Chapter 5:

Biodiversity

5.0 BIODIVERSITY

5.1 INTRODUCTION

This Biodiversity Chapter was authored by Caroline Kelly BSc. MSc. of Scott Cawley Ltd. It provides an assessment of the potential ecological effects of the proposed strategic housing development at Golf Lane, Carrickmines', Co. Dublin (refer to Figure 5.1 for location). The proposed development consists of a residential development of 482 no. units (all apartments), along with ancillary residential amenities, and provision of a childcare facility, gym, and local shop. A detailed description of the proposed development is included in Section 5.4.

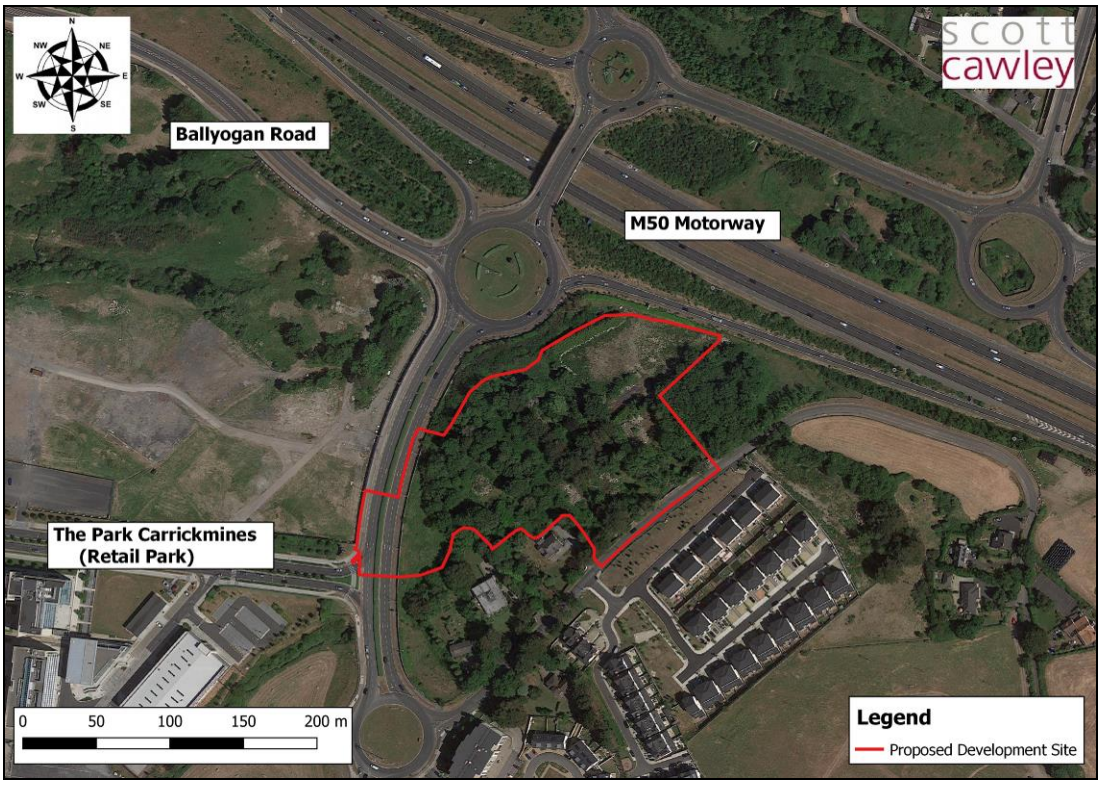
The proposed development site consists of a brownfield site, formerly comprising a number of one-off residential dwellings. Currently the site is composed of disturbed ground where these residential dwellings once stood (demolished in recent years), and remnants of their associated gardens. The surrounding environment is suburban-rural in nature, with a number of residential developments in the immediate surroundings of the proposed development site, and agricultural lands in the wider vicinity. The M50 motorway lies to the east of the proposed development site and "The Park Carrickmines" lies to the west.

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

A separate Appropriate Assessment Screening Report for the proposed development has also been prepared by Scott Cawley and has been submitted with this planning application.

Figure 5.1: Location of Proposed Development Site



5.1.1 GUIDANCE, PLANS & POLICY

The collation of ecological baseline data and the preparation of this assessment has had regard to EU and Irish legislation and policy documents. In addition, the following guidelines have been considered in preparing this chapter of the EIAR:

- *Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment.* (European Commission, 2013).
- *Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EIAR).* Draft August 2017. (EPA, 2017).
- *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment.* August 2018. (Department of Housing, Planning and Local Government, 2018).
- *Guidelines for Assessment of Ecological Impacts of National Roads Schemes: Revision 2* (National Roads Authority, 2009)
- *Guidelines for Ecological Impact Assessment in the UK and Ireland* (CIEEM, 2018
- *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2017)
- *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (Collins, 2016)
- *Bat Mitigation Guidelines for Ireland* (Kelleher & Marnell, 2006)
- *Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes* (National Roads Authority, 2006a)
- *Bird Monitoring Methods - A Manual of Techniques for Key UK Species* (Gilbert et al., 1998).
- *Best Practice Guidance for Habitat Survey and Mapping* (Smith et al., 2011).
- *Guide to Habitats in Ireland* (Fossitt, 2000)
- *The National Vegetation Database* (Weekes & Fitzpatrick, 2010
- *New Flora of the British Isles* (Stace, 2019)
- *British Bryological Society's Mosses and Liverworts of Britain and Ireland: A Field Guide* (Atherton et al., 2010).

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

- National Biodiversity Action Plan 2017-2021 (Department of Culture Heritage and the Gaeltacht, 2017)
- Dún Laoghaire-Rathdown County Development Plan 2016-2022 (Dún Laoghaire-Rathdown County Council, 2016)
    - <u>General Biodiversity Protection</u>
        - **Policy 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.
    - <u>Protection of Designated Sites</u>
        - **Policy 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.
        - **Policy 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.

- Protection of Non-Designated Areas
    - **Policy 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 - 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 assessments 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 recommendations and objectives of the Green City Guidelines (2008) and 'Ecological Guidance Notes for Local Authorities and Developers' (Dún Laoghaire- Rathdown Version 2014).
- Protection of Watercourses
    - **Policy LHB25: Rivers and Waterways -** It is Council policy to maintain and protect the natural character and ecological value of the river and stream corridors in the County and where possible to enhance existing channels and to encourage diversity of habitat. It is also policy (subject to the sensitivity of the riverside habitat) to provide public access to riparian corridors to promote improved passive recreational activities.
- Protection of Hedgerows
    - **Policy 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.
- Protection of Green Infrastructure
    - **Policy OSR1: Green Infrastructure Strategy** - It is Council policy to protect existing green infrastructure and encourage and facilitate, in consultation with relevant stakeholders, the development of new green infrastructure, recognising the synergies that can be achieved with regard to the following, sustainable transport, provision of open space amenities, sustainable management of water, protection and management of biodiversity and protection of cultural and built heritage.

- Dún Laoghaire-Rathdown Green Infrastructure Strategy (Appendix 14 of Dún Laoghaire-Rathdown County Development Plan 2016-2022 (Dún Laoghaire-Rathdown County Council, 2016))
    - The proposed development site lies along "*Corridor 4- Dún Laoghaire to the Mountains*" and "*Corridor 6- Gateway Parks*" of the Councils Green Infrastructure Strategy.
    - Objectives for Corridor 4 include:
        - To provide a multi-functional GI corridor connecting the mountain, urban area and coast.
        - To develop the proposed Jamestown Park as a Gateway Park to the mountains.
    - Objectives for Corridor 6 include:
        - To provide transitional gateways to the mountains and open spaces from the urban areas of the County.
        - Ensure that sustainable travel options are supported by the wider GI network.
        - To connect a chain of existing and proposed parks and open spaces along the urban fringe, providing variety of recreational and visitor experiences.
        - Ensure the cultural heritage assets are incorporated in the GI assets associated with these gateway parks.
        - To develop Fernhill Gardens into a Gateway Park / Regional Park.
    - The proposed development site is not included as open space on the mapping included in Appendix A - Baseline Maps of the Green Infrastructure Strategy.

- Dún Laoghaire-Rathdown Biodiversity Plan 2009-2013 (Dún Laoghaire-Rathdown County Council, 2013)
    - Objective 1: Gathering information of the biodiversity resource
        - Target 1: Identify the full range of habitats in Dún-Laoghaire – Rathdown
        - Target 2: Identify "key species" for the county and establish baseline data
        - Target 3: Establish a database of biodiversity information
    - Objective 2: Managing the Resource
        - Target 4: Establish and promote agreed, policies, guidelines and administrative mechanisms for the effective incorporation of biodiversity issues
        - Target 5: Provide the means by which biodiversity issues are fully integrated into the future development of Dún- Laoghaire – Rathdown
        - Target 6: Establish effective management plans for selected key sites and species
    - Objective 3: Education and Awareness
        - Target 7: Raise awareness of the value and importance of biodiversity in our daily lives
        - Target 8: Provide training to assist in the understanding and promotion of the county's biodiversity resource
    - Objective 4: Cooperation
        - Target 9: Engage with communities and groups
        - Target 10: Foster good communication between all relevant stakeholders
- Ballyogan & Environs Local Area Plan 2019-2025 (Dún Laoghaire-Rathdown County Council, 2019)
    - <u>General Environmental Protection</u>
        - **Policy BELAP ENV10 – County Development Plan Provisions:** That all proposals for development demonstrate compliance with relevant County Development Plan provisions relating to sustainable development and the protection of the environment, including those listed on Table 9.1 of the SEA Environmental Report that accompanies this Plan.
        - **Policy BELAP ENV11 – Construction Management Plans:** That Construction Management Plans include details of appropriate mitigation measures for lighting specifically designed to minimise impacts to biodiversity, including bats.
        - **Policy BELAP ENV12 – Badger Setts:** That any badger setts within the Plan area be protected insofar as possible through the provisions of adequate buffers between the setts and proposed development or as otherwise agreed by the National Parks and Wildlife Services prior to commencement of development.
        - **Policy BELAP ENV13 – Habitats Survey:** Planning applications for development in areas of environmental sensitivity will be required to provide an updated habitat and protected mammal survey.
    - <u>Green Infrastructure Policy</u>
        - **Policy BELAP ENV7 – Links to Adjoining:** That development proposals be required to illustrate potential pedestrian/cycle links to adjoining lands in order to create new connections to green areas within urban areas.
    - <u>Protection of Surface Water Quality</u>
        - **Policy BELAP SI4 – Water Framework Directive:** To facilitate compliance with the requirements of the EU Water Framework Directive and any relevant legislation. In this regard, the Council will facilitate compliance with the relevant objectives and measures set out in the River Basin Management Plan 2018- 2021, or its successor, and associated Programme of Measures, where relevant.
        - **Policy BELAP SI5 – Surface Waters Regulations:** To ensure the implementation of the surface water legislation Environmental Objectives (Surface Waters) Regulations 2009 to ensure that development permitted would not have an unacceptable impact on water

quality including surface waters, ground water, river corridors, estuarine waters, bathing waters, coastal and transitional waters.

- **Policy BELAP SI7 – SuDS:** To ensure that Sustainable Drainage Systems (SuDS) is applied to any development in the BELAP area and that site specific solutions to surface water drainage systems are developed which meet the requirements of the Water Framework Directive and associated River Basin Management Plan. SuDS measures may include green roofs, permeable paving, detention basins, water butts, infiltration etc.
- **Policy BELAP SI11 – Sediment Control:** That best practice sediment control measures will be used for all developments.

5.2 STUDY METHODOLOGY

5.2.1 AUTHOR STATEMENT

This Biodiversity Chapter was authored by Caroline Kelly, who also carried out the field surveys, along with Lorna Gill and Adele Goulding Sheehan, and reviewed by Andrew Speer of Scott Cawley Ltd.

Caroline Kelly is a Senior Ecologist at Scott Cawley Ltd. with over 4 years' professional ecological consultancy experience in preparing ecological reports and assessments for inclusion in planning applications. She holds an honours degree in Environmental Biology, from University College Dublin (UCD), and a Masters in Ecological Assessment from University College Cork (UCC). Caroline has experience in habitat survey and assessment (including Annex I habitats and legally protected sites) in a range of terrestrial, freshwater and coastal environments. She is also experienced in surveys for protected species (e.g. bats, badger and otter), bird surveys (both breeding and overwintering) and surveys for invasive species. Whilst working at Scott Cawley Ltd. Caroline has managed ecological assessments for a wide range of projects including tourism, recreational, industrial. Commercial, residential, transport and renewable energy developments. Caroline undertook the initial site survey of the proposed development site, identifying the habitats present and assessing the site for signs of protected mammal species.

Lorna Gill is a Consultant Ecologist with Scott Cawley Ltd. Lorna holds an MSc in Conservation and Biodiversity from the University of Exeter and an Honours Degree in Natural Sciences with a specialisation in Zoology from Trinity College Dublin. Lorna is experienced in carrying out field surveys in Ireland including wintering birds, breeding birds, bats and other protected mammals. Other experience includes monitoring badger sett closures, radiotracking bats, manual bat call analysis and the use of GIS software. At Scott Cawley, Lorna's work also includes ecological fieldwork and data analysis, the preparation of Appropriate Assessment reports and Ecological Impact Assessments for residential and other commercial projects across the country. Lorna carried out the breeding bird surveys to inform this assessment.

Adele Goulding Sheehan graduated from IT Tralee with an Honours Degree in Field Biology with Wildlife Tourism, a practical, field-based ecology degree. The degree incorporated bat surveys in Ballyseedy Woods and in the Education Centre at Knockreer House in Killarney National Park, as well as modules in species identification which focussed on the ecology and anatomy of Irish bat species. Adele specialised in the study of parasites and has a keen interest in the conservation of the Freshwater Pearl Mussel and preventative control measures against *Vespa velutina,* an alien invasive hornet species. Adele has experience in various habitat and field surveys, bat call analysis, data statistics and analysis, GIS and report writing. Adele undertook the bat surveys to inform this assessment.

Andrew Speer is a Technical Director at Scott Cawley Ltd. with over 14 years' professional ecological consultancy experience in preparing Ecological Impact Assessments (EcIAs). Andrew is a Full Member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and holds a BSc (Hons) in Zoology from the National University of Ireland Galway, a Pg Dip in Geographic Information Systems (GIS) from the University of Ulster and an Adv Dip in Planning & Environmental Law from King's Inns. He has extensive experience in ecological impact assessment and has been the lead author on numerous EcIA reports. Andrew also provides technical review and due diligence of EcIA documentation for public and local authorities to aid their decision-making process.

5.2.2 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 freshwater environment could, theoretically, extend downstream as far as the coast.

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.

5.2.3 DESK STUDY

A desk study was undertaken on the 23rd October 2020 to collate available information on the local ecological environment. The following resources were used to inform the assessment presented in this report:

- Information relating to land zonings in the area from the *Dún-Laoghaire – Rathdown County Development Plan 2016-2022* (Dún Laoghaire-Rathdown County Council, 2016)
- Information of policies and objectives proposed for the area as contained in the *Ballyogan & Environs Local Area Plan 2019-2025* (Dún Laoghaire-Rathdown County Council, 2019)
- 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 5.1** and

- Figure **5.2** for descriptions and locations of protected sites in the vicinity of the proposed development
- Records of rare and protected species within 2km of the proposed development site, as held by the National Biodiversity Data Centre www.biodiversityireland.ie or the NPWS – refer to **Appendix 5.2** 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, 2013)
- Information on the location, nature and design of the proposed development supplied by the applicant's design team, in particular:
    - *Hydrological & Hydrogeological Qualitative Risk Assessment for Lands at Glenamuck Road, Carrickmines – Proposed Mixed Development Glenamuck Road, Carrickmines, Co.* Dublin (AWN Consulting, 2020)
    - *Ground Investigations Ireland: Glenamuck Road Environmental Assessment Report April 2020* (Ground Investigations Ireland, 2020)
    - *Ground Investigations Ireland: Site at Glenamuck Road, Ground Investigation Report January to March 2020* (Ground Investigations Ireland, 2020)

5.2.4 FIELD SURVEY

This section details the methodologies of all ecological surveys undertaken at the proposed development site.

Table 5.1: Ecological surveys and survey dates

Survey	Survey Date(s)	Surveyor(s)
Habitat survey	26th February 2020	Scott Cawley Ltd.
Habitat survey (follow up visit to survey additional areas)	21st September 2020	Scott Cawley Ltd.
Mammal survey	26th February 2020	Scott Cawley Ltd.
Breeding Bird survey	11th and 29th June 2020	Scott Cawley Ltd.
Bat surveys: Walked transect surveys	4th and 22nd June 2020	Scott Cawley Ltd.

5.2.4.1 Habitats and Flora Survey

A habitat survey was undertaken of the proposed development site on the 26th February 2020 by Caroline Kelly, BSc. MSc., following the methodology described in *Best Practice Guidance for Habitat Survey and Mapping* (Smith et al., 2011). A follow up site visit was also carried out by Síofra Quigley, BSc., MSc. on the 21st September 2020, to cover additional areas not previously surveyed. All habitat types were classified using the *Guide to Habitats in Ireland* (Fossitt, 2000), recording the indicator species and abundance using the DAFOR

scale[1] 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).

5.2.4.2 Fauna Surveys

5.2.4.2.1 *Terrestrial Mammals (excl. Bats)*

A terrestrial fauna survey (excluding bats) was undertaken on the 26th February 2020 by Caroline Kelly, BSc. MSc. 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 and identification of breeding/ resting places such as badger setts and otter holts, if present. The habitats on site were assessed for signs of usage by protected/red-listed fauna species, and their potential to support these species.

5.2.4.2.2 Breeding Birds

Breeding bird surveys were undertaken on the 11th and 29th June 2020 by Lorna Gill, BA. MSc., using a methodology adapted from the *Bird Monitoring Methods - A Manual of Techniques for Key UK Species* (Gilbert et al., 1998). The study area covered all lands contained within the site boundary, between Golf Lane and Glenamuck Road. Lands within the study area were slowly walked in a manner allowing the surveyor to come within 50m of all habitat features. 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.

5.2.4.2.3 Bats

Potential Bat Roosts

An assessment of the potential for existing trees on site to support roosting bats was undertaken during the mammal survey on the 26th February 2020. All mature trees were examined from ground level for any features which could offer potential to roosting bats. Such features include cavities, damaged limbs, peeling bark, knotholes and dense ivy. Where trees were deemed to be suitable to support roosting bats their location, species and potential roosting features were recorded.

Trees were categorised according to the criteria described below in Table 5.2.

Table 5.2: Assessing the value of trees to bats (derived from Hundt, 2012)

Tree Category	Description
Suitable	Trees with multiple, highly suitable features capable of supporting larger roosts; Trees with definite bat potential, with potential for use by at least single bats; Trees with no obvious potential, although the tree is of a size and age that elevated surveys may result in cracks or crevices being found; or the tree supports some features which may have limited potential to support bats.
Unsuitable	Trees with no potential to support bats.

Activity surveys

Two bat activity surveys were conducted on site by Adele Goulding Sheehan BSc., on the 4th June and 22nd June 2020, respectively. Bat surveys were conducted at the site having regard to the following guidelines:

[1] The DAFOR scale is an ordinal or semi-quantitative scale for recording the relative abundance of plant species. The name DAFOR is an acronym for the abundance levels recorded: Dominant, Abundant, Frequent, Occasional and Rare.

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

Both bat surveys conducted consisted of extended dusk surveys and had a duration of approximately three hours, commencing 30 minutes prior to dusk and continuing for 2.5 hours after. Details relating to these bat surveys are provided in

Table 5.3. Surveys were completed using both direct observation and a handheld ultrasound bat detector (Elekon Batlogger M) which was used to record any echolocation calls. The surveyor walked the lands at a slow pace to record any bat activity present.

Data collected during bat surveys was analysed using “BatExplorer” sound analysis software.

Table 5.3: Details regarding bat surveys undertaken in June 2020

Date	Sunset Time	Survey Times	Weather
4th June 2020	21:46	21:15 – 00:15	Temperature: Mild (17-16°C) Wind: NW (4.3km/h – NE 2.4 km/h) Clear sky
22nd June 2020	21:56	21:29 – 00:28	Temperature: Mild (18°C) Cloudy After 23:00 slight drizzle rain

5.2.4.3 Ecological Evaluation and Impact Assessment

5.2.4.3.1 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* (National Roads Authority, 2009) and the guidance provided in *Guidelines for Ecological Impact Assessment in the UK and Ireland* (CIEEM, 2018) – refer to Appendix 5.3 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.

5.2.4.3.2 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

5.2.4.3.3 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.

5.2.4.3.4 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 (National Roads Authority, 2009).

The term 'integrity' is most often used when determining impact significance in relation to designated areas for nature conservation (e.g. 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 National Roads Authority (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.

5.3 The Existing Receiving Environment (Baseline Situation)

5.3.1 DESIGNATED SITES

5.3.1.1 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 the proposed development boundary. The nearest European site to the proposed development is Knocksink Woods SAC; 4.8km to the south-west. Other SACs (or candidate SACs, which enjoy the same level of protection as SACs) in the vicinity of the proposed development site include Ballyman Glen SAC, Wicklow Mountains cSAC, Glenasmole Valley cSAC, Bray Head SAC, Glen of the Downs SAC, Rockabill to Dalkey Island SAC, South Dublin Bay SAC, North Dublin Bay SAC and Howth Head cSAC.

SPA sites located in the vicinity of the proposed development site include Wicklow Mountains SPA, Dalkey Islands SPA, South Dublin Bay and River Tolka Estuary SPA, North Bull Island SPA and Howth Head Coast SPA.

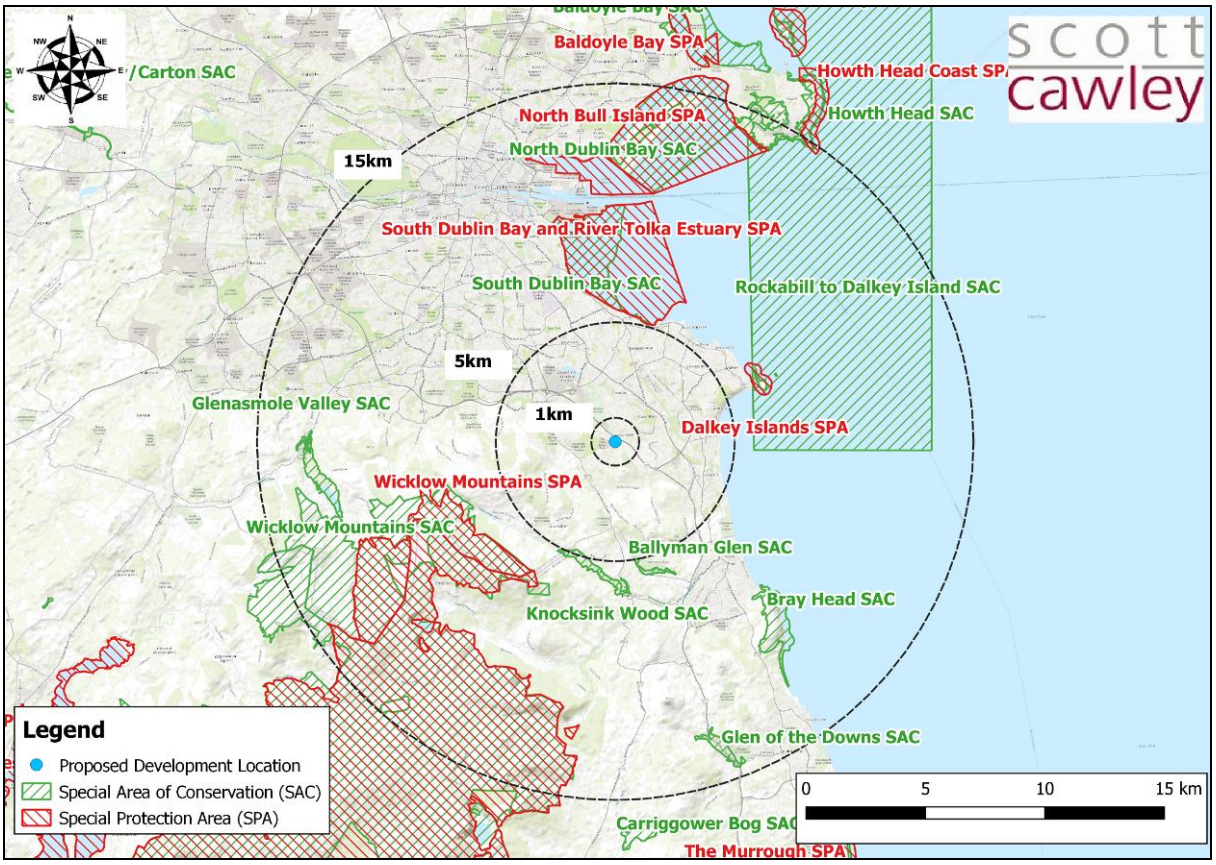
There is an existing watercourse on site, the Golf Stream, which discharges to the Carrickmines Stream, a tributary of the Shanganagh River. The Shanganagh River discharges into the coastal waters of Killiney Bay, within which Rockabill to Dalkey Island SAC and Dalkey Island SPA are located.

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 Appendix 5.1.

The locations of those SAC and SPA sites relative to the proposed development are illustrated on

Figure 5.2 below.

Figure 5.2: European sites in the vicinity of the proposed development site



The issue as to whether the proposed development will or will not have likely significant effects on any of these European sites is considered in the Appropriate Assessment Screening Report which accompanies this planning application.

5.3.1.2 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 NHA or pNHA sites within the proposed development boundary. In addition, there are no NHA sites in the vicinity of the proposed development site.

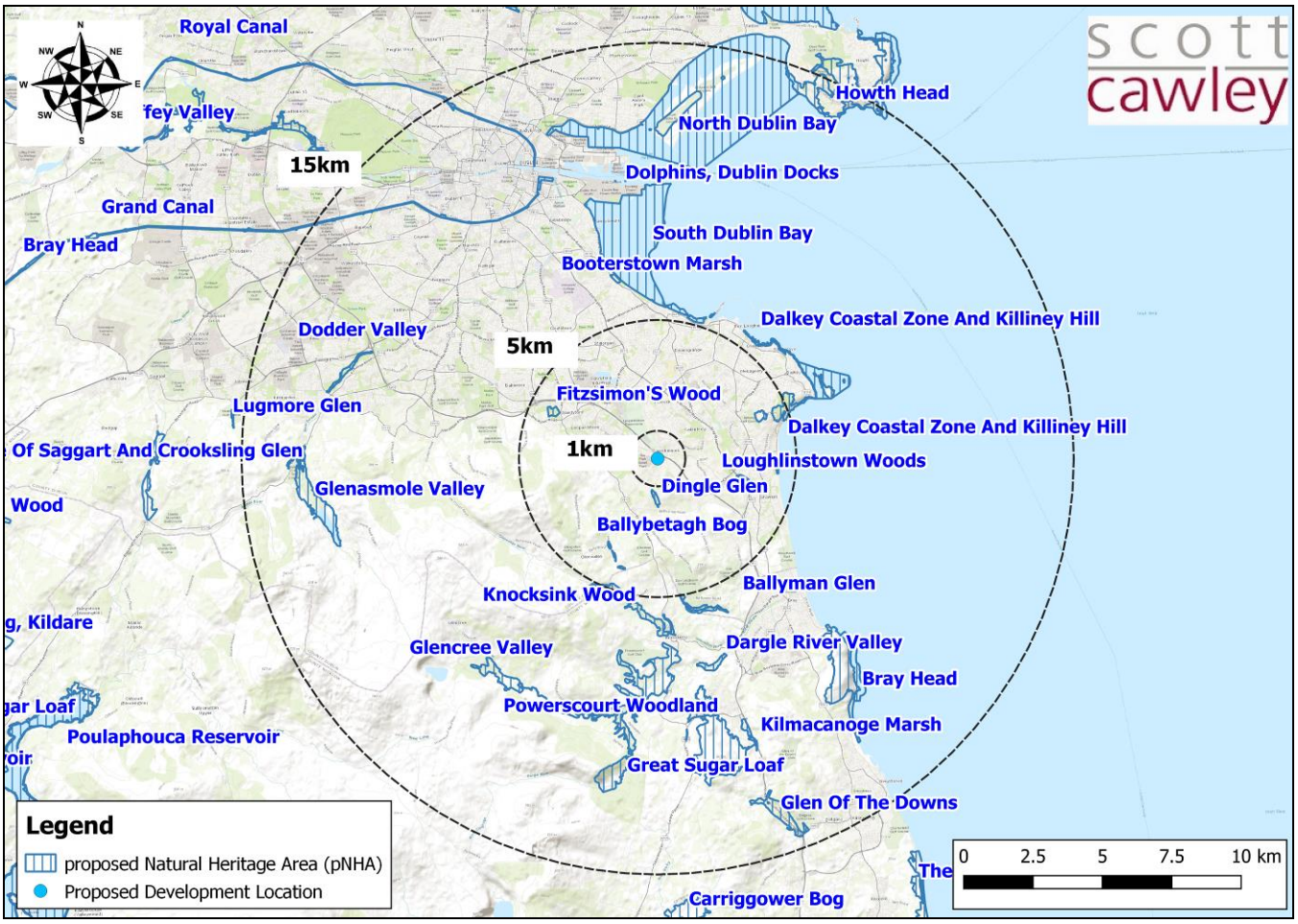
Several pNHA sites are located within the vicinity of the proposed development site. The nearest pNHA is Dingle Glen pNHA which is located approximately 1.2km south of the proposed development site. Other pNHAs in the vicinity of the proposed development site include Fitzsimon's Wood pNHA, Loughlinstown Woods pNHA, Ballybetagh Bog pNHA, Dalkey Coastal Zone and Killiney Hill pNHA, Ballyman Glen pNHA, and Knocksink Wood pNHA.

There is an existing watercourse on site, the Golf Stream, which discharges to the Carrickmines Stream, a tributary of the Shanganagh River. The Shanganagh River discharges into the coastal waters of Killiney Bay and passes through Loughlinstown Woods pNHA, c. 3.6km downstream of the proposed development site, on its way to the sea. Its discharge point is located within the Dalkey Coastal Zone and Killiney Hill pNHA.

The locations of the pNHA sites relative to the proposed development are illustrated on

Figure 5.3 below.

Figure 5.3: National sites in the vicinity of the proposed development site



5.3.1.3 Habitats and Flora

The following habitat types were recorded during the multidisciplinary survey conducted on 26th February 2020:

- Treelines (WL2)
- Hedgerows (WL1)
- Scrub (WS1)
- Dry Meadows and Grassy Verges (GS2)
- Spoil and Bare Ground (ED2)
- Recolonising Bare Ground (ED3)
- Refuse and Other Waste (ED5)
- Ornamental/ Non-native Shrub (WS3)
- Buildings and Artificial Surfaces (BL3)
- Depositing/ Lowland Rivers (FW2)

Many of these habitats occurred in mosaics with other habitat types. Figure 5.4 shows the extents of the habitats recorded on site.

Treelines (WL2)

Several treelines are present within the proposed development site, often associated with the boundaries of residential dwellings which previously occupied the site. Species recorded in treelines on site included mature *Fraxinus excelsior* and *Cupressus* sp. Many of these mature ash trees were covered in dense ivy and were identified as being potentially suitable for roosting bats. *Griselinia littoralis* occurred at the base of the mature ash treeline, along with bramble and a stone wall (BL1), which likely previously formed a boundary of a residential plot.

Treelines occurred in a mosaic with hedgerows (WL1) in some areas of the site, giving an overall "overgrown treeline" impression. Treelines on site are regarded as being of local importance (higher value), owing to their structure and composition, as well as their significance as landscape features.

It should also be noted that treelines, such as those located within the proposed development site, provide ecological connectivity across the wider landscape and are useful features for commuting and foraging bats, as well as other commuting/ foraging mammal species such as fox and badger.

Plate 5.1: Example of treeline, as identified on site.

Plate 5.2: Conifer treeline identified on site.

Hedgerows (WL1)

Several hedgerows were identified within the proposed development site, some of which were associated with boundaries of previous residential dwellings and others which were more natural landscape features, and scrubby in nature. Hedgerows associated with previous residential dwellings and their associated gardens, or associated with motorway/roadside planting, were generally either composed entirely of ornamental species such as *Prunus laurocerasus*, or had elements of ornamental planting such as *Berberis darwinii*, alongside more native species

such as *Ilex aquifolium*, *Prunus spinosa*, *Salix* sp., *Crataegus monogyna, Rubus fruticosus* agg. and *Fraxinus excelsior*.

Hedgerows often occurred in mosaics with other habitats on site, such as treelines (WL2), where the hedgerow elements had been left unmanaged and created an "overgrown treeline" impression. Those hedgerows on site, which are mainly composed of native species, are regarded as being of local ecological importance (higher value), owing to the diversity which they contain, while those hedgerows which are composed of a single non-native/ornamental species (e.g. cherry laurel) are regarded to be of local ecological importance (lower value).

Hedgerows, like treelines, create ecological connectivity between different areas, across the wider landscape. They too, offer potential for commuting fauna species, including breeding birds.

Scrub (WS1)

Scrub was frequently encountered within the proposed development site. A large area of *Ulex europaeus* and *Cytisus scoparius* scrub occurs in the north-east of the site. Both of the aforementioned species are co-dominant here. *Buddleja davidii* is occasionally present. Towards the edge of the scrub habitat, *Holcus lanatus*, *Urtica dioica*, bramble, *Vicia* sp. and *Hypericum androsaemum* occur. Some areas of scrub have recently been cleared and are more aligned with the Fossitt category of Spoil and Bare Ground (ED2). In these areas there is no vegetation present and building rubble occurs. This area is described as a mosaic of scrub and spoil and bare ground (WS1/ ED2).

Other areas of scrub, which occur towards the proposed development site boundary, are dominated by *Ulex europaeus*, with abundant *Rubus fruticosus* agg. and occasional *Buddleja davidii*. *Salix* sp. occur in scrub along the banks of the Golf Stream, along with *Rubus fruticosa* agg and *Ulex europaeus*.

Scrub was also found in mosaics with the following habitat types on site; Spoil and Bare Ground (ED2), Recolonising Bare Ground (ED3) and Dry Meadows and Grassy Verges (GS2).

Scrub identified at the proposed development site is regarded to be of local ecological importance (lower value), given the lack of diversity in its vegetative composition.

It should, however, be noted that areas of scrub can offer potential habitat to breeding birds, and some areas of scrub such as the willow-bramble-gorse scrub along the banks of the stream may provide a useful foraging resource for local bats.

Plate 5.3: Gorse scrub with intermittent patches of bare ground.

Plate 5.4: Gorse scrub with cherry laurel hedgerow.

Dry Meadows and Grassy Verges (GS2)

Unmanaged areas of grassland, which occurred at the proposed development site, were classified under this habitat type. Typically, these areas were dominated by tall tussocky grass species such as *Dactylis glomerata*, with shorter grass species such as *Holcus lanatus* and *Festuca rubra*, occurring to a lesser extent. Tall herbaceous plants such as *Heracleum sphondylium*, *Cirsium arvense* and *Epilobium* spp. were frequently encountered in these areas, along with *Plantago lanceolata* and *Vicia* spp.

This habitat type was also found in mosaics with the following Recolonising Bare Ground (ED3) and Scrub (WS1).

As a relatively species poor and unmanaged grassland, this habitat is valued as being of a local importance (lower value).

Plate 5.5: Dry meadows and grassy verges in the north of the site.

Spoil and Bare Ground (ED2)

Areas of spoil and bare ground on site, consisted of building rubble and recently cleared ground, which is largely devoid of vegetation and creates uneven surface underfoot. This habitat also occurred in a mosaic with Scrub (WS1).

This habitat type is regarded as being of local ecological importance (lower value) and is not of ecological interest.

Recolonising Bare Ground (ED3)

Areas of recolonising bare ground consisted of disturbed ground where opportunistic species are now establishing. Species recorded in these areas included *Cirsium arvense, Urtica dioica, Ranunculus repens, Holcus lanatus and Rumex obtusifolius.*

Across the proposed development site, this habitat occurred in mosaics with the following habitat types; Scrub (WS1) and Dry Meadows and Grassy Verges (GS2).

Due to the disturbed nature of this habitat type, and limited species composition, it is regarded as being of local ecological importance (lower value).

Refuse and Other Waste (ED5)

Areas of waste were recorded on site and were mostly composed of household waste and furniture etc from previous residential dwellings which had occupied the site before. In the west of the site, there is a mound of building rubble which was categorised under this habitat type. Vegetation present on this mound included scrubby species such as *Ulex europaeus*, *Rubus fruticosa* agg and *Buddleja davidii* as well as *Hypericum androsaemum* and other ornamentals (remnants of previous residential gardens).

This habitat also occurred in mosaics with the following habitat types; Buildings and Artificial Surfaces (BL3); Dry Meadows and Grassy Verges (GS2); and; Ornamental/ Non-native Shrub (WS3).

Areas of waste are of no ecological interest and are deemed to be of local ecological importance (lower value).

Plate 5.6: Mound of building rubble in the west of the site.

Ornamental/ Non-native Shrub (WS3)

Areas in which the remnants of previous residential gardens were evident were classified under this habitat type. Species here were of a non-native, ornamental nature and included *Cotoneaster* sp., *Berberis darwinii, Hypericum androsaemum, Griselinia littoralis* and *Carex pendula*.

This habitat occurred in a mosaic with the following habitat types; Refuse and Other Waste (ED5); Dry Meadows and Grassy Verges (GS2); and; Buildings and Artificial Surfaces (BL3).

Given the non-native nature of this habitat it is deemed to be of local ecological importance (lower value).

Buildings and Artificial Surfaces (BL3)

Areas which were formerly driveways and patios etc. associated with residential dwellings were classified under this habitat type. These areas are largely devoid of vegetation except mosses, *Hedera helix* and opportunistic plant species which are attempting to recolonise the area.

This habitat also occurred in mosaics with the following habitat types; Refuse and Other Waste (ED5); Dry Meadows and Grassy Verges (GS2); and; Ornamental/ Non-native Shrub (WS3).

These areas are of local ecological importance (lower value).

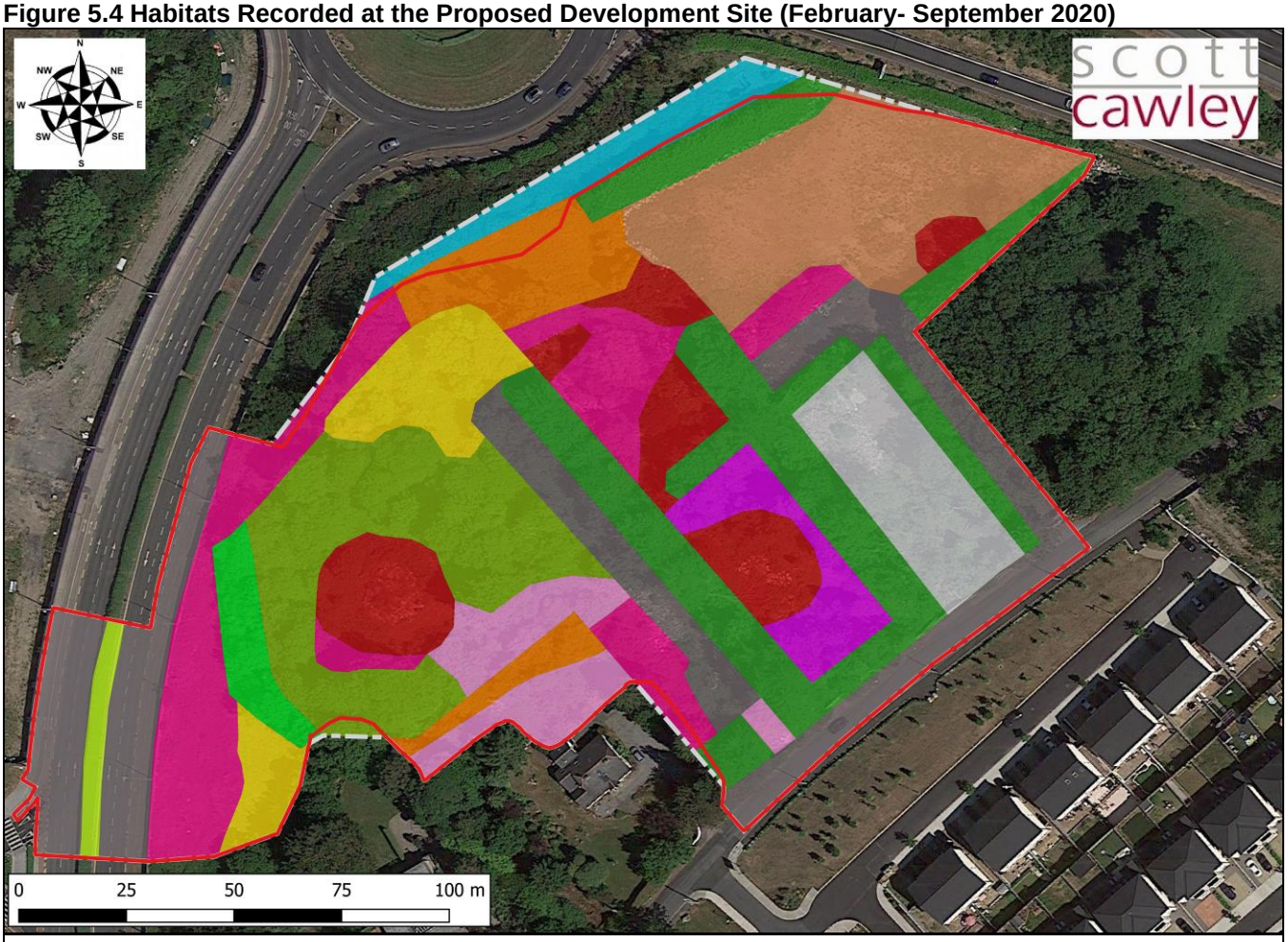
Depositing/ Lowland Rivers (FW2)

The Golf Lane Stream flows along the northern boundary of the proposed development site. It is a heavily modified waterbody, with a sluice and multiple concrete weirs noted. It is approximately 3m in width and of unknown depth. Away from the sluice the banks of the stream are composed of earth and are vegetated, with the following species occurring on the bankside; *Urtica dioica*, *Rubus fruticosa* agg, *Holcus lanatus*, *Dipsacus fullonum*, *Cytisus scoparius*, *Ulex europaeus* and *Salix* sp. On the northern side of the stream the bank is composed of dense, impenetrable *Ulex europaeus* scrub (WS1).

The Golf Lane Stream is of local ecological importance (higher value) as, despite its modified nature, it is regarded as an important habitat locally due to the connectivity it provides with the wider landscape and the potential it offers to fauna species as a foraging and commuting resource.

Plate 5.7: Depositing/ lowland river (Golf Lane Stream) located in the north-east of the site.

Figure 5.4 Habitats Recorded at the Proposed Development Site (February- September 2020)



Legend

- Proposed Site Boundary
- Survey Area

Habitats

- Buildings & Artificial Surfaces (BL3)
- Buildings & Artificial Surfaces/ Refuse & Other Waste/ Dry Meadows & Grassy Verges/ Ornamental/ Non-native Shrub (BL3/ ED5/ GS2/ WS3)
- Recolonising Bare Ground (ED3)
- Refuse & Other Waste (ED5)
- Depositing/ Lowland Rivers/ Scrub (FW2/ WS1)
- Dry Meadows & Grassy Verges (GS2)
- Dry Meadows & Grassy Verges/ Scrub (GS2/ WS1)
- Hedgerows (Local Importance (Higher Value)) (WL1)
- Non-native Hedgerows (Local Importance (Lower Value)) (WL1)
- Treelines (WL2)
- Treelines/ Hedgerows (WL1/ WL2)
- Scrub (WS1)
- Scrub/ Spoil & Bare Ground (WS1/ ED2)
- Scrub/ Dry Meadows & Grassy Verges (WS1/ GS2)

5.3.1.4 Fauna

5.3.1.4.1 Terrestrial Mammals (excl. bats)

Based on data gathered during the desktop study, otter are known to occur in the vicinity of the proposed development site, with NBDC holding records from nearby watercourses dating back to 1980. Furthermore, previous work by Scott Cawley Ltd. for the Cherrywood Planning Scheme Biodiversity Plan, recorded evidence of otter along the Carrickmines' River valley and Brides Glen, watercourses which occur in the same catchment as the proposed development site.

No evidence of otter was recorded during the terrestrial mammal survey undertaken, although it should be noted that the banks of the Golf Stream on site are densely vegetated and access was limited. Given the modified nature of the Golf Stream, coupled with the lack of evidence of otter activity, it is unlikely that otter holts are present, although local populations of otter may use the watercourse for commuting and foraging purposes. Otter, 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.

Desktop records also exist for badger in the vicinity of the proposed development site. According to a review of the NBDC database, records for badger, from 2017, exist within 2km of the proposed development site at Cherrywood and Rathmichael. In addition, two badger setts (most likely outlier setts) were identified at lands known as Quadrant 3 in The Park retail park to the west of the proposed development site during ecological surveys undertaken there between August 2017 and December 2018. The habitats recorded at the proposed development site would offer some potential for foraging and commuting badgers, although no signs of badger activity was recorded during the terrestrial mammal survey undertaken in February 2020. Badger, and their breeding and resting places, are protected under the Wildlife Acts.

Considering the results of the desktop study, the habitats recorded on site and the potential they offer to terrestrial mammal species, and adopting a precautionary approach, it is reasonable to assume that terrestrial mammal species such as otter and badger could potentially use the site for foraging and commuting purposes. There was no evidence of any badger setts or otter holts detected during the mammal survey conducted on site and therefore no resting places for these species exist within the proposed development site. Given the legal protection afforded to badger, the presence of suitable habitat to support badger within the proposed development site and their known presence within the wider area, as revealed from the desktop study, the local badger population is regarded as being of local importance (higher value) for the purpose of this assessment. The local otter population is regarded to be of County importance, given its protected status, known distribution along watercourses in the wider environment and presence of a suitable watercourse to the north of the proposed development site.

Other protected terrestrial mammal species, for which records exist within 2km of the proposed development site include hedgehog *Erinaceus europaeus,* red deer *Cervus elaphus*, red squirrel *Sciurus vulgaris* and pygmy shrew *Sorex minutus*. No evidence of hedgehog was recorded during the mammal survey conducted on site, despite pockets of suitable habitat (e.g. grassland) occurring. Red deer are unlikely to occur on site as they tend to be found in more upland areas, such as the Wicklow Mountains. No evidence of deer was noted on site. Red squirrel, although sometimes found in gardens, is unlikely to occur on site, given its association with coniferous forestry and the absence of such habitat within the proposed development site. No evidence or observations of red squirrel were made during the mammal survey conducted. Finally, no evidence of pygmy shrew was recorded on site despite pockets of suitable habitat being present. The local populations of protected small mammal species such as hedgehog and pygmy shrew are regarded as being of local importance (higher value) due to the presence of suitable habitat on site and known distribution within the wider area.

5.3.1.4.2 Breeding Birds

The results of the desktop study indicated that a wide variety of passerine bird species, typical of the suburban environment, are known to occur within the vicinity of the proposed development site, including; barn swallow *Hirundo rustica*, magpie *Pica pica*, blue tit *Cyanistes caeruleus*, chaffinch *Fringilla coelebs*, coal tit *Periparus ater*, bullfinch *Pyrrhula pyrrhula*, blackbird *Turdus merula*, starling *Sturnus vulgaris* and wood pigeon *Columba palumbus.*

The following bird species were recorded during the two dedicated breeding bird surveys which were undertaken on site in June 2020; chaffinch, robin *Erithacus rubecula*, wren *Troglodytes troglodytes*, chiffchaff *Phylloscopus collybita*, goldfinch *Carduelis carduelis*, wood pigeon, house sparrow *Passer domesticus*, blackbird, goldcrest *Regulus regulus* and rook *Corvus frugilegus*. Of these, wren and goldfinch exhibited behaviours which confirmed

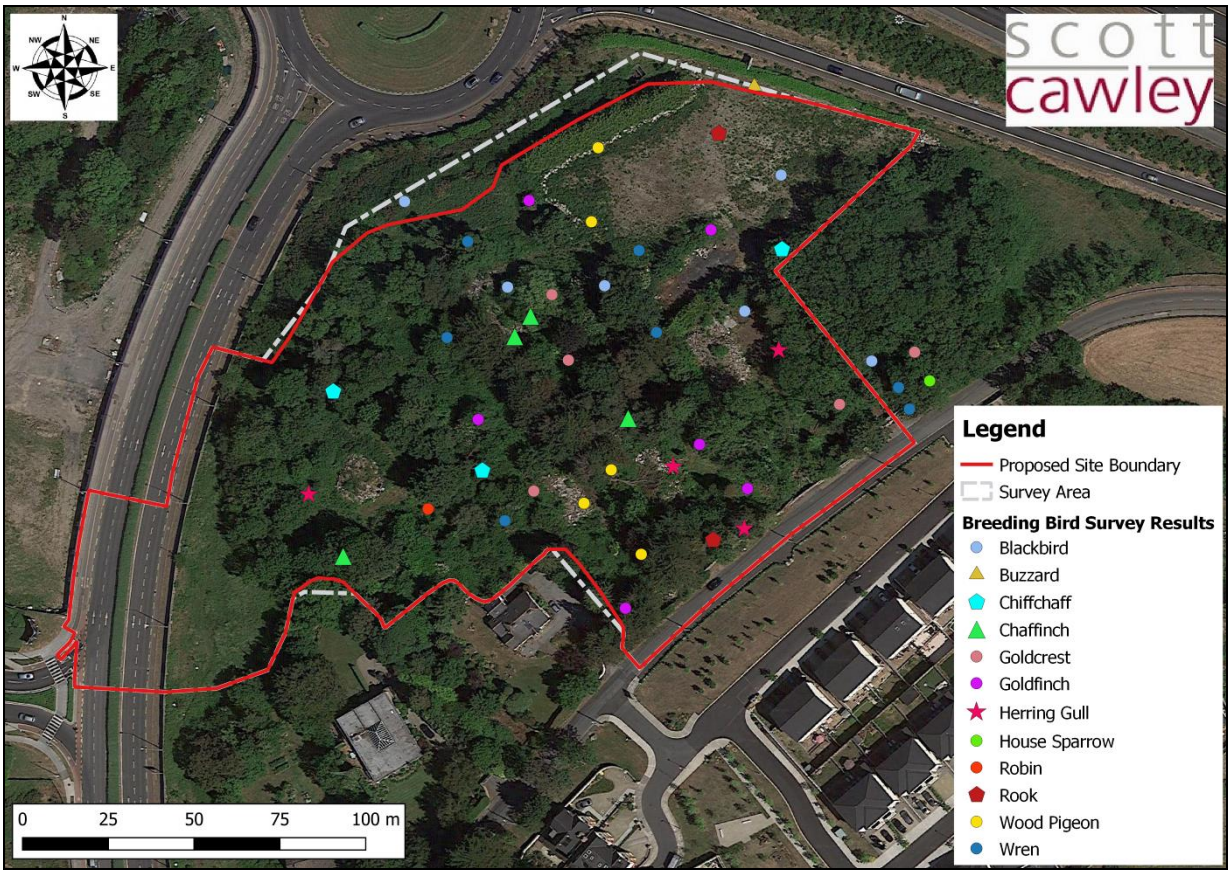
that they were breeding on site (e.g. territorial calling, presence of juveniles etc). The majority of the bird species which were recorded of site are of a low conservation concern. However, robin, house sparrow and goldcrest are all Amber-listed species, meaning that they are of moderate conservation concern[2]. Given the nature of the proposed development site and its suburban location, it is likely that many of the other passerine species recorded also use the site for breeding purposes (e.g. robin, chaffinch, chiffchaff etc).

In addition to passerine species, herring gull *Larus argentatus* was also observed flying at height over the site, indicating that it was not using the site but was rather just transiting over the site. Finally, during the first breeding bird survey on the 11th June, a single buzzard *Buteo buteo* was observed being mobbed by a hooded crow along the eastern boundary of the site. The results of the two breeding bird surveys undertaken on site are presented on Figure 5.5.

Finally, during one of the bat surveys undertaken on site in June 2020, an owl, which could not be identified to species level was observed flying over the Golf Lane Stream, to the north of the site. The owl came from the west and did not land in the site but continued its flight eastwards towards the M50 motorway. No records for owl species were returned within the 2km study area used in the desktop study.

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. Breeding birds present at the proposed development site are regarded as being of local ecological importance (higher value), due to the fact that whilst the birds identified on site are passerine birds typical of a suburban environment, a number of them are of moderate conservation concern, and, as per Irish legislation, all wild birds and their eggs and nest are legally protected.

Figure 5.5: Results of breeding bird surveys conducted on site (June 2020)



5.3.1.4.3 Wintering Birds

The desk study records included a small number of wintering waterfowl, gull and wader species within *c*. 2km of the proposed development site. There is no suitable habitat (e.g. wetland habitats, amenity grassland for inland foraging etc.) for wintering SCI and non-SCI waterfowl, gulls or waders such as curlew *Numenius arquata* onsite. The habitats recorded on site offer suitable foraging habitat and shelter for smaller overwintering species such as

[2] Amber-listed species have an unfavourable status in Europe, have moderately declined in abundance or range, a very small population size, a localized distribution, or occur in internationally important numbers (Colhoun & Cummins, 2013).

passerines, for example, chaffinches etc. The proposed development site is likely to support small numbers of common overwintering passerine birds, rather than waterfowl and waders given the habitats identified on site. Nevertheless, populations of wintering passerine birds will be affected by the construction of the proposed development and are therefore included in this assessment.

The proposed development site is likely to support a small number of common passerine bird species during the winter. This population of wintering birds is valued to be of local importance (higher value).

5.3.1.4.4 Bats

The majority of mature trees on site were identified as being potentially suitable to support roosting bats. These trees contain features, or are of a suitable size to contain features, which could be used by roosting bat species.

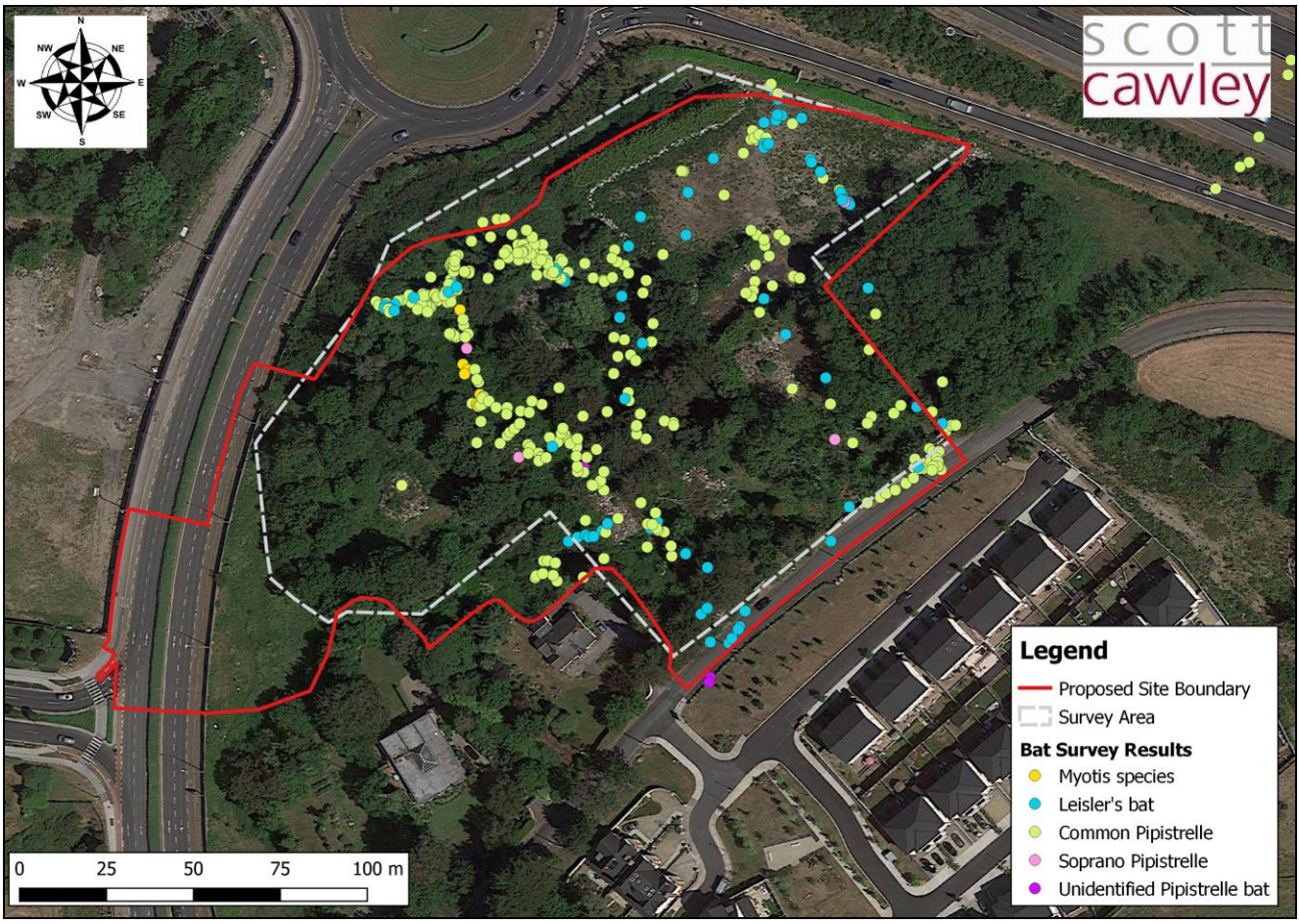
In addition, the bat surveys carried out on site identified four species of bat which use the site – common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, Leisler's bat *Nyctalus leislerii* and unidentified Myotis species (*Myotis* spp.).

The first bat species detected during the survey conducted on the 4th June 2020 was an unidentified Myotis bat flying along one of the treelines which runs north-south through the site at 22:06, approximately 20 minutes after sunset. The first common pipistrelle bat was recorded the following minute (22:07), flying along the same treeline. Soprano pipistrelle bat was first detected at 22:45, again along the same treeline. Leisler's bat was first detected at 22:49, flying at height over the site. Common pipistrelle was by far the most commonly recorded bat species on site, accounting for 87% of all recordings made, with recordings of this species being made in almost all areas of the site. The last bat recorded on site during the first survey was a common pipistrelle bat, which was recorded flying over Golf Lane at 00:11 on the 5th June 2020.

The first bat recorded during the survey on the 22nd June 2020 was a Leisler's bat, which was recorded flying at height over the site, near the south-western boundary, at 21:52, four minutes prior to sunset. Leisler's bats are known to emerge slightly earlier than other bat species. Common pipistrelle was first detected at 22:11 flying near a treeline in the east of the site. An unidentified pipistrelle bat was recorded along Golf Lane at 22:55. No Myotis species were recorded during the second bat survey undertaken. Again, common pipistrelle bat was the most frequently encountered bat species on site, with 67% of recordings made being attributed to this species. The last bat recorded on site was a Leisler's bat, recorded flying at height near the site entrance at 00:27 on 23rd June 2020. The results of the bat surveys carried out on site are displayed on Figure 5.6.

Bat activity on site over the course of the surveys was deemed to be relatively high, probably owing to the overgrown nature of the site which would render it a useful foraging resource for local bat populations. 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 also listed on Annex II) and are afforded strict protection under the Habitats Directive and the European Communities (Birds and Natural Habitats) Regulations, 2011. Importantly, no bat roosts were identified within the boundary of the proposed development site during surveys undertaken. The population of bats associated with the proposed development site is regarded to be of local ecological importance (higher value), given the protected status afforded to bats in Ireland, the fact that the species encountered during surveys are all relatively common species and that while bat activity on site was relatively high, it was attributed to a small number of bats.

Figure 5.6: Results of bat surveys undertaken at the proposed development site (June 2020)



5.3.1.5 Summary of Ecological Evaluation

Table ***5.4*** below 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 National Roads Authority, 2009).

Table 5.4 Summary of the ecological evaluation

Ecological Receptor	Ecological Valuation	KER?
Designated Sites		
European Designated Sites (SACs, cSACs and SPAs)	International	**Yes**
National Designated Sites (NHAs and pNHAs)	National	**Yes**
Habitats		
Treelines (WL2)	Local importance (higher value)	**Yes**
Hedgerows (WL1)	Local importance (higher value)	**Yes**
Scrub (WS1)	Local importance (lower value)	No
Dry Meadows and Grassy Verges (GS2)	Local importance (lower value)	No
Spoil and Bare Ground (ED2)	Local importance (lower value)	No
Refuse and Other Waste (ED5)	Local importance (lower value)	No
Recolonising Bare Ground (ED3)	Local importance (lower value)	No
Ornamental/ Non-native Shrub (WS3)	Local importance (lower value)	No
Buildings and Artificial Surfaces (BL3)	Local importance (lower value)	No
Depositing/ Lowland Rivers (FW2)	Local importance (higher value)	**Yes**
Fauna Species		
Bats	Local importance (higher value)	**Yes**
Terrestrial mammal species (e.g. badger and otter)	Local importance (higher value)	**Yes**
Protected Small Mammal species (e.g. hedgehog and pygmy shrew)	Local importance (higher value)	**Yes**
Breeding Birds	Local importance (higher value)	**Yes**
Wintering Passerine Birds	Local importance (higher value)	**Yes**

5.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

Full details of the proposed development can be found in the accompanying documentation within this application. In brief, the proposed development comprises a residential development of 482 no. units (all apartments), along with ancillary residential amenities, and provision of a childcare facility, gym, and local shop. The proposed residential units comprise 31 no. studio units, 183 no. 1-bedroom units, 229 no. 2-bedroom units, and 39 no. 3-bedroom units (including 2 no. duplex type units).

The proposed development is set out in 7 no. blocks which comprise the following:

- Block A1 comprises 62. no, apartments within a part four, part six storey building, including 10 no. studio units, 7 no. 1-bedroom units, 41 no. 2 bedroom units, and 4 no. 3-bedroom units. An ESB substation is provided at ground floor level.
- Block A2 comprises 85 no. apartments within a part four, part eight storey building, including 25 no. 1-bedroom units, 45 no. 2-bedroom units, and 15 no. 3-bedroom units.
- Block A3 comprises 79 no. apartments within a part four, part twelve storey building, including 21 no. studio units, 19 no. 1-bedroom units, 28 no. 2-bedroom units, and 11 no. 3-bedroom units.
- Block B0 comprises 150 no. apartments and resident's amenities within a part four, part eighteen, part twenty-one and part twenty-two storey building. The apartments include 76 no. 1-bedroom units, 68 no. 2-bedroom units, and 6 no. 3-bedroom units (including 2 no. duplex type units). An ESB substation, resident's concierge area and amenity space (171 sq.m sq.m) are provided at ground floor level. A further resident's amenity / event space is provided at the twentieth and twenty-first floor levels (83 sq.m).
- Block B1 comprises 8 no. apartments and is four storeys in height, directly abutting Block B. The apartments include 4 no. 1-bedroom units, and 4 no. 2-bedroom units.
- Block C comprises 42 no. apartments and a local shop within a part five, part seven storey building. The apartments include 30 no. 1-bedroom units, 9 no. 2-bedroom units, and 3 no. 3-bedroom units. A local shop (154 sq.m) and an ESB substation are provided at ground floor level.
- Block D comprises 56 no. apartments, a commercial gym, resident's concierge area, resident's lounge, and a childcare facility in a part four, part seven storey building. The apartments include 22 no. 1-bedroom units, and 34 no. 2-bedroom units. The resident's concierge area (99 sq.m), commercial gym (340 sq.m), and childcare facility (300 sq.m) units are located at ground floor level. The resident's lounge (292 sq.m) is located at first floor level.

Two basement levels are proposed, providing car parking spaces (299 no.), bin stores, plant rooms, bicycle parking (1,000 no. spaces), and circulation areas. A further 240 no. bicycle parking spaces and 4 no. car parking spaces are provided at ground level. The proposed development includes landscaping, boundary treatments, public, private and communal open space (including roof terraces), two cycle / pedestrian crossings over the stream at the western side of the site, along with a new pedestrian and cycle crossing of Glenamuck Road South at the west of the site, cycle and pedestrian facilities, play facilities, and lighting. The proposed buildings include the provision of private open space in the form of balconies and winter gardens to all elevations of the proposed buildings. The development also includes vehicular, pedestrian, and cycle accesses, drop off areas, boundary treatments, services, and all associated ancillary and site development works.

As part of the proposed development a cycle and pedestrian route will be created linking Golf Lane to Glenamuck Road. The cycle/ pedestrian route will be linked from the proposed development to the Glenamuck Road via a clear span bridge to cross the Golf Stream. The provision of a clear span bridge will avoid in-stream works within the watercourse.

Regarding surface water, an extensive surface water network surrounds the proposed development site at present. A 225mm diameter UPVC surface water sewer runs to the north of the site. The existing surface water network located on Golf Lane runs north towards the M50, where it meets the surface water sewer from the proposed development site (225mm sewer running to the north of the site) and discharges to the Carrickmines River culvert between the slipway and motorway. In addition, there is an extensive surface water network on Glenamuck Road, although it is believed that the surrounding area's surface water discharges into the Carrickmines River or its tributaries.

In terms of existing foul water infrastructure, an existing 225mm diameter foul sewer lies under Golf Lane, due to the recent development on the south-eastern side of the road, draining north-east. Also, a 300mm diameter Irish Water foul sewer is located to the north of the subject site (parallel to the 225mm diameter surface water sewer

mentioned in the previous paragraph), draining south-east. This sewer is believed to be of recent construction to create a mains water connection for one of the previous dwellings present on site.

The proposed management of surface water for the proposed development has been designed to comply with the policies and guidelines outlined in the Greater Dublin Strategic Drainage Study (GDSDS) and with the requirements of Dún Laoghaire – Rathdown County Council. The proposed surface water strategy incorporates attenuation of storm water to limit discharge from the site, although storage facilities and Sustainable Urban Drainage Systems (SUDS) elements will be designed to allow infiltration or reduction of run-off volumes and rates where possible. Run-off from the podium slab and green-roofs will be conveyed by a slung drainage system, within the basement extents, to the north of the site. The podiums will consist of green areas and raised planters, providing interception storage and treatment. Bioretention with under drains will be used, where possible, to convey run-off from the podium to gullies at the podium slab level. The hard-standing areas of the podium have been designed to drain to the filter drains, green areas and bioretention areas. 'Stormtech' systems have been introduced as an additional treatment stage and an additional SUDS feature which allows infiltration to ground.

The final surface water discharge point for the site will be to the Golf Stream. A flap valve will be constructed as part of the outfall to ensure flood water cannot enter the system. Flow controls will be constructed to restrict the surface water discharge to greenfield run-off rates, in accordance with the GDSDS and Local Authority Policy. The following SUDS measures have been incorporated into the proposed surface water strategy:

- Bioswales, filter drains and rain gardens- included to provide attenuation, treatment and infiltration where possible;
- Attenuation storage - in the form of 2 no. attenuation storage tanks, using 'Stormtech' systems. Tank 1 is located on the north-western side of the proposed development site and accounts for 270m3 of the proposed storage, with a discharge rate of 1.6l/s controlled by a 'Hydrobrake Optimum' flow control device. Tank 2 is located on the northern side of the proposed development site and accounts for 510m^3 of the proposed storage with a discharge rate of 2.3l/s controlled by a 'Hydrobrake Optimum' flow control device.
- Green roofs - (approximately 3665m^2) on Blocks A-D. Green roof specifications include a 100mm minimum construction depth and sedum planting.
- Green podium (with a soil depth of up to 300mm) with landscaped areas and raised planters (with a soil depth in excess of 750mm) to reduce run-off rates and total impermeable area.
- Class 2 separator – all basement level drainage is discharged to the foul sewerage network via a Class 2 separator.

The proposed foul drainage for the proposed development, is largely reliant on slung drainage in the basement. The foul waters generated on site will exit the basement at two locations. From these locations, foul waters will gravitate to a single discharge point, to the north of the proposed development, to the 300mm Irish Water foul sewer. The predicted foul loadings to be generated from the proposed development is estimated at 1301 P.E. (Population Equivalent). Foul waters will drain to the Shanganagh WasteWater Treatment Plant (WWTP), where they will be treated before ultimate discharge into Kiliney Bay.

The estimated duration of construction for the proposed development is 30 months, depending on construction phasing. Significant rock excavation will be required, in Granite bedrock, during construction. No blasting or piling will be required, and drilling and ripping are the methods envisaged for rock excavation. During construction earthworks will consist of reducing existing levels for the proposed basement structure and foundations. Suitable material, such as rock, will be crushed and used on site where possible. Excess material will be disposed of offsite to a suitably licensed facility in accordance with the project's Construction Waste Management Plan. The results of the Ground Investigations revealed that the material on site can be classified as non-hazardous, with no significant quantities of contaminants present[3].

Landscaping proposals include the retention of 23no. of the existing 205no. individual trees on site. It is also proposed to provide 234no. semi-mature trees, to replace those which will be lost as a result of the proposed development. The overall tree strategy will result in a net increase of 76no., in relation to the number of trees on site. A large component of native species, or varieties of same, are included in the species of trees to be planted on site. Species include the following: downy birch *Betula pubescens*; ash *Fraxnius excelsior*; alder *Alnus glutinosa*; rowan *Sorbus aucuparia*; bird cherry *Prunus padus*; Scot's pine varietes *Pinus sylvestris* "Frensham"; Hazel variety *Corylus avellana* 'Red majestic'; *Liquidambar styraciflua "*Worplesdon*"*; *Pinus thunbergii*; *Amalanchier* "Prince William"; and; *Acer griseum*. Windbreaks in the form of holm oak *Quercus ilex* and downy

[3] Trace levels of asbestos were detected in sample TP-02 at 0.5m. Levels detected were less than the laboratory limit of <0.001%

birch are also proposed towards the south-west of the proposed development site. Areas of proposed wildflower planting will be scattered throughout the areas of communal open spaces and residential courtyards. A large area of wildflower planting is also proposed in the vicinity of the proposed cycle/ pedestrian track to the north of the proposed apartment blocks. The approximate area of wildflower planting is *c.* 2,129m^2.This wildflower planting will comprise a mix of medium height wildflowers that are typical of many meadows that once grew in Ireland and consists of annuals, perennials and biennials. Species may include cowslip *Primula veris*, lady's bedstraw *Galium verum,* kidney vetch *Anthyllis vulneraria*, selfheal *Prunella vulgaris*, yarrow *Achillea millefolium*, yellow ratte *Rhinanthus minor*, wild angelica *Angelica sylvestris*, birds-foot trefoil *Lotus corniculatus*, corn poppy *Papaver rhoeas* and cornflower *Centaurea cyanus*. Wetland wildflower planting is proposed in the north-west corner of the site, as well as along the banks of the Golf Stream, just south of the proposed pedestrian/cycle bridge. The approximate area of wetland planting is *c.* 1,043m^2. This wildflower planting will comprise mainly of perennials with some annuals and biennials also included. Species may include meadow buttercup *Ranunculus acris*; flag iris *Iris pseudacorus*; meadowsweet *Filipendula ulmaria*; Devil's-bit scabious *Succisa pratensis* and wild angelica. Other softscape landscaping proposals include the provision of areas of lawn (amenity grassland), ground cover, borders of shrubs and grasses and areas of reinforced grass. Boundary hedges will comprise evergreen hedgerows (*Euonymus japonicus*) around private areas and native hedgerow (hawthorn *Crataegus monogyna*) in open areas. For further details regarding the proposed landscaping please refer to Landscape Strategy Report (Cameo & Partners, 2020).

The proposed development also includes the installation of artificial lighting on site, post-construction. The lighting design is in accordance with the standards required by Dun-Laoghaire – Rathdown County Council. Lighting will comprise 24 no. LED luminaires, of 6m height, 6 of which will be installed along the proposed cycle path to the north of the site. The remaining 18 luminaires will be installed along the access roads and pedestrian walkways throughout the development complex. The proposed luminaires will not produce any upward light spill (i.e. no light spill above 6m). In particular, the optics (Street Optic R02) to be installed along the proposed cycle path are particularly effective in reducing backlight. Lighting will be on a photocell arrangement between dusk and dawn and the chosen luminaires contain an inbuilt multi-step dimming program which allows for night-time hours to be dimmed by 25%. This means that during off-peak hours of nocturnal foraging /activity, the adjacent public lighting can be further designed to minimise impact on the local wildlife. The colour rendering of the selected light fitting is 3000K, making the LED fittings a warmer light, helping to further minimise the impact of the local wildlife. Other artificial lighting to be installed will include architectural lighting such as up-standing lighting, pavement strip lighting and bollard lighting, which will be located in the central part of the development.

5.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

5.5.1 European Sites

5.5.1.1 Potential Impacts

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 in any European sites 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.

5.5.2 Nationally Designated Sites

In the case of NHAs and pNHAs the assessment considers whether the integrity[4] 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.

5.5.2.1 Potential Impacts

The proposed development site does not overlap with any nationally designated sites and it is not located within their immediate vicinity. The nearest nationally designated site is Dingle Glen pNHA, located *c.* 1.2km south of the proposed development site. There is no source-pathway-receptor connection between the proposed development

[4] Refer to Section 5.2.4.3 for definition and impact assessment methodology

site and Dingle Glen pNHA and, therefore, there is no potential for the proposed development to result in impacts on this pNHA.

There is an existing watercourse on site, the Golf Stream, which discharges to the Carrickmines Stream, a tributary of the Shanganagh River. The Shanganagh River discharges into the coastal waters of Killiney Bay and passes through Loughlinstown Woods pNHA on its way to the sea. Its discharge point is located within the Dalkey Coastal Zone and Killiney Hill pNHA. Foul water generated by the proposed development during operation will be transferred to Shanganagh WWTP for treatment prior to ultimate discharge into Killiney Bay. The discharge location from Shanganagh WWTP lies within 100m of the Dalkey Coastal Zone and Killiney Hill pNHA. Dalkey Coastal Zone and Killiney Hill pNHA and Loughlinstown Woods pNHA are the only pNHAs for which a viable source-pathway-receptor link between the proposed development site and these pNHAs exist.

Activities associated with the construction of the proposed development, could potentially result in impacts to the water quality of the Golf Stream and Glenamuck North River, and in turn, downstream watercourses to which they are connected. Therefore, theoretically, the ZoI for potential impacts to surface waters during construction could extend to Killiney Bay. For example, an accidental pollution event during construction could potentially adversely impact the water quality of these watercourses and potentially the downstream pNHAs to which they flow (e.g. Loughinstown Woods pNHA and Dalkey Coastal Zone and Killiney Hill pNHA). However, the possibility of construction and operational phase impacts, as a result of impacts to surface waters in the environment has been examined in both the Appropriate Assessment Screening Report included in this planning application, and the *Hydrological and Hydrogeological Qualitative Risk Assessment for Lands at Glenamuck Road Carrickmines – Proposed Mixed Development Glenamuck Road, Carrickmines, Co. Dublin* report prepared by AWN Consulting (AWN Consulting, 2020).

AWN Consulting examined the potential for construction related discharges and accidental pollution events to affect water quality in the downstream environment. They concluded that if any silt-laden stormwater managed to enter the public stormwater sewer, i.e. without on-site mitigation, the suspended solids will naturally settle within the surface water drainage system or naturally settle within 500m of the proposed development site. Likewise, in the event of a worst-case pollution incident occurring during the construction of the proposed development (e.g. 500 litre hydrocarbon spill), without any mitigation measures, any contaminated run-off will have attenuated and diluted well within 1km of the proposed development site. Therefore, there is no potential for any construction related activities to affect the downstream pNHA sites of Loughlinstown Woods pNHA or the Dalkey Coastal Zone and Killiney Hill pNHA.

The surface water design for the operational phase of the proposed development includes the use of a number of SUDS measures, which will reduce the volume of surface waters discharging from site and improve the environmental quality of such discharges. A petrol interceptor is included in the surface water design, however, AWN Consulting concluded that, even without the inclusion of the interceptors, in the event of a car leak in the proposed basement car park, there is adequate dilution prior to outfall in Killiney Bay and as such there is no likely impact to surface water quality therein (AWN Consulting, 2020). Furthermore, during operation, foul waters generated by the proposed development will be discharged to Shanganagh WasteWater Treatment Plant (WWTP) for treatment, prior to ultimate discharge into Killiney Bay. The predicted foul loadings to be generated from the proposed development is estimated at 1301 P.E. (Population Equivalent). The most recent available Annual Environmental Report (AER) (Irish Water, 2018) for Shanganagh WWTP states that the discharge from the WWTP does not have an observable impact on the water quality of the receiving waters and the WWTP is operating in compliance with the Emission Limit Values (ELV's) set in the WWTP discharge licence. Shanganagh WWTP has a design capacity of 186,000 P.E., and in 2018 had a peak operational loading of 126,035. This means that the WWTP, as of 2018, had a remaining capacity of 59,965 P.E. The predicated foul loadings generated by the proposed development is estimated at 1301 P.E. Considering the above, it can be concluded that Shanganagh WWTP has sufficient capacity to adequately process the quantities of foul waters predicted to be generated by the proposed development during operation, such that discharges will not result in any impact to the receiving waters of Killiney Bay.

Moreover, the Conceptual Site Model and resultant report prepared by AWN Consulting, notes that the peak effluent discharge calculated for the proposed development would equate to 0.62% of the licenced discharge (peak hydraulic capacity) at Shanganagh WWTP and would not impact on the overall water quality within Killiney Bay and therefore would not have an impact on the current Water Body Status (as defined within the Water Framework Directive) (AWN Consulting, 2020).

Considering the above, there is no potential for the proposed development to result in impacts on any pNHA sites, as a result of hydrological impacts.

Introducing or spreading non-native invasive plant species

Planting, dispersing, or allowing/causing the dispersal, spread or growth of certain non-native plant species is controlled under Article 49 of the European Communities (Birds and Natural Habitats) Regulations, 2011; and refers to plant or animal species listed on the Third Schedule of those regulations. The accidental spread of non-native invasive plant species as a result of construction works has the potential to impact upon terrestrial habitats within and immediately adjacent to the proposed development boundary; potentially affecting plant species composition, diversity and abundance over the long-term. The effects of introducing such non-native invasive plant species to highly sensitive and ecologically-important habitat areas (e.g. designated area for nature conservation or areas of Annex I habitat) have the potential to result in a likely significant negative effect, at geographic scales ranging from local to international.

There are no non-native invasive species, listed on the Third Schedule of the *Birds and Natural Habitats Regulations* within the proposed development site. However, landscaping proposals have the potential to introduce non-native species of a potentially invasive nature into the development site, post-construction, from which they could spread into the wider environment via the surface water network. The potential introduction of non-native invasive species into downstream pNHAs (e.g. Loughlinstown Woods pNHA), as a result of landscaping proposals in the proposed development site, could result in an impact, which may be significant at the national level.

5.5.3 Habitats and Flora

5.5.3.1 Potential Impacts

Habitat loss

Construction of the proposed development will result in the loss of habitat area; totalling approximately 2.27ha. None of the habitats directly affected by the proposed development are considered to be any greater than of local biodiversity importance (higher value). The majority of the habitats within the proposed development boundary (*c.*1.8ha of the c. 2.56ha application site) are of local biodiversity importance (lower value) and predominantly comprise of buildings, artificial surfaces, refuse and building waste, species poor scrub, disturbed ground and species-poor rough grassland. As these habitats are of local biodiversity importance (lower value), their loss or modification will not result in a likely significant effect on biodiversity.

The habitat types within the proposed development boundary, and the area of each, that are considered to be of a high local biodiversity value are as follows:

- Hedgerows (WL1) and Treelines (WL2) (including areas which comprise a mosaic of these two habitat types)– *c*.0.72ha

The linear length of hedgerow, as mapped on the habitat map (see **Figure 5.4**) being lost is c.50m and the linear length of treelines, as mapped on **Figure 5.4**, being removed is c.355m.

To offset the significant loss of trees from the proposed development site, as a result of construction (182 existing trees will be removed), the proposed landscaping plan provides for the planting of 234 no. new semi-mature trees, resulting in a net gain of 76 no. trees on site. The majority of new trees will be native species, or varieties of same, with species including *Alnus glutinosa, Sorbus aucuparia, Prunus padus/ Prunus avium, Betula pubescens, Pinus sylvestris* “Frensham” and *Corylus avellana* “Red majestic”. The landscaping proposal includes a total linear length of 213m of treeline habitat to be planted, as well as 137m of hedgerow and 139.6m of treeline/ hedgerow habitat.

In addition, it is proposed to include a wildflower meadow area to the north of Block A2 residential building. This will comprise a 2,129m^2 dry wildflower meadow, composed of native species, such as yarrow, yellow- rattle, cowslip and Red Clover *Trifolium pratense*. To the north-east of Block B1, and along the banks of the Golf Stream to the south of the proposed pedestrian/ cycle bridge, it is proposed to include a wetland wildflower meadow of approximate area 1,043m^2. Angelica, meadow buttercup, flag iris, purple loosestrife, meadowsweet and ragged-robin are examples of species which may be included here. Seed mixes for all areas of wildflower meadows will be of Irish provenance.

It is important to note that the Golf Stream, which was classified as a depositing/ lowland river (FW2), is not contained within the site boundary and no direct impacts on this watercourse are predicated as a result of the proposed development. The proposed pedestrian/ cycle bridge, which will cross the Golf Stream, has been designed so as to avoid direct impacts and instream works within the Golf Stream habitat. It will be a clear-span structure with works to the riverbanks including installation of bridge abutments and works to restore an overland flow path at the north eastern side of the site where spoil material has been dumped. Bridge abutment works will

largely fall outside the 100-year flood line of the Golf Stream. Therefore, no direct impacts to the Golf Stream habitat are predicted as a result of the proposed development.

Policy LHB26 of the *Dún-Laoghaire – Rathdown County Development Plan 2016-2022*, states that "*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". The proposed development will result in the loss of c.50m of hedgerow and c.355m of treelines. Considering the relatively short length of hedgerow being removed in the context of the local resource of this habitat type (extensive hedgerow networks are present along the agricultural lands to the south and west of the proposed development site), this is not likely to result in a significant negative effect, at any geographic scale. The limited amount of hedgerow habitat which will be lost as a result of the proposed development is not considered to be significant in the context of Policy LHB26 of the Dún-Laoghaire – Rathdown County Development Plan 2016-2022, considering the provision of 137m of hedgerow habitat in the landscaping proposal, which will result in an overall net gain of 87m of hedgerow habitat on site post-development. Proposed boundary hedges will comprise evergreen hedgerows (*Euonymus japonicus*) around private areas and native hedgerow (hawthorn *Crataegus monogyna*) in open areas. With regards treelines, the landscaping design includes for c.213m of treeline and 139.6m of treeline/hedgerow habitat and, therefore, considering the relatively small length of treeline loss remaining, this is not likely to result in a significant negative effect, at any geographic scale.

Introducing or spreading non-native invasive plant species

Planting, dispersing, or allowing/causing the dispersal, spread or growth of certain non-native plant species is controlled under Article 49 of the European Communities (Birds and Natural Habitats) Regulations, 2011; and refers to plant or animal species listed on the Third Schedule of those regulations. The accidental spread of non-native invasive plant species as a result of construction works has the potential to impact upon terrestrial habitats within and immediately adjacent to the proposed development boundary; potentially affecting plant species composition, diversity and abundance over the long-term. The effects of introducing such non-native invasive plant species to highly sensitive and ecologically-important habitat areas (e.g. designated area for nature conservation or areas of Annex I habitat) have the potential to result in a likely significant negative effect, at geographic scales ranging from local to international.

There are no non-native invasive species, listed on the Third Schedule of the *Birds and Natural Habitats Regulations* within the proposed development site. However, landscaping proposals have the potential to introduce non-native species of a potentially invasive nature into the development site, post-construction. The potential introduction of non-native invasive species, as a result of landscaping proposals, could be significant at the local level.

Habitat degradation from dust generated during construction

The proposed development has the potential to generate dust during construction works which could affect vegetation in habitat areas within and adjacent to the proposed development boundary. In the absence of mitigation, this has the potential to affect highly sensitive and ecologically-important habitat areas (e.g. Golf Stream) and result in a likely significant negative effect at the local level.

Habitat degradation as a result of effects on surface water quality

In the absence of mitigation, the proposed development has the potential to result in detrimental effects on the surface water quality of the Golf Stream, Glenamuck North River and Carrickmines Stream and the aquatic flora and fauna these watercourses support. This could arise through an accidental pollution event during construction (i.e. through the release of sediment/ hydrocarbons or other harmful substances directly into the watercourses, or over land runoff). This is most likely to occur during works in the vicinity of the Golf Stream (e.g. during the construction of the proposed pedestrian/ cycle bridge). Degradation of surface water quality in the Golf Stream could lead to some impacts within a certain distance further downstream, as well as in the immediate vicinity of the proposed development site. Owing to the fact that the Golf Stream and other downstream watercourses are considered highly sensitive and ecologically-important habitats, the effect of habitat degradation as a result of effects on surface water quality is considered to be significant at the local level.

5.5.4 Bats

5.5.4.1 Potential Impacts

All bat species in Ireland are protected under the Wildlife Acts and are listed in Annex IV of the EU Habitats Directive 92/43/EEC. It is an offence under Section 23 of the Wildlife Acts and under Section 51 of the European Communities (Birds and Natural Habitats) Regulations, 2011 to kill or to damage or destroy the breeding or resting place of any bat species.

Effects of Habitat Loss on Bats

The proposed development will include the removal of bat foraging habitat (hedgerows and treelines) from the proposed development site.

No bat roosts were identified during bat surveys conducted in June 2020, and therefore no known bat roosts will be lost as a result of the proposed development. All the bats recorded using the site are common species in Ireland that are classified as being of "least concern" in the *Ireland Red List No. 3: Terrestrial Mammals* (Marnell et al., 2019).

All mature trees on site were identified as being potentially suitable to support roosting bats. The loss of a substantial proportion of trees on site has the potential to result in a loss of roosting opportunities to local bats, as well as the loss of active bat roosts (if present).

The proposed development will require the removal of 182 of the 205 existing trees on site. 23no. existing trees will be retained and supplemented by a total of 234no. new semi-mature trees, resulting in a net gain of 76no. trees on site. Despite this net gain, it must be acknowledged that the proposal will result in a large proportion of the site being unvegetated for some time, between the removal of existing trees and planting of proposed trees. Therefore, the proposed development will result in a short-term reduction of available commuting and foraging habitat within the site, owing to this removal of vegetation. Furthermore, a large number of the existing trees on site are mature specimens while the replacement trees are semi-mature, meaning that the proposed replacement trees are unlikely to provide roosting potential for local bats (generally only mature trees are of a suitable size to contain potential roost features such as cavities and knotholes etc.).

Post-development, a good proportion of the northern boundary will be vegetated with retained mature trees and proposed new semi-mature trees, which may result in a vegetated corridor, in close proximity to the Golf Stream, suitable for use by foraging bats (Please refer to Drawing C0112 L100 for Landscaping Details).

The loss of trees on site, which provide suitable foraging and commuting habitat for local bats, will be a short-term impact, as the proposal includes a net gain of 76no. trees on site. Therefore, this is regarded as a short-term impact, significant at the local scale. The potential reduction in roosting opportunities for bats on site, as a result of the decrease in mature trees on site, will be a permanent impact, significant at the local level only. The overall impact on local bat populations as a result of habitat loss will be a short-term negative impact, which over time will become insignificant at the local scale, and will not affect the conservation status of the local bat population.

Effects of Disturbance and Mortality on Bats

No bat roosts were identified within the proposed development site based on surveys conducted in 2020. However, many of the mature trees present on site were identified as being potentially suitable to support roosting bats. Therefore, the felling of these mature trees to facilitate the construction of the proposed development has the potential to result in disturbance to bats or in a worst-case scenario, the mortality of bats roosting in suitable trees. In the absence of mitigation, the effects of mortality or disturbance on bat populations would be significant at the local level only given the low number of bats likely to be present within trees on site.

Regarding the proposed buildings' height and the potential for this to pose a collision risk to local bats, the proposed development site is not considered to be a particularly sensitive site for bats- it is not part of any important migratory route used by bats and, based on the results of bat surveys undertaken, it supports low numbers of common bat species only. Recent studies, investigating the cause of bat collisions with buildings found that building material is an important factor to be considered (Greif et al., 2017) and that smooth vertical surfaces such as glassy exteriors and windows can be particularly problematic (Timm, 1989; Greif et al., 2017). Whilst the design of the facades of the proposed buildings does include large areas of glazing, it should be noted other materials are also proposed on the external surfaces of the buildings. For example, in Block BO, the tallest building in the proposed development, large expanses of glazing are proposed but the mullions and transoms of

these windows will be composed of natural anodized aluminium. Pale bricks will also form part of the external finish of the building. The inclusion of these other materials will help to break up the glazing, making the building more detectable to bats. Irish bat species navigate largely by echolocation calls, and fixed structures such as those proposed as part of the proposed development present a low risk in terms of collision. In the absence of mitigation there could be a low level of mortality attributable to bat collision with glazing of the proposed building, however this impact is unlikely to cause any significant effect at a local scale.

Effects of Lighting on Bats

Bats are light-sensitive species, and increased illumination of a site can affect how bats utilise a site (ILP, 2018). For roosting bats, increased light levels can affect predation, as avian predators tend to rely on vision to catch their prey, and increased light levels at night-time may increase bats vulnerability to such predation. Illumination of foraging and commuting habitat can result in abandonment of habitat. The response to lighting in Ireland by foraging bats varies by species, with Leisler's bat, a high-flying species, as well as common pipistrelle and soprano pipistrelle appearing to be least affected by artificial lighting (Roche et al., 2014).

The subject lands were largely unlit during the bat surveys, with the exception of some light spill from the adjacent roads along the site boundaries. During the construction stage and its operation, and in the absence of any mitigation, the proposed development will result in an increase in artificial lighting on site. Light spill will originate both from installation of public lighting along the vehicular access road and pedestrian routes/ entrances within the development complex and from light spill from the residential units themselves. Furthermore, the removal of vegetation on site will increase light spill penetration from existing surrounding artificial light sources. The provision of a cycle path to the north of the development, linking the proposed development site to Glenamuck Road, will result in an additional linear strip of increased artificial lighting, in close proximity to the Golf Stream.

The proposed luminaires will not produce any upward light spill (i.e. no light spill above 6m). In particular, the optics (Street Optic R02) to be installed along the proposed cycle path are particularly effective in reducing backlight. Lighting will be on a photocell arrangement between dusk and dawn and the chosen luminaires contain an inbuilt multi-step dimming program which allows for night-time hours to be dimmed by 25%. This means that during off-peak hours of nocturnal foraging /activity, the adjacent public lighting can be further designed to minimise impact on the local wildlife. The colour rendering of the selected light fitting is 3000K, making the LED fittings a warmer light, helping to further minimise the impact of the local wildlife. The light modelling prepared for the proposed lighting design has shown that the proposed light levels are generally very low around the perimeter of the site (0.2lux). The light levels along the Golf Stream are generally below 2 lux and, as previously stated, the optics used in this area (Street Optic R02) are particularly effective in minimising backlight. Therefore, it is anticipated that bats will be able to continue foraging/ commuting along the perimeter of the proposed development site, including the Golf Stream, post-development.

Bat species encountered on site, during surveys undertaken in June 2020, included Leisler's bat, common pipistrelle, soprano pipistrelle and Myotis species. Leisler's bat and pipistrelle species are more tolerant of artificial light than other slow flying species (including myotis species) (ILP, 2018). The increase in artificial light levels within the proposed development site, and its immediate surroundings, could potentially result in a reduction in the quality of foraging habitat available to local populations of bats. This would be significant at the local level only, given the species present and level of bat activity recorded on site. The overall impact of increased artificial lighting at the proposed development site will be a permanent impact, significant at the local level, which will not affect the conservation status of the local bat population.

5.5.5 Otter

5.5.5.1 Potential Impacts

Effects of Habitat Loss

The proposed development site has the potential to be used by otter due to suitable habitat for foraging and commuting along the Golf Stream and the presence of otter from the local area from the findings of the desktop review. The conversion of the lands to buildings and artificial surfaces, with associated landscaping, will not reduce the amount of semi-natural habitat available for foraging in this area for otters as they mainly rely on watercourses and prey within. Considering that the proposed pedestrian/cycle bridge has been designed to avoid any in-stream works, the aquatic habitat preference of otter, and the abundance of available suitable habitat downstream, the impact of the proposed development with regards habitat loss for otters, is not considered significant at any geographical scale.

Effects Arising from Disturbance or Displacement of Foraging Otters during Construction

While the proposed development will result in increased human presence on site, the potential effects on otters in terms of disturbance during the construction phase are, for the most part, not significant in this instance. This is because, the proposed construction works are limited in terms of scale, particularly in the vicinity of the watercourses on site, and works will be largely confined to daylight hours, when otters are least likely to forage within the proposed development site. Even in the event that the construction phase of the proposal coincides with construction of other projects in the immediate vicinity, there will be no significant disturbance or displacement effects on otters. Otters are widespread in Ireland and found in close proximity to human settlements, including in Dublin City, and therefore are likely to adapt to changes in human activity levels in the proposed development site and surrounding area.

However, one aspect of construction which could potentially result in significant effects on local otter populations, is the installation of artificial lighting to accommodate night-time working, if necessary, in the vicinity of the watercourses on site. Lighting may be obtrusive along the watercourse and may inhibit otter activity here. Otters are adaptive species and may over time become habituated to this lighting. Therefore, the effect of artificial lighting associated with the construction phase of the project is deemed to be a temporary impact, significant at the local scale only.

Effects of Surface Water Pollutants on Prey Availability

In the absence of any mitigation, there is potential for a pollution event during the construction phase of the proposed development to result in impacts on otters in the locality. Potential impacts include fish kill (thereby affecting prey availability within the watercourses on site and potentially further downstream) and indirect effects of impacts on water quality. Potential accidental spillages into the Golf Stream, would in turn adversely affect otters in the locality, as oil has a negative effect on the otter's waterproof coat and thus negates their ability to control body temperature in water. Furthermore, otters may be affected by contamination of water by heavy metal compounds through bioaccumulation in their prey items. Regarding the potential for an accidental oil spillage, the effects on prey availability could be amplified should a pollution episode coincide with a pollution event triggered by other plans, projects, or land use activities in the Dargle sub-catchment. The effects on otter would likely be significant at the county geographic level.

Effects Arising from Disturbance or Displacement of Foraging Otters during Operation

During the operational phase of the proposed development, human activity will increase, as will artificial lighting, in comparison with the baseline conditions. As otters are mainly nocturnal creatures, and human activity across the proposed development site will largely occur during daylight hours (it is envisaged that the gates at all entrances will be locked at night to reduce anti-social behaviour), the effects of human disturbance on otter are not deemed to be significant at any geographical scale.

The proposed development includes the installation of artificial lighting along the proposed pedestrian/ cycle path towards the northern boundary of the site. This area is in close proximity to the Golf Stream and therefore there is potential for light spill from the proposed luminaires to affect otter activity along this watercourse. Highly directional lighting has been proposed for the pedestrian/cycle path and therefore light spill, if any, will be to a very low degree. Whilst otter activity may be inhibited initially, as a result of any light spill onto the Golf Stream, otter are very adaptive species and it is highly likely that over time local populations of otter will become habituated to lighting in this area. Therefore, the effect of artificial lighting associated with the operational phase of the project is deemed to be a temporary impact, significant at the local scale only, and decreasing to a non-significant impact within a very short period.

5.5.6 Badger

5.5.6.1 Potential Impacts

Effects of Habitat Loss

Despite the fact that no signs of badger activity were recorded during the survey conducted on site in February 2020, the site has the potential to be used by foraging and commuting badger. This is due to suitable foraging and commuting habitat on site, and the fact that badger are known to occur in the wider vicinity (as identified in the desktop review). The conversion of the lands to buildings and artificial surfaces, and associated landscaping proposals, will reduce the amount of semi-natural habitat available for foraging badgers within the site. However,

the overall loss of habitat (maximum area of2.27ha) is not considered to be significant at any scale, considering the average badger territory size of more than 80ha in Ireland[5], and the abundance of available suitable habitat (e.g. agricultural lands and associated boundary hedgerows and treelines, scrub and patches of woodland) surrounding the proposed development site.

Effects Arising from Disturbance or Displacement of Foraging/ Commuting Badgers During Construction

While the proposed development will result in increased human presence on site, the potential effects on badgers in terms of disturbance are not significant in this instance. This is because, the proposed construction works will be carried out over a relatively short period of time (i.e. 24 months), and works will largely be confined to daylight hours, when badgers are least likely to forage in the vicinity of the proposed development site. Even in the event that the construction phase of the proposal coincides with construction of other projects in the immediate vicinity, there will be no significant disturbance or displacement effects on badgers. Badgers are widespread in Ireland and found in close proximity to human settlements, including in Dublin City, and therefore are likely to adapt to changes in human activity levels in the proposed development site and surrounding area.

Potential for Direct Harm to Badgers During Construction

In the absence of mitigation there is potential for accidental direct harm to badgers to occur during construction. This is because it is a possibility that Badger will establish new setts within the proposed development site before construction works commence, and the locations of potential newly established setts could be within the ZoI of the proposed development. This scenario has been taken into account in the mitigation strategy, with measures designed to prevent direct and indirect harm coming to badgers.

5.5.7 Small Mammals

5.5.7.1 Potential Impacts

Effects of Habitat Loss

The proposed development site has the potential to be used by hedgehogs and pygmy shrew, due to suitable habitat for foraging, commuting and breeding purposes, and their presence in the wider environment as identified during the desktop review. The conversion of the lands to buildings and artificial surfaces, along with associated landscaping proposals, will reduce the amount of semi-natural habitat available for foraging small mammals on site. Considering the abundance of similar habitats in the wider environs, the overall loss of habitat for small mammals is not considered significant at any geographic scale.

Furthermore, given the relatively low numbers of individuals of each species that are likely to be affected, and that they are highly mobile species, vegetation 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.

Effects Arising from Disturbance or Displacement of Foraging Small Mammals

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 small mammal species from both breeding/resting places and from foraging habitat. However, given the predicted duration of construction for the proposed development, disturbance will be a temporary impact and is therefore extremely unlikely to result in any long-term effects on the local small mammal populations or their conservation status. Therefore, disturbance/displacement during construction is unlikely to result in a significant negative effect, at any geographic scale.

[5] "Studies in several Irish counties have shown that territory size can vary from as little as 15ha to almost 300ha, with a mean of 80ha". Source: https://www.vincentwildlife.ie/species/badger

5.5.8 Breeding Birds

5.5.8.1 Potential Impacts

Effects of Habitat Loss on Birds

The trees, scrub, hedgerows and treelines in the lands are of good suitability for nesting bird species. Species that commonly nest in these habitats were encountered during surveys of the lands in 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 reason:

- While the lands will be of lower suitability for foraging species for the duration of the construction phase of the development (owing to disturbance and the removal of suitable vegetation), the implementation of landscape planting will enhance the lands in terms of foraging opportunities for common bird species encountered during the surveys (a number of fruiting tree species are included in the landscaping proposals which will provide a foraging resource for local birds).

The effects of habitat loss on ground-nesting species arising from the proposed development will not be significant at any geographic scale considering the amount of alternative suitable habitat available in the local area.

Effects of Mortality and Disturbance on Bird Species

The potential for disturbance is likely to arise from noise associated with the construction phase of the proposed development. A range of bird species utilise the proposed development site to forage within. While there is some potential for short-term disturbance of bird species foraging within the lands at the early stage of construction, it is anticipated that birds will acclimatise to human presence. This is because the lands are located in a suburban-rural locality, and the bird species noted on site are generally associated with gardens and other suburban habitats frequented by people. The potential for disturbance of foraging bird species during construction is not considered to be significant at any geographic scale.

The proposed development site contains several common species of bird, many of which are likely to nest within hedgerows, treelines, immature woodland and scrub. There is potential for direct impacts on nesting birds and/or mortality of birds arising from the clearance of vegetation within the site.

If site clearance works were to be undertaken during the bird breeding season (March to August, inclusive) it is likely that nest sites holding eggs or chicks will be destroyed and birds killed.

Mortality of birds at the scale of the proposed development, over what is likely to be a single breeding bird season in terms of completing site clearance works, will probably have a short-term effect on local breeding bird population abundance. However, in the longer-term this would be unlikely to affect the ranges of the breeding bird species recorded in the study area nor would it be likely to affect the long-term viability of the local populations.

Mortality of birds during site clearance works is not predicted to affect the conservation status of any of the breeding bird species present within the study area.

Nevertheless, owing to the legal protection afforded to birds under the Wildlife Acts, mitigation measures are included to minimise the risk of bird mortality during site clearance.

The potential for disturbance of breeding bird species during construction is considered to be significant at the local geographic scale.

With regards to the height and location of the buildings, the site is not regarded to be a particularly sensitive site for breeding birds - based on the surveys undertaken, the site supports low numbers of common passerine species only. It is not located along an important migratory route for bird species, and the proposed development does not pose a significant collision risk for bird species. From a review of available literature on the subject, bird collisions with man-made structures are common and well documented (Banks, 1979; Klem, 1990; Jenkins et al., 2010; Erickson et al., 2005; and; Erickson et al., 2001) with migratory passerine species the most prevalent collision victims (Bing et al., 2012; and; Longcore et al., 2013). Bird collision with buildings is generally associated with reflective material such as windows or large surfaces of glass which create a mirror and appear to show the continuation of the sky or surrounding landscape, an effect that can be exacerbated by lighting (Sheppard & Phillips, 2015). Whilst the design of the facades of the proposed buildings does include large areas of glazing, it

should be noted other materials are also proposed on the external surfaces of the buildings. For example, in Block BO, the tallest building in the proposed development, large expanses of glazing are proposed but the mullions and transoms of these windows will be composed of natural anodized aluminium. Pale bricks will also form part of the external finish of the building, As well as creating a strong architectural identity, the use of different materials here interrupts the glazing, making the building more detectable to birds. In the absence of mitigation there could be a low level of mortality attributable to bird collision with glazing on the lower levels of the proposed building, however this impact is unlikely to cause any significant effect at a local scale.

5.5.9 Wintering Birds

5.5.9.1 Potential Impacts

Effects of Habitat Loss on Birds

The habitats, grasslands, hedgerows and treelines in the lands are of good suitability for foraging non-SCI wintering passerine species. The proposed development site is not capable of supporting populations of any SCI wintering birds due to an absence of suitable habitat (e.g. wetland habitats, amenity grassland for inland foraging birds etc.).

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. Non-SCI wintering birds will benefit from the implementation of landscape planting similarly to breeding birds. Due to aforementioned factors, the effects of habitat loss on wintering bird species arising from the proposed development will not be significant at any geographic scale.

Effects of Mortality and Disturbance on Bird Species

The potential for disturbance is likely to arise from noise associated with the construction phase of the proposed development. For birds, construction-related disturbance effects would not be expected to extend beyond a distance of *c.* 300m, as noise levels associated with general construction activities would attenuate to close to background levels at that distance (Cutts et al., 2009). A range of wintering passerine species may utilise the proposed development site to forage within. While there is some potential for short-term disturbance of bird species foraging within the lands at the early stage of construction, it is anticipated that birds will acclimatise to human presence. This is because the lands are located in a semi-urban locality, and the wintering passerine species are generally associated with gardens and other urban habitats frequented by people. The potential for disturbance of foraging wintering passerine species during construction is not considered to be significant at any geographic scale.

With regards to the height and location of the buildings, the site is not located along an important migratory route for wintering bird species, is not located in close proximity to any significant wetland feature which could be used by ducks and waders, and the proposed development does not pose a significant collision risk for bird species. From a review of available literature on the subject, bird collisions with man-made structures are common and well documented (Banks, 1979; Klem, 1990; Jenkins et al., 2010; Erickson et al., 2005; and; Erickson et al., 2001) with migratory passerine species the most prevalent collision victims (Bing et al., 2012; and; Longcore et al., 2013). Bird collision with buildings is generally associated with reflective material such as windows or large surfaces of glass which create a mirror and appear to show the continuation of the sky or surrounding landscape, an effect that can be exacerbated by lighting (Sheppard & Phillips, 2015). Whilst the design of the facades of the proposed buildings does include large areas of glazing, it should be noted other materials are also proposed on the external surfaces of the buildings. For example, in Block BO, the tallest building in the proposed development, large expanses of glazing are proposed but the mullions and transoms of these windows will be composed of natural anodized aluminium. Pale bricks will also form part of the external finish of the building, As well as creating a strong architectural identity, the use of different materials here interrupts the glazing, making the building more detectable to birds. In the absence of mitigation there could be a low level of mortality attributable to bird collision with glazing on the lower levels of the proposed building, however this impact is unlikely to cause any significant effect at a local scale.

5.6 POTENTIAL CUMULATIVE IMPACTS

According to the *Dún Laoghaire-Rathdown County Development Plan 2016-2022*, the proposed development site and its environs are currently zoned as "*Objective A: To protect and-or improve residential amenity*". The surrounding lands comprise residential, commercial and agricultural lands as well as Carrickmines Golf Club.

The Strategic Environmental Assessment (SEA) prepared for the *Dún Laoghaire-Rathdown County Development Plan 2016-2022* includes various mitigation measures to avoid/ reduce the environmental impacts of the Plan. These mitigation measures are in the form of protective policies and objectives, which all development within the County must comply with. Likewise, an SEA was prepared for the *Ballyogan and Environs LAP 2019-2025* which included mitigation measures in the form of protective policies and objectives to avoid/ reduce/ offset potential significant adverse effects of implementing the Plan. Development within the administrative boundary of the *Ballyogan and Environs LAP 2019-2025* must comply with these protective policies and objectives.

Existing or proposed projects or plans impacting on the same key ecological receptors have the potential to lead to impacts of a higher level of significance when assessed cumulatively. The most likely of these potential impacts is the potential for impacts in Killiney Bay via surface and foul water discharges. In summary, Killiney Bay is currently unpolluted and the proposed development, even in the absence of mitigation measures, will not result in any appreciable effect on water quality in Killiney Bay. There are also protective policies and objectives in place at a strategic planning level (e.g. *Dún-Laoghaire – Rathdown County Development Plan 2016-2022* and the Eastern and Midland Regional Assembly's *Regional Spatial and Economic Strategy 2019-2031*) to protect water quality in Killiney Bay.

Potential cumulative impacts on commuting and foraging bats have also been considered. Further development in the area could result in further habitat loss or fragmentation of linear landscape features such as treelines and hedgerows and increases in artificial lighting, all of which would have a detrimental effect on local bat populations. Given the nature of the surrounding environment (consisting of existing residential dwellings, commercial and agricultural lands) it is unlikely that there would be wide-scale vegetation clearance in the surrounding locality. Agricultural lands to the south of the proposed development site are zoned as "*Objective G: To protect and improve high amenity areas*" and "*Objective B: To protect and improve rural amenity and to provide for the development of agriculture*", while those to the west are zoned as "*Objective F: To preserve and provide for open space with ancillary active recreational amenities*". The zoning objectives do not allow for large-scale development on these lands and essentially protect the lands from development. A review of planning application in the area, accessed via the Dun-Laoghaire- Rathdown County Council Online Planning Search facility[6], did not reveal any live planning applications within the immediate vicinity of the proposed development site. Furthermore, permitted applications in the immediate locality of the proposed development site mainly comprise minor residential development/ modifications/ extensions to existing residential dwellings. The Biodiversity Chapter which forms part of the EIAR for the permitted mixed-use development at lands known as Q3, situated in The Park, Carrickmines, has been reviewed as part of the cumulative assessment. The Biodiversity Chapter prepared in respect of the Q3 development acknowledges that the Q3 development will result in a loss of foraging routes for bats, but states that following implementation of the mitigation measures proposed, "*there are expected to be no residual negative effects to flora and fauna which can be considered significant*". Therefore, it can be concluded that no large-scale developments have been permitted in the area, which could give rise to significant cumulative impacts with regards habitat loss or fragmentation for local bats. In addition, the suburban nature of the surrounding environment means that artificial lighting is already widespread, and it is likely that any local bats using the area are habituated to some level of night-time lighting and that core foraging areas in the wider area consist of unlit green areas such as local parks, watercourses and recreational areas such as Carrickmines Golf Club. Therefore, significant cumulative impacts, on local bats, can be excluded.

Potential cumulative impacts on breeding birds and mammals (e.g. otter, badger and small mammals), with regard habitat loss and fragmentation has also been examined. Similarly, to the potential for cumulative impacts on bats as a result of habitat loss/ fragmentation, the nature of the surrounding environment (consisting of existing residential dwellings, commercial and agricultural lands) means that it is unlikely that there would be wide-scale vegetation clearance in the surrounding locality which could result in wide scale removal/ fragmentation of breeding bird habitat or suitable foraging and commuting habitat for protected mammal species. Based on a review of orthophotography there is ample undeveloped lands in the surrounding environment (e.g. agricultural lands, areas of dense scrub/ immature woodland/ boundary features such as treelines and hedgerows) which are likely to be used by breeding birds and protected mammal species. As outlined above, it is highly unlikely that any development requiring large-scale vegetation clearance would occur in the vicinity of the proposed development

[6] Dun-Laoghaire- Rathdown County Council Online Planning Search facility. Available at: https://dlrcocouncil.maps.arcgis.com/apps/webappviewer/index.html?id=af21eeb123224c4c877f410139ed1e69 [Accessed 23/10/2020]

site because of the existing zoning objectives in place for surrounding lands. Furthermore, the Biodiversity Chapter which forms part of the EIAR for the permitted mixed-use development at lands known as Q3, situated in The Park, Carrickmines, notes that impacts to badgers during construction include disturbance, loss of badger setts and potential mortality risk to animals during construction. Mitigation measures to avoid/ reduce the effects of these impacts was provided in the Q3 development Biodiversity Chapter which states that following implementation of the mitigation measures proposed, "*there are expected to be no residual negative effects to flora and fauna which can be considered significant*". Therefore, significant cumulative impacts, as a result of habitat loss/ fragmentation to breeding birds or protected mammal species, can be excluded.

5.7 'DO NOTHING' IMPACT

Under the likely "do-nothing" scenario, the site would not be expected to change significantly. The lack of management would more than likely result in the habitats becoming more overgrown and scrubby with disturbed areas gradually being colonised by opportunistic species. Local fauna would continue to use the site as they currently do and the site would be expected to maintain its current ecological value.

5.8 AVOIDANCE, REMEDIAL & MITIGATION MEASURES

5.8.1 Nationally Designated Sites

5.8.1.1 Mitigation Measures

As set out in Section 5.5.2.1, there is no potential for the proposed development site to result in significant effects on nationally-designated sites as a result of hydrological impacts. Therefore, mitigation measures to this effect are not required. There is the potential for landscaping proposals to result in the introduction of invasive species on site, and potentially to downstream habitats, as outlined in Section 5.5.2.1. Mitigation measures to avoid such an impact are provided in Section 5.8.2.1.3.

5.8.1.2 Significance of Residual Effects

Residual effects on nationally designated sites will be reduced to levels not considered significant, following adherence to the measures outlined in Section 5.8.2.1.3 and the proposed development is compliant with Policies LHB29 and LHB22 of the *Dún-Laoghaire – Rathdown County Development Plan 2016-2022* (Dún-Laoghaire – Rathdown County Council, 2016), with respect to the protection of nationally designated sites.

5.8.2 Habitats & Flora

5.8.2.1 Mitigation Measures

5.8.2.1.1 Retention and Protection of Vegetation during Construction

BIO CONST 1: Any vegetation (including trees, hedgerows or treelines, or areas of woodland adjacent to, or within, the proposed development boundary) 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 along the proposed development boundary that are to be retained, both within and adjacent to the proposed development boundary (where the root protection area of the tree extends into the proposed development boundary), 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 10m 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 any retained hedgerows to ensure that the root protection areas are not damaged.

5.8.2.1.2 Habitat Enhancement

BIO OPER 1: The following relatively simple measures will be undertaken to enhance the biodiversity value of the proposed development:

- The use of herbicides in the maintenance of landscaping will be avoided, thus allowing a greater diversity of species to become established within existing habitats.
- Where practical, a low-intensity mowing regime will be adopted in areas of open space/ amenity, in order to enhance the habitats potential to support a range of pollinator species.

5.8.2.1.3 Prevent the Introduction of Non-native Invasive Species Through Landscaping Proposals

BIO CONST 2: The landscaping proposals, for this application, have been reviewed by a suitably qualified ecologist to ensure that no species listed on the Third Schedule of the *Birds and Natural Habitats Regulations* are included in the planting scheme.

The following recommendations have also been made with regards to the landscaping proposals:

- Seed mixes for proposed wildflower meadows/ wetland areas will be of Irish provenance. Seed mixes will be sourced from Design by Nature (http://wildflowers.ie/) or similar, to ensure that the mixes obtained are suitable for the environmental/ ground conditions and comprise species native to Ireland.
- Planting lists will include pollinator-friendly species and species which provide a foraging resource for local wildlife (e.g. fruiting trees which provide a foraging resource for birds etc.).
- The majority of proposed trees will be native species, with non-native specimen trees proposed at the podium level only to provide shape and character in this setting. Native trees, or varieties of such, proposed include *Alnus glutinosa, Sorbus aucuparia, Prunus padus/ Prunus avium, Betula pubescens, Pinus sylvestris* "frensham" and *Corylus avellana* "Red majestic". Trees will be sourced from Irish nurseries to reduce the risk of imported diseases etc.

5.8.2.1.4 Protection of Vegetation from Dust during Construction

BIO CONST 3: To control dust emissions during construction works, standard mitigation measures shall be implemented, which include: spraying of exposed earthwork activities and site haul roads during dry and/or windy conditions; provision of wheel washes at exit points; control of vehicle speeds and speed restrictions (20 km/h on any un-surfaced site road); covering of haulage vehicles; and, sweeping of hard surface roads. These procedures will be strictly monitored and assessed on a daily basis.

Dust screens will be implemented at locations where there is the potential for air quality impacts on sensitive ecological receptors (i.e. within 100m of the works), such as the Golf Stream and Glenamuck North River, during the construction phase.

5.8.2.1.5 Protection of the Surface Water Quality of the Golf Stream during Construction

BIO CONST 4: The following general measures will be taken with regards the protection of surface water quality in the Golf Stream during the construction phase of the proposed development:

- Exclusion zones of between 5- 10m will be employed along the banks of the Golf Stream and construction vehicles will be excluded from this area. Exclusion zones will be defined by erecting a 1m high barrier along the watercourse formed by steel road pins supporting an orange PVC barrier with warning signs appropriately fixed at regular intervals.
- To prevent direct surface water runoff generated on site during construction from entering the Golf Stream, surface water discharge from the site will be managed and controlled for the duration of the construction works until the permanently attenuated surface water drainage system of the proposed development site is completed. A temporary drainage system will be installed prior to the commencement of the construction works, to collect surface water runoff during construction.

- All oils, fuels, paints and other chemicals will be stored in a secure bunded construction hardstand area. Refuelling and servicing of construction machinery will take place in a designated hardstand area which is also remote from any surface water features (e.g. Golf Stream) when not possible to carry out such activities off site.
- A response procedure will be put in place to deal with any accidental pollution events and spillage kits will be available and construction staff will be familiar with the emergency procedures and use of the equipment.
- Concrete batching will take place off site. Wash down and wash out of concrete trucks will take place off site, at locations where there is no risk of run-off to receiving drainage features or watercourses, and any excess concrete will not be disposed of on site. Pumped concrete will be monitored to ensure there is no accidental discharge. Mixer washing will not be discharged into surface water drains.
- Discharge from any vehicle wheel wash areas will be directed to on-site settlement tanks/ponds. Debris and sediment captured by vehicle wheel washes will be disposed off-site at a licensed facility.
- Foul drainage discharge from the construction compound will be tankered off site to a licensed facility until a connection to the public foul drainage network has been established.
- Weather conditions and seasonal weather variation will be taken into account when planning stripping of topsoil and excavations, with an objective of minimising soil erosion and sediment runoff. These activities will not take place during heavy or prolonged periods of rainfall.

5.8.2.1.6 Specific Measures to Ensure Protection of the Golf Stream During Bridge Construction

BIO CONST 5: The Inland Fisheries Ireland's guidelines to achieve best practice will be implemented during the construction phase and the following mitigation measures will be implemented:

- Best site management practice for the control of silt and solids discharge into the watercourse.
- Excavation must be properly monitored; all topsoil is to be stored at a safe distance from the excavation.
- Earthworks to allow construction of abutments will be carried out to reduce existing ground levels to formation/foundation levels. Soil heap locations to be detailed in the appointed contractor's detailed construction management plan.
- Crane Setup for installation of main spans. Temporary access routes for craneage to be agreed prior to construction and be detailed in the contractor's detailed construction management plan. Construction of hard standing including foundations for crane outriggers need to be included.
- Prefabricated beams transportation. Delivery of precast elements to site. Storage area of prefabricated elements to be defined in contractor's construction management plan within reach of crane to minimise further disruption/construction traffic at river edge.
- Placement of prefabricated bridge beams. Crane position to be designed to minimise movements near river edge
- Demobilisation of crane.

5.8.2.2 Significance of Residual Effects

Residual effects on habitats and flora will be reduced to levels not considered significant, following adherence to the measures outlined in Section 5.8.2.1 and the proposed development is compliant with Policies LHB25 and LHB26 of the *Dún-Laoghaire – Rathdown County Development Plan 2016-2022* (Dún-Laoghaire – Rathdown County Council, 2016), and Policies BELAP SI5 and BELAP SI11 of the *Ballyogan and Environs LAP 2019-2025*, with respect to the protection of watercouses and hedgerows.

5.8.3 Bats

5.8.3.1 Mitigation Measures

5.8.3.1.1 Measures to Protect Bats during Vegetation Clearance

BIO CONST 6: All bat species and their roost sites are strictly protected under both European and Irish legislation including:

- Wildlife Act 1976 and Wildlife (Amendment) Act, 2000 (S.I. No. 38 of 2000)
- Council Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna 1992 (Council Directive 92/43/EEC)
- European Communities (Birds and Natural Habitats) Regulations, 2011

It is an offence under Section 23 of the Wildlife Acts 1976-2017 and under Section 51 of the European Communities (Birds and Natural Habitats) Regulations, 2011 to kill a bat or to damage or destroy the breeding or resting place of any bat species. Under the European Communities (Birds and Natural Habitats) Regulations it is not necessary that the action should be deliberate for on offence to occur. A derogation may be granted by the Minister where there is no satisfactory alternative and the derogation is not detrimental to the maintenance of the populations of the species to which the Habitats Directive relates at a favourable conservation status in their natural range.

The following mitigation measures are proposed in relation to the felling of any mature trees on site. All mature trees on site were identified as being potentially suitable for roosting bats. Bats could occupy suitable roosting features at any time prior to the commencement of works. Therefore, there is an inherent risk that bats could be affected by the proposed felling works. The following mitigation procedures will be followed:

- In the unlikely event that roosting bats are found on the site during works, the works will immediately cease in that area and the local NPWS Conservation Ranger will be contacted. If bats are found to be roosting on the site, a derogation licence will be required from the NPWS and appropriate alternative roosting sites will be provided in the form of bat boxes. The bats will be removed by hand by a suitably qualified and licenced bat surveyor, under licence from the NPWS.
- Trees which have potential to support roosting bats, will be felled during the periods April-May or September – October, as during this period bats are capable of flight and may avoid the risks from tree felling if proper measures are undertaken, but are also neither breeding nor in hibernation.
- Trees with potential to support roosting bats will be felled in one of the following two methodologies, depending on the potential roost features identified, and an ecologist must be present during felling of these trees:

a. Trees will be section felled and the felled parts left in situ on the ground for a period of 24 hours. This should allow any bats present to escape or bats extracted by a licenced bat worker and placed in bat boxes to be erected on site.
b. Trees will be felled using heavy plant to push over the tree. In order to ensure the optimum warning for any roosting bats that may still be present, the tree will be pushed lightly two to three times, with a pause of approximately 30 seconds between each nudge to allow bats to become active. The tree will then be pushed to the ground slowly and should remain in place until it is inspected by a bat specialist.
c. The project ecologist will determine which of the above felling methodologies is most suitable for each tree with potential to support roosting bats. All other trees on site (i.e. those which are not identified as having potential to support roosting bats) can be felled in the usual manner.

- Where remedial works (e.g. pruning of limbs or removal of dense ivy) is to be undertaken to trees deemed to be suitable for bats (e.g. all mature trees on site), the affected sections of the tree will be checked by a bat specialist (using endoscope under a separate derogation licence held by that individual) for potential roost features before removal. For limbs containing potential roost features high in the tree canopy, this will necessitate the rigging and lowering of the limb to the ground (with the potential roost feature intact) for inspection by the bat specialist before it is cut up or mulched. If bats are found to be present, they will be removed by a bat specialist licenced to handle bats and released in the area in the evening following capture.

5.8.3.1.2 Measures to Enhance the sites Roosting Potential for Bats

BIO OPER 2: In order to enhance the proposed development sites roosting potential for local bats, 6no. Schwegler 1FF bat boxes will be erected on suitable retained trees in suitable locations within the site. This will provide additional roosting opportunities for local bats, and recognises the degree of tree loss the proposed development requires. An ecologist will advise on the location and position of any bat boxes to be installed, paying consideration to the aspect and height etc. that the bat box will be located at.

5.8.3.1.3 Measures to Reduce the Effects of Lighting on Bats During Construction

BIO CONST 7: Any external lighting to be installed, including facilitating night time working or security lighting, on the site will be sensitive to the presence of bats in the area. Lighting of the site during construction will be designed in accordance with the following guidance:

- *Guidance Notes for the Reduction of Obtrusive Light GN01* (Institute of Lighting Professionals, 2020)
- *Bats & Lighting - Guidance Notes for Planners, Engineers, Architects and Developers (*Bat Conservation Ireland, December 2010)
- *Bats and Lighting in the UK – Bats and the Built Environment Series* (Bat Conservation Trust UK, January 2008).

5.8.3.2 Significance of Residual Effects

Residual effects on bats will be reduced to levels not considered significant, following adherence to the measures outlined in Section 5.8.3.1 and the proposed development is compliant with Policies LHB19 and LHB23 of the *Dún-Laoghaire – Rathdown County Development Plan 2016-2022* (Dún-Laoghaire – Rathdown County Council, 2016), with respect to the protection of natural heritage and areas which are important for protected species, and Policy BELAP ENV13 of the *Ballyogan and Environs LAP 2019-2025* with respect to surveys for protected mammal species.

5.8.4 Otter

5.8.4.1 Mitigation Measures

5.8.4.1.1 Measures to Protect Otter During Construction

BIO CONST 8: As otter could potentially establish new holts in the future within the ZoI of the proposed development, in particular along the Golf Stream, a pre-construction confirmatory survey of all suitable habitat along the banks of the Golf Stream will be required within 12 months of any construction works commencing. Any new otter holts present will be afforded protection in line with the requirements set out in the National Roads Authority's *Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes* (2008).

5.8.4.1.2 Measures to Protect Otters from Artificial Lighting During Construction

BIO CONST 9: Whilst it is not envisaged that there will be any requirement for night-time working during construction, the following measure is proposed as a precautionary measure, to protect otter from artificial lighting during the construction phase of the proposed development:

- Night-time working, and installation of associated artificial lighting, will not be permitted within the vicinity of the Golf Stream on site;
- Flood lighting of the proposed development site, particularly in the vicinity of the Golf Stream, will not be permitted;
- Artificial lighting to accommodate night-time working in other areas of the site will be designed in a manner which is sensitive to the potential presence of nocturnal wildlife and will endeavour to maintain baseline light levels in sensitive areas.

5.8.4.1.3 Measures to Prevent Water Pollution

BIO CONST 10: Mitigation measures outlined for the protection of depositing/lowland river habitat with the Golf Stream in Sections 5.8.2.1.5 and 5.8.2.1.6 will mitigate the effects of surface water pollutants on prey availability of otter and potential oil spills.

5.8.4.2 Significance of Residual Effects

Residual effects on otter will be reduced to levels not considered significant, following adherence to the measures outlined in Section 5.8.4.1 and the proposed development is compliant with Policies LHB19, LHB23 and LHB25 of the *Dún-Laoghaire – Rathdown County Development Plan 2016-2022* (Dún-Laoghaire – Rathdown County Council, 2016), with respect to the protection of natural heritage, areas which are important for protected species and rivers and waterways, and Policy BELAP ENV13 of the *Ballyogan and Environs LAP 2019-2025* with respect to surveys for protected mammal species.

5.8.5 Badger

5.8.5.1 Mitigation Measures

5.8.5.1.1 Measures to Protect Badgers During Construction

BIO CONST 11: The mitigation measures described below follow the recommendations set out in the *Guidelines for the Treatment of Badgers during the Construction of National Road Schemes (*National Roads Authority, 2006c). These guidelines set out the best practice approach in considering and mitigating impacts on badgers during construction works.

As badger could potentially establish new setts in the future within the ZoI of the proposed development, a pre-construction check of all suitable habitat within the proposed development boundary will be required within 12 months of any construction works commencing. Any new badger setts present will be afforded protection in line with the requirements set out in the TII/NRA guidance document as follows:

- Badger setts will be clearly marked and the extent of bounds prohibited for vehicles clearly marked by fencing and signage
- No heavy machinery shall be used within 30m of badger setts; lighter machinery (generally wheeled vehicles) shall not be used within 20m of a sett entrance; light work, such as digging by hand or scrub clearance shall not take place within 10m of sett entrances
- During the breeding season (December to June inclusive), none of the above works shall be undertaken within 50m of active setts, nor blasting or pile driving within 150m of active setts
- Works can be undertaken within these zones following consultation with, the approval of and, if required, under the supervision of a badger ecologist

As the proposed development will not result in the loss of any badger setts, there is no requirement to construct any artificial setts as part of the mitigation strategy.

5.8.5.2 Significance of Residual Effects

Residual effects on badger will be reduced to levels not considered significant, following adherence to the measures outlined in Section 5.8.5.1 and the proposed development is compliant with Policies LHB19 and LHB23 of the *Dún-Laoghaire – Rathdown County Development Plan 2016-2022* (Dún-Laoghaire – Rathdown County Council, 2016), with respect to the protection of natural heritage and areas which are important for protected species and Policy BELAP ENV13 of the *Ballyogan and Environs LAP 2019-2025* with respect to surveys for protected mammal species.

5.8.6 Small Mammals

5.8.6.1 Mitigation Measures

As there is no risk of a significant negative effect from the proposed development on the local small mammal populations, mitigation measures intended to avoid or reduce any harmful effects of their populations are not required.

5.8.6.2 Significance of Residual Effects

No residual effects on small mammals are predicted as a result of the proposed development and the proposed development is compliant with Policies LHB19 and LHB23 of the *Dún-Laoghaire – Rathdown County Development Plan 2016-2022* (Dún-Laoghaire – Rathdown County Council, 2016), with respect to the protection

of natural heritage and areas which are important for protected species, and Policy BELAP ENV13 of the *Ballyogan and Environs LAP 2019-2025* with respect to surveys for protected mammal species.

5.8.7 Breeding Birds

5.8.7.1 Mitigation Measures

5.8.7.1.1 Measures to Protect Breeding Birds During Construction

BIO CONST 12: 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 3 days of the nest survey, otherwise repeat surveys will be required.

5.8.7.1.2 Measures to Provide Additional Nesting Opportunities for Breeding Birds

BIO OPER 3: In order to enhance the availability of nesting habitat for local populations of breeding birds, 6no. bird boxes, of different designs, will be erected on suitable retained trees, in suitable locations.

5.8.7.2 Significance of Residual Effects

Residual effects on breeding birds will be reduced to levels not considered significant, following adherence to the measures outlined in Section 5.8.7.1 and the proposed development is compliant with Policies LHB19 and LHB23 of the *Dún-Laoghaire – Rathdown County Development Plan 2016-2022* (Dún-Laoghaire – Rathdown County Council, 2016), with respect to the protection of natural heritage and areas which are important for bird species.

5.8.8 Wintering Birds

5.8.8.1 Mitigation Measures

As there is no risk of a significant negative effect from the proposed development on wintering birds, mitigation measures intended to avoid or reduce any harmful effects of their populations are not required.

5.8.8.2 Significance of Residual Effects

No residual effects on wintering birds are predicted as a result of the proposed development and the proposed development is compliant with Policies LHB19 and LHB23 of the *Dún-Laoghaire – Rathdown County Development Plan 2016-2022* (Dún-Laoghaire – Rathdown County Council, 2016), with respect to the protection of natural heritage and areas which are important for bird species.

5.9 PREDICTED RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

Post-construction, the proposed development will result in changes to the existing habitats on site. Habitats will be more modified in nature than those currently found on site. In addition, the removal of substantial amounts of vegetation, and proposed landscape planting, will result in changes to the potential breeding habitats for birds on site, as well as a potential reduction in the extent of suitable foraging habitat for badgers and small mammal species (e.g. hedgehog and pygmy shrew). Increased artificial lighting, and removal of existing mature trees, may impact local commuting and foraging bat species, as well as mammals such as otter and badger. Mitigation to avoid or reduce significant impacts on key ecological receptors has been provided.

5.10 MONITORING

The following monitoring is proposed for the proposed development site, post-construction:

<u>Bird Boxes:</u>

- Monitoring of use of the prescribed bird boxes will take place in summer, to check for nesting activity, for 3 years post-completion of the development, to determine if they need to be relocated within the site.

<u>Bat Boxes</u>

- Monitoring of use of proposed bat boxes will be undertaken annually for 5 years, by a suitably qualified and experienced bat ecologist, to check for roosting activity. Monitoring will take place twice a year- once in April/ May and once in September/ October. Results of the monitoring surveys will be provided to the competent authority.

5.11 REINSTATEMENT

In the event that the full extent of the proposed development is not completed under this application, it is unlikely that any significant impacts on biodiversity would occur. The exception to this would be if the replacement trees were not planted on site, following the felling of the majority of existing trees on site, which would leave the proposed development site almost devoid of vegetation. This would have significant impacts on local fauna (e.g. breeding birds, bats etc). However, the planting of replacement trees is a mitigation measure expressly committed to in the EIAR and, in the event that permission is granted in accordance with the plans and particulars submitted with the planning application – including the EIAR – such replacement planting would be required pursuant to a planning condition.

5.12 INTERACTIONS

5.13

The main interaction relating to this EIAR Chapter on Biodiversity is with regards Water. Interactions exist between potential impacts on hydrology with respect to the potential impact of water pollution on local watercourses (e.g. the Golf Stream) and protected areas in downstream designated sites. Potential negative impacts on local watercourses could give rise to impacts on the aquatic environments and fauna that utilise these resources and are supported by these watercourses. With regards to potential for impacts to occur on downstream designated European sites, the Appropriate Assessment Screening report has determined that likely significant effects can be excluded. Furthermore, Section 5.5.2.1 has concluded that impacts on nationally designated sites located downstream of the proposed development site can also be excluded. In the context of the EIA to be conducted by the Board (but not the AA Screening), consideration should be given to the mitigation measures outlined in Sections 8.8.1.1 and 8.8.1.2 of Chapter 8: Water, and referred to in Section 5.8.2.1.5 and 5.8.2.1.6 of this Chapter aim to avoid/ minimise impacts on hydrology during the construction of the proposed development.

Interactions also exist with Landscape and Visual, Noise and Vibration and Air and Climate. Chapter 9: Air Quality and Climate concludes that no significant effects on climate are predicated as a result of either the construction or operation of the proposed development. Impacts on climate at both phases are described as imperceptible. Landscaping proposals are relevant to biodiversity in that such proposal may affect the habitats that will be found on site post-development, and could have effects on protected species which use the site for foraging and commuting purposes (e.g. bats). However, landscaping proposals could also have a positive effect on biodiversity on the site through the provision of wildflower meadows and native species.

Noise impacts as a result of the construction and operation of the proposed development are relevant to biodiversity in that they can result in disturbance impacts to sensitive fauna (e.g. breeding birds) as described in 5.5.8.1. Air quality impacts are relevant to biodiversity in that the generation of dust during construction can affect sensitive habitats in the vicinity of the proposed development site (e.g. the Golf Stream, and other watercourses). This potential impact is described in 5.5.3.1, and mitigation to reduce this impact is provided in Section 5.8.2.1.4.

5.14 DIFFICULTIES ENCOUNTERED IN COMPILING

Habitat surveys were conducted in February 2020, which lies outside of the optimal survey period for most higher plant species. However, given the limited ecological value of the habitats identified on site, which are typical of the suburban environment, and the fact that a follow up site visit was carried out in September 2020 to record any changes to the baseline environment, this is not deemed to be a limitation, in that it has not inhibited the habitat classification, and does not affect the impact assessment and its conclusions.

The banks of the Golf Stream, which runs along the northern boundary of the proposed development site, were densely vegetated, often with impenetrable bramble and gorse scrub which made access quite restrictive. This is not regarded to be a limitation, as the proposed development will not impact on the existing watercourse.

With regards to the potential for otter holts to be present along the banks of this watercourse, the fact that the watercourse is highly modified at this location, with multiple concrete weirs and a sluice, together with a lack of evidence of otter activity, would mean that it would be unlikely that otter holts occur on site. Therefore, the overgrown nature of the banksides, and associated restricted access, is not a limitation that has compromised the impact assessment or its conclusions.

5.15 REFERENCES

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APPENDIX 5.1: EUROPEAN SITES IN THE VICINITY OF THE PROPOSED DEVELOPMENT SITE & THEIR QUALIFYING INTERESTS (QIS) (SEE FIGURE 5.2)

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)	
Knocksink Wood SAC [000725] [7220] Petrifying springs with tufa formation (Cratoneurion)* [91A0] Old sessile oak woods with Ilex and Blechnum in the British Isles [91E0] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)* NPWS (2020) *Conservation objectives for Knocksink Wood SAC [000725].* Generic Version 7.0. Department of Culture, Heritage and the Gaeltacht.	Located c. 4.7km to the south-west of the proposed development site
Ballyman Glen SAC [000713] [7220] Petrifying springs with tufa formation (Cratoneurion)* [7230] Alkaline fens NPWS (2019) *Conservation Objectives: Ballyman Glen SAC 000713*. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.	Located c. 4.9km to the south of the proposed development site
Rockabill to Dalkey Island SAC [003000] [1170] Reefs [1351] Harbour porpoise *Phocoena phocaena* NPWS (2013) *Conservation Objectives: Rockabill to Dalkey Island SAC 003000.* Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	Located c. 5.8km to the east of the proposed development site
Wicklow Mountains cSAC [002122] [3110] Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3160] Natural dystrophic lakes and ponds [4010] Northern Atlantic wet heaths with *Erica tetralix* [4030] European dry heaths [4060] Alpine and Boreal heaths [6130] *Calaminarian* grasslands of the *Violetalia calaminariae* [6230] Species-rich Nardus 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 (*Androsacetalia alpinae* and *Galeopsietalia ladani*) [8210] Calcareous rocky slopes with chasmophytic vegetation [8220] Siliceous rocky slopes with chasmophytic vegetation [91A0] Old sessile oak woods with *Ilex* and Blechnum in the British Isles [1355] *Lutra lutra* (Otter)	Located c. 6.4km to the south-west of the proposed development site

European Site Name [Code] and its Qualifying interest(s) / Special Conservation Interest(s) (*Priority Annex I Habitats)	Location Relative to the Proposed Development Site
NPWS (2017) *Conservation Objectives: Wicklow Mountains SAC 002122.* Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.	
South Dublin Bay SAC [000210] [1140] Mudflats and sandflats not covered by seawater at low tide [1210] Annual vegetation of drift lines [1310] *Salicornia* and other annuals colonising mud and sand [2110] Embryonic shifting dunes NPWS (2013) *Conservation Objectives: South Dublin Bay SAC 000210.* Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	Located c. 5.2km to the 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] *Salicornia* and other annuals colonising mud and sand [1330] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1395] Petalwort *Petalophyllum ralfsii* [1410] Mediterranean salt meadows (*Juncetalia maritimi*) [2110] Embryonic shifting dunes [2120] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2130] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2190] Humid dune slacks NPWS (2013) *Conservation Objectives: North Dublin Bay SAC 000206.* Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	Located c. 10.9km to the north-east of the proposed development site
Glenasmole Valley cSAC [001209] [6210] Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) [6410] Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [7220] Petrifying springs with tufa formation (*Cratoneurion*) NPWS (2020) *Conservation objectives for Glenasmole Valley SAC [001209].* Generic Version 7.0. Department of Culture, Heritage and the Gaeltacht.	Located c. 11.8km to the west of the proposed development site
Glen of the Downs SAC [000719] [91A0] Old sessile oak woods with Ilex and Blechnum in the British Isles NPWS (2020) *Conservation objectives for Glen of the Downs SAC [000719].* Generic Version 7.0. Department of Culture, Heritage and the Gaeltacht.	Located c. 12.6km to the south-east of the proposed development site

European Site Name [Code] and its Qualifying interest(s) / Special Conservation Interest(s) (*Priority Annex I Habitats)	Location Relative to the Proposed Development Site
Bray Head SAC [000714] [1230] Vegetated sea cliffs of the Atlantic and Baltic coasts [4030] European dry heaths NPWS (2017) *Conservation Objectives: Bray Head SAC 000714*. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.	Located c. 8.5km to the south-east of the proposed development site
Howth Head cSAC [000202] [1230] Vegetated sea cliffs of the Atlantic and Baltic coasts [4030] European dry heaths NPWS (2016) *Conservation Objectives: Howth Head SAC 000202.* Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.	Located c. 14km to the north-east of the proposed development site
Special Protection Area (SPA)	
Wicklow Mountains SPA [004040] [A098] Merlin *Falco columbarius* [A103] Peregrine *Falco peregrinus* NPWS (2020) *Conservation objectives for Wicklow Mountains SPA [004040].* Generic Version 7.0. Department of Culture, Heritage and the Gaeltacht.	Located c. 6.4km to the south-west of the proposed development site
Dalkey Islands SPA [004172] [A192] Roseate Tern *Sterna dougallii* [A193] Common Tern *Sterna hirundo* [A194] Arctic Tern *Sterna paradisaea* NPWS (2020) *Conservation objectives for Dalkey Islands SPA [004172].* Generic Version 7.0. Department of Culture, Heritage and the Gaeltacht.	Located c. 6.3km to the north-east of the proposed development site
South Dublin Bay and River Tolka Estuary SPA [004024] [A046] Light-bellied Brent Goose *Branta bernicla hrota* [A130] Oystercatcher *Haematopus ostralegus* [A137] Ringed Plover *Charadrius hiaticula* [A141] Grey Plover *Pluvialis squatarola* [A143] Knot *Calidris canutus* [A144] Sanderling *Calidris alba* [A149] Dunlin *Calidris alpina* [A157] Bar-tailed Godwit *Limosa lapponica* [A162] Redshank *Tringa totanus* [A179] Black-headed Gull *Croicocephalus ridibundus* [A192] Roseate Tern *Sterna dougallii* [A193] Common Tern *Sterna hirundo* [A194] Arctic Tern *Sterna paradisaea*	Located c. 5.2km to the north-east of the proposed development site

European Site Name [Code] and its Qualifying interest(s) / Special Conservation Interest(s) (*Priority Annex I Habitats)	Location Relative to the Proposed Development Site
[A999] Wetland and Waterbirds NPWS (2015) *Conservation Objectives: South Dublin Bay and River Tolka Estuary SPA 004024*. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	
North Bull Island SPA [004006] [A046] Light-bellied Brent Goose *Branta bernicla hrota* [A048] Shelduck *Tadorna tadorna* [A052] Teal *Anas crecca* [A054] Pintail *Anas acuta* [A056] Shoveler *Anas clypeata* [A130] Oystercatcher *Haematopus ostralegus* [A140] Golden Plover *Pluvialis apricaria* [A141] Grey Plover *Pluvialis squatarola* [A143] Knot *Calidris canutus* [A144] Sanderling *Calidris alba* [A149] Dunlin *Calidris alpina* [A156] Black-tailed Godwit *Limosa limosa* [A157] Bar-tailed Godwit *Limosa lapponica* [A160] Curlew *Numenius arquata* [A162] Redshank *Tringa totanus* [A169] Turnstone *Arenaria interpres* [A179] Black-headed Gull *Croicocephalus ridibundus* [A999] Wetlands & Waterbirds NPWS (2015) *Conservation Objectives: North Bull Island SPA 004006.* Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	Located c. 10.9km to the north-east of the proposed development site
Howth Head Coast SPA [004113] [A188] Kittiwake *Rissa tridactyla* NPWS (2020) *Conservation objectives for Howth Head Coast SPA [004113].* Generic Version 7.0. Department of Culture, Heritage and the Gaeltacht.	Located c. 14.8km to the north-east of the proposed development site

APPENDIX 5.2: DESK STUDY

Desk Study Flora and Fauna Records

The desktop study did not return any records of protected, rare, or other notable plant species, within 2km of the proposed development site.

Desktop records of protected, rare, or other notable fauna species, within 2km of the proposed development site, are listed below in Table 5.1. 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 or Amber 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 5.1 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[7]	Red List Status[8]	Source
Amphibians			
Common frog *Rana temporaria*	HD_V, WA	Least concern	NBDC online database record
Mammals			
Badger *Meles meles*	WA	Least concern	NBDC online database record
Otter *Lutra lutra*	HD_II, HD_IV, WA	Least concern	NBDC online database record
Brown long-eared bat *Plecotus auritus*	HD_IV, WA	Least concern	NBDC online database record
Common pipistrelle *Pipistrellus pipistrellus*	HD_IV, WA	Least concern	NBDC online database record

[7] 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

[8] Mammal Red-list from Marnell, F., Kingston, N. & Looney, D. (2009) *Ireland Red List No. 3: Terrestrial Mammals* and Marnell, F., Looney, D. & Lawton, C. (2019) *Ireland Red List No. 12: Terrestrial Mammals*.

Birds from Colhoun, K. & Cummins, S. (2013) 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[7]	Red List Status[8]	Source
Hedgehog *Erinaceus europaeus*	WA	Least concern	NBDC online database record
Leisler's bat *Nyctalus leisleri*	HD_IV, WA	Least concern	NBDC online database record
Pygmy shrew *Sorex minutus*	WA	Least concern	NBDC online database record
Red deer *Cervus elaphus*	WA	Least concern	NBDC online database record
Red squirrel *Sciurus vulgaris*	WA	Least concern	NBDC online database record
Soprano pipistrelle *Pipistrellus pygmaeus*	HD_IV, WA	Least concern	NBDC online database record
Birds			
Barn swallow *Hirundo rustica*	WA	Amber	NBDC online database record
Black-headed gull *Chroicocephalus ridibundus*	WA	Red	NBDC online database record
Common starling *Sturnus vulgaris*	WA	Amber	NBDC online database record
Common swift *Apus apus*	WA	Amber	NBDC online database record
Eurasian curlew *Numenius arquata*	BD_II, WA	Red	NBDC online database record
Eurasian teal *Anas crecca*	BD_II (I), III (II), WA	Amber	NBDC online database record
European greenfinch *Carduelis chloris*	WA	Amber	NBDC online database record
European robin *Erithacus rubecula*	WA	Amber	NBDC online database record
Goldcrest *Regulus regulus*	WA	Amber	NBDC online database record
House martin *Delichon urbicum*	WA	Amber	NBDC online database record
House sparrow *Passer domesticus*	WA	Amber	NBDC online database record
Mediterranean Gull *Larus melanocephalus*	BD_I, WA	Amber	NBDC online database record
Peregrine falcon *Falco peregrinus*	BD_I, WA	Green	NBDC online database record
Invertebrates			

Common Name/ Scientific Name	**Legal Status[7]**	**Red List Status[8]**	**Source**
Great yellow bumble bee *Bombus (Subterraneobombus) distinguendus*	none	Endangered	NBDC online database record
Lasioglossum (Lasioglossum) lativentre	none	Critically Endangered	NBDC online database record
Red-tailed carder bee *Bombus (Thoracombus) ruderarius)*	none	Vulnerable	NBDC online database record

APPENDIX 5.3: EXAMPLES OF ECOLOGICAL EVALUATION

Ecological Valuation Criteria
International Importance: • '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.[9] • 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)[10] of the following: o Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and / or o Species of animal and plants listed in Annex II and/or IV of the Habitats Directive. • Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971). • World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972). • Biosphere Reserve (UNESCO Man & The Biosphere Programme). • Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979). • Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979). • Biogenetic Reserve under the Council of Europe. • European Diploma Site under the Council of Europe. • Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).[11] •
National Importance: • Site designated or proposed as a Natural Heritage Area (NHA). • Statutory Nature Reserve. • Refuge for Fauna and Flora protected under the Wildlife Acts. • National Park. • Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park. • Resident or regularly occurring populations (assessed to be important at the national level)[12] of the following: o Species protected under the Wildlife Acts; and/or o Species listed on the relevant Red Data list. • Site containing 'viable areas'[13] of the habitat types listed in Annex I of the Habitats Directive.

[9] See Articles 3 and 10 of the Habitats Directive.
[10] 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.
[11] Note that such waters are designated based on these waters' capabilities of supporting salmon (*Salmo salar*), trout (*Salmo trutta*), char (*Salvelinus*) and whitefish (*Coregonus*).

Ecological Valuation Criteria

County Importance:
• Area of Special Amenity.[14]
• 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)[15] of the following:
  o Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
  o Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
  o Species protected under the Wildlife Acts; and/or
  o 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 (BAP) if this has been prepared.
• Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county.
• Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.

Local Importance (higher value):
• Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared;
• Resident or regularly occurring populations (assessed to be important at the Local level)[16] of the following:
  o Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
  o Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
  o Species protected under the Wildlife Acts; and/or
  o 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.

[12] 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.

[13] 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).

[14] 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.

[15] 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 importance where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

[16] 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.

Ecological Valuation Criteria
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.