmental Clerk of Works will seek input from a lighting specialist and an Ecologist to ensure correct implementation. Following implementation of the measures prescribed in relation to artificial lighting, there will be no significant disturbance related effects to any key ecological feature.

6.2 Implementation and Monitoring

Prior to commencement of the proposed development, an Environmental Clerk of Works (ECoW) shall be appointed sufficiently in advance of the proposed development to oversee, advise, and facilitate implementation of all mitigation measures set out in Section 6.1, including any changes required by planning conditions (if consented). The ECoW will be appointed to oversee, advise, and facilitate the proper implementation of all ecological mitigation measures by the contractor, to include consultation input from key statutory consultees (e.g. NPWS, LCC). The ECoW will:

- have appropriate environmental management expertise;
- have or retain appropriate ecological expertise for purposes of proper implementation of mitigation measures (e.g. conducting pre-construction ecological surveys for bats, nesting birds, mammals and invasive species), engage with personnel on ecological sensitivities, provide input to artificial lighting design and locations in relation to ecological features of interest);
- liaise with the NPWS as appropriate; and
- ensure implementation of the mitigation measures proposed in this report.

The measures relating to ecology described in this section shall be further refined and expanded into a Construction and Environmental Management Plan (CEMP) as more information becomes available in the course of the project design (e.g. including but not limited to construction methods and work schedule). The CEMP should be prepared prior to commencement of project construction subject to the approval of LCC and the ECoW. The CEMP will remain at all times a live document, subject to amendment of adaptive management throughout construction as required. The ECoW (in consultation with a qualified Ecologist) will review the EcIA, planning conditions, post consent consultations with statutory bodies (if required), results of pre-construction surveys, to inform the production of an ecological report which will document compliance with all the prescribed mitigation measures outlined in this report. The document will be available on request should the competent authority and any key statutory consultees (e.g. NPWS) wish to review this information.

Section 7 Enhancement

It is important that the proposed development is sustainable and, where possible, produces a net gain for biodiversity and nature conservation. National policies promote the inclusion of measures to enhance biodiversity within development proposals. CIEEM (2018) guidelines state that enhancement of biodiversity should be an objective of all projects. The following measures to enhance biodiversity along the proposed scheme are recommended. Figure 7 has been attributed with the same corresponding map reference number provided and described for each enhancement measure in the text below and should be read in conjunction with this section of the report.

1. General management – Litter removal Clean-up of litter and rubbish dumping recorded at Down's Lane within the area of mixed broadleaved woodland. Clean up of litter should be scheduled regularly as should general litter collection. This will maintain
2. Interpretation Panel – A panel outlining the importance of the Ridge of Portlaoise pNHA for biodiversity should be installed adjacent to the proposed cycle track in mixed broadleaved woodland at Down's Lane. Graphical examples of selected species and their life-cycles should be illustrated.
3. Build a Solitary Bee Bank – attract digging or 'mining' bees by providing a quiet, sunny, well-drained patch of earth, free from vegetation on south facing slopes and supplement with some sand if necessary. A suitable location for building a solitary bee bank is in the eastern section of phase 1 comprising sections of south facing slopes on exposed sand/gravel soil. Care should be taken not to disturb any red listed plants such as blue fleabane and pyramidal orchid previously recorded in this area.

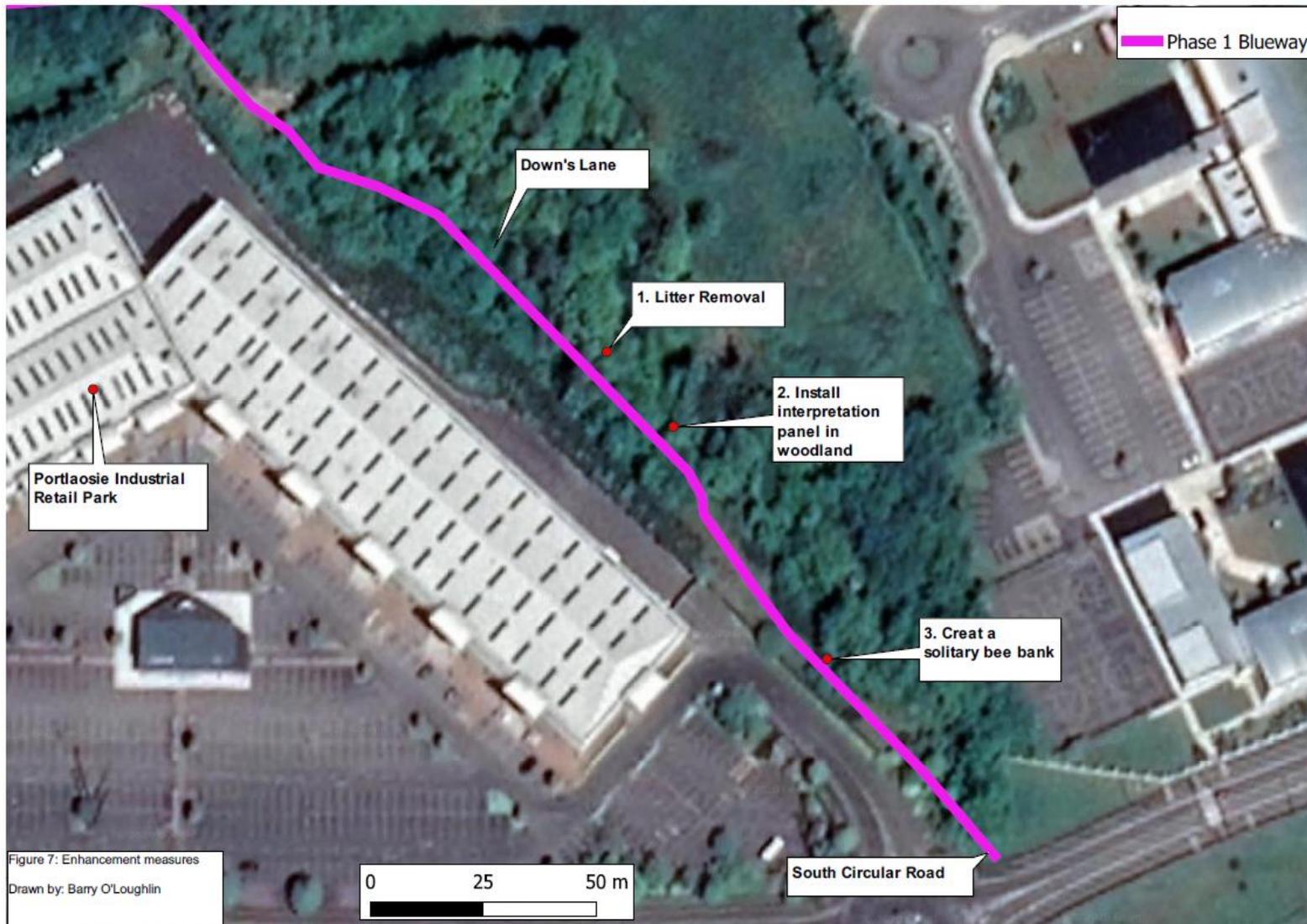


Figure 7 Enhancement measures

Section 8 Cumulative Effects

The proposed development was considered in combination with other known developments and activities in the area that could result in cumulative effects on biodiversity. The assessment focuses on the potential for cumulative effects on biodiversity identified as part of the current assessment. A planning search of granted and pending planning applications within the vicinity of the proposed development within the last five years was completed. This included a review of online Planning Registers and served to identify past and future projects, their activities and their predicted environmental effects. A search was conducted in September 2020 of planning applications within the vicinity of the proposed development on Laois County Council Planning Enquiry System¹², the National Planning Application Map Viewer¹³, An Bord Pleanála¹⁴ and 'Part 8' local authority-led developments currently being progressed by LCC and recent outcomes. A planning search of granted and pending planning applications made within the vicinity of the proposed development within the last five years (duration of a permission generally set out in the conditions to the permission, often limited to 5 years) was completed. Withdrawn, incomplete and refused planning applications are not included. The relevant planning applications reviewed are presented in Table 8.1.

Table 8.1 Planning Application Search within the vicinity of the proposed development

Planning Reference Number	Development Address	Summary Development Description	Application Status /Outcome	Grant Date /Decision Date
1631	Units 5 & 6 Portlaoise Retail Park, New Road, Portlaoise, Co. Laois.	Amalgamate Units 5 and 6 at Portlaoise Retail Park, to provide a single retail warehouse of 2395 m2, including associated minor internal works to remove internal partition walls at Units 5 & 6 Portlaoise Retail Park, New Road, Portlaoise, Co. Laois. The subject site is located to the north of the New Road (Portlaoise Orbital Route) and to the east of Timahoe Road.	Conditional	04/04/2016
17233	Portlaoise Retail Park, New Road, Portlaoise, Co. Laois	Construct a standalone café/restaurant unit with an overall height of 5.02m and a gross floor area of 232 sq.m, to be located within the central section of the car park of Portlaoise Retail Park. The proposal includes signage for the unit, associated outdoor seating area, bin store, landscaping and all associated site works on the 0.064 ha site.	Conditional	20/10/2017
18478	Lismard Business Park, Timahoe Road, Portlaoise.	Erect a 799.3 sq m single storey Kidney Dialysis Treatment Centre and connected 49.0sq m open service compound area, building and site signage together with 29 no. car parking spaces.	Conditional	12/11/2018
17362	Unit 11, Lismard Business Park, Timahoe Road, Portlaoise, Co. Laois.	(a) change use from existing light industrial to health centre/gymnasium totalling 1728.9 sqm and (b) revisions to rear elevation, together with all associated site and development works	Conditional	25/9/2017
16273	Timahoe Road, Portlaoise, Co. Laois.	Retain the following: (a) single storey lean-to extension to building and sub-division of building into 2 no. commercial units; (b) first floor offices and canteen; (c) canopy over service area; (d) 2.0m high boundary wall; (e) 2 no. steel storage containers; (f) alteration to front façade; (g) signage; (h) carwash facility; (I) entrance; (j) change of site boundaries and all associated site works	Conditional	31/8/2016

¹² Available at <https://laois.ie/departments/planning/> [Accessed September 2020].

¹³ Available at <https://myplan.ie/national-planning-application-map-viewer/> [Accessed September 2020].

¹⁴ Available at <http://www.pleanala.ie/> [Accessed September 2020]

Planning Reference Number	Development Address	Summary Development Description	Application Status /Outcome	Grant Date /Decision Date
19568	Unit 1, Lismard Business Park, New Road, Portlaoise	Change use from a general warehouse to a warehouse with ancillary trade counters (for the sale of building related products principally to trade) and external amendments to the property including: additional car parking spaces towards the rear of the building. On the south east elevation: fill in existing goods ramp and existing good-in door and construct two new ramps to service a new customer entrance to the trade counters and a new good entrance. On the north east of the building include security bollards and mark out a hatched pedestrian route. On the south west elevation include an area for mechanical plant. On the north west elevation, cladding of either side of the door and insert new doors. The proposal includes all associated works to facilitate the development	Conditional	14/1/2020
2050	Unit 1, Lismard Business Park, New Road, Portlaoise	Erect signage relating to the use of the development granted under 19/568 including downlighters on the two largest signs. Condition 6 of 19/568 requires planning permission for all new signage	Decision made	Decision due date: 26/3/2020
17521	No. 2 Rose Cottage, New Road, Portlaoise	Retain existing domestic garage.	Conditional	15/1/2018
151	Aghnaharna Drive, Summerhill, Portlaoise, Co. Laois.	Construct 5 no. detached two storey dwelling houses in place of 4 detached two storey houses previously granted under planning permission reference no. 99/1404 (Grounding permission) and planning permission reference no. 06/1640 and will comprise of: 1 no. house type 408 and 4 no. house type 405. Permission is also sought for alterations to the layout of this section of the overall development. Permission is also sought for all ancillary site development works	Conditional	13/7/2015
18450	Aghnaharna, Portlaoise, Co. Laois	Remove existing foundation pads for a previously permitted apartment block and the provision of 79 no. two-storey terraced, semi-detached and detached dwellings (19 no. 4 Bedroom house and 60 no. 3 bedroom houses); a total of 158 no. new parking spaces; the creation and landscaping of a vehicular entrance from the Portlaoise Southern Circular Road to Aghnaharna Drive; the provision of a pedestrian access located off the Portlaoise Southern Circular Road at the south-eastern corner of the site; hard and soft landscaping; boundary treatments; sub-station; solar panels; and all associated site development works above and below ground	Conditional	7/3/2019
19217	Aghnaharna, Portlaoise, Co. Laois	Amend house no.53 (134.6 sq m) in the permitted 79 No. unit residential scheme as granted planning permission under Reg. Ref. 18/450 and comprises a single storey extension to the rear of the property measuring 28.1 sq m; amendments to the door and window arrangements on the 4 No. facades; internal changes to the layout of the permitted dwelling; and all associated works	Conditional	5/7/2019
19690	The Drive, Mount Stewart, Portlaoise	Consist of amendments to the previously approved development permitted under reg ref 18/450 to omit a pair of semi-detached 3 bed two storey houses on site no's 1 and 2 The Drive, Mount Stewart and replaced with a new 4 bed two storey detached house type F3 and including all associated site development works.	Conditional	24/3/2020

Other similar Blueway green infrastructure projects such as the Barrow Navigation (Grand Canal - Barrow Line) and (River Barrow) (PI Ref: 1737 and ABP Ref: PL01.301245) was considered in this assessment. The project comprises a multi-use shared leisure route (Blueway), approximately 115 kilometres (km) in length, on the existing navigation towpath, to include tailored surface finishes, information directional, and safety signage, and all other associated ancillary works. Approximately 16km of the route is located in Co. Laois. The project was originally granted planning consent by the relevant local authorities (PI Ref: 1737) but subsequently refused planning permission by An Bord Pleanála (ABP Ref: PL01.301245) on appeal in April 2019.

The planning search in Table 8.1 includes a number of small-scale projects such as internal works and construction of retail units, alterations and modifications to existing commercial units; and amendments and construction of residential developments and dwelling houses within the vicinity of the study area. The works outlined above are small scale in nature and typical of an urban environment in which the proposed works are situated. According to landuse zoning (Laois County Development Plan 2017-2023) for Portlaoise town, much of the surrounding area of the scheme is zoned for 'General Business (C1.1 commercial, retail)' and 'Community, Educational and Institutional (S5 mixed/general community services/facilities uses)' and this is reflected in the planning applications presented in Table 8.1. No potentially significant cumulative pollution, disturbance, displacement or habitat loss effects on biodiversity have been identified with regard to the proposed development. Similarly, no cumulative effects with regard to Phase 2 and Phase 3 of the proposed blueway cycle scheme is anticipated given that the application has been subject to a separate EcIA and NIS that comprises robust mitigation measures that safeguard important ecological features along the scheme (CAAS, 2020b and CAAS, 2020c).

The provision of cycle track will have a positive impact on the urban environs of Portlaoise town by reducing the dependency on automobiles and other modes of transport which have the potential to contribute to greenhouse gas emissions. Laois County Council has prepared the Walking and Cycling Strategy with the aim of providing sustainable travel patterns within Portlaoise town to achieve objectives set out in the low carbon town project. The proposed development includes robust mitigation and best practice to ensure that there will be no significant effects combined with other projects on biodiversity. Taking into consideration other projects in the area and the predicted effects associated with phase 1 of the scheme, no residual cumulative effects on biodiversity have been identified.

Section 9 Residual Effects

No significant effects on key ecological features are expected as a result of the proposed development along phase 1 of the scheme. Mitigation measures will be employed on a precautionary basis to protect key ecological features of conservation concern throughout the duration of the proposed development. Taking into consideration the temporary duration and small scale nature of the proposed works surrounding the urban environs of Portlaoise, residual effects (following implementation of prescribed mitigation measures) in relation to sources of impacts identified in Section 5 will be minimised to effects predicted to be significant at the local geographic scale to insignificance. There will be positive impacts on local biodiversity as a result of mitigation and enhancement measures to result in biodiversity net gains as a consequence of the planting of native tree species, installing bird and bat boxes, eradicating invasive species (cherry laurel) and managing areas for invertebrates (bees) and rare plants. The residual impact characterisation for key ecological features is presented in Table 9.1.

Table 9.1 Residual impact characterisation for key ecological features within the ZoI of the project

Key Ecological Feature within ZoI of the Project	Impact Type	Significance if unmitigated	Mitigation Measure	Residual Effect (following implementation of mitigation)
Mixed broadleaved woodland (WD1) (including sections of the Ridge of Portlaoise pNHA)	Habitat Loss (Tree Felling)	Permanent direct negative effect predicted to be significant ranging from the local to the national geographic scale	Replacement tree planting and habitat creation	Potential effects will be minimised to the local geographic scale
Rare plants (red listed plants of "Least Concern" (Wyse Jackson et al., (2016)) within	Loss of rare plants associated with the construction of the cycle track	Permanent direct negative effect predicted to be significant at the local geographic scale	Translocation of rare plants to suitable receptor sites in adjoining area to proposed cycle track. Habitat management	Potential effects will be minimised to the local geographic scale to insignificance
Non-volant mammals	Habitat Loss (Tree Felling)	Short-term, direct negative effect predicted to be significant at the local geographic scale	Replacement tree planting and habitat creation; Pre-construction surveys; Timing of works	No setts, dens or holts were found during field surveys. Following implementation of mitigation, potential effects will be minimised to insignificance
	Artificial lighting (construction and operational phases)	Ranges from Temporary to Long-term, indirect, negative effect predicted to be significant at the local geographic scale	Mitigation in relation to lighting design and prescribed measures in relation to best practices during construction and operational phases	Potential effects will be minimised to insignificance

Key Ecological Feature within ZoI of the Project	Impact Type	Significance if unmitigated	Mitigation Measure	Residual Effect (following implementation of mitigation)
Bats	Habitat Loss (Tree Felling)	Short-term, direct, negative effect predicted to be significant at the local scale	Replacement tree planting and habitat creation; Pre-construction surveys; Avoidance of bat boxes; Installation of bat boxes; Timing of works	No roosting bats found in tree structures during surveys. Following implementation of mitigation, potential effects will be minimised to insignificance
	Artificial Lighting	Ranges from Temporary to Long-term, indirect, negative effect predicted to be significant at the local geographic scale	Mitigation in relation to lighting design and prescribed measures in relation to best practices during construction and operational phases	Potential effects will be minimised to insignificance
Birds	Habitat Loss (Tree Felling)	Short-term, direct, negative effect predicted to be significant at the local scale	Replacement tree planting and habitat creation; Pre-construction surveys; Avoidance of bat bird boxes; Installation of bird boxes; Timing of works	Potential effects will be minimised to insignificance
	Artificial lighting (construction and operational phases)	Ranges from Temporary to Long-term, indirect, negative effect predicted to be significant at the local geographic scale	Mitigation in relation to lighting design and prescribed measures in relation to best practices during construction and operational phases	Potential effects will be minimised to insignificance
Invasive species	High Impact Invasive Species; cherry laurel	Long-term, direct negative effect predicted to be significant at the local geographic scale	Biosecurity measures to be adhered to during construction works; Treatment and eradication of high and medium impact invasive species	Potential effects will be minimised to insignificance

Section 10 Concluding Statement

Following consideration of the residual effects (post mitigation) it is noted that the proposed development (phase 1 of Triogue Blueway) will not result in any significant effects on any key ecological features/receptors. No significant effects on receptors of International, National or County Importance are anticipated. The potential for effects on the designated sites are fully described in the Appropriate Assessment Screening Report that accompanies the planning application and this concludes that in view of best scientific knowledge and on the basis of objective information, the proposed development associated with phase 1 of the scheme either individually or in combination with other plans or projects, is not likely to have significant effects on any European site. The ecological effects on flora and faunal receptors of Local Importance are not considered to be significant. Provided that the proposed works are carried out in accordance with the design, best practice and mitigation prescribed within this report, significant effects on biodiversity are not anticipated at the international, national or county scales.

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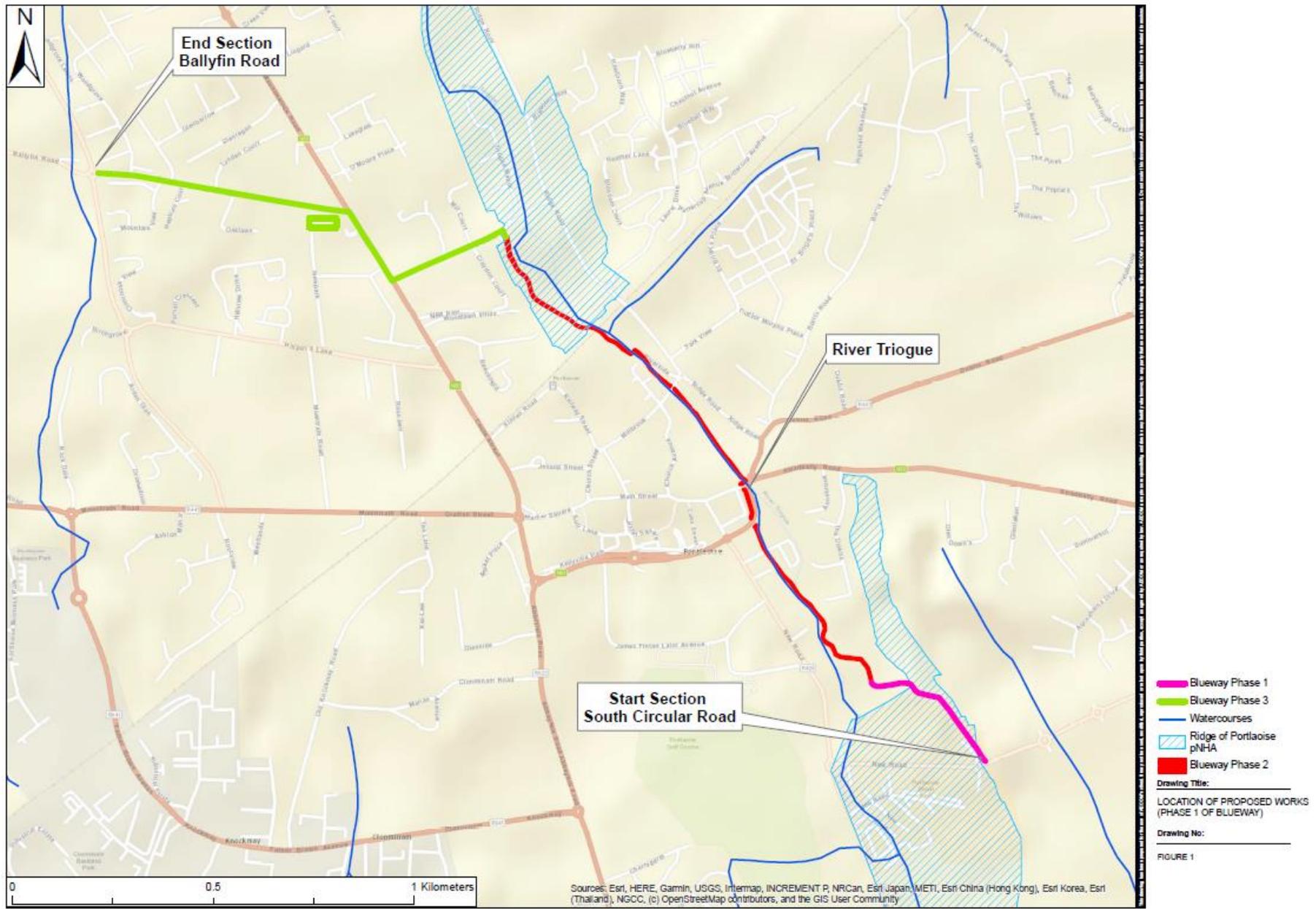
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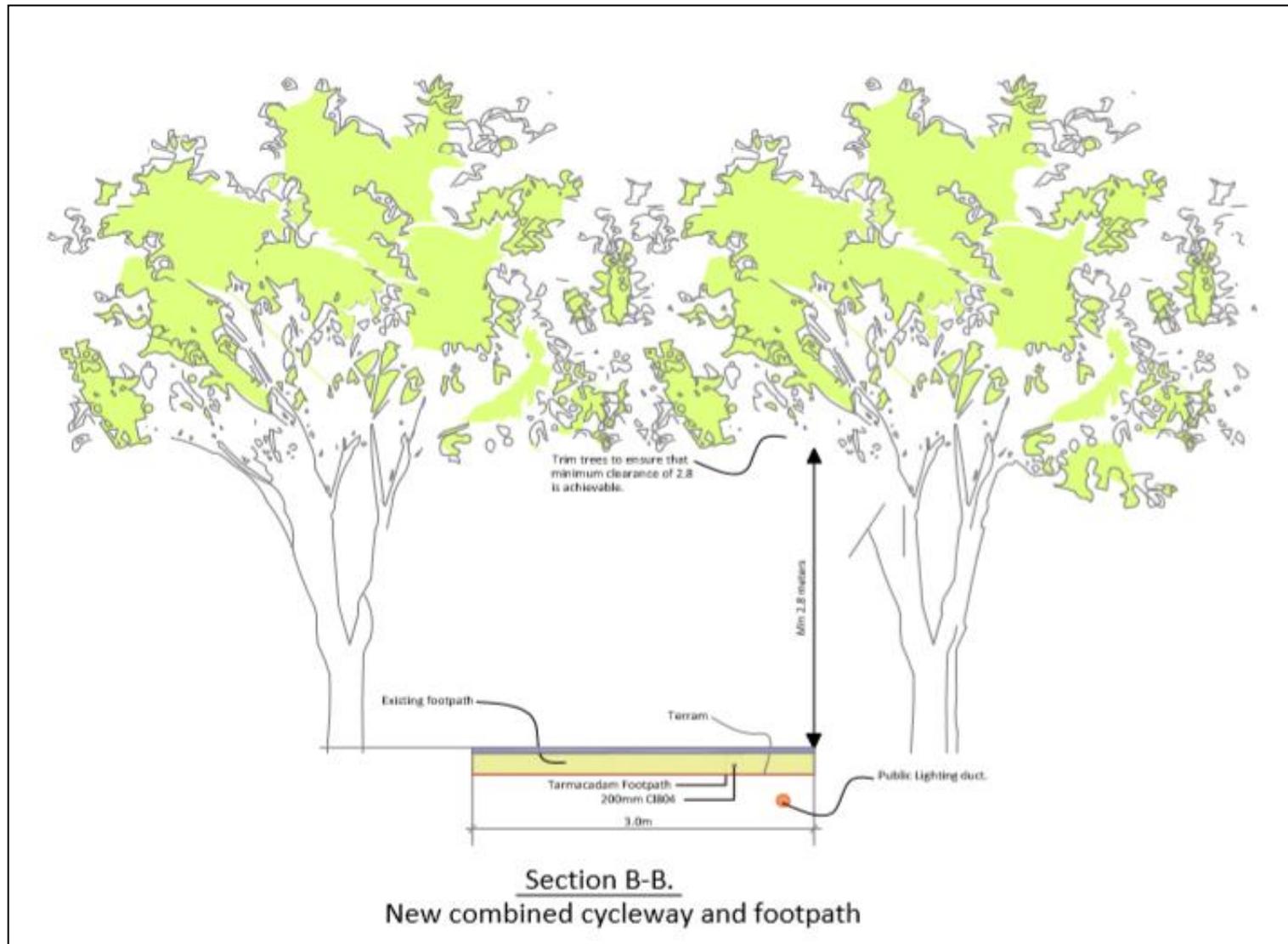
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Appendix 1: Map of Triogue Blueway



Appendix 2 Drawing: Section B-B Construction Build Up of the track along Phase 1 of the Scheme



Appendix 3 Bat Survey Technical Report

Bat Survey Report

for Phase 1, 2 and 3 of Triogue Blueway (Cycleway Scheme)



Prepared for

Laois County Council

23rd August 2020

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1. Introduction

1.1 Background

Dr Emma Boston was commissioned to carry out a bat survey for a proposed cycle way scheme known as the Triogue Blueway (Cycleway Scheme) (hereafter known as 'the proposed development'), located in Portlaoise, Co. Laois.

The scheme extends from the Ballyfin Road (western end) as far as the South Circular Road (eastern end) navigating through the urban environs of Portlaoise and through public parks, laneways (woodland sections) and existing road infrastructure for a total distance of approximately 2.6 km (refer to Figure 1; Appendix A). The proposed route is largely confined along existing road infrastructure and the built environment. Due to the diverse range of the receiving environment, the scheme will be split into 3 phases with the level of ecological investigations applied being appropriate to the surrounding environments. Phase 1 consists of works starting at the South Circular Road and finishing at Páirc an Phobail (or People's Park) where the proposed cycle track links to the existing footway. Phase 1 is largely concentrated within the Ridge of Portlaoise Proposed Natural Heritage Area (pNHA), an area of mixed broadleaved woodland and recolonising bare ground, mainly following an existing gravel track and laneway (Downs lane). Phase 2 extends from the end of Phase 1 at the Páirc an Phobail as far as Green Mill Lane Road and uses existing pathways and hardstanding. This phase runs adjacent to the River Triogue, navigating through urban road sections and along the River Triogue to the Linear Park. Phase 3 of the works runs through an urban environment between Green Mill Lane Road and Ballyfin Road along existing public carriageways.

1.2 Aims and Objectives

The aim of this survey was to:

- i. To determine bat activity within the environs of the proposed development and provide baseline information to inform the Ecological Impact Assessment (EclA);
- ii. Determine the ecological value of the habitats of the proposed development for bats;
- iii. To provide recommendations in relation to the project design to minimise any potential effects on bats.

2. Survey Methods

2.1 Field Survey

An assessment of the ecological value of habitats along the proposed development for roosting, foraging and commuting bats was assessed during a daytime walkover and Preliminary Roost Assessment (PRA) survey, followed by a nocturnal bat activity survey. The surveys were carried out following standard methodology in accordance with and the best practice guidelines published by the Bat Conservation Trust (BCT) (Collins, 2016).

2.1.1 Preliminary Roost Assessment

A ground level assessment of trees at sections concentrated along Phase 1, Phase 2 and Phase 3 of the cycle route was carried out on 01 August 2020. This survey focused on trees and built structures which have the potential to be impacted (earmarked for felling and demolition) as a result of widening existing pathways to accommodate the proposed route. This assessment was conducted

during daylight hours from ground level, using binoculars where necessary and identified any potential roost features or evidence of use by bats (e.g. droppings or staining). The results were used to grade any features as having Negligible, Low, Moderate, or High suitability for roosting bats in accordance with Bat Conservation Trust guidelines (Collins, 2016).

2.1.2 Bat Activity Survey

A bat activity transect was carried out on the 01 August 2020. The site was walked using a hand-held continuously recording bat detector to record echolocation calls of bats encountered along the route of the proposed development. The transect route is outline in Figure 1. Taking into consideration the length of the route, the transect was walked in two parts concentrated in habitats identified as potentially suitable to support foraging, commuting and roosting bats. The first part of the survey started at sunset 21:23 on the South Circular Road, passing through Phase 1 into Phase 2 as far as James Fintan Lalor Avenue, before returning to the start (refer to Figure 1). The second part of the survey began at the Old Portlaoise convent grounds (derelict site at present) off Ridge Road and continued from the Laois County Council car park to the end of River Triogue Linear Park and back, ending at 23:30 (refer to Figure 1).

A Batlogger M detector (Elekon, AG) was used. Upon hearing a bat, surveyors recorded the bat's location, the direction and height of the bat's flight and any notable behaviour (e.g. foraging or commuting) where possible. Recorded calls were analysed using Kaleidoscope Pro version 5.1.0 (Wildlife Acoustics, Inc.) software to confirm species identification in the field. In addition to observations on bat activity and behaviour, notes were made on the levels of illumination (public lighting/artificial lighting) along the transect.

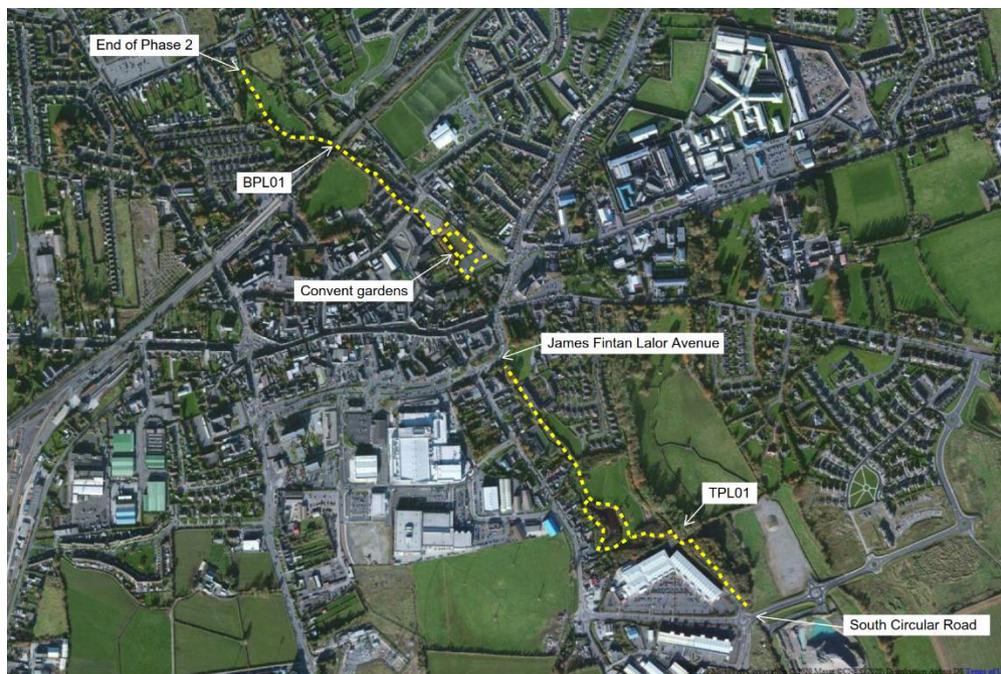


Figure 1 Walked bat activity transect and location of potential roost features (see Table 1)

2.2 Surveyor Experience

Bat surveys were led Dr Emma Boston, MRSB, MCIEEM with the assistance of Mark McDermott CSci. Emma has over 14 years' professional experience in the survey of bats for research, conservation and consultancy. Emma has expertise in using of a range of survey methods, techniques and

equipment, including acoustic call analysis. She has carried out bat surveys for small and large developments and infrastructure schemes and has been involved in many projects where she has had to design and prescribe specific mitigation for bats. She has held licences in Northern Ireland, the Republic of Ireland and Scotland to disturb or catch bats for development, education, and research purposes.

3. Results

3.1 Field Survey

3.1.1 Preliminary Roost Assessment

The results of the PRA are detailed in Table 1 and Figure 1. Of the trees surveyed, only one had suitable features for roosting bats, while suitable gaps were identified in the masonry of the railway bridge. In addition, four bat boxes were observed in the People's Park (Bat box 12, Lat: 53.0298361, Long: -7.2889436; Bat boxes 26 & 27, Lat: 53.0307890, Long: -7.2912234; Bat box 29, Lat: 53.0305261, Long: -7.2906052, See Figure 2). There were no obvious signs of use by bats noted during the PRA.

Table 1 Summary of the PRA

Item	Description	Assessment	Photographs
Mature horse-chestnut tree (TPL01) (Lat: 53.0292175, Long: -7.2864981) (See Figure 1)	Lifting bark along the length of the trunk creating a variety of crevices suitable for a small number of roosting bats.	Moderate suitability	
Railway bridge (BPL01) (Lat: 53.037928, Long: -7.2996626) (See Figure 1)	Railway bridge within the River Triogue Linear Park. Small number of crevices within the stone structure, suitable for one or two bats opportunistically.	Low suitability	

3.1.2 Bat Activity Survey

Survey details of the walked activity transect are summarised in Table 2.

Table 2 Bat survey details. Sunset time 01 August 2020 at 21:23.

Time	Temperature (°C)	Cloud cover (%)	Wind	Precipitation
Start: 21:23	14	50	Light breeze	Dry (Light shower at 22:06)
End: 23:30	12	30	Light breeze	Dry

Three bat species were identified during this survey, soprano pipistrelle *Pipistrellus pygmaeus*, common pipistrelle *Pipistrellus pipistrellus* and Leisler's bat *Nyctalus leisleri*. The transect began along Phase 1 of the scheme at sunset and returned through this section 50 minutes after sunset. No bats were recorded at sunset, while later in the evening common pipistrelle was recorded foraging along the pathway between the People Park and the Ridge of Portlaoise pNHA, and another at the beginning of the transect on the edge of Portlaoise Retail park (Figure 2).



Figure 2 Bat activity recorded at Phase 1 and Phase 2 (Pairc an Phobail (People's Park)). Common pipistrelle shown in green and soprano pipistrelle in red. Locations of bat boxes indicated by blue squares.

Within the Peoples Park, soprano pipistrelles were first heard at 15 minutes after sunset foraging around the lake, later joined by common pipistrelles at 20 minutes after sunset along the River Triogue (Figure 3).



Figure 3 Bat activity recorded at Phase 2 the People’s Park. Common pipistrelle shown in green and soprano pipistrelle in red.

Along the second section of the transect which began at the former convent grounds along Ridge Road, soprano pipistrelles were heard at a bridge over the River Triogue, and common pipistrelle foraging up and down the river at the entrance to the River Triogue Linear Park. (Figure 4).



Figure 4 Bat activity recorded Phase 2 at the former convent grounds to the River Triogue Linear Park. Common pipistrelle shown in green and soprano pipistrelle in red.

Continuing along the linear park both common and soprano pipistrelles were heard at intervals, and a single Leisler's bat was recorded commuting over the site at height (Figure 5).



Figure 5 Bat activity recorded Phase 2 along the River Triogue Linear Park. Common pipistrelle shown in green, soprano pipistrelle in red and Leisler's in blue.

4. Discussion

Three bat species were recorded along the proposed scheme, soprano pipistrelle, common pipistrelle and Leisler's bat. The pipistrelles were mainly observed foraging along the River Triogue, and within the two public parks, while only a single Leisler's bat was recorded commuting overhead. The earliest bats recorded during the survey were a soprano pipistrelle within the People's Park just after sunset, followed by common pipistrelle, suggesting that both species are likely roosting within the vicinity of the park, potentially using the bat boxes noted on site. A review of previous bat studies undertaken, including Pairc an Phobail (People's Park) and River Triogue recorded common pipistrelles, but also Daubenton's bat *Myotis daubentoni*, foraging over the water. The latter were not recorded during this survey, though it is possible that this species arrives to forage later, travelling from roosting sites further afield.

Bats are known to rely on visual clues (e.g. treelines, hedgerows) in addition to using echolocation for both commuting and foraging, and various studies have revealed that bat vision functions better in low light. Luminance can disrupt bat activity by interrupting vision. The current level of illumination varied along the route of the proposed scheme; however, given the species detected were all relatively light tolerant species this did not appear to impact on distribution.

Common and soprano pipistrelle were observed foraging in sections close to lighting, including along the edge of the Portlaoise Retail Park (Phase 1, Appendix 1) illuminated by flood lighting, and around

a light in the grounds of St. Francis School (Phase 2, Appendix 1) which backs onto the River Triogue. Common pipistrelles were also observed foraging at the first stretch of the Linear Park lined by streetlights. Nevertheless, there are stretches of the proposed scheme that are at present completely dark, including the mature woodland within the pNHA at Phase 1, the People's Park, and much of the path following the river as far as James Fintan Lalor Avenue, with the exception of some domestic lighting. Similarly, the stretch of the Linear Park path preceding the stone railway bridge, and within the open parkland up to Phase 3 were in complete darkness, only broken by an area illuminated from the railway tracks on the north-western side of the stone railway bridge.

4.1 Ecological Value of the Study Area

Overall the habitats on site, based on the field survey findings, are of local ecological importance for both commuting and foraging bats (IEEM, 2006; Wray et. Al, 2020). The River Triogue in particular is an important corridor which traverses Portlaoise town connecting to the agricultural landscape beyond. In this study we found they are used by moderate numbers of relatively common bat species, however, Daubenton's bat have been recorded during previous studies. The findings suggest there may be roosting habitat for soprano and common pipistrelles within the vicinity of the proposed route, but no significant roosting features were noted during the survey, with the exception of the bat boxes erected in People's Park. As such, the implications of this proposed development on local roosting bat populations are small scale, while there could be moderate scale implications to local populations of bats which utilise this river corridor and parkland as a commuting route or as foraging habitat.

4.2 Proposed Development

To facilitate the construction of the 3m cycle pathway through Phase 1 of the proposed development the removal of deadwood and the felling of a number trees within the mature woodland of the Ridge of Portlaoise pNHA will be required, while along Phase 2 the existing path is to be widened necessitating the pruning or removal of trees at sections.

Bats and their roosts are protected by law, under the Wildlife Act 1976 (as amended), as such it is an offence to disturb, injure or kill bats or disturb or destroy bat roosts. While no bat roosts were identified during this survey, four bat boxes were noted along the footprint of the proposed development, which should be considered potential bat roosts, along with the mature house chestnut tree (TPL01, Figure 1) identified during the PRA. If this tree, along with the four bat boxes are to be impacted by the construction of the new cycleway, then further bat surveys must be conducted to determine the presence/likely absence of roosting bats. This too applies should any works be proposed at the stone railway bridge (BPL01, Figure 1), in particular the repointing of masonry, a bat survey must be conducted to ensure the crevices identified are not used by roosting bats.

The installation of public lighting is proposed along Phases 1 and 2 of this scheme, parts of which are not currently illuminated. Given the potential for increased illumination to disrupt bat activity, in order to maintain the quality of this habitat for both foraging and commuting bats, in particular for less light tolerant species such as the Daubenton's bat, it is recommended that the public lighting is designed in such a way as to minimise the impact on bats.

5. Recommendations

The proposed public lighting should be designed to minimise light spill on to habitat features, such as the River Triogue or the bat boxes present on site, and concentrate artificial light only where required. Where public lighting is to be installed along the proposed scheme, the following recommendations are proposed (following BCT 2009, ILP 2011):

- Lighting should be minimised wherever possible in terms of number of lights, the power of the lights (lux level), as well as the UV content. Using powerful lighting on wildlife corridors can, for some species, effectively sever connectivity; and
- Directional lighting, facing and located away from the surrounding vegetation should be used, e.g. the use of hoods, cowls.

In addition to measures to avoid impacts, there is opportunity for ecological enhancement for bats as part of the proposed development. Given lack of roosting opportunities available to local bat populations at present, the addition of bat boxes, in a variety of designs suitable for bats with differing roosting habits could be installed on mature trees within the Ridge of Portlaoise pNHA, the Peoples Park and River Triogue Linear Park to supplement those already present.

Bat boxes should be installed on mature trees, positioned to face south, south east, or south west and at heights no less than 4m above ground level. Suitably experienced ecologists must oversee the installation of the boxes. All personnel should wear gloves to reduce transmission of human pheromones, which may reduce or delay uptake of boxes by bats.

Bat boxes are available commercially from a variety of suitable outlets (eg. NHBS website <http://www.nhbs.com>).

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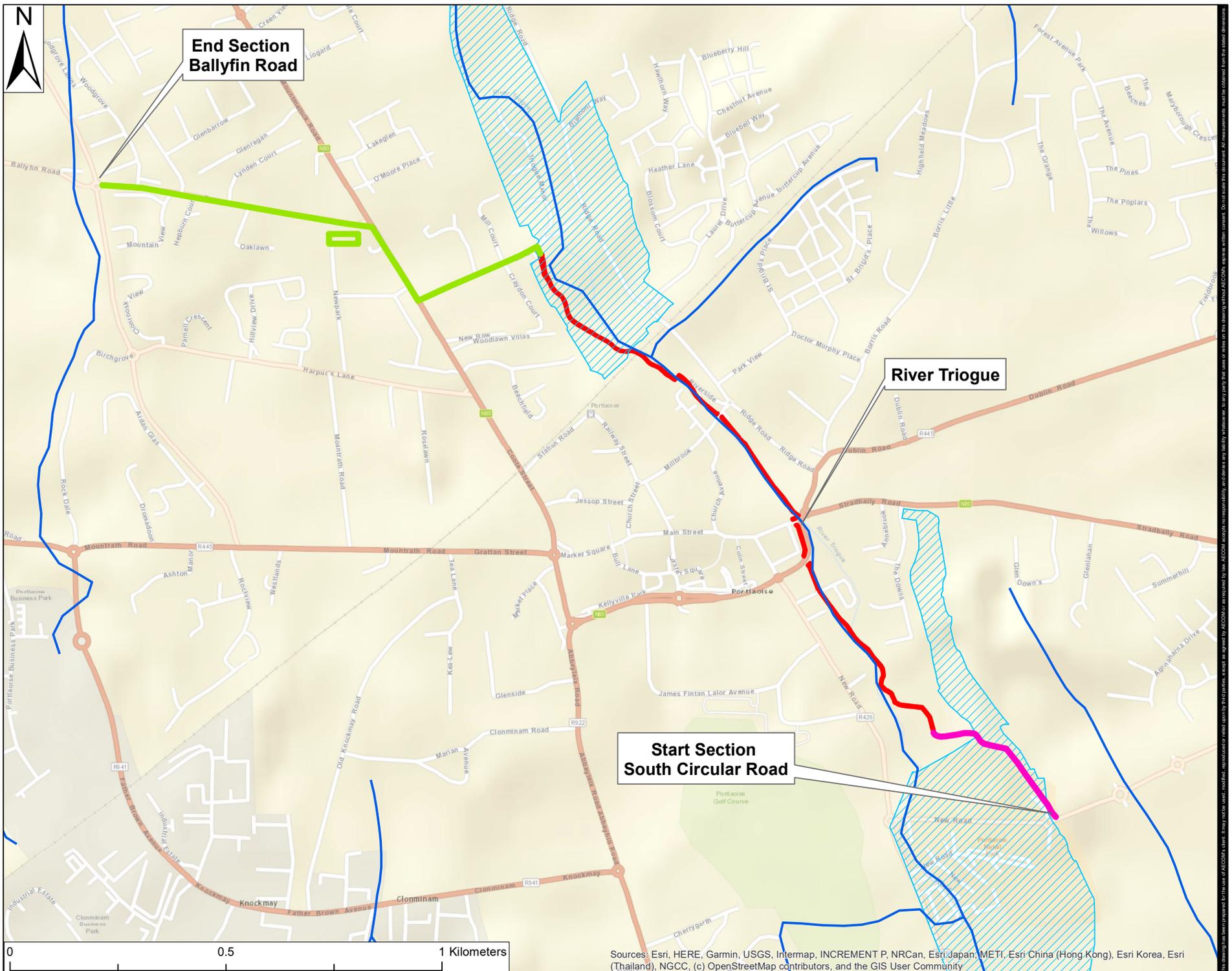
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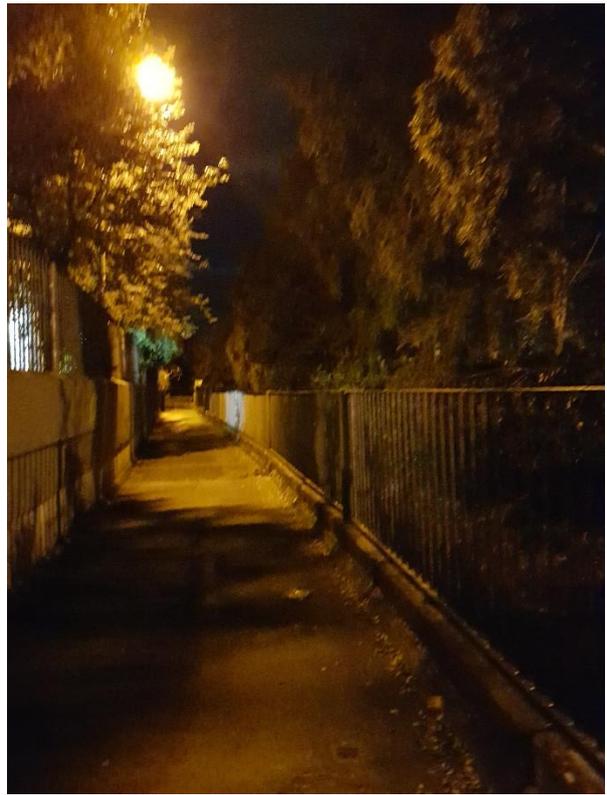
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Appendix A Triogue Blueway Phase 1, Phase 2, Phase 3



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Appendix B Photographs



Photographs 1 and 2 Street lighting at Rankins Wood, and along the path at River Triogue Linear Park.

Appendix 4 Ecological Evaluation Criteria (NRA, 2009)

Ecological valuation: Examples
<p>International Importance:</p> <ul style="list-style-type: none"> <input type="checkbox"/> 'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation. <input type="checkbox"/> Proposed Special Protection Area (pSPA). <input type="checkbox"/> Site that fulfills the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended). <input type="checkbox"/> Features essential to maintaining the coherence of the Natura 2000 Network.⁴ <input type="checkbox"/> Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive. <input type="checkbox"/> Resident or regularly occurring populations (assessed to be important at the national level)⁵ of the following: <ul style="list-style-type: none"> <input type="checkbox"/> Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or <input type="checkbox"/> Species of animal and plants listed in Annex II and/or IV of the Habitats Directive. <input type="checkbox"/> Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971). <input type="checkbox"/> World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972). <input type="checkbox"/> Biosphere Reserve (UNESCO Man & The Biosphere Programme). <input type="checkbox"/> Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979). <input type="checkbox"/> Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979). <input type="checkbox"/> Biogenetic Reserve under the Council of Europe. <input type="checkbox"/> European Diploma Site under the Council of Europe. <input type="checkbox"/> Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).⁶
<p>National Importance:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Site designated or proposed as a Natural Heritage Area (NHA). <input type="checkbox"/> Statutory Nature Reserve. <input type="checkbox"/> Refuge for Fauna and Flora protected under the Wildlife Acts. <input type="checkbox"/> National Park. <input type="checkbox"/> Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park. <input type="checkbox"/> Resident or regularly occurring populations (assessed to be important at the national level)⁷ of the following: <ul style="list-style-type: none"> <input type="checkbox"/> Species protected under the Wildlife Acts; and/or <input type="checkbox"/> Species listed on the relevant Red Data list. <input type="checkbox"/> Site containing 'viable areas'⁸ of the habitat types listed in Annex I of the Habitats Directive.

County Importance:

- Area of Special Amenity.⁹
- 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 important populations of species, or viable areas of semi-natural habitats or natural heritage features identified in the National or Local BAP;¹¹ 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 Importance (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)¹² 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 Importance (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.

Appendix 5 NPWS Site Synopsis: Ridge of Portlaoise pNHA (000876)

SITE SYNOPSIS

SITE NAME: RIDGE OF PORTLAOISE

SITE CODE: 000876

The ridge of Portlaoise is an elongated raised ridge or esker formed of sand and gravel which was deposited when a mass of ice covered this area during the last period of glaciation. The esker runs through the eastern part of Portlaoise town and extends in a south-south-east to north-north-west direction. North of the town, the secondary road to Mountmellick runs along the top of the ridge, while south of Portlaoise the L26 road to Timahoe runs alongside it.

Much of the esker is wooded. In the southern part, Scots Pine (*Pinus sylvestris*) and Beech (*Fagus sylvatica*) form the canopy. Elsewhere, multi-stemmed Hazel (*Corylus avellana*) and/or Ash (*Fraxinus excelsior*) predominate, with a range of other native species, for example Wych Elm (*Ulmus glabra*), Elder (*Sambucus nigra*), Holly (*Ilex aquifolium*) and Hawthorn (*Crataegus monogyna*) occasionally present. Ground flora beneath the woodland canopy includes Wood Melic (*Melica uniflora*), Sanicle (*Sanicula europaea*), Bluebell (*Hyacinthoides non-scripta*), with a range of ferns such as Hart's-tongue (*Phyllitis scolopendrium*) and grasses including False Brome (*Brachypodium sylvaticum*).

Open grassland on the esker is calcareous and typically species-rich. Quaking-grass (*Briza media*), Crested Dog's-tail (*Cynosurus cristatus*) and Cock's-foot (*Dactylis glomerata*) are among the grasses which predominate. Herbs present include Yarrow (*Achillea millefolium*), Pignut (*Conopodium majus*) and Common Bird's-foot-trefoil (*Lotus corniculatus*).

There are a number of disused gravel pits located along the length of the esker which are assessed by means of old trackways. All of these add habitat diversity to the site.

Nettle-leaved Bellflower (*Campanula trachelium*) is a rare species which is legally protected under the Flora Protection Order of 1987. This plant has been recently recorded on this site – a new station for the species. Elsewhere in Ireland it is virtually confined to the south-east of the country, and has been reported from only three sites since 1970. Another rare plant, listed in the Red Data Book, Blue Fleabane (*Erigeron acer*), occurs in disused gravel pits within the site. It is a plant of eskers, dry grassland, sandy pastures and walls (especially on calcium-rich substrates) and has been recorded from only five 10km squares since 1970.

Light grazing by cattle/sheep is not necessarily incompatible with conservation of esker habitats although overgrazing can result in a lack of tree regeneration and damage to ground flora.

Eskers are under increasing threat in Ireland, due to the demand for sand and gravel for the construction industry. Of the few eskers which have survived, only a small percentage retain their semi-natural flora of woodland and this is one of the best

examples of esker in Co. Laois, along with those at Timahoe (000421) to the south-east and Clonaslee (000859), to the north-west. The ridge of Portlaoise also has two rare plants, one of which is protected under the Flora Protection Order.

9.12.2009

Appendix 6 Plant Species List (Phase 1)

Common Name	Scientific Name	Conservation Status (Wyse Jackson et al., 2016; Annex II EU Habitats Directive).
Trees		
Sycamore	<i>Acer pseudoplanatus</i>	
Downy birch	<i>Betula pubescens</i>	
Sweet chestnut	<i>Castanea sativa</i>	
Hazel	<i>Corylus avellana</i>	
Hawthorn	<i>Crataegus monogyna</i>	
Beech	<i>Fagus sylvatica</i>	
Ash	<i>Fraxinus excelsior</i>	
Holly	<i>Ilex aquifolium</i>	
Larch sp.	<i>Larix sp.</i>	
Scots Pine	<i>Pinus sylvestris</i>	
Aspen	<i>Populus tremula</i>	
Sessile oak	<i>Quercus petraea</i>	
Willow sp.	<i>Salix sp.</i>	
Elder	<i>Sambucus nigra</i>	
Flowering Plants		
Yarrow	<i>Achillea millefolium</i>	
Pyramidal orchid	<i>Anacamptis pyramidalis</i>	Least Concern (Wyse Jackson et al., 2016)
Wild angelica	<i>Angelica sylvestris</i>	
Lords-and-ladies	<i>Arum maculatum</i>	
Hart's-tongue fern	<i>Asplenium scolopendrium</i>	
Hard fern	<i>Blechnum spicant</i>	
Knapweed	<i>Centaurea nigra</i>	
Common Knapweed	<i>Centaurea nigra</i>	
Centauray	<i>Centaurium erythraea</i>	
Spear thistle	<i>Cirsium vulgare</i>	
Pignut	<i>conopodium majus</i>	

Common Name	Scientific Name	Conservation Status (Wyse Jackson et al., 2016; Annex II EU Habitats Directive).
Cock's foot	<i>Dactylis glomerata</i>	
Field horsetail	<i>Equisetum arvense</i>	
Blue fleabane	<i>Erigeron acer</i>	Least Concern (Wyse Jackson et al., 2016)
Meadow sweet	<i>Filipendula ulmaria</i>	
Cleavers	<i>Galium aparine</i>	
Herb Robert	<i>Geranium robertianum</i>	
Ivy	<i>Hedera helix</i>	
Atlantic Ivy	<i>Hedera hibernica</i>	
Yorkshire fog	<i>Holcus lanatus</i>	
Bluebell	<i>Hyanthoides non-scripta</i>	
Perforate St. John's-wort	<i>Hypericum perforatum</i>	
Cat's-ear	<i>Hypochoeris radicata</i>	
Ornamental holly "Golden King"	<i>Ilex altaclerensis</i>	
Holly	<i>Ilex aquifolium</i>	
Common ragwort	<i>Jacobaea vulgaris</i>	
Field scabious	<i>Knautia arvensis</i>	
Ox-eye daisy	<i>Leucanthemum vulgare</i>	
Golden privet	<i>Ligustrum oval</i>	
Fairy flax	<i>Linum catharticum</i>	
Honeysuckle	<i>Lonicera periclymenum</i>	
Bird's-foot trefoil	<i>Lotus corniculatus</i>	
Daffodil sp.	<i>Narcissus sp.</i>	
Bee orchid	<i>Orphys apifera</i>	Least Concern (Wyse Jackson et al., 2016)
Red robin	<i>Photinia fraseri</i>	
Bamboo sp.	<i>Phyllostachys sp.</i>	
Ribwort plantain	<i>Plantago lanceolata</i>	
Self-heal	<i>Prunella vulgaris</i>	
Cherry laurel	<i>Prunus laurocerasus</i>	

Common Name	Scientific Name	Conservation Status (Wyse Jackson et al., 2016; Annex II EU Habitats Directive).
Lesser celandine	<i>Ranunculus ficaria</i>	
Japanese rose	<i>Rosa rugosa</i>	
Bramble	<i>Rubus fruticosus agg.</i>	
Sanicle	<i>Sanicula europaea</i>	
Bittersweet	<i>Solanum dulcamara</i>	
Red clover	<i>Trifolium pratense</i>	
Colt's-foot	<i>Tussilago farfara</i>	
Common gorse	<i>Ulex europaeus</i>	
common nettle	<i>Urtica dioica</i>	
Bush vetch	<i>Vicia sepium</i>	
Common dog-violet	<i>Viola riviniana</i>	

Appendix 7 Plates



Plate 1: Ornamental / non-native shrub (WS3) and scrub (WS1) occur adjacent to the south circular road at the eastern section of phase 1. This area occurs near Portlaoise Retail Park.



Plate 2: Dry calcareous and neutral grassland (GS1) and recolonising bare ground (ED3) mosaic. A path traverses this habitat which leads to Down's Lane. This habitat partially overlaps the Ridge of Portlaoise pNHA. Blue fleabane and pyramidal orchid were recorded at this location.

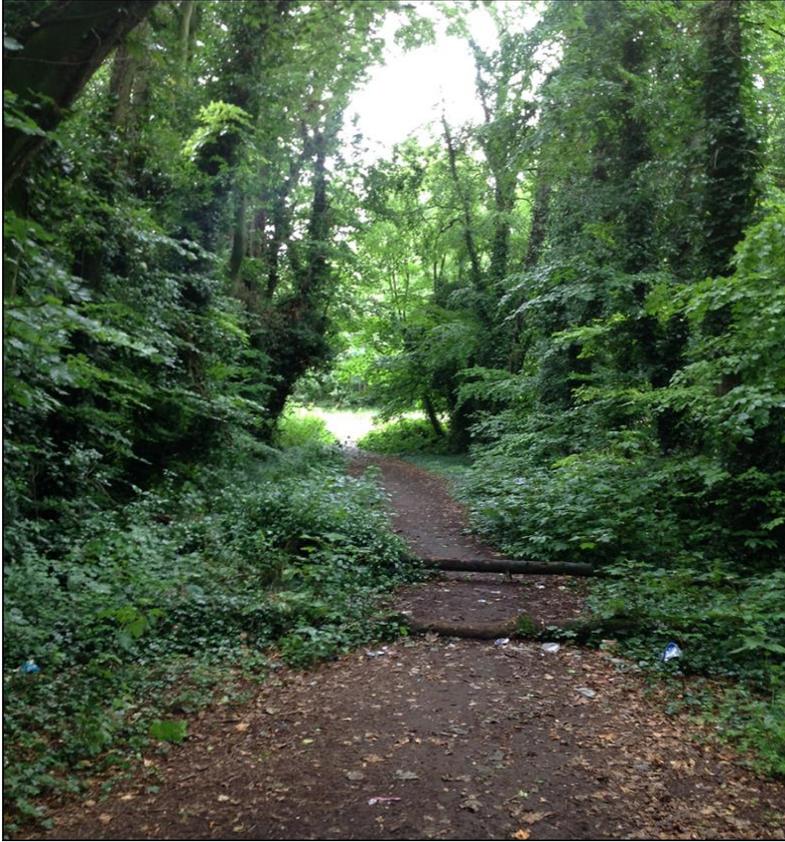


Plate 3: Mixed broadleaved woodland located at "Down's Lane" with wind-blown trees. The cycle track will be constructed on the existing laneway. This section of the scheme lies with the Ridge of Portlaoise pNHA.

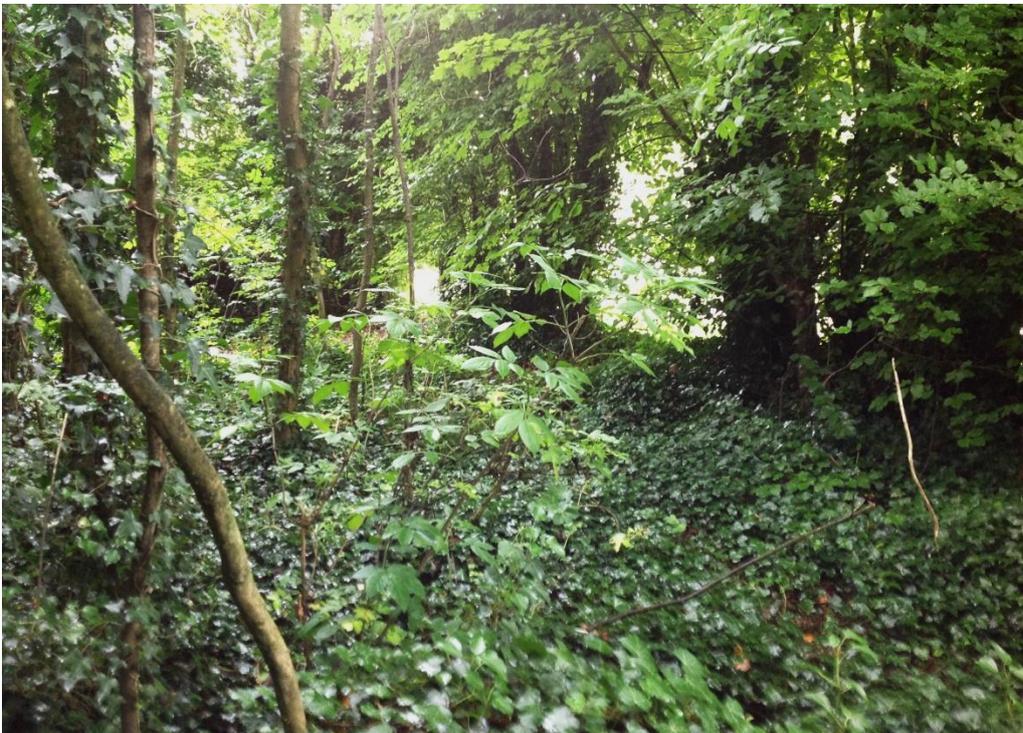


Plate 4: There will be a requirement for some tree felling (mostly beech in mixed broadleaved woodland) within a localised section of the Ridge of Portlaoise pNHA located off Down's Lane.



Plate 5: A gravel path comprising spoil and bare ground (ED2) with grass verges (GS2) links the an area of mixed broadleaved woodland at Down Lane (Ridge of Portlaoise pNHA) to an area of semi-mature mixed broadleaved woodland adjacent to Pairc an Phobail (People's Park).

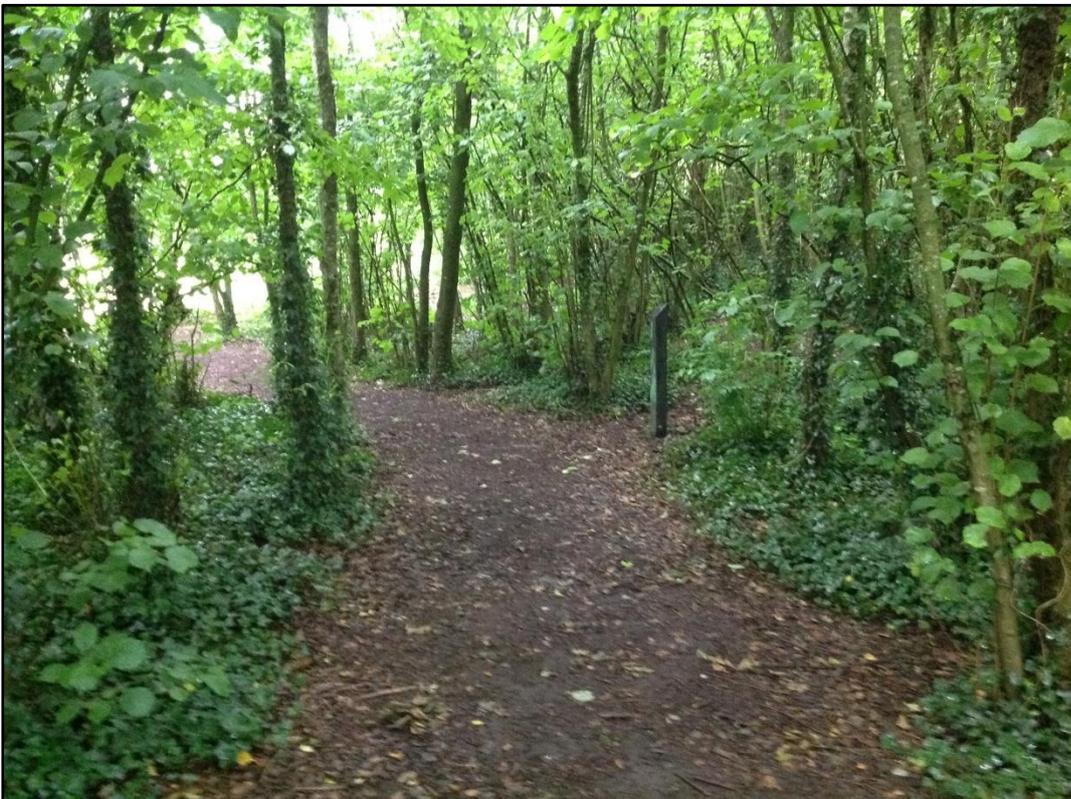


Plate 6: Semi-mature mixed broadleaved woodland adjacent to Pairc an Phobail (People's Park) which comprises beech, hazel and sessile oak. The proposed cycleway will require tree felling to facilitate construction of the cycle track.



Plate 7: Blue fleabane recorded on dry calcareous and neutral grassland (GS1) and Recolonising bare ground (ED3) at the eastern section of Phase 1



Plate 8: Pyramidal Orchid was recorded outside the proposed development footprint.

There is evidence of scrub encroachment onto areas of dry calcareous and neutral Grassland at the eastern section of Phase 1.