



ECOLOGICAL IMPACT ASSESSMENT REPORT

FOR
PROPOSED STRATEGIC HOUSING
DEVELOPMENT

AT

GLENINA AND KARUNA,
SANDYFORD ROAD, SANDYFORD,
DUBLIN 18

ON BEHALF OF
Midsal Homes Ltd.

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DOCUMENT CONTROL SHEET

Client	Midsal Homes Ltd.
Project Title	Proposed Strategic Housing Development at Glenina and Karuna, Sandyford Road, Sandyford, Dublin 18
Document Title	Ecological Impact Assessment Report

Revision	Status	Author(s)	Reviewed	Approved	Issue Date
1.0	Draft for internal Review	Shannen O'Brien <i>Project Ecologist</i>	Colin Lennon <i>Technical Director</i>	-	-
2.0	Draft for Client	Shannen O'Brien <i>Project Ecologist</i>	Colin Lennon <i>Technical Director</i>	Colin Lennon <i>Technical Director</i>	07/10/2021
3.0	Draft for Client	Shannen O'Brien <i>Project Ecologist</i>	Colin Lennon <i>Technical Director</i>	Colin Lennon <i>Technical Director</i>	27/04/2022
4.0	Final	Shannen O'Brien <i>Project Ecologist</i>	Colin Lennon <i>Technical Director</i>	-	-

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1 INTRODUCTION

Enviroguide Consulting was commissioned by Midsal Homes Ltd. to undertake an Ecological Impact Assessment for the Proposed Strategic Housing Development at the site at Glenina and Karuna, Sandyford Road, Sandyford, Dublin 18.

This Ecological Impact Assessment (EclA) assesses the potential effects of the Proposed Development on habitats and species; particularly those protected by National and International legislation or considered to be of particular nature conservation importance. This report will describe the ecology of the Proposed Development area, with emphasis on habitats, flora and fauna, and will assess the potential effects of the Construction and Operational Phases of the Proposed Development on these ecological receptors. The report follows Guidelines for Ecological Impact Assessment in the UK and Ireland, by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018).

1.1 Quality assurance and competence

Synergy Environmental Ltd., T/A Enviroguide Consulting, is wholly Irish Owned multi-disciplinary consultancy specialising in the areas of the Environment, Waste Management and Planning. All Enviroguide consultants carry scientific or engineering qualifications and have a wealth of experience working within the Environmental Consultancy sectors, having undergone extensive training and continued professional development.

Enviroguide Consulting as a company remains fully briefed in European and Irish environmental policy and legislation. Enviroguide staff members are highly qualified in their field. Professional memberships include the Chartered Institution of Wastes Management (CIWM), the Irish Environmental Law Association and Chartered Institute of Ecology and Environmental Management (CIEEM).

All surveying and reporting have been carried out by qualified and experienced ecologists and environmental consultants. Aisling Walsh, Professional Bat Ecologist with Ash Ecology and Environmental Ltd. undertook the on-site bat surveys. Shannen O'Brien, Ecologist with Enviroguide undertook the habitat surveys and desktop research for this report.

Aisling Walsh is a Professional Ecologist and director of Ash Ecology Consulting. Aisling has a wealth of academic qualification having studied a MSc in Biodiversity and Conservation (TCD), A BSc (Hons) Zoology (NUIG), a Diploma in Applied Aquatic Sciences (GMIT), a Post Graduate Diploma in Statistics (TCD), and a Certificate in Environmental Noise (Institute of Acoustics); while also holding a full membership of the Chartered Institute of Ecology and Environmental Management (CIEEM). Aisling has written numerous Ecological Impact Assessments (EclA), Screening for Appropriate Assessment Stage I and Stage II Natura Impact Statement, Environmental Impact Assessments/Statements, Badger Surveys, Bat Surveys, Habitat Surveys. She has also provided input and reviewed Ecological and Environmental assessments for several EIS and EIA Reports and conducted numerous noise surveys for EPA licensed facilities. AEE is listed as a Registered Practice by the CIEEM.

Shannen O'Brien has a B.A. in Zoology from Trinity College Dublin and a M.Sc. Hons. in Wildlife Conservation and Management from University College Dublin, and has experience in desktop research, report writing, and literature scoping-review, as well as practical field and

laboratory experience (Pollinator surveying, sampling and identification, habitat surveying, invasive species surveying, etc.). Shannen has prepared Stage I and Stage II Appropriate Assessment Reports, Invasive Species Surveys, Ecology Statements, and Ecological Impact Assessments (EclA).

2 RELEVANT LEGISLATION

An Ecological Impact Assessment (EclA) is a process of identifying, quantifying, and evaluating potential effects of development-related or other actions on habitats, species and ecosystems (CIEEM, 2016). The Proposed Development is a sub-threshold for an Environmental Impact Assessment (EIA) under the Planning and Development Regulations 2011-2018.

When an EclA is undertaken as part of an EIA process it is subject to the EIA Regulations (under the EU Planning and Development [Environmental Impact Assessment] Regulations 2001-2018). An EclA is not a statutory requirement, however it is a best practice evaluation process. This EclA has been undertaken to support and assess the Proposed Development planning application and assesses the potential impacts that the Proposed Development may have on the ecology of the site and its environs. Where potential for a risk to the environment is identified, mitigation measures are proposed on the basis that by deploying these mitigation measures the risk is eliminated or reduced to an insignificant level. This EclA is provided to assist the Competent Authority with its decision making in respect of the Proposed Development.

2.1 National Legislation

2.1.1 Wildlife Act 1976 and amendments

The Wildlife Act 1976 was enacted to provide protection to birds, animals, and plants in Ireland and to control activities which may have an adverse impact on the conservation of wildlife. With regard to the listed species, it is an offence to disturb, injure or damage their breeding or resting place wherever these occur without an appropriate licence from the National Parks and Wildlife Service (NPWS). This list includes all wild birds along with their nests and eggs. Intentional destruction of an active nest from the building stage up until the chicks have fledged is an offence. This includes the cutting of hedgerows from the 1st of March to the 31st of August. The act also provides a mechanism to give statutory protection to Natural Heritage Areas (NHAs). The Wildlife Amendment Act 2000 widened the scope of the Act to include most species, including the majority of fish and aquatic invertebrate species which were excluded from the 1976 Act.

2.1.2 EU Habitats Directive 1992 and EC (Birds and Natural Habitats) Regulations 2011

The EU Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive 1992) provides protection to particular species and habitats throughout Europe. The Habitats Directive has been transposed into Irish law through the EC (Birds and Natural Habitats) Regulations 2011.

Annex IV of the EU Habitats Directive provides protection to a number of listed species, wherever they occur. Under Regulation 23 of the Habitats Directive, any person who, in regards to the listed species, “Deliberately captures or kills any specimen of these species in the wild, deliberately disturbs these species particularly during the period of breeding, rearing, hibernation and migration, deliberately takes or destroys eggs from the wild or damages or destroys a breeding site or resting place of such an animal shall be guilty of an offence.”

2.1.3 Flora (Protection) Order, 2015

The Flora (Protection) Order (S.I. No. 356/2015) affords protection to several species of plant in Ireland, including 68 vascular plants, 40 mosses, 25 liverworts, 1 stonewort and 1 lichen. This Act makes it illegal for anyone to uproot, cut or damage any of the listed plant species and it also forbids anyone from altering, interfering, or damaging their habitats. This protection is not confined to within designated conservation sites and applies wherever the plants are found.

2.2 International Legislation

2.2.1. EU Birds Directive

The Birds Directive constitutes a level of general protection for all wild birds throughout the European Union. Annex I of the Birds Directive includes a total of 194 bird species that are considered rare, vulnerable to habitat changes or in danger of extinction within the European Union. Article 4 establishes that there should be a sustainable management of hunting of listed species, and that any large scale non-selective killing of birds must be outlawed. The Directive requires the designation of Special Protection Areas (SPAs) for: listed and rare species, regularly occurring migratory species and for wetlands which attract large numbers of birds. There are 25 Annex I species that regularly occur in Ireland and a total of 153 Special Protection Areas have been designated.

2.2.2. EU Habitats Directive

The Habitats Directive aims to protect some 220 habitats and approximately 1000 species throughout Europe. The habitats and species are listed in the Directives annexes, where Annex I covers habitats and Annex II, IV and V cover species. There are 59 Annex I habitats in Ireland and 33 Annex IV species which require strict protection wherever they occur. The Directive requires the designation of Special Areas of Conservation for areas of habitat deemed to be of European interest. The SACs together with the SPAs from the Birds Directive form a network of protected sites called Natura 2000.

2.2.3. Water Framework Directive

The EU Water Framework Directive (WFD) 2000/60/EC is an important piece of environmental legislation which aims to protect and improve water quality. It applies to rivers, lakes, groundwater, estuaries, and coastal waters. The Water Framework Directive was agreed by all individual EU member states in 2000, and its first cycle ran from 2009 – 2015. The Directive runs in 6-year cycles, so the second (current) cycle runs from 2016 – 2021. 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 to achieve at least 'good' ecological status, through River Basin Management Plans (RBMP), by 2027.

2.2.4. Bern and Bonn Convention

The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982) was enacted to conserve all species and their habitats. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979, enacted 1983) was introduced to give protection to migratory species across borders in Europe.

2.2.5. Ramsar Convention

The Ramsar Convention on Wetlands is an intergovernmental treaty signed in Ramsar, Iran, in 1971. The treaty is a commitment for national action and international cooperation for the conservation of wetlands and their resources. In Ireland there are currently 45 Ramsar sites which cover a total area of 66,994 Ha.

3 DESCRIPTION OF THE PROPOSED DEVELOPMENT

3.1 Location

The Site is currently comprised of two residential units, approximately 0.829Ha, and is accessed via the R117 (Sandyford Road), almost 330m south of the M50. The east, north and south boundaries of the Site are abutted by residential dwellings, and the west of the Site is bounded by Sandyford Road. The surrounding landscape is primarily urban in nature, although a woodland, Fitzsimon's Wood, lies approximately 90m west of the Site.

3.2 Description

The Proposed Development principally consists of the demolition of the existing dwelling and ancillary buildings known as 'Glenina', the existing dwelling known as 'Karuna' and the existing boundary wall fronting Sandyford Road, and the construction of a residential development principally comprising 137 No. apartments (32 No. 1-bed units, 78 No. 2-bed units and 27 No. 3-bed units) in 4 No. blocks ranging in height from part-1 No. storey to part-6 No. storeys with a part-basement/part-undercroft level (at Blocks B, C and D).

The Proposed Development which has a gross floor space of 13,144 sq m (over a part-basement/part-undercroft level measuring 4,508 sq m, principally providing car and cycle parking and plant) also includes: internal communal amenities and support facilities (404 sq m); 137 No. car parking spaces, which include 127 No. spaces and 6 No. GoCar spaces located at basement level (accessed beneath Block B) and 4 No. set down spaces located at surface level adjacent to Block A; motorcycle parking spaces; cycle parking spaces; bin store; substation; switch room; meter rooms; plant rooms; new telecommunications infrastructure at rooftop level including microwave link dishes concealed in shrouds; hard and soft landscaping, including communal amenity space; private amenity space with balconies facing north, south, east and west; boundary treatments; and all associated works above and below ground.

The incorporation of Sustainable Urban Drainage Systems (SUDS) into the design of the Proposed Development is mandatory for all new developments under the Greater Dublin Regional Code of Practice for Drainage Works. As such, the Proposed Development design entails a suite of SuDS measures. SUDS is a series of management practices and control structures that aim to mimic natural drainage. SUDS reduces flood risk, improves water quality and provides amenity through the use of permeable paving, swales, green roofs, rain water harvesting, detention basins, ponds and wetlands.

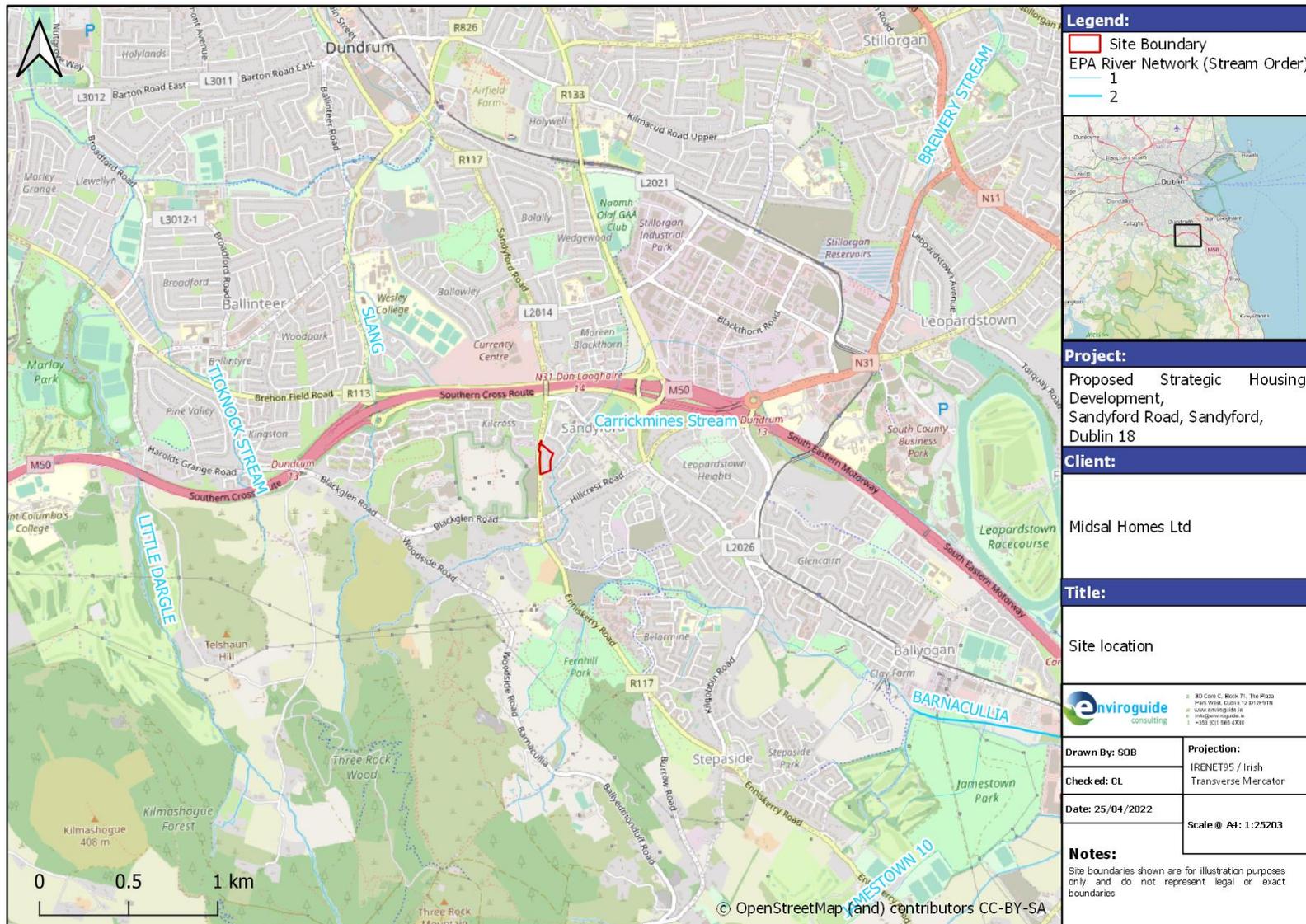


FIGURE 1. SITE LOCATION.

4 METHODOLOGY

This section details the steps and methodology employed to undertake an Ecological Impact Assessment of the Proposed Development.

4.1 Scope of Assessment

The specific objectives of the study were to:

- Undertake baseline ecological surveys and evaluate the nature conservation importance of the Site of the Proposed Development.
- Identify and assess the direct, indirect, and cumulative ecological implications or impacts of the Proposed Development during its lifetime; and
- Where possible, propose mitigation measures to remove or reduce those impacts at the appropriate stage of development.

4.2 Desk Study

A desktop study was carried out to collate and review available information, datasets and documentation sources pertaining to the site's natural environment. The desktop study relied on the following sources:

- Information on species records and distributions, obtained from the National Biodiversity Data Centre (NBDC) at www.maps.biodiversityireland.ie.
- Information on waterbodies, catchment areas and hydrological connections obtained from the Environmental Protection Agency (EPA) at www.gis.epa.ie.
- Information on bedrock, groundwater, aquifers and their statuses, obtained from Geological Survey Ireland (GSI) at www.gsi.ie ;
- Information on the network of designated conservation sites, boundaries, qualifying interests and conservation objectives, obtained from the National Parks and Wildlife Service (NPWS) at www.npws.ie ;
- Satellite imagery and mapping obtained from various sources and dates including Google, Digital Globe and Ordnance Survey Ireland.
- Information on the existence of permitted developments, or developments awaiting decision, in the vicinity of the Proposed Development from Dún Laoghaire-Rathdown County Council available at: <https://dlrcocouncil.maps.arcgis.com/apps/webappviewer/index.html?id=af21eeb123224c4c877f410139ed1e69>
- Information on the extent, nature and location of the Proposed Development, provided by the applicant and/or their design team.
- The current conservation status of birds in Ireland taken from Gilbert et al. (2021).
- The pollinator friendly planting code provided by The All-Ireland Pollinator Plan (2015-2020) available at www.pollinators.ie
- Dún Laoghaire-Rathdown County Council Biodiversity Plan 2009 – 2013
- Dún Laoghaire-Rathdown County Council County Development Plan 2022 – 2028

A comprehensive list of all the specific documents and information sources consulted in the completion of this document is provided in Section 11, References.

4.3 Field surveys

4.3.1 Habitat Surveys

A habitat survey was carried out at the Site on the 1st of September 2021 by Enviroguide Ecologist Shannen O'Brien. Habitats were categorised according to the Heritage Council's 'A Guide to Habitats in Ireland' (Fossitt, 2000) to level 3. The habitat mapping exercise had regard to the 'Best Practice Guidance for Habitat Survey and Mapping' (Smith et al., 2010) published by the Heritage Council. Satellite imagery was used together with GPS to accurately enable field navigation. Habitat categories, characteristic plant species, invasive species and other ecological features were recorded.

4.3.2 Bat Surveys

Bat surveys were carried out on Site of the Proposed Development on the 16th of September 2021 and the 21st of April 2022 by Ash Ecology & Environmental Ltd (AEE). Details of the bat surveys can be found in the Bat Survey Report in Appendix III.

4.3.3 Bird Surveys

A general activity bird survey was completed on the 1st of September 2021. All birds encountered on Site, through visual and/or audio means, were recorded during this survey.

4.3.4 Mammal Surveys

Mammal surveys of the Site were carried out in conjunction with the habitat survey. The Site was examined for tracks and signs of mammals. The habitat types recorded throughout the survey area were used to assist in identifying the fauna considered likely to utilise the area.

4.3.5 Invasive Species Surveys

The Site was assessed for the presence of invasive plant species during the habitat survey undertaken.

4.4 Consultation

No consultation was undertaken as part of this Ecological Impact Assessment.

4.5 Assessment

The value of the ecological resources, i.e., the habitats and species present or potentially present, was determined using the ecological evaluation guidance given in the National Roads Authority's Ecological Assessment Guidelines (NRA, 2009a), presented in Appendix I. This evaluation scheme, with values ranging from locally important to internationally important, seeks to provide value ratings for habitats and species present that are considered ecological receptors of impacts that may ensue from a proposal. As per the NRA guidelines, impact assessment is only undertaken of key ecological receptors (KERs).

The assessment of the potential effect or impact of the Proposed Development on the identified key ecological receptors was carried out with regard to the criteria outlined in the draft EPA Guideline (EPA, 2017), presented in Appendix II. These guidelines set out a number of parameters such as quality, magnitude, extent and duration that should be considered when

determining which elements of the Proposed Development could constitute impact or sources of impacts.

4.6 Limitations

An extensive search of available datasets for records of rare and protected species within proximity of the Proposed Development has been undertaken as part of this assessment. However, the records from these datasets do not constitute a complete species list. The absence of species from these datasets does not necessarily confirm an absence of species in the area.

5 BASELINE ECOLOGICAL CONDITIONS

5.1 Site Overview

5.1.1 Geology, Hydrology and Hydrogeology

The Site of the Proposed Development is located primarily within the Ovoca-Vartry catchment and the Dargle_SC_010 sub-catchment, however the northwest area of the Site falls within the Liffey and Dublin Bay catchment and Dodder_SC_010 sub-catchment. The closest watercourse to the Site is Carrickmines Stream approximately 13m southeast of the Site, which flows into the Shanganagh River approximately 6.7km to the southeast of the Site, and ultimately into Killiney Bay. The status of the Shanganagh River was designated as *Good* by the EPA in 2020 (station code: RS10S010600). The River Slang is located approximately 950m west of the Site, and this watercourse flows into the River Dodder 4.6km northwest of the Site of the Proposed Development, and ultimately into Dublin Bay. The River Dodder was designated as *Moderate* by the EPA in 2010 (station code: RS09D010800).

The Site is situated mainly on the Wicklow groundwater body, which is Not at Risk of not meeting its WFD objectives, however the northwest area of the Site is located on the Kilcullen groundwater body, which is *At Risk* of not meeting its WFD objectives. The aquifer type within the Site boundary is a *Poor Aquifer (PI)* aquifer on bedrock which is *Generally Unproductive except for Local Zones*. The groundwater rock units underlying the aquifer are classified as *Granites & other Igneous Intrusive rocks* (GSI, 2021). The level of vulnerability of the Site to groundwater contamination via human activities is *Extreme*. The soil is classified as *Urban*, and the subsoil is man-made (*Made*) (EPA, 2021).

5.2 Designated Sites

The Habitats Directive (92/43/EEC) seeks to conserve natural habitats and wild fauna and flora by the designation of Special Areas of Conservation (SACs) and the Birds Directive (2009/147/EC) seeks to protect birds of special importance by the designation of Special Protection Areas (SPAs). It is the responsibility of each member state to designate SPAs and SACs, both of which will form part of Natura 2000, a network of protected sites throughout the European Community. SACs are selected for the conservation of Annex I habitats (including priority types which are in danger of disappearance) and Annex II species (other than birds). SPAs are selected for the conservation of Annex I birds and other regularly occurring migratory birds and their habitats. The annexed habitats and species for which each site is selected correspond to the qualifying interests of the sites; from these the conservation objectives of the site are derived.

Natural Heritage Areas (NHAs) are designations under the Wildlife Acts to protect habitats, species, or geology of national importance. The boundaries of many of the NHAs in Ireland overlap with SAC and/or SPA sites. Although many NHA designations are not yet fully in force under this legislation (referred to as 'proposed NHAs' or pNHAs), they are offered protection in the meantime under planning policy which normally requires that planning authorities give recognition to their ecological value.

Table 1 below presents details of the designated sites within a 15km radius of the Proposed Development. In addition, the potential for connectivity with designated sites at distances of

greater than 15km from the Development was also considered in this initial assessment. In this case, there is no potential connectivity between the Development site and designated sites located at a distance greater than 15km from the Proposed Development.

The result of this preliminary screening concluded that there is a total of 9 SACs, 4 SPAs and 27 pNHAs located within the Zone of Influence of the Proposed Development Site. The distances to each site listed are taken from the nearest possible point of the Proposed Development Site boundary to nearest possible point of each Natura 2000 site or pNHA. In addition, Dublin Bay is designated as a UNESCO Biosphere¹. Dublin Bay Biosphere contains three different zones, which are managed in different ways:

- The core zone of Dublin Bay Biosphere comprises 50km² of areas of high natural value. Key areas include the Tolka and Baldoyle Estuaries, Booterstown Marsh, Howth Head, North Bull Island, Dalkey Island and Ireland's Eye.
- The buffer zone comprises 82km² of public and private green spaces such as parks, greenbelts and golf courses, which surround and adjoin the core zones.
- The transition zone comprises 173km² and forms the outer part of the Biosphere. It includes residential areas, harbours, ports and industrial and commercial areas. The Site of the Proposed Development is located within this zone.

TABLE 1. DESIGNATED SITES WITHIN THE ZONE OF INFLUENCE (15KM) OF THE PROPOSED DEVELOPMENT, POTENTIAL PATHWAYS BETWEEN THE PROPOSED DEVELOPMENT SITE AND THE DESIGNATED SITES. SITES THAT HAVE BEEN SCREENED INTO THIS ECIA FOR FURTHER ASSESSMENT ARE SHADED IN GREEN.

Site Name & Code (Receptor)	Distance to Proposed Development	Potential Pathway to receptor
Special Area of Conservation		
Wicklow Mountains SAC (002122)	5.0km	No – Refer to AA Screening Report accompanying this application.
South Dublin Bay SAC (000210)	5.0km	<p>Yes – Weak hydrological pathway via surface water discharges to the River Slang during the Construction and Operational Phases and discharges from Ringsend WwTP into Dublin Bay during the Operational Phase.</p> <p>However, the potential for surface water generated at the Site of the Proposed Development to this SAC and cause significant effects, during both the Construction and Operational Phase, is negligible due to:</p> <ul style="list-style-type: none"> • The distance and consequent potential for dilution in the River Slang, River Dodder and Dublin Bay. Surface water discharges would have to travel over 11km along these watercourses before reaching the River Liffey and discharging into Dublin Bay. • The potential for dilution in the surface water network during heavy rainfall events. <p>The potential for foul waters generated at the Site of the Proposed Development to reach this SAC and cause significant effects, during the Operational Phase, is negligible due to:</p>

¹ A biosphere is a special designation awarded by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) but managed in partnership by communities, NGOs and local and national governments (<https://www.dublinbaybiosphere.ie/>).

Site Name & Code (Receptor)	Distance to Proposed Development	Potential Pathway to receptor
		<ul style="list-style-type: none"> The potential for dilution in the surface water network during heavy rainfall events. The upgrade works to Ringsend WWTP which will increase the capacity of the facility from 1.6 million PE to 2.4 million PE. It is considered that effects on marine biodiversity and the European sites within Dublin Bay from the current operation of Ringsend WwTP are unlikely. The main area of dispersal of the treated effluent from Ringsend WwTP is in the Tolka Basin and around North Bull Island. South Dublin Bay is unaffected by the effluent from the plant (Irish Water, 2018). The increase of Population Equivalent (PE) at the facility as a result of the Proposed Development, assuming each PE unit was not previously supported by the WwTP, is considered to be an insignificant increase in terms of the overall scale of the facility. The total daily flow of foul water from the Proposed Development is estimated to be 61m³, which is 0.0001% of the volume of raw effluent treated at Ringsend per day. This potential increased load does not have the capacity to alter the effluent released from the WwTP to such an extent as to result in likely significant effects on this SAC. In addition, upgrade works are currently on-going at Ringsend WwTP to increase the capacity of the facility from 1.6 million PE to 2.4 million PE. This plant upgrade will result in an overall reduction in the final effluent discharge of several parameters from the facility including BOD, suspended solids, ammonia, DIN and MRP (Irish Water, 2018).
Knocksink Wood SAC (000725)	6.2km	No – Refer to AA Screening Report accompanying this application.
Ballyman Glen SAC (000713)	7.8km	
Glenasmole Valley SAC (001209)	8.9km	
Rockabill to Dalkey Island SAC (003000)	9.2km	
North Dublin Bay SAC (000206)	10.0km	<p>Yes – Weak hydrological pathway via surface water discharges to the River Slang during the Construction and Operational Phases and discharges from Ringsend WwTP into Dublin Bay during the Operational Phase.</p> <p>However, the potential for surface water generated at the Site of the Proposed Development to reach this SAC and cause significant effects, during both the Construction and Operational Phase, is negligible due to:</p> <ul style="list-style-type: none"> The distance and consequent potential for dilution in the River Slang, River Dodder and Dublin Bay. Surface water discharges would have to travel over 11km along these watercourses before reaching the River Liffey and discharging into Dublin Bay. The potential for dilution in the surface water network during heavy rainfall events. <p>The potential for foul waters generated at the Site of the Proposed Development to reach this SAC and cause significant effects, during the Operational Phase, is negligible due to:</p>

Site Name & Code (Receptor)	Distance to Proposed Development	Potential Pathway to receptor
		<ul style="list-style-type: none"> The potential for dilution in the surface water network during heavy rainfall events. The upgrade works to Ringsend WWTP which will increase the capacity of the facility from 1.6 million PE to 2.4 million PE. It is considered that effects on marine biodiversity and the European sites within Dublin Bay from the current operation of Ringsend WwTP are unlikely. The main area of dispersal of the treated effluent from Ringsend WwTP is in the Tolka Basin and around North Bull Island. South Dublin Bay is unaffected by the effluent from the plant (Irish Water, 2018). The increase of Population Equivalent (PE) at the facility as a result of the Proposed Development, assuming each PE unit was not previously supported by the WwTP, is considered to be an insignificant increase in terms of the overall scale of the facility. The total daily flow of foul water from the Proposed Development is estimated to be 61m³, which is 0.0001% of the volume of raw effluent treated at Ringsend per day. This potential increased load does not have the capacity to alter the effluent released from the WwTP to such an extent as to result in likely significant effects on this SAC. In addition, upgrade works are currently on-going at Ringsend WwTP to increase the capacity of the facility from 1.6 million PE to 2.4 million PE. This plant upgrade will result in an overall reduction in the final effluent discharge of several parameters from the facility including BOD, suspended solids, ammonia, DIN and MRP (Irish Water, 2018).
Bray Head SAC (000714)	12.2km	No – Refer to AA Screening Report accompanying this application.
Howth Head SAC (000202)	14.1km	
Special Protection Area		
South Dublin Bay and River Tolka Estuary SPA (004024)	5.0 km	<p>Yes – Weak hydrological pathway via surface water discharges to the River Slang during the Construction and Operational Phases and discharges from Ringsend WwTP into Dublin Bay during the Operational Phase.</p> <p>However, the potential for surface water generated at the Site of the Proposed Development to this SPA and cause significant effects, during both the Construction and Operational Phase, is negligible due to:</p> <ul style="list-style-type: none"> The distance and consequent potential for dilution in the River Slang, River Dodder and Dublin Bay. Surface water discharges would have to travel over 11km along these watercourses before reaching the River Liffey and discharging into Dublin Bay. The potential for dilution in the surface water network during heavy rainfall events. <p>The potential for foul waters generated at the Site of the Proposed Development to reach this SPA and cause significant effects, during the Operational Phase, is negligible due to:</p> <ul style="list-style-type: none"> The potential for dilution in the surface water network during heavy rainfall events. The upgrade works to Ringsend WWTP which will increase the capacity of the facility from 1.6 million PE to 2.4 million PE.

Site Name & Code (Receptor)	Distance to Proposed Development	Potential Pathway to receptor
		<ul style="list-style-type: none"> It is considered that effects on marine biodiversity and the European sites within Dublin Bay from the current operation of Ringsend WwTP are unlikely. The main area of dispersal of the treated effluent from Ringsend WwTP is in the Tolka Basin and around North Bull Island. South Dublin Bay is unaffected by the effluent from the plant (Irish Water, 2018). The increase of Population Equivalent (PE) at the facility as a result of the Proposed Development, assuming each PE unit was not previously supported by the WwTP, is considered to be an insignificant increase in terms of the overall scale of the facility. The total daily flow of foul water from the Proposed Development is estimated to be 61m³, which is 0.0001% of the volume of raw effluent treated at Ringsend per day. This potential increased load does not have the capacity to alter the effluent released from the WwTP to such an extent as to result in likely significant effects on this SPA. In addition, upgrade works are currently on-going at Ringsend WwTP to increase the capacity of the facility from 1.6 million PE to 2.4 million PE. This plant upgrade will result in an overall reduction in the final effluent discharge of several parameters from the facility including BOD, suspended solids, ammonia, DIN and MRP (Irish Water, 2018).
Wicklow Mountains SPA (004040)	5.1 km	No – Refer to AA Screening Report accompanying this application.
Dalkey Islands SPA (004172)	8.9 km	
North Bull Island SPA (004006)	10.0 km	<p>Yes – Weak hydrological pathway via surface water discharges to the River Slang during the Construction and Operational Phases and discharges from Ringsend WwTP into Dublin Bay during the Operational Phase.</p> <p>However, the potential for surface water generated at the Site of the Proposed Development to this SPA and cause significant effects, during both the Construction and Operational Phase, is negligible due to:</p> <ul style="list-style-type: none"> The distance and consequent potential for dilution in the River Slang, River Dodder and Dublin Bay. Surface water discharges would have to travel over 11km along these watercourses before reaching the River Liffey and discharging into Dublin Bay. The potential for dilution in the surface water network during heavy rainfall events. <p>The potential for foul waters generated at the Site of the Proposed Development to reach this SPA and cause significant effects, during the Operational Phase, is negligible due to:</p> <ul style="list-style-type: none"> The potential for dilution in the surface water network during heavy rainfall events. The upgrade works to Ringsend WWTP which will increase the capacity of the facility from 1.6 million PE to 2.4 million PE. It is considered that effects on marine biodiversity and the European sites within Dublin Bay from the current operation of Ringsend WwTP are unlikely. The main area of dispersal of the treated effluent from Ringsend WwTP is in the Tolka Basin and around North Bull

Site Name & Code (Receptor)	Distance to Proposed Development	Potential Pathway to receptor
		<p>Island. South Dublin Bay is unaffected by the effluent from the plant (Irish Water, 2018).</p> <ul style="list-style-type: none"> The increase of Population Equivalent (PE) at the facility as a result of the Proposed Development, assuming each PE unit was not previously supported by the WwTP, is considered to be an insignificant increase in terms of the overall scale of the facility. The total daily flow of foul water from the Proposed Development is estimated to be 61m³, which is 0.0001% of the volume of raw effluent treated at Ringsend per day. This potential increased load does not have the capacity to alter the effluent released from the WwTP to such an extent as to result in likely significant effects on this SPA. In addition, upgrade works are currently on-going at Ringsend WwTP to increase the capacity of the facility from 1.6 million PE to 2.4 million PE. This plant upgrade will result in an overall reduction in the final effluent discharge of several parameters from the facility including BOD, suspended solids, ammonia, DIN and MRP (Irish Water, 2018).
Proposed Natural Heritage Area		
Fitzsimon's Wood (001753)	0.1km	Yes – there is no hydrological connection, however due to the proximity of the Site to this pNHA, potential impacts may arise from emissions of noise, dust, pollutants and/or vibrations produced from the Site during the Construction Phase
Dingle Glen (001207)	4.3km	No – there is no hydrological connection with this pNHA and the intervening distances between the Site and the pNHA are sufficient to exclude the possibility of significant effects on the pNHA arising from: emissions of noise, dust, pollutants and/or vibrations emitted from the Site during the Construction Phase; increased traffic volumes during the Construction and Operational Phase and associated emissions; potential increased lighting emitted from the Site during Construction and Operational Phase; and increased human presence at the Site during Construction and Operational Phase.
Ballybetagh Bog (001202)	4.9km	
Boosterstown Marsh (001205)	5.0km	
South Dublin Bay (000210)	5.0km	<p>Yes – Weak hydrological pathway via surface water discharges to the River Slang during the Construction and Operational Phases and discharges from Ringsend WwTP into Dublin Bay during the Operational Phase.</p> <p>However, the potential for surface water generated at the Site of the Proposed Development to reach this pNHA and cause significant effects, during both the Construction and Operational Phase, is negligible due to:</p> <ul style="list-style-type: none"> The distance and consequent potential for dilution in the River Slang, River Dodder and Dublin Bay. Surface water discharges would have to travel over 11km along these watercourses before reaching the River Liffey and discharging into Dublin Bay. The potential for dilution in the surface water network during heavy rainfall events. <p>The potential for foul waters generated at the Site of the Proposed Development to reach this pNHA and cause significant effects, during the Operational Phase, is negligible due to:</p> <ul style="list-style-type: none"> The potential for dilution in the surface water network during heavy rainfall events.

Site Name & Code (Receptor)	Distance to Proposed Development	Potential Pathway to receptor
		<ul style="list-style-type: none"> The upgrade works to Ringsend WWTP which will increase the capacity of the facility from 1.6 million PE to 2.4 million PE. It is considered that effects on marine biodiversity and the European sites within Dublin Bay from the current operation of Ringsend WwTP are unlikely. The main area of dispersal of the treated effluent from Ringsend WwTP is in the Tolka Basin and around North Bull Island. South Dublin Bay is unaffected by the effluent from the plant (Irish Water, 2018). The increase of Population Equivalent (PE) at the facility as a result of the Proposed Development, assuming each PE unit was not previously supported by the WwTP, is considered to be an insignificant increase in terms of the overall scale of the facility. The total daily flow of foul water from the Proposed Development is estimated to be 61m³, which is 0.0001% of the volume of raw effluent treated at Ringsend per day. This potential increased load does not have the capacity to alter the effluent released from the WwTP to such an extent as to result in likely significant effects on this pNHA. In addition, upgrade works are currently on-going at Ringsend WwTP to increase the capacity of the facility from 1.6 million PE to 2.4 million PE. This plant upgrade will result in an overall reduction in the final effluent discharge of several parameters from the facility including BOD, suspended solids, ammonia, DIN and MRP (Irish Water, 2018).
Knocksink Wood (000725)	6.2km	<p>No – there is no hydrological connection with these pNHAs and the intervening distances between the Site and these pNHAs are sufficient to exclude the possibility of significant effects on these pNHAs arising from: emissions of noise, dust, pollutants and/or vibrations emitted from the Site during the Construction Phase; increased traffic volumes during the Construction and Operational Phase and associated emissions; potential increased lighting emitted from the Site during Construction and Operational Phase; and increased human presence at the Site during Construction and Operational Phase.</p>
Loughlinstown Woods (001211)	6.7km	
Dalkey Coastal Zone And Killiney Hill (001206)	6.9km	
Dodder Valley (000991)	7.1km	
Grand Canal (002104)	7.1km	
Ballyman Glen (000713)	7.8km	
Dolphins, Dublin Docks (000201)	8.4km	<p>Yes – Weak hydrological pathway via surface water discharges to the River Slang during the Construction and Operational Phases and discharges from Ringsend WwTP into Dublin Bay during the Operational Phase.</p> <p>However, the potential for surface water generated at the Site of the Proposed Development to this pNHA and cause significant effects, during both the Construction and Operational Phase, is negligible due to:</p> <ul style="list-style-type: none"> The distance and consequent potential for dilution in the River Slang, River Dodder and Dublin Bay. Surface water discharges would have to travel over 11km along these watercourses before reaching the River Liffey and discharging into Dublin Bay. The potential for dilution in the surface water network during heavy rainfall events. <p>The potential for foul waters generated at the Site of the Proposed Development to reach this pNHA and cause significant effects, during the Operational Phase, is negligible due to:</p>

Site Name & Code (Receptor)	Distance to Proposed Development	Potential Pathway to receptor
		<ul style="list-style-type: none"> The potential for dilution in the surface water network during heavy rainfall events. The upgrade works to Ringsend WWTP which will increase the capacity of the facility from 1.6 million PE to 2.4 million PE. It is considered that effects on marine biodiversity and the European sites within Dublin Bay from the current operation of Ringsend WwTP are unlikely. The main area of dispersal of the treated effluent from Ringsend WwTP is in the Tolka Basin and around North Bull Island. South Dublin Bay is unaffected by the effluent from the plant (Irish Water, 2018). The increase of Population Equivalent (PE) at the facility as a result of the Proposed Development, assuming each PE unit was not previously supported by the WwTP, is considered to be an insignificant increase in terms of the overall scale of the facility. The total daily flow of foul water from the Proposed Development is estimated to be 64.2m³, which is 0.0001% of the volume of raw effluent treated at Ringsend per day. This potential increased load does not have the capacity to alter the effluent released from the WwTP to such an extent as to result in likely significant effects on this pNHA. In addition, upgrade works are currently on-going at Ringsend WwTP to increase the capacity of the facility from 1.6 million PE to 2.4 million PE. This plant upgrade will result in an overall reduction in the final effluent discharge of several parameters from the facility including BOD, suspended soils, ammonia, DIN and MRP (Irish Water, 2018).
Powerscourt Woodland (001768)	8.8km	<p>No – there is no hydrological connection with these pNHAs and the intervening distances between the Site and these pNHAs are sufficient to exclude the possibility of significant effects on these pNHAs arising from: emissions of noise, dust, pollutants and/or vibrations emitted from the Site during the Construction Phase; increased traffic volumes during the Construction and Operational Phase and associated emissions; potential increased lighting emitted from the Site during Construction and Operational Phase; and increased human presence at the Site during Construction and Operational Phase.</p>
Royal Canal (002103)	8.8km	
Glenasmole Valley (001209)	8.9km	
Glenree Valley (001755)	9.2km	
North Dublin Bay (000206)	9.5km	<p>Yes – Weak hydrological pathway via surface water discharges to the River Slang during the Construction and Operational Phases and discharges from Ringsend WwTP into Dublin Bay during the Operational Phase.</p> <p>However, the potential for surface water generated at the Site of the Proposed Development to this pNHA and cause significant effects, during both the Construction and Operational Phase, is negligible due to:</p> <ul style="list-style-type: none"> The distance and consequent potential for dilution in the River Slang, River Dodder and Dublin Bay. Surface water discharges would have to travel over 11km along these watercourses before reaching the River Liffey and discharging into Dublin Bay. The potential for dilution in the surface water network during heavy rainfall events.

Site Name & Code (Receptor)	Distance to Proposed Development	Potential Pathway to receptor
		<p>The potential for foul waters generated at the Site of the Proposed Development to reach this pNHA and cause significant effects, during the Operational Phase, is negligible due to:</p> <ul style="list-style-type: none"> • The potential for dilution in the surface water network during heavy rainfall events. • The upgrade works to Ringsend WWTP which will increase the capacity of the facility from 1.6 million PE to 2.4 million PE. • It is considered that effects on marine biodiversity and the European sites within Dublin Bay from the current operation of Ringsend WwTP are unlikely. • The main area of dispersal of the treated effluent from Ringsend WwTP is in the Tolka Basin and around North Bull Island. South Dublin Bay is unaffected by the effluent from the plant (Irish Water, 2018). • The increase of Population Equivalent (PE) at the facility as a result of the Proposed Development, assuming each PE unit was not previously supported by the WwTP, is considered to be an insignificant increase in terms of the overall scale of the facility. The total daily flow of foul water from the Proposed Development is estimated to be 64.2m³, which is 0.0001% of the volume of raw effluent treated at Ringsend per day. This potential increased load does not have the capacity to alter the effluent released from the WwTP to such an extent as to result in likely significant effects on this pNHA. In addition, upgrade works are currently on-going at Ringsend WwTP to increase the capacity of the facility from 1.6 million PE to 2.4 million PE. This plant upgrade will result in an overall reduction in the final effluent discharge of several parameters from the facility including BOD, suspended soils, ammonia, DIN and MRP (Irish Water, 2018).
Dargle River Valley (001754)	10.3km	<p>No – there is no hydrological connection with these pNHAs and the intervening distances between the Site and these pNHAs are sufficient to exclude the possibility of significant effects on these pNHAs arising from: emissions of noise, dust, pollutants and/or vibrations emitted from the Site during the Construction Phase; increased traffic volumes during the Construction and Operational Phase and associated emissions; potential increased lighting emitted from the Site during Construction and Operational Phase; and increased human presence at the Site during Construction and Operational Phase.</p>
Great Sugar Loaf (001769)	11.1km	
Lugmore Glen (001212)	11.8km	
Bray Head (000714)	12.2km	
Liffey Valley (000128)	12.5km	
Powerscourt Waterfall (001767)	12.5km	
Kilmacanoge Marsh (000724)	12.8km	
Howth Head (000202)	14.2km	
Slade Of Saggart And Crooksling Glen (000211)	14.3km	
Santry Demesne (000178)	14.4km	

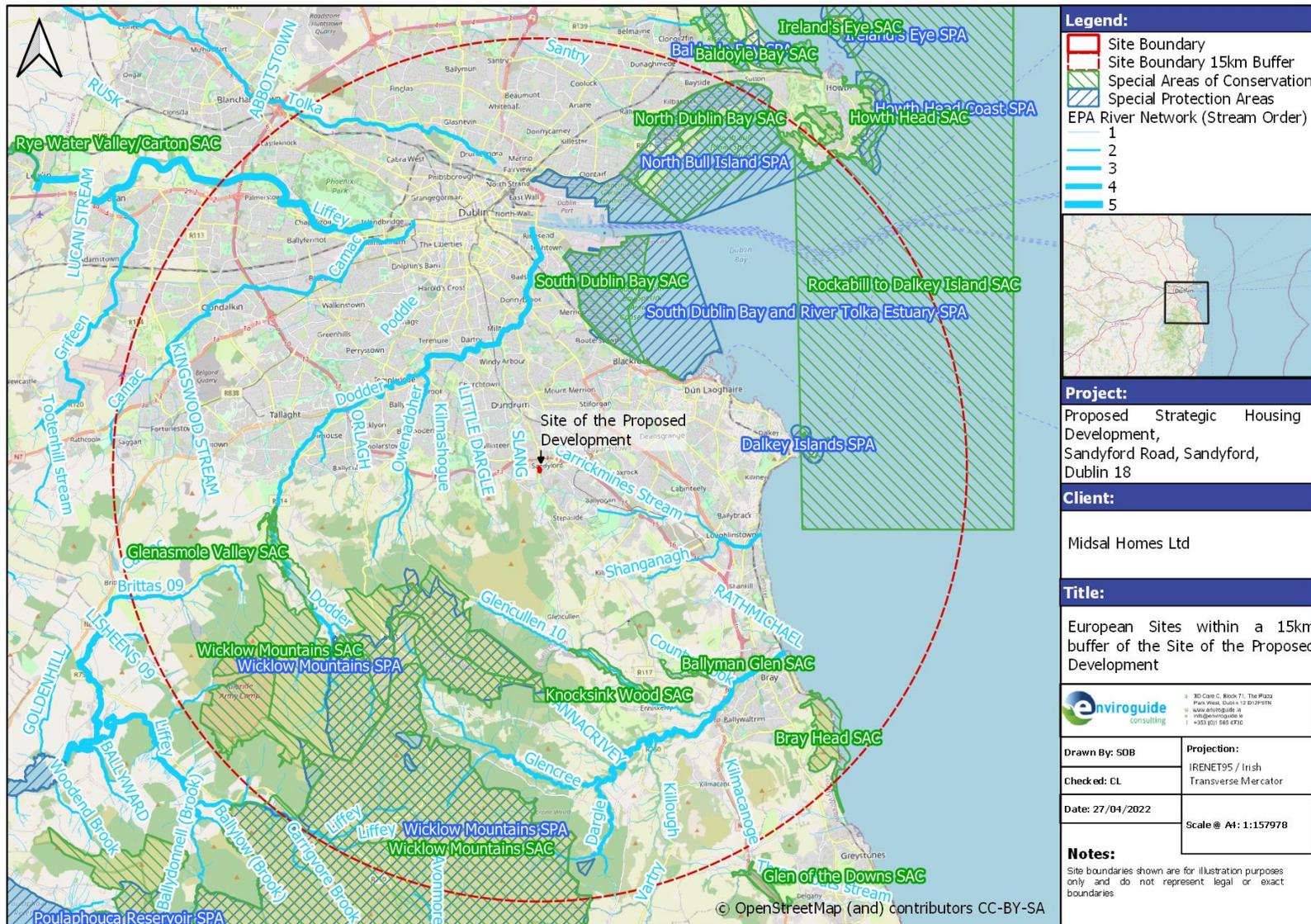


FIGURE 2. NATURA 2000 SITES WITHIN 15KM OF THE PROPOSED DEVELOPMENT SITE.

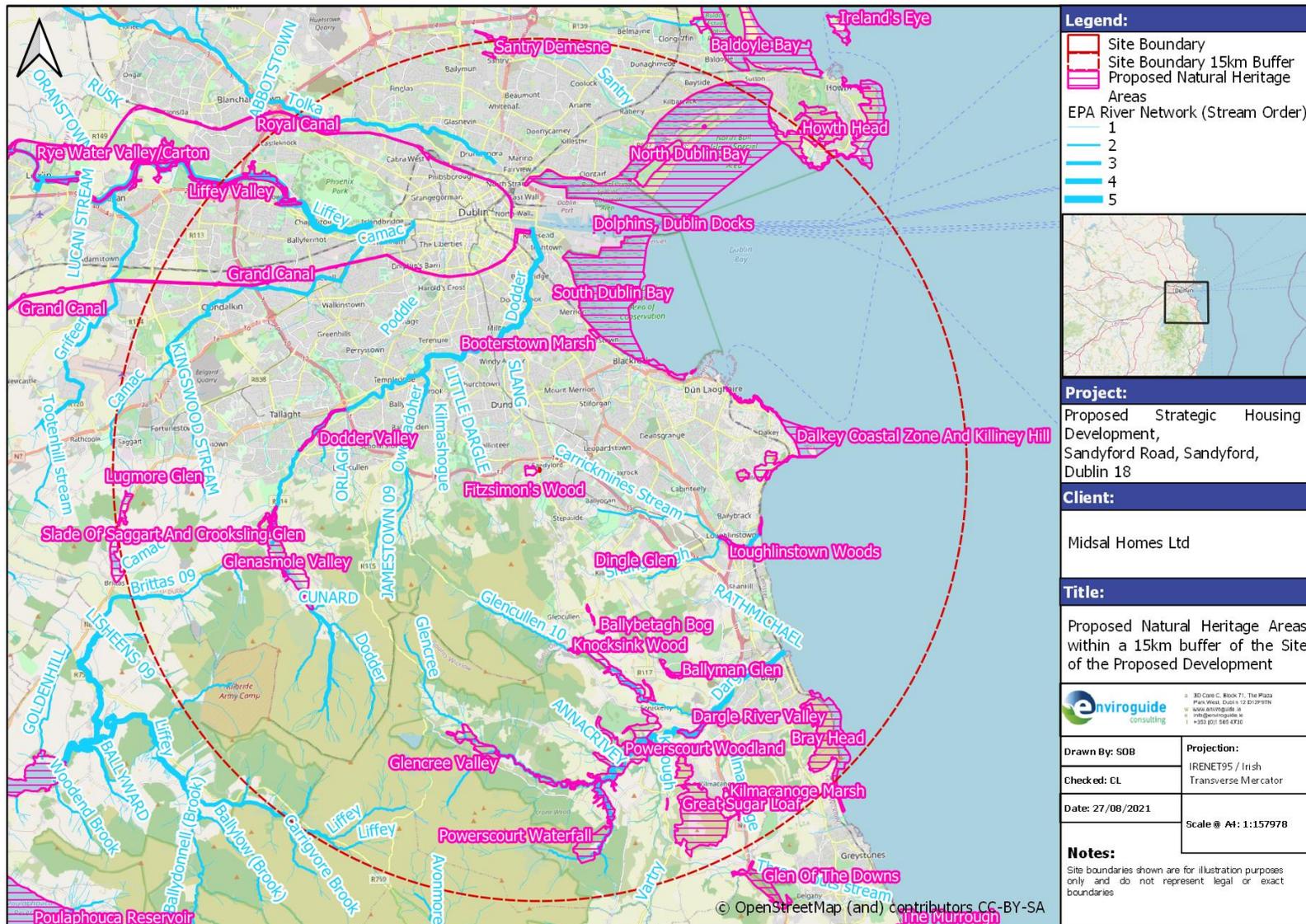


FIGURE 3. PROPOSED NATURAL HERITAGE AREAS WITHIN 15KM OF THE PROPOSED DEVELOPMENT SITE

5.3 Desk Study

5.3.1 Species and Species Groups

The Site of the Proposed Development is located within the Ordnance Survey Ireland National Grid 2km square O12X. Species records from the National Biodiversity Data Centre (NBDC) online database for this grid square was studied for the presence of rare or protected flora and fauna. The following records were excluded:

- Records greater than 20 years old.
- Species records with no designation or conservation status (excluding mammals and birds).

In addition, data from various sources (e.g., Inland Fisheries Ireland) were used to determine the presence of species in the vicinity of the Proposed Development. The following sections outline the results of this assessment.

5.3.1.1 Flora

Rare and Protected Flora

Species records from the NBDC online database were studied for the presence of rare or protected flora and no records were found. There are no records for protected bryophytes within the area².

Invasive Plant Species

The NBDC have records (dated within the last 20 years) of 4 *High Impact* and 6 *Medium Impact* invasive plant species within the 2km (O12X) grid square (Table 2).

TABLE 2. INVASIVE PLANT SPECIES WITHIN THE 2KM (O12X) GRID SQUARE. THE RECORDS ARE DATED WITHIN THE LAST 20 YEARS AND ARE PROVIDED BY THE NBDC.

Name	Date of last record	Database	Legal status / Designation
Cherry Laurel <i>Prunus laurocerasus</i>	03/04/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	- High Impact Invasive
Japanese Knotweed <i>Fallopia japonica</i>	18/06/2018	National Invasive Species Database	- High Impact Invasive - Regulation S.I. 477 (Ireland)
Rhododendron <i>Rhododendron ponticum</i>	07/06/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	- High Impact Invasive - Regulation S.I. 477 (Ireland)
American Skunk-cabbage <i>Lysichiton americanus</i>	23/04/2021	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	- Medium Impact Invasive - EU Regulation No. 1143/2014 - Regulation S.I. 477 (Ireland)
Butterfly Bush <i>Buddleja davidii</i>	05/05/2016	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	- Medium Impact Invasive

² <https://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=71f8df33693f48edbb70369d7fb26b7e>

Name	Date of last record	Database	Legal status / Designation
Himalayan Honeysuckle <i>Leycesteria formosa</i>	30/05/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	- Medium Impact Invasive
Sycamore <i>Acer pseudoplatanus</i>	14/05/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	- Medium Impact Invasive
Three-cornered Garlic <i>Allium triquetrum</i>	04/04/2021	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	- Medium Impact Invasive - Regulation S.I. 477 (Ireland)
Traveller's-joy <i>Clematis vitalba</i>	05/05/2016	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	- Medium Impact Invasive

5.3.1.2 Mammals (excl. bats)

Records for terrestrial mammals were retrieved from the NBDC online database. Table 3 lists these species, their last record date and summarises their legal status/designation. 10 terrestrial mammals were recorded within the 2km grid square (O12X), six of which are native, are the remaining four species, Brown Rat, Grey Squirrel, Fallow Deer, and Sika Deer, are High Impact invasive species.

TABLE 3. TERRESTRIAL MAMMAL SPECIES WITHIN THE 2KM (O12X) GRID SQUARE. THE RECORDS ARE DATED WITHIN THE LAST 20 YEARS AND ARE PROVIDED BY THE NBDC.

Name	Date of last record	Database	Legal Status / Designation
Brown Rat <i>Rattus norvegicus</i>	10/10/2015	Atlas of Mammals in Ireland 2010-2015	- High Impact Invasive - Regulation S.I. 477 (Ireland)
Eastern Grey Squirrel <i>Sciurus carolinensis</i>	25/12/2018	Mammals of Ireland 2016-2025	- High Impact Invasive - EU Regulation No. 1143/2014 - Regulation S.I. 477 (Ireland)
Eurasian Badger <i>Meles meles</i>	07/01/2016	Mammals of Ireland 2016-2025	- Wildlife (Amendment) Act, 2000
Eurasian Pygmy Shrew <i>Sorex minutus</i>	02/05/2018	Mammals of Ireland 2016-2025	- Wildlife (Amendment) Act, 2000
Eurasian Red Squirrel <i>Sciurus vulgaris</i>	30/04/2018	Mammals of Ireland 2016-2025	- Wildlife (Amendment) Act, 2000
European Otter <i>Lutra lutra</i>	04/12/2016	Mammals of Ireland 2016-2025	- EU Habitats Directive Annex II - Wildlife (Amendment) Act, 2000
Fallow Deer <i>Dama dama</i>	26/06/2018	Mammals of Ireland 2016-2025	- High Impact Invasive - Regulation S.I. 477 (Ireland) - Wildlife (Amendment) Act, 2000
Red Fox <i>Vulpes vulpes</i>	25/08/2018	Atlas of Mammals in Ireland 2010-2015	- n/a
Sika Deer <i>Cervus nippon</i>	13/10/2018	Atlas of Mammals in Ireland 2010-2015	- High Impact Invasive - Regulation S.I. 477 (Ireland) - Wildlife (Amendment) Act, 2000
Wood Mouse <i>Apodemus sylvaticus</i>	02/05/2018	Mammals of Ireland 2016-2025	- n/a

5.3.1.3 Bats

There are 4 bat species recorded within the 2km grid square associated with the Site (O12X). The NBDC maps landscape suitability for bats based on Lundy et al. (2011). The index ranges from 0 to 100 with 0 being least favourable and 100 most favourable for bats. The overall habitat suitability index for bats in the area is 17.44.

TABLE 4 BAT SPECIES WITHIN THE 2KM (O12X) GRID SQUARE. THE RECORDS ARE DATED WITHIN THE LAST 20 YEARS AND ARE PROVIDED BY THE NBDC.

Name	Date of last record	Database	Legal Status / Designation
Brown Long-eared Bat <i>Plecotus auritus</i>	08/06/2010	National Bat Database of Ireland	- EU Habitats Directive Annex IV - Wildlife (Amendment) Act, 2000
Lesser Noctule <i>Nyctalus leisleri</i>	08/06/2010	National Bat Database of Ireland	- EU Habitats Directive Annex IV - Wildlife (Amendment) Act, 2000
Pipistrelle <i>Pipistrellus pipistrellus sensu lato</i>	08/06/2010	National Bat Database of Ireland	- EU Habitats Directive Annex IV - Wildlife (Amendment) Act, 2000
Soprano Pipistrelle <i>Pipistrellus pygmaeus</i>	08/06/2010	National Bat Database of Ireland	- EU Habitats Directive Annex IV - Wildlife (Amendment) Act, 2000

5.3.1.4 Birds

A total of 21 bird species have been recorded within the 2km grid square by the NBDC. Of these, 2 are listed as *Red* and 4 are listed as *Amber* in *Birds of Conservation Concern in Ireland 2020-2026* (Gilbert et al., 2021).

Red listed species include:

Red Kite *Milvus milvus*
Redwing *Turdus iliacus*

Amber listed species include:

Greenfinch *Carduelis chloris*
House Martin *Delichon urbicum*
House Sparrow *Passer domesticus*
Mallard *Anas platyrhynchos*

5.3.1.5 Fish

There were no fish species recorded within the 2km grid square by the NBDC.

Atlantic salmon (*Salmo salar*) & Brown trout (*Salmo trutta*)

There are three species of salmonid associated with freshwater habitats in Ireland, namely Atlantic Salmon (*Salmo salar*), Brown Trout (*Salmo trutta*) and Arctic Char (*Salvelinus alpinus*), the latter of which is only associated with lake waterbodies in Ireland. The Atlantic salmon is listed as an Annex II species under the Habitat Directive. The River Dodder was surveyed by Inland Fisheries Ireland (IFI) in September 2018, with the closest survey site located at Mount Carmel Hospital 4.7km northwest of the Site of the Proposed Development (Matson et al., 2019). Brown Trout within the 0+ and 1+ and older age classes were recorded at this survey site during the 2018 surveys.

Petromyzonidae (Lamprey sp.)

There are three lamprey species native to Ireland including Sea Lamprey (*Petromyzon marinus*), River Lamprey (*Lampetra fluviatilis*) and Brook Lamprey (*Lampetra planeri*). All three species are listed under Annex II of the Habitats Directive and are protected by the Fisheries Acts 1959 to 2006. Lamprey sp. were not recorded at the Mount Carmel Hospital survey site in 2018 (Matson et al., 2019).

European eel (*Anguilla anguilla*)

European eel is a red listed species³ and are currently considered to be one of the most threatened fish species in Ireland (King *et al.* 2011). European Eel was recorded within the surveys carried out at the Mount Carmel Hospital site in 2018.

There are no waterbodies within the Site of the Proposed Development itself.

5.3.1.6 Amphibians

The Common Frog *Rana temporaria* and Smooth Newt *Lissotriton vulgaris* were recorded within the 2km (O12X) grid square (NBDC: *Amphibians and reptiles of Ireland*).

5.3.1.7 Invertebrates

There are no NBDC records of protected invertebrates within the 2km (O12X) grid square. There is a record of 1 threatened invertebrate species (NBDC: *Butterflies of Ireland*).

- Small Heath *Coenonympha pamphilus*

5.3.1.8 Other species and species groups

There are no records of common lizard *Zootoca vivipara* within the 2km grid square (O12X). In addition, this species is associated with coastal and heathland habitats, but also locally in rural gardens, stone walls and roadside verges (King *et al.*, 2011). The habitat at the Site of the Proposed Development is not considered suitable for this species.

5.4 Field Surveys

5.4.1 Habitats & Flora

The habitats encountered and identified at the Site of the Proposed Development have been classified and coded as per Fossitt (2000). These are described below.

- Buildings and artificial surfaces (BL3)
- Stone walls and other stonework (BL1)
- Hedgerows (WL1)
- Treelines (WL2)
- Amenity Grassland (Improved) (GA2)
- Ornamental/non-native shrub (WS3)
- Scrub (WS1)

Buildings and artificial surfaces (BL3) exist on Site in the form of two residential dwellings, their corresponding driveways and a part of Sandyford Road, and a greenhouse in the northwest of the Site. *Stone walls and other stonework (BL1)* create the west and east boundaries of the Site, with *Hedgerows (WL1)* comprised of Redclaws (*Escallonia sp.*) planted along the southeast stone wall, and Viburnum (*Viburnum sp.*) and Privet (*Ligustrum sp.*) covering the southwest stonewall, and Lawson Cypress (*Chamaecyparis lawsoniana*) *Treelines (WL2)* habitat growing along the northeast stonewall. Lawson Cypress treelines also exist along the north, northwest, and south boundaries of the Site, and form a buffer dividing the two residential properties currently comprising the Site. Hedgerows consisting of Cherry

³ The status of a species is designated by the relevant authorities as Red, Amber or Green. Red list species range from vulnerable to extinct, Amber list species with unfavourable conservation status or declining population, and Green list species are those which are not currently of conservation concern.

Laurel (*Prunus laurocerasus*) line either side of the driveway in the north residential property on Site, with the south hedge extending approximately 15m into the Site, and the two northern hedgerows reaching roughly 30m east into the Site. Spotted Laurel (*Aucuba japonica*) hedging lies north of the driveway of the south residence, with Lawson Cypress treeline abutting the south of this driveway, both of which stretch around 20m into the property.

Amenity grassland (improved) (GA2) form the lawns of both residential units on Site and is predominant throughout the Site. Floral species observed within this habitat include Buttercup (*Ranunculus sp.*), Dandelion (*Taraxacum officinale agg.*), Daisy (*Bellis perennis*), with Self-Heal (*Prunella vulgaris*) found in the north property and Ribwort Plantain (*Plantago lanceolata*) prevalent in the south property of the Site. Ornamental/non-native shrub (WS3) is planted throughout the northern residential property and includes species such as Japanese Pieris (*Pieris japonica*), Sage (*Salvia officinalis*), and Windmill Palm (*Trachycarpus fortunei*). Scrub (WS1) is found in two distinct stands towards the south of the Site and is comprised of Fuchsia (*Fuchsia magellanica*) that has become overgrown with Bramble (*Rubus fruticosus agg.*).



FIGURE 4. BUILDINGS AND ARTIFICIAL SURFACES (BL3) AND ORNAMENTAL/NON-NATIVE SHRUB (WS3) AT THE SITE OF THE PROPOSED DEVELOPMENT.



FIGURE 5 HEDGEROW (WL1) HABITAT AGAINST STONE WALLS AND OTHER STONEMWORK (BL1) ON SITE



FIGURE 6 AN EXAMPLE OF TREELINE (WL2) PRESENT ON SITE WITH AMENITY GRASSLAND (IMPROVED) (GA2) IN THE FOREGROUND



FIGURE 7 SCRUB (WS1) RECORDED ON SITE

5.4.1.1 Invasive Plant Species

One High Impact invasive plant species was recorded at the Site:

- Cherry Laurel (*Prunus laurocerasus*) was found in the form of hedgerows on Site and was also observed in the understorey of the treeline that borders the driveway of the south residential property on Site. The species can outcompete native flora by forming thick stands.



FIGURE 8 CHERRY LAUREL HEDGING RECORDED ON SITE

One Medium Impact invasive plant species were recorded on Site:

- Sycamore (*Acer pseudoplatanus*) was recorded within the treeline that forms the south boundary of the Site.



FIGURE 9 SYCAMORE OBSERVED ON SITE



FIGURE 10 HABITATS FOUND WITHIN SITE OF THE PROPOSED DEVELOPMENT

5.4.2 Bats

One bat species was recorded on the Site of the Proposed Development during the bat surveys on the 16th of September 2021 and the 21st of April 2022: Common Pipistrelle *Pipistrellus pipistrellus*. A low-moderate level of bat activity was recorded on Site with a total of 17 passes during the September 2021 survey and 14 passes during the April 2022 survey. The buildings on Site were deemed to have 'Negligible' bat roost potential, and the trees on Site were found to have 'Low' bat potential.

5.4.3 Birds

The bird species recorded on site visit 1st of September 2021 are outlined in Table 5.

TABLE 5 BIRD SPECIES OBSERVED ON SITE – 1ST OF SEPTEMBER 2021

Species	Conservation Concern	Observations/Notes
Blackbird <i>Turdus merula</i>	Green	Male observed within the hedgerow in the southeast of Site
Peregrine Falcon <i>Falco peregrinus</i>	Green	Individual observed attempting to hunt the Blackbird found on Site before flying into the treeline that comprises the south boundary
Robin <i>Erithacus rubecula</i>	Green	Individual holding territory in the northeast corner of the Site and another individual heard singing in the treeline in the northwest of the Site
Wren <i>Troglodytes troglodytes</i>	Green	Individual heard singing in the treeline that creates the boundary between the two properties currently on Site
Jackdaw <i>Corvus monedula</i>	Green	Pair observed within the treeline in the northwest of the Site
Collared Dove <i>Streptopelia decaocto</i>	Green	Pair observed within the mature Tasmanian Blue Gum (<i>Eucalyptus globulus</i>) tree in the north residence
Woodpigeon <i>Columba palumbus</i>	Green	Individuals observed foraging on Site
Magpie <i>Pica pica</i>	Green	Individual heard calling along the north boundary of the Site
Rook <i>Corvus frugilegus</i>	Green	Several birds observed flying over the Site

5.4.4 Mammals (excl. bats)

No rare or protected mammals were recorded within the Site of the Proposed Development. A Grey Squirrel (*Sciurus carolinensis*) was observed travelling through the upper storey of the treeline that forms the south boundary of the Site. However, as this species is classified as a 'High Impact' invasive species and is not afforded protection under the Wildlife (Amendment) Act, 2000, it is not considered further in this assessment.

5.5 Designated sites, habitat and species evaluation

Fauna which have the potential to utilise habitat within the immediate area of the Proposed Development, or for which records exist in the wider area, have been evaluated below in Table 6 for their conservation importance. In addition, designated sites and habitats have been evaluated. This evaluation follows the Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009b). The rationale behind these evaluations is also provided. The term 'ecological receptors' is used when impacts upon them are likely.

TABLE 6. EVALUATION OF DESIGNATED SITES, HABITATS AND FAUNA RECORDED WITHIN THE SURROUNDING AREA.

Designated Sites/Species/Habitats	Evaluation	Key Ecological Receptor (KER)	Rationale
Designated Sites			
SACs & SPAs	International Importance	No	Significant effects on Natura 2000 sites ruled out in AA Screening.
pNHAs	National Importance	Yes	Refer to Table 1
Dublin Bay Biosphere	International Importance	No	No significant hydrological connection or otherwise to Dublin Bay Biosphere
Habitats			
Buildings and artificial surfaces (BL3)	Local importance (lower value)	No	Man-made habitat of negligible biodiversity value.
Stone walls and other stonework (BL1)	Local importance (lower value)	No	Man-made habitat of negligible biodiversity value.
Hedgerows (WL1)	Local importance (lower value)	No	The hedgerows located along the west and east boundaries are quite thin, and therefore do not offer suitable nesting habitat, and the denser hedgerows along the driveways on Site are highly managed and comprised of non-native species, and so are considered of low biodiversity value.
Treelines (WL2)	Local importance (lower value)	No	The treelines on Site are mainly comprised of mature Lawson Cypress, which do offer suitable nesting habitat for a number of species. However, as Fitzsimon's Wood is located 0.1km west of the Site, the removal of this habitat will not significantly impact biodiversity in the surrounding area.
Amenity Grassland (Improved) (GA2)	Local importance (lower value)	No	Low diversity grassland, considered of low biodiversity value.
Ornamental/non-native shrub (WS3)	Local importance (lower value)	No	Highly managed non-native flora of low biodiversity value.
Scrub (WS1)	Local importance (lower value)	No	Low diversity scrub dominated by Bramble.
Fauna			
Eurasian Badger <i>Meles meles</i>	Local importance (lower value)	No	The badger is an adaptable species of lowland grassland and woodland habitats, and also occasionally occurs in upland and suburban areas (Marnell et al., 2019). No evidence of Badger was recorded on Site, and there is an abundance of woodland habitat in the landscape surrounding the Site.
Eurasian Pygmy Shrew <i>Sorex minutus</i>	Local importance (lower value)	No	This species requires habitat with vegetative cover, including grassland and woodland (Marnell et al., 2019). No evidence of this species was recorded on Site, and there is an abundance of suitable habitat in Fitzsimon's Wood 0.1km from the Site.
Eurasian Red Squirrel <i>Sciurus vulgaris</i>	Local importance (lower value)	No	Red squirrels are found in high densities within broadleaved woodland compared to conifer woodland (Marnell et al., 2019), and the tree species on this Site are mainly conifers. Grey squirrels, which have been found to outcompete this species, were observed on Site.

Designated Sites/Species/Habitats	Evaluation	Key Ecological Receptor (KER)	Rationale
Red Fox <i>Vulpes vulpes</i>	Local importance (lower value)	No	This species is not considered to be of conservation concern, and therefore is not assessed further in this report.
Wood Mouse <i>Apodemus sylvaticus</i>	Local importance (lower value)	No	This species is not considered to be of conservation concern, and therefore is not assessed further in this report.
Bat Assemblage	Local importance (lower value)	No	Low-moderate bat activity was recorded on Site on the 16 th of September 2021 and 21 st of April 2022
Bird Assemblage	Local importance (higher value)	Yes	A number of species were recorded on Site on the 1 st of September 2021.
Amphibian Assemblage	Local importance (lower value)	No	No suitable habitat at the Site for this species (e.g., ditches, ponds).
Brown Trout <i>Salmo trutta</i> ; Atlantic Salmon <i>Salmo salar</i>	County Importance	Yes	Weak hydrological pathway to the River Dodder via surface water discharges to the River Slang.

6 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

As per the relevant guidelines, likely significant effects have been assessed for Key Ecological Receptors only, as listed in Table 6. An impact is considered to be significant if it is predicted to affect the integrity or conservation status of a KER at a given geographical scale. All impacts are described in the absence of mitigation.

6.1 Construction Phase

6.1.1 Impacts on Proposed Natural Heritage Areas

6.1.1.1 *Fitzsimon's Wood (001753)*

During the Construction Phase, there is potential for *negative, short-term, slight* impacts on this pNHA due to emissions of noise, dust, pollutants and/or vibrations emitted from the Site. Fitzsimon's Wood is considered to be of ecological importance as birch woodland is rare in Dublin, and Badger and Sika Deer, both of which are protected under the Wildlife (Amendments) Act, 2000, have been recorded within this pNHA (Dún Laoghaire-Rathdown County Council Biodiversity Plan 2009 – 2013).

6.1.2 Impacts on fauna

6.1.2.1 *Mammals (excluding bats)*

The Proposed Development could have a potential *negative, permanent, moderate* impact at a local level on small mammal species, if they are present, such as Hedgehog, in the absence of mitigation measures, through the removal of hedgerow, treeline and shrub habitat within the Site of the Proposed Development.

Small mammal species, such as Hedgehog, have the potential to become entangled in construction materials such as netting and plastic sheeting, as well as other waste materials, causing entrapment and injury or death. This constitutes a *negative, short-term, significant* impact at a local level.

Disturbance of mammal species due to noise and dust generated during the Construction Phase, although unlikely, is possible and, as such, a precautionary approach is adopted with these disturbances representing potential *negative, short-term, slight* impacts at a *local scale*.

6.1.2.2 *Bats*

Noise generated during the Construction Phase has the potential to cause *negative, short-term, slight* impacts in the form of disturbance to mammals at a local level, potentially including bats should they roost in the surrounding landscape.

Commuting habitat for bats will be lost during the Construction Phase of the Proposed Development as treelines are removed. This could have a *negative, permanent, moderate* impact on local bat species.

6.1.2.3 *Birds*

There will be some loss of foraging and nesting habitat for birds at the Site of the Proposed Development through the removal of vegetation at the Site, and disturbance of species during

the Construction Phase is possible. This could have a *negative, permanent, moderate impact* on birds on a *local* scale.

The increased noise and dust levels associated with the Construction Phase of the Proposed Development may have the potential to cause *negative, short-term, slight impacts* to local bird populations.

6.1.2.4 Aquatic Fauna

There is potential for *negative, short-term, moderate impacts* on fish species within the River Slang/River Dodder system due to contaminated surface water discharge generated during the Construction Phase. This could result in deterioration of water quality due to pollutants such as silt, hydrocarbons, cementitious material and other chemicals used in construction.

6.2 Operational Phase

6.2.1 Impacts on Fauna

6.2.1.1 Mammals (excluding bats)

During the Operational Phase, there is potential for disturbance to mammals utilising the Site in general through night-time light pollution. This could have a *negative, permanent, slight* impact on mammals in the locality.

6.2.1.2 Bats

During the Operational Phase, in the absence of suitable mitigation, there is potential for disturbance to bats utilising the Site in general through light pollution during the Operational Phase. Given the urban context of the Site, this could have a *negative, permanent, slight* impact on bats in the locality. In addition, there is potential for a *negative, permanent, slight* impact on bats in the locality through the loss of foraging resources in the absence of suitable mitigation measures.

6.2.1.3 Birds

No significant effects on birds are anticipated during the Operational Phase.

6.2.1.4 Aquatic Fauna

No significant effects on fish species are anticipated during the Operational Phase. Mandatory SuDS measures have been incorporated into the design to treat and minimise surface water runoff from the site.

6.3 Do nothing impact

Under the do-nothing scenario, the Site would remain as is, namely two managed residential properties and landscaped gardens. The hedgerow and treeline habitat would continue to serve as a biodiversity corridor providing habitat connectivity, nesting/roosting and foraging habitat for birds and mammals.

7 MITIGATION AND ENHANCEMENT MEASURES

7.1 Designated Sites

Due to the lack of hydrological connections from the Proposed Development to any designated sites within a 15km radius of the Site, and the distances between the Site of the Proposed Development and any of the listed designated sites; there is no possibility for potential significant impacts on water quality at these sites.

Fitzsimon's Wood pNHA will be protected from adverse impacts due to emissions of noise, dust, pollutants and/or vibrations produced from the Site during the Construction Phase by the measures outlined in Section 7.2.5.

7.2 Construction Phase

7.2.1 Planting of native flora and protecting pollinators

The planting of pollinator-friendly flora will improve local biodiversity and increase insect abundance. This will provide additional food for bats and birds at the Site.

The following measures have been incorporated into the landscape design:

- The planting proposal includes pollinator-friendly shrub and perennial plant mixes, as well as bulb planting, providing forage for local pollinating insects.
- Mature hedge planting will abut areas of the Site boundary, and, along with the trees to be planted on Site, will provide nesting and commuting habitat for local bird and mammal species.

7.2.2 Aquatic Fauna & Surface Waters

The following measures set out below will protect surface waters throughout the Construction Phase:

General Surface water mitigation measures

- Storm drain inlets which could receive stormwater from the project will be protected throughout the Construction Phase. Inlet protection will be installed before soil-disturbing activities begin.
- Any imported materials will, as much as possible, be placed on site in their proposed location and double handling will be avoided. Where this is not possible designated temporary material storage areas will be used.
- Refuelling of plant during Construction Phase will only be carried out at designated refuelling station locations on site. Each station will be fully equipped for spill response and a specially trained and dedicated Environmental and Emergency Spill Response team will be appointed before the commencement of works on site.
- Only emergency breakdown maintenance will be carried out on site. Drip trays and spill kits will be available on site to ensure that any spills from vehicles are contained and removed off site.
- All personnel working on site will be trained in pollution incident control response.

- Any other diesel, fuel or hydraulic oils stored on site will be stored in bunded storage tanks- the bunded area will have a volume of at least 110% of the volume of the stored materials as per best practice guidelines (Enterprise Ireland, BPGCS005).
- Portaloos and/or containerised toilets and welfare units will be used to provide facilities for site personnel. All associated waste will be removed from site by a licenced waste management contractor.
- Runoff from machine service and concrete mixing areas will not enter the nearby drainage network.

All wastewater generated on-site during the Construction Phase will be stored and disposed of appropriately. Under no circumstances will any untreated wastewater generated onsite (from equipment washing, road sweeping etc.) be released into the foul/surface water drainage network.

Contaminated soils if encountered will be segregated. If dewatering is required groundwater will be treated as required prior to discharge as agreed with Local Authority.

7.2.3 Bats

7.2.3.1 Tree Removal

Specifically, where tree felling is necessary, the following protocol should be followed for trees as they were classed as 'Low'. No trees of 'Moderate' or 'High' potential were identified:

- Tree-felling should be undertaken in the period late August to late October/early November. During this period bats are capable of flight and this may avoid risks associated with tree-felling.
- Felling during the winter months should be avoided as this creates the additional risk that bats may be in hibernation and thus unable to escape from a tree that is being felled. Additionally, disturbance during winter may reduce the likelihood of survival as the bats' body temperature is too low and they may have to consume too much body fat to survive.
- Tree-felling should be undertaken using heavy plant and chainsaw. There is a wide range of machinery available with the weight and stability to safely fell a tree. Normally trees are pushed over, with a need to excavate and sever roots in some cases. In order to ensure the optimum warning for any roosting bats that may still be present, an affected tree will be pushed lightly two to three times, with a pause of approximately 30 seconds between each nudge to allow bats to become active. Any affected trees should then be pushed to the ground slowly and should remain in place for a period of 48 hours to allow bats to escape. No tree mulching will take place until after this period.
- A derogation licence from the National Parks and Wildlife Services (NPWS) may be required for felling if, during tree removal works bats are found to be roosting in any affected trees.

7.2.4 Birds

7.2.4.1 Habitat removal

Any clearance of vegetation should ideally be carried out outside the main breeding season, i.e., 1st March to 31st August, in compliance with the Wildlife Act 2000. Should any vegetation removal be required during this period, this vegetation should be checked for birds, and if any

are noted during this evaluation prior to removal, a derogation licence is required from the NPWS. This would note the section of habitat that is a nest site, the precise location within the hedgerow/trees, the species of bird present; and also elaborate the means by which the birds would be protected prior to nest removal. If eggs have been laid, the nest should be protected until the young have fledged after which time the nest could be destroyed (under licence from the NPWS only). This would also require further compensatory measures including nesting sites for birds if practicable.

7.2.5 Reduction of noise and dust related impacts

Reduction of noise impacts

Short-term increases in disturbance levels as a direct result of human activity and through increased generation of noise during the Construction Phase can have a range of impacts depending upon the sensitivity of the ecological receptor, the nature and duration of the disturbance and its timing.

Noise generated during the Construction Phase of the Proposed Development could cause temporary disturbance to a number of faunal species in the vicinity of the Site of the Proposed Development. To mitigate this disturbance, the following measures will be implemented:

- Selection of plant with low inherent potential for generating noise.
- Siting of plant as far away from sensitive receptors as permitted by site constraints.
- Avoidance of unnecessary revving of engines and switch off plant items when not required.
- Keep plant machinery and vehicles adequately maintained and serviced.
- Proper balancing of plant items with rotating parts.
- Keep internal routes well maintained and avoid steep gradients.
- Minimise drop heights for materials or ensure a resilient material underlies.
- Use of alternative reversing alarm systems on plant machinery.
- Where noise originates from resonating body panels and cover plates, additional stiffening ribs or materials should be safely applied where appropriate.
- Limiting the hours during which site activities likely to create high levels of noise are permitted.
- Appointing a site representative responsible for matters relating to noise.
- Monitoring typical levels of noise during critical periods and at sensitive locations.

These measures will ensure that any noise disturbance to nesting birds or any other fauna species in the vicinity of the Site of the Proposed Development will be reduced to a minimum.

Reduction of dust related impacts

The following general dust control measures will be followed for the duration of the Construction Phase of the Proposed Development and will ensure no significant dust related impacts occur to nearby sensitive receptors including local faunal species.

- In situations where the source of dust is within 25m of sensitive receptors screens (permeable or semi-permeable) will be erected.
- Haulage vehicles transporting gravel and other similar materials to site will be covered by a tarpaulin or similar.
- Access and exit of vehicles will be restricted to certain access/exit points.

- Vehicle speed restrictions of 20km/hr will be in place.
- Bowsers will be available during periods of dry weather throughout the construction period.
- During dry and windy periods, and when there is a likelihood of dust nuisance, a bower will operate to ensure moisture content is high enough to increase the stability of the soil thereby reducing the amount of dust.
- Stockpiles will be stored in sheltered areas of the site, covered, and watered regularly or as needed if exposed during dry weather.
- Gravel should be used at site exit points to remove caked-on dirt from tyre tracks.
- Equipment should be washed at the end of each work day.
- Hard surfaced roads will be wet swept to remove any deposited materials.
- Unsurfaced roads will be restricted to essential traffic only.
- If practical, wheel-washing facilities should be located at all exits from the construction site.
- Dust production as a result of site activity will be minimised by regular cleaning of the site access roads using vacuum road sweepers and washers. Access roads should be cleaned at least 0.5km on either side of the approach roads to the access points.
- Public roads outside the site shall be regularly inspected for cleanliness, as a minimum daily, and cleaned as necessary. A road sweeper will be made available to ensure that public roads are kept free of debris.
- The frequency of cleaning will be determined by the site agent and is weather and activity dependent
- The height of stockpiles will be kept to a minimum and slopes should be gentle to avoid windblown soil dust.
- The following will be dampened during dry weather:
 - Unpaved areas subject to traffic and wind
 - Stockpiles
 - Areas where there will be loading and unloading of dust-generating materials
- Under no circumstances should wastewater from equipment, wheel or surface cleaning enter the surface water drainage network.

7.2.6 Invasive Species

7.2.6.1 Cherry Laurel

The Cherry Laurel currently existing on Site will be removed via the below methods, which are extracted from Maguire et al. (2008) Best Practice Management Guidelines *Rhododendron Rhododendron ponticum* and Cherry Laurel *Prunus laurocerasus*:

Cherry Laurel is a dense thicket forming invasive ever-green shrub of gardens, parks and woodlands from South West Asia. The leaves are thick and laurel-like, poisonous with cyanide, the white flowers are produced on upright spikes and are succeeded in autumn by blackish cherry-like fruits which should not be eaten.

Cut and remove stems by hand or chainsaw, cutting as close to the ground as possible to remove above ground growth. Chip or remove the cut material from the area to allow for effective follow-up work and prevent regrowth.

Digging the stumps out. The effectiveness of this technique is increased by removing all viable roots. This can be done manually or with a tractor and plough. To avoid regrowth, stumps should be turned upside down and soil should be brushed off roots.

Cherry laurel can be controlled via chemical means, but as there is not a significant amount of this floral species within the Site, mechanical removal is recommended.

7.2.7 Biosecurity

The following will be adhered to, to avoid the introduction of invasive species to the Proposed Development site.

- Any material required on the site will be sourced from a stock that has been screened for the presence of any invasive species by a suitably qualified ecologist and where it is confirmed that none are present.
- All machinery will be thoroughly cleaned and disinfected prior to arrival on site to prevent the spread of invasive species.

7.3 Operational Phase

7.3.1 Bats

In order to minimise disturbance to bats utilising the site in general, the lighting and layout of the proposed development should be designed to minimise light-spill onto habitats used by the local bat population foraging or commuting. This can be achieved by ensuring that the design of lighting accords with guidelines presented in the Bat Conservation Trust & Institute of Lighting Engineers '*Bats and Lighting in the UK - Bats and Built Environment Series*', the Bat Conservation Trust '*Artificial Lighting and Wildlife Interim Guidance*' and the Bat Conservation Trust '*Statement on the impact and design of artificial light on bats*'. Therefore, where possible, the lighting scheme should include the following:

- Lighting will only be installed where necessary for public safety in known Bat Foraging and Roosting locations. These lights have been designed and selected with specific shutters and filters to minimise any potential for back spills into the sensitive locations while still providing the primary function of safely lighting the pedestrian routes.
- Reflectance's – Downward lighting can be reflected from bright surfaces. To minimize bat disturbance, the design avoids the use of bright surfaces and incorporates darker colour lamp heads and poles to reduce reflectance. Only luminaires with an upward light ratio of 0% and with good optical control to be used.
- Lighting controls and dimming shall be utilised for post-curfew times.
- Shielding of Luminaires & Light - To minimize bat disturbance, the design avoids the use of upward lighting by shielding or by downward directional focus. i.e no upward tilt.
- Type of Light – To minimize bat disturbance, the design avoids the use of strong UV lighting. The lighting design is based on the use of LED lighting which has minimal or no UV output of significance. The warmer colour temperatures with peak wavelengths greater than 550nm (~3000°K) cause less impacts on bats, and this has been implemented within the Public Lighting Design plan by Renaissance Engineering (April, 2022) included as part of the Proposed Development.

8 CUMULATIVE IMPACTS

If the Proposed Development and existing or proposed projects or plans impact on the same KERs, there is potential to lead to cumulative impacts which could be of a higher level of significance. This applies to potential impacts on bats due to the combined loss of suitable commuting and/or foraging habitat in the locality and potential impacts on birds due to the combined loss of nesting or foraging habitat in the locality.

8.1.1 Existing granted planning permissions

There are several existing planning permissions on record in the area ranging from small-scale extensions and alterations to existing residential properties to some larger-scale developments. The larger-scale developments within the area are outlined below:

Planning Application Reference: D14A/0843/E

Demolition of former residence and construction of 6 no. 2 storey 4-bedroom houses (in 2 Terraces of 3 houses each) as well as 4 no. Apartments (2 no. one bedroom apartments, 2 no. two bedroom apartments) and 2 no. three bedroom Duplexes in a 2/3 storey building and associated site development works. **(Decision: Extension of Duration. Decision Date: 27/10/2020).**

Planning Application Reference: D19A/0744

Permission for development. The development will consist of: the construction of 15 no. dwellings comprising 1 no. 1.5 storey 3-bedroom detached dwelling (Type A), 1 no. 1.5 storey 3-bedroom detached dwelling (Type E), 1 no. 1.5 storey 3-bedroom detached dwelling (Type F), 1 no. 1.5 storey 4-bedroom detached dwelling (Type D), 1 no. 2.5 storey 5-bedroom detached dwelling (Type B), 2 no. 2.5 storey 5-bedroom detached dwellings (Type C), 2 no. 2.5 storey 5-bedroom detached dwellings (Type H) and 6 no. duplex units in a single 3 storey block (Type G), consisting of 3 no. 2 bedroom ground floor and 3 no. 3 bedroom upper floors units with vehicular and pedestrian access from the Sandyford Road (Coolkill), including all associated on and off site development works, car parking, soft and hard landscaping pedestrian/cycle link to south-eastern boundary, boundary treatments and 225 mm dia. outfall foul sewer of circa 180 m, which will discharge into the existing foul manhole at Kilcross housing estate to the west of the subject site all on overall application site circa 0.49ha. **(Decision: Grant Permission. Decision Date: 29/07/2020).**

Planning Application Reference: D20A/0143

Permission for modifications to the previously permitted residential development, permitted under planning reg. ref. D16A/0393, and subsequent planning reg. ref. D18A/0509. Permission for minor amendments to the floor plans and elevations of the apartment block, Dun Gaoithe Hall, which will consist of 18 no. 1 and 2-bedroom apartments. The amendments proposed would provide 61.8m² additional floor area within the building. **(Decision: Grant Permission. Decision Date: 11/01/2021).**

Planning Application Reference: ABP30982821

Permission for a Strategic Housing Development. The site for proposed residential development is generally bounded by Thornberry Road to the north, by Atkinson Drive and the adjoining open space lands to the west, Sandyford Hall residential development adjacent

Ferncarriga Avenue to the east and by Village Road and Griannan Fidh residential development to the south (Townland of Woodside). The site for proposed below ground wastewater storage tank is on open space lands generally bounded Griannan Fidh residential development to the north, Sandyford Hall residential development to the east and open space lands (including detention basin) to the south and west (Townland of Kilgobbin). The development will consist of: - 445no. 'Build-to-Rent' apartment units (158no. 1-bedroom units and 287no. 2-bedroom units) arranged in 9no. blocks ranging in height from 2 – 8 storeys over 2no. independent single level basements. Private patios / terraces and balconies are provided for all apartment units. Upper-level balconies are proposed on elevations of all multi-aspect apartment buildings. Blocks A – D are located above Basement 1 (5,949 sq. m gross floor area) and Blocks F – J are above Basement 2 (5,058 sq. m gross floor area). Provision 1no. childcare facility (c. 514.9 sq. m gross floor area) in Block D. Provision of resident amenity space / communal areas (c. 1,455.7 sq. m gross floor area) in Block C and Block G. And all associated and ancillary site development, infrastructural, landscaping and boundary treatment works including: - New vehicular access to / from Basement 1 from Atkinson Drive and new vehicular access to / from Basement 2 from Thornberry Road. Provision of c. 9,799 sq. m public open space, including a public plaza onto Village Road and improvement works to existing open space area to the north of existing Griannan Fidh residential development. Provision of 354no. car parking spaces including basement parking, set down spaces for proposed childcare facility and repositioning of set down area on Atkinson Drive. Provision of 638no. bicycle parking spaces. Provision of 14no. motorcycle parking spaces. Communal bin storage and plant provided at basement level and additional plant provided at roof level. Provision of below ground wastewater storage tank (c. 500 sq.m.) and associated connection to the wastewater networks including ancillary above ground kiosk and appropriate landscaping on open space lands to the south of Griannan Fidh residential development. The application contains a statement setting out how the proposal is consistent with the objectives of the Dun Laoghaire-Rathdown County Development Plan 2016 – 2022. The application contains a statement indicating why permission should be granted for the proposed development, having regard to a consideration specified in section 37(2)(b) of the Planning and Development Act, 2000, as amended, notwithstanding that the proposed development materially contravenes a relevant development plan or local area plan other than in relation to the zoning of the land. **(Decision: Grant Permission. Decision Date: 15/07/2021).**

Planning Application Reference: D19A/0729

Permission to remove 3 No. single storey prefabricated buildings and the single storey shed structure to the rear/western/northern side of the existing school building in order to construct a new two storey extension in that location. The proposed extension will accommodate 2 No. Classrooms, 5 No. Resource Rooms, a new staff room, an Accessible Toilet, Staff Toilets and other ancillary areas including an internal landscaped Open Well, a new Boiler House, a Store Room and a new exit/accommodation Staircase. The works will also include modifications to the Reception Office at ground floor level within the return building and to the Toilet accommodation at both levels within the main school building. **(Decision: Grant Permission. Decision Date: 21/01/2020).**

Planning Application Reference: D21A/0595

Permission for development. The development will principally consist of the demolition of the single storey dwelling known as 'The Pastures' and ancillary garage (241 sq m) and the

construction of a residential development comprising 33 no. apartments (10 no. one bedroom units, 20 no. two bedroom units and 3 no. three bedroom units) in 2 no. apartment blocks ranging in height from part 3 no. to part 5 no. storeys. The development proposes a total gross floor area of 3,112 sq m. The development also proposes public and communal open space, 26 no. car parking spaces; bicycle parking; hard and soft landscaping; and all other associated site works above and below ground. **(Decision: Request Additional Information. Decision Date: 19/08/2021).**

Planning Application Reference: D21A/0344

Permission for proposed development. The proposed development will consist of the following: (i) Works to elevations of Building 1; (ii) Extension of and works to Building 2; (iii) Provision of temporary Building 2 for the duration of the works; (iv) Site security works; (v) Revisions to car parking layout; (v) All associated site development works. **(Decision: Grant Permission. Decision Date: 27/07/2020).**

At the time of writing, there are no proposed or permitted forestry operations (thinning, clear felling, road construction) in close proximity to the Site of the Proposed Development⁴.

Given the lack of natural habitat within the proposed sites and distance and urban buffer between the Proposed Development site and the above-mentioned permitted developments, it is concluded that there is no potential for in-combination effects to arise as a result of the Proposed Development on local ecology.

8.1.2 Relevant policies and plans

The following policies and plans were reviewed and considered for possible in-combination effects with the Proposed Development.

- Dún Laoghaire-Rathdown County Development Plan 2022 – 2028
- Dún Laoghaire-Rathdown Biodiversity Plan 2009 – 2013

The Dún Laoghaire-Rathdown County Development Plan 2022 – 2028 has directly addressed the protection of European Sites through specific policies (GIB19). The relevant recommendations and mitigation measures have been integrated into the plan. The Dún Laoghaire-Rathdown Biodiversity Plan 2009 – 2013 is set out to protect and improve biodiversity, and as such will not result in negative in-combination effects with the Proposed Development.

On examination of the above it is considered that there are no means for the Proposed Development to act in-combination with any plans or projects, that would cause any likely significant effects on any European sites.

In addition, sustainable development including SuDS measures for all new developments is inherent in the objectives of all development plans within the Greater Dublin Area.

8.1.3 Operation of Ringsend WwTP

In June 2018 Irish Water applied for (and subsequently received) planning permission for upgrade works to the Ringsend Wastewater Treatment (WwTP) facility. These are currently on-going and will increase the capacity of the facility from 1.6 million PE to 2.4 million PE. This

⁴ <https://forestry-maps.apps.rhos.agriculture.gov.ie/>

plant upgrade will result in an overall reduction in the final effluent discharge of several parameters from the facility including BOD, suspended solids, ammonia, DIN and MRP. An Environmental Impact Assessment Report (EIAR) was submitted by Irish Water as part of this application. The EIAR contains sections relating to Marine Biodiversity and Terrestrial Biodiversity, and each contains a section on the 'do-nothing scenario'. These reviews the effects of the WwTP on biodiversity in Dublin Bay in the absence of the upgrade works and so are relevant to this report.

The EIAR report acknowledges that under the do-nothing scenario "the areas in the Tolka Estuary and North Bull Island channel will continue to be affected by the cumulative nutrient loads from the river Liffey and Tolka and the effluent from the Ringsend WwTP", which could result in a decline in biodiversity (Irish Water, 2018). Nevertheless, the negative impacts of nutrient over-enrichment, which could result in the deterioration of the biological status of Dublin Bay are considered "unlikely" (Irish Water, 2018). This is because historical data suggests that pollution in Dublin Bay has had little or no effect on the composition and richness of the benthic macroinvertebrate fauna. The EIAR notes that "although a localised decline could occur, it is not envisaged to be to a scale that could pose a threat to the shellfish, fish, bird or marine mammal populations that occur in the area." Furthermore, the EIAR notes that significant impacts on waterbird populations foraging on invertebrates in Dublin Bay due to nutrient over-enrichment are "unlikely" to occur (Irish Water, 2018). What is important in the context of this EclA is that the do-nothing scenario predicts that nutrient and suspended solid loads from the WwTP will "continue at the same levels and the impact of these loadings should maintain the same level of effects on marine biodiversity" and that "if the *status quo* is maintained there will be little or no change in the majority of the intertidal faunal assemblages found in Dublin Bay which would likely continue to be relatively diverse and rich across the bay."

Therefore, it can be concluded that significant effects on marine biodiversity and the Natura 2000 sites within Dublin Bay from the *current* operation of Ringsend WwTP are unlikely. Importantly, this conclusion is not dependent upon any future works to be undertaken at Ringsend. Thus, in the absence of any upgrading works, significant effects to habitats, fauna and Natura 2000 sites are not likely to arise.

On examination of the above it is considered that there are no means for the Proposed Development to act in-combination with any plans or projects.

9 RESIDUAL IMPACTS

Residual impacts are impacts that remain once mitigation has been implemented or impacts that cannot be mitigated. Table 7 provides a summary of the impact assessment for the identified Key Ecological Resources (KERs) and local biodiversity, and details the nature of the impacts identified, mitigation proposed and the classification of any residual impacts.

Provided all mitigation measures are implemented in full and remain effective throughout the lifetime of the Development, no significant negative residual impacts on the local ecology or on any designated nature conservation sites are expected from the Proposed Development.

TABLE 7. SUMMARY OF POTENTIAL IMPACTS ON KER(S), BIODIVERSITY, MITIGATION PROPOSED AND RESIDUAL IMPACTS.

Key Ecological Resource	Level of Significance	Potential Impact	Impact Without Mitigation				Proposed Mitigation	Residual Impact
			Quality	Magnitude / Extent	Duration	Significance		
Fitzsimon's Wood pNHA	National Importance	Air pollution due to noise and dust emissions during the Construction Phase	Negative	Local	Short-term	Slight	All construction works to be carried out in accordance with suggested measures in section 7.2.5.	Neutral
Small Mammals	Local Importance (higher value)	Mortality during Construction Phase	Negative	Local	Permanent	Significant	Best practise construction waste storage/handling measures to be implemented. Work likely to cause disturbance during hibernation (removal of hibernation habitats such as log piles and dense scrub) will not take place during November to March . Planting of shrub and tree species to take place as part of project design. Construction related noise control/minimisation measures to be implemented.	Neutral
		Loss of sections of potential foraging and commuting habitat.			Permanent	Moderate		
		Disturbance due to noise and dust generated during Construction Phase.			Short-term	Slight		
Bat assemblage	Local Importance (lower value)	Loss of sections of potential foraging and commuting habitat.	Negative	Local	Permanent	Moderate	Planting of shrub and tree species to take place as part of project design. Construction related noise control/minimisation measures to be implemented.	Neutral
		Disturbance due to noise generated during Construction Phase.			Short-term	Slight		

Key Ecological Resource	Level of Significance	Potential Impact	Impact Without Mitigation				Proposed Mitigation	Residual Impact
			Quality	Magnitude / Extent	Duration	Significance		
		Disturbance/removal of foraging routes/habitat due to increased lighting as a result of the Proposed Development.			Permanent		Wildlife-friendly lighting measures to be included as part of the Operational Phase of the Proposed Development as outlined in 7.2.1	
Breeding-Bird assemblage	Local Importance (lower value)	Loss of nesting and foraging habitat during the Construction Phase.	Negative	Local	Permanent	Moderate	Planting of shrub and tree species to take place as part of project design.	Positive; Permanent.
		Disturbance due to noise generated during Construction Phase.			Short-term	Slight	Construction related noise control/minimisation measures to be implemented.	Neutral.
Aquatic Fauna	County Importance	Deterioration in water quality due to surface water discharges associated with the Construction Phase.	Negative	Local	Short-term	Moderate	Mitigation measures to protect surface waters as outlined in section 7.2.2	Neutral

10 CONCLUSION

It is considered that provided the mitigation measures proposed are carried out in full, there will be no significant negative impact to any valued habitats, designated sites or individual or group of species as a result of the Proposed Development.

Based on the successful implementation of these measures and proposed works, to be carried out in accordance with the landscape plan, there will be no significant negative ecological impacts arising from Construction and Operational Phases of the Proposed Development.

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APPENDIX I – VALUE OF ECOLOGICAL RESOURCES

The criteria outlined in the table below, taken from the Guidelines for *Assessment of Ecological Impacts of National Road Schemes* published by the NRA, were used for assigning value to designated sites, habitats and species within the Site of the Proposed Development and surrounding area.

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

	<ul style="list-style-type: none"> - 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) of the following: <ul style="list-style-type: none"> - 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 (Biodiversity Action Plan), 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.
<p>Local Importance (Higher Value)</p>	<ul style="list-style-type: none"> - Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared; - Resident or regularly occurring populations (assessed to be important at the Local level) of the following: <ul style="list-style-type: none"> - 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.
<p>Local Importance (Lower Value)</p>	<ul style="list-style-type: none"> - 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 II – EPA IMPACT ASSESSMENT CRITERIA

Criteria used to define quality of effects.

In line with the draft EPA Guidelines (EPA, 2017), the following terms are defined when quantifying the quality of effects:

Quality	Definition
Positive Effects	A change which improves the quality of the environment (for example by increasing species diversity; or improving the reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
Neutral Effects	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Negative/adverse Effects	A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property by causing nuisance).

Criteria used to define significance of effects.

In line with the draft EPA Guidelines (EPA, 2017), the following terms are defined when quantifying significance of impacts:

Significance of Effects	Definition
Imperceptible	An effect capable of measurement but without significant consequences.
Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect which alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Very significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.

Criteria used to define duration of effects.

In line with the draft EPA Guidelines (EPA, 2017), the following terms are defined when quantifying duration and frequency of effects:

Quality of Effects	Definition
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting less than a year
Short-term	Effects lasting one to seven years
Medium term	Effects lasting seven to fifteen years

Long-term	Effects lasting fifteen to sixty years
Permanent	Effects lasting over sixty years
Reversible	Effects that can be undone, for example through remediation or restoration.

APPENDIX III – BAT REPORT

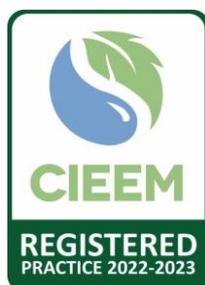
April

2022

Bat Survey Report



**Sandyford Road,
Sandyford
Dublin 18**



ASH Ecology & Environmental

Bat Survey Report – Sandyford Road, Sandyford, Dublin 18

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Appendices

Appendix A	Plates – April 2022
Appendix B	Bat Data - September 16 th 2021 and April 21 st 2022

1. INTRODUCTION

1.1 Purpose of the Report

Ash Ecology and Environmental Ltd (AEE) was commissioned to carry out a bat activity and emergence survey on behalf of Enviroguide Consulting during September 2021 and April 2022 as part of a proposed housing development.

The site is located along Sandyford Road in Sandyford, Dublin 18 (Grid Ref 53.268313, -6.228838); see Figure 1. An aerial photo of site and surrounding landscape is shown as Figure 2. The site contains two houses, 'Glenina' to the north and 'Karuna' to the south which will be demolished along with any outbuildings. See Figure 3 for the proposed layout.

A previous bat survey in September 2021 was required to assess the value of the site for bats, namely any habitats, treelines and buildings present. An updated survey in April 2022 was completed to update the findings of September 2021 and document changes for the bat population onsite, if any.

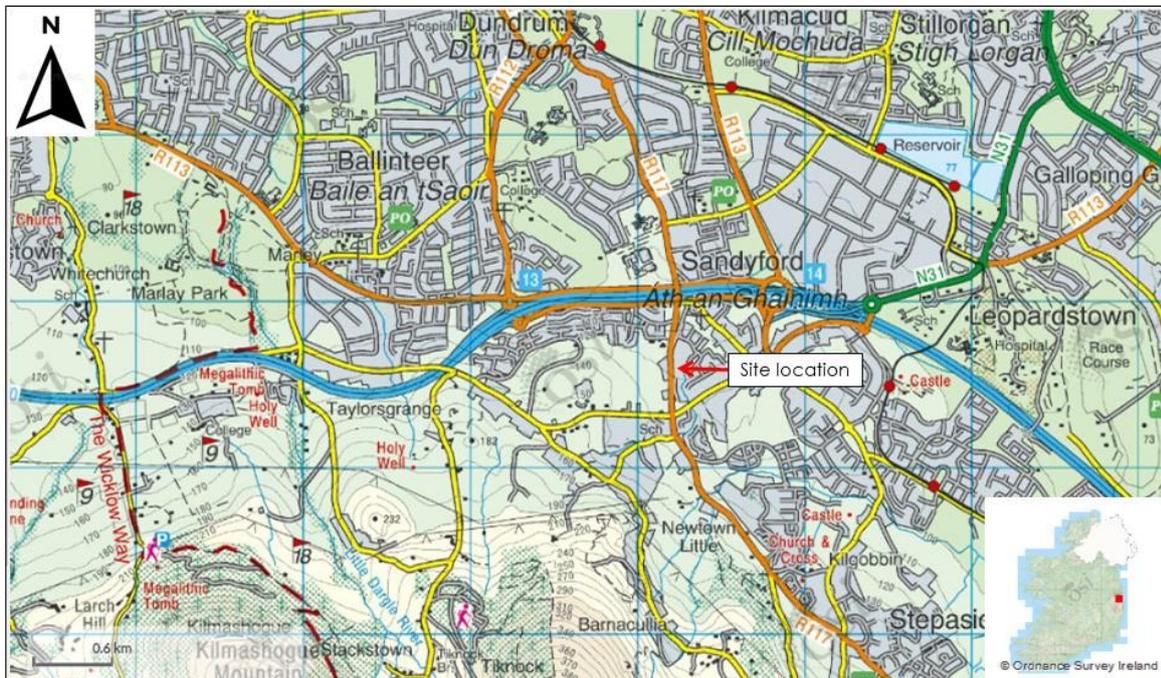


Figure 1 Site Location Map



Figure 2 Aerial Photo of Site and surrounding landscapes (suburban to the north, east and south and more naturalised to the west).



Figure 3 Proposed Site Layout

1.2 Competency of Assessor

This report has been prepared by Ash Ecology & Environmental Ltd (AEE) whose managing director and leading ecologist is Aisling Walsh who is a full member of the Chartered Institute of Ecological & Environmental Management (CIEEM) while the company, AEE, is a Registered Practice by the CIEEM.

Aisling's qualifications include M.Sc. (Dist) in Biodiversity and Conservation (TCD) and B.Sc. (Hons) Zoology (NUIG), a diploma in Applied Aquatic Science (GMIT) and a Certificate in Applied Biology (GMIT). Aisling has over 15 years of experience providing environmental consultancy and environmental assessment services. Aisling has written numerous Ecological Impact Assessments (EclA), Screening for Appropriate Assessment Stage I and Stage II Natura Impact Statements, chapters for Environmental Impact Assessments/Statements (EIAR), Badger Surveys, Bat Surveys, Bird and Habitat Surveys.

Aisling is a licenced bat ecologist (example of recent: DER/BAT 2020 – 46 EUROPEAN, DER/BAT 2020 – 48 EUROPEAN, DER/BAT 2021 – 89 EUROPEAN, DER/BAT 2022 – 12 EUROPEAN) and a member of Bat Conservation Ireland. In addition she has completed several bat courses to continue her training and CPD with the most recently (May 2021) a Lantra-accredited course, developed by the Bat Conservation Trust and supported by the Arboricultural Association to access bat tree roost features. Over the past 15 years Aisling has completed 100s of bat surveys providing her with more than adequate experience in the profession.

1.3 Bat Legislation

In view of their sensitive status across Europe, all species of bat have been listed on Annex IV of the EC 'Habitats and Species Directive' and some, such as the lesser horseshoe bat, are given further protection and listed on Annex II of this Directive. This Directive was transposed into Irish law as the European Communities (Natural Habitats) Regulations, 1997, and combined with the Wildlife Acts (1976 to 2018), ensures that individual bats and their breeding sites and resting places are fully protected. This has important implications for those who own or manage sites where bats occur.

All bat species are protected under the Wildlife Acts 1976-2018 which make it an offence to wilfully interfere with or destroy the breeding or resting place of these species; however, the Acts permit limited exemptions for certain kinds of development.

All species of bats in Ireland are listed on Schedule 5 of the 1976 Act, and are therefore subject to the provisions of Section 23, which make it an offence to:

1. *Intentionally kill, injure or take a bat,*
2. *Possess or control any live or dead specimen or anything derived from a bat,*
3. *Wilfully interfere with any structure or place used for breeding or resting by a bat,*
4. *Wilfully interfere with a bat while it is occupying a structure or place which it uses for that purpose.*

1.4 Derogation licences

In order to obtain a licence to allow the destruction of bat roosts etc., in advance of any otherwise legitimate development which may impact on the favourable conservation status of bats, Section 25 of the Habitats Regulations must be satisfied. It must therefore be demonstrated by the applicant that all reasonable steps have been taken to minimise the impact and that any remaining damage will be adequately compensated for. The first aim of the developer, working with professional advice, should be to entirely avoid or minimise the potential impact of a proposed development on bats and their breeding and resting places.

Current NPWS advice is that there should be no net loss in local bat population status, taking into account factors such as population size, viability and connectivity. Hence, when it is unavoidable that a development will affect a bat population, the mitigation should aim to maintain a population of equivalent status in the area.

One of the key aims of the Directive is to encourage member states to maintain at, or restore to, favourable conservation status those species of community interest (Article 2(2)). 'Favourable conservation status' is defined in the Habitats and Species Directive (Article 1(i)). Conservation status is defined as "the sum of the influences acting on the species concerned that may affect the long term distribution and abundance of its population within the territory." It is assessed as favourable when: "population dynamics data on the species concerned indicate that it is maintaining itself on a long term basis as a viable component of its natural habitats, and the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and there is, or will probably continue to be, a sufficiently large habitat to maintain its populations on a long term basis." Note that even though there is apparent overlap between the Wildlife Acts and the Habitats Regulations, they run concurrently. No action in relation to bats that would not be permitted under the Habitats Regulations may be licensed under the Wildlife Acts.

Derogation licences granted under the Regulations include reference to the relevant provisions of the Wildlife Acts to ensure that all requirements for licensing are covered in the one document. It should also be noted that a licence only allows what is permitted within its terms and conditions; it does not legitimise all actions related to bats at a given site.⁵

⁵ Kelleher, C. & Marnell, F. (2006) Bat Mitigation Guidelines for Ireland. Irish Wildlife Manuals, No. 25. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

2. METHODOLOGY

2.1 Information Sources

A desk-based review of information sources was completed. Information contained on the websites of the National Parks and Wildlife Service (NPWS)⁶ and the National Biodiversity Data Centre (NBDC)⁷ was reviewed.

The following publications and websites were also reviewed and consulted:

- Bat Conservation Ireland <https://www.batconservationireland.org/>
- Bat Roosts in Trees: A Guide to Identification and Assessment for Tree-Care and Ecology Professionals (2018)
- Bat Conservation Trust (2018) Bats and artificial lighting in the UK Bats and the Built Environment series⁸
- Kelleher, C. & Marnell, F. (2006) Bat Mitigation Guidelines for Ireland. Irish Wildlife Manuals, No. 25. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.
- Mitchell-Jones, A.J, & McLeish, A.P. (eds). 2004., 3rd Edition Bat Workers' Manual, JNCC, Peterborough, ISBN 1 86107 558 8
- Bat Conservation Ireland (2012) Bats and Appropriate Assessment Guidelines, Version 1, December 2012. Bat Conservation Ireland, www.batconservationireland.org⁹
- Bat Conservation Trust (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines 3rd edition
- CIEEM (June 2021) Bat Mitigation Guidelines - A guide to impact assessment, mitigation and compensation for developments affecting bats
- Bat Conservation Ireland (2010) Bats & Lighting Guidance Notes for: Planners, engineers, architects and developers¹⁰
- Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes (National Roads Authority, 2005).
- Guidelines for the Treatment of Bats during the Construction of National Road Schemes (National Roads Authority, 2005).
- Bats and Lighting in the UK – Bats and the Built Environment Series (Institute of Lighting Professionals, September 2011)
- Guidance Notes for the Reduction of Obtrusive Light GN01 (Institute of Lighting Professionals, 2011).
- Bats and Lighting – Guidance Notes for Planners, Engineers, Architects and Developers (Bat Conservation Ireland);
- The Eurobats Mitigation of Lighting Document

⁶ The National Parks and Wildlife Services map viewer <http://webgis.npws.ie/npwsviewer/>

⁷ The National Biodiversity Data Centre www.nbdc.ie

⁸ <https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/>

⁹ https://www.batconservationireland.org/wp-content/uploads/2013/09/BCIreland-AA-Guidelines_Version1.pdf

¹⁰ https://www.batconservationireland.org/wp-content/uploads/2013/09/BCIrelandGuidelines_Lighting.pdf

2.2 Desk Study

2.2.1 Previous Records

A desktop review was carried out to identify the previous records of Bat species within the Proposed Development Site and its environs. The study area occurs in 10km² Grid Square O12. The website the NBDC (www.nbdc.ie) was accessed on 22/04/2022 to establish any previous bat records and shown below in Table 1.

Table 1 Historical Bat Records in 10km² Grid Square O12 (NBDC website www.nbdc.ie accessed 22/04/2022)

Species Name - Common	Species Name - Latin	Last Documented Record O12
Brown Long-eared Bat	<i>Plecotus auritus</i>	08/06/2010
Daubenton's Bat	<i>Myotis daubentonii</i>	05/09/2014
Lesser Noctule	<i>Nyctalus leisleri</i>	31/10/2014
Nathusius's Pipistrelle	<i>Pipistrellus nathusii</i>	04/08/2012
Natterer's Bat	<i>Myotis nattereri</i>	04/08/2011
Common Pipistrelle	<i>Pipistrellus pipistrellus</i>	31/10/2014
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	31/10/2014
Whiskered Bat	<i>Myotis mystacinus</i>	01/06/2004

2.2.2 Species Background

Ireland had ten known bat species until February 2013, when a single live greater horseshoe bat (*Rhinolophus ferrumequinum*) was found roosting in Co. Wexford¹¹. On 8th June 2020, a single audio recording was confirmed in the Glendaough area, Co. Wicklow. It was found on two more occasions in the same area in early July 2020 (Bat Conservation Ireland, July 2020).

The ten species (excluding the greater horseshoe) are briefly described overleaf. For a more comprehensive overview see McAney, 2006.¹²

The dependence of Irish bat species on insect prey has left them vulnerable to habitat destruction, land drainage, agricultural intensification and increase use of pesticides. Also, their reliance on buildings as roosting sites has made them particularly vulnerable to renovation works and the use of timber chemical treatment. Buildings are highly important as roosting sites for bats and all Irish bat species use buildings for all roost types. Most significant in terms of roosts in houses are maternity roosts, but cellars and even attics may serve as hibernation sites for bats. Roosts within buildings can far exceed the numbers encountered in trees, bridges, caves or cliffs and roosts of over 1,000 bats have been recorded in buildings.¹³

¹¹ National Biodiversity Data Centre <http://www.biodiversityireland.ie/new-bat-species-found-in-ireland/>

¹² McAney, K. (2006) *A Conservation Plan for Irish Vesper Bats*. Irish Wildlife Manual No.20. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government.

¹³ NRA (2005) Guidelines for the Treatment of Bats Prior to the Construction of National Road Schemes. National Roads Authority, Dublin

2.2.2.1 Family Vespertilionidae:

Common pipistrelle *Pipistrellus pipistrellus*

This species was only recently separated from its sibling, the soprano or brown pipistrelle *P. pygmaeus*¹⁴, which is detailed below. The common pipistrelle's echolocation calls peak at 45 kHz. The species forages along linear landscape features such as hedgerows and treelines as well as within woodland.

Soprano pipistrelle *Pipistrellus pygmaeus*

The soprano pipistrelle's echolocation calls peak at 55 kHz, which distinguishes it readily from the common pipistrelle on detector. The pipistrelles are the smallest and most often seen of our bats, flying at head height and taking small prey such as midges and small moths. Summer roost sites are usually in buildings, but tree holes and heavy ivy are also used. Roost numbers can exceed 1,500 animals in mid-summer.

Nathusius' pipistrelle *Pipistrellus nathusii*

Nathusius' pipistrelle is a recent addition to the Irish fauna and has mainly been recorded from the north-east of the island in Counties Antrim and Down¹⁵ and also in Fermanagh, Longford and Cavan. It has also recently been recorded in Counties Cork and Kerry.¹⁶ However, the known resident population is enhanced in the autumn months by an influx of animals from Scandinavian countries. The status of the species has not yet been determined.

Leisler's bat *Nyctalus leisleri*

This species is Ireland's largest bat, with a wingspan of up to 320mm; it is also the third most common bat, preferring to roost in buildings, although it is sometimes found in trees and bat boxes. It is the earliest bat to emerge in the evening, flying fast and high with occasional steep dives to ground level, feeding on moths, caddisflies and beetles. The echolocation calls are sometimes audible to the human ear being around 15 kHz at their lowest. The audible chatter from their roost on hot summer days is sometimes an aid to location. This species is uncommon in Europe and as Ireland holds the largest national population the species is considered as Near Threatened here.

Brown long-eared bat *Plecotus auritus*

This species of bat is a 'gleaner', hunting amongst the foliage of trees and shrubs, and hovering briefly to pick a moth or spider off a leaf, which it then takes to a sheltered perch to consume. They often land on the ground to capture their prey. Using its nose to emit its echolocation, the long-eared bat 'whispers' its calls so that the insects, upon which it preys, cannot hear its approach (and hence, it needs oversize ears to hear the returning echoes). As this is a whispering species, it is extremely difficult to monitor

¹⁴ Barratt, E. M., Deauville, R., Burland, T. M., Bruford, M. W., Jones, G., Racey, P. A., & Wayne, R. K. (1997) *DNA Answers the Call of Pipistrelle Bat Species*. *Nature* 387: 138 - 139.

¹⁵ Richardson, P. (2000) *Distribution Atlas of Bats in Britain and Ireland 1980 - 1999*. The Bat Conservation Trust, London, England.

¹⁶ Kelleher, C. (2005) *International Bat Fieldcraft Workshop, Killarney, Co. Kerry*. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government.

in the field as it is seldom heard on a bat detector. Furthermore, keeping within the foliage, as it does, it is easily overlooked. It prefers to roost in old buildings.

Natterer's bat *Myotis nattereri*

This species has a slow to medium flight, usually over trees but sometimes over water. It usually follows hedges and treelines to its feeding sites, consuming flies, moths, caddisflies and spiders. Known roosts are usually in old stone buildings but they have been found in trees and bat boxes. The Natterer's bat is one of our least studied species and further work is required to establish its status in Ireland.

Daubenton's bat *Myotis daubentonii*

This bat species feeds close to the surface of water, either over rivers, canals, ponds, lakes or reservoirs but it can also be found foraging in woodlands. Flying at 15 kilometres per hour, it gaffs insects with its over-sized feet as they emerge from the surface of the water - feeding on caddis flies, moths, mosquitoes, midges etc. It is often found roosting beneath bridges or in tunnels and also makes use of hollows in trees.

Whiskered bat *Myotis mystacinus*

This species, although widely distributed, has been rarely recorded in Ireland. It is often found in woodland, frequently near water. Flying high, near the canopy, it maintains a steady beat and sometimes glides as it hunts. It also gleans spiders from the foliage of trees. Whiskered bats prefer to roost in buildings, under slates, lead flashing or exposed beneath the ridge beam within attics. However, they also use cracks and holes in trees and sometimes bat boxes. The whiskered bat is one of our least studied species and further work is required to establish its status in Ireland.

Brandt's bat *Myotis brandtii*

This species is known from five specimens found in Counties Wicklow (Mullen, 2007), Cavan, and Clare in 2003, a specimen in Kerry in 2005¹⁷ and another in Tipperary in 2006.¹⁸ No maternity roosts have yet been found. It is very similar to the whiskered bat and cannot be separated by the use of detectors. Its habits are similar to its sibling.

2.2.2.2 Family Rhinolophidae:

Lesser horseshoe bat *Rhinolophus hipposideros*

This species is the only representative of the Rhinolophidae or horseshoe bat family in Ireland. It differs from our other species in both habits and looks, having a unique nose leaf with which it projects its echolocation calls. It is also quite small and, at rest, wraps its wings around its body. Lesser horseshoe bats feed close to the ground, gleaning their prey from branches and stones. It often carries its prey to a perch to consume, leaving the remains beneath as an indication of its presence.

The echolocation call of this species is of constant frequency and, on a heterodyne bat detector, sounds like a melodious warble. The species is confined to six counties along the Atlantic seaboard: Mayo, Galway, Clare, Limerick, Kerry and Cork. The current Irish national population is estimated at 12,500 animals. This species is listed on Annex II of the EC Habitats Directive and 41 Special Areas of Conservation have been

¹⁷ Kelleher, C. 2006a *Nathusius pipistrelle* *Pipistrellus nathusii* and Brandt's Bat *Myotis brandtii* - New Bat Species to Co. Kerry – Irish Naturalists' Journal 28: 258.

¹⁸ Kelleher, C. 2006b Brandt's Bat *Myotis brandtii*, New Bat Species to Co. Tipperary. Irish Naturalists' Journal 28: 345.

designated in Ireland for its protection. Where it occurs, it is often found roosting within farm buildings.

2.2.3 Landscape Suitability

The National Biodiversity Data Centre (NBDC) maps landscape suitability bats based on Lundy *et al.* (2011). The maps are a visualisation of the results of the analyses based on a 'habitat suitability' index. The index ranges from 0 to 100 with 0 being least favourable and 100 most favourable for bats. The overall assessment of bat habitats for the current study area is given as 17.44, relatively low. Table 2 gives the suitability of the study area for the bat species found in the study area (based on NBDC) along with their Irish Red List Status (from Marnell *et al.*, 2019).¹⁹

Table 2 Suitability of the study area for the bat species found in the Sandyford area (based on the NBDC data) with Irish Red list status indicated.

Common name	Scientific name	Suitability index	Irish red list status
All bats	-	17.44	Least Concern
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	30	Least Concern
Brown long-eared bat	<i>Plecotus auritus</i>	23	Least Concern
Common pipistrelle	<i>Pipistrellus pipistrellus</i>	32	Least Concern
Lesser-horseshoe bat	<i>Rhinolophus hipposideros</i>	0	Least Concern
Leisler's bat	<i>Nyctalus leisleri</i>	34	Least Concern
Whiskered bat	<i>Myotis mystacinus</i>	14	Least Concern
Daubenton's bat	<i>Myotis daubentonii</i>	3	Least Concern
Nathusius' pipistrelle	<i>Pipistrellus nathusii</i>	10	Least Concern
Natterer's bat	<i>Myotis nattereri</i>	11	Least Concern

2.2.4 Bat Roosts

Bats were originally cave and tree dwelling animals but many now find buildings just as suitable for their needs. Bats are social animals and most species congregate in large colonies during summer. These colonies consist mostly of females of every reproductive class, with some juvenile males from the previous year. Male bats normally roost individually or in small groups meeting up with the females in the late autumn-early winter, when it is time to mate. In summer, bats seek warm dry buildings in which they can give birth and suckle their young. In winter, they seek out places with a constant low temperature and high humidity where they can become torpid and hibernate during adverse weather conditions. However, bats do not hibernate continuously during winter and will awake and hunt during mild nights when there are insects available, and it is energetically advantageous to forage.

¹⁹ Marnell, F., Looney, D. & Lawton, C. (2019) Ireland Red List No. 12: Terrestrial Mammals. National Parks and Wildlife Service, Department of the Culture, Heritage and the Gaeltacht, Dublin, Ireland.

2.2.4.1 Maternity Roosts

Maternity roosts are the most significant roosts and they are predominantly all-female aggregations that are formed from late May onwards and remain as a relatively cohesive unit until mid to late August. Not all female bats give birth annually. These females that do bear young in a given year avail of a suitable building, tree and sometimes cave (or equivalent). The young are flightless for several weeks and hence are vulnerable to dangers such as tree felling and restoration, reinforcement or demolition of structures such as buildings and bridges.

2.2.4.2 Mating Roosts

Most bat species mate in autumn but pregnancy does not occur until the following spring. During this time males will take possession of a cavity in a building, tree, bridge, cave or mine and attract females to these sites to establish a harem. Male bats call both from a perch and in flight in much the same manner that male birds sing.

2.2.4.3 Hibernation Roosts

Bats have a high metabolic rate and in temperate countries, such as Ireland, flying insects are not available in sufficient numbers during winter to sustain bats. Therefore, bats hibernate during winter. In hibernation sites, bats are often completely inactive for several days and are extremely vulnerable to disturbance by human activities due to the time taken for them to become sufficiently active to allow escape. Hibernation may extend from November to the end of March, during which time bat activity will take place sporadically.

2.2.4.4 Night Roosts

These are roosts which are used as resting places for bats between foraging bouts. They also provide retreats for bats from predators or during inclement weather conditions. They also function as feeding perches and may be important for socialising.

2.3 General Activity Survey

General bat activity surveys and emergence surveys of the two houses was undertaken on the 16th September 2021 from 19.10 to 21.15 (sunset was 19.38) and April 21st from 20.00 (sunset was 20.36) to 22.40 by walking the Site boundaries to include all structures onsite. In September 2021 both houses were occupied however in April 2022 the house 'Glenina' was occupied and 'Karuna' was vacant.

In September 2021 the weather was optimal for a bat survey with temperatures on the night a warm 18-19°C in calm conditions. In April 2022 the weather was dry with temperatures of 14°C.

Bat activity and emergence surveys are best carried out April to mid-September (which is deemed suitable for presence/absence surveys) and in suitable weather conditions²⁰ which these surveys were.

The equipment used for the bat activity survey included an Elekon Bat Logger M detector. Visual observations were taken with the aid of a powerful L.E.D. torch (AP Pros-Series 220 Lumens High Performance Spotlight).

General Site photos are contained in Appendix A (April 2022).

2.4 Buildings Assessment Methodology

A bat potential assessment of the two houses was carried out on the 16th September 2021 and again on April 21st 2022. A Seek Thermal Reveal Pro High-Resolution Thermal Imaging Camera, along with a RIDGID 36848 Micro CA-150 Hand-Held Borescope was available for any inspection of any crevices/roof spaces on the building (where accessible). The borescope is fitted with a camera and allows visibility of confined spaces and narrow passages potentially used by hibernating/roosting bats. It allows spaces up to 3m from ground level to be inspected.

The BCT guidelines were followed for the assessment rating²⁰ and classified using Table 4.1 of the BCT guidelines (2016) which is shown as Table 3 overleaf.

²⁰ *Bat Surveys for Professional Ecologists, Good Practice Guidelines (2016)*

Table 3 Guidelines for assessing the potential suitability of proposed development sites for bats, based on the presence of roost features within the landscape, to be applied using professional judgement.

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

^a For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.

^b Evidence from the Netherlands shows mass swarming events of common pipistrelle bats in the autumn followed by mass hibernation in a diverse range of building types in urban environments (Korsten *et al.*, 2015). This phenomenon requires some research in the UK but ecologists should be aware of the potential for larger numbers of this species to be present during the autumn and winter in large buildings in highly urbanised environments.

^c This system of categorisation aligns with BS 8596:2015 Surveying for bats in trees and woodland (BSI, 2015).

2.5 Bat Potential Tree Assessment

A number of non-native mature *Leylandii* trees and hedging were present along the boundaries. The treeline was assessed as a section for any 'Potential Roost Features' (PRFs) listed below and, to assess whether the treelines may be used as important commuting and foraging routes.

- Natural holes (e.g., knot holes) arising from naturally shed branches or branches previously pruned back to a branch collar.
- Man-made holes (e.g., cavities that have developed from flush cuts or cavities created by branches tearing out from parent stems).
- Cracks/splits in stems or branches (horizontal and vertical).
- Partially detached or loose bark plates.
- Cankers (caused by localised bark death) in which cavities have developed.
- Other hollows or cavities, including butt rots.

- Compression of forks with included bark, forming potential cavities.
- Crossing stems or branches with suitable roosting space between.
- Ivy stems with diameters in excess of 50mm with suitable roosting space behind (or where roosting space can be seen where a mat of thinner stems has left a gap between the mat and the trunk).
- Bat or bird boxes.
- Other suitable places of rest or shelter.

Certain factors such as orientation of the feature, height from the ground, the direct surroundings and its location in respect to other features may enhance or reduce the potential value.

Trees were then classified into general bat roost potential groups based upon the presence of these features. An evaluation table is shown as Table 4.

Table 4 Classification and Survey Requirements for Bats in Trees²¹

Classification of Tree	Description of Category and Associated Features (based on Potential Roosting Features listed above)	Likely Further Survey Work / Actions
Confirmed Roost	Evidence of roosting bats in the form of live / dead bats, droppings, urine staining, mammalian fur oil staining, etc.	<p>A National Parks and Wildlife (NPWS) derogation licence application will be required if the tree or roost site is affected by the development or proposed arboricultural works. This will require a combination of aerial assessment by roped access bat workers (where possible, health and safety constraints allowing) and nocturnal survey during appropriate periods (e.g. nocturnal survey - May to August) to inform on the licence.</p> <p>Works to tree undertaken under supervision in accordance with the approved good practice method statement provided within the licence.</p> <p>However, where confirmed roost site(s) are not affected by works, work under a precautionary good practice method statement may</p>

²¹ Bat Surveys for Professional Ecologists: Good Practice Guidelines (J., Collins (Bat Conservation Trust), 2016²¹).

Classification of Tree	Description of Category and Associated Features (based on Potential Roosting Features listed above)	Likely Further Survey Work / Actions
High Potential	<p>A tree with one or more Potential Roosting Features that are obviously suitable for larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter protection, conditions (height above ground level, light levels, etc.) and surrounding habitat. Examples include (but are not limited to); woodpecker holes, larger cavities, hollow trunks, hazard beams, etc.</p>	<p>be possible.</p> <p>Aerial assessment by roped access bat workers (if appropriate) and / or nocturnal survey during appropriate period (May to August).</p> <p>Following additional assessments, tree may be upgraded or downgraded based on findings.</p> <p>If roost sites are confirmed and the tree or roost is to be affected by proposals a licence from the NPWS will be required.</p> <p>After completion of survey work (and the presence of a bat roost is discounted), a precautionary working method statement may still be appropriate.</p>
Moderate Potential	<p>A tree with Potential Roosting Features which could support one or more potential roost sites due to their size, shelter protection, conditions (height above ground level, light levels, etc.) and surrounding habitat but unlikely to support a roost of high conservation status (i.e., larger roost, irrespective of wider conservation status).</p> <p>Examples include (but are not limited to); woodpecker holes, rot cavities, branch socket cavities, etc.</p>	<p>A combination of aerial assessment by roped access bat workers and / or nocturnal survey during appropriate period (May to August).</p> <p>Following additional assessments, tree may be upgraded or downgraded based on findings.</p> <p>After completion of survey work (and the presence of a bat roost is discounted), a precautionary working method statement may still be appropriate.</p> <p>If a roost site/s is confirmed a licence from the NPWS will be required.</p>
Low Potential	<p>A tree of sufficient size and age to contain Potential Roosting Features</p>	<p>No further survey required but a precautionary</p>

Classification of Tree	Description of Category and Associated Features (based on Potential Roosting Features listed above)	Likely Further Survey Work / Actions
	<p>but with none seen from ground or features seen only very limited potential.</p> <p>Examples include (but are not limited to); loose/lifted bark, shallow splits exposed to elements or upward facing holes.</p>	<p>working method statement may be appropriate.</p>
Negligible/No potential	Negligible/no habitat features likely to be used by roosting bats	None.

2.6 Landscape Evaluation

Ecological survey results were evaluated to determine the significance of identified features located in the study area on an importance scale ranging from international-national-county-local (from NRA, 2009) The local scale is approximately equivalent to one 10km square but can be operationally defined to reflect the character of the area of interest. Because most sites will fall within the local scale, this is sub-divided into two categories: local importance (higher value) and local importance (lower value).

3. RESULTS

3.1 General Activity Survey

The results of the bat surveys carried out in September 2021 and April 2022 are summarized in Table 5 with the complete dataset of bat species identified in real time in the field, for both surveys, using the Elekon Batlogger M detector are presented in Appendix B. A map outlining the locations of the bat calls for September 2021 is shown as Figure 4 and April 2022 as Figure 5.

On both surveys, only one species of bat were detected, Common Pipistrelle (17 bat passes in September 2021 and 14 bat passes in April 2022). An overall low-moderate level of bat activity recorded on both occasions despite ambient weather and low lighting levels. It is possible that as the treelines along the boundaries containing mature non-native *Leylandii* would have less insect foraging available than native broadleaf species.²²

Table 5 Bat Results Summary Data – 16th September 2021 and 21st April 2022

Species Name – Common	Species Name – Latin	Number of Passes	Peak Frequency (kHz)
16/09/2021			
Common Pipistrelle	<i>Pipistrellus pipistrellus</i>	17	46.5
21/04/2022			
Common Pipistrelle	<i>Pipistrellus pipistrellus</i>	14	46.5

²² Kennedy, C.E.J. and Southwood, T.R.E. (1984) The number of species of insects associated with British trees: a re-analysis. *J. Animal Ecology* 53: 455 -478



Figure 4 Bat Activity Map with Legend – September 16th 2021



Figure 5 Bat Activity Map with Legend – April 21st 2022

3.2 Buildings Assessment Survey

The existing houses onsite were inspected as per the methodology set out in Section 2.4. All spaces that could potentially allow bats access the buildings were visually examined in detail for bats, signs of bats, or evidence of bat activity, using a torch where necessary. Cracks, crevices etc. were investigated for ingress / egress points and evidence of bat habitation, such as smearing lines, droppings, and staining.

In September 2021 both houses were occupied however in April 2022 the house 'Glenina' was occupied and 'Karuna' was vacant. The bat potential of the two houses onsite were deemed to be 'Negligible-Low' (Table 3) with a lack of suitable bat roost features observed on external examination of these buildings.

No bat emergence was detected or observed from either house or any other structures on the sites during the surveys on September 16th 2021 and April 21st 2022.

3.3 Bat Potential Tree Assessment

In general Leylandii trees would not be considered a high value species for roosting bats. Bats tend to like clear flight paths to tree cavities which Leylandii seldom offer. The upward growth form of the branches does not promote bat roost features. Bats also appear to be deterred by the strong odour and sticky resin imparted from these trees. As non-native trees they support a relatively low diversity of invertebrates living on the conifers themselves.

The majority of Leylandii trees within the site were on the outer boundary of the entire site and an internal boundary between the two subject houses, these trees were classed as having 'Low' bat potential (Table 4), any bats observed flew over the Leylandii treelines, or alongside them, but were not observed flying into them.

3.4 Landscape Evaluation

The landscape is considered of local importance (Lower value) for bats due to the urban landscapes to the north, east and south. Towards the west it was more naturalised, albeit with a construction site in front of the wooded area. The landscape suitability score for this area was quite low overall. The Leylandii trees along the site boundaries would provide some commuting element to the wider urban landscape.

4. RECOMMENDATIONS

4.1 Buildings Assessment

The two houses were deemed to be of 'Negligible/Low bat' roosting potential. No bats were noted emerging from either house. During April 2022 it was noted that 'Karuna' House was vacant and 'Glenina' house was still occupied. A pre-demolition survey is warranted if the houses are demolished after March 2023 to ensure no bats are present at that time.

A derogation licence from the National Parks and Wildlife Services (NPWS) will be required for if bats are found to be roosting during any demolition works.

4.2 Tree Removal

Specifically, where tree felling is necessary, the following protocol should be followed for trees as they were classed as 'Low'. No trees of 'Moderate' or 'High' potential were identified:

- Tree-felling should be undertaken in the period late August to late October/early November. During this period bats are capable of flight and this may avoid risks associated with tree-felling.
- Felling during the winter months should be avoided as this creates the additional risk that bats may be in hibernation and thus unable to escape from a tree that is being felled. Additionally, disturbance during winter may reduce the likelihood of survival as the bats' body temperature is too low and they may have to consume too much body fat to survive.
- Tree-felling should be undertaken using heavy plant and chainsaw. There is a wide range of machinery available with the weight and stability to safely fell a tree. Normally trees are pushed over, with a need to excavate and sever roots in some cases. In order to ensure the optimum warning for any roosting bats that may still be present, an affected tree will be pushed lightly two to three times, with a pause of approximately 30 seconds between each nudge to allow bats to become active. Any affected trees should then be pushed to the ground slowly and should remain in place for a period of 48 hours to allow bats to escape. No tree mulching will take place until after this period.
- A derogation licence from the National Parks and Wildlife Services (NPWS) may be required for felling if, during tree removal works bats are found to be roosting in any affected trees.

4.3 Lighting for Bats

In order to minimise disturbance to bats utilising the site in general, the lighting and layout of the proposed development should be designed to minimise light-spill onto habitats used by the local bat population foraging or commuting. This can be achieved by ensuring that the design of lighting accords with guidelines presented in the Bat Conservation Trust & Institute of Lighting Engineers '*Bats and Lighting in the UK - Bats and Built Environment Series*', the Bat Conservation Trust '*Artificial Lighting and*

Wildlife Interim Guidance and the Bat Conservation Trust *Statement on the impact and design of artificial light on bats*. Therefore, where possible, the lighting scheme should include the following:

- The avoidance of direct lighting of proposed areas of habitat creation / landscape planting, or on existing trees if retained.
- Unnecessary light spill controlled through a combination of directional lighting and hooded / shielded luminaires or strategic planting to provide screening vegetation.
- Lights should be of low intensity. It is better to use several low intensity lights than one strong light spilling light across the entire area.
- Narrow spectrum lighting should be used with a low UV component. Glass also helps reduce the UV component emitted by lights.
- The colour rendering of the selected light fitting should be 3000k making the LED fittings a warmer light, helping to further minimize the impact on the local wildlife

4.4 Roosting Opportunities

A series of 5+ bat boxes will be erected on suitable substrates around the Site to provide future roosting opportunities for bats. The type recommended is the 2F Schwegler Bat Box.

5. CONCLUSION

The Site itself is considered to be of Lower Importance for bats for the following reasons:

- The trees onsite were mainly non-native Leylandii which do offer commuting networks for bats but lack foraging opportunities due to a poorer invertebrate assemblage associated with these tree species.
- Bat activity on site was relatively low on the night of both surveys (September 16th 2021 and April 21st April 2022) despite ambient weather and low lighting conditions.
- The buildings onsite have negligible-low bat potential.
- The surrounding landscape is highly urbanised with a low bat suitability score assigned.

On the basis of the findings of the survey works completed September 2021 and April 2022 it is concluded that the overall impact on bats, arising from the Proposed Development, will most likely be negligible for bats if:

- A bat friendly lighting design is implemented.
- The tree felling procedure outlined in Section 4.2 is carried out and semi mature native species of trees are planted to compensate.
- Boundary treelines and hedging are retained where possible for commuting bats.
- Bat boxes (~5) are erected on suitable substrates e.g. trees if available, around the site during the operational phase.
- A bat emergence survey of the two houses is carried out the night prior to demolition if this occurs after March 2023.

APPENDICES

APPENDIX A



Plate 1 Occupied Dwelling house 'Glenina' (north of site) with Negligible/Low Bat Potential. No bat emergence on September 2021 or April 2022.



Plate 2 Now vacant house 'Karuna' (south of site) with Negligible/Low Bat Potential. No bat emergence on September 2021 or April 2022.



Plate 3 Mature Leylandi trees on site boundaries, Low Bat Potential.



Plate 4 Mature Leylandi trees on site boundaries, Low Bat Potential.



Plate 5 Looking towards the east, non-native Leylandi treelines on garden boundaries.

APPENDIX B

16/09/2021	Species Text	Calls [#]	Mean Peak Frequency [kHz]	Mean Max Frequency [kHz]	Mean Min Frequency [kHz]	Mean Call Length [ms]	Mean Call Distance [ms]	Temperature [°C]	Latitude [WGS84]	Longitude [WGS84]
19:36:55	Common Pipistrelle	4	47.9	52.8	47.4	3	218	19	53.26858	-6.22873
19:40:15	Common Pipistrelle	5	44.8	49.7	44.3	5	316	19	53.26859	-6.2287
19:47:08	Common Pipistrelle	2	47	49.9	46.4	2.6	778	19	53.26858	-6.22873
19:49:13	Common Pipistrelle	8	47.7	51.9	46.8	3	85	19	53.26857	-6.22874
19:51:34	Common Pipistrelle	3	47	51.6	46.3	3	256	19	53.26858	-6.22872
19:55:36	Common Pipistrelle	1	47	49.1	46.4	2.6	0	19	53.2686	-6.22871
19:56:40	Common Pipistrelle	10	47.5	53.3	46.5	3	132	19	53.26858	-6.22873
20:32:59	Common Pipistrelle	10	47.8	52.2	46.9	2	80	19	53.26876	-6.22872
20:33:58	Common Pipistrelle	8	46.1	52.7	45.5	5	305	19	53.26865	-6.22835
20:36:01	Common Pipistrelle	8	48.8	54.5	48	2	196	19	53.26792	-6.22827
20:47:03	Common Pipistrelle	8	46.9	53.2	46.4	5	323	19	53.26827	-6.22845
20:49:58	Common Pipistrelle	12	48	54.6	47.1	3	180	19	53.26791	-6.2289
20:55:54	Common Pipistrelle	14	48.1	63.8	47.5	3	269	18	53.26793	-6.22877

21:03:46	Common Pipistrelle	19	47.7	55.4	47.1	3	95	18	53.26793	-6.22877
21:07:52	Common Pipistrelle	6	49.3	55.2	48.6	3	224	18	53.26798	-6.22881
21:09:04	Common Pipistrelle	25	48.3	54.5	47.7	3	95	18	53.26787	-6.22873
21:14:57	Common Pipistrelle	6	47.1	55.4	46.7	5	156	18	53.2682	-6.22863

21/04/2022	Species Text	Calls [#]	Mean Peak Frequency [kHz]	Mean Max Frequency [kHz]	Mean Min Frequency [kHz]	Mean Call Length [ms]	Mean Call Distance [ms]	Temperature [°C]	Latitude [WGS84]	Longitude [WGS84]
20:46:42	Common Pipistrelle	24	44.2	52	43.5	6	90	14	53.26815	-6.22851
20:47:55	Common Pipistrelle	33	45	61.6	44.4	4	85	14	53.26815	-6.22834
20:53:35	Common Pipistrelle	79	45.5	70.3	45.1	5	90	13	53.2682	-6.22835
21:07:06	Common Pipistrelle	18	48.2	61.6	46.8	3	80	13	53.26848	-6.22812
21:07:34	Common Pipistrelle	27	46.2	67.9	45.7	5	84	13	53.26854	-6.22815
21:33:52	Common Pipistrelle	16	47.1	58.7	46.6	4	100	13	53.26815	-6.22828
21:48:48	Common Pipistrelle	16	45.7	57.6	44.9	3	85	14	53.26811	-6.22847
21:53:48	Common Pipistrelle	22	44.8	61.6	44.6	4	66	13	53.26828	-6.22824
22:01:23	Common Pipistrelle	4	47.7	51.1	46.5	2	79	13	53.26811	-6.22834
22:07:40	Common Pipistrelle	13	47.7	52.2	46.3	2	186	13	53.26853	-6.22817

22:13:31	Common Pipistrelle	20	47.3	59.2	46.4	3	70	13	53.26817	-6.22836
22:17:26	Common Pipistrelle	6	46.7	55.9	46.2	3	290	13	53.26853	-6.22813
22:30:04	Common Pipistrelle	6	46.5	55.8	46.2	3	227	14	53.26818	-6.22832
22:41:58	Common Pipistrelle	13	48	58	47.5	3	90	14	53.26819	-6.22835