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ENVIRONMENTAL CONSULTANTS

Ecological Impact Assessment Report

Tyrrell's Land, Portlaoise, Co. Laois

Van Dijk Architects

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1 Introduction

Flynn Furney Environmental Consultants (FFEC) has been appointed to prepare an Ecological Impact Assessment (EclA) for the proposed residential development on a greenfield site on the Stradbally Road in Portlaoise, Co. Laois. A series of surveys were carried out in April 2026 to investigate whether any protected and important habitats and/or species are likely to be impacted by the proposed development.

This assessment aims to:

- Establish baseline ecological data for the proposed development site.
- Determine the ecological value of the identified ecological features.
- Assess the impact of the proposed development on ecological features of value (biodiversity).
- Apply mitigation measures to avoid, reduce, remedy or compensate impacts; and
Identify any residual impacts after mitigation and compensation.

This report presents the methodology and findings of the assessment, along with the mitigation that is proposed to reduce ecological impacts, where relevant.

NB: Due to suboptimal survey timings, this report is issued as a draft to be updated when further assessments, namely bat surveys and lighting impact (which depend on bat survey data), have been carried out. Bat surveys are scheduled for early May, weather depending.

1.1 Statement of Authority

Flynn Furney Environmental Consultants has 20-plus years of experience in ecological surveying and management. We have detailed knowledge of the principles and implementation of both Irish and European environmental legislation. We have worked closely with statutory bodies on habitat management and protection projects, including the National Parks and Wildlife Service and Waterways Ireland. Other expertise includes Ecological Impact Assessment, Habitat and Floral Surveys, Bird Surveying, Bat Surveying, and Fish and Waterways Surveys.

Field and desk surveys were conducted by Christopher Doyle (B.Sc., PGDip.) and Ashley Maggy (B.A., M.Sc.), with support from Meabh Convery (BSc.) and Juliette O'Flaherty (BSc.) in April 2026. This report has been prepared by the above and has been reviewed by Billy Flynn (BSc., MSc.)

Christopher Doyle is an ecologist with Flynn Furney Environmental Consultants. He holds a bachelor's degree in applied plant sciences from University College Cork (2019) and a post graduate diploma in bioeconomy with business from Munster Technological University (2021) and over the past 6 years has developed significant experience in appropriate assessment, ecological impact assessment, biodiversity auditing, habitat and species surveying, ecological clerk of works (ECoW) and invasive non-native species (INNS) management.

Ashley Maggy (MSc, BA, AAS) is an Ecologist with Flynn Furney Environmental Consultants. She holds a master's degree in biodiversity and conservation from Trinity College Dublin (2024) and has experience across a broad range of ecological projects in Ireland, including conservation management, biodiversity planning, and environmental assessments for infrastructure and development projects. Before joining

Flynn Furney Environmental Consultants, Ashley worked as a researcher with the New York State Department of Environmental Conservation, studying the ecological impacts of outdoor recreation, and as a Science Communications Officer with Centre ValBio Research Station in Madagascar.

Billy Flynn is a Chartered Ecologist and Environmental Scientist with around 30 years' experience in ecological survey and impact assessment.

1.2 Outline of the Site Location and Proposed Works

Tyrell's Land is a green field site accessible via Stradbally Road, Co. Portlaoise. The proposed development plan involves the construction of 67no. residential units, (consisting of 11no. 2-bedroom housing units, 31no. 3-bedroom housing units, 4no. 4-bedroom housing units, and 6no. 1-bedroom apartment units, 11no. 2-bedroom apartment units, and 4no. 3-bedroom apartment units) The development will see the construction of two new access points one at the north of the site and one at the south of the site.

The development will also include the provision of public open space, public walk-way along east boundary, flood defence infrastructure, public lighting, upgraded vehicular access along the Stradbally Road, 116 no. car parking spaces including both in-curtilage and on street parking, (includes required accessible parking space and EV charging spaces), cycle parking, boundary treatments, ESB Substation, laying of underground sewers, watermains and pipes, attenuation, the importation of soil and stone as by product for engineering and landscaping purposes within the development and all associated ancillary works including site development works, and hard and soft landscaping.

1.3 European Legislation on Biodiversity Conservation

1.3.1 Council Directive on the conservation of Natural Habitats of Wild Fauna and Flora

1.3.1.1 92/43/EEC- The Habitats Directive

The main aim of the Directive is to promote the maintenance of biodiversity through the conservation of natural habitats and wild species listed on the Annexes of the Directive. Member States are required to take measures to maintain or restore, at a favourable conservation status, biodiversity, whilst taking account of economic, social, cultural requirements and regional and local characteristics.

It gives effect to site and species protection measures through the establishment of the Natura 2000 network and designation of European Sites, including Special Areas of Conservation (SAC) and Special Protected Areas (SPA). It also establishes a list of species (other than birds) whose habitats must be protected to secure their survival. These priority species and habitats are subject to a higher level of protection.

The Directive also requires appropriate assessment of any plan or project not directly connected with or necessary to the management of a European Site, but likely to have significant effects upon a European site, either individually or in combination with other plans or projects.

1.3.2 Council Directive on the Conservation of Wild Birds

1.3.2.1 2009/147/EC- The Birds Directive

The Directive provides a framework for the conservation and management of, and human interactions with, wild birds in Europe. It makes provisions for the maintenance of the wild bird populations across their natural range; conserves the habitats for rare or vulnerable species listed in Annex I and of migratory species through the classification of SPAs and provides protection for all wild birds.

1.4 Irish Legislation on Biodiversity Conservation

1.4.1 The European Communities

1.4.1.1 (Birds and Natural Habitats) (Amendment) Regulations 2015 S.I. No. 355 of 2015

The European Communities (Birds and Natural Habitats) (Amendment) Regulations provides that the following shall be construed together as one:

- Wildlife Act 1976
- Wildlife (Amendment) Acts of 2000, 2010, 2012 and 2023
- European Communities (Birds and Natural Habitats) (Restrictions of the Use of Poison Bait) Regulations 2010
- European Communities (Birds and Natural Habitats) Regulations 2011
- European Communities (Birds and Natural Habitats) (Amendment) Regulations of 2013, 2015
- Wildlife Amendment Bill 2016 (proposed legislation)

1.4.2 European communities (Birds and Natural Habitats)

1.4.2.1 Regulations 2011 to 2015

The Regulations give effect to requirements relating to the designation of protected sites under the Birds Directive and Habitats Directive. The Regulations provide for the protection and management of European Sites and place obligations on all public authorities to have regard to the requirements of the Habitats Directive beyond the realms of planning related consents issued under the Planning and Development Act (the PDA) 2000, as amended. The Regulations also provide for the protection of species of European importance.

1.4.2.2 Wildlife Acts 1976 to 2023

The Acts provide for *inter alia* the protection of wildlife. The Acts prohibit the intentional killing, taking or injuring of certain wild birds or wild animals; or the intentional destruction, uprooting or picking of certain wild plants.

The basic designation for wildlife is the Natural Heritage Area (NHA). This is an area considered important for the habitats present or which holds species of plants and animals whose habitat needs protection. To date, 75 raised bogs have been given legal protection, covering some 23,000 hectares. These raised bogs are located mainly in the midlands. A further 73 blanket bogs, covering 37,000ha, mostly in western areas are also designated as NHAs.

The Geological Survey of Ireland (GSI) is compiling a list of geological/geomorphological sites in need of protection through NHA designation. A committee of expert geologists provides an initial list of sites which then undergo a process of survey, reporting and review, to provide recommendations regarding NHA status or otherwise. The GSI has completed its list of karst (i.e. exposed limestone) and early fossil sites.

In addition, there are 630 proposed NHAs (pNHAs), which were published on a non-statutory basis in 1995, but have not since been statutorily proposed or designated. These sites are of significance for wildlife and habitats. Some of the pNHAs are tiny, such as a roosting place for rare bats. Others are large

- a woodland or a lake, for example. The pNHAs cover approximately 65,000ha and designation will proceed on a phased basis over the coming years.

Under the Wildlife Amendment Act (2000) , NHAs are legally protected from damage from the date they are formally proposed for designation.

1.4.2.3 Wildlife Amendment Bill 2016

The purpose of the Bill is to provide for the implementation of a reconfiguration of the Raised Bog Natural Heritage Area Network arising from (i) the proposals from the Review of Raised Bog Natural Heritage Area Network published in January 2014; (ii) an assessment of the effects on the environment of the proposals arising from the Review and, if required, any other screening for an assessment or as the case may be, assessment, including public consultation undertaken and (iii) observations or submissions received during the course of public consultation.

Taken as a whole, nature conservation legislation is of key importance in undertaking an EclA for proposed development as it shapes planning policy.

2 Methodologies

2.1 Desk Study

Prior to the main fieldwork for this assessment, a desktop survey of available information sources was conducted. These included:

- The National Biodiversity Data Centre Online Database
- The National Biodiversity Network Online Atlas
- The OSI Geohive Database
- The NPWS Protected Species Database and Online Mapping
- The Environmental Protection Agency Database and;
- The EPA Water Quality in Ireland Report

Designated sites were identified using the current boundary shapefiles (SAC 2023, SPA 2023, NHA 2019/06, pNHA 2015), downloaded from the NPWS website. Other online mapping reviewed included Geohive maps, All Ireland Wetland Survey maps, aerial photography, and EPA shapefile datasets. Habitat mapping reviewed included the Irish Semi-Natural Grassland Surveys (ISGS), the National Survey of Native Woodland (NSNW) and the Ancient and long-established Woodland (NPWS shapefiles). Desk research also included a review of records available through the National Biodiversity Data Centre mapping system.

2.2 Zone of Influence

Following the guidance set out by the NRA (2009b), the proposed development has been evaluated based on an identified zone of influence (ZOI) concerning the potential impact pathways to ecological features (habitats, flora and fauna). The ZOI for terrestrial habitats is limited to the footprint of the proposed development. Hydrological linkages between the proposed development and aquatic habitats/species can occur over significant distances; however, the significance of the impact will be site-specific depending on the receiving water environment and nature of the potential impact. Adopting a precautionary approach, the distance over which surface water discharges could have a significant impact on receiving watercourses is considered to extend downstream of the proposed development site to the Irish Sea. The ZOI for significant impacts to breeding birds is considered to extend no more than 100 m from the proposed development to take account of disturbance during construction. The ZOI for mammals such as bats, badgers and otters will be specific to each species and may extend over larger distances due to the fact that they can commute and forage many kilometres from their breeding sites. More detailed ZOIs will be established on a species-to-species basis.

2.3 Field Surveys

Field work for this survey was carried out in October 2025. The primary aims of the field surveys were to:

- Identify habitat types within the study area
- Assess for the presence of protected species of flora and fauna
- Identify ecological and environmental constraints to the construction of this urban development
- Identify ecological sensitivities around and within the study area
- Identify any protected fauna species that may be present.

These surveys considered a broad survey area to ensure all other important features that could be impacted by the development due to connectivity to the proposed development site were considered. These included significant treelines and hedgerows, mammal paths, streams and other watercourses feeding and surrounding parts of the application site. General habitat mapping was carried out per the guidelines given by Smith *et al.* (2011) and was classified according to *A Guide to Habitats in Ireland* (Fossitt, 2000). Mammal survey methodology followed NRA (2008) and NRA (2005), and the bat survey and the classification of bat roost potential methodology followed Collins (2023).

2.3.1 Ecological Constraints or Limitations

The surveys were carried out during April and May 2026, which is a very suitable period for identifying many plant species, surveying for bat activity and survey for mammals.

2.4 Ecological Impact Assessment Methodology

This ecological impact assessment has been prepared in accordance with relevant legislation and best practice guidance, including:

- The Chartered Institute of Ecology and Environmental Management Guidelines for Ecological Impact Assessment in the UK and Ireland: terrestrial, freshwater and Coastal 2nd Edition. CIEEM (2018).
- The EPA's Draft Advice Notes on Preparing Environmental Impact Statements (EPA, 2015a).
- The EPA's Draft Revised guidelines on Information to be Contained in Environmental Impact Statements (EPA, 2015b).
- Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009).

Ecological features (habitats and species) were evaluated for their conservation importance according to the National Roads Authority's scheme (NRA 2009). For habitats or species, the significance of effects was assessed with reference to their conservation status, abundance and distribution. Description of significant effects follows guidance outlined in the EPA Draft Revised Guidelines on the Information to be Contained in EIS (EPA, 2015b). The term 'significant effect' as used in this report follows guidance (CIEEM, 2018) and is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general. In the case of designated sites, a significant negative effect would undermine the conservation objectives and targets for that site. The significance of impacts on habitats was determined with reference to the value of the feature being affected and the magnitude of the impact. Impacts are considered ecologically significant at a stated geographic scale, usually the ZOI of the project, or are considered not significant.

2.4.1 Introduction and Context

The impacts which may be expected from the development of the proposed residential area are assessed below. These possible impacts have been assessed under the CIEEM (2018) and the National Roads

Authority guidelines (NRA, 2006). Criteria for assessment of duration of impacts used (EPA 2002). These guides assess the impact significance upon features of sites proposed for works. Impact significance must be given in the context of their respective ecological value of the site and features under study.

2.4.2 Assessing Ecological Value

The ecological value of an area or feature is defined with reference to geographical context. That is, whether it is of value locally, regionally, nationally or internationally. This is assessed by ecologists on reviewing survey outcomes. Key criteria are the presence of designated sites, the site or feature containing protected species or areas of high biodiversity. The criteria for ecological value are given in Table 1.

Table 1: Ecological Value Criteria.

Ecological Value	Criteria
International	- Natura 2000 Sites including Special Areas of Conservation (SAC) & Special Protection Areas (SPA). - Sites that satisfy the criteria for designation as a Natura 2000 Site (see Annex III of the Habitats Directive, as amended). - Features essential to maintaining the coherence of the Natura 2000 Network. Sites containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive. - Resident or regularly occurring populations (assessed to be important at the national level) of the following: - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive. Ramsar Sites - World Heritage Sites (Convention for the Protection of World Cultural & Natural Heritage, 1972). - Sites hosting significant species populations under the Bonn Convention - Sites hosting significant populations under the Berne Convention
National	- Areas of Special Scientific Interest (ASSI) or Natural Heritage Area (NHA). - National Nature Reserves (NNR). - Marine Nature Reserves (MNR). - Area of Outstanding Natural Beauty (AONB). - Refuge for species protected under the Wildlife (Northern Ireland) Order 1985 (as amended). - Undesignated sites fulfilling the criteria for designation as an ASSI; NNR; MNR; and/or refuge for species protected under the Wildlife (Northern Ireland) Order 1985 (as amended). - Resident or regularly occurring populations (important at the national level) of the following: - Species protected under Wildlife (Northern Ireland) Order 1985 or Wildlife Act 1976, as amended); and/or - Species listed on the relevant Red Data list. - Sites containing 'viable areas' of the habitat types listed in Annex I of the Habitats Directive.

Regional	• Sites of Local Nature Conservation Importance (SLNCI). Areas subject to a Tree Preservation Order. • Resident or regularly occurring populations (assessed to be important at the Regional level) of the following: • Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive. • Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; Species protected under the Wildlife (Northern Ireland) Order 1985 (as amended); and/or • Species listed on the relevant Red Data list. • Sites containing areas of the habitat types listed in Annex I of the Habitats Directive that do not satisfy the criteria for valuation as of International or National importance. • Regionally important populations of species or viable areas of semi-natural habitats or natural heritage features identified in the National or Local Biodiversity Action Plan (BAP), if this have been prepared. • Sites containing semi-natural habitat types with high biodiversity in a regional context and a high degree of naturalness, or populations of species that are uncommon within the region. • Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.
Local	• Locally important populations of priority species or habitats or features of natural heritage importance identified in the Local BAP, if this has been prepared; Resident or regularly occurring populations (assessed to be important at the Local level) of the following: • Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; • Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; Species protected under the Wildlife (Northern Ireland) Order 1985 (as amended); and/or • Species listed on the relevant Red Data list 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; • 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.

Ecological Impact Assessment must also consider the significance of effects that may be expected to arise from a proposed development. CIEEM guidelines (2018) define a significant effect as: "an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features'... or for biodiversity in general. Conservation objectives may be specific (e.g. for a

designated site) or broad (e.g. national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local”.

It also states that:

“an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project. A significant effect is a positive or negative ecological effect that should be given weight in judging whether to authorise a project: it can influence whether permission is given or refused and, if given, whether the effect is important enough to warrant conditions, restrictions or further requirements such as monitoring”.

2.4.3 Assessing Significance of Effects

The criteria for assessment of the significance of effects are given in the following table. It should be noted that significant effects may also include beneficial effects.

Table 2: Criteria for Assessing Significance of Effects.

Impact Significance		Criteria
Significant Negative Effect	Major Adverse	• Loss of, permanent damage to or adverse impact on any part of a site of international or national importance; • Loss of a substantial part or key feature of a site of regional importance; • Loss of favourable conservation status (FCS) of a legally protected species; • Loss of or moderate damage to a population of nationally rare or scarce species.
	Moderate Adverse	• Temporary disturbance to a site of international or national importance, but no permanent damage; • Loss of or permanent damage to any part of a site of regional importance; • Loss of a key feature of local importance; • A substantial reduction in the numbers of legally protected species such that there is no loss of FCS but the population is significantly more vulnerable; • Reduction in the amount of habitat available for a nationally rare or scarce species, or species that are notable at a regional or county level.
No Significant Effect	Minor Adverse	• Temporary disturbance to a site of regional value, but no permanent damage; • Loss of, or permanent damage to, a feature with some ecological value in a local context but that has no nature conservation designation; • A minor impact on legally protected species but no significant habitat loss or reduction in FCS; • A minor impact on populations of nationally rare or scarce species or species that are notable at a regional or county level.
	Negligible	• No impacts on sites of international, national or county importance;

		• Temporary disturbance or damage to a small part of a feature of local importance; • Loss of or damage to land of negligible nature conservation value; • No reduction in the population of legally protected, nationally rare, nationally scarce or notable (regional level) species on the site or its immediate vicinity. • Beneficial and adverse impacts balance such that resulting impact has no overall affect upon feature.
	Minor Beneficial	• A small but clear and measurable gain in general wildlife interest, e.g. small-scale new habitats of wildlife value created where none existed before or where the new habitats exceeds in area that habitats lost.
Significant Positive Effect	Moderate Beneficial	• Larger new scale habitats (e.g. net gains over 1 ha in area) created leading to significant measurable gains in relation to the objectives of biodiversity action plans.
	Major Beneficial	• Major gains in new habitats (net gains of at least 10 ha) of high significance for biodiversity being those habitats, or habitats supporting viable species populations, of national or international importance cited in Annexes I and II of the habitats Directive or Annex I of the Birds Directive.

2.4.4 Impact Duration and Likelihood

The duration of impact must also be considered when assessing overall ecological impacts. Criteria for assessment of duration of impacts used (EPA 2002), the following terms are used when quantifying duration:

Table 3: Impact Duration and Timescales.

Impact Duration	Timescale
Temporary	Up to 1 year
Short-term	1-7 years
Medium-term	7-15 years
Long-term	15-60 years
Permanent	Over 60 years

The likelihood of impacts should also be defined. Assessment of the likelihood of impact followed CIEEM guidelines. The assessed likelihoods are as follows:

Table 4: Likelihood and Probability of Impacts

Likelihood	Probability
Almost Certain	Probability estimated at greater than 95%
Probable or Likely	Probability estimated between 50% and 95%
Unlikely	Probability estimated between 5% and 50%
Extremely Unlikely	Probability estimated at less than 5%

2.5 Key Ecological Receptors

In accordance with National Roads Authority guidelines (2009), impact assessment is only undertaken of 'key ecological receptors' (KERS). KERS are within the zone of influence of the project and are "both of sufficient value to be material in decision making and likely to be affected significantly". To qualify as KERS, features must be of local ecological importance (higher value) or higher.

Features falling below this threshold are not assessed. Impacts are described as being either significant or not significant. Broadly, 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, abundance and distribution. CIEEM, 2018).

3 Results

3.1 Desk Study

3.1.1 Connectivity to Designated Areas

The proximity of the proposed development area to Natura 2000 Sites, and Qualifying Interests (QIs)/ Special Conservation Interests (SCIs) of said Sites, is of importance when identifying potentially likely significant effects. Certain species for which they are designated are considered 'mobile QIs', and can range outside of the Site in which they are QI/SCI. The range of mobile QI/SCI species varies considerably, from several meters (e.g. in the case of whorl snails *Vertigo spp.*), to hundreds of kilometres (in the case of migratory wetland birds). Whilst static species and habitats are generally considered within the immediate footprint of a development, they can be significantly affected at considerable distances from an effect source; for example, where an aquatic QI habitat or plant is located many kilometres downstream from a pollution source. Hydrological linkages between the proposed development and Natura 2000 Sites (and their QIs/SCIs) can occur over significant distances; however, any effect will be site-specific depending on the receiving water environment and nature of the potential impact.

NHAs, pNHAs and all other sites designated for the protection of biodiversity are assessed in the same way.

A reasonable worst-case ZOI for water pollution from the proposed development is considered to be the ground and surface water, wherein the proposed works are to be located. The likely effects of the proposed development on Designated Areas have been appraised using a source-pathway-receptor model, where:

- A 'source' is defined as the individual element of the proposed development that has the potential to impact on a European site, its qualifying features and its conservation objectives;
- A 'pathway' is defined as the means or route by which a source can affect the ecological receptor.
- A 'receptor' is defined as the Special Conservation Interests of Special Protection Areas (SPA) or Qualifying Interests (QI) of Special Areas of Conservation (SAC) for which Conservation Objectives have been set for the European sites being screened.
- A source-pathway-receptor model is a standard tool used in environmental assessment. For an effect to be likely, all three elements of this mechanism must be in place. The absence or removal of one of the elements of the mechanism results in no likelihood for the effect to occur. The source pathway-receptor model was used to identify a list of European sites, and their QIs/SCIs, with potential links to European sites. These are termed as 'relevant' European sites/QIs/SCIs throughout this report

3.1.2 Hydrological Connectivity



Figure 1: Proximity of Shanganagh Cottage development to the Rathmichael River.

The project is situated in the Ovoca-Vartry (WFD catchment code: 10) and in the Dargle sub-catchment (WFD: 10_5). The nearest surface water body, the Rathmichael River, is c. 0.28 km away, which outflows into Dublin Bay after c. 2.0 km. Rathmichael River has a river waterbody status of 'good'. The groundwater WFD status for Wicklow is rated as "good". It is considered that there is no pathway to surface water from the planned extension, as it is separated from Rathmichael River by ~280 m of existing built infrastructure, such as a main road, housing facilities and a nursing home facility, which effectively cuts it off from the river in a way that would prevent any runoff.

Groundwater vulnerability is defined as the vulnerability of a given area of groundwater to waterborne pollutants. Any works that will break ground or require excavation pose a risk of contaminating groundwater. Local groundwater around the site of the proposed extension is recorded as having high vulnerability. No groundwork will be taking place in any areas with higher than low vulnerability, without appropriate risk management measures.

Similarly, subsoil permeability is defined as the ease with which water can pass through subsoil. If the subsoil is highly permeable, pollutants are more easily transported through the soil to the groundwater below, posing a risk of contamination. The subsoil permeability of the area of the proposed housing units is marked as highly permeable, being mainly composed of limestone sands and gravel; therefore, any work that excavates the ground may introduce contaminants through the soil. As such, it is considered that there is a significant risk of pollution to groundwater (i.e. percolation), and risk management measures need to be implemented to reduce the risk of groundwater contamination.

It is considered the proposed development has potential hydrological connectivity to the surrounding areas via groundwater infiltration.

3.1.3 Natura 2000 Sites

SACs are sites of international importance due to the presence of Annex I habitats and/or Annex II species listed under the EU Habitats Directive (92/43/EEC). SPAs are designated for the protection of bird species listed on Annex I of the Bird Directive (2009/147/EC), regularly occurring populations of migratory species and areas of international importance for migratory birds. The European sites correspond to those that were subject to Screening for Appropriate Assessment (presented in a separate report). The AA Screening considered all Natura 2000 Sites within the ZOI of the proposed development and/or with hydrological connectivity to the proposed development sites and concluded that there is no likelihood of effects as a result of the proposed development, either alone or in combination with other plans and projects. The following rationale was provided:

“Annex I habitats, Annex II, IV, or V species and Annex I bird species, which are identified as of utmost conservation importance under the Habitats and Birds Directive, receive legal protection within the Irish framework through the transposition of the Directive into national law, primarily under the European Communities (Natural Habitats) Regulations (S.I. 94 of 1997), which mandates the designation and conservation of Special Areas of Conservation and Special Protection Areas to safeguard these critical habitats.

The habitats surrounding the site are typically associated with urban and amenity landscapes, often found in parks and green areas within apartment blocks perimeters. The primary habitat types within the footprint are: Built Environment (BL3), Scrubs (WS1), Mixed Broadleaved Woodland (WD1) and Amenity Grassland (GA2) and Grassy verges (GS2). There were no habitats listed on Annex I habitats within the survey area. Similarly, no Annex species were identified during the field survey. Several Annex 1 bird species that may travel beyond the bounds of their respective SPAs have been recorded within 2 km of the proposed development over the last ten years; however, it is not believed that these species will be impacted for the following reasons:

- Lack of suitable foraging or breeding ground within the ZOI of the proposed development.
- The proposed development site is further removed from the borders of the SPA than the QI bird species would practically range e.g. Terns are primarily marine birds which spend most of their feeding time hunting for fish in the open sea, nesting mostly on open terrains near the shore (NPWS, 2024). The proposed development is located in an urban area over 6 km from Dalkey Island SPA, and no recent sightings of the QI species were recorded in that area for the past decade.

3.1.4 NHAs and pNHAs

There are no NHAs within a significant distance of the proposed development. The nearest NHA is Clonreher Bog, over 5 km away. The nearest pNHA is the Ridge of Portlaoise, immediately adjacent the site to the west. However, the proposed development will not directly impact upon this site.

As with the Natura 2000 sites assessed above, there is no significant connectivity to any other NHAs or pNHAs. No other pathways could be identified that might carry pollutants or act as vectors for impact from the proposed development site to any sensitive designated receptors.

3.2 Protected Species

A review of NBDC data for the surrounding 1 km found that the following protected species may be present in the local area (though other species that have not been recorded on the NBDC database may also be present):

Amphibians

- Common Frog — *Rana temporaria*
- Smooth Newt — *Lissotriton vulgaris*

Birds

- Curlew — *Numenius arquata*
- Gannet — *Morus bassanus*
- Garganey — *Spatula querquedula*
- Great Spotted Woodpecker — *Dendrocopos major*
- Greenfinch — *Chloris chloris*
- Grey Wagtail — *Motacilla cinerea*
- Herring Gull — *Larus argentatus*
- House Martin — *Delichon urbicum*
- House Sparrow — *Passer domesticus*
- Kestrel — *Falco tinnunculus*
- Lapwing — *Vanellus vanellus*
- Lesser Black-backed Gull — *Larus fuscus*
- Mallard — *Anas platyrhynchos*
- Meadow Pipit — *Anthus pratensis*
- Mediterranean Gull — *Ichthyiaetus melanocephalus*
- Mistle Thrush — *Turdus viscivorus*
- Peregrine — *Falco peregrinus*
- Pheasant — *Phasianus colchicus*
- Red Kite — *Milvus milvus*
- Red-throated Diver — *Gavia stellata*
- Redwing — *Turdus iliacus*
- Robin — *Erithacus rubecula*
- Sand Martin — *Riparia riparia*

- Sandwich Tern — *Thalasseus sandvicensis*
- Sparrowhawk — *Accipiter nisus*
- Starling — *Sturnus vulgaris*
- Stonechat — *Saxicola rubicola*
- Swallow — *Hirundo rustica*
- Swift — *Apus apus*
- Wheatear — *Oenanthe oenanthe*
- Willow Warbler — *Phylloscopus trochilus*
- Yellowhammer — *Emberiza citrinella*

Insects (Hymenoptera)

- Blunt-jawed Nomad Bee — *Nomada striata*
- Buffish Mining Bee — *Andrena nigroaenea*
- Furry-clasped Furrow Bee — *Lasioglossum lativentre*
- Great Yellow Bumblebee — *Bombus distinguendus*
- Moss Carder Bee — *Bombus muscorum*
- Painted Mining Bee — *Andrena fucata*
- Red-tailed Bumblebee — *Bombus lapidarius*
- Tawny Mining Bee — *Andrena fulva*

Mammals

- Badger (*Meles meles*)
- Hedgehog — *Erinaceus europaeus*
- Otter (*Lutra lutra*)
- Red Squirrel — *Sciurus vulgaris*

A full list of all protected species records, including their relevant datasets can be found in Appendix A. The above species list is merely indicative of what may be in the area and does not confirm the presence of any one species, nor does it preclude the absence of another.

Bat records within 4 km were assessed again prior to the bat survey. The NBDC database search returned records for five species of bat: Leisler's bat (*Nyctalus leisleri*), Soprano Pipistrelle, Common Pipistrelle and Daubenton's bat (*Myotis daubentonii*) and Brown long-eared Bat (*Plecotus auritus*). In addition, Bat Conservation Ireland's *habitat suitability index*, available to view on the NBDC online mapping portal, classifies the landscape within which the site is located, as having a moderate to high suitability for bats, with a score of 32.

4 Field Surveys

4.1 Habitats & Flora

The proposed site of Tyrrell's land development lies at coordinates 53.033867, -7.288510 and is mainly comprised of agricultural grassland with a combination of hedgerows, mixed broadleaf woodland and a small stream. Habitat surrounding the proposed site consists of built land in the form of residential areas and parkland at the southwest end of the site. The following habitat types were recorded in accordance with Fossitt (2000):

GA1 - Improved Agricultural Grassland: Species recorded consist of Bitter dock (*Rumex obtusifolius*), Common Mouse-ear (*Cerastium fontanum*), Creeping buttercup (*Ranunculus repens*), Meadow buttercup (*Ranunculus acris*), Common daisy (*Bellis perennis*), Self-heal (*Prunella vulgaris*), Field speedwell (*Veronica agrestis*), Meadow thistle (*Cirsium dissectum*), Germander speedwell (*Veronica chamaedrys*), Dandelion (*Taraxacum*), Great mullein (*Verbascum thapsus*), and Cuckooflower (*Cardamine pratensis*).

WD1 – Mixed Broadleaved Woodland: A stand of mixed native and non-native trees is located in the Eastern portion of the site. Tree species include Beech (*Fagus sylvatica*), Sycamore (*Acer pseudoplatanus*), Holly (*Ilex aquifolium*), Larch (*Larix decidua*), Willow (*Salix spp.*), Hazel (*Corylus avellana*), Sitka spruce (*Picea sitchensis*). With an understory of Atlantic Ivy (*Hedera hibernica*), Bramble (*Rubus fruticosus agg.*), dominated by Ground elder (*Aegopodium podagraria*).

WL1 - Hedgerow: Hedgerow species primarily consisted of Hawthorn (*Crataegus*), Ash (*Fraxinus excelsior*), Ivy (*Hedera helix*), Willow (*Salix spp.*), Hybrid bluebell (*Hyacinthoides x massartiana* H. non-scripta x *hispanica*), Nettle (*Urtica dioeca*), Cleavers (*Galium aparine*) and Blackthorn (*Prunus spinosa*).

BL3 / WL2 - Built Land and Treeline: Surrounding a small car park and bordering the agricultural field, species found were Beech (*Fagus sylvatica*), Field Maple (*Acer campestre*), and Sycamore (*Acer pseudoplatanus*)



Figure 2: Habitat Map based on Fossitt Guide 2000

Flora observed during the survey comprised a mix of native and non-native species. **Several invasive and non-native species were recorded onsite.** These species were primarily recorded in the woodland and hedgerow habitats, as pictured in Figure 3.

- Hybrid bluebells (*Hyacinthoides x massartiana* H. non-scripta x hispanica)
- Snowberry (*Symphoricarpos albus*)
- Sycamore (*Acer Pseudoplatanus*) throughout the WD1 habitat



Figure 3: Invasive and Non-Native Species Map

4.2 Terrestrial Fauna

Fauna presence was notable. A **high diversity of birds** was recorded through visual and auditory observation. This area also contained a Rookery and Heronry site.

Species recorded include:

- Dunnock (*Prunella modularis*)
- Eurasian Chaffinch (*Fringilla coelebs*)
- Common Chiffchaff (*Phylloscopus collybita*)
- European Robin (*Erithacus rubecula*)
- Eurasian Wren (*Troglodytes troglodytes*)
- Rook (*Corvus frugilegus*)
- Willow Warbler (*Phylloscopus trochilus*)
- Common Wood Pigeon (*Columba palumbus*)
- Common Blackbird (*Turdus merula*)
- Eurasian Blackcap (*Sylvia atricapilla*)
- Eurasian Jackdaw (*Coloeus monedula*)
- Goldcrest (*Regulus regulus*)
- Eurasian Blue Tit (*Cyanistes caeruleus*)

- Grey Heron (*Ardea cinerea*)

Mammal activity was evidenced by:

- Several small mammal paths were found on-site, scat found indicated Red Fox (*Vulpes vulpes*)
- A deceased Greater white-toothed shrew (*Crocidura russula*) was found next to a hedgerow
- Along the pond bank from the woodland habitat on the Northeast side of the site, a Bank Vole (*Myodes glareolus*) was seen going into the water
- Tadpoles (*Rana temporaria*) were observed in the pond, and this is a habitat likely to be suitable for newts
- A Badger sett was located on the site; Precise location details have been withheld for conservation and wildlife protection purposes

The site is considered to be of moderate to high ecological value, largely due to the presence of a diverse bird community and evidence of nesting activity.

The woodland and hedgerow habitats are well connected and are likely to function as supporting habitats for mobile fauna species protected under the Wildlife Acts. Evidence of Common Frog (*Rana temporaria*) was recorded in a pond adjacent to the woodland. While Smooth Newt (*Lissotriton vulgaris*) was not observed during field surveys, the available habitat is considered suitable for the species. Both species are protected in Ireland under the Wildlife Act 1976 (as amended) and are listed under Annex V of the EU Habitats Directive, which requires their exploitation to be managed to maintain favourable conservation status.

Badgers are a protected species in Ireland under the Wildlife Acts. It is an offence to kill, injure, or disturb badgers, or to damage or interfere with a sett. A badger sett was identified within the site; appropriate mitigation measures will be required to avoid disturbance.

Potential Key Ecological Receptors (KERs) include habitats that support nesting birds, as well as species such as the hedgehog and badger.

4.3 Bats

Potential roosting features were assessed during the daylight walkover survey on April 23rd. An evening bat walkover was also carried out on 31st April to determine activity around the site.

Maps of the bat calls recorded and potential roost features noted are shown below. **Further results were pending** at time of writing.



5 Impact Assessment

5.1 Impact Assessment: Habitats

The potential impacts on the habitats identified within and surrounding the proposed development site are provided in the table below.

Table 5: Impact Assessment habitats

Impact Assessment: Habitats				
Ecological Feature	Evaluation	Nature of Impact	Significance	Duration & Likelihood
Habitats within the Proposed Development Site				
Buildings and Artificial Surfaces	Negligible ecological value	Removal of existing structures and ground sealing may lead to temporary increases in runoff and potential contaminants entering surrounding areas. Construction activity may also create short-term disturbance.	Negligible	Almost certain, long-term (permanent structural change)
Improved agricultural grassland	Low to moderate ecological value	Permanent loss of low-quality grassland due to site clearance and land-take. Potential for disturbance, soil stripping, and increased runoff during construction. Loss of foraging ground for birds and small mammals.	Negligible	Almost certain, long-term (permanent structural change)
Hedgerow	Moderate ecological value	Permanent loss of established hedgerow due to site clearance. Loss of habitat connectivity. Loss of nesting habitat for bird species.	Minor Adverse	Almost certain, long-term (permanent structural change)
Mixed Broadleaved Woodland	Moderate ecological value	Permanent loss and disruption of mixed broadleaved woodland. Loss and disruption of nesting habitat of bird species and habitat for mammal species. Loss and disruption of present heronry.	Moderate	Almost certain, long-term (permanent structural change)
Mature and semi mature trees	Moderate ecological value	Permanent loss of Mature and semi mature as well as the disruption of retained trees. Loss and disruption of nesting habitat.	Minor Adverse	Almost certain, long-term (permanent structural change)
Habitats surrounding the Proposed Development Site				
Deciduous Woodland	Moderate ecological value; Moderate bat	Potential indirect disturbance during construction through noise, vibration, and permanent increased human activity. Minor edge effects	Minor Adverse	Likely; Short-term (construction phase) and

	potential, no burrows were found, and no evidence of protected species were recorded; no links to Annex I habitats were found.	may occur, including light spill and dust deposition. No direct loss of woodland habitat is anticipated.		permanent due to increased human activity.
Scrub Area	Moderate ecological value for bird nesting and foraging. Additionally, this could be a possible nesting area for hedgehogs.	Potential indirect disturbance during construction through noise, vibration, and permanent increased human activity. Minor edge effects may occur, including light spill and dust deposition.	Minor Adverse	Likely; Short-term (construction phase) and permanent due to increased human activity.
Hedgerow	Moderate ecological value for bird nesting & foraging as well as mammal connectivity & nesting.	Potential indirect disturbance during construction through noise, vibration, and permanent increased human activity. Minor edge effects may occur, including light spill and dust deposition.	Minor Adverse	Likely; Short-term (construction phase) and permanent due to increased human activity.
Improved agricultural grassland	Low to moderate ecological value. Bird and mammal foraging habitat	Potential indirect disturbance during construction through noise, vibration, and permanent increased human activity. Minor edge effects may occur, including light spill and dust deposition.	Negligible	Likely; Short-term (construction phase) and permanent due to increased human activity.

5.2 Impact Assessment: Fauna

The potential impacts on the fauna within and surrounding the proposed development site is provided in the table below.

Table 6: Impact Assessment for fauna

Impact Assessment: Fauna			
Species/Group	Nature of Impact	Significance	Duration & Likelihood
Bats	Multiple bat roosting sights likely to be disturbed or removed due to proposed development.	Moderate	Permanent, Likely

Badgers	Loss of foraging habitat, disturbance due to light pollution, construction works and increase in human activity.	High; Badger sett within impact area of development	Permanent, Likely
Hedgehogs	Loss of foraging and/ or nesting habitat, disturbance due to light pollution and increased human activity.	Negligible – no evidence of hedgehog activities were found during the survey.	Temporary, unlikely
Otters	Disruption to commuting routes and feeding areas.	Negligible	Permanent, unlikely
Amphibians	Loss of terrestrial habitat, disturbance during breeding season, direct disturbance due to groundworks. Possible contamination of standing bodies of water used as breeding grounds.	Moderate	Permanent, Likely
Birds	Loss of foraging habitat and nesting habitat during breeding season. Disturbance due to construction works.	High	Temporary, Permanent

5.3 Cumulative and In-Combination Impacts

An Coimisiún Pleanála planning portal was searched for planning applications within the surrounding area. Planning permission has been granted in the area for numerous other developments, mostly for redevelopment, with a few larger-scale projects nearby.

Table 7: Cumulative and In-Combination Effects Table

Reference	Description	Determination of possible cumulative effects
316554	Dredging and removal of silt and vegetation from a man-made shallow lake 'Glendowns'.	No in-combination effects likely as the Proposed development is predicted to have no significant effects on the receiving environment.

2560147	Works associated with the proposed uprate of the existing 110 kV Overhead Line (OHL) between the existing Cushaling 110 kV substation in the townland of Ballykilleen, Co. Offaly & the existing Portlaoise 110 kV substation in the townlands of Clonminam & Kylekiproe, Co. Laois.	No in-combination effects likely as the Proposed development is predicted to have no significant effects on the receiving environment.
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The assessment of cumulative and in combination effects was based on the identification of shared ecological receptors and pathways. As the proposed development does not result in significant effects on habitats or species and does not interact spatially or functionally with other developments, no cumulative or in-combination effects are predicted.

5.4 Impacts on Habitats

Significant impacts on habitats within the Zone of Influence are predicted as a result of this development. Habitats within the development footprint consist of improved agricultural, grassland, hedgerow, mixed broadleaved woodland and mature & semi mature trees. The impact of the development is expected to be either negligible to minor, with the exception of the expected loss and disruption to the mixed broadleaved woodland. This is due to the presence of widespread nests and nesting habitat found throughout the woodland.

Habitats adjacent to the woodland include: Deciduous woodland, scrub area, hedgerow and improved agricultural grassland. While each of these are likely to be impacted by both the construction phase and by a permanent increase in human activity surrounding each habitat. Each impact was however deemed to be either negligible or minor and as such may be remediated with appropriate and effective mitigation measures. Further, no Annex I habitats or habitats of conservation importance occur within or near the site. Overall, habitat losses and temporary construction disturbance are not considered significant at the local or wider level.

5.5 Impacts on Fauna

Potential Impacts on Badgers: During the field survey a badger sett was found within the area of impact for the project. While it has yet to be determined whether the sett is currently active, under the precautionary principle the sett should be considered active without any further conclusive evidence. As such the construction phase and increase in human activity is a threat to the suitability of this sett. Badgers and their setts are protected under the Wildlife Act, 1976; Wildlife Amendment Act, 2002 and Appendix III of the Bern Convention (1979).

Plausible impacts include:

- Loss of low-value foraging habitat within the footprint of proposed works
- Disturbance from construction noise, vibration, and lighting
- Disturbance from an increase of human activity in the immediate area surrounding the site
- Short-term displacement if badgers are present in the wider landscape

Due to the presence of the badger sett key consideration must be taken as to not disturb the sett. During construction an appropriate zone of exclusion where no development activity may occur must be

observed. Further mitigation such as ensuring adequate connectivity between the sett and suitable foraging habitat.

Potential Impacts on Bats: Though no bat presence was identified during the bat survey, the area surrounding the cottage has been deemed to have medium to high bat habitat. The cottage building does not present prominent roosting features, as no visible crevices or loose roof tiles were observed during both the Ecological and Bat Survey.

Further surveys should be carried out no more than 2 months before construction to determine whether any active roosts have formed in the interim. Not surveying for new roosts may mean missing them and accidentally demolishing them with the building. The presence of active roosts will prevent any work from being carried out on buildings containing them.

Potential Impacts on Amphibians: No ponds or suitable breeding waterbodies were found within or immediately adjacent to the site, and no amphibians were recorded during the survey. Smooth newt presence is considered likely due to the presence of both woodland and aquatic habitats. Potential, but limited, impacts may include:

- Loss of optimal spawning area
- Loss of terrestrial habitat
- Disturbance during groundworks if individuals occur incidentally
- Temporary pollution risk (e.g., runoff, siltation) affecting any off-site standing water indirectly

Given the suitable quality of terrestrial habitat and the presence of breeding features, impacts are assessed as Moderate, Temporary, and Likely to be significant. Standard construction best practices (pollution control, good site management) will somewhat minimise risks however further mitigation measures may be required to minimise the impact.

Potential Impacts on Hedgehogs: No hedgehogs were recorded during the field survey, and no confirmed nesting or hibernation sites were identified within or immediately adjacent to the site. However, the site contains areas of amenity grass, scrub, and boundary features which may provide low suitability habitat for hedgehogs moving through the wider landscape or using the site on an opportunistic basis for foraging, nesting, or hibernation.

Although no direct evidence of hedgehog presence was identified, the species is widespread and nocturnal, and its absence during daytime surveys does not preclude occasional use of the site. As such, direct impacts are considered unlikely, but the following indirect, temporary impacts may occur during the construction phase:

- Localised loss of low-value foraging and shelter habitat within the footprint of the proposed works
- Disturbance to potential nesting or hibernation features during vegetation clearance and ground disturbance
- Risk of injury or mortality during site clearance if individuals are present within dense vegetation
- Temporary displacement or disturbance arising from construction noise, vibration, lighting, and increased human activity
- Short-term disruption of local movement routes where boundary vegetation or linear features are removed

Given the absence of confirmed hedgehog records and the limited extent of suitable habitat within the site, any impacts are assessed as Negligible to Minor, Temporary, and Unlikely to be significant at a local population level.

6 Impact Mitigation

Mitigation measures to address the potential impacts from the proposed development on habitats and fauna within and surrounding the proposed development (as required) are provided below.

Table 5: Mitigation Strategies for fauna

Species/ Group	Nature of potential Impact	Recommended Mitigation Measures	Impact after mitigation
Badger	Loss of foraging habitat, disturbance due to light pollution and construction works.	Pre-construction Surveys: Conduct detailed pre-construction surveys to identify whether the sett is active and what type of sett it is. Surveys should be carried out by licensed ecologists at the appropriate time of year (typically late winter or early spring) when Badger activity is more detectable. The surveys should identify any signs of active Badger presence, including active setts, foraging areas, and latrines. Trail cameras may be required to assess the number of Badgers present to help inform the type of sett. Protection of Active Setts: If the Badger sett is found to be active, it should be fully protected. Specific mitigation can be recommended at that stage but may include installing Badger proof fencing at the edge of the site for the duration of the works, marking nearby sett entrances and digging with hand tools only near sett entrances.	Negligible
Hedgehogs	Loss of nesting/ hibernation habitat, habitat fragmentation, disturbance due to construction activity	Pre-construction Surveys: Conduct detailed pre-construction surveys to identify areas with potential for Hedgehog nesting or hibernation, such as dense scrub, brush piles, log piles, and long grass. Where suitable habitat is present and works are scheduled during the active season (March-October), a licensed ecologist should carry out a survey prior to any clearance. Protection of Active Hibernaculum/ Nests: Avoid vegetation clearance during the hibernation period, as this species is at their most vulnerable state (November-March). When possible, retain and enhance habitat connectivity by making hedgehog corridors. This can be done by the addition of native hedgerow planting or creating a 13x13cm gap within fencing to allow for safe movement.	Negligible

Bats	Loss of foraging habitat, disturbance due to light pollution and construction works	Pre-construction Bat Surveys: Conduct pre-construction bat survey on any building which will be impacted by route construction. Emergence surveys should be carried out during the bat activity season (typically from May to August). This will help determine the presence of any bat species and inform further mitigation efforts. Minimise Night-time Construction and Light Pollution: Prohibit construction activities during dusk and night-time hours, particularly in or near woodlands or areas where bats are likely to forage or commute. Any construction work that requires lighting should be carefully controlled to avoid spillover into nearby bat habitats. Lighting should be kept to a minimum and directed away from sensitive areas, with the use of bat-friendly lighting (such as low-intensity, warm-spectrum lights) in any areas that require illumination. Limit new light pollution from car park or on external of building: No new 'always on' external lighting will be added to ensure that it does not reduce foraging areas. Bats are sensitive to light, and artificial lighting can disrupt their natural behaviours, including foraging, commuting, and roosting. No light spill will be allowed on any vegetated areas. All lights will be cowed to direct light spill only onto artificial surfaces and will be designed in adherence to Bat Conservation Trust guidance.	Minor Adverse
Smooth Newt	Loss of terrestrial habitat, disturbance during breeding season, direct disturbance due to groundworks	Pre-construction survey: Habitat suitability assessment and targeted presence/absence surveys should be undertaken where suitable breeding ponds or terrestrial habitat occur within or adjacent to the site. Surveys should be carried out during the optimal survey window (typically March-June) under suitable weather conditions. Sensitivity to Site Clearance and Habitat Retention: If evidence of newts is found onsite during the pre-construction survey then ecological supervision is to be undertaken during vegetation and topsoil removal. Retain rough grassland, scrub, and damp refugia where possible. Post-construction enhancement may include the creation of suitable refuges such as log piles, stone piles, and amphibian hibernacula to maintain population viability	Minor Adverse
Otter	Reduced water quality, disruption to	Mitigation for Reduced Water Quality: Implementation of a CEMP is needed with pollution prevention measures for works in proximity to water courses. Install silt fences and sediment traps where ground disturbance may occur.	Negligible

	commuting routes and feeding areas		
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7 Biodiversity Enhancement Measures

Native Planting: Use native plant species for landscaping to support local biodiversity, including wildflowers, shrubs, and trees. Ensure that plants are suited to the local soil and climate conditions. Examples include: Hawthorn, Blackthorn, Elder, Silver Birch, Oak, Hazel, etc. Utilise species that can be used as foraging and nesting grounds for birds, bats, and small mammals.

Bat boxes: The integration of bat boxes, or bat bricks, into the building itself may promote bat roosting on site, but not actually within the building structure. Bat bricks and tubes can be incorporated into new builds to allow for roosting opportunities.

Small Mammal Corridors: Species such as hedgehogs can suffer from habitat fragmentation in urban settings. Therefore, it is recommended to provide habitat connectivity for such species. This can be easily done by the addition of native hedgerow planting or creating a 13x13cm gap within fencing to allow for safe movement. Additionally, “deadwood” onsite can be left in piles to provide essential shelter.

Habitat Creation for Amphibians: The simple addition of a small wildlife pond onsite could aid in the enhancement of amphibian habitat. Providing essential refuge for native species such as the Common Frog and Smooth Newt. Ensure ponds are shallow with gentle sloping sides to allow for easy access.

Sustainable Drainage Systems (SuDS): Implement SuDS to manage surface water runoff, prevent erosion, and improve water quality. Features like permeable paving in the car park can reduce runoff and allow water to soak through to the ground.



Figure 5: An example of permeable parking spaces.

Rain Gardens and Swales: Designate areas within the car park or around the grounds for rain gardens or swales to filter out pollutants and promote groundwater recharge.

Lighting: Use outdoor lighting only when necessary, choose a warm lighting source, and install low lighting angled downwards to avoid additional glare. Use sensor lighting when possible to avoid lighting at all hours.

8 Conclusion

Overall, the proposed development is considered to have a moderate impact on the surrounding ecology, largely due to its location within an urban setting but proximity to a semi-natural area. Temporary impacts may occur to fauna species that use the surrounding area for foraging grounds, such as birds, bats, badgers and hedgehogs. Mitigation measures for fauna are outlined in Table 7. Trees that have bat potential should be reassessed prior to construction and demolition to prevent disturbance. Additionally, clearance of vegetation and scrub should be monitored by an ecologist on site to prevent the possible disturbance of protected species using the area.

A number of small measures that can significantly increase biodiversity value have also been included. By integrating these measures, along with any mitigation relating to protected species, the development can proceed with reduced ecological impacts and improved environmental outcomes, maintaining the area's limited but still important natural value and ensuring the protection of sensitive species and habitats.

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Appendix A: NBDC Records

Appendix A1: NBDC records of protected and invasive species within 1 km of the site of proposed development.

Species group	Species name	Record count	Date of last record	Designation
Amphibian	Common Frog (<i>Rana temporaria</i>)	23	12/02/2007	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex V Protected Species: Wildlife Acts
Bird	Black-headed Gull (<i>Chroicocephalus ridibundus</i>)	3	10/01/2021	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Brambling (<i>Fringilla montifringilla</i>)	1	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List

Bird	Common Gull (<i>Larus canus</i>)	1	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Cormorant (<i>Phalacrocorax carbo</i>)	13	12/04/2023	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Curlew (<i>Numenius arquata</i>)	10	04/01/2019	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List

Bird	Goldcrest (<i>Regulus regulus</i>)	9	10/01/2023	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Greenfinch (<i>Chloris chloris</i>)	8	24/05/2020	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Grey Wagtail (<i>Motacilla cinerea</i>)	36	27/07/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Bird	Herring Gull (<i>Larus argentatus</i>)	15	10/01/2021	Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List

Bird	House Martin (<i>Delichon urbicum</i>)	2	25/04/2016	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	House Sparrow (<i>Passer domesticus</i>)	4	01/06/2020	Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Kestrel (<i>Falco tinnunculus</i>)	1	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List

Bird	Kingfisher (<i>Alcedo atthis</i>)	17	07/06/2020	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Lesser Black-backed Gull (<i>Larus fuscus</i>)	6	01/04/2023	Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Linnet (<i>Linaria cannabina</i>)	3	30/09/2016	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List

Bird	Little Egret (<i>Egretta garzetta</i>)	5	02/06/2020	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species
Bird	Little Grebe (<i>Tachybaptus ruficollis</i>)	1	31/12/2011	Protected Species: Wildlife Acts
Bird	Mallard (<i>Anas platyrhynchos</i>)	10	30/01/2023	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Mandarin Duck (<i>Aix galericulata</i>)	4	03/08/2016	Invasive Species: The Wildlife (Northern Ireland) Order 1985
Bird	Mistle Thrush (<i>Turdus viscivorus</i>)	8	10/01/2021	Protected Species: Wildlife Acts

Bird	Mute Swan (<i>Cygnus olor</i>)	1	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Oystercatcher (<i>Haematopus ostralegus</i>)	3	24/11/2018	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Bird	Redwing (<i>Turdus iliacus</i>)	4	02/03/2021	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Bird	Robin (<i>Erithacus rubecula</i>)	17	27/07/2024	Protected Species: Wildlife Acts
Bird	Rock Dove (<i>Columba livia</i>)	4	30/09/2016	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds

				Directive >> Annex II, Section I Bird Species
Bird	Sand Martin (<i>Riparia riparia</i>)	16	04/04/2021	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Snipe (<i>Gallinago gallinago</i>)	1	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section III Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Bird	Sparrowhawk (<i>Accipiter nisus</i>)	6	24/04/2020	Protected Species: Wildlife Acts

Bird	Starling (<i>Sturnus vulgaris</i>)	11	26/08/2020	Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Swallow (<i>Hirundo rustica</i>)	5	26/04/2020	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Swift (<i>Apus apus</i>)	15	26/06/2025	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List

Bird	Teal (<i>Anas crecca</i>)	2	18/01/2019	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bird	Willow Warbler (<i>Phylloscopus trochilus</i>)	5	16/04/2019	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Flowering plant	Butterfly-bush (<i>Buddleja davidii</i>)	7	13/08/2024	Invasive Species: Medium Risk Invasive Species (2013 Report)

Flowering plant	Fallopia japonica x sachalinensis = F. x bohemica	13	21/05/2010	Invasive Species: EU Invasive Alien Species Regulation No. 1143/2014 Invasive Species: Regulation S.I. 477/2011 (Ireland) Invasive Species: High Risk Invasive Species (2013 Report) Invasive Species: Regulation S.I. 374/2024 (Ireland)
Flowering plant	Giant Hogweed (Heracleum mantegazzianum)	3	03/09/2012	Invasive Species: EU Invasive Alien Species Regulation No. 1143/2014 Invasive Species: Regulation S.I. 477/2011 (Ireland) Invasive Species: High Risk Invasive Species (2013 Report) Invasive Species: Regulation S.I. 374/2024 (Ireland)

Flowering plant	Giant-rhubarb (<i>Gunnera tinctoria</i>)	1	24/05/2020	Invasive Species: EU Invasive Alien Species Regulation No. 1143/2014 Invasive Species: Regulation S.I. 477/2011 (Ireland) Invasive Species: Detailed Risk Assessment Invasive Species: High Risk Invasive Species (2013 Report) Invasive Species: Regulation S.I. 374/2024 (Ireland) Invasive Species: Detailed Risk Assessment >> High Risk
Flowering plant	Himalayan Balsam (<i>Impatiens glandulifera</i>)	90	09/05/2025	Invasive Species: EU Invasive Alien Species Regulation No. 1143/2014 Invasive Species: Regulation S.I. 477/2011 (Ireland) Invasive Species: Detailed Risk Assessment Invasive Species: High Risk Invasive Species (2013 Report) Invasive Species: Regulation S.I. 374/2024 (Ireland) Invasive Species: Detailed Risk Assessment >> High Risk

Flowering plant	Himalayan Honeysuckle (<i>Leycesteria formosa</i>)	1	10/07/2021	Invasive Species: Medium Risk Invasive Species (2013 Report)
Flowering plant	Japanese Knotweed (<i>Fallopia japonica</i>)	51	09/05/2025	Invasive Species: EU Invasive Alien Species Regulation No. 1143/2014 Invasive Species: Regulation S.I. 477/2011 (Ireland) Invasive Species: High Risk Invasive Species (2013 Report) Invasive Species: Regulation S.I. 374/2024 (Ireland) Invasive Species: The Wildlife (Northern Ireland) Order 1985
Flowering plant	Least Duckweed (<i>Lemna minuta</i>)	1	31/12/1993	Invasive Species: Medium Risk Invasive Species (2013 Report)
Flowering plant	Spanish Bluebell (<i>Hyacinthoides hispanica</i>)	1	30/03/2021	Invasive Species: Regulation S.I. 477/2011 (Ireland) Invasive Species: Regulation S.I. 374/2024 (Ireland) Invasive Species: The Wildlife (Northern Ireland) Order 1985
Flowering plant	Sycamore (<i>Acer pseudoplatanus</i>)	2	07/06/2016	Invasive Species: Medium Risk Invasive Species (2013 Report)

Flowering plant	Three-cornered Garlic (<i>Allium triquetrum</i>)	11	13/05/2023	Invasive Species: Regulation S.I. 477/2011 (Ireland) Invasive Species: Detailed Risk Assessment Invasive Species: Medium Risk Invasive Species (2013 Report) Invasive Species: Regulation S.I. 374/2024 (Ireland) Invasive Species: Detailed Risk Assessment >> Moderate Risk
Flowering plant	Traveller's-joy (<i>Clematis vitalba</i>)	1	10/08/2021	Invasive Species: Medium Risk Invasive Species (2013 Report)
Insect - beetle (Coleoptera)	Harlequin Ladybird (<i>Harmonia axyridis</i>)	22	21/06/2025	Invasive Species: Regulation S.I. 477/2011 (Ireland) Invasive Species: High Risk Invasive Species (2013 Report) Invasive Species: Regulation S.I. 374/2024 (Ireland)
Insect - hymenopteran	Red-tailed Bumblebee (<i>Bombus lapidarius</i>)	15	07/06/2019	Threatened Species: Near threatened
Insect - mayfly (Ephemeroptera)	<i>Procladius bifidus</i>	1	31/12/1947	Threatened Species: Vulnerable
Insect - mayfly (Ephemeroptera)	<i>Rhythrogena germanica</i>	1	31/12/1947	Threatened Species: Vulnerable
Mollusc	Jenkins' Spire Snail (<i>Potamopyrgus antipodarum</i>)	2	09/09/2016	Invasive Species: Medium Risk Invasive Species (2013 Report)

Moss	Blunt-fruited Pottia (<i>Tortula caucasica</i>)	1	29/01/2011	Threatened Species: Near threatened
Reptile	Common Lizard (<i>Zootoca vivipara</i>)	1	08/09/1968	Protected Species: Wildlife Acts
Terrestrial mammal	American Mink (<i>Neovison vison</i>)	5	26/10/2011	Invasive Species: EU Invasive Alien Species Regulation No. 1143/2014 Invasive Species: Regulation S.I. 477/2011 (Ireland) Invasive Species: High Risk Invasive Species (2013 Report) Invasive Species: Regulation S.I. 374/2024 (Ireland) Invasive Species: The Wildlife (Northern Ireland) Order 1985
Terrestrial mammal	Badger (<i>Meles meles</i>)	4	04/09/2018	Protected Species: Wildlife Acts
Terrestrial mammal	Brown Rat (<i>Rattus norvegicus</i>)	1	15/09/2015	Invasive Species: High Risk Invasive Species (2013 Report)
Terrestrial mammal	Common Pipistrelle (<i>Pipistrellus pipistrellus sensu stricto</i>)	21	03/08/2013	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Terrestrial mammal	Daubenton's Bat (<i>Myotis daubentonii</i>)	126	30/08/2021	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >>

				Annex IV Protected Species: Wildlife Acts
Terrestrial mammal	Grey Squirrel (<i>Sciurus carolinensis</i>)	26	15/12/2022	Invasive Species: EU Invasive Alien Species Regulation No. 1143/2014 Invasive Species: Regulation S.I. 477/2011 (Ireland) Invasive Species: High Risk Invasive Species (2013 Report) Invasive Species: Regulation S.I. 374/2024 (Ireland)
Terrestrial mammal	Leisler's Bat (<i>Nyctalus leisleri</i>)	13	27/06/2013	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Terrestrial mammal	Otter (<i>Lutra lutra</i>)	4	28/09/2017	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts

Terrestrial mammal	Pipistrelle (<i>Pipistrellus pipistrellus</i> sensu lato)	15	03/08/2014	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Terrestrial mammal	Soprano Pipistrelle (<i>Pipistrellus pygmaeus</i>)	24	03/08/2013	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts