



Ecological Impact Assessment

Proposed Student Residential Development

Our Lady's Grove

Goatstown Road,

Goatstown, Dublin 14

prepared for Thornton O'Connor Town Planning
on behalf of Colbeam Limited

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1 Introduction

This Ecological Impact Assessment (EclA) was authored by Nicholas Fettes of Scott Cawley Ltd.

It provides an assessment of the potential ecological effects of the proposed development on lands at Our Lady's Grove, Goatstown, Dublin 14 (refer to Figure 1 below for location). Colbeam Limited intend to apply to An Bord Pleanála for permission for a student residential development at a c. 2.12 ha (21,218 sq m) site at Our Lady's Grove (which includes an existing childcare facility 'The Grove After School Care', Our Lady's Grove Goatstown Dublin 14, D14 V290 and D14 N8C2), Goatstown Road, Goatstown, Dublin 14 (centred on Irish Grid reference point O 17577 29174). A detailed description of the proposed development is included in Section 2.

The proposed development site consists primarily of buildings and artificial surfaces, with significant sections of spoil and bare ground and dry meadow and grassy verges. The site is principally bounded by Jesus and Mary College Secondary School to the north and east; The Grove (a residential development) to the east; residences on Larchfield Road and Friarsland Avenue to the south; and residences on Friarsland Road to the west. OSI aerial photography from before 2005 shows the southern section of the proposed development site as maintained amenity grassland. However, due to the site being subject to different developments over the last number of years, the land use pattern has changed from being managed grassland to unmanaged and disturbed and appears to have been previously used as a construction compound.

Figure 1 *Location of the proposed development site in the surrounding environment*



The purpose of the report is to:

- Establish and evaluate the baseline ecological environment, as relevant to the proposed development
- Identify, describe, and assess all potentially significant ecological effects associated with the proposed development

- Set out the mitigation measures required to address any potentially significant ecological effects and ensure compliance with relevant nature conservation legislation
- Provide an assessment of the significance of any residual ecological effects
- Identify any appropriate compensation, enhancement, or post-construction monitoring requirements

Scott Cawley have prepared an Appropriate Assessment (AA) Screening report which accompanies this proposal and forms part of the planning application for the proposed development.

2 Description of the Proposed Development

The various elements of the proposed development are described in detail in the planning application. In brief, the proposed development will principally consist of:

- The construction of a Student Accommodation development containing 698 No. bedspaces with associated facilities located in 8 No blocks, which range in height from part 3 No. storeys to part 6 No. storeys over part lower ground floor level (7 No. storeys as viewed from an internal courtyard at Lower Ground Floor Level).
- Some 679 No. bedspaces are provided in 99 No. clusters ranging in size from 5 No. bedspaces to 8 No. bedspaces, each with a communal Living/Kitchen/Dining room. The remaining 19 No. bedspaces are accessible studios.
- The provision of communal residential amenity space at lower ground floor level (349 sq m) including the provision of a movie room (108 sq m), a music room (42 sq m) and a laundry (37 sq m); communal residential amenity space (1,356 sq m) at ground floor level including the provision of a gym (228 sq m), reception desk and seating area (173 sq m), a common room (338 sq m), a study space (104 sq m), a library (64 sq m), a yoga studio (74 sq m), a prayer room (33 sq m) and group dining (33 sq m).
- The development also includes staff and administrative facilities (195 sq m);
- 9 No. car parking spaces; 4 No. motorcycle parking spaces; 860 No. cycle parking spaces;
- Refuse stores; Signage; An ESB substation and switchroom;
- Boundary treatments; green roofs; PV panels; hard and soft landscaping; plant; lighting; and all other associated site works above and below ground.
- The development includes the demolition of part of the Goatstown Afterschool building (558 sq m) and the construction of a new external wall to the remaining ope, in addition to the demolition of a prefabricated structure adjacent to the Afterschool building (161 sq m).

Construction and commissioning is expected to take c. 2.5 years based on information provided by the design team.

Surface water runoff generated from the proposed development will discharge via a new internal storm drainage network to the existing surface water drainage network along the eastern boundary of Our Lady's Grove. From there, surface waters will flow via the existing surface water drainage network and will ultimately drain into Dublin Bay.

Sustainable Drainage Systems (SuDS) measures being proposed include permeable paving and other porous surfacing, green roofs, hydrobrake flow control devices and full retention interceptors. However, it must be noted that these are included in the design, not for the purposes of avoiding or reducing any potential harmful effects to any European sites, but are required for new developments under the objectives of the Greater Dublin Strategic Drainage Study¹ and Dún Laoghaire–Rathdown County Development Plan 2016-2022 (policy E13).

¹ Dublin Drainage Consultancy (2005) Greater Dublin Strategic Drainage Study - Final Strategy Report.

The proposed development will result in an overall increase of 706 P.E. (population equivalent) foul effluent generated from the site, which will be discharged to the existing foul water drainage system on the main access road to the development. Foul waters will then discharge to the public foul sewer trunk along Goatstown Road. From there, foul effluent will be transferred to Ringsend WWTP for treatment prior to discharge to Dublin Bay. The Ringsend WWTP is currently operating at over its capacity of 1,640,000 P.E., with a current loading of 1,980,000 P.E., with peaks well in excess of this². The Ringsend WWTP is non-compliant with the limits set out in its licence due to overloading, however its discharge is not having an observable negative impact on water quality of Dublin Bay³.

3 Planning, Policy and Legislation

The collation of ecological baseline data and the preparation of this assessment has had regard to the following legislation and policy documents. This is not an exhaustive list but the most relevant legislative and policy basis for the purposes of preparing this EclA.

The following international legislation is relevant to the proposed development:

- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora; hereafter, referred to as the 'Habitats Directive'. The Habitats Directive is the legislation under which the Natura 2000 network⁴ was established and special areas of conservation (SACs) are designated for the protection of natural habitat types listed in Annex I, and habitats of the species listed in Annex II, of that directive.
- Directive 2009/147/EEC; hereafter, referred to as the 'Birds Directive'. The Birds Directive is the legislation under which special protection areas are designated for the protection of endangered species of wild birds listed in Annex I of that directive.

The following national legislation is relevant to the proposed development:

- *Wildlife Acts 1976 to 2019*; hereafter collectively referred to as the 'Wildlife Acts'. The Wildlife Acts are the principal pieces of legislation at national level for the protection of wildlife and for the control of activities that may harm wildlife. All bird species, 22 other animal species or groups of species, and 86 species of flora are protected under this legislation.
- *Planning and Development Acts 2000 to 2019*; hereafter collectively referred to as the 'Planning and Development Acts'. This piece of legislation is the basis for Irish planning. Under the legislation, development plans (usually implemented at local authority level) must include mandatory objectives for the conservation of natural heritage and for the conservation of European Sites. It also sets out the requirements in relation to environmental assessment with respect to planning matters, including transposition of the Habitats and Birds Directive into Irish law.

² Irish Water (2018) Ringsend Wastewater Treatment Plant Upgrade Project. Accessed 16.11.2020 [<https://www.water.ie/projects-plans/ringsend/>].

³ EPA (2020) Ringsend D0034-01 Annual Environmental Report 2019. Accessed 16.11.2020 [http://www.epa.ie/licences/lic_eDMS/090151b280778766.pdf].

⁴ The Natura 2000 network is a European network of important ecological sites, as defined under Article 3 of the Habitats Directive 92/43/EEC, which comprises both special areas of conservation and special protection areas. Special conservation areas are sites hosting the natural habitat types listed in Annex I, and habitats of the species listed in Annex II, of the Habitats Directive, and are established under the Habitats Directive itself. Special protection areas are established under Article 4 of the Birds Directive 2009/147/EC for the protection of endangered species of wild birds. The aim of the network is to aid the long-term survival of Europe's most valuable and threatened species and habitats.

In Ireland these sites are designed as *European sites* - defined under the Planning Acts and/or the Birds and Habitats Regulations as (a) a candidate site of Community importance, (b) a site of Community importance, (c) a candidate special area of conservation, (d) a special area of conservation, (e) a candidate special protection area, or (f) a special protection area. They are commonly referred to in Ireland as Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

- *European Communities (EC) (Birds and Natural Habitats) Regulations 2011 to 2015*; hereafter the 'Birds and Habitats Regulations'. This legislation transposes the Habitats and Birds Directives into Irish law. It also contains regulations (49 and 50) that deal with invasive species (those included within the Third Schedule of the regulations).
- *Flora (Protection) Order, 2015*. This lists species of plant protected under Section 21 of the Wildlife Acts.

The following plans and policies are relevant to the proposed development:

- Dún Laoghaire-Rathdown County Development Plan 2016-2022 (Dún Laoghaire-Rathdown County Council, 2016)
- Dún Laoghaire-Rathdown Biodiversity Plan 2009-2013 (Dún Laoghaire-Rathdown County Council, 2013)

The following policies from the Dún Laoghaire-Rathdown County Development Plan 2016-2022 (DLRCC, 2016) are relevant to the proposed development as several designated sites are within the downstream receiving environment, and due to the potential for the site to host protected species, trees and hedgerows and/or invasive species.

LHB19: Protection of Natural Heritage and the Environment – It is council policy to protect and conserve the environment including, in particular, the natural heritage of the County and to conserve and manage Nationally and Internationally important and EU designated sites – such as Special Protection Areas, candidate Special Areas of Conservation, proposed Natural Heritage Areas and Ramsar sites – as well as non-designated areas of high nature conservation value which serve as 'Stepping Stones' for the purposes of Article 10 of the Habitats Directive

LHB20: Habitats Directive – It is council policy to ensure the protection of natural heritage and biodiversity, including European sites that form part of the Natura 2000 network, in accordance with relevant EU Environmental Directives and applicable National Legislation, Policies, Plans and Guidelines.

LHB22: Designated Sites – It is council policy to protect and preserve areas designated as proposed Natural Heritage Areas, candidate Special Areas of Conservation, and Special Protection Areas. It is Council Policy to promote the maintenance and as appropriate, delivery of 'favourable' conservation status of habitats and species within these areas.

LHB23: Non-Designated Areas of Biodiversity Importance – It is council policy to protect and promote the conservation of biodiversity in areas of natural heritage importance outside Designated Areas and to ensure that notable sites, habitats and features of biodiversity importance outside Designated Areas and to ensure that notable sites, habitats and features of biodiversity importance – including species protected under the Wildlife Acts 1976 and 2000, the Birds Directive 1979, the Habitats Directive 1992, and rare species – are adequately protected. Ecological assessment will be carried out for all developments in areas that support, or have potential to support, features of biodiversity importance or rare and protected species and appropriate mitigation/avoidance measures will be implemented. In implementing this policy regard shall be had to the recommendation and objectives of the Green City Guideline (2008) and 'Ecological Guidance Notes for Local Authorities and Developers' (Dún Laoghaire-Rathdown Version 2014).

LHB26: Hedgerows – It is council policy to protect hedgerows in the county from development, which would impact adversely upon them. It is council policy to promote the county's hedgerows by increasing coverage, where possible, using locally native species and to develop an appropriate code of practice for road hedgerow maintenance.

LHB29: Invasive Species – It is council policy to support as appropriate the National Parks and Wildlife Service efforts to seek to control and manage alien / invasive species (e.g. Japanese

knotweed, Giant Hogweed, Himalayan Balsam, etc.) and noxious weeds (e.g. Ragwort, Thistle, Dock, etc.) within the county.

OSR7: Trees and Woodland – *It is Council policy to implement the objectives and policies of the Tree Strategy for the County – ‘dlr TREES 2011-2015’ - to ensure that the tree cover in the County is managed and developed to optimise the environmental, climatic and educational benefits which derive from an ‘urban forest’.*

4 Methodology

4.1 Author Statement

This Ecological Impact Assessment (EclA) was authored by Nicholas Fettes. Lauren Shinkwin and Nicholas Fettes carried out the field surveys to inform this report. It was reviewed by Shea O’Driscoll, Niamh Burke and Maeve Maher-McWilliams of Scott Cawley Ltd.

Nicholas Fettes, Consultant Ecologist at Scott Cawley, holds an honours degree in Zoology and a Masters in Environmental Policy, both acquired at University College Dublin. He has obtained experience working in a diverse set of environmental roles in the public, private, and charity/NGO sectors, including as a biodiversity conservation officer with the IUCN where he worked on the red list for bryophytes and invasive alien species, as an environmental intern with An Taisce, and as an assistant to Fingal County Council’s biodiversity officer. Since joining Scott Cawley in 2020, Nicholas has gained experience in habitat and protected species surveys, particularly bats, and has been involved in the preparation of environmental reports, namely AA Screening and Nature Impact Statements (NIS) for a range of different projects across the country.

Lauren Shinkwin holds a first class honours degree in Zoology from University College Dublin, and obtained a distinction in her Masters in Advanced Wildlife Conservation in Practice from the University of the West of England, Bristol. Lauren has professional experience working in a range of terrestrial, fresh water and marine environments in Ireland, the U.K., South Africa, and the U.S.A. Her work has included carrying out habitat surveys, invasive species surveys as well as surveying a wide variety of mammal, bird, reptile and invertebrate species. Since joining Scott Cawley, her work has included preparing AA Screening Reports, Natura Impact Statements and Ecological Impact Assessments for a wide range of projects across Ireland, including tourism, industrial, residential and renewable energy developments.

Shea O’Driscoll, Consultant Ecologist at Scott Cawley, holds an honours degree in Zoology from University College Dublin and a Masters in Advanced Wildlife Conservation in Practice from the University of the West of England, Bristol. Shea has experience in habitat survey and assessment in a range of terrestrial and aquatic environments, surveys for protected species including otter, bats and badger, he has undertaken a number of ecological clerks of works roles as well as invasive species surveys for public infrastructure works across Ireland. Since joining Scott Cawley in 2017, Shea has gained extensive experience and been the lead author on numerous ecological assessments that include PEA, EclA and AA Screening for a range of projects including tourism, industrial, residential and renewable energy developments.

Niamh Burke is Principal Ecologist with Coiscéim Ecology. She holds a BSc (Hons) in Natural Sciences with Environmental Science and a PhD in salmonid ecology. She is a Chartered Environmentalist (CEnv) with the Society for the Environment (Soc Env) and a Full Member of the CIEEM. Niamh is a senior scientist with academic research and consulting experience in terrestrial ecology, aquatic ecology and fluvial geomorphology. She is an experienced project manager with a full working knowledge of EIA, the planning process and relevant environmental legislation, both national and European. With a specialism in aquatic habitats, she also has experience of terrestrial species’ surveys and mitigation approaches. In her extensive consultancy roles she has acted as reviewer for all ecological reporting, ensuring consistency of standards and approach.

Maeve Maher-McWilliams holds an honours degree in Biological Sciences from Queens University Belfast and attained a distinction in her Masters in Evolutionary and Behavioural Ecology from University of Exeter. She is an Associate member of CIEEM. She has worked in ecological consultancy for over eight years and has worked on a range of large to small scale projects across Ireland and the UK. Maeve’s primary technical

specialism is ornithology, however her skills extend to protected mammal and habitat surveys. Her involvement extends from inception to post planning compliance, survey completion, project and survey management, carrying out of Ecological Impact Assessment, and authoring of EIAR Chapters, Appropriate Assessment Screening reports and Natura Impact Statements. She regularly undertakes surveys and prepares AA Screening, NIS and EclA reports.

4.2 Scope of the Assessment

The study area is defined by the zone of influence of the proposed development with respect to the ecological receptors that could potentially be affected.

The Zone of Influence (Zoi), or distance over which potentially significant effects may occur, will differ across the Key Ecological Receptors (KERs), depending on the potential impact pathway(s). The results of both the desk study and the suite of ecological field surveys undertaken has established the habitats and species present within, and in the vicinity of, the proposed development site. The Zoi and study area was then informed and defined by the sensitivities of each of the KERs present, in conjunction with the nature and potential impacts associated with the proposed development.

The Zoi of habitat loss impacts will be confined to within the proposed development boundary.

The Zoi of potential impacts on surface water quality in the receiving environment could extend downstream as far as Killiney Bay.

The Zoi of general construction activities (i.e. risk of spreading/introducing non-native invasive species, dust deposition and disturbance due to increased noise, vibration, human presence and lighting) is not likely to extend more than several hundred metres from the proposed development.

4.3 Desk Study

An initial desk study was undertaken on the 4th April 2018, with updated desk searches undertaken between 9th and 13th November 2020 to collate available information on the local ecological environment. The following resources were used to inform the assessment presented in this report:

- Data on European sites, Natural Heritage Areas (NHAs) or proposed Natural Heritage Areas (pNHAs) as held by the National Parks and Wildlife Service (NPWS) from <https://www.npws.ie/protected-sites> and <https://www.npws.ie/maps-and-data> – refer to Appendix II as well as Figure 2 and Figure 3 for descriptions and locations of protected sites in the vicinity of the proposed development
- Records of rare and protected species for the 2km grid square(s), as held by the National Biodiversity Data Centre www.biodiversityireland.ie or the NPWS – refer to Appendix III for all desk study flora and fauna records
- Ordnance Survey Ireland mapping and aerial photography from <http://map.geohive.ie/>
- Data on waterbodies, available for download from the Environmental Protection Agency (EPA) web map service. Available from <https://gis.epa.ie/EPAMaps/>
- Information on soils, geology, and hydrogeology in the area available from the Geological Survey Ireland (GSI) online Spatial Resources service. Available from <https://www.gsi.ie/en-ie/data-and-maps/Pages/Groundwater.aspx>
- Information on the conservation status of birds in Ireland from *Birds of Conservation Concern in Ireland* (Colhoun & Cummins, 2014)
- Information on the location, nature and design of the proposed development supplied by the applicant's design team
- Information contained within an Ecological Impact Assessment Report prepared for a proposed residential and childcare development at Our Lady's Grove, Dublin 14 (Scott Cawley, 2019)

- Information contained within an Appropriate Assessment Screening Report prepared for a proposed residential development at Our Lady's Grove, Goatstown, Dublin 14 (Scott Cawley, 2020a)
- Information contained within an Ecological Technical Note prepared to inform a pre-application submission to An Bord Pleanála (Scott Cawley, 2020b)

4.4 Field Survey

Table 1 Ecological surveys and survey dates

Survey	Survey Date(s)	Surveyor(s)
Habitat survey	5 th April 2018 13 th November 2020	Lauren Shinkwin (Scott Cawley Ltd.) Nicholas Fettes (Scott Cawley Ltd.)
Bat Building Inspections	2 nd May 2018	Lauren Shinkwin (Scott Cawley Ltd.)
Bat Tree Inspections	2 nd May 2018 13 th November 2020	Lauren Shinkwin (Scott Cawley Ltd.) Nicholas Fettes (Scott Cawley Ltd.)
Bat activity surveys (including dusk emergence/dawn re-entry)	9 th June 2020 9 th July 2020	Adele Goulding Sheehan (Scott Cawley Ltd.) Niall McHugh (Scott Cawley Ltd.) Nicholas Fettes (Scott Cawley Ltd.)
Wintering Bird Survey	19 th December 2019 24 th January 2020 19 th February 2020 11 th March 2020	Lorna Gill (Scott Cawley Ltd.)
Breeding bird survey	20 th May 2020 3 rd June 2020 29 th June 2020	Lorna Gill (Scott Cawley Ltd.)

4.4.1 Habitats and Flora Survey

Lauren Shinkwin of Scott Cawley carried out a site walkover survey of the site on 5th April 2018 which included surveying habitats present as well as surveying for signs of mammal activity. Nicholas Fettes, also of Scott Cawley, performed a final site walkover survey on 13th November 2020 to ensure the most up to date information on the condition of the site, was recorded. These surveys encompassed the proposed development site and its immediate surroundings. Habitat surveys, conducted during the site walkover, followed the methodology described in *Best Practice Guidance for Habitat Survey and Mapping* (Smith *et al.*, 2011). All habitat types were classified using the *Guide to Habitats in Ireland* (Fossitt, 2000), recording the indicator species, and recording any species of conservation interest. Vascular and bryophyte plant nomenclature generally follow that of *The National Vegetation Database* (Weekes & FitzPatrick, 2010), having regard to more recent taxonomic changes to species names after the *New Flora of the British Isles* (Stace, 2019) and the British Bryological Society's *Mosses and Liverworts of Britain and Ireland: A Field Guide* (Atherton *et al.*, 2010). Annex I habitat types were classified after the *Interpretation manual of European Union Habitats EUR28* (European Commission, 2013) with reference to the corresponding national habitat survey reports and NPWS wildlife manuals, as applicable. The nomenclature for Annex I habitats follows that of the *Interpretation manual of European Union Habitats EUR28* with abbreviated names after those used in *The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview* (NPWS, 2019a and 2019b).

4.4.2 Fauna Surveys

4.4.2.1 Terrestrial Mammals (excl. Bats)

As part of the site walkover surveys, the presence/absence of terrestrial fauna species were surveyed through the detection of field signs such as tracks, markings, feeding signs, and droppings, as well as by direct observation. The habitats on site were assessed for signs of usage by protected/red-listed fauna species, and their potential to support these species. Surveys to check for the presence of badger setts within the study area, and to record any evidence of use, were undertaken on the 5th April 2018 and on the 13th November 2020.

4.4.2.2 Foraging, Commuting & Roosting Bats

Habitat suitability for foraging/commuting/roosting bats was assessed during the site walkover surveys of the proposed development site on 5th April 2018 and 13th November 2020.

Bat Building Inspections

Internal and external inspections of the Grove After School (GAS) building located within the proposed development site were carried out on the 2nd May 2018. A systematic inspection of the external and all accessible internal areas and roof spaces of the building involved a search for evidence of bats such as:

- Dead specimens;
- Bat droppings;
- Urine splashes;
- Fur-oil staining;
- Squeaking noises;
- Feeding remains (moth wings);
- Bat-fly (Nycteribiid) pupal cases; and/or,
- Odour.

Hibernation period for bats in Ireland is from November to February included. Hibernation roosts are characterised by uniform conditions, such as having a constant cool temperature and high humidity and are usually associated with places like caves and cellars. This is not the case with the GAS building, as this structure was assessed to be of low suitability meaning, as per Table 2 below, it does not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis by a larger number of bats (i.e. unlikely to be suitable for maternity or hibernation).

Bat Tree Inspections

During the site walkover surveys on 5th April 2018 and 13th November 2020, the trees within the proposed development site were assessed for their potential to support roosting bats, having regard to the following guidelines:

- Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016);
- Bat Mitigation Guidelines for Ireland (Kelleher & Marnell, 2006); and,
- Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes (NRA, 2006a).

Several trees located across the proposed development boundary were examined from ground level for potential to support roosting bats. They were assessed based on the presence of features commonly used by bats. Examples of such features include:

- Natural holes;

- Cracks/splits in major limbs;
- Loose bark; and,
- Hollows/cavities.

Trees were assessed against suitability categories listed in Table 2 below.

Table 2. Assessment criteria for potential suitability of proposed development sites for bats, derived from similar criteria in Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016).

Suitability	Description of Roosting Habitat	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	<p>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 conditions⁵ 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).</p> <p>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.</p>	<p>Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or un-vegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat.</p> <p>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.</p>
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 ² 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).	<p>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.</p> <p>Habitat that is connected to wider landscape that could be used by bats for foraging such as trees, scrub, grassland, or water.</p>
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats in a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	<p>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.</p> <p>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.</p> <p>Site is close to and connected to a known roost.</p>

Bat Activity Surveys

Two separate bat activity surveys were undertaken in 2020 of the proposed development site. The level of survey effort for suitability of PRFs (trees and buildings) and habitat suitability for commuting and foraging

⁵ For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.

bats identified within the proposed development is in line with *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (Collins, 2016).

Niall McHugh and Nicholas Fettes of Scott Cawley carried out a single dusk emergence survey, followed by a bat activity survey, on the 9th June 2020. Adele Goulding Sheehan and Niall McHugh, also of Scott Cawley, carried out a single dawn re-entry survey, preceded by a bat activity survey, on the 6th July 2020. Both surveys were carried out using direct observation and handheld ultrasound detectors (Elekon BatLogger M). These surveys focussed on the GAS building within the proposed development site at roost emergence and roost re-entry times to identify the presence of roosting bats. Following this the survey involved walking transects which covered the site and a representation of each habitat type within the lands to record bat activity across the site. The surveys commenced 15 minutes prior to sunset (or 2 hours before sunrise in the case of the dawn re-entry survey) and lasted for 1.5 – 2 hours (see Table 3). Surveys were undertaken within the main season of bat activity during relatively calm dry weather conditions and the temperature on all nights was within the range suitable for bat activity (i.e. above 8°C). The data generated from the surveys was analysed using Elekon BatExplorer software to differentiate species by their sonograms. Calls were identified against species descriptions within *British Bat Calls: A Guide to Species Identification* (Russ, 2012).

Table 3 Bat activity survey information

Date	Surveyor(s)	Survey Times	Sunset/Sunrise Time	Temperature	Weather
9 th June 2020	Niall McHugh Nicholas Fettes	21:40 – 23:39	21:56	16°C	Humid, little breeze, no precipitation.
9 th July 2020	Adele Goulding Sheehan Niall McHugh	03:00 – 05:15	05:18	12°C	Very breezy, light and persistent precipitation.

4.4.2.3 Breeding Birds

Habitat suitability for breeding birds was assessed during an initial site walkover survey of the proposed development site on 5th April 2018. Following this, three dedicated breeding bird surveys were undertaken within the proposed development site on 20th May 2020, 3rd June 2020 and 29th June 2020 by Lorna Gill of Scott Cawley. Methodology followed an adapted version from the *Bird Monitoring Methods - A Manual of Techniques for Key UK Species* (Gilbert *et al.*, 1998). The study area covered the lands bounded by Jesus and Mary College Secondary School to the north and east; The Grove (a residential development) to the east; residences on Larchfield Road and Friarsland Avenue to the south; and residences on Friarsland Road to the west. Lands within the study area were slowly walked in a manner allowing all habitat features present to be surveyed. Birds were identified by sight and song, and general location and activity were recorded using the British Trust for Ornithology (BTO) species and activity codes.

4.4.2.4 Wintering Birds

Wintering bird surveys were undertaken on the 19th December 2019, 24th January 2020, 19th February 2020 and 11th March 2020 by Lorna Gill of Scott Cawley using a methodology based on the *Bird Monitoring Methods - A Manual of Techniques for Key UK Species*⁶. The study area covered the lands bounded by Jesus and Mary College Secondary School to the north and east; The Grove (a residential development) to the east; residences on Larchfield Road and Friarsland Avenue to the south; and residences on Friarsland Road

⁶Gilbert, G., Gibbons, D.W. & Evans, J. (1998) *Bird Monitoring Methods - A Manual of Techniques for Key UK Species*. RSPB: Sandy

to the west. Lands were initially surveyed visually using binoculars/scope from a vantage point(s) at the edge of the study area followed by a walkover of the area to identify birds which may not be visible from a distance (e.g. waders) and evidence of usage by wildfowl such as swans or geese (e.g. droppings). Birds were identified by sight and general location and activity were recorded using the British Trust for Ornithology (BTO) species and activity codes.

4.4.3 Survey Limitations

The timing of habitat and fauna surveys are not considered to have imposed any limitations on the survey outcomes as they were carried out during the optimum time periods (seasonality) for detection of target species and habitats.

The bat building inspections carried out in 2018 of the GAS building were not repeated in 2020. However, this is not considered to be a limitation on the bat surveys as the GAS building was deemed to be of low suitability and no evidence of roosting bats was found in 2018 (see section 5.3.2). In addition, emergence and re-entry surveys were carried out on the GAS building in 2020 within the active bat season and during optimal survey conditions with no evidence of roosting bats observed (see section 5.3.2). Furthermore, it is noted that conditions of the GAS building between surveys undertaken in 2018 and the summer of 2020 have not changed and therefore the 2018 building inspection results remain valid.

Therefore sufficient survey data was gathered to fully inform the assessment of impacts and the mitigation measures described in this report.

4.5 Ecological Evaluation and Impact Assessment

4.5.1 Ecological Evaluation

Ecological receptors (including identified sites of ecological importance) are valued with regard to the ecological valuation examples set out in *Guidelines for Assessment of Ecological Impacts of National Roads Schemes: Revision 2* (NRA, 2009) and the guidance provided in *Guidelines for Ecological Impact Assessment in the UK and Ireland* (CIEEM, 2018) – refer to Appendix I for examples of how ecological importance is assigned. In accordance with these guidelines, important ecological features within what is referred to as the Zone of Influence (Zoi) of the proposed development which are “both of sufficient value to be material in decision making and likely to be affected significantly” are deemed to be ‘Key Ecological Receptors’ (KERs). These are the ecological receptors which may be subject to significant effects from the proposed development, either directly or indirectly. KERs are those biodiversity receptors with an ecological value of local importance (higher value) or greater.

4.5.2 Impact Assessment

Ecological impact assessment is conducted following a standard source-pathway-receptor model, where, in order for an impact to be established all three elements of this mechanism must be in place. The absence or removal of one of the elements of the mechanism is sufficient to conclude that a potentially significant effect would not occur.

- Source(s) – e.g. pollutant run-off from proposed works
- Pathway(s) – e.g. groundwater connecting to nearby qualifying wetland habitats
- Receptor(s) – e.g. wetland habitats and the fauna and flora species they support

4.5.2.1 Characterising and Describing the Impacts

The parameters considered in characterising and describing the potential impacts of the proposed development are per the EPA’s *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2017) and CIEEM’s *Guidelines for Ecological Impact Assessment in the UK and Ireland* (CIEEM, 2018): whether the effect is positive, neutral or negative; the significance of the effects;

the extent and context of the effect; the probability, duration and frequency of effects; and, cumulative effects.

Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. The following development types are included in considering cumulative effects:

- Existing projects (under construction or operational)
- Projects which have been granted consent but not yet started
- Projects for which consent has been applied for which are awaiting a decision, including those under appeal
- Projects proposed at a plan level, if relevant (e.g. future strategic infrastructure such as roads or greenways)

The likelihood of an impact occurring, and the predicted effects, can also be an important consideration in characterising impacts. In some cases it may not be possible to definitively conclude that an impact will not occur. In these cases the evaluation of significant effects is based on the best available scientific evidence but where reasonable doubt still remains then the precautionary principle is applied and it may need to be assumed that significant effects may occur. Professional judgement is used in considering the contribution of all relevant criteria in determining the overall magnitude of an impact.

4.5.2.2 Significant Effects

In determining whether potential impacts will result in significant effects, the CIEEM guidelines were followed. The approach considers that significant effects will occur when there are impacts on either:

- the structure and function (or integrity) of defined sites, habitats or ecosystems; or
- the conservation status of habitats and species (including extent, abundance and distribution).

Integrity

The term “integrity” may be regarded as the coherence of ecological structure and function, across the entirety of a site that enables it to sustain all of the biodiversity or ecological resources for which it has been valued (NRA, 2009).

The term ‘integrity’ is most often used when determining impact significance in relation to designated areas for nature conservation (e.g. SACs, SPAs or pNHA/NHAs) but can also be the most appropriate method to use for non-designated areas of biodiversity value where the component habitats and/or species exist with a defined ecosystem at a given geographic scale.

An impact on the integrity of an ecological site or ecosystem is considered to be significant if it moves the condition of the ecosystem away from a favourable condition: removing or changing the processes that support the sites’ habitats and/or species; affect the nature, extent, structure and functioning of component habitats; and/or, affect the population size and viability of component species.

Conservation Status

Similar definitions for conservation status given in the EU Habitats Directive 92/43/EEC, in relation to habitats and species, are also used in the CIEEM (2018) and NRA (2009) guidance which are summarised as follows:

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

An impact on the conservation status of a habitat or species is considered to be significant if it will result in a change in conservation status, having regard to the definitions of favourable conservation status provided in the EU Habitats Directive 92/43/EEC – i.e. into the future, the range, area and quality of habitats are likely to be maintained/increased and species populations are likely to be maintained/increased.

According to the CIEEM methodology, if it is determined that the integrity and/or conservation status of an ecological receptor will be impacted on, then the level of significance of that impact is related to the geographical scale at which the impact will occur (i.e. local, county, national, international). In some cases an impact may not be significant at the geographic scale at which the ecological feature has been valued but may be significant at a lower geographical level. For example, a particular impact may not be considered likely to have a negative effect on the overall conservation status of a species which is considered to be internationally important. However, an impact may occur at a local level on this internationally important species. In this case, the impact on an internationally important species is considered to be significant at only a local, rather than an international level.

5 Baseline Ecological Environment

5.1 Land Use Zoning

The proposed development site is currently zoned as *'Objective A – to protect and-or improve residential amenity'* within the Dún Laoghaire-Rathdown County Development Plan 2016-2022 (DLRCC, 2016). The majority of the surrounding land falls under the same zoning, although there are sections of surrounding land zoned as *'Objective NC – to protect, provide for and-or improve mixed-use neighbourhood centre facilities'*, *'Objective E – to provide for economic development and employment'*, *'Objective F – to preserve and provide for open space with ancillary active recreational amenities'* and a large area to the northwest zoned as *'Objective TLI – to facilitate, support and enhance the development of third level education institutions'* which encompasses the grounds of University College Dublin, Belfield Campus. There is zoning *'To protect and preserve trees and woodlands'* in the southern section of the proposed development site, however the site does not form part of the Ecological Network Map of sites identified in the Dún Laoghaire-Rathdown County Development Plan 2016-2022 (DLRCC, 2016).

5.2 Designated Sites

5.2.1 European Sites

Special Areas of Conservation (SAC) are designated under the EC Habitats Directive (92/43/EEC) for the protection of habitats listed on Annex I and/or species listed on Annex II of the Directive. Special Protection Areas (SPAs) are designated under the Birds Directive (2009/147/EC) for the protection of bird species listed on Annex I of the Directive, regularly occurring populations of migratory species (such as ducks, geese or waders), and areas of international importance for migratory birds.

There are no European sites within or directly adjacent to the boundaries of the proposed development site. The closest European sites to the proposed development are South Dublin Bay SAC (000210) and South Dublin Bay and River Tolka Estuary SPA (004024), located c. 2.8km and 2.7km north east respectively. The proposed development site is within the Liffey and Dublin Bay catchment. The closest watercourses to the proposed development site are the Elm Park Stream, c. 200m north, and the River Slang, located c. 582m west, of the proposed development site.

The Elm Park Stream rises in Goatstown and is culverted for part of its course, flowing through UCD Belfield campus before emerging in Elm Park Golf Course, from where the watercourse finally discharges to Dublin Bay coastal waterbody just south of the Merrion Gates c. 1.3km downstream.

Surface waters within the River Slang flow into the River Dodder after c. 834m before converging with the River Liffey a further c. 5.2km downstream. Surface waters within the River Liffey ultimately discharge into Dublin Bay coastal waterbody a further c. 5.8km downstream.

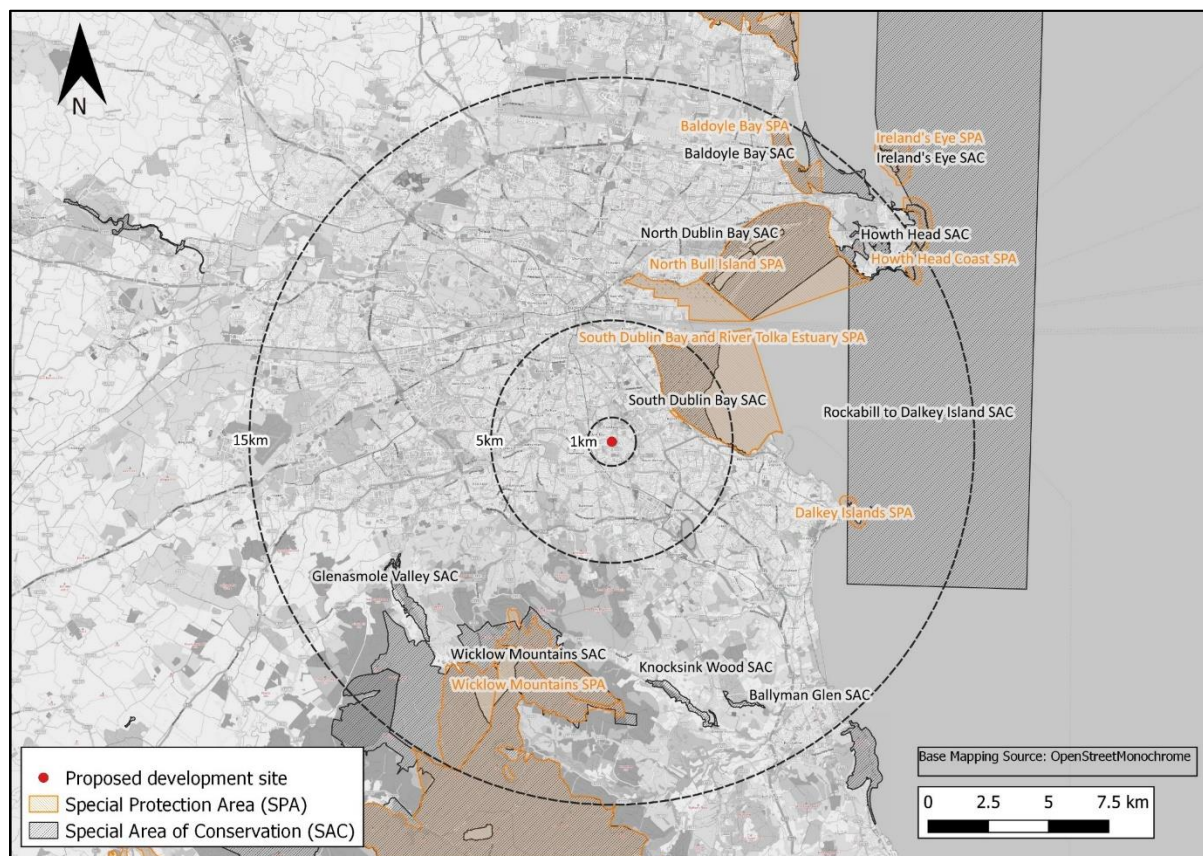
Therefore, the proposed development is hydrologically connected to the following European sites in Dublin Bay: South Dublin Bay SAC (000210), North Dublin Bay SAC (000206), Rockabill to Dalkey Island SAC

(003000), Dalkey Islands SPA (004172), South Dublin Bay and River Tolka Estuary SPA (004024) and North Bull Island SPA (004006).

The SAC and SPA sites in the vicinity of the proposed development, their distance from the proposed development and their qualifying interests/special conservation interests are presented in Table 1 of Appendix II.

The locations of those SAC and SPA sites relative to the proposed development are illustrated in Figure 2 below.

Figure 2 *European sites in the vicinity of the proposed development*



5.2.2 Nationally Designated Sites

Natural Heritage Areas (NHAs) are designated under the Wildlife Acts to protect habitats, species or geology of national importance. In addition to NHAs there are proposed NHAs (referred to as pNHAs), which are also sites of significance for wildlife and habitats and were published on a non-statutory basis in 1995, but have not since been statutorily proposed or designated. Proposed NHAs are offered protection in the interim period under county or city development plans which requires that planning authorities give due regard to their protection in planning policies and decisions.

There are no nationally designated sites within or directly adjacent to the boundaries of the proposed development site, with the closest site to the proposed development being Booterstown Marsh pNHA (001205) which is c. 2.7km north-east of the proposed development. According to a site synopsis available from the NPWS⁷ Booterstown Marsh pNHA has been designated as a site of local/regional ornithological importance, and remains the only example of saltmarsh in South Dublin.

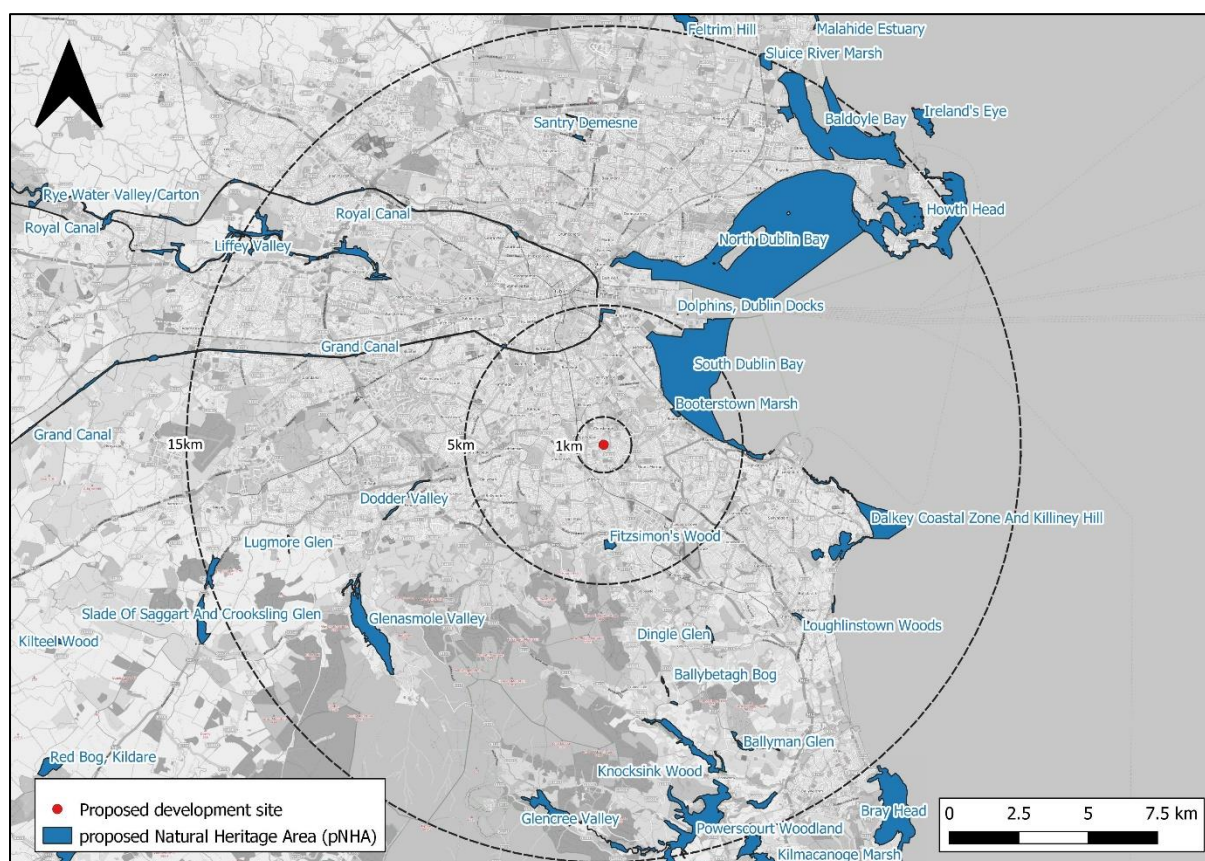
⁷ NPWS (2009). *Proposed Natural Heritage Area Site Synopsis Portfolio*. Updated November 2009. Available online at www.npws.ie [Accessed 12th November 2020]

Surface waters within the proposed development site ultimately discharge into the Dublin Bay coastal waterbody via the River Slang, River Dodder and River Liffey. Therefore, the proposed development is hydrologically connected to the following nationally designated sites in the downstream receiving environment: South Dublin Bay pNHA (000210), North Dublin Bay pNHA (000206), Dolphins, Dublin Docks pNHA (000201), Booterstown Marsh pNHA (001205) and Dalkey Coastal Zone and Killiney Hill pNHA (001206).

Though there are no NHA sites in the vicinity of the proposed development, pNHA sites in the vicinity of the proposed development, their distance from the proposed development and their qualifying interests/special conservation interests are presented in Table 2 of Appendix II.

The locations of those pNHA sites relative to the proposed development are illustrated in Figure 3 below.

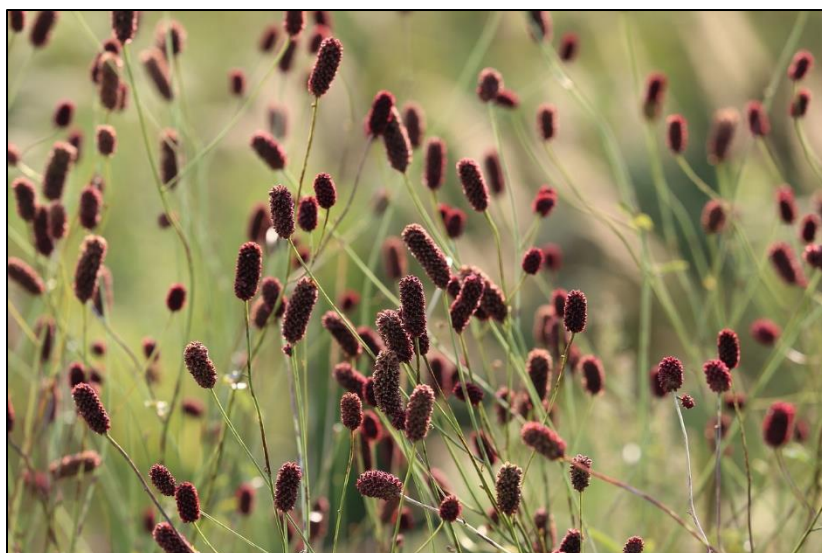
Figure 3 *Nationally designated sites in the vicinity of the proposed development*



5.3 Habitats and Flora

The National Biodiversity Data Centre (NBDC) database search returned no records of any plant species listed on Annex II of the EU Habitats Directive within 2km of the proposed development site. However, the search returned one record of a protected flora species under the Flora (Protection) Order 2015 within 2km of the proposed development site:

- Great Burnet *Sanguisorba officinalis*



No Annex II plant species and no records of plant species protected through their inclusion within the Flora (Protection) Order, 2015 were recorded during the field surveys in 2020.

The NBDC database search returned records of the following invasive species within 2km of the proposed development site listed on the Third Schedule of the Birds and Habitats Regulations:

- Giant Hogweed *Heracleum mantegazzianum*: The NBDC lists this species as a high impact invasive species. It is listed on the Third Schedule of the Birds and Habitats Regulations and is therefore subject to restrictions under Regulations 49 and 50 of the same legislation, which prohibits the introduction and dispersal, and the dealing and keeping of listed species.
- Himalayan Balsam or Indian Balsam *Impatiens glandulifera*: The NBDC lists this species as a high impact invasive species.
- Japanese Knotweed *Fallopia japonica*: The NBDC lists this species as a high impact invasive species.
- Japanese Knotweed hybrid *Fallopia japonica x sachalinensis = F. x bohemica*: The NBDC lists this species as a high impact invasive species. It is not listed on the Third Schedule of the Birds and Habitats Regulations, however, both Japanese knotweed *Fallopia japonica* and Giant knotweed *Fallopia sachalinensis* are.
- Parrot's-feather *Myriophyllum aquaticum*: The NBDC lists this species as a high impact invasive species.
- Spanish Bluebell *Hyacinthoides hispanica*: The NBDC lists this species as having a low risk of impact.
- Three-cornered Garlic/Leek *Allium triquetrum*: The NBDC lists this species as a medium impact invasive species.

The NBDC database search returned records of the following invasive species within 2km of the proposed development site not listed on the Third Schedule of the Birds and Habitats Regulations:

- Butterfly-bush *Buddleja davidii*: The NBDC lists this species as a medium impact invasive species.
- Canadian Fleabane *Conyza canadensis*: The NBDC lists this species as a medium impact invasive species.

-
- Canadian Waterweed *Elodea canadensis*: The NBDC lists this species as a high impact invasive species.
 - Cherry Laurel *Prunus laurocerasus*: The NBDC lists this species as a high impact invasive species.
 - Himalayan Honeysuckle *Leycesteria Formosa*: The NBDC lists this species as a medium impact invasive species.
 - Least Duckweed *Lemna minuta*: The NBDC lists this species as a medium impact invasive species.
 - Sycamore *Acer psuedoplatanus*: The NBDC lists this species as a medium impact invasive species.
 - Traveller's Joy *Clematis vitalba*: The NBDC lists this species as a medium impact invasive species.

No non-native invasive species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 were recorded within the proposed development site during the field surveys in 2018 and 2020. In addition, none of these plant species occur within the proposed development site, other than Sycamore which was noted during the site survey in the south western corner of the proposed development site.

The following habitat types of the Heritage Council classification system (Fossitt, 2000) were identified within the proposed development site and are mapped in Figure 4 below.

Figure 4 *Habitats within the proposed development site*



The habitats within the proposed development site include:

- Amenity grassland (GA2)
- Dry meadows and grassy verges (GS2)
- Treelines (WL2)
- Scattered trees and parkland (WD5)
- Spoil and bare ground (ED2)
- Recolonising bare ground (ED3)
- Buildings and artificial surfaces (BL3)

5.3.1 Habitats of Local Importance (Lower Value)

Of the seven habitat types recorded, six are of local importance (lower value) due to their small area of either semi-natural or non-native species which can be of some use, albeit limited, for local wildlife and habitat linkage purposes.

5.3.1.1 Amenity grassland (GA1)

This habitat type was identified in locations surrounding the Grove After School (GAS) building and single-storey prefab, and along the Goatstown Road where tree planting occurs in some areas of this habitat. This habitat type was dominated by grass species Yorkshire-fog *Holcus lanatus* and Red Fescue *Festuca rubra*. Dominant forb species present included White Clover *Trifolium repens*, Meadow Buttercup *Ranunculus acris* and Creeping Buttercup *Ranunculus repens*. Occasionally occurring species included Daisy *Bellis perennis*, Ribwort Plantain *Plantago lanceolata* and Creeping Thistle *Cirsium arvense*. Due to the dominance of common grasses and low number of forb species present, this habitat is of little botanical interest and therefore is valued as being of a local importance (lower value).



Plate 1 – Example of Amenity Grassland (GA2) within the proposed development site

5.3.1.2 Dry meadows and grassy verges (GS2)

The majority of the proposed development site is dominated by dry meadows and grassy verges or a mosaic of this habitat type combined with spoil and bare ground. This habitat type was identified mostly in the southwestern corner of the proposed development site. These grassland areas are not regularly maintained and have been left unmown. This habitat is dominated by grass species Cocksfoot *Dactylis glomerata*, Yorkshire-fog and Red Fescue. Dominant forb species present include Dogwood *cornus sanguinea*, Meadow Buttercup, Creeping Buttercup and Dandelion *Taraxacum officinale* agg. Occasionally occurring species included Cow Parsley *Anthriscus sylvestris*, Creeping Thistle, Tutsan *Hypericum*

androsaemum, Yarrow *Achillea millefolium* and Daffodil *Narcissus sp.* Due to the dominance of common grasses and low number of forb species present, this habitat is of little botanical interest and therefore is valued as being of a local importance (lower value).



Plate 2 – Example of Dry Meadows and Grassy Verges (GS2) in the southwest of the proposed development site with Treelines (WL2) in the background

5.3.1.3 Scattered trees and parkland (WD5)

This habitat was located in the north eastern section of the proposed development site bordered by buildings and artificial surfaces and dry meadows and grassy verges. This habitat consisted of Ash *Fraxinus excelsior*, Turkish Hazel *Corylus colurna*, Sycamore *Acer pseudoplatanus* and Silver Birch *Betula pendula*. The ground flora of this habitat was consistent with dry meadows and grassy verges recorded within the site. Overall, this habitat is valued as being of local ecological importance (lower value) due to its small, fragmented area and as these trees were not identified as having potential for roosting bats and had limited value for breeding birds.



Plate 3 – Example of Scattered Trees and Parkland (WD5) in the north of the proposed development site

5.3.1.4 Spoil and bare ground (ED2)

This habitat type was located in the south east of the proposed development site and is bordered to the east by buildings and artificial surfaces habitat type. This habitat type consisted primarily of bare ground

and rubble with mounds of spoil. This section of land was used as a compound for development on adjacent lands (The Grove) and contained construction material, machinery and vehicles. There was little to no plant cover associated with this habitat type, and thus being of little to no botanical interest, this habitat is valued as being of local ecological importance (lower value).



Plate 4 – Example of Spoil and bare ground (ED2) habitat in the east of the proposed development site

5.3.1.5 Recolonising bare ground (ED3)

This habitat type was identified to the west of the spoil and bare ground habitat in the south east of the proposed development site. It consisted of mounds of spoil that have been recolonised by the species of the adjacent dry meadow and grassy verges habitat, as described above. This habitat is of little botanical interest and therefore is valued as being of a local ecological importance (lower value).

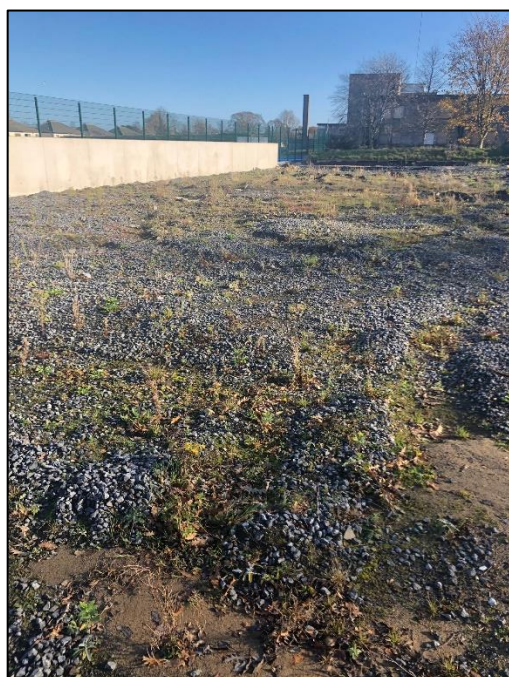


Plate 5 – Example of Recolonising bare ground (ED3) in the centre of the proposed development site

5.3.1.6 Buildings and artificial surfaces (BL3)

Buildings and artificial surfaces include all hardstanding areas, access roads and buildings. This habitat type consisted of the existing GAS buildings and surrounding hardstanding areas, roads and hardstanding associated with The Grove to the east of the site and including Goatstown Road. This habitat is valued as being of local ecological importance (lower value).



Plate 6 – Example of Buildings and artificial surfaces (BL3) in the proposed development site

5.3.2 Habitats of Local Importance (Higher Value)

5.3.2.1 Treelines (WL2)

Treelines were identified along the southern and western boundary of the site and along the northern periphery of the grassland area in the southwest corner. Frequently occurring species present included Ash, Leyland Cypress *Cupressocyparis leylandii*, Sitka Spruce *Picea sitchensis*, Scots Pine *Pinus sylvestris*, Oak *Quercus robur*, Silver Birch and Sycamore *Acer*. Occasional species present included Hawthorn *Crataegus monogyna* and Ornamental Cherry *Prunus variety*. The understorey of treelines was generally limited to plant species associated with adjacent habitats such as dry meadows and grassy verges. Overall, this habitat is valued as being of local ecological importance (higher value) as they provide connectivity to other sites in the surrounding areas and represent suitable foraging and commuting habitat for bats and small mammals, as well as nesting and feeding habitat for birds.



Plate 7 – Example of Treeline (WL2) habitat running through the centre of the proposed development site

5.4 Fauna

5.4.1 Terrestrial Mammals (excl. bats)

No badger setts, feeding signs or territorial markings of badger *Meles meles* (i.e. latrines) were observed within the site during field surveys in April 2018 and November 2020.

Notwithstanding the absence of signs of badger gathered during the site surveys in 2020, the proposed development site are likely to be part of the wider territory of local badger populations. In addition, a desk study search identified one record of badger within c. 2km of the site returned from the NBDC database from 2016.

In light of the above and considering the protection offered to badgers and their setts, the local badger population is valued as being of local importance (higher value).

No signs of small mammals were noted during the site surveys within the proposed development site in April 2018 or November 2020. However, the rank unmanaged grassland within the proposed development site is suitable for hedgehog *Erinaceus europaeus*. This species is widespread and common in Ireland (Marnell *et al.*, 2019). In light of the protection afforded to hedgehog under the Wildlife Acts, the local small mammal populations are assessed as being of local importance (higher value).

Otter *Lutra lutra*, and their breeding and resting places, are protected under the Wildlife Acts. Otter are also listed on Annex II and Annex IV of the EU Habitats Directive and are afforded strict protection under the Habitats Directive and the European Communities (Birds and Natural Habitats) Regulations, 2011. A desk study search identified one record of otter within c. 2km of the site returned from the NBDC database from 2017.

The Elm Park Stream, c. 200m north of the proposed development site, is a highly modified watercourse that is heavily culverted for much of its length according to a recent study on Otter usage of the stream⁸. Only one sign of otter (n=1) was recorded on the concrete sluice where the stream discharges to Dublin Bay on Merrion Strand. No signs of otter were recorded further up the watercourse and it is assessed that

⁸ Macklin, R. & Brazier, B. (2019) Otter survey of selected rivers in Dún Laoghaire-Rathdown County Council district with management recommendations. Prepared by Triturus Environmental Ltd. for Dún Laoghaire-Rathdown County Council

the culverted nature of the stream, the observed poor water quality as well as the presence of associated trash screens, likely precluded otter presence.

The River Slang, c. 582m west of the proposed development site, is a tributary of the River Dodder. The River Dodder is listed as being important for otter, and the River Slang is a functional part of the Dodder River system. Although it is acknowledged that otter use these waterways, evidence of otter usage of the River Slang itself was found to be very low compared to other watercourses (a total of n=3 signs of otter were recorded along the Slang, with a very low average compared to other watercourses of 0.4 signs per kilometre)⁹. The River Slang was found to be a heavily modified and urbanised watercourse, with poor levels of naturalness overall, thus providing limited ecological value for aquatic fauna including otter. No holts or sign of otter (i.e. spraint) were observed within the proposed development site during surveys in April 2018 or November 2020. Furthermore, the River Slang is located approximately 582m west of the proposed development site (far exceeding the 10m riparian buffer considered to comprise the foraging/hunting range of Otter either side of watercourses)¹⁰, and the proposed development site itself is mostly dominated by artificial surfaces and recolonising bare ground, making it largely unsuitable for otter.

Therefore, otter is valued to be only of local importance (lower value) and is not considered further in this assessment.

5.4.2 Bats

During the desk study, the NBDC database returned records of the following bat species within 2km of the proposed development site; Daubenton's bat *Myotis daubentonii*, Leisler's bat *Nyctalus leisleri*, Soprano pipistrelle bat *Pipistrellus pygmaeus* and Common pipistrelle bat *Pipistrellus pipistrellus*. A review of records held by Bat Conservation Ireland returned 47 records of bat roosts from within 10km of the proposed development site. Records for roosts of bat species in the immediate surrounding area (within 1km) include Soprano pipistrelle, Common pipistrelle, Leisler's bat and Brown long-eared bat *Plecotus auritus*. All species have a widespread distribution across the region.

Bats, and their breeding and resting places, are protected under the Wildlife Acts. All bat species are also listed on Annex IV of the EU Habitats Directive (with the Lesser Horseshoe bat *Rhinolophus hipposideros* also listed on Annex II) and are afforded strict protection under the Habitats Directive and the European Communities (Birds and Natural Habitats) Regulations, 2011.

Bat Building Inspections

No evidence of bats was encountered during the internal and external inspection of the Grove After School (GAS) building within the proposed development site on 2nd May 2018. The GAS building is considered to have low suitability for roosting bats. The building has a flat roof and therefore has no available roof space to inspect. There was a concrete water tower structure which was checked internally (see Plate 5 below) and had no suitable roost features.

⁹ Macklin, R. & Brazier, B. (2019) Dublin City Otter Survey. Prepared by Triturus Environmental Ltd. for Dublin City Council

¹⁰ NPWS (2007) *Lutra Lutra* (1355) Conservation status assessment report. [<https://www.npws.ie/sites/default/files/general/otter-conservation-status-report.pdf>]



Plate 8 – Typical characteristics of the external and internal conditions of the GAS building


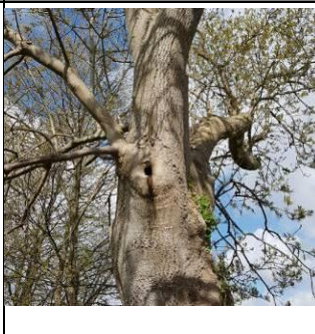









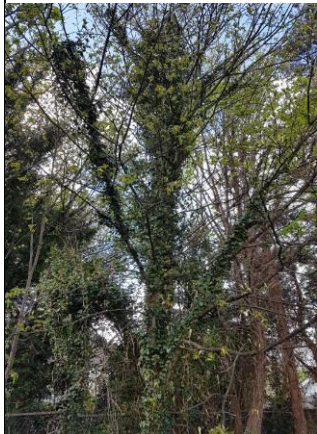
Plate 9 – Water tank tower external and internal


Bat Tree Inspections

Trees within the site were checked for evidence of Potential Roost Features (PRFs) as outlined in Table 4. Features identified within trees that could potentially be used as a bat roost feature include: cracked bark, knot holes, cavities and dense ivy cover. The tree number and type below cross reference the tree number assigned in the project arborist report (The Tree File, 2019), which has now been updated to include the most recent information for tree impacts on the site (The Tree File, 2021).

Table 4: Tree Potential Roost Features identified within the proposed site

Tree ID no., type & status	PRF and Suitability	Plate	Tree ID no., type & status	PRF and Suitability	Plate
– 26 – Beech – Outside redline boundary	– Knot holes – Low suitability		– 70 – Ash – Will be removed	– Knot holes & crack/twist in bark – Low suitability	

Tree ID no., type & status	PRF and Suitability	Plate	Tree ID no., type & status	PRF and Suitability	Plate
					
<ul style="list-style-type: none"> – 27 – Ash – Outside redline boundary 	<ul style="list-style-type: none"> – Dense ivy cover – Low suitability 		<ul style="list-style-type: none"> – 75 – Silver Birch – Will be retained 	<ul style="list-style-type: none"> – Dense ivy cover – Low suitability 	
<ul style="list-style-type: none"> – 44 – Ash – Will be removed 	<ul style="list-style-type: none"> – Knot hole – Low suitability 		<ul style="list-style-type: none"> – 77 – Ash – Will be retained 	<ul style="list-style-type: none"> – Dense ivy cover – Low suitability 	
<ul style="list-style-type: none"> – 58 – Hawthorn – Will be removed 	<ul style="list-style-type: none"> – Dense ivy cover – Low suitability 		<ul style="list-style-type: none"> – 84 – Sycamore – Will be retained 	<ul style="list-style-type: none"> – Dense ivy cover – Low suitability 	

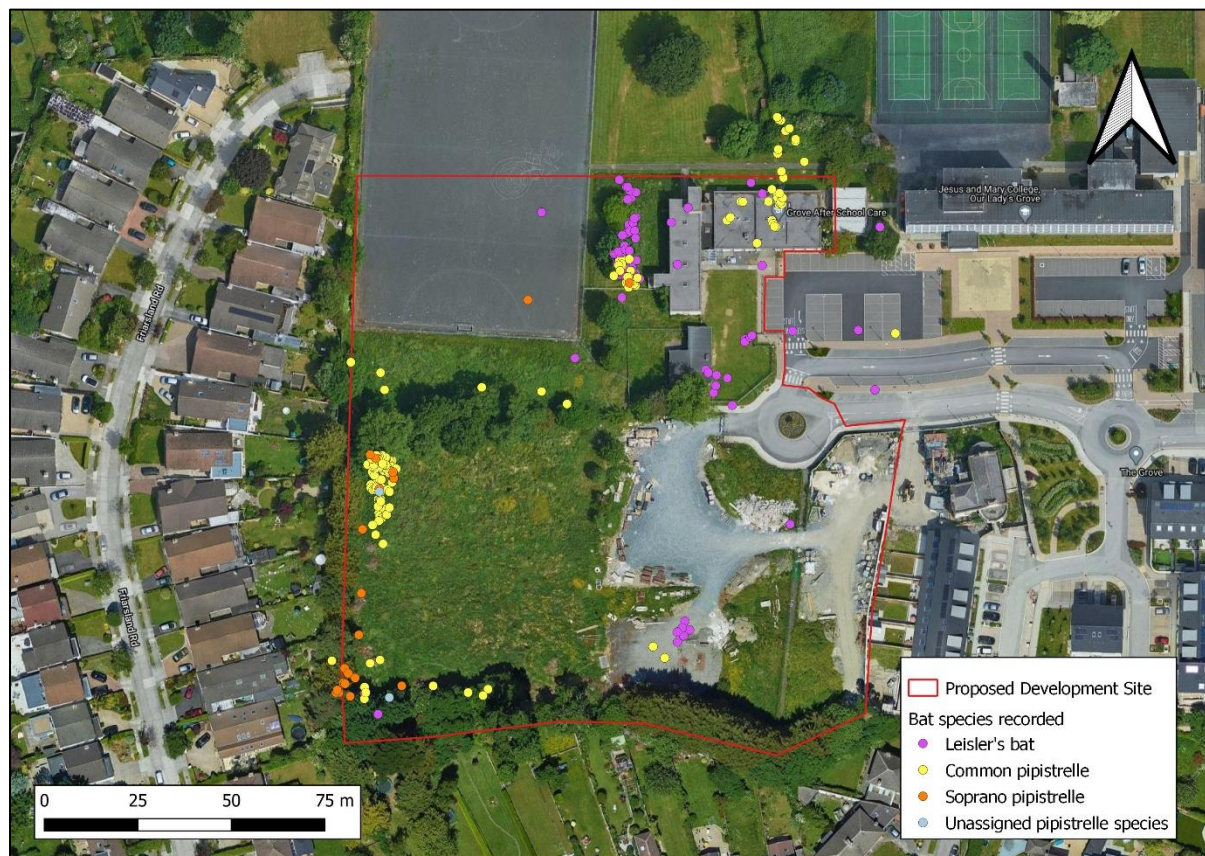
Tree ID no., type & status	PRF and Suitability	Plate	Tree ID no., type & status	PRF and Suitability	Plate
– 59 – Ash – Will be removed	– Knot holes – Low suitability				

Bat Activity Surveys

No bats were noted to be actively using any features within the proposed development site as a roost during the surveys carried out during June and July 2020.

Bat surveys carried out within the proposed development site and its vicinity on 9th June and 9th July 2020 recorded Common pipistrelle, Soprano pipistrelle and Leisler's bat using the area for commuting and foraging purposes. All of the aforementioned bat species were recorded over the two survey nights with Common pipistrelle being the most commonly recorded species overall, followed closely by Leisler's bat. Leisler's bat and Common pipistrelle bat activity was noted across the site with the highest areas of activity for Common pipistrelle being along the treeline between the site and residential properties along Friarsland Road. The most activity recorded for Leisler's bat was in the more open areas around the GAS building. Soprano pipistrelle activity was noted in a few select areas with the majority of activity recorded along the treeline between the site and residential properties along Friarsland Road. Bat activity within the proposed development site and its vicinity are illustrated in Figure 5.

Figure 5 Areas of bat activity noted within the proposed development site and its vicinity during the 2020 surveys



Considering the relatively unlit nature of the site, the presence of semi-natural linear habitats within the proposed development site and its immediate surroundings, and the connectivity these linear habitats provide for commuting and foraging bats, the site is assessed to be of moderate suitability for commuting and foraging bat species.

The proposed development site has been valued as being of local importance (higher value) for bats as the site was found to be used by small numbers of common bat species for foraging and commuting and due to the presence of potential roost features of low suitability found within the site.

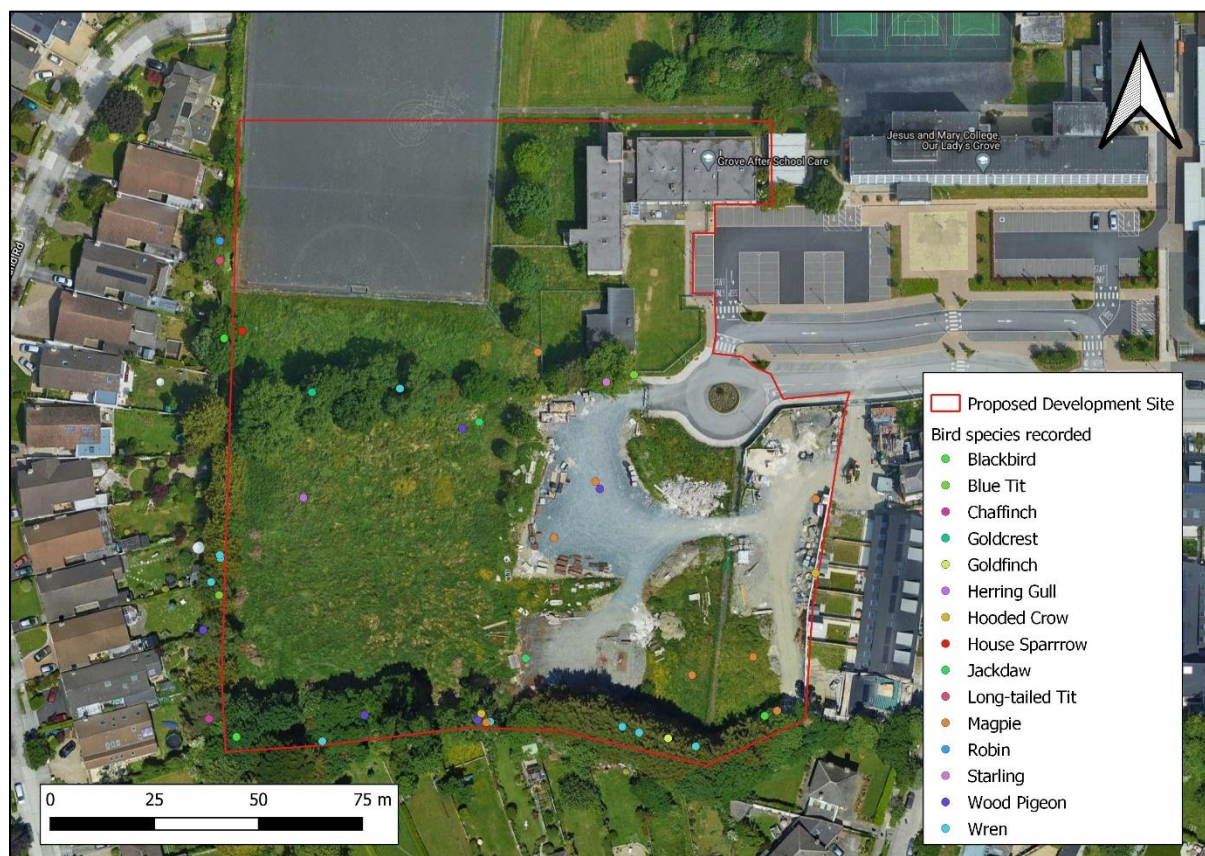
5.4.3 Breeding birds

All wild birds, and their nests and eggs, are protected under the Wildlife Acts. Some bird species are also listed on Annex I of the EU Birds Directive.

Three dedicated breeding bird surveys were carried out within the proposed development site on the 20th May, 3rd June and 29th June 2020. The majority of species recorded within or flying over the proposed development site during these surveys included Jackdaw *Corvus monedula*, Magpie *Pica pica*, Blackbird *Turdus merula*, Hooded crow *Corvus cornix* and Woodpigeon *Columba palumbus* all of which are green-listed, and therefore of least conservation concern (Colhoun & Cummins, 2014). However, amber and red listed birds as per the Birds of Conservation Concern in Ireland (BoCCI) list were also noted during this dedicated survey and included Robin *Erithacus rubecula*, Goldcrest *Regulus regulus* and House sparrow *Passer domesticus*, all of which are amber listed bird species and Herring Gull *Larus argentatus* which is a red listed bird species. Whilst Herring gull were recorded flying over the proposed development site, the other bird species were recorded predominantly within the treeline habitat on site, with some activity noted within the scattered trees and parkland habitat. With the exception of birds commuting over the site, common sub-urban bird species recorded within treeline and scattered trees and parkland habitat are

considered to breed and nest within the proposed development site. The locations of these bird species recorded within the proposed development site are illustrated in Figure 6.

Figure 6 Bird species noted within the proposed development site and its vicinity



In light of the suitability of the proposed development site for bird species, the fact that amber listed bird species have been recorded using the site and the protection afforded to breeding birds and their nests, the proposed development site are valued as being of local importance (higher value) for breeding birds.

5.4.4 Wintering birds

Four dedicated wintering bird surveys were carried out within the proposed development site on the 19th December 2019, 24th January 2020, 19th February 2020 and 11th March 2020. Linnet *Linaria cannabina*, an amber listed bird species, and Herring Gull and Black-headed Gull *Larus ridibundus*, red listed bird species, were observed within the proposed development site. A peak count of nine Linnet were observed in the treeline west of the roundabout on one survey visit, whilst Herring Gull (peak count of four on one occasion) were observed flying over the site.

Although mostly associated with wetland habitats which do not occur within the proposed development site, wintering birds like waders and waterfowl are known to utilise inland sites for terrestrial feeding purposes in Dublin¹¹. The proposed development site contains no significant area of amenity grassland, and is dominated by artificial surfaces, areas of spoil and bare ground and recolonising bare ground and overgrown grassy verges, thus providing very low suitability for wetland and wader species. Only Black-headed Gull was recorded during the wintering bird surveys in very low numbers (peak count of six on one

¹¹ Benson, L. (2009). Use of Inland Feeding Sites by Light-bellied Brent Geese in Dublin 2008-2009: A New Conservation Concern? Irish Birds 8: 563-570

Enviroguide (2019). Natura Impact Statement for Proposed Strategic Housing Development at St. Paul's College, Sybil Hill Road, Raheny, Dublin.

occasion), with no other evidence of wintering wetland birds or their signs (e.g. feathers and droppings) observed.

Thus, this site does not represent an important inland site for wintering Black-headed Gull, or any other wintering bird species.

In light of the low suitability of the proposed development site for wintering bird species, the proposed development site are valued as being of local importance (lower value) for wintering birds, particularly waders and waterfowl.

5.5 Summary of Ecological Evaluation

Table 5 overleaf summarises the ecological evaluation of all receptors taking into consideration legal protection, conservation status and local abundance, and identifies the Key Ecological Receptors (KERs). Species, habitats and features not qualifying as KERs are not subjected to impact assessment in line with current best practice of assessing the impacts on what are determined to be important ecological or biodiversity features: CIEEM and TII guidelines (CIEEM, 2018 and NRA, 2009).

Table 5 Summary of the ecological evaluation

Ecological Receptor	Ecological Valuation	KER?
Designated Sites		
South Dublin Bay SAC	International	Yes
North Dublin Bay SAC	International	Yes
Rockabill to Dalkey Island SAC	International	Yes
Dalkey Islands SPA	International	Yes
South Dublin Bay and River Tolka Estuary SPA	International	Yes
North Bull Island SPA	International	Yes
South Dublin Bay pNHA	National	Yes
North Dublin Bay pNHA	National	Yes
Dolphins, Dublin Docks pNHA	National	Yes
Boosterstown Marsh pNHA	National	Yes
Dalkey Coastal Zone and Killiney Hill pNHA	National	Yes
All other SAC or SPA sites	International	No
All other NHA or pNHA sites	National	No
Habitats		
Amenity grassland (GA2)	Local importance (lower value)	No
Dry meadows and grassy verges (GS2)	Local importance (lower value)	No
Treelines (WL2)	Local importance (higher value)	Yes
Scattered trees and parkland (WD5)	Local importance (lower value)	No
Spoil and bare ground (ED2)	Local importance (lower value)	No
Recolonising bare ground (ED3)	Local importance (lower value)	No
Buildings and artificial surfaces (BL3)	Local importance (lower value)	No
Fauna Species		
Badgers	Local importance (higher value)	Yes
Other small mammals	Local importance (higher value)	Yes
Otter	Local Importance (lower value)	No
Bats	Local importance (higher value)	Yes
Breeding birds	Local importance (higher value)	Yes
Wintering birds	Local importance (lower value)	No

6 Assessment of Effects and Mitigation Measures

6.1 European Sites

6.1.1 Potential Impacts

This section describes and assesses the potential for the proposed development to result in likely significant effects on European sites that lie within the Zol of the proposed development. In the context of European sites this is focussed on the habitats and species for which the sites are selected (QIs for cSACs and SCIs for SPAs) and the conservation objectives supporting their conservation status in each site. This assessment is directly related to the assessment methodology for European sites required under the Habitats Directive, which is presented in the Appropriate Assessment (AA) Screening Report for the proposed development that accompanies this application.

The assessment presented in the Appropriate Assessment Screening Report concluded that the potential impacts associated with the proposed development do not have the potential to affect the receiving environment and, consequently, do not have the potential to affect the conservation objectives supporting the qualifying interests or special conservation interests of any European sites; either alone or in combination with any other plans or projects.

6.1.2 Mitigation Measures

As set out above and in the AA Screening Report, in concluding that there is no possibility of significant effects on any European sites due to the proposed development, mitigation measures intended to avoid or reduce any harmful effects of the proposed development on European sites were not required or taken into account.

6.1.3 Significance of Residual Effects

The assessment presented above and in the AA Screening Report (Section 3.3) concluded that the potential impacts associated with the proposed development do not have the potential to affect the receiving environment and, consequently, do not have the potential to affect the conservation objectives supporting the qualifying interests or special conservation interests of any European sites; either alone or in combination with any other plans or projects. Therefore there is no risk of the proposed development resulting in the possibility of significant effects on any European site, either alone or in combination with other plans or projects. Therefore, there is no possibility of significant residual effects on any European sites due to the proposed development.

6.2 Nationally Designated Sites

In the case of NHAs and pNHAs the assessment considers whether the integrity¹² of any such site would be affected by the proposed development with reference to the ecological features for which the site is designated, or is proposed.

6.2.1 Potential Impacts

As outlined within Section 4.2 of this report, the zone of influence of the proposed development in relation to designated sites extends to NHAs/pNHAs and European sites downstream of the proposed development in River Dodder and its tributaries and to European and nationally designated sites in Dublin Bay. Therefore, the only nationally designated sites within the potential zone of influence of the proposed development are South Dublin Bay pNHA (000210), North Dublin Bay pNHA (000206), Dolphins, Dublin Docks pNHA (000201), Booterstown Marsh pNHA (001205) and Dalkey Coastal Zone and Killiney Hill pNHA (001206).

¹² Refer to Section 4.6.2.2 for definition and impact assessment methodology

These designated sites are located in the downstream receiving environment within Dublin Bay Coastal Waterbody¹³, to which the surface waters from the lands ultimately discharge via the Slang River, River Dodder and the River Liffey.

Notwithstanding the location of the aforementioned designated sites in the downstream receiving environment, there is not considered to be any potential for significant effects arising from the construction or operation of the proposed development for the same reasons as European sites above.

6.2.2 Mitigation Measures

As set out in section 6.2.1 above, in concluding that the proposed development is not likely to have a significant effect on any nationally designated sites, mitigation measures intended to avoid or reduce any harmful effects of the proposed development on these sites were not required or taken into account.

6.2.3 Significance of Residual Effects

The assessment presented in section 6.2 above concluded that there was no risk of the proposed development resulting in a likely significant effect on any nationally designated site, either alone or in combination with other plans or projects. Therefore, the proposed development is not likely to have significant residual effects on any nationally designated sites.

6.3 Habitats and Flora

6.3.1 Potential Impacts

6.3.1.1 Habitat loss and loss of flora

Treelines (WL2) habitat has been identified as being of local ecological importance (higher value) due to its provision of connectivity to other habitats in the surrounding areas and represents suitable foraging and commuting habitat for bats, as well as nesting and feeding habitat for birds and small mammals. The proposed development will result in tree loss occurring along the treeline running west to east from the roundabout through the centre of the proposed development site. In addition, part of Tree Line 2 along the southern boundary of the site will be removed, however this removal of trees does not affect the integrity or ecological function of the periphery treeline. In all, 34 trees will be removed as a result of the proposed development (The Tree File, 2021) which equates to c. 70m of treeline habitat and represents c. 40% of the treeline habitat within the proposed development site. This includes eight 'Category U' trees (trees deemed unsafe and/or necessary for removal) being removed, seven 'Category C' trees (trees of low quality and value), and 19 'Category B' trees (trees of moderate quality and value).

The treeline running west from the roundabout contains a mix of native and non-native species, whereas Tree Line 2 is largely composed of non-native mature Leyland Cypress *Cupressocyparis leylandii* trees which is a non-native species and therefore has reduced ecological value. Where suitable, replacement planting with more biodiversity friendly native tree and hedge species that also produce nuts and berries benefitting birds and mammals will take place within the site. By including native species in the planting up of the site, this enhancement measure will allow for less intensive management and more biodiversity friendly planting.

Where possible, mature trees deemed as important or vigorous in the arborist report in the site have been retained, to ensure connectivity is kept across the site. In addition, the inclusion of a "nature trail" along the periphery treeline within the proposed development site will act as an ecological buffer to the existing periphery treeline, functioning as a retained corridor for wildlife with understorey ground flora planting of All Ireland Pollinator Plan friendly species proposed (see Appendix IV).

¹³ Based on interrogation of spatial data on Water Features, including sub basins, and coastal waterbodies, held by the EPA and available for review on the EPA MapViewer www.epa.ie

The proposed development will result in the loss of 34 trees and c. 70 m of treeline. Considering the length of treeline being removed in the context of the local resource of this habitat type, the native planting proposed with non-native tree species removed in the landscaping design, and the planting of 56no. new trees within the site, resulting in a net gain of 22no. trees, this is not likely to result in a significant negative effect, at any geographic scale.

Considering this and given that it is unlikely that there would be wide scale vegetation clearance in the surrounding locality (*i.e.* the surrounding area is predominantly made of residential houses and gardens) significant cumulative impacts are unlikely.

6.3.1.2 Damage to vegetation to be retained

In the absence of any mitigation, there is potential for damage to areas of treelines marked for retention. While sections of these habitats are being retained within and adjacent to the proposed development site, there remains a risk of damage to the habitats arising during construction such as driving vehicles and storing materials within tree root protection zones, or through accidental machinery strikes to branches or trunks of trees. This impact, in a worst-case scenario could result in damage and degradation of trees, and ultimately death of individual trees and result in a likely significant negative effect, at a local geographic scale.

6.3.2 Mitigation Measures

6.3.2.1 Retention and Protection of Vegetation during Construction

Any vegetation (including trees or hedgerows adjacent to, or within, the proposed development site) which is to be retained shall be afforded adequate protection during the construction phase in accordance with the Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road Schemes (National Roads Authority, 2006b), as follows:

- All trees within the proposed development site that are to be retained, both within and adjacent to the proposed development site (where the root protection area of the tree extends into the proposed development site), will be fenced off at the outset of works and for the duration of construction to avoid structural damage to the trunk, branches or root systems of the trees. Temporary fencing will be erected at a sufficient distance from the tree so as to enclose the Root Protection Area (RPA) of the tree. The RPA will be defined based upon the recommendation of a qualified arborist
- Where fencing is not feasible due to insufficient space, protection for the tree/hedgerow will be afforded by wrapping hessian sacking (or suitable equivalent) around the trunk of the tree and strapping stout buffer timbers around it
- The area within the RPA will not be used for vehicle parking or the storage of materials (including soils, oils and chemicals). The storage of hazardous materials (e.g. hydrocarbons) or concrete washout areas will not be undertaken within 10 m of any retained trees, hedgerows and treelines
- A qualified arborist shall assess the condition of, and advise on any repair works necessary to, any trees which are to be retained or that lie outside of the proposed development boundary but whose RPA is impacted by the works. Any remedial works required will be carried out by a qualified arborist
- A buffer zone of at least 5m will be maintained between construction works and retained hedgerows to ensure that the root protection areas are not damaged

6.3.3 Significance of Residual Effects

With regard to the KER habitat identified within the proposed development site, there will be some permanent loss of sections of treeline habitat within the site. However, the impacts of effects from loss of treeline habitat will be reduced over the medium to long-term as a result of the extensive landscaping

design and retention and replanting of trees as outlined within the *Landscape Development Report* along with the mitigation strategy to protect vegetation to be retained. Assuming the full and successful implementation of the mitigation measures, no long-term significant impacts are predicted and the proposed development will not result in a significant residual impact on treelines at any geographic scale.

6.4 Badgers

6.4.1 Potential Impacts

6.4.1.1 Habitat loss

Construction will result in the permanent loss of badger foraging habitat within the proposed development site. The loss of habitat may affect local badgers, as it will reduce the foraging area and feeding resource available within their existing territories. Loss of foraging habitat can also have a knock-on consequence of increased conflict with neighbouring badger groups in competition for resources. This territorial behaviour is a natural dynamic between neighbouring badger groups in response to many other factors that affect population numbers, territorial behaviour, and dispersion of individuals.

However, there is alternative suitable foraging habitat located within the immediate surrounding environment (i.e the UCD GAA Pitches within the Belfield Campus, as well as within the grounds of the HSE Central Mental Hospital). These alternative foraging resources are likely to be sufficient to maintain the local population in the long-term, however there will be an overall loss of badger foraging habitat as a result of the proposed development and a temporary displacement of badgers from the proposed development site during construction. Additionally, no signs of badger were noted within the proposed development site during the site surveys in April 2018 or November 2020. In light of the above, it is predicted that, despite any temporary effects, the loss of foraging habitat associated with the proposed development is unlikely to affect the conservation status of the local badger population and will not result in a likely significant negative effect, at any geographic scale. As significant effects on badger due to habitat loss are not predicted to arise from the proposed development on its own, there is no possibility of significant cumulative effects in that respect.

6.4.1.2 Disturbance/displacement

In conjunction with any displacement effects associated with habitat loss, increased human presence and/or noise and vibration during construction or operation, has the potential to displace badgers from foraging habitat. However, considering the lack of evidence of any badger activity recorded within the proposed development site and that the majority of human disturbance/noise will typically be undertaken during normal daylight hours and badgers are nocturnal in habit, significant displacement of badgers from foraging areas is considered unlikely to affect the local badger population.

Similarly, nocturnal mammals, such as the badger, are likely to be disturbed by the introduction of artificial light into foraging areas (Rich & Longcore, 2005) which could affect use of foraging areas and use of potential badger setts. Disturbance or displacement due to light effects could occur during construction or operation. However, given the presence of existing artificial lighting within the immediate vicinity of the proposed development site (i.e. along Goatstown Road and surrounding residential streets) the local badger population would be expected to be habituated to artificial light spill.

Additionally, as outlined within the landscaping proposals accompanying this application, planting of native woodland shrubs/trees will be established within the site which will provide a level of screening from residential dwellings and artificial light spill, which will reduce the levels of disturbance to foraging badgers using the proposed development site. This will be further enhancement through the retention of trees throughout the proposed development site as outlined in the *Landscape Development Report*.

It is therefore predicted that displacement/disturbance effects associated with increased artificial light spill or increased human presence and/or noise and vibration is unlikely to affect the conservation status of the local badger population and will not result in significant negative effect, at any geographic scale. As

significant effects on badger due to disturbance/displacement are not predicted to arise from the proposed development on its own, there is no possibility of significant cumulative effects in that respect.

6.4.2 Mitigation Measures

As the proposed development site will not result in any significant effect on the local badger population, no mitigation measures are required.

6.4.3 Significance of Residual Effects

As outlined within section 6.4.1 above, the proposed development site will not result in any significant effect on the local badger population, thus no residual impacts are predicted on badgers at any geographical scale.

6.5 Other small mammals

6.5.1 Potential Impacts

6.5.1.1 Habitat loss

A large portion of the proposed development site consists of rank grassland and trees with potentially suitable habitat to support small mammal species, such as hedgehog. Given the relatively low numbers of individuals of hedgehog that are likely to be affected, and that they are highly mobile species, site clearance is unlikely to result in a level of mortality that would affect the species' conservation status, and result in a significant negative effect, even at a local geographic scale. The understorey of retained treeline habitat will provide refuge for small mammals during construction works. In addition, the inclusion of a "nature trail" within the proposed development will act as a corridor for small mammals through the site and will include understorey ground flora planting which will provide foraging, refuge and breeding habitat for small mammals such as hedgehog. In light of the above, it is predicted that, despite any temporary effects, the loss of foraging habitat associated with the proposed development is unlikely to affect the conservation status of small mammals such as the local hedgehog population and will not result in a likely significant negative effect, at any geographic scale. As significant effects on small mammal, such as hedgehog, due to habitat loss are not predicted to arise from the proposed development on its own, there is no possibility of significant cumulative effects in that respect.

6.5.1.2 Disturbance/displacement

In conjunction with any displacement effects associated with habitat loss, increased human presence and/or noise and vibration associated with construction works, has the potential to displace mammal species from both breeding/resting places and from foraging habitat. However, considering that disturbance will be short-term, it is extremely unlikely to result in any long-term effects on the local small mammal population or their conservation status, particularly considering the extensive planting outlined within the landscaping design, the retention of trees and the presence of alternative suitable habitat of a similar nature surrounding the proposed development site. Therefore, disturbance/displacement is unlikely to result in a significant negative effect, at any geographic scale. As significant effects on small mammals such as hedgehog due to habitat loss or disturbance/displacement are not predicted to arise from the proposed development on its own, there is no possibility of significant cumulative effects in that respect.

6.5.2 Mitigation Measures

As the proposed development site will not result in any significant effect on the local small mammal population, no mitigation measures are required.

6.5.3 Significance of Residual Effects

As outlined within section 6.6.1 above, the proposed development site will not result in any significant effect on the local small mammal population, thus no significant residual impacts are predicted at any geographic scale.

6.6 Bats

6.6.1 Potential Impacts

6.6.1.1 Direct mortality

Bats, and their breeding and resting places, are strictly protected under the Birds and Habitats Regulations, and under the Wildlife Acts, and it is an offence under that legislation to intentionally kill or injure bats or to interfere with or destroy their breeding or resting places.

No evidence of the presence of roosting bats was recorded during the internal building inspection of the Grove After School (GAS) building carried out in May 2018, nor during the dusk emergence and dawn re-entry surveys in June and July 2020. The two-storey flat roofed GAS building was considered low suitability for roosting bats. Nine trees with potential roosting features (PRFs) were identified within the proposed development site. Although no roosts were identified during the bat activity surveys of the site, removal of trees identified with PRFs could result in the potential loss of a bat roost, if present, and as such, there would be a significant impact on bats at a local scale. The size of any bat roost within the trees identified in Table 3 is likely to be small, as tree roosts generally accommodate relatively small and/or transitional bat roosts. Four trees identified with PRFs will be removed as part of the development and include trees no. 44, 58, 59, and 70.

Therefore, the proposed development, in the absence of mitigation, has the potential to result in a significant negative effect, with regard direct mortality, at a local geographic scale. As significant effects on bats due to direct mortality are predicted to arise from the proposed development on its own, there is a possibility of significant cumulative effects in that respect.

6.6.1.2 Habitat loss

There were moderate levels of bat activity noted across the site in general, with the main areas of activity noted along the treeline between the proposed development site and residential properties along Friarsland Road. During the manual activity surveys in June and July 2020 calls of the following bat species were recorded: Common pipistrelle, Soprano pipistrelle and Leisler's bat and a small number of unassigned calls of the genus *Pipistrellus* were recorded.

In light of the above and considering the suitability of habitats within the proposed development site for commuting/foraging bats, the removal of trees will result in loss of ecological connectivity and foraging habitat for bat species within the proposed development site. There is alternative suitable foraging habitat located in the immediate surroundings, such as within the HSE Central Mental Hospital and nearby UCD GAA grounds, along with the retention of trees on site as outlined in the landscape design, all of which are likely to be sufficient to maintain the local population in the long-term. It is therefore predicted that, despite any temporary effects, the loss of foraging/commuting habitat associated with the proposed development site will not affect the conservation status of the local bat population and will not result in a likely significant negative effect, at any geographic scale. Furthermore, considering that the most frequently recorded species; Common pipistrelle, Soprano pipistrelle and Leisler's bat, are known to have a widespread distribution across the region and in Ireland, and that these species are showing an increase in their population trend (Roche *et al.*, 2014). They are also relatively light-tolerant species which are often recorded in towns and cities. As significant effects on bats due to loss of foraging/commuting habitat are not predicted to arise from the proposed development on its own, there is no possibility of significant cumulative effects in that respect.

6.6.1.3 Disturbance/displacement

An increase in the existing light levels during construction and operation, within and adjacent to the proposed development site may potentially indirectly impact on bat species that utilise the site for foraging and/or commuting. Given the built-up nature of the wider surrounding environment and the presence of artificial lighting within the immediate vicinity of the proposed development site (i.e. along Goatstown Road, The Grove (a residential development) to the east and along residences on Larchfield Road and Friarsland Avenue to the south and residences on Friarsland Road to the west) the local bat population would be expected to be habituated to artificial light spill, especially as the most common species recorded within the proposed development site i.e. Leisler's bat, Soprano pipistrelle and Common pipistrelle bat are some of the least sensitive species to artificial light spill, and are recorded in towns and cities across Ireland.

However, it is possible that lighting required during the construction and operational stages of the proposed development may illuminate previously unlit feeding and/or commuting areas, making them unsuitable for bats and it is likely that bats may not use the site to the extent that they do currently.

In light of this and in the absence of mitigation, the proposed development could result in a significant negative effect, albeit at a local geographic scale.

6.6.2 Mitigation Measures

6.6.2.1 Measures to Protect Bats during Construction

Although no evidence of bats was recorded in the GAS building located within the proposed development site and it was considered to have low suitability, precautionary mitigation has been proposed in the event that small numbers of bats are found roosting within the building. It is recommended that if bats are encountered during any works at the site the relevant activity will be suspended, and the advice of a suitably qualified and licenced bat ecologist is sought. If occupied, a derogation licence from NPWS may be needed in order to permit removal of bats and to develop appropriate mitigation for the loss of any roosts on the site.

Four trees found containing potential roost features (PRFs), each assessed as being of low suitability, located within the proposed development site are due to be removed. While no evidence of bats roosting in trees on site was found during the surveys, a precautionary approach will be taken and all identified potential bat roost trees shall be inspected at height using an endoscope by an experienced ecologist for the presence of bats immediately prior to felling using the soft-felling technique (i.e. section-felled using controlled rigging under the supervision of an experienced ecologist, and tree limbs are cut and left grounded overnight to allow any bats to make their way out). If bats are present, the relevant works will have to cease and NPWS will have to be contacted in order to obtain a derogation licence.

In order to provide additional roosting opportunities for bats the proposed development will include six Schwegler 2F bat boxes¹⁴ to be erected on suitable retained trees in suitable locations across the site, the location of which to be decided by a suitably qualified and experienced bat ecologist. This has been recommended as an enhancement measure for the site rather than a mitigation measure as no confirmed roosting sites have been identified.

6.6.2.2 Measures to Control and Reduce Light Spill During Construction and Operation

Any light spill affecting bat use of suitable habitats within the proposed development, i.e. the retained periphery treelines, and outside of the proposed development site will be avoided. Light levels during construction and operation in these areas will be maintained at baseline levels. If baseline light level surveys are not undertaken, baseline levels are considered to be 0.1 lux to 1 lux to account for varying

¹⁴ Bat boxes are available to purchase online from NHBS www.nhbs.com and similar websites

weather conditions i.e. typical moonlight/cloudy sky being 0.1lux and clear night with full moon being 1lux¹⁵.

This will be achieved through sensitive siting and design of the lighting elements. This will include careful consideration of light placement on buildings, column heights and luminaire design. Accessories such as baffles, hoods or louvres can be used to reduce light spill and direct light to where it is needed. Ideally luminaires should be selected which do not emit UV light (e.g. metal halide and fluorescent light sources should be avoided). LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.

The construction lighting plan, which will be in operation during the construction phase only, will be reviewed by a suitability qualified ecologist. If areas of light spill on suitable bat habitat, i.e. the retained periphery treelines, is identified measures to reduce light spill will be implemented and may include modification of lighting locations and column heights, luminaire design and/or introducing additional screening to reduce light spill. Following a review of the lighting design prepared for the proposed development by Axiseng, and which accompanies this application, it can be that baseline lux levels as set out above will be maintained along the retained periphery treelines during the operational phase of the proposed development.

6.6.3 *Significance of Residual Effects*

Potential impacts on bats include mortality of bats during construction and/or disturbance from the proposed development site during construction and operation, particularly from artificial light spill. However, assuming the full and successful implementation of the mitigation measures, no long-term significant impacts are predicted, and the proposed development will not result in significant negative residual effects on the local bat population at any geographical scale.

6.7 **Breeding Birds**

6.7.1 *Potential Impacts*

6.7.1.1 *Habitat loss*

The clearance of vegetation within the lands will result in the permanent loss of foraging and nesting habitats for birds. This includes the dry meadows and grassy verges habitat utilised by a range of common bird species as well as the treelines habitat. Therefore, the effects of this loss on breeding birds is assessed as being significant as the loss will be permanent and will result in the replacement of semi-natural habitats with lower suitability. The effects will be significant at the local geographic scale.

With the exception of treelines and scattered trees, the habitats in the lands are of low suitability for nesting bird species. Species that commonly nest in grassland vegetation were not encountered during surveys of the lands in May and June 2020. The effects of habitat loss on bird species arising from the proposed development will not be significant at any geographic scale for the following reasons:

- While the lands will be of lower suitability for foraging species for the duration of the construction phase of the development, the implementation of landscape planting will enhance the lands in terms of foraging opportunities for common garden bird species; and,
- Majority of the habitat with suitability for nesting bird species i.e. treelines, is being retained in the proposed development, and the implementation of landscape planting (incl. additional native trees and hedges, with a net gain of 22no. trees) will enhance the lands in terms of breeding opportunities.

¹⁵ Institute of Lighting Professionals (2018) Guidance Note 8 Bats and Artificial Lighting. Available online at <https://cdn.bats.org.uk/pdf/Resources/ilp-guidance-note-8-bats-and-artificial-lighting-compressed.pdf?mtime=20181113114229>

As significant effects on breeding birds due to habitat loss are not predicted to arise from the proposed development on its own, there is no possibility of significant cumulative effects in that respect.

6.7.1.2 Direct mortality

All birds, their nests, eggs and unfledged young are protected in Ireland through the Wildlife Acts. In the absence of any mitigation, there is potential for clearance of vegetation to result in mortality of birds or their young, or the destruction of a nest. This would most likely occur if site preparation works were to be undertaken during the breeding bird season, i.e. between 1st March and 31st August. The effects of mortality or loss of a nest for all breeding birds would be significant at the local geographic scale. As significant effects on breeding birds due to direct mortality are predicted to arise from the proposed development on its own, there is a possibility of significant cumulative effects in that respect.

6.7.1.3 Disturbance/displacement

There will be an increase in noise and human presence within the proposed development site during construction and operation which is likely to displace breeding birds, from habitat areas adjacent to the proposed development site. However, the site has a significant amount of foot traffic already, and species recorded utilising habitats within the site are considered to be sub-urban and urban species which are likely to adapt to the increased human presence.

Although it is not possible to quantify the magnitude of potential noise impact it could potentially extend for several hundred metres from the proposed development site. Given the bird species that have been recorded to use the proposed development site, and likely to breed there, including three amber listed bird species, effects from disturbance or displacement effects are assessed to be significant for breeding birds at the local geographic scale.

However, this disturbance is likely to be greatest during construction which will be a temporary impact, whereas disturbance during the operational phase of the project would be much lower. Additionally, there is alternative habitat for temporarily displaced birds in the surrounding area. The retained trees on the site will provide refuge for birds during construction and operation, and landscape planting that includes seed bearing species will enhance the site suitability and provide a valuable food resource for birds throughout the year.

Significant effects on breeding birds due to disturbance/displacement are predicted to arise during the construction phase of the proposed development, however these will only be temporary and therefore no long-term significant impacts at any geographical scale are predicted. There is no possibility of significant cumulative effects in that respect.

6.7.2 Mitigation Measures

6.7.2.1 Measures to Protect Breeding Birds During Construction

Where feasible, vegetation (e.g. hedgerows, trees, scrub and grassland) will not be removed, between the 1st March and the 31st August, to avoid direct impacts on nesting birds. Where the construction programme does not allow this seasonal restriction to be observed, then these areas will be inspected by a suitably qualified ecologist for the presence of breeding birds prior to clearance. Areas found not to contain nests will be cleared within three days of the nest survey, otherwise repeat surveys will be required. Should nesting birds be encountered during surveys, the removal of vegetation will be required to be delayed until after the nesting season (1st March to 31st August inclusive).

6.7.3 Significance of Residual Effects

Habitat loss, displacement of birds and potential mortality to nesting birds during construction of the proposed development will likely result in a negative effect on the local bird population. Although the mitigation strategy outlined above will minimise the impact of those effects on the population of breeding birds within the proposed development site. Therefore, the proposed development is unlikely to result in

any long-term effects on the local breeding bird populations, and so there will be no likely significant negative residual effect, at any geographic scale.

7 Enhancement

During the baseline surveys conducted for this site, it was noted that there are very few wildflowers/forbs available for pollinator species, and that the site was mostly dominated by rank grasses. In light of this, the proposed landscape design of the site has incorporated a number of features to enhance the biodiversity of the site. These include the planting of species rich, pollinator-friendly plants (from the list provided in Appendix VI) in a variety of areas and habitats including woodland-edge planting to the site, ornamental planting throughout to include herbaceous plants and grasses with a focus on pollinator-friendly species (“bee and butterfly” borders), a mix of native trees/shrubs (with emphasis on fruit and nut-bearing species) and ground covers, formal hedgerows and climbing plants, and linear grassland strips of biodiversity friendly groundcover mix either side of the path through the “nature trail”.

These new planting mixes developed for these spaces will benefit a range of species, from invertebrates to small mammals and birds. Considering the inclusion of new tree planting and pollinator-friendly planting within the landscaping designs for the proposed development site, and the installation of six bat boxes on retained trees within the periphery treeline which is buffered by the nature trail, it is assessed that these measures will result in the overall enhancement of biodiversity above the existing level.

8 Conclusions

As outlined within section 6 above and the AA Screening accompanying this application, the proposed development does not pose a risk of adversely affecting (either directly or indirectly) the integrity of any European or nationally designated sites either alone or in combination with any other plans or projects.

The proposed development has no potential to affect the surface water quality or the ecology of the adjacent waterbodies. The surface water systems are designed in accordance with the principles of SuDS as recommended in the Greater Dublin Strategic Drainage Study. There will be no works (e.g. piling/blasting) which may affect groundwater and groundwater-dependent terrestrial habitats.

The proposed development will result in some temporary loss of treeline habitat within the proposed development site, but this will not result in any significant negative effects following the implementation of mitigation and enhancement measures as detailed in this report. The landscape design will ensure that the biodiversity value of the habitats to be retained and created as part of the proposed development, are maximised.

The proposed development does have the potential to result in significant negative effects on habitats (treelines), breeding birds and bats at local geographic levels. Following the implementation of mitigation measures, no residual impacts on any key ecological receptors is predicted.

A comprehensive suite of mitigation measures are proposed, in addition to the extensive and stringent environmental control measures that have been incorporated into the design of the proposed development. All of the mitigation measures will be implemented in full and are best practice, tried and tested, and effective control measures to protect biodiversity and the receiving environment. It is recommended that all mitigation measures included within this report are committed to and delivered through the planning conditions. In addition, the landscape design will ensure that the biodiversity value of the habitats to be retained and created as part of the proposed development are maximised, enhancing the site biodiversity above the existing level.

Considering the elements included within the design of the proposed development (as described in section 4), and the implementation of the mitigation measures proposed in section 6 to avoid or minimise the effects of the proposed development on the receiving ecological environment, no significant residual ecological effects are predicted, either alone or cumulatively with any other projects. The proposed development complies with relevant biodiversity policies of the Dun Laoghaire-Rathdown County Development Plan 2016-2022 (Dún Laoghaire-Rathdown County Council, 2016) considered in this report.

The recommended biodiversity enhancement measures are in line with the Dún Laoghaire-Rathdown Biodiversity Plan 2009-2013 (Dún Laoghaire-Rathdown County Council, 2013).

Table 6 Summary of the significant residual ecological effects of the proposed development

Ecological Receptor	Ecological Valuation	Impacts with Potentially Significant Effects	Potential Significance of Effects	Mitigation Measures	Compensation	Enhancement	Significance of Residual Effects
Designated Sites							
South Dublin Bay SAC	International	None	International	None	None	None	None
North Dublin Bay SAC	International	None	International	None	None	None	None
Rockabill to Dalkey Island SAC	International	None	International	None	None	None	None
Dalkey Islands SPA	International	None	International	None	None	None	None
South Dublin Bay and River Tolka Estuary SPA	International	None	International	None	None	None	None
North Bull Island SPA	International	None	International	None	None	None	None
South Dublin Bay pNHA	National	None	National	None	None	None	None
North Dublin Bay pNHA	National	None	National	None	None	None	None
Dolphins, Dublin Docks pNHA	National	None	National	None	None	None	None
Boosterstown Marsh pNHA	National	None	National	None	None	None	None
Dalkey Coastal Zone and Killiney Hill pNHA	National	None	National	None	None	None	None
Habitats							
Treelines	Local (higher)	Habitat loss	Significant at Local scale	Any vegetation (including trees or hedgerows adjacent	Although not specifically included as compensation for	None	None

				to, or within, the proposed development site) which is to be retained shall be afforded adequate protection during the construction phase in accordance with the Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road Schemes (National Roads Authority, 2006b)	loss of treeline habitat, the inclusion of planting of new trees and shrubs (with native species included) in the landscape design will help offset the loss of this habitat.		
Fauna Species							
Bats	Local (higher)	Direct mortality Habitat loss Disturbance/displacement	Significant at Local scale	Demolition of structures/felling of trees following seasonal restrictions. Roost presence/absence surveys prior to demolition of structures/felling of suitable bat roost trees. Soft felling of suitable bat roost trees. Measures to protect retaining hedges and trees in the proposed development. Measures to control	Although not included specifically as a compensation measure, the inclusion of planting of trees and hedges (with native species included) in the landscape design will help offset loss of habitat used by bats.	Placement of artificial roosts (bat box/tube) within the proposed development site.	None

				and reduce light spill during construction and operation.			
Breeding birds	Local (higher)	Habitat loss Disturbance/displacement Direct mortality	Temporarily significant at Local scale	Measures to protect breeding birds from direct mortality during construction (Seasonal vegetation clearance).	Landscape design elements proposed as part of this development (see section 8) will compensate for loss of habitat for breeding birds, due to greater diversity and availability of insect prey and increased vegetation structure and diversity.	None	None
Badger	Local (higher)	None	Not significant at Local scale	None	None	None	None
Small mammals	Local (higher)	None	Not significant at Local scale	None	None	None	None

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Appendix I

Examples of Ecological Valuation from NRA (2009)

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 fulfils 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.¹ • 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)² 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. 1988).³
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.

¹ See Articles 3 and 10 of the Habitats Directive

² It is suggested that, in general, 1% of the national population of such species qualifies as an internationally important population. However, a smaller population may qualify as internationally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

³ Note that such waters are designated based on these waters' capabilities of supporting salmon (*Salmo salar*), trout (*Salmo trutta*), char (*Salvelinus*) and whitefish (*Coregonus*)

- 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)⁴ of the following:
 - Species protected under the Wildlife Acts; and/or
 - Species listed on the relevant Red Data list.
- Site containing 'viable areas'⁵ of the habitat types listed in Annex I of the Habitats Directive

County Importance:

- Area of Special Amenity.⁶
- Area subject to a Tree Preservation Order.
- Area of High Amenity, or equivalent, designated under the County Development Plan.
- Resident or regularly occurring populations (assessed to be important at the County level)⁷ of the following:
 - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
 - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
 - Species protected under the Wildlife Acts; and/or
 - Species listed on the relevant Red Data list.
- Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance.
- County important populations of species, or viable areas of semi-natural habitats or natural heritage features identified in the National or Local 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.

Local Importance (higher value):

⁴ It is suggested that, in general, 1% of the national population of such species qualifies as a nationally important population. However, a smaller population may qualify as nationally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

⁵ A 'viable area' is defined as an area of a habitat that, given the particular characteristics of that habitat, was of a sufficient size and shape, such that its integrity (in terms of species composition, and ecological processes and function) would be maintained in the face of stochastic change (for example, as a result of climatic variation).

⁶ It should be noted that whilst areas such as Areas of Special Amenity, areas subject to a Tree Preservation Order and Areas of High Amenity are often designated on the basis of their ecological value, they may also be designated for other reasons, such as their amenity or recreational value. Therefore, it should not be automatically assumed that such sites are of County importance from an ecological perspective.

⁷ It is suggested that, in general, 1% of the County population of such species qualifies as a County important population. However, a smaller population may qualify as County important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

- 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)⁸ of the following:
 - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
 - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
 - Species protected under the Wildlife Acts; and/or
 - Species listed on the relevant Red Data list.
- Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality;
- Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.

Local Importance (lower value):

- Sites containing small areas of semi-natural habitat that are of some local importance for wildlife;
- Sites or features containing non-native species that are of some importance in maintaining habitat links.

⁸ It is suggested that, in general, 1% of the local population of such species qualifies as a locally important population. However, a smaller population may qualify as locally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

Appendix II

Designated sites within the Vicinity of the Proposed Development

European sites in the vicinity of the proposed development are listed below in **Table 1**, along with their qualifying/special conservation interests, reference to the most recent conservation objectives document, and their location relative to the proposed development site.

Other nationally protected sites for nature conservation in the vicinity of the proposed development are listed below in **Table 2**, along with the nature conservation interests for which they are designated, and their location relative to the proposed development site.

Table 1 European sites in the vicinity of the proposed development

European Site Name [Code] and its Qualifying interest(s) / Special Conservation Interest(s) (*Priority Annex I Habitats)	Location Relative to the Proposed Development Site
Special Area of Conservation (SAC)	
South Dublin Bay SAC [000210] [1140] Mudflats and sandflats not covered by seawater at low tide [1210] Annual vegetation of drift lines [1310] <i>Salicornia</i> and other annuals colonising mud and sand [2110] Embryonic shifting dunes NPWS (2013) <i>Conservation Objectives: South Dublin Bay SAC 000210</i> . Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	Located c.2.8km north east of the proposed development site.
North Dublin Bay SAC [000206] [1140] Mudflats and sandflats not covered by seawater at low tide [1210] Annual vegetation of drift lines [1310] <i>Salicornia</i> and other annuals colonising mud and sand [1330] Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) [1395] Petalwort <i>Petalophyllum ralfsii</i> [1410] Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [2110] Embryonic shifting dunes [2120] Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2130] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2190] Humid dune slacks NPWS (2013) <i>Conservation Objectives: North Dublin Bay SAC 000206</i> . Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	Located c.7.5km north east of the proposed development site.
Wicklow Mountains candidate SAC [002122] [3110] Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) [3160] Natural dystrophic lakes and ponds [4010] Northern Atlantic wet heaths with <i>Erica tetralix</i> [4030] European dry heaths [4060] Alpine and Boreal heaths [6130] <i>Calaminarian</i> grasslands of the <i>Violetalia calaminariae</i> [6230] Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) [7130] Blanket bogs (* if active bog) [8110] Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>)	Located c.7.6km south west of the proposed development site.

<p>[8210] Calcareous rocky slopes with chasmophytic vegetation</p> <p>[8220] Siliceous rocky slopes with chasmophytic vegetation</p> <p>[91A0] Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles</p> <p>[1355] <i>Lutra lutra</i> (Otter)</p> <p>NPWS (2017) <i>Conservation Objectives: Wicklow Mountains SAC 002122</i>. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.</p>	
<p>Rockabill to Dalkey Island SAC [003000]</p> <p>[1170] Reefs</p> <p>[1351] Harbour porpoise <i>Phocoena phocoena</i></p> <p>NPWS (2013) <i>Conservation Objectives: Rockabill to Dalkey Island SAC 003000</i>. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.</p>	<p>Located c.9.8km east of the proposed development site.</p>
<p>Glenasmole Valley candidate SAC [001209]</p> <p>[6210] Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites)</p> <p>[6410] Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>)</p> <p>[7220] Petrifying springs with tufa formation (<i>Cratoneurion</i>)</p> <p>NPWS (2020) <i>Conservation objectives for Glenasmole Valley SAC [001209]</i>. Generic Version 7.0. Department of Culture, Heritage and the Gaeltacht.</p>	<p>Located c.9.9km south of the proposed development site.</p>
<p>Knocksink Wood SAC [000725]</p> <p>[7220] Petrifying springs with tufa formation (<i>Cratoneurion</i>)*</p> <p>[91E0] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae)*</p> <p>[91A0] Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles</p> <p>NPWS (2020) <i>Conservation objectives for Knocksink Wood SAC [000725]</i>. Generic Version 7.0. Department of Culture, Heritage and the Gaeltacht.</p>	<p>Located c.9.9km south west of the proposed development site.</p>
<p>Ballyman Glen SAC [000713]</p> <p>[7220] Petrifying springs with tufa formation (<i>Cratoneurion</i>)*</p> <p>[7230] Alkaline fens</p> <p>NPWS (2019) <i>Conservation objectives: Ballyman Glen SAC 000713</i>. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.</p>	<p>Located c.11.3km south east of the proposed development site.</p>
<p>Howth Head candidate SAC [000202]</p> <p>[1230] Vegetated sea cliffs of the Atlantic and Baltic coasts</p> <p>[4030] European dry heaths</p> <p>NPWS (2016) <i>Conservation Objectives: Howth Head SAC 000202</i>. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.</p>	<p>Located c.12.1km north east of the proposed development site.</p>
<p>Baldoyle Bay candidate SAC [000199]</p> <p>1140 Mudflats and sandflats not covered by seawater at low tide</p> <p>1310 Salicornia and other annuals colonizing mud and sand</p> <p>1330 Atlantic salt meadows (<i>Glaucopuccinellietalia maritimae</i>)</p> <p>1410 Mediterranean salt meadows (<i>Juncetalia maritimi</i>)</p> <p>NPWS (2012) <i>Conservation Objectives: Baldoyle Bay SAC 000199</i>. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht</p>	<p>Located c.12.9km north east of the proposed development site.</p>
Special Protection Area (SPA)	

<p>South Dublin Bay and River Tolka Estuary SPA [004024]</p> <p>[A046] Light-bellied Brent Goose <i>Branta bernicla hrota</i> [A130] Oystercatcher <i>Haematopus ostralegus</i> [A137] Ringed Plover <i>Charadrius hiaticula</i> [A141] Grey Plover <i>Pluvialis squatarola</i> [A143] Knot <i>Calidris canutus</i> [A144] Sanderling <i>Calidris alba</i> [A149] Dunlin <i>Calidris alpina</i> [A157] Bar-tailed Godwit <i>Limosa lapponica</i> [A162] Redshank <i>Tringa totanus</i> [A179] Black-headed Gull <i>Croicocephalus ridibundus</i> [A192] Roseate Tern <i>Sterna dougallii</i> [A193] Common Tern <i>Sterna hirundo</i> [A194] Arctic Tern <i>Sterna paradisaea</i> [A999] Wetland and Waterbirds</p> <p>NPWS (2015) <i>Conservation Objectives: South Dublin Bay and River Tolka Estuary SPA 004024</i>. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.</p>	<p>Located c. 2.7km north east of the proposed development site.</p>
<p>North Bull Island SPA [004006]</p> <p>[A046] Light-bellied Brent Goose <i>Branta bernicla hrota</i> [A048] Shelduck <i>Tadorna tadorna</i> [A052] Teal <i>Anas crecca</i> [A054] Pintail <i>Anas acuta</i> [A056] Shoveler <i>Anas clypeata</i> [A130] Oystercatcher <i>Haematopus ostralegus</i> [A140] Golden Plover <i>Pluvialis apricaria</i> [A141] Grey Plover <i>Pluvialis squatarola</i> [A143] Knot <i>Calidris canutus</i> [A144] Sanderling <i>Calidris alba</i> [A149] Dunlin <i>Calidris alpina</i> [A156] Black-tailed Godwit <i>Limosa limosa</i> [A157] Bar-tailed Godwit <i>Limosa lapponica</i> [A160] Curlew <i>Numenius arquata</i> [A162] Redshank <i>Tringa totanus</i> [A169] Turnstone <i>Arenaria interpres</i> [A179] Black-headed Gull <i>Croicocephalus ridibundus</i> [A999] Wetlands & Waterbirds</p> <p>NPWS (2015) <i>Conservation Objectives: North Bull Island SPA 004006</i>. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.</p>	<p>Located c. 7.5km north east of the proposed development site.</p>
<p>Wicklow Mountains SPA [004040]</p> <p>[A098] Merlin <i>Falco columbarius</i> [A103] Peregrine <i>Falco peregrinus</i></p> <p>NPWS (2020) <i>Conservation objectives for Wicklow Mountains SPA [004040]</i>. Generic Version 7.0. Department of Culture, Heritage and the Gaeltacht.</p>	<p>Located c. 7.8km south west of the proposed development site.</p>

Dalkey Islands SPA [004172] [A192] Roseate Tern <i>Sterna dougallii</i> [A193] Common Tern <i>Sterna hirundo</i> [A194] Arctic Tern <i>Sterna paradisaea</i> NPWS (2020) <i>Conservation objectives for Dalkey Islands SPA [004172]</i> . Generic Version 7.0. Department of Culture, Heritage and the Gaeltacht.	Located c. 9.7km south east of the proposed development site.
Baldoyle Bay SPA [004016] A046 Light-bellied Brent Goose <i>Branta bernicla hrota</i> A048 Shelduck <i>Tadorna tadorna</i> A137 Ringed Plover <i>Charadrius hiaticula</i> A140 Golden Plover <i>Pluvialis apricaria</i> A141 Grey Plover <i>Pluvialis squatarola</i> A157 Bar-tailed Godwit <i>Limosa lapponica</i> A999 Wetland and Waterbirds NPWS (2013) <i>Conservation Objectives: Baldoyle Bay SPA 004016. Version 1</i> . National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	Located c. 12.9km north east of the proposed development site.
Howth Head Coast SPA [004113] [A188] Kittiwake (<i>Rissa tridactyla</i>) NPWS (2020) <i>Conservation objectives for Howth Head Coast SPA [004113]</i> . Generic Version 7.0. Department of Culture, Heritage and the Gaeltacht.	Located c. 14.1km north east of the proposed development site.

Table 2 Nationally protected sites in the vicinity of the proposed development

Designated Site Name [Code] and its nature conservation features	Location Relative to the Proposed Development Site
proposed Natural Heritage Area (pNHA)	
Boooterstown Marsh pNHA [001205] Boooterstown Marsh is the only saltmarsh in south Dublin and, despite some concerns about the increasing salinity of the site, it remains a valuable habitat for many birds as well as containing a diverse flora including the protected plant Borrer's Saltmarsh-grass (<i>Puccinellia fasciculata</i>).	Location c. 2.7km north-east of the proposed development site.
South Dublin Bay pNHA [000210] Listed under similar conservation objectives as it's SAC/SPA designations.	Located c. 2.8km north-east of the proposed development site.
Fitzsimon's Wood pNHA [001753] Intact basic woodland structure and birch woodland is very rare in Co. Dublin, Fitzsimon's Wood continues to be of ecological importance.	Location c. 3.5km south of the proposed development site.
Grand canal pNHA [002104] The Grand Canal is a man-made waterway linking the River Liffey at Dublin with the Shannon at Shannon Harbour and the Barrow at Athy. The Grand Canal proposed Natural Heritage Area (pNHA) comprises the canal channel and the banks on either side of it. The canal system is made up of a number of branches - the Main Line from Dublin to the Shannon, the Barrow Line from Lowtown to Athy, the Edenderry Branch, the Naas and Corbally Branch and the Milltown	Location c. 3.6km north-west of the proposed development site.

Designated Site Name [Code] and its nature conservation features	Location Relative to the Proposed Development Site
Feeder. The ecological value of the canal lies more in the diversity of species it supports along its linear habitats than in the presence of rare species. It crosses through agricultural land and therefore provides a refuge for species threatened by modern farming methods.	
Royal Canal pNHA [002103] The Royal Canal is a man-made waterway linking the River Liffey at Dublin to the River Shannon near Tarmonbarry. There is a branch line from Kilashee to Longford Town. The canal NHA comprises the central channel and the banks on either side of it. The main water supply is from Lough Owel (also an NHA) via a feeder channel into the canal at Mullingar. The ecological value of the canal lies more in the diversity of species it supports along its linear habitats than in the presence of rare species. It crosses through agricultural land and therefore provides a refuge for species threatened by modern farming methods.	Location c. 5.4km north of the proposed development site.
Dolphins, Dublin Docks pNHA [000201] Listed under similar conservation objectives as South Dublin Bay and river Tolka Estuary SPA [004024].	Location c. 5.4km north-east of the proposed development site.
North Dublin Bay pNHA [000206] Listed under similar conservation objectives as it's SAC/SPA designations.	Location c. 7km north-east of the proposed development site.
Dodder Valley pNHA [000991] The site represents the last remaining stretch of natural river bank vegetation on the River Dodder in the built-up Greater Dublin Area. Includes a diversity of flora and bird species as well.	Located c. 7km west of the proposed development site.
Dingle Glen pNHA [001207] The importance in this site lies in the variety of habitats within a relatively small area, mainly for its woodland regeneration structure. The site is secluded and not subject to much disturbance	Location c. 7.5km south-east of the proposed development site.
Dalkey Coastal Zone And Killiney Hill pNHA [001206] This site represents a fine example of a coastal system with habitats ranging from the sub-littoral to coastal heath. The flora is well developed and includes some scarce species. The islands are important bird sites. The site also has geological importance.	Location c. 7.5km south-east of the proposed development site.
Ballybetagh Bog pNHA [001202] Although the site contains samples of fen and marsh vegetation, the main interest lies in its historical value. Ballybetagh Bog has become a classical site of quaternary studies due to the intensity of research. The bones of Giant Irish Deer have been found in upwards of 150 sites in the country, but nowhere else have their surroundings been subjected to such intense investigation.	Location c. 8.5km south-east of the proposed development site.
Loughlinstown Woods pNHA [001211] This site is a good example of demesne-type mixed woodland. It is now used chiefly for amenity purposes.	Location c. 9.1km south-east of the proposed development site.
Liffey Valley pNHA [000128] This site is important because of the diversity of habitats it contains, ranging from terrestrial to aquatic. A number of rare and threatened plant species have been recorded from the site.	Location c. 9.8km north-west of the proposed development site.

Designated Site Name [Code] and its nature conservation features	Location Relative to the Proposed Development Site
Knocksink Wood pNHA [000725] Listed under similar conservation objectives as it's SAC designation.	Located c. 9.8km south of the proposed development site.
Glenasmole Valley pNHA [001209] Listed under similar conservation objectives as it's SAC designation.	Located c. 10.5km south-west of the proposed development site.
Santry Demesne pNHA [000178] This site comprises the remnants of a former demesne woodland, which is generally of good quality and ecological interest as it occurs in an area where little has survived of the original vegetation. The site also harbours a legally protected plant species under the Flora Protection Order 1987, the Hairy St. John's-wort (<i>Hypericum hirsutum</i>).	Located c. 10.9km north of the proposed development site.
Ballyman Glen pNHA [000713] Listed under similar conservation objectives as it's SAC designation.	Located c. 11.4km south-east of the proposed development site.
Lugmore Glen [001212] About 2km south-east of Saggart, this site is a fine example of a wooded glen with a good representation of woodland plants. This type of semi-natural habitat is now scarce in Co. Dublin. The presence of a rare plant species, Yellow Archangel (<i>Lamium galeobdolon</i>), adds to the interest of the site.	Located c. 11.8km west of the proposed development site.
Howth Head pNHA [000202] Listed under similar conservation objectives as it's SAC/SPA designations.	Location c. 12km north-east of the proposed development site.
Glencree Valley pNHA [001755] The importance of the site is that it is a good example of deciduous woodland even though it is rather fragmented. The presence of an upland river and boggy flushes add to the habitat diversity of the site.	Location c. 12.6km south-west of the proposed development site.
Powerscourt woodland pNHA [001768] Although the site includes many exotic plant species, the habitats are still of interest and support an interesting flora. The mix of semi-natural habitats and estate woodland is particularly conducive to macro-fungi. The well documented record of land management practices held by the demesnes adds to the scientific interest. The area is also of great educational value, being frequently used for teaching.	Location c. 12.7km south of the proposed development site.
Baldoye Bay pNHA [000199] Listed under similar conservation objectives as it's SAC/SPA designations.	Location c. 12.9km north-east of the proposed development site.
Dargle River Valley pNHA [001754] The importance of this site is that it is a fine example of a wooded valley. It is likely that this valley has been wooded for a long period and such habitats are becoming rare in north County Wicklow. The removal of the conifers would increase the interest of the site. The site is also of considerable geological importance.	Location c. 13.9km south-east of the proposed development site.

Designated Site Name [Code] and its nature conservation features	Location Relative to the Proposed Development Site
<p>Slade Of Saggart And Crooksling Glen [000211]</p> <p>The site includes a good example of a wooded river valley and a small wetland System (Brittas Ponds). The presence of a rare plant (Shoreweed <i>Littorella uniflora</i>), a rare invertebrate (<i>Halticoptera patellana</i>) and a variety of wildfowl species (Teal, Mallard, Pochard and Tufted Duck) adds to the interest of the site.</p>	<p>Location c. 14.5km west of the proposed development site.</p>
<p>Great Sugar Loaf pNHA [001769]</p> <p>The site is of both ecological and geological interest, and is also a prominent feature in the landscape of north County Wicklow. Due to its ease of access and close proximity to large urban areas, the Great Sugar Loaf is a valuable educational and recreational asset.</p>	<p>Location c. 14.6km south-east of the proposed development</p>
<p>Sluice River Marsh pNHA [001763]</p> <p>The site is of interest and importance as a relatively intact freshwater marsh, a habitat that is now rare in County Dublin, with surrounding patches of wet grassland, scrub and wet woodland included.</p>	<p>Location c. 14.7km north-east of the proposed development</p>

Appendix III

Desk Study Flora and Fauna Records

Desktop records of protected, rare, or other notable plant species are listed below in **Table 1**. These are plant species which are legally protected under the Flora (Protection) Order, 2015 and/or are listed as Critically Endangered, Endangered or Vulnerable on the relevant national Red Data list for Ireland¹.

The majority of the bryophyte species which were added to the revised Flora (Protection) Order, 2015 legislation were considered highly unlikely to occur within the study area, based on a review of the habitat preferences for each species and on the habitats present within the study area.

Table 1 *Records of protected, red-listed or notable flora recorded from the desk study in the vicinity of the study area*

Common Name/ Scientific name	Red List Status	Source
Blunt-fruited Pottia (Tortula modica)	Threatened Species: Vulnerable	NBDC record
Clustered Feather-moss (Rhynchostegium confertum)	Threatened Species: Least concern	NBDC record
Ctenidium molluscum var. molluscum	Threatened Species: Least concern	NBDC record
Fern-leaved Hook-moss (Cratoneuron filicinum)	Threatened Species: Least concern	NBDC record
Intermediate Screw-moss (Syntrichia intermedia)	Threatened Species: Least concern	NBDC record
Kneiff's Feather-moss (Leptodictyum riparium)	Threatened Species: Least concern	NBDC record
Marble Screw-moss (Syntrichia papillosa)	Threatened Species: Least concern	NBDC record
Red Beard-moss (Bryoerythrophyllum recurvirostrum)	Threatened Species: Least concern	NBDC record
Sand Feather-moss (Brachythecium mildeanum)	Threatened Species: Least concern	NBDC record
Springy Turf-moss (Rhytidiadelphus squarrosus)	Threatened Species: Least concern	NBDC record
Water Screw-moss (Syntrichia latifolia)	Threatened Species: Least concern	NBDC record
Wood Bristle-moss (Orthotrichum affine)	Threatened Species: Least concern	NBDC record

¹ Vascular flora from Wyse Jackson, M., FitzPatrick, Ú., Cole, E., Jebb, M., McFerran, D., Sheehy Skeffington, M. & Wright, M. (2016) *Ireland Red List No. 10: Vascular Plants*. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs, Dublin, Ireland.

Bryophytes from Lockhart, N., Hodgetts, N. & Holyoak, D. (2012) *Ireland Red List No.8: Bryophytes*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

Desktop records of protected, rare, or other notable fauna species are listed below in **Table 2**. In relation to amphibian, reptile and mammal species those which are protected under the Wildlife Acts, the Habitats Directive and/or are listed as threatened (Vulnerable to Critically Endangered) on the relevant national Red Lists are included. In the case of bird species, only those species listed in Annex I of the Birds Directive or on the Birds of Conservation Concern in Ireland (BoCCI) Red List are included in the table below. For invertebrate species, those which are listed as threatened (Vulnerable to Critically Endangered) on the relevant national Red List are included.

Table 2 Records of protected, red-listed or notable fauna from the desktop study in the vicinity of the study area

Common Name/ Scientific Name	Legal Status ²	Red List Status ³	Source
Amphibians			
Common frog <i>Rana temporaria</i>	HD_V, WA	Least concern	NBDC online database record
Smooth Newt (<i>Lissotriton vulgaris</i>)	WA	Least concern	NBDC online database record
Mammals (Terrestrial)			
Badger <i>Meles meles</i>	WA	Least concern	NBDC online database record
Otter <i>Lutra lutra</i>	HD_II & IV, WA	Near threatened	NBDC online database record
Daubenton's bat <i>Myotis daubentonii</i>	HD_IV, WA	Least concern	NBDC online database record
Leisler's bat <i>Nyctalus leisleri</i>	HD_IV, WA	Least concern	NBDC online database record
Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	HD_IV, WA	Least concern	NBDC online database record

² HD_II/IV/V = Habitats Directive Annexes II/IV/V; WA = Wildlife Acts; BD_I/II/III = Birds Directive Annex I/II/III; OSPAR = Convention for the protection of the marine environment of the North-east Atlantic 1992

³ 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.

Birds from Colhoun, K. & Cummins, S. (2014) Birds of Conservation Concern in Ireland 2014-2019. *Irish Birds* 9:523-544.

Amphibians, reptiles and fish from King, J.L., Marnell, F., Kingston, N., Rosell, R., Boylan, P., Caffrey, J.M., Fitzpatrick, Ú., Gargan, P.G., Kelly, F.L., O'Grady, M.F., Poole, R., Roche, W.K. & Cassidy, D. (2011) *Ireland Red List No. 5: Amphibians, Reptiles & Freshwater Fish*.

Non-Marine Molluscs from Byrne, A., Moorkens, E.A., Anderson, R., Killeen, I.J. & Regan, E.C. (2009) *Ireland Red List No. 2 – Non-Marine Molluscs*.

Butterflies from Regan, E.C., Nelson, B., Aldwell, B., Bertrand, C., Bond, K., Harding, J., Nash, D., Nixon, D., & Wilson, C.J. (2010) *Ireland Red List No. 4 – Butterflies*.

Moths from Allen, D., O'Donnell, M., Nelson, B., Tyner, A., Bond, K.G.M., Bryant, T., Crory, A., Mellon, C., O'Boyle, J., O'Donnell, E., Rolston, T., Sheppard, R., Strickland, P., Fitzpatrick, U., & Regan, E. (2016) *Ireland Red List No. 9: Macro-moths (Lepidoptera)*.

Damselflies and dragonflies from Nelson, B., Ronayne, C. & Thompson, R. (2011) *Ireland Red List No.6: Damselflies & Dragonflies (Odonata)*.

Water beetles from Foster, G. N., Nelson, B. H. & O Connor, Á. (2009) *Ireland Red List No. 1 – Water beetles*.

Common Name/ Scientific Name	Legal Status ²	Red List Status ³	Source
Common pipistrelle <i>Pipistrellus pipistrellus</i>	HD_IV, WA	Least concern	NBDC online database record
Pine Marten (<i>Martes martes</i>)	HD_V, WA	Least concern	NBDC online database record
Birds			
Black-headed gull <i>Larus ridibundus</i>	WA	Red	NBDC online database record
Herring gull <i>Larus argentatus</i>	WA	Red	NBDC online database record
Kingfisher <i>Alcedo atthis</i>	BD_I, WA	Amber	NBDC online database record
Barn Swallow <i>Hirundo rustica</i>	BD_I, WA	Amber	NBDC online database record
Grey Wagtail (<i>Motacilla cinerea</i>)		Red	NBDC online database record
Tufted Duck (<i>Aythya fuligula</i>)	BD_II(I), III(II), WA	Red	NBDC online database record
Invertebrates			
Large Red Tailed Bumble Bee <i>Bombus (Melanobombus)</i> <i>lapidarius</i>	None	Threatened Species: Near threatened	NBDC online database record

Appendix IV

Biodiversity-friendly Native Planting List

Biodiversity Friendly Planting Lists	
Climbers	
Common name	Scientific name
Honeysuckle	<i>Lonicera periclymenum</i>
Ivy	<i>Hedera helix</i>
Field rose	<i>Rosa arvensis</i>
Blackberry	<i>Rubus fruticosus</i> agg.
Raspberry	<i>Rubus idaeus</i>
Sweet-briar	<i>Rosa rubiginosa</i>
Trees	
Common name	Scientific name
Hazel	<i>Corylus avellana</i>
Willow	<i>Salix</i> spp. (<i>S. cinerea</i> , <i>S. caprea</i> , <i>S. viminalis</i> , <i>S. purpurea</i> , etc.)
Blackthorn	<i>Prunus spinosa</i>
Hawthorn	<i>Crataegus monogyna</i>
Wild Cherry	<i>Prunus avium</i>
Wild Privet	<i>Ligustrum vulgare</i>
Crab apple	<i>Malus sylvestris</i>
Elder	<i>Sambucus nigra</i>
Irish Whitebeam	<i>Sorbus hibernica</i>
Rowan	<i>Sorbus aucuparia</i>
Silver birch	<i>Betula pendula</i>
Downy birch	<i>Betula pubescens</i>
Alder	<i>Alnus glutinosa</i>
Aspen	<i>Populus tremula</i>
Pedunculate oak	<i>Quercus robur</i>
Sessile oak	<i>Quercus petraea</i>
Scot's pine	<i>Pinus sylvestris</i>
Yew	<i>Taxus baccata</i>
Shrubs	
Common name	Scientific name
Broom	<i>Cytisus scoparius</i>

Blackthorn	<i>Prunus spinosa</i>
Hawthorn	<i>Crataegus monogyna</i>
Guelder rose	<i>Viburnum opulus</i>
Gorse	<i>Ulex europaeus</i>
Dog rose	<i>Rosa canina</i> agg.
Field rose	<i>Rosa arvensis</i>
Hedgerow species	
Common name	Scientific name
Hazel	<i>Corylus avellana</i>
Willow	<i>Salix</i> spp. (<i>S. cinerea</i> , <i>S. caprea</i> , <i>S. viminalis</i> , <i>S. purpurea</i> , etc.)
Blackthorn	<i>Prunus spinosa</i>
Hawthorn	<i>Crataegus monogyna</i>
Broom	<i>Cytisus scoparius</i>
Bramble	<i>Rubus fruticosus</i> agg.
Wild Cherry	<i>Prunus avium</i>
Crab apple	<i>Malus sylvestris</i>
Elder	<i>Sambucus nigra</i>
Irish Whitebeam	<i>Sorbus hibernica</i>
Rowan	<i>Sorbus aucuparia</i>
Dog rose	<i>Rosa canina</i> agg.
Field rose	<i>Rosa arvensis</i>
Guelder rose	<i>Viburnum opulus</i>
Honeysuckle	<i>Lonicera periclymenum</i>
Ivy	<i>Hedera helix</i>
Gorse	<i>Ulex europaeus</i>
Raspberry	<i>Rubus idaeus</i>
Spindle	<i>Euonymus europaeus</i>
<u>Herbaceous understorey</u>	
Common bluebell	<i>Hyacinthoides non-scripta</i> (not the hybrid with Spanish Bluebell)
Meadowsweet	<i>Filipendula ulmaria</i>
Ramsons	<i>Allium ursinum</i>
Wood avens	<i>Geum urbanum</i>
Dog violet	<i>Viola riviniana</i>
Primrose	<i>Primula vulgaris</i>
Pond/wetland planting	
Common name	Scientific name

Fool's watercress	<i>Apium nodiflorum</i>
Marsh marigold	<i>Caltha palustris</i>
Cuckoo flower	<i>Cardamine pratensis</i>
Marsh willowherb	<i>Epilobium palustre</i>
Yellow iris	<i>Iris pseudacorus</i>
Purple loosestrife	<i>Lythum salicaria</i>
Water forget-me not	<i>Myosotis scorpiodes</i>
Common reed	<i>Phragmites australis</i>
Common Club-rush	<i>Schoenoplectus lacustris</i>
Celery-leaved buttercup	<i>Ranunculus scleratus</i>
Creeping buttercup	<i>Ranunculus repens</i>
Bulrush	<i>Typha latifolia</i>
Meadowsweet	<i>Filipendula ulmaria</i>
Wild angelica	<i>Angelica sylvestris</i>
Redshank	<i>Polygonum persicaria</i>
Water mint	<i>Mentha aquatica</i>
Ragged robin	<i>Silene flos-cuculi</i>

Selection of species for planting in flower and herb beds/borders

Common name	Scientific name
<u>Bulbs</u>	
<i>Autumn flowering</i>	
Autumn crocus	<i>Colchicum</i> species
Crocus, autumn-flowering	<i>Crocus</i> species
<i>Winter flowering</i>	
Crocus, winter-flowering	<i>Crocus</i> species
Winter aconite	<i>Eranthis hyemalis</i>
Common snowdrop	<i>Galanthus nivalis</i>
<i>Spring flowering</i>	
Crocus, spring-flowering	<i>Crocus</i> species
Armenian grape hyacinth	<i>Muscari armeniacum</i>
Common star of Bethlehem	<i>Ornithogalum umbellatum</i>
<i>Summer flowering</i>	
Garlic species	<i>Allium</i> species

Perennials for flower beds and borders

Autumn flowering

Carmichael's monk's hood	<i>Aconitum carmichaelii</i>
Japanese anemone	<i>Anemone</i> × <i>hybrida</i>
Chinese anemone	<i>Anemone hupehensis</i>
Michaelmas daisy	<i>Aster</i> species and hybrids
Trailing bellflower	<i>Campanula poscharskyana</i>
Hardy blue-flowered leadwort	<i>Ceratostigma plumbaginoides</i>
Chrysanthemum	<i>Chrysanthemum</i> species & hybrids
Dahlia	<i>Dahlia</i> species & hybrids
Perennial sunflower	<i>Helianthus</i> × <i>laetiflorus</i>
Autumn ox-eye	<i>Leucanthemella serotina</i>
Sage – autumn-flowering	<i>Salvia</i> species

Winter flowering

Helleborine species and hybrids *Helleborus*, winter-flowering

Spring flowering

Alpine rock cress	<i>Arabis alpina</i> subsp. <i>caucasica</i>
Juniper-leaved thrift	<i>Armeria juniperifolia</i>
Aubretia	<i>Aubrieta</i> species
Gold dust	<i>Aurinia saxatilis</i>
Elephant ear	<i>Bergenia</i> species
Leopard's bane	<i>Doronicum</i> × <i>excelsum</i>
Wallflower 'Bredon'	<i>Erysimum</i> 'Bredon'
Mediterranean spurge	<i>Euphorbia characias</i>
Cushion spurge	<i>Euphorbia epithymoides</i>
Hellebore, spring-flowering	<i>Helleborus</i> species & hybrids
Alpine candytuft	<i>Iberis saxatilis</i>
Perennial candytuft	<i>Iberis sempervirens</i>
Spotted dead nettle	<i>Lamium maculatum</i>
Lungwort	<i>Pulmonaria</i> species

Summer flowering

Yarrow	<i>Achillea</i> species
Dyer's chamomile	<i>Anthemis tinctoria</i>
Columbine	<i>Aquilegia</i> species
Lesser calamint	<i>Calamintha nepeta</i>
Bellflower species	<i>Campanula carpatica</i> (Tussock bellflower), <i>Campanula glomerata</i> (Clustered bellflower), <i>Campanula lactiflora</i> (Milky bellflower), <i>Campanula latifolia</i> (Giant bellflower), <i>Campanula persicifolia</i> (Peach-leaved bellflower)
Perennial cornflower	<i>Centaurea montana</i>

Dahlia	<i>Dahlia</i> species
Purple coneflower	<i>Echinacea purpurea</i>
Globe thistle	<i>Echinops</i> species
Fleabane	<i>Erigeron</i> species
Siberian wallflower	<i>Erysimum</i> × <i>allionii</i>
Garden strawberry	<i>Fragaria</i> × <i>ananassa</i>
Cranesbill (summer-flowering)	<i>Geranium</i> species
Avens (summer-flowering)	<i>Geum</i> species
Dame's violet	<i>Hesperis matronalis</i>
Macedonian scabious	<i>Knautia macedonica</i>
Broad-leaved everlasting pea	<i>Lathyrus latifolius</i>
Shasta daisy	<i>Leucanthemum</i> × <i>superbum</i>
Spearmint	<i>Mentha spicata</i>
Bergamot	<i>Monarda didyma</i>
Peony	<i>Paeonia</i> species
Cinquefoil	<i>Potentilla</i> species
Coneflower	<i>Rudbeckia</i> species
Sage	<i>Salvia</i> species
Garden scabious	<i>Scabiosa caucasica</i>
Small scabious	<i>Scabiosa columbaria</i>
Checkerbloom	<i>Sidalcea malviflora</i>
Stokes' aster	<i>Stokesia laevis</i>
Pyrethrum	<i>Tanacetum coccineum</i>
Purple top	<i>Verbena bonariensis</i>
Garden speedwell	<i>Veronica longifolia</i>
Birds-foot trefoil	<i>Lotus corniculatus</i>

