5 Biodiversity

5.1 Introduction

5.1.1 Background

This Biodiversity Chapter for the Environmental Impact Assessment Report (EIAR) was prepared by Scott Cawley Ltd.

This Chapter provides an assessment of the potential impacts of the proposed development on biodiversity. The site is located on lands at St. Teresa's (Craigmore), Temple Hill, Monkstown, Blackrock, Co. Dublin ("the subject lands") (Centred on Irish Grid Reference O 21855 28949). (refer to Figure 5.1 for the location of the proposed development site). The proposed development consists of a strategic housing development ("SHD"), with associated landscaping, lighting and drainage. A detailed description of the proposed development is included in Chapter 3 of the EIAR.

The subject lands extend to c. 3.9ha in a mature landscaped setting adjoining Rockfield Park. The site is bounded to the north by Temple Road, with mature residential development to the east and the Alzheimer's Society of Ireland to the west. The site is within 1 km of Blackrock Village. The lands themselves are mostly comprised of areas of artificial surfaces and buildings, as well as grasslands, treelines and woodlands. The hardstanding areas within the proposed development site comprise an old nunnery and school house, as well as a gate lodge and associated paved areas and roads. The adjacent lands and wider environs are largely urban and residential in nature to the north, east and west, and largely amenity-related in nature to the south (beyond which there are further urban residential lands).
The proposed SHD will be built on the existing built areas (after demolition of the existing buildings) and hardstanding ground. The location of the proposed development site in relation to the surrounding environment is presented below in Figure 5.1.

Figure 5.1: Proposed development in the context of its surroundings. The Carysfort-Maretimo Stream (canalised and/or closed-culverted along much of its length) lies adjacent to but outside of the site.

5.1.2 Aims

The purpose of this chapter is to:

- Establish and evaluate the baseline ecological environment, as relevant to the proposed development
- Identify, describe, and assess all potentially significant ecological impacts associated with the proposed development
- Set out the mitigation measures required to address any potentially significant ecological impacts and ensure compliance with relevant nature conservation legislation
- Provide an assessment of the significance of any residual ecological impacts
- Identify any appropriate monitoring requirements

A separate, stand alone Appropriate Assessment Screening Report (AASR) (Scott Cawley Ltd., 2021) has been prepared and is being submitted as part of the planning application documentation. The AASR contains information relevant to the competent authority's assessment of potential impacts that may arise from the proposed development on any European site.

5.1.3 Planning, Policy and Legislation

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

The following EU legislation is relevant to the environmental assessment (including EIA and AA screening) of proposed development:

- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora; hereafter, referred to as the 'Habitats Directive'. The Habitats Directive is the legislation under which the Natura 2000 network[1] was established and special areas of conservation (SACs) are designated for the protection of natural habitat types listed in Annex I, and habitats of the species listed in Annex II, of that directive.
- Directive 2009/147/EEC; hereafter, referred to as the 'Birds Directive'. The Birds Directive is the legislation under which special protection areas are designated for the protection of endangered species of wild birds listed in Annex I of that directive.
- Directive 2000/60/EC; hereafter, referred to as the 'Water Framework Directive'. The Water Framework Directive is a piece of legislation adopted with the aim of attaining good status in all water bodies (rivers, lakes, groundwater and transitional (estuarine) and coastal waters) that are of lesser status at present and retaining good status or better where such status exists at present, throughout the EU. As part of this aim, the legislation requires the establishment of two primary monitoring programmes for water bodies: the Surveillance Monitoring (SM) and the Operational Monitoring (OM) networks for surface waters and groundwater.

The following national legislation is relevant to the proposed development:

[1] The Natura 2000 network is a European network of important ecological sites, as defined under Article 3 of the Habitats Directive 92/43/EEC, which comprises both special areas of conservation and special protection areas. Special conservation areas are sites hosting the natural habitat types listed in Annex I, and habitats of the species listed in Annex II, of the Habitats Directive, and are established under the Habitats Directive itself. Special protection areas are established under Article 4 of the Birds Directive 2009/147/EC for the protection of endangered species of wild birds. The aim of the network is to aid the long-term survival of Europe's most valuable and threatened species and habitats. In Ireland these sites are designed as European sites - defined under the Planning Acts and/or the Birds and Habitats Regulations as (a) a candidate site of Community importance, (b) a site of Community importance, (c) a candidate special area of conservation, (d) a special area of conservation, (e) a candidate special protection area, or (f) a special protection area. They are commonly referred to in Ireland as Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

- Wildlife Acts 1976 to 2020; hereafter collectively referred to as the 'Wildlife Acts'. The Wildlife Acts are the principal pieces of legislation at national level for the protection of wildlife and for the control of activities that may harm wildlife. All bird species, 22 other animal species or groups of species, and 86 species of flora are protected under this legislation.
- Planning and Development Acts 2000 to 2021; hereafter collectively referred to as the 'Planning and Development Acts'. Under the legislation, development plans (usually implemented at local authority level) must include mandatory objectives for the conservation of natural heritage and for the conservation of European Sites. The Planning and Development Acts and the Regulations made thereunder also set out the requirements in relation to environmental assessment with respect to applications for proposed strategic housing development, including transposition of relevant obligations under the the EIA, Habitats and Birds Directive into Irish law.
- European Communities (EC) (Birds and Natural Habitats) Regulations 2011 to 2015; hereafter the 'Birds and Habitats Regulations'. This legislation contains regulations (49 and 50) that deal with invasive species (those included within the Third Schedule of the regulations).
- Flora (Protection) Order, 2015. This lists species of plant protected under Section 21 of the Wildlife Acts.

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

- All-Ireland Pollinator Plan 2015-2020 (National Biodiversity Data Centre, 2015)
- Dun-Laoghaire-Rathdown County Development Plan 2016-2022 (Dun Laoghaire-Rathdown County Council, 2016)
- National Biodiversity Action Plan 2017-2021 (Department of Culture Heritage and the Gaeltacht, 2017)
- Draft Biodiversity Action Plan for Dun Laoghaire-Rathdown County 2022-2028 (Dun Laoghaire-Rathdown County Council, 2021). This lists Dun Laoghaire-Rathdown County's objectives and actions in relation to biodiversity within the county boundary and how they align with those listed in National Biodiversity Action Plan 2017-2021 (National Parks and Wildlife Service (NPWS), 2017).
- Blackrock Local Area Plan (Dún Laoghaire-Rathdown County Council, 2015).

5.2 Study Methodology

5.2.1 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*[2] and the guidance provided in *Guidelines for Ecological Impact Assessment in the UK and Ireland*[3] – refer to Appendix 5.2 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.

5.2.1.1 *Impact Assessment*

The biodiversity impact assessment has been undertaken with regard to the following guidance documents:

[2] NRA (2009) *Guidelines for Assessment of Ecological Impacts of National Roads Schemes: Revision 2*. National Roads Authority.
[3] CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland*. Chartered Institute of Ecology and Environmental Management, Winchester, UK.

- *Environmental Impact Assessment of Projects, Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017)*
- *Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Union, 2013)*
- *Guidelines on the information to be contained in Environmental Impact Assessment Reports. Draft, August 2017 (Environmental Protection Agency, 2017)*
- *Advice notes for Preparing Environmental Impact Statements. Draft September 2015 (Environmental Protection Agency, 2015)*
- *Guidelines for Ecological Impact Assessment in the UK and Ireland*[3]

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

5.2.1.2 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*[4] and CIEEM's *Guidelines for Ecological Impact Assessment in the UK and Ireland*: 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 following plans are also included in considering cumulative effects:

- Dun-Laoghaire-Rathdown County Development Plan 2016-2022 (Dun Laoghaire-Rathdown County Council, 2016)
- Blackrock Local Area Plan (Dún Laoghaire-Rathdown County Council, 2015).

The likelihood of an impact occurring, and the predicted effects, can also be an important consideration in characterising impacts. In some cases, excluding assessments under Article 6(3) of the Habitats Directive, the evaluation of significant effects is based on the best available scientific evidence but where reasonable doubt still remains then the precautionary principle is applied, and it may need to be assumed that significant effects may occur. Professional judgement is used in considering the contribution of all relevant criteria in determining the overall magnitude of an impact.

[4] Environmental Protection Agency. (2017) *Guidelines on the information to be contained in Environmental Impact Assessment Reports*. Draft, August 2017. (refer to Table 3.3)

5.2.1.3 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).

5.2.2 Scope of the Biodiversity Assessment

The study area is defined by the Zone of Influence (ZoI) of the proposed development with respect to the ecological receptors that could potentially be affected.

The 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 is confined to within the proposed development boundary.

The ZoI of potential impacts on surface water quality in the receiving environment extends downstream to freshwater, estuarine and coastal ecosystems associated with waterbodies that are hydrologically connected to the proposed development via the Carysfort-Maretimo Stream, which is located directly adjacent (west of) to the proposed development boundary.

The ZoI of air quality effects related to dust deposition is likely to be located within and/or adjacent to the proposed development site boundary.

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 16th April 2021 (and updated on 16th November 2021), to collect any available information on the local ecological environment. The following resources assisted in the production of this report, in addition to those listed in the Reference section of this report:

- Data on European sites, Natural Heritage Areas (NHAs) or proposed Natural Heritage Areas (pNHAs) as held by the National Parks and Wildlife Service (NPWS) from https://www.npws.ie/protected-sites and https://www.npws.ie/maps-and-data – refer to Appendix 5.1 and Figure 5.2 and Figure 5.3 for descriptions and locations of protected sites in the vicinity of the proposed development
- Records of rare and protected species, as held by the National Biodiversity Data Centre www.biodiversityireland.ie within c.2km of the proposed development site, or the NPWS within the same grid square (O22) in which the proposed development site is located
- Spatial information relevant to the planning process including land zoning and planning applications from Department of Housing Planning, Community and Local Government web map portal. Available from https://myplan.ie/
- Ordnance Survey Ireland mapping and aerial photography from www.osi.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 local biodiversity policies and objectives within the Dun Laoghaire-Rathdown County Development Plan 2016-2022 (DLRCC, 2016);
- Information on the location, nature and design of the proposed development supplied by the applicant's design team; and,
- Information on the conservation status of birds in Ireland from Birds of Conservation Concern in Ireland[5].

5.2.4 Consultation

A consultation letter was submitted by email to the Development Applications Unit of the Department of Culture, Heritage and the Gaeltacht on 25th January 2021 (DAU Ref: G Pre00029/2021). The letter included an outline description of the proposed development and a request for any comments on the proposal. No response from that authority was received by Scott Cawley Ltd. prior to submission of the planning application for the proposed development.

5.2.5 Field Survey Methodology

Surveys for habitats, protected, rare and invasive flora, terrestrial mammals (including bats) and amphibians and reptiles, as well as ground-level assessments of trees and structures with respect to their suitability for roosting bats, as well as nesting birds, were undertaken on 14th, 16th and 23rd March 2018. These surveys were repeated on 18th May 2021.

5.2.6 Habitats and Flora Survey

A habitat survey was undertaken at the proposed development site following the methodology described in *Best Practice Guidance for Habitat Survey and Mapping*[6]. All habitat types were classified using the *Guide to Habitats in Ireland*[7], recording the indicator species and abundance using the DAFOR scale[8] and recording any species of conservation interest. Vascular and bryophyte plant nomenclature generally follow that of the National Vegetation Database[9], having regard to more recent taxonomic changes to species names after the *New Flora of the British Isles*[10] and the British Bryological Society's *Mosses and Liverworts of Britain and Ireland: A Field Guide*[11].

5.2.7 Fauna Surveys

Terrestrial Mammals (Excl. Bats)

A terrestrial fauna survey (excluding bats) was also undertaken in tandem with the habitat surveys above. The presence and absence of terrestrial fauna species were surveyed through the detection of field signs such as tracks, markings, feeding signs, and droppings, as well as by direct observation. The habitats on site were assessed for signs of usage by protected and red-listed fauna species, and their potential to support these species. Surveys included checks for the presence of badger setts within the subject lands, and to record any evidence of use. This also involved the use of camera traps (Bushnell HD Trophy Cam model in 2018 surveys; Maginon WK H HDW model in 2021 surveys) near potentially active badger setts within the lands. Three camera traps were deployed over a four week recording period from 17th February 2021 to 12th March 2021 by Alexis FitzGerald of Scott Cawley. A walkover survey of adjacent lands at St. Catherine's (Dunardagh) and Rockfield Park was also undertaken on 23rd March and 3rd April 2018, respectively (and both areas were resurveyed on 16th November 2021) to check for signs of mammal (e.g. badger) resting places.

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[5] Gilbert, G., Stanbury, A. & Lewis, L. (2021) Birds of Conservation Concern in Ireland 4: 2020-2026. *Irish Birds* 43: 1-22.
[6] Smith, G.F., O'Donoghue, P., O'Hora, K. & Delaney, E. (2011) *Best Practice Guidance for Habitat Survey and Mapping*. The Heritage Council Church Lane, Kilkenny, Ireland.
[7] Fossitt, J.A. (2000) *A Guide to Habitats in Ireland*. Heritage Council, Kilkenny.
[8] 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 (D), Abundant (A), Frequent (F), Occasional (O) and Rare (R).
[9] Weekes, L.C. & FitzPatrick, Ú. (2010) *The National Vegetation Database: Guidelines and Standards for the Collection and Storage of Vegetation Data in Irelan*d. Version 1.0. Irish Wildlife Manuals, No. 49. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.
[10] Stace, C. (2019) *New Flora of the British Isles*. 4th Edition. C&M Floristics.
[11] Atherton, I., Bosanquet, S. & Lawley, M. (2010) *Mosses and Liverworts of Britain and Ireland: A Field Guide*. Latimer Trend & Co., Plymouth.

Birds

Bird activity within the subject lands was recorded on 14th, 16th and 23rd March 2018 and on 7th June 2018. A systematic inspection of the external parts of the building was undertaken to search for birds' nests. Areas of amenity grassland within the lands were checked for signs for overwintering wetland birds, such as their droppings and feathers. A single breeding bird survey was also carried out on 10th June 2021, and an owl survey on 27th May 2021, both by Shane Brien and Zuzana Erosova of Scott Cawley Ltd. The surveys were carried out using a methodology adapted from the *Bird Monitoring Methods - A Manual of Techniques for Key UK Species* (Gilbert *et al.,* 1998).

Birds were identified by sight as well as by identification of songs and calls, and general location and activity were recorded using the British Trust for Ornithology (BTO) species and activity codes.

Bats

A ground-level assessment of all trees and structures within the subject lands, to examine their suitability to support roosting bats and potential to act as important landscape features for commuting and foraging bats, was completed. The assessment of structures included external inspections only. The assessment was based on guidelines (see Table 5.1) in *Bat Surveys for Professional Ecologists: Good Practice Guidance*[12] and included inspections of trees and structures for potential roost features (PRFs), and for signs of bats (staining at roost entrances, droppings, carcasses, insect remains).

A check of internal and external parts of all buildings within the lands was undertaken on 16th March 2018. This involved a search for signs such as bat droppings, dead specimens and feeding remains, and involved access to roof spaces. These inspections were repeated fully on 8th December 2020 and 9th February 2021.

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

	shelter, protection, conditions and surrounding habitat.	High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, treelined watercourses and grazed parkland. Site is close to and connected to known roosts.

Table 5.1: Guidelines for assessing the potential suitability of proposed development sites for bats, based on the presence of habitat features within the landscape, applied according to professional judgement (Taken from Collins (2016)[11]).

Two separate pre-dawn bat roost presence/absence surveys involving three surveyors each were undertaken on 22nd May 2018 and 7th June 2018. Surveys were undertaken within the main season of bat activity during calm dry weather conditions. Bat calls were recorded using Elekon Batlogger M detectors. One dawn and one dusk surveys were also undertaken on 7th September 2020 and 18th September 2020, respectively. A repeat of these one dawn and one dusk surveys were also undertaken on 10th June and 27th May 2021.

Bat activity within the lands was recorded through the deployment of two automated bat detectors (Wildlife Acoustics Songmeter 2+ detectors) between 25th May 2018 and 7th June 2018, and a single manual transect survey on 5th July between 21:40 (i.e. 15 minutes before sunset) until 23:25 (i.e. one and a half hours after sunset). One detector (SM2-16675) was deployed along a yew hedgerow south of St. Teresa's House, while the second detector (SM2-16688) was deployed within woodland in the southeast corner of the lands.

The surveys were designed with reference to methodologies in *Bat Surveys for Professional Ecologists: Good Practice Guidelines*[12], and survey details are provided in Table 5.1. Surveys involved completion of a walked transect within the proposed development site and bat activity was recorded using a handheld bat detector (Batlogger-M). Recordings collected in the field were analysed using specialist sound analysis software (Elekon BatExplorer) to aid in the identification of bat species by their calls, (where this was possible), using professional judgement and with reference to *British Bat Calls: A Guide to Species Identification*[13].

5.3 The Existing Receiving Environment (Baseline)

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 (NRA), 2009).

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

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

Conservation Status

[12] Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn). The Bat Conservation Trust, London. ISBN-13 978-1-872745-96-1; Kelleher, C. & Marnell, F. (2006) *Bat Mitigation Guidelines for Ireland; Irish Wildlife Manuals, No. 25*. National Parks and Wildlife Service.

[13] Russ, J. (2012) *British Bat Calls: A Guide to Species Identification*. Pelagic Publishing, Exeter, United Kingdom. ISBN 978-1-907807-25-1.

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

- For natural habitats, conservation status means the sum of the influences acting on the natural habitat and its typical species, that may affect its extent, structure and functions as well as its distribution, or the long-term survival of its typical species, at the appropriate geographical scale
- For species, conservation status means the sum of influences acting on the species concerned that may affect the abundance of its populations, as well as its distribution, at the appropriate geographical scale
- An impact on the conservation status of a habitat or species is considered to be significant if it will result in a change in conservation status, having regard to the definitions of favourable conservation status provided in the EU Habitats Directive 92/43/EEC – *i.e.* into the future, the range, area and quality of habitats are likely to be maintained or increased and species populations are likely to be maintained or increased.

According to the CIEEM methodology, if it is determined that the integrity and/or conservation status of an ecological receptor will be impacted upon, 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.

5.3.1 Proposed Development

5.3.1.1 Designated Areas

European sites

An Appropriate Assessment Screening Report has been prepared in respect of the proposed St. Teresa's SHD and submitted with the application for permission, so as to enable the Board to carry out a Stage One Screening for Appropriate Assessment. For the purposes of the separate and distinct EIA which the Board must conduct, a summary of the information provided in the AASR is set out here, for ease of reference.

Special Areas of Conservation (SAC) are designated under the Habitats Directive as transposed into Irish law. The legislation enables the protection of certain habitats (listed on Annex I of the Directive) and/ or species (listed on Annex II). Special Protection Areas (SPAs) are designated under the Birds Directive. This allows for the protection of bird species on Annex I of the Directive, regularly occurring populations of migratory species (such as ducks, geese or waders), and important wetland habitats for birds.

The subject lands are not located within or adjacent to any European sites (see Figure 5.2). The closest European site is South Dublin Bay SAC (000210) and South Dublin Bay and River Tolka Estuary SPA (004024), both of which are located c.300m north of the proposed development site.

The Carysfort-Maretimo Stream flows northwards just west of the proposed development site and has the potential to hydrologically connect the proposed development site to European sites located downstream in Dublin Bay.

There are four SACs and four SPAs within the vicinity of the proposed development and downstream in Dublin Bay as follows (see Figure 5.2):

- South Dublin Bay SAC (000210), which is c.300m north of the proposed development site and designated for dune and tidal habitats.
- North Dublin Bay SAC (000206), which is c.5.4km north of the proposed development site and designated for a range of coastal habitats, and populations of *Petalophyllum ralfsii*.

- North Bull Island SPA (004006), which is c.5.2km north of the proposed development site and designated for a range of wintering wetland bird species.
- South Dublin Bay and River Tolka Estuary SPA (004024), which is c.300m north of the proposed development site and designated for a range of wintering wetland bird species.
- Howth Head SAC (000202), which is c.9.2km north-east of the proposed development site and designated for its coastal and heathland habitats.
- Howth Head Coast SPA (004113), which is c.10.7km north-east of the proposed development site and designated for its populations of kittiwake *Rissa tridactyla*.
- Rockabill to Dalkey Island SAC (003000), which is c.5.4km east of the proposed development site and designated for its coastal reef habitat and harbour porpoise *Phocoena phocoena* populations.
- Dalkey Islands SPA (004172), which is c.5.5km south-east of the proposed development site and designated for a range of coastal bird species.

Full lists of the qualifying interests (QI) and special conservation interest (SCI) species of these European sites are presented in Appendix 5.1.

Based on the results of the desk study and the site walkover surveys, the subject lands do not contain optimal habitat for QI or SCI species for which any European sites have been designated. The Carysfort-Maretimo Stream is canalised and/or closed-culverted along much of its length and is not known to be used by QI species, such as Atlantic salmon and white-clawed crayfish. Whilst otter spraint has been recorded at one location along the Carysfort-Maretimo Stream (c.250m north of the proposed development boundary in 2019 (Macklin & Brazier, 2019)), the local populations of these three species are not QI populations of SACs as the proposed development site is not hydrologically connected to European sites designated for the species (*i.e.* the Carysfort-Maretimo Stream is not located within the same river catchment that supports any SAC population of Atlantic salmon, otter and/or white-clawed crayfish).

The subject lands may be potentially used by SCIs as the proposed development is within the normal foraging range of SCI species of North Bull Island SPA, South Dublin Bay and River Tolka Estuary SPA, Dalkey Islands SPA and Howth Head Coast SPA as well as due to the mobile nature of SCI species. However, only one SCI species of these downstream SPAs were recorded flying over the lands, namely black-headed gull, which is an SCI species for the North Bull Island SPA and South Dublin Bay and River Tolka Estuary SPA.

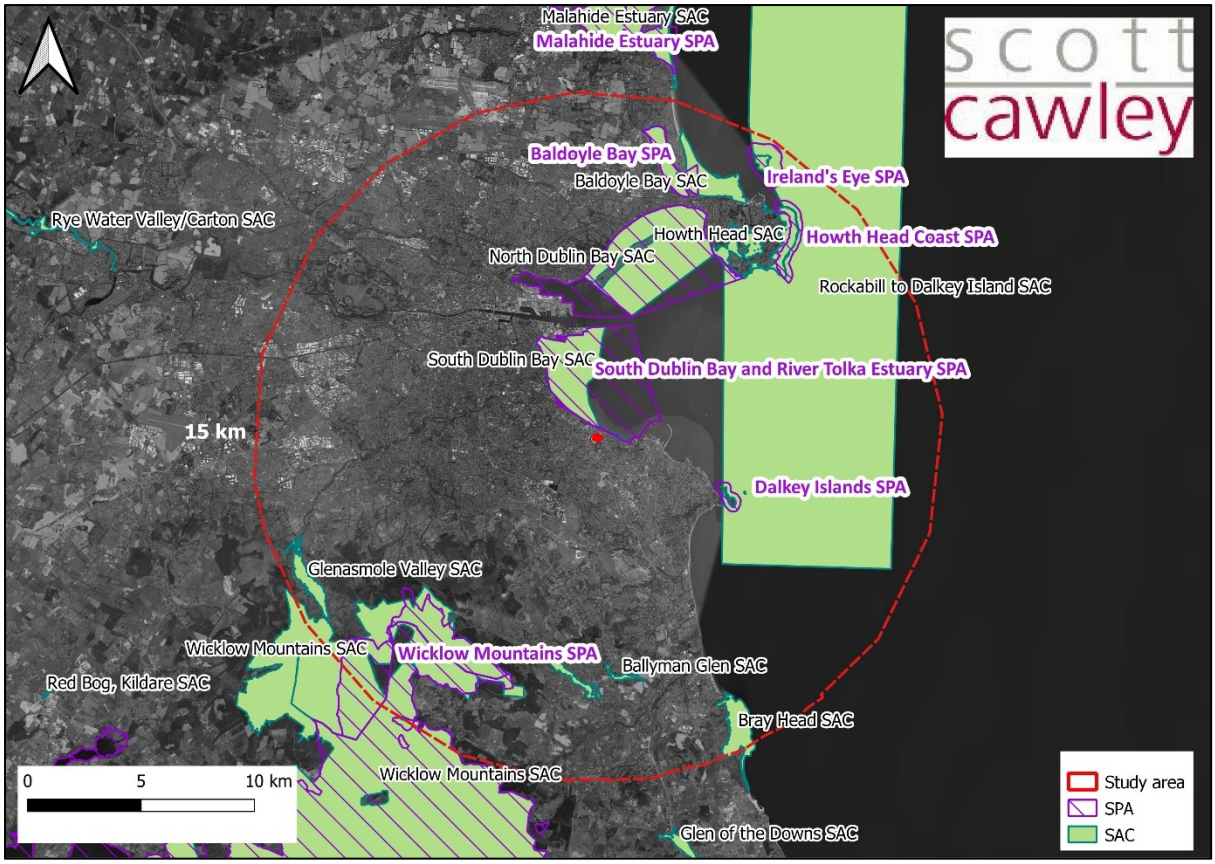

Figure 5.2: European sites in the vicinity of the proposed development site.

Nationally Designated Sites

Natural Heritage Areas (NHAs) are designations under the Wildlife Acts in order to protect habitats, species or geology of national importance. The boundaries of many of the NHAs in Ireland overlap with European sites. Although many NHA designations are not yet fully in force under this legislation (referred to as '*proposed NHAs*' or pNHAs), they are offered protection in the meantime under planning legislation which requires that planning authorities (including, in this instance, the Board) give recognition to their ecological value[14]. Proposed NHAs are offered protection under development plans, as is the case for the *Dun Laoghaire-Rathdown County Development Plan 2016-2022* through Policy LHB22 on (proposed) Natural Heritage Areas, which requires that planning authorities give due regard to their protection in planning policies and decisions (Dun Laoghaire-Rathdown County Council, 2016).

The proposed development site does not overlap with any NHA or pNHA. There are 25 national sites located within c.15km of the proposed development, of which all are pNHAs (see Figure 5.3).

The South Dublin Bay pNHA and Booterstown Marsh pNHA are hydrologically connected to the proposed development site. The Carysfort-Maretimo Stream connects these two pNHAs hydrologically to the proposed development site.

There are no other pNHAs hydrologically connected via surface water network to the proposed development.

The pNHAs within the vicinity of the proposed development are as follows:

- South Dublin Bay pNHA (210) – c. 300m from the subject lands and connected to it via the surface water and foul water networks. This site has been designated for its wintering bird populations

[14] NPWS (2019). Natural Heritage Areas Webpage. Available online at www.npws.ie/protected-sites/nha. Accessed 16 April 2021.

- Booterstown Marsh pNHA (1205) – c. 1.9km northwest of the subject lands. It is one of the only saltmarshes in south Dublin, is important for overwintering birds, and contains the protected species *Puccinellia fasciculata*.
- Dalkey Coastal Zone And Killiney Hill pNHA (1206) – c. 2.8km east of the subject lands. This site is designated for the range of coastal habitats it contains and due to the presence of several rare plant species.
- Fitzsimon's Wood pNHA (1753) – c. 4.8km west of the subject lands. This site is designated as it is a rare example of birch woodland within the Dublin area.
- Dolphins, Dublin Docks pNHA (201) – c. 5km north of the subject lands. Designated due to its importance for breeding terns.
- North Dublin Bay pNHA (206) – c. 5.4km north of the subject lands. Designated for its range of overwintering wetland bird species.
- Dingle Glen pNHA (1207) – c. 6km south. Designated for its variety of woodland and scrub habitats.
- Loughlinstown Woods pNHA (1211) – c. 6.1km south. Designated for its example of demesne woodland.
- Grand Canal pNHA (2104) – c. 6.2km north. Designated for its range of semi-natural habitats along a large linear feature.
- Royal Canal pNHA (2103) – c. 7km north. Designated for its range of semi-natural habitats along a large linear feature.
- Ballybetagh Bog pNHA (1202) – c. 8.1km south. Designated for archaeological reasons, as it contains the remains of numerous examples of Giant Deer.
- Howth Head pNHA (202) – c. 9.2km northwest. Information on the reasons for designation of this site are not publicly available through the NPWS website.
- Knocksink Wood pNHA (725) – c. 9.6km southwest. Designated for its woodland and tufa springs habitats.
- Ballyman Glen pNHA (713) – c. 9.8km south. Designated for its tufa springs and alkaline fen habitats.
- Dodder Valley pNHA (991) – c. 10km west. Designated for its range of semi-natural bankside habitats and riverine habitats.
- Baldoyle Bay pNHA (199) – c. 11km north. Designated for its range of intertidal habitats and wetland bird species.
- Powerscourt Woodland pNHA (1768) – c. 11.5km south. Designated for its flora which includes a variety of woodland types.
- Santry Demesne pNHA (178) – c. 12km north. Designated for its population of *Hypericum hirsutum* and as it consists of some of the only remaining semi-natural vegetation in the North Dublin area.
- Dargle River Valley pNHA (1754) – c. 12km south. Designated for its example of woodland along a river valley and for the presence of a rare plant species *Lamiastrum galeobdolon*.
- Bray Head pNHA (714) – c. 12.4km south. Designated for its heathland vegetation and population of breeding and overwintering birds.
- Great Sugar Loaf pNHA (1769) – c. 13km south. Designated for its range of habitats including woodland, scree and heath vegetation, as well as for its geological interest.
- Liffey Valley pNHA (128) – c. 13.3 northwest. Designated for its range of habitats and the presence of rare flora, including *Hypericum hirsutum*.
- Ireland's Eye pNHA (203) – c. 13.5km northeast. Designated for its breeding seabirds and coastal habitats.
- Glenasmole Valley pNHA (1209) – c. 13.5km southwest. Designated for its tufa spring and calcareous grassland habitats.

- Glencree Valley pNHA (1755) – c. 13.6km south. Designated for its example of deciduous woodland.
- Sluice River Marsh pNHA (1763) – c. 13.7km north. Designated for its marsh habitats.
- Kilmacanoge Marsh pNHA (724) – c. 14.6km south. Designated for the presence of fen-carr woodland.
- Feltrim Hill pNHA (1208) c.14.9km north. Designated for its geological interest. More detailed descriptions of the qualifying interests of the pNHA sites in the vicinity of the proposed development are presented in Appendix 5.1.

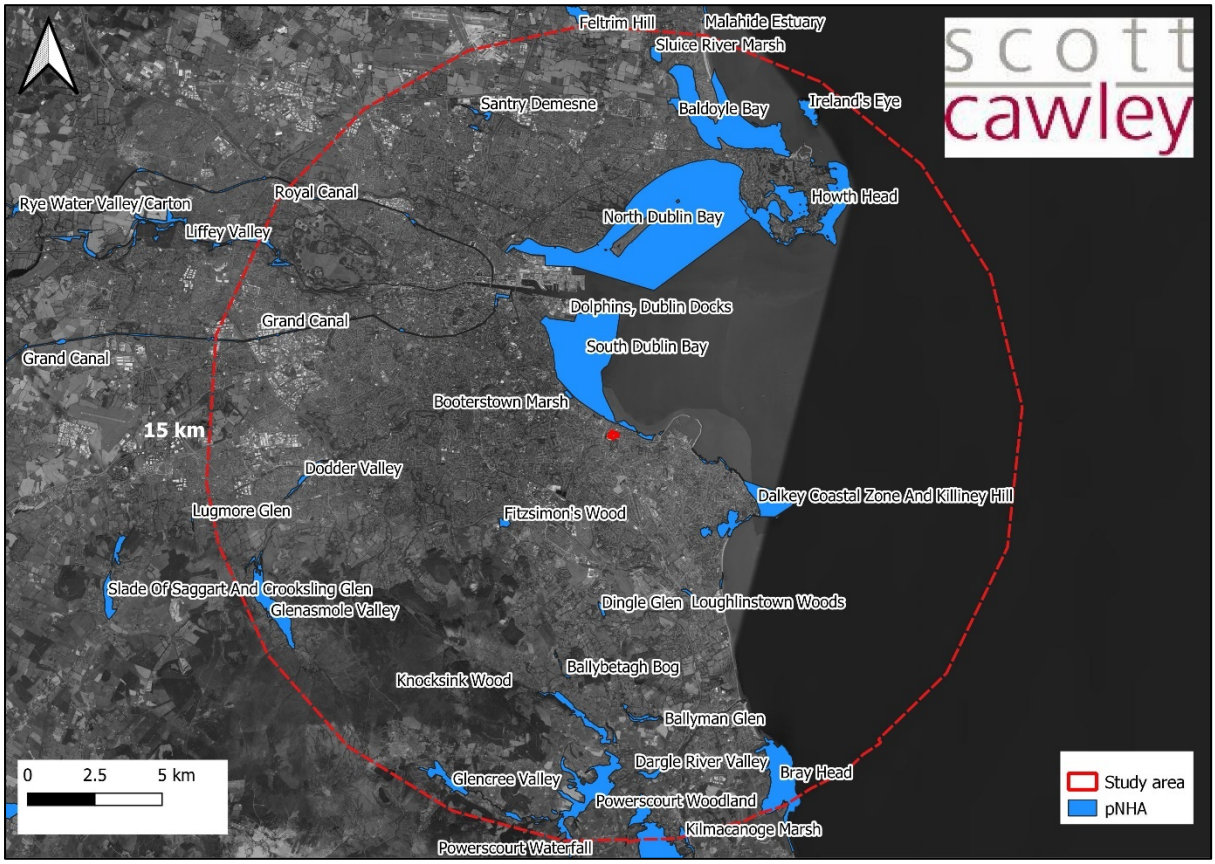

Figure 5.3: Natural Heritage Areas and proposed Natural Heritage Areas within the vicinity of the proposed development site.

5.3.2 Habitats and Flora

No records of plant species protected through their inclusion within the *Flora (Protection) Order, 2015* were returned from a search of the NBDC database for the locality. The invasive species *Hyacinthoides hispanica* and *Allium triquetrum* were identified within woodland, hedgerow and ornamental shrub habitats within the lands. Their known locations are illustrated within Figure 5.4 of this report. These species are subject to restriction under Section 49 of the Birds and Habitats Regulations.

The following habitat types of the Heritage Council classification system (Fossitt, 2000) were identified within the subject lands and surroundings and are mapped in Figure 5.4:

- Amenity grassland (improved) (GA2)
- Dry meadows and grassy verges (GS2)
- Hedgerows (WL1)
- Treelines (WL2)
- (Mixed) broadleaved woodland (WD1)
- Scattered trees and parkland (WD5)
- Scrub (WS1)

- Ornamental/non-native shrub (WS3)
- Flower beds and borders (BC4)
- Buildings and artificial surfaces (BL3)

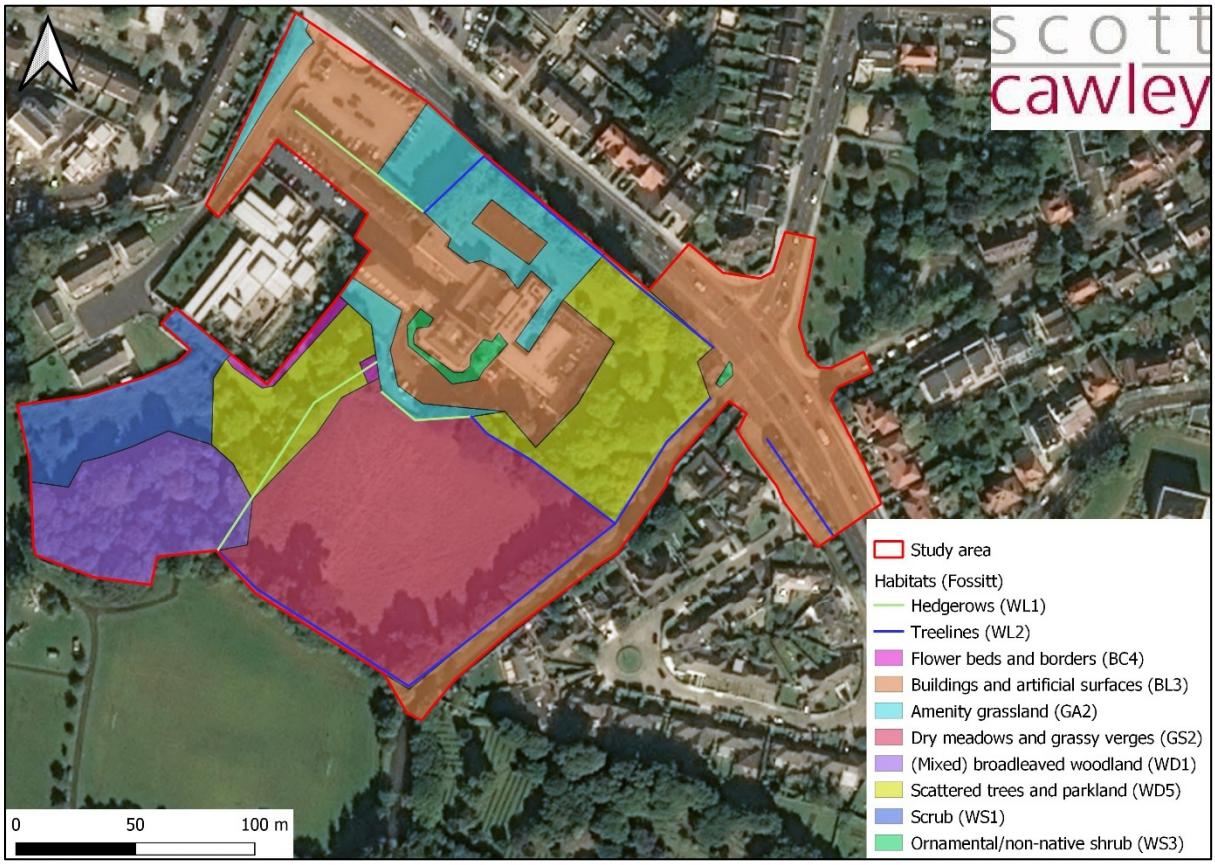

Figure 5.4: Habitats within the subject lands.

Amenity grassland (improved) (GA2)

Amenity grassland (improved) (GA2) is found in the vicinity of St. Teresa's House and is dominated by *Lolium perenne* and coarse grasses such as *Holcus lanatus* alongside *Trifolium repens* and creeping *Ranunculus repens*. It is a low diversity habitat type, is associated with high-intensity human use, does not have a high degree of naturalness and does not host any rare species. Therefore it is considered to be of local importance (lower value).

Dry meadows and grassy verges (GS2)

Plate 1: Dry meadow and grassy verge habitat in a large field south of Craigmore House.

A large field south of St. Teresa's House has been left unmown since early summer 2018 and was still the case during the 2021 surveys (see Plate 1) and has been assigned to the habitat dry meadows and grassy verges (GS2). The species-composition is very similar to the areas of amenity grassland (GA2), but with the addition of *Festuca rubra* agg., *Urtica dioica* and *Heracleum sphondylium*, *Prunella vulgaris*, *Leucanthemum vulgare* and *Arrhenatherum elatius*. The example at St. Teresa's is not particularly species-rich, however, this habitat is locally infrequent, and therefore it is considered to be of local importance (higher value).

Hedgerows (WL2) and Treelines (WL2)

Plate 2: Taxus baccata hedgerow ***Plate 3: (mixed) broadleaved woodland in southwest of the lands***

The subject lands contain hedgerows (WL2) and treelines (WL2). Both linear habitats within the lands are dominated by non-native species that are likely to have been planted for ornamental purposes and have

become overgrown and semi-natural (see Plate 2). Where dense vegetation forms to the base of a linear feature it has been classified as hedgerow, whereas where this does not occur, it has been classified as treeline. The most frequently-encountered species for these habitat types include *Taxus baccata*, *Aesculus hippocastanum*, *Cupressus* x *leylandii* and *Ilex aquifolium*.

A *Taxus baccata* hedgerow, illustrated in Plate 2 and corresponding to no. 40 in the Tree Survey report (The Tree File, 2021), although largely comprising ornamental species at ground and understorey levels, has a structural diversity similar to semi-natural hedgerows. Its understorey is composed of *Symphoricarpos alba* and *Hyacinthoides hispanica*, both invasive species. Spanish bluebell is listed on the Third Schedule of the Birds and Habitats Regulations and is a restricted species. It is an offence under Section 49 of the Birds and Habitats Regulations to cause the spread of this species. While *Symphoricarpos alba* is not listed within any legislation in Ireland, it is considered to be an invasive species of hedgerow and woodland habitats. Other hedgerows within the lands are monospecific *Cupressus* x *leylandii* hedgerows with a more diverse overstorey of ornamental trees.

While hedgerows and treelines within the lands do not have a high-degree of naturalness and are not particularly species-rich examples, both habitats are nonetheless considered to be of local importance (higher value) due to the connectivity they provide to other habitats in the surrounding landscape and their rarity at a local scale. They are afforded protection through local and county level policies and objectives (policies NHC5 and NHC8 of the *Blackrock Local Area Plan* (DLRCC, 2015); policy LHB26 of the *Dún Laoghaire-Rathdown County Development Plan 2016-2022* (DLRCC, 2016)).

(Mixed) broadleaved woodland (WD1)

The southwestern corner of the lands contains the habitat (mixed) broadleaved woodland (WD1) (illustrated in Plate 3). There are signs of some disturbance within the woodland, *i.e.* the accumulation of household and electronic waste. This habitat is again dominated by non-native planted tree species including *Acer pseudoplatanus*, *Fagus sylvatica* and *Aesculus hippocastanum*. There has been some regeneration of these species as well as the native species *Fraxinus excelsior*, *Ilex aquifolium*, *Prunus spinosa*, and *Crataegus monogyna*. The understorey is largely composed of *Hedera helix*, with abundant *Heracleum sphondylium*, *Smyrnium olusatrum* and patches of the invasive *Hyacinthoides hispanica*. This habitat type is considered to be of local importance (higher value) as, although it is largely composed of non-native species, its understorey has a degree of naturalness, and it is rare at a local scale. The habitat is also the subject of policies NHC5 and NHC8 of the *Blackrock Local Area Plan* (DLRCC, 2015) and policy LHB26 of the *Dún Laoghaire-Rathdown County Development Plan 2016-2022* (DLRCC, 2016).

Scattered trees and parkland habitat (WD5)

Plate 4: Parkland/scattered trees within the lands.

Mixed broadleaved woodland (WD1) transitions to scattered trees and parkland habitat (WD5) where the understorey is dominated by grassland species (illustrated in Plate 4). Tree species within this habitat are similar to elsewhere within the lands, *i.e.* are a mix of ornamental species including a high proportion of *Acer pseudoplatanus*, *Aesculus hippocastanum* and *Ilex aquifolium*. The understorey is analogous to amenity grassland. This habitat type is considered to be of local importance (higher value) due to its rarity at a local scale.

Scrub (WS1)

Just north of the aforementioned broadleaved woodland area, an area of scrub can be found, which is dominated *Heracleum sphondylium, Urtica dioica, Rubus fruticosus* agg. and *Rubus idaeus*, with also some other species such as *Rumex obtusifolius* and *Holcus lanatus*. This habitat type is considered to be of local importance (higher value) due to its rarity at a local scale.

Ornamental/non-native shrub (WS3), flower beds and borders (BC4) and buildings and artificial surfaces (BL3)

The area immediately adjacent to Craigmore House contains ornamental plantings classified as ornamental/non-native shrub (WS3) and flower beds and borders (BC4). Some of these borders contain the Third Schedule-listed invasive species, *Allium triquetrum*. The buildings and roads within the lands are classified as buildings and artificial surfaces (BL3) and contain very few plant species. The avenues leading to the buildings are lit at night. These habitats are considered to be of local importance (lower value) in terms of their botanical value due to their highly modified and generally species-poor nature.

5.3.3 Fauna

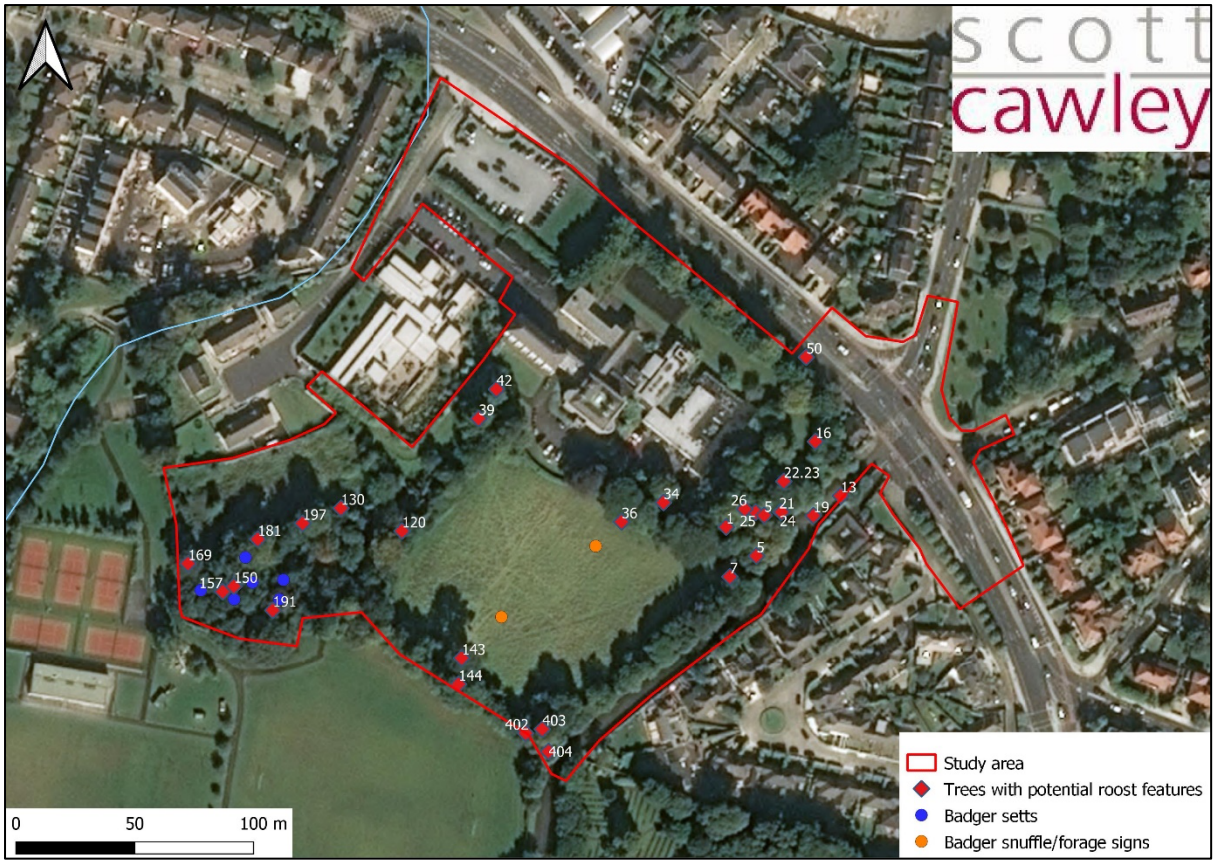

Figure 5.5: Fauna signs noted within the subject lands.

5.3.3.1 *Bats*

Eight of Ireland's nine resident bat species have been recorded in the Dún Laoghaire-Rathdown County area (Bat Conservation Ireland, 2018). While a search of the database of species records held by the NBDC did not return any records of bat species within the vicinity of the subject lands, both common pipistrelle bat *Pipistrellus pipistrellus* and Leisler's bat *Nyctalus leisleri* are known to occur within Blackrock Park to the northwest (pers. obs.). Indeed, the nearest records of these two species returned from a search of the NBDC database was from this park (at O211298) in 2004. All bats in Ireland are listed as being of 'least concern' (Nelson *et al.*, 2019).

Plate 5: View of former dormitory building from within school building.

Plate 6: Internal attic space in Craigmore House. White debris is lime rendering.

No signs of bats were noted from internal and external inspections of Craigmore House and the accompanying school and former institutional buildings, and of the gate lodge. In light of the scale, age and materials of construction (illustrated in Plate 5 and Plate 6), the buildings within the lands are considered to be of moderate suitability for roosting bats. Nonetheless, no bats were observed exiting from or returning to any of the buildings within the lands during pre-dawn presence/absence surveys.

Only soprano pipistrelle bat *Pipistrellus pygmaeus* and common pipistrelle bat *Pipistrellus pipistrellus* were recorded on automated detectors within the lands in 2018. Seven hundred bat calls were recorded within the woodland on SM2-16688 (location illustrated in Plate 7), while 140 bat calls were recorded on the hedgerow close to Craigmore on SM2-1675. On most nights only a few calls were recorded, with the exception of 28th-30th May 2018, when a maximum of 238 bat calls were recorded on a single detector in the woods in the southeast of the lands. Automated detectors record echolocation calls, but not behaviour associated with the calls, and therefore 238 calls does not necessarily represent 238 bats foraging within an area and can often represent repeated movements of a small number of bats within a defined area.

The manual transect of the lands on 5th July 2018 provides an insight into the use of habitats within the lands by bats. Leisler's bat and soprano pipistrelle bat were the only species recorded within the lands on this occasion. Activity was concentrated along hedgerows and treelines leading south of Craigmore House and along the southern boundary with Rockfield Park, where a single soprano pipistrelle bat was observed foraging along the boundary between the treeline and the adjacent area of dry meadow grassland. Activity levels were low, with soprano pipistrelle only recorded over a two-minute period between 22:22 and 22:23. Most Leisler's bat activity was recorded between 22:05 and 22:07, with a single recording from 22:15. The relatively small number of calls recorded within the lands on automated detectors, many of which are separated by long periods with no recorded bat activity, and the relatively small number of bats observed during the walked transect suggests that the lands were being used by a small population of foraging bat species.

Date	No. of bat calls (SM2-16688)	No. of bat calls (SM2-16675)
25/05/2018	10	2
26/05/2018	58	14
27/05/2018	47	4
28/05/2018	97	5
29/05/2018	105	1
30/05/2018	238	6
31/05/2018	29	11
01/06/2018	36	3
02/06/2018	10	3
03/06/2018	13	4
04/06/2018	17	5
05/06/2018	5	5
06/06/2018	26	37
07/06/2018	9	40
Total	**700**	**140**

Table 5.2: Number of bat calls per day by detector.

Plate 7: Bat detector deployed in woods.

As per the results of the automated detectors, only two species (soprano pipistrelle bat and common pipistrelle bat) were recorded within the lands during presence/absence surveys, albeit foraging along a treeline along the driveway to Craigmore House. Bats were only recorded on two occasions on 7th June 2018. No bats were recorded on 22nd May 2018.

The 2020 and 2021 bat activity surveys returned very similar results to the 2018 surveys, with very limited activity recorded. In both surveys, there was a distinct paucity of activity within and along the edges of woodland, scrub and through rough grassland. Activity was limited to infrequent passes of common pipistrelle and soprano pipistrelle along the edge of linear woodland bordering the field and within small openings in the canopy of trees. However, there was a slight increase in activity in the wooded area to the south and southeast of the main building (St. Teresa's House) and old school, mostly of pipistrelle species. The mature hedgerows and treelines that cross the subject lands are considered to constitute highly suitable foraging and commuting habitat for bats. Thirty trees within the subject lands were identified as having some potential to host roosting bats due to their age, size and/or the presence of numerous cracks or cavities visible from ground level. These trees have been listed along with their number code and the particular potential roost features noted on them, in Appendix 5.6. The bat species recorded during the surveys are all common species and of "Least concern" (Nelson et al., 2019). The local bat populations using the proposed development site and the surroundings as foraging and commuting habitat are valued as being of local importance (higher value).

Other Terrestrial Mammals

A search of the NBDC database for the site returned records of grey squirrel *Sciurus vulgaris*, an invasive species subject to restrictions under Section 50 of the Birds and Habitats Regulations, and hedgehog *Erinaceus europaeus*, which is protected under the *Wildlife Acts (as amended)*. Grey squirrel were observed in the lands in May 2018.

All small mammal species returned in the NBDC search are of "Least" conservation concern (Nelson *et al.*, 2019). They are widely distributed throughout Ireland. The habitats on-site may be potentially used for breeding, commuting and foraging by all small mammal species. The local small mammal populations are considered to be of local importance (higher value).

Multiple mammal holes were noted within the subject lands, including six within an area of mixed broadleaved woodland in the southwest of the lands, and five in a compost heap along a treeline east of Craigmore House. Motion-activated infra-red cameras were deployed at these holes to determine their use by protected mammals. Deployment dates and results are collated in Table 5.3.

Camera	Location	Deployment	Collection	Result
B170419322	Mammal hole near wall at northern edge of woodland (53.296710, -6.175473)	16/03/2018	23/03/2018	Fox and cats recorded on multiple occasions. Potential badger (footage low-resolution) at 02:37 on 23/03/2018 photographed in front of resting place
B170419325	Mammal hole in bank by wall separating lands from Rockfield Park. Obscured by dense foliage	16/03/2018	23/03/2018	Fox, cats, mice and blackbird recorded multiple times. Badger recorded twice on 17/03/2018 at 00:36 and 00:37 at sett entrance.
B170419322	On holly tree facing large hole that is partially filled with drink cans	23/03/2018	03/04/2018	Fox recorded crossing field of view on one occasion
B170419325	On sycamore above clearing facing large mammal hole on opposite bank	23/03/2018	03/04/2018	Fox and domestic cat recorded on multiple occasions
B170419322	In sparse vegetation opposite compost heap east of Craigmore House	03/04/2018	12/04/2018	Badger recorded foraging in vicinity of the compost heap at 00:46 on 07/04/2018 and at 23:39 on 11/04/2018. No observations of badgers emerging from holes, although foxes are noted emerging on several occasions
B170419325	Beside large mammal hole by clearing in woods	03/04/2018	12/04/2018	Badger recorded sniffing at entrance of hole at 23:18 on 04/04/2018 and at 22:24 and 23:10 on 11/04/2018. Badger appears to exit hole at 23:33 on 04/04/2018 and 23:05 on 08/04/2018. Cats and foxes recorded inspecting entrance to sett on numerous occasions throughout the survey period.
219033	Beside large mammal hole by clearing in woods	17/02/2021	12/03/2021	Badger recorded sniffing near entrance of hole at 22:39 on 26/02/2021. Cats and foxes recorded inspecting entrance to sett on numerous occasions throughout the survey period.
219106	In sparse vegetation opposite compost heap east of Craigmore House	17/02/2021	12/03/2021	No observations of badgers emerging from holes, although foxes are noted emerging on several occasions

219105	Beside large mammal hole by clearing in woods	24/02/2021	12/03/2021	Badger recorded walking across the camera's view and foraging for food at 03:14 on 18/02/2021 and at 22:39, 22:47 and 22:48 on 26/02/2021. Cats and foxes recorded inspecting entrance to sett on numerous occasions throughout the survey period. Long-eared owl also observed flying across the camera's view.

Table 5.3: Details of trigger camera deployments within lands at St. Teresa's.

The mammal holes located within the woodland are considered to be possibly active badger setts in 2021 (marked in Figure 5.5) in this instance based on footage of badgers near their entrances (see

Plate 8). Badgers in 2018 appeared to use the setts within the woodland only infrequently, with only two recordings at one sett on 17th March 2018 over a seven-night recording period, and one recording at one sett on 26th February 2021, also over a seven-night recording period. Similarly badgers were noted emerging from another sett entrance on 4th and 8th April 2018 during a nine-night recording period. This would suggest while the lands are part of an active badger territory, the setts within the lands are only occasionally occupied and have likely been disused in recent years by local badger populations (although this cannot be confirmed beyond all doubt). All of the holes in the woodland nonetheless have potential to host badgers in light of the lands forming a badger territory, and the lands are clearly readily used by badgers for foraging purposes.

A number of holes in a compost heap east of Craigmore House is occupied by a family of foxes. These holes constitute a fox den and are not considered to be badger setts. This was confirmed by camera footage in both 2018 and 2021.

Evidence of foraging mammals was identified within the lands, including what appeared to be badger feeding signs, trails leading across the site between woodland and grassland and prints of mammals (fox and badger).

A walkover of the adjoining lands at Rockfield Park and at St. Catherine's (formerly Dunardagh) were undertaken on 23rd March and 3rd April 2018, respectively (both areas being resurveyed on 16th November 2021), to search for further signs of badger. No signs of any resting places were noted within either property, although potential snuffle holes and foraging signs were present in both.

Badgers, and their breeding and resting places, are protected under the Wildlife Acts. Due to their stable Irish populations, they are considered to be of "Least concern" in terms of conservation (Nelson *et al.*, 2019). The subject lands are considered to be of local importance (higher value) for badgers, as there are known, active badger setts in the lands and furthermore, there is suitable habitat within the lands and its vicinity to support such local badger populations.

Plate 8: Badger in woodland in south-western portion of the site, in 2021 surveys.

No evidence of any other protected mammal species were identified within the subject lands although it is likely that they host a population of common species such as pygmy shrew *Sorex minutus*. Fox *Vulpes vulpes* occur within the lands, although this species is not protected in Ireland. The lands are considered to be of local importance (higher value) for terrestrial mammals.

5.3.3.2 *Birds*

Surveys of the lands for overwintering bird species were undertaken in March 2018. There are records of overwintering wetland bird species, for which European sites in Dublin Bay have been designated, using amenity grassland sites in the vicinity of the proposed development site for terrestrial feeding (Benson, 2009; Enviroguide Consulting, 2019). Rockfield Park to the immediate south of the subject lands is one such terrestrial feeding site for light-bellied brent geese *Branta bernicla hrota*, which utilise the grassland pitches for supplementary foraging. No signs of brent geese (including sightings of birds, presence of feathers, droppings, or grazing signs) were noted within the lands in March 2018. The grassland south of Craigmore House contains a relatively large proportion of mosses, are enclosed by tall trees, and are home to several resident domestic cats.

The following factors may contribute to the lack of overwintering wetland bird usage within the lands: The proportion of moss to grass within the sward may mean that the lands consist of low quality foraging habitat; the presence of tall trees on the perimeter of the field may inhibit take-off and landing for the birds; while, the presence of cats (a predator of birds) may discourage birds from landing. The only wetland bird species noted within the lands were black-headed gull *Chroicocephalus ridibundus* and herring gull *Larus argentatus*. The former was noted flying through the lands, while the latter species was noted to land on the rooves of buildings surrounding Craigmore House and is breeding on some of the chimneys.

The lands contain a range of common garden and woodland bird species. The majority of species encountered within the lands are common in Ireland and are listed within the green list of species in *Birds of Conservation Concern in Ireland 2020-2026* (Gilbert *et al.,* 2021). Green-listed species encountered were blackbird *Turdus merula*, mistle thrush *Turdus viscivorus*, robin *Erithacus rubecula*, wren *Troglodytes troglodytes*, magpie *Pica pica*, chaffinch *Fringilla coelebs*, dunnock *Prunella modularis*, blue tit *Cyanistes caeruleus*, great tit *Parus major*, hooded crow *Corvus cornix*, jackdaw *Corvus monedula*, goldfinch *Carduelis carduelis*, bullfinch *Pyrrhula pyrrhulla* and feral pigeon *Columba livia domestica*. One long-eared owl *Asio otus* was recording flying across a camera trap in the woodland at the south-western portion of the site on 27th February 2021 (see Plate 9). A long-eared owl was subsequently observed during an owl survey on 27th May 2021 flying east along but well above the southernmost treeline on site. There was no indication of long-earned owl nesting on site to be found during the survey. A search in the woodland at the south-western corner of the site found no owl pellets on the ground, nor feathers. This owl species is currently green-listed and is not of conservation concern.

Several species of birds have an unfavourable status in Europe, have moderately declined in abundance or range, a very small population size, a localised distribution, or occur in internationally important numbers and therefore are included within the BoCCI amber list (Gilbert *et al.,* 2021) were recorded. These were greenfinch *Chloris chloris*, starling *Sturnus vulgaris*, house sparrow *Passer domesticus*, black-headed gull *Chroicocephalus ridibundus* and herring gull *Larus argentatus*. Note that all of the aforementioned species are widespread and common garden birds in the Dublin area. No species listed on the BoCCI red list (Gilbert *et al.,* 2021) (high conservation concern) were recorded within the lands.

Bird activity within the lands is concentrated within hedgerows, treelines and woodland. Multiple species were noted singing from perches, while species such as woodpigeon were noted feeding on ivy and other species within these habitats. Bird species are likely to use a variety of habitats within the lands for foraging, including areas of grassland and woodland habitats.

None of the buildings were noted to contain breeding swallows, house martins or swifts during checks following bat activity surveys in May and June 2018, or December 2020 and February 2021.

Due to the aforementioned facts and the presence of suitable habitat within and directly adjacent to the proposed development site, the local breeding bird and wintering bird populations are both considered to be of local importance (higher value).

Plate 9: long-eared owl flying across a camera trap in the woodland at the south-western portion of the site in 2021 surveys.

5.3.4 Summary of Ecological Evaluation

Table 5.4 and Table 5.5 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).

Ecological Receptor	Ecological Valuation	KER?
Designated Sites		
North Bull Island SPA	International	**Yes**
South Dublin Bay SAC	International	**Yes**
South Dublin Bay and River Tolka Estuary SPA	International	**Yes**
North Dublin Bay SAC	International	**Yes**
Howth Head SAC	International	**Yes**
Howth Head Coast SPA	International	**Yes**
Dalkey Island SPA	International	**Yes**
Rockabill to Dalkey Island SAC	International	**Yes**
All other European sites	International	No
Dolphins, Dublin Docks pNHA	National	**Yes**
South Dublin Bay pNHA	National	**Yes**
Booterstown Marsh pNHA	National	**Yes**
North Dublin Bay pNHA	National	**Yes**
Dalkey Coastal Zone And Killiney Hill pNHA	National	**Yes**
All other nationally designated sites	National	No

Table 5.4: Summary of the ecological evaluation of designated sites.

Ecological Receptor	Ecological Valuation	KER?
Habitats		
Scrub (WS1)	Local importance (higher value)	**Yes**
Scattered trees and parkland (WD5)	Local importance (higher value)	**Yes**
Ornamental/non-native shrub (WS3)	Local importance (lower value)	No
Flower beds and borders (BC4)	Local importance (lower value)	No
Buildings and artificial surfaces (BL3)	Local importance (lower value)	No
Dry meadows and grassy verges (GS2)	Local importance (higher value)	**Yes**
Hedgerows (WL1)	Local importance (higher value)	**Yes**
Treelines (WL2)	Local importance (higher value)	**Yes**
Fauna Species		
Badger	Local importance (higher value)	**Yes**
Small mammals	Local importance (higher value)	**Yes**
Birds	Local importance (higher value)	**Yes**
Bats	Local importance (higher value)	**Yes**

Table 5.5: Summary of the ecological evaluation of habitats and fauna.

5.4 Description of the Proposed Development

The proposed development comprises 493 residential units delivered in a combination of new apartment buildings (ranging in height from 3- 10 storeys overall in height) and a relocated St. Teresa's Lodge.
St. Teresa's House provides for 6 apartments, comprising 5 no. 2-bed units and 1 no. 3-bed unit. The new build element of 487 units is set out in 11 no. residential development blocks (Blocks A1-C2 and D1 – E2) ranging in height from 3-10 storeys over basement comprising:

- Block A1 (5 storeys) comprising 37 no. apartments (33 no. 1 bed units and 4 no. 2 bed units)
- Block B1 (10 storeys) comprising 55 no. apartments (37 no. 1 bed units, 10 no. 2 bed units and 8no. 3 bed units)
- Block B2 (8 storeys) comprising 42 no. apartments (28 no. 1 beds, 9 no. 2 beds and 5 no. 3 beds)
- Block B3 (8 storeys) comprising 42 no. apartments (28 no. 1 beds, 9 no. 2 beds and 5 no. 3 beds)
- Block B4 (5 storeys) comprising 41 no. apartments (4 no. studio units, 4 no. 1 bed units, 27 no. 2 bed units and 6 no. 3 bed units).
- Block C1 (3 storeys) comprising 10 no. apartments (1 no. studio unit, 3 no. 1 bed units and 6 no. 2 bed

units).
• Block C2 (3 storeys) comprising 6 no. apartments (2 no. 1 bed units, 4 no. 2 bed units,) together with a creche facility of 392 sq. m at ground floor level and outdoor play area space of 302sq.m
• Block C3 (1 storey plus basement level) comprising residential amenity space of 451 sq. m.
• Block D1 (6 storeys) comprising 134 no. apartments (12 no. studio units, 22 no. 1 bed units, 90 no. 2 bed units and 10 no. 3 bed units).
• Block E1 (6 storeys) comprising 70 apartment units (34 no. 1 bed units, 26 no. 2 bed units and 10 no. 3 bed units).
• Block E2 (6 storeys) comprising 50 units (1 no. studio unit, 29 no. 1 bed units, 18 no. 2 bed units and 2 no. 3 bed units).
Each residential unit has associated private open space in the form of a terrace/balcony.
Resident amenity space c. 451 sq. m. accommodating a gym and studio space at basement level; residents' lounge/café, work booths/meeting room and reception/foyer/parcel store at ground floor.
Crèche facility of 392. sq. m.
252 no. residential car parking spaces (161 no. at basement level and 91 no. at surface level) and 20 motorcycle spaces at basement level are proposed. 8 no. car parking spaces for creche use are proposed at surface level.
1056 no. bicycle parking spaces (656 no. at basement level and 400 no. at surface level).
15,099.7 sq. m. public open space in the form of a central parkland, garden link, woodland parkland (incorporating an existing folly), a tree belt, entrance gardens, plazas, terraces, gardens, and roof terraces for Blocks B2 and B3.
There will be no blasting or other works that may impact groundwater. The works will involve vegetation clearance and there will be demolitions of all buildings within the proposed development site. The construction programme is expected to last c.40-48 months.

5.5 Potential Impact of the Proposed Development

5.5.1 Construction Stage

5.5.1.1 Potential Impacts on Designated Sites during Construction

European Sites
The assessment presented in the Appropriate Assessment Screening Report concluded that, following an examination, analysis and evaluation of the best available information, it can be concluded that the possibility of any significant effects on any European sites, whether arising from the project alone or in combination with other plans and projects, can be excluded. In reaching this conclusion, the nature of the project and its potential relationship with all European sites within the zone of influence, and their conservation objectives, were fully considered. Therefore, the proposed development does not require an Appropriate Assessment or the preparation of a Natura Impact Statement (NIS).

Therefore, as the possibility that the proposed development will result in the disturbance or displacement of the qualifying or special conservation interest species of any European site can be excluded, there is no potential for any in combination effects to occur in that regard.

Nationally Designated Sites
The proposed development boundary does not overlap with any nationally designated sites, and the nearest site, South Dublin Bay pNHA, occurs c.310m north of the proposed development boundary (see Figure 5.3). There are no other nationally designated sites in the immediate vicinity. The proposed development does not have the potential to affect the receiving environment and, consequently, does not have the potential to affect the integrity of any nationally designated site; either alone or in combination with any other plans or projects.

As the proposed development does not traverse any national sites, there is no potential for habitat fragmentation of a national site to occur.

The proposed development is indirectly hydrologically connected to nationally designated sites in Dublin Bay and therefore there is potential for foul and surface water from the proposed development to cause

pollution events in downstream nationally designated sites in Dublin Bay. A Hydrological and Hydrogeological Risk Assessment (AWN, 2021) submitted with this application deals with the hydrology and hydrogeology of the proposed development site. The risk assessment also assesses the hydrological and hydrogeological risks associated with the proposed development. The assessment involved the creation of a conceptual site model (CSM). This model is "*developed based on a good understanding of the hydrological and hydrogeological environment, plausible sources of impact and knowledge of receptor requirements. This in turn allows possible Source Pathway Receptor (S-P-R) linkages to be identified. If no S-P-R linkages are identified, then there is no risk to identified receptors*". All potential sources were considered, including during construction and operational phases. All potential sources of contamination are considered without taking account of any measures intended to avoid or reduce harmful effects of the proposed project (mitigation measures) i.e. a worst-case scenario. Potential sources considered include: rupturing of/leakage from fuel tanks or construction equipment; run-off of wet cement or suspended solids into nearby waterways; leakage of petrol/diesel from car parking areas; silt run-off from stormwater drainage system; any potential issues with foul water drainage. The assessment found that the potential for off-site migration due to any construction discharges is low as there is no significant pathway in the underlying aquifer or through land ditches or streams. Indeed, there is no 'direct' hydrological linkage for construction or operational run-off from the site to nationally designated sites as stormwater is discharged through a combined sewer towards the Ringsend WWTP. There is also no 'direct' pathway for foul sewage to any receiving water body, including the Carysfort-Maretimo Stream. There is however an 'indirect pathway' through the public sewer, which is pumped from West Pier and ultimately discharges to the Ringsend WWTP prior to discharge to Dublin Bay post treatment. The assessment also found that the potential for hydrogeological impacts on the underlying aquifer is low based on the low chemical storage on site. Furthermore, the overburden thickness, low permeability nature of till and a lack of fracture connectivity within the granite bedrock aquifer will minimise the rate of off-site migration for any indirect discharges to ground at the site. Loading levels and the high level of dilution in the combined sewer, West Pier pumping station and in Dublin Bay will ensure that there are no negative impacts on nationally designated sites as a result of polluted stormwater discharge from the site. Finally, in terms of operational phase discharge from car parking areas, there will be negligible loading of discharge, and the distance between the source and Dublin Bay (c. 300m) and the significant dilution in the combined sewer will ensure that any released hydrocarbons are maintained at background levels and will not negatively impact on nationally designated sites. In summary, the assessment concluded that, based on the potential sources of pollution from the proposed development during construction and operation phases, there is no potential for impacts to occur on nationally designated sites in Dublin Bay.

In line with good practice effective mitigation measures have been included in the construction design, management of construction programme and during the operational phase of the proposed development. However, it must be noted that these are included in the design, not for the purposes of avoiding or reducing any potential harmful effects to any nationally designated sites but are required for new developments under the under the objectives of the Greater Dublin Strategic Drainage Study and Dun Laoghaire-Rathdown County Council Development Plan and in line with good construction practice.

It is an objective of the Greater Dublin Strategic Drainage Study, and the Dun Laoghaire-Rathdown County Council Development Plan 2016-2022, to incorporate Sustainable Urban Drainage Systems (SUDS) within new developments. The SUDS features associated with the proposed development are not included within the design to avoid or reduce any potential harmful effects to any nationally designated sites. As there are no hydrological or hydrogeological risks associated with the proposed development according to the *Hydrological and Hydrogeological Risk Assessment* completed by AWN Consulting (2021), there are therefore no nationally designated sites at risk of habitat degradation.

Construction-related disturbance and displacement of fauna species could potentially occur within the vicinity of the proposed development site. For mammal species such as badger, disturbance effects would not be expected to extend beyond 150m[15]. For birds, disturbance effects would not be expected to extend

[15] This is consistent with Transport Infrastructure Ireland (TII) guidance (Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes and Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes) documents. This is a precautionary distance, and likely to be moderated by the screening effect provided by surrounding vegetation and buildings, with the actual ZoI of construction related disturbance likely to be much less in reality.

beyond a distance of c.300m, as noise levels associated with general construction activities would attenuate to close to background levels at that distance[16]. The South Dublin Bay pNHA is just beyond the c.300m disturbance ZoI for birds.

Howth Head pNHA, Dolphins, Dublin Docks pNHA, South Dublin Bay pNHA, Booterstown Marsh pNHA, North Dublin Bay pNHA and Dalkey Coastal Zone And Killiney Hill pNHA are designated for the presence of coastal and estuarine habitats and usage of these sites species of interest, including wintering birds, It is likely that these sites are also designated for similar reasons to those for which North Bull Island SPA, South Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA, North Dublin Bay SAC, Howth Head, SAC, Howth Head Coast SPA, Dalkey Island SPA and Rockabill to Dalkey Island SAC are also designated.
In absence of mitigation, such potential impacts may result in a likely significant effect at the national geographic scale.

The *Dun Laoghaire-Rathdown County Development Plan 2016-2022* (Dun Laoghaire-Rathdown County Council, 2016) have policies and objectives for the protection of South Dublin Bay pNHA.

Introducing or spreading non-native invasive plant species
Planting, dispersing, or allowing and causing the dispersal, spread or growth of certain non-native plant species is prohibited under Regulation 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 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 site 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.* pNHAs) has the potential to result in a likely significant negative effect, at geographic scales ranging from local to national.

The non-native invasive species *Allium triquetrum* and *Hycanthoides hispanica* (both listed on the Third Schedule) were recorded within the site. Site clearance and excavation works have the potential, in the absence of mitigation, to result in the introduction and/or spread of non-native invasive species, such as *Allium triquetrum* and *Hycanthoides hispanica*, either outside or within the subject lands. The potential impacts in this instance could have a local level impact if the species were to expand into surrounding woodland/treeline habitats, but are not at risk of spreading in nearby pNHAs as those pNHA sites are all marine and aquatic in nature.

The need to control and manage non-native invasive species is highlighted in Policy NCH10 of the *Blackrock Local Area Plan* (Dún Laoghaire-Rathdown County Council, 2015).

5.5.1.2 Potential Impacts on Habitats and Flora during Construction Stage

Habitat loss
Hedgerows, treelines, (mixed) broadleaved woodland and scattered trees and parkland habitats are afforded protection in the *Dun Laoghaire-Rathdown County Development Plan 2016-2022* policies and objectives, specifically policies LHB23 and LHB26. Other relevant policies and objectives of *Dun Laoghaire-Rathdown County Development Plan 2016-2022* can be found in Appendix 5.5. In addition, the subject lands are located within the area of the *Blackrock Local Area Plan* (Dún Laoghaire-Rathdown County Council, 2015). Policies NHC5 and NHC8 of this plan provide protection for hedgerows and treelines in the plan area.

[16] The disturbance zone of influence for waterbirds is based on the relationship between the noise levels generated by general construction traffic/works (BS 5228:2009 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1 Noise) and the proximity of those noise levels to birds – as assessed in Cutts, N. Phelps, A. & Burdon, D. (2009) Construction and Waterfowl: Defining Sensitivity, Response, Impacts and Guidance, and Wright, M., Goodman, P & Cameron, T. (2010) Exploring Behavioural Responses of Shorebirds to Impulsive Noise. Wildfowl (2010) 60: 150–167. At 300m, noise levels are below 60dB or, in most cases, are approaching the 50dB threshold below which no disturbance or displacement effects would arise.

Construction of the proposed development will result in the permanent loss of habitat. None of the habitats directly affected by the proposed development are considered to be any greater than of local biodiversity importance (higher value).

Much of the habitats within the proposed development boundary are of local biodiversity importance (lower value) and are predominantly comprised of improved grassland and buildings and artificial surfaces. The loss or modification of habitats of local biodiversity importance (lower value) will not result in a likely significant effect on biodiversity.

The habitat types that are of local importance (higher value) and their area of coverage within the proposed development boundary, as well as the area of each to be removed, are as follows:

- Hedgerows (WL1) – *c.*215m in length; *c.*173m of which is to be removed
- Treelines (WL2) – *c.*557m in length; *c.*300m of which is to be removed
- Scattered trees and parkland (WD5) – *c.*0.69ha; *c.*0.60ha of which is to be removed
- (Mixed) broadleaved woodland (WD1) – *c.*0.4ha; *c.*0.13ha of which is to be removed
- Dry meadows and grassy verges (GS2) – *c.*1.14ha; all of which is to be removed
- Scrub (WS1) – *c.*0.27ha; all of which is to be removed

Under the proposed site layout, the treeline along the eastern and southern boundary (*i.e.* along the access road shared with St. Catherine's (Dunardagh) and corresponding to trees 354-404 in the Tree Survey report (The Tree File, 2021)) will be retained. Part of the treeline running across the lands immediately in front of Craigmore House (corresponding to trees 22-25, 36-37, 39, 41-42 in the Tree Survey Report (The Tree File, 2021)) will also be retained[17]. However, almost the entire length of hedgerow within the lands, the treelines north and south-west of Craigmore House, most of the scattered trees and parkland (WD5) habitat east and south-west of the House, part of the (mixed) broadleaved woodland (WD1) habitat in the south-west of the site and all the dry meadows and grassy verges (GS2) and scrub (WS1) habitat south and south-west of the House will be removed in order to facilitate the construction of the development (see Figure 5.6 for areas of habitat retention).

With regards to the area of parkland, buildings B3 and B4 are proposed to be built within this habitat, and will require the removal of trees 26, 43, 46-49, 117, 117a, 120, 126-129[18] and most of the parkland habitat. There will also be loss of parkland habitat during the construction phase of the proposed development when the grassy understorey will be disturbed by construction traffic. With regards to the area of mixed broadleaved woodland, buildings E1-E4 are located partially within this habitat or within the root protection area of several trees from the habitat type. The construction of buildings E1-E4 will necessitate the loss of approximately one-third of the mixed broadleaved woodland habitat and trees 169, 173-189 and 197[19]. There will also be changes to most of the woodland understorey (the exception being the area in the vicinity of identified badger setts) to facilitate the landscaping of the area for public amenity, which will involve sowing of a herbaceous/shrub understorey. The area of dry meadows and grassy verges will be re-sown with a commercial grass seed mix and managed for amenity purposes. The area of scrub in the south-west of the site will be entirely replaced by buildings and other built surfaces. Habitats scheduled for retention are illustrated in Figure 5.6.

Overall, significant portions of these habitats will be removed (most notably the hedgerow, parkland, scrub and dry meadows and grassy verges habitats), where they fall within the footprint of the proposed development. However, the majority of the existing treelines and broadleaved woodland habitats within the site will be retained as they currently are. As the area of habitat removed to facilitate construction of the proposed development is relatively large, the loss of these habitat types is considered significant, albeit at the local scale only. The mitigation measures proposed for this impact are summarised in Table 5.6.

[17] Trees 33, 35 and 38 are listed as Category U. According to the Tree Survey Report (The Tree File, 2017) accompanying this planning application, Category U trees typically relate to trees that are dead, dying or dangerous. Such trees may present a threat of suffer from a defect or disease that is considered irremediable.

[18] 126-129 are category U trees.

[19] 173 and 197 are category U trees.

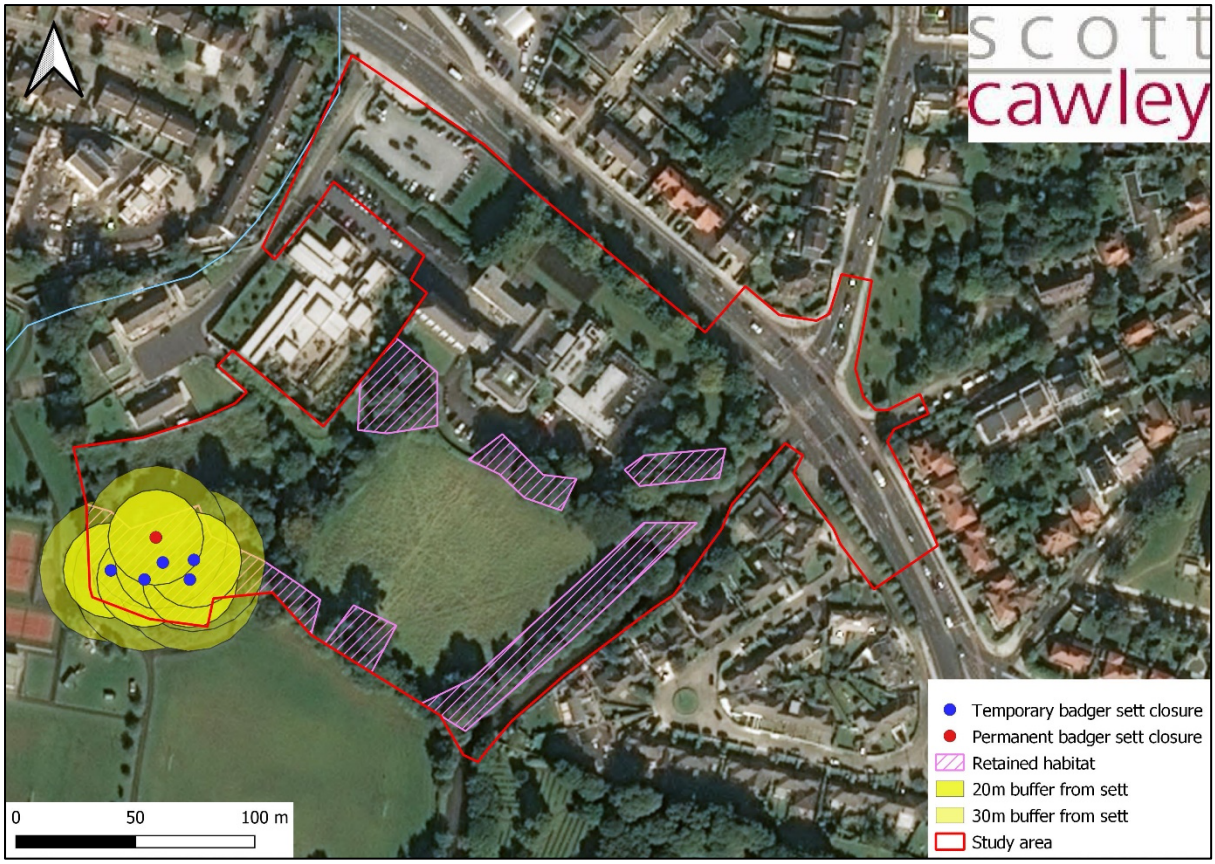

Figure 5.6: Badger sett closures, and areas of habitat for retention/protection during construction. All other areas of habitat within the site will be removed.

5.5.1.3 *Potential Impacts on Fauna during Construction Stage*

Potential Impacts of Habitat Loss

Badger

Badgers, and their breeding and resting places, are protected under the Wildlife Acts. Due to their stable Irish populations, they are considered to be of "Least concern" in terms of conservation (Nelson *et al.*, 2019). Badgers and badger setts were recorded within the proposed development site during the surveys (although 2021 camera surveys did not record any current badger activity in the site). In circumstances where badgers and badger setts have been recorded within the development site, as well as the presence of suitable breeding, foraging and commuting habitat for badgers, the proposed development site is considered to be utilised by badger. Furthermore, it is proposed that the northernmost of the six sett entrances, which is inactive, be closed permanently, and that the remaining sett entrances in the lands be closed temporarily for the duration of the construction phase of the proposed development. In addition, the construction of the proposed development will marginally reduce the amount of semi-natural habitat available to local badger populations and potentially fragment habitat corridors used by badger. Considering the presence of evidence of badger use of the proposed development site, the proposed development will result in a significant impact on badgers, albeit at a local geographical scale.

Small mammals

The proposed development site contains suitable foraging, commuting and breeding habitat for hedgehogs and pygmy shrews, and commuting opportunities for other small mammals. The construction of a development will disconnect habitat corridors and reduce the amount of semi-natural habitat available to local small mammal populations; although the area of habitat loss on site is relatively large, there is nonetheless an abundance of available suitable habitat for small mammals in the surrounding environment and particularly in the lands to the south, and a naturalised buffer zone will remain in place on site with the

retained woodland and treelines. Therefore, the proposed development will not result in a significant impact on small mammals at any geographical scale.

Birds
In the absence of mitigation to protect birds and their nests, there is potential for direct impacts on breeding birds due to loss of suitable breeding bird habitat and/or the risk of direct mortality and injury to birds, which may arise from the clearance of vegetation within the proposed development site. This potential impact would be most likely to arise if clearance works are undertaken during the time of year when birds are likely to be nesting (*i.e.* 1st March to 31st August, inclusive).

The bird species recorded at the proposed development site during surveys include those that are commonly found in suburban and urban habitats (*e.g.* blackbird, hooded crow, robin and wren). These habitats include hedgerows, treelines and grasslands, which can be found in the wider surrounding area, such as to the south of the proposed development site.

The clearance of vegetation may result in a loss of breeding bird habitat, however considering the amount of suitable foraging habitat located within the wider environs, the habitat loss will result in a significant negative effect on the populations of bird species at a local scale only.

Under the Wildlife Acts, it is an offence to disturb birds while on their nests, or to wilfully take, remove, destroy, injure or mutilate their eggs or nests. Mitigation measures have been identified and will be implemented to ensure adherence to the Wildlife Acts.

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

There are 30 trees with mostly moderate suitability for bat tree roost sites present within the proposed development site and as such there is potential for direct impacts on roosting bats to occur as a consequence of vegetation removal and/or works associated with the proposed development. In particular, prf trees 21, 34, 26, 120 (Category U tree – see section 5.5.1.2 above), 130, 181 and 197 (seven prf trees in total) are to be removed as part of the proposed development plans.

During activity surveys, bat species were recorded foraging and commuting within the proposed development site, but at relatively low levels. Leisler's bat and soprano pipistrelle bat (of which are of "Least concern" (Nelson *et al.*, 2019)) were the only species recorded within the lands. Activity was concentrated along hedgerows and treelines leading south of Craigmore House and along the southern boundary with Rockfield Park, where a single soprano pipistrelle bat was observed foraging along the boundary between the treeline and the adjacent area of dry meadow grassland. Considering that the majority of bat activity is generally concentrated in unlit areas, there is potential for direct impacts on foraging and commuting bats from increased light levels during construction in e.g. along the woodlands and treelines. However, the impact is considered to be insignificant on the local bat populations due to working hours being restricted to day-time hours when there is no requirement for lighting in the summer, and due to bats hibernating during winter months when there is a more significant requirement for lighting during construction. The clearance of vegetation may result in a loss of bat foraging habitat, however considering the amount of suitable foraging/commuting habitat located within the wider environs and particularly to the west of the site, the habitat loss will result in a significant negative effect on the populations of foraging, commuting and roosting bat species at a local scale only.

Potential Impacts Arising from Disturbance or Displacement

Construction-related disturbance and displacement of fauna species could potentially occur within the vicinity of the proposed development. For mammal species such as badger, disturbance effects would not

be expected to extend beyond 150m[20]. For birds, 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[21].

Badger
The presence of badger setts within the 150m disturbance ZoI of the proposed development will necessitate the closure of these setts prior to construction, and will also result in increased human presence on site. This impact is ameliorated by the fact that the proposed works will be largely confined to daylight hours, when badgers are least likely to forage within the proposed development site. Furthermore, 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, as there are large areas of suitable habitat in the wider environs towards the south the proposed development site. Badgers are widespread in Ireland and found in close proximity to human settlements, including in Dublin City, and therefore are likely to adapt to the temporary changes in human activity levels in the proposed development site and surrounding area. Disturbance or displacement of badgers from the setts on site, as well as displacement from local foraging habitat, during construction is therefore likely to result in a significant negative effect at a local geographic scale.

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 mammals from both breeding and resting places and from foraging habitat. However, given the limited potential for the majority of the site to support locally significant small mammal populations, and given that the disturbance will be medium-term (c.40-48 months), it is extremely unlikely to result in any long-term effects on the local small mammal populations or their conservation status. Disturbance or displacement during construction therefore is unlikely to result in a significant negative effect, at any geographic scale.

Birds
The construction of the proposed development will result in a temporary increase in construction-related noise and vibration and human disturbance over a construction period of c.40-48 months. This could potentially result in a medium-term reduction in the breeding success of birds that utilise suitable breeding habitat in the locality of the proposed development site.

The Amber-listed species (i.e. greenfinch, starling, house sparrow, black-headed gull and herring gull) recorded within the proposed development site, have seen short-term declines in their populations (Gilbert *et al.*, 2021). The smaller passerines rely on hedgerows, treelines and woodland, for breeding.

Given the existing background noise in the surrounding urban environment and similar habitats found in the surroundings within the wider environs, it will not result in a significant negative effect on the populations of these bird species at any geographic scale.

Bats

[20] This is consistent with Transport Infrastructure Ireland (TII) guidance (*Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes* and *Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes*) documents. This is a precautionary distance, and likely to be moderated by the screening effect provided by surrounding vegetation and buildings, with the actual ZoI of construction related disturbance likely to be much less in reality.
[21] The disturbance zone of influence for waterbirds is based on the relationship between the noise levels generated by general construction traffic/works (BS 5228:2009 *Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1 Noise*) and the proximity of those noise levels to birds – as assessed in Cutts, N. Phelps, A. & Burdon, D. (2009) *Construction and Waterfowl: Defining Sensitivity, Response, Impacts and Guidance*, and Wright, M., Goodman, P & Cameron, T. (2010) *Exploring Behavioural Responses of Shorebirds to Impulsive Noise*. Wildfowl (2010) 60: 150–167. At 300m, noise levels are below 60dB or, in most cases, are approaching the 50dB threshold below which no disturbance or displacement effects would arise.

Temporary artificial lighting associated with the construction works will further illuminate the site and its immediate environs. In absence of mitigation, this could potentially displace bats foraging and/or commuting bats from the lands within the proposed development site and in the locality. In consideration of the nature of the surrounding environment (*i.e.* semi-urban) and the fact that any artificial lighting during construction would be temporary and the site is partially lit by the existing St. Teresa's buildings and adjacent Temple Road to the immediate north of the site, it is considered that the proposed development will not result in a significant negative effect on local bat populations at any geographical scale. As a precaution, lighting mitigation has been provided to minimise any effect on individual bats during construction.

5.5.2 Operational Stage

5.5.2.1 Potential Impacts on Designated Sites during Operational Stage

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

Surface Water
A Hydrological and Hydrogeological Risk Assessment (AWN, 2021) submitted with this application deals with the hydrology and hydrogeology of the proposed development site. The risk assessment also assesses the hydrological and hydrogeological risks associated with the proposed development. The assessment involved the creation of a conceptual site model (CSM). This model is "*developed based on a good understanding of the hydrological and hydrogeological environment, plausible sources of impact and knowledge of receptor requirements. This in turn allows possible Source Pathway Receptor (S-P-R) linkages to be identified. If no S-P-R linkages are identified, then there is no risk to identified receptors*". All potential sources were considered, including during construction and operational phases. All potential sources of contamination are considered without taking account of any measures intended to avoid or reduce harmful effects of the proposed project (mitigation measures) i.e. a worst-case scenario. Potential sources considered include: rupturing of/leakage from fuel tanks or construction equipment; run-off of wet cement or suspended solids into nearby waterways; leakage of petrol/diesel from car parking areas; silt run-off from stormwater drainage system; any potential issues with foul water drainage. The assessment found that the potential for off-site migration due to any construction discharges is low as there is no significant pathway in the underlying aquifer or through land ditches or streams. Indeed, there is no 'direct' hydrological linkage for construction or operational run-off from the site to European sites as stormwater is discharged through a combined sewer towards the Ringsend WWTP. There is also no 'direct' pathway for foul sewage to any receiving water body, including the Carysfort-Maretimo Stream. There is however an 'indirect pathway' through the public sewer, which is pumped from West Pier and ultimately discharges to the Ringsend WWTP prior to discharge to Dublin Bay post treatment. The assessment also found that the potential for hydrogeological impacts on the underlying aquifer is low based on the low chemical storage on site. Furthermore, the overburden thickness, low permeability nature of till and a lack of fracture connectivity within the granite bedrock aquifer will minimise the rate of off-site migration for any indirect discharges to ground at the site. Loading levels and the high level of dilution in the combined sewer, West Pier pumping station and in Dublin Bay will ensure that there are no significant negative effects on European sites as a result of polluted stormwater discharge from the site. Finally, in terms of operational phase discharge from car parking areas, there will be negligible loading of discharge, and the distance between the source and Dublin Bay (c. 300m) and the significant dilution in the combined sewer will ensure that any released hydrocarbons are maintained at background levels and will not negatively impact on European sites. In summary, the assessment concluded that, based on the potential sources of pollution from the proposed development during construction and operation phases, there is no potential for impacts to occur on European sites in Dublin Bay.

In line with good practice effective mitigation measures have been included in the construction design, management of construction programme and during the operational phase of the proposed development. However, it must be noted that these are included in the design, not for the purposes of avoiding or reducing

any potential harmful effects to any European sites but are required for new developments under the under the objectives of the Greater Dublin Strategic Drainage Study and Dun Laoghaire-Rathdown County Council Development Plan and in line with good construction practice.

It is an objective of the Greater Dublin Strategic Drainage Study, and the Dun Laoghaire-Rathdown County Council Development Plan 2016-2022, to incorporate Sustainable Urban Drainage Systems (SUDS) within new developments. The SUDS features associated with the proposed development are not included within the design to avoid or reduce any potential harmful effects to any European sites.

Foul Water

Foul waters generated by the proposed development will discharge to the existing public sewer, which is pumped from West Pier and ultimately discharges to the Ringsend WWTP prior to discharge to Dublin Bay. The maximum contribution of foul waters (peak flow of 16.38 l/s) from the proposed development is 0.15% of the peak hydraulic capacity at Ringsend WWTP.

Foul water, comprising sewage and industrial effluent (and some surface water run-off), from the Dublin area has historically been, and will continue to be, treated at Ringsend WWTP prior to discharge to Dublin Bay. The most recent information from Irish Water indicates that the plant is operating above its capacity of 1.64 million P.E.[22], with a current operational loading of *c.* 2.2 million P.E. Ringsend WWTP operates under a discharge licence from the EPA (D0034-01) and must comply with the licence conditions.

Despite the capacity issues associated with the Ringsend WWTP, the Liffey Estuary Lower and Dublin Bay are currently classified by the EPA as being of "Unpolluted" water quality status[23]. The Tolka Estuary is currently classified by the EPA as being "Potentially Eutrophic". The pollutant content of future foul water discharges to Dublin Bay is considered likely to decrease in the long-term for the following reasons:

- An Bord Pleanála granted planning permission for an upgrade to the Ringsend WWTP in April 2019[24], which will increase capacity at the plant, and
- There is a commitment in the National Development Plan 2021-2030[25] to invest in and progress the Greater Dublin Drainage Project which will involve the provision of a new regional wastewater treatment plant at a site in the northern part of the Greater Dublin Area and the provision of a new Orbital Drainage Sewer linking the new plant to the existing regional sewer network, which will enable future connections for identified areas of development within the catchment area. The provision of the Greater Dublin Drainage Project will augment the wastewater treatment capacity currently provided by Ringsend WWTP across the Greater Dublin Area.

It is also an objective of the Greater Dublin Strategic Drainage Study, and all development plans within the catchment of Ringsend WWTP, to include Sustainable Urban Drainage Systems (SUDS) within new developments. The relevant development plans also have protective policies/objectives in place to protect water quality in the receiving freshwater and marine environments, and to implement the Water Framework Directive in achieving good water quality status for Dublin Bay.

Considering the above, particularly the current unpolluted status of Dublin Bay, and that foul water discharges from the proposed development would equate to a very small percentage of the overall discharge volumes sent to Ringsend WWTP for treatment, it is concluded that the proposed development will not impact on the overall water quality status of Dublin Bay.

[22] Irish Water (2017) *Annual Environmental Report*. Accessed from http://www.epa.ie/licences/lic_eDMS/090151b280672a63.pdf

[23] Transitional and Coastal Surface Water Quality data (2010-2012) accessed from the EPA Envision Mapviewer www.gis.epa.ie/Envision (accessed May 2019)

[24] An Bord Pleanála Case Reference PL29S.301798 – *10-year permission for development of the Ringsend wastewater treatment plant upgrade project including a regional bio solids storage facility*, Available online at www.pleanala.ie/casenum/301798.htm.

[25] Government of Ireland (2021) *Project Ireland 2040, National Development Plan 2021-2030.*

Nationally Designated Sites
Nationally designated sites would be subjected to the same potential impacts from operational stage described above with respect to potential impacts on European sites. In absence of mitigation, such potential impacts may result in a likely significant effect at the national geographic scale.

There is no direct hydrological connection between the proposed development site and the nearest nationally designated site, South Dublin Bay pNHA. Furthermore, the Hydrological and Hydrogeological Risk Assessment (AWN, 2021) has concluded that there is no pathway for potential indirect impacts to occur (see Section 5.5.2.1 above).

5.5.2.2 *Potential Impacts on Habitats and Flora during Operational Stage*

A significant proportion of the habitats within the proposed development will be either removed or replaced during the construction stage, prior to operation of the proposed development. The primary remaining sensitive habitats located within the proposed development site are the broadleaved woodland and treelines that are to be retained (see Figure 5.6). No further impacts on these habitats and flora are expected during the operational stage of the proposed development, with the exception of a likely increase in footfall and human traffic within these habitats, which may lead to increased trampling of ground flora. Despite this, the proposed development in operation will not result in a significant negative effect on habitats within the proposed development site at any geographical scale.

5.5.2.3 *Potential Impacts on Fauna during Operational Stage*

Birds
The proposed development during operation will likely result in a significant increase in levels of noise and human disturbance at the proposed development site from those levels currently present at the existing site. However, local bird species are likely to habituate to this increased human presence and background noise as they currently occupy an already heavily urbanised environment in the vicinity. Nonetheless, given the presence of parklands to the immediate south of the site, there may be potential impacts on birds as a consequence of noise and/or human disturbance, albeit at a local geographic scale.

Furthermore, the latest government guidelines document on building heights (Department of Housing, Planning and Local Government, 2018) states that in "*development locations in proximity to sensitive bird and / or bat areas, proposed developments need to consider the potential interaction of the building location, building materials and artificial lighting to impact flight lines and / or collision*". With regards to the height and location of the buildings, the site is not regarded to be a particularly sensitive one for bird species (see Section 5.3.3.2 above), and is not located along an important migratory route for any bird species. The buildings will be largely surrounded to the south by existing treelines within the site, which will further lessen the likelihood of bird collisions. Bird collisions with man-made structures are common and well documented with migratory passerine species being the most prevalent collision victims (Banks, 1979, Erickson *et al.,* 2005, Klem, 1990). 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 (Klem, 1990). Whilst the design of the facades of the proposed buildings does include some areas of glazing (particularly on balcony/terrace guardings), it should be noted that other materials are also proposed on the external surfaces of the buildings, particularly, extensive areas of brick. The use of different materials will minimise the effect of the glazing, making the buildings more detectable to birds and therefore reducing the potential for collisions to occur. In the absence of mitigation there could be a low level of mortality attributable to bird collision with glazing on the proposed buildings, however this impact is unlikely to cause any significant effect at a local scale or any other geographic scale.

Bats
In absence of mitigation, permanent artificial lighting associated with the operation of the proposed development could potentially displace foraging and/or commuting bats from the lands within the proposed development site. The wider surrounding lands are urban in nature towards the east, west and north. A precautionary approach has been adopted and it is considered that, in the absence of mitigation, the potential displacement of bats from the proposed development site as a consequence of artificial lighting

could potentially have a negative significant effect in the long-term on bat populations at a local geographic scale.

Furthermore, the proposed development during operation will likely result in a significant increase in levels of noise and human disturbance at the proposed development site from those levels currently present at the existing site, although the bat species recorded on site typically occur in urban and suburban environments and are regularly exposed to noise levels/disturbance indicative of these environs. Therefore, there may be potential impacts on bats as a consequence of noise and/or human disturbance, albeit at a local geographic scale.

The latest government guidelines document on building heights (Department of Housing, Planning and Local Government, 2018) states that in "*development locations in proximity to sensitive bird and / or bat areas, proposed developments need to consider the potential interaction of the building location, building materials and artificial lighting to impact flight lines and / or collision*". With regards to the height and location of the buildings, the site is not regarded to be a particularly sensitive one for bat species (see 5.3.4.1 above). Recent studies investigating the cause of bat collisions with buildings found that building material is an important factor to be considered and that smooth vertical surfaces such as glassy exteriors and windows can be particularly problematic (Greif *et al.,* 2017, Timm, 1989). Whilst the design of the facades of the proposed buildings does include some areas of glazing (particularly on balcony/terrace guardings), it should be noted that other materials are also proposed on the external surfaces of the buildings, particularly, extensive areas of brick. The inclusion of these other materials will help to minimise the effect of the glazing, making the buildings more detectable to bats and therefore reducing the potential for collisions to occur. 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 on the proposed buildings, however, this impact is unlikely to cause any significant effect at a local scale or any other geographic scale.

5.6 Mitigation Measures

5.6.1 Construction Stage

5.6.1.1 Mitigation Measures for Invasive Plant Species during Construction Stage

Non-native invasive plant species

The following mitigation measures will ensure that there will be no impacts from non-native invasive species within habitats in the local area:

- The invasive species *Hyacinthoides hispanica* and *Allium triquetrum* will be re-surveyed and marked on the ground by the site ecologist prior to the commencement of construction works within the lands. This will be undertaken in late spring, when the plants are in their flowering and vegetative phase and clearly identifiable above ground;
- The areas of *Hyacinthoides hispanica* and *Allium triquetrum* will be removed from all habitats within the lands. The material will be removed from site by an appropriately qualified and licensed professional with experience in treatment of invasive species. Treatment of Hyacinthoides hispanica and Allium triquetrum may be by a combination of mechanical means (i.e. removal by trowel or shovel and transport to a licensed facility for treatment) and chemical means (i.e. application of herbicide to growing material). Both species are listed on the Third Schedule of the Birds and Habitats Regulations and are considered to be high-risk species. The requirement for further treatment of both species will be determined based on ongoing monitoring of the lands following completion of initial clearance.
- Monitoring for invasive species will also be carried out annually within the lands in spring/summer months throughout the construction period to ensure no further populations become established or spread.

5.6.1.2 Mitigation Measures for Habitats during Construction Stage

Water quality

The following mitigation measures will ensure there are no impacts on water quality in the immediate vicinity of the proposed development from release of hydrocarbons, polluting chemicals, sediment/silt and contaminated waters control during the construction stage of the proposed development and therefore no potential impacts on the downstream receiving water courses, *i.e.* the Carysfort-Maretimo Stream:

- Specific measures to prevent the release of sediment over baseline conditions to the existing surface water drainage network, during the construction work, which will be implemented. These measures include, but are not limited to:
    - silt fences,
    - silt curtains,
    - settlement lagoons, and
    - filter materials.
- Provision of exclusion zones and barriers (e.g. silt fences) between earthworks, stockpiles and temporary surfaces to prevent sediment washing into the existing drainage systems and hence the downstream receiving water environment.
- Provision of temporary construction surface drainage and sediment control measures to be in place before earthworks commence.
- Weather conditions will be taken into account when planning construction activities to minimise risk of run-off from the site.
- Prevailing weather and environmental conditions will be taken into account prior to the pouring of cementitious materials for the works adjacent to any surface water drainage features, or drainage features connected to same. Pumped concrete will be monitored to ensure no accidental discharge. Mixer washings and excess concrete will not be discharged to existing surface water drainage systems. Concrete washout areas will be located remote any surface water drainage features, where feasible, to avoid accidental discharge to watercourses. Washing out of any concrete trucks on site will be avoided (dry brush shoots will be used instead).
- Fuels and chemicals (including hydrocarbons or any polluting chemicals) will be stored in a designated, secure bunded area(s) to prevent any seepage of potential pollutants into the local surface water network.
- All mobile fuel bowsers shall carry a spill kit and operatives must have spill response training. All fuel containing equipment such as portable generators shall be placed on drip trays. All fuels and chemicals required to be stored on-site will be clearly marked. Care and attention will be taken during refuelling and maintenance operations, with particular attention paid to gradient and ground conditions, which could increase risk of discharge to waters.
- A register of all hazardous substances, which will either be used on site or expected to be present (in the form of soil and/or groundwater contamination) will be established and maintained. This register will be available at all times and shall include as a minimum:
    - Valid Safety Data Sheets;
    - Health & Safety, Environmental controls to be implemented when storing, handling,
    - using and in the event of spillage of materials;
    - Emergency response procedures/precautions for each material; and,
    - The Personal Protective Equipment (PPE) required when using the material.
    - Implementation of response measures to potential pollution incidents.
- Robust and appropriate Spill Response and Environmental Emergency procedures will be communicated, resourced and implemented for the duration of the works.
- Emergency procedures/precautions and spillage kits will be available and construction staff will be trained and experienced in emergency procedures in the event of accidental fuel spillages.
- All trucks will have a built-on tarpaulin that will cover excavated material as it is being hauled off-site and wheel wash facilities will be provided at all site egress points.
- Water supplies shall be recycled for use in the wheel wash. All waters shall be drained through appropriate filter material prior to discharge from the construction sites.

- The removal of any made ground material, which may be contaminated, from the construction site and transportation to an appropriate licenced facility shall be carried out in accordance with the Waste Management Act, best practice and guidelines for same.
- Implementation of effective measures to minimise waste and ensure correct handling, storage and disposal of waste (most notably wet concrete, pile arisings and asphalt).
- All of the above measures implemented on site will be monitored throughout the duration of construction to ensure that they are working effectively, to implement maintenance measures if required and applicable, and to address any potential issues that may arise.

The aforementioned mitigation measures will also protect against potential accidental pollution events in downstream nationally designated sites, particularly South Dublin Bay pNHA.

Terrestrial Habitats
The following measures will be implemented to minimise the risk of accidental damage to hedgerows, treelines, woodland and parkland habitat (and individual trees) during the construction phase of the proposed development:

- A site ecologist will be appointed by the employer's representative to undertake an ecological clerk of works role over the construction phase of the proposed development. The site ecologist will be responsible for monitoring compliance with the proposed ecological mitigation measures. They will liaise with the site foreman and report to the local authority on a regular basis;
- All hedgerows, treelines and areas of woodland/parkland that are scheduled for retention will be fenced-off from construction traffic using Heras fencing or similar at the outset of works and for the duration of construction to avoid damage to the trunk, branches or root systems of the trees. Temporary fencing will be erected at a sufficient distance from trees so as to enclose the Root Protection Area (RPA) of the tree (National Roads Authority, 2005-2011). In general the RPA covers an area equivalent to a circle with a radius 12 times the stem diameter (measured at 1.5m above ground level for single stemmed trees);
- 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. It will still be necessary to ensure that the area within the RPA is not used for vehicle parking or the storage of materials (including oils and chemicals). This measure is considered secondary to fencing of retained habitats, and should only be undertaken as a last resort; and,
- Spoil materials such as rubble, topsoil, building goods and equipment, will not be placed within the RPA of trees or within 5m of hedgerows.

The aforementioned measures are included within a Woodland Management Plan that is appended to the EIAR (see Appendix 5.7).

Furthermore, the planting of a new hedgerow is proposed on site, as outlined in section 5.7 below.

5.6.1.3 Mitigation Measures for Birds during Construction Stage

Vegetation clearance/demolition of a structure
The following mitigation measures are proposed to comply with the legal protection afforded to breeding birds and their nests under the Wildlife Acts:

- In order to avoid disturbance or harm to breeding birds, their nests, eggs and/or their unflown young, all works involving the removal of trees, hedgerows, grasslands or the demolition of the structure will be undertaken outside of the nesting season (i.e. 1 March to 31 August inclusive)

In circumstances where this seasonal restriction cannot be observed then:

- A breeding bird survey will be undertaken by a suitably experienced ecologist in order to assess whether birds are nesting within suitable habitat affected by or immediately adjacent to the proposed works. Should nesting birds be encountered during surveys, the removal of trees or hedgerows or the demolition of the buildings will be delayed until after the nesting season (i.e. 1 March to 31 August inclusive), or until the chicks have fully fledged.

5.6.1.4 Mitigation Measures for Bats during Construction Stage

Lighting

During construction, any external lighting to be installed, including facilitating night-time working or security lighting, on the site shall be sensitive to the presence of bats in the area, downlighting, and time limited where possible. Lighting of sensitive wildlife areas and primary ecological corridors (*e.g.* Grand Canal) and light pollution in general should be avoided.

Lighting of the site during construction is 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).

Vegetation Clearance

The following mitigation measures are proposed in relation to those trees identified as having potential to support roosting bats (see Figure 5.5), and particularly those which will be removed during the construction stage. 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 felling works. The following mitigation procedures will be followed:

- Felling of potential tree roosts will be undertaken during the periods April to May or September to October as during this period bats are capable of flight and may avoid the risks from tree felling if proper measures are undertaken, but also are neither breeding nor in hibernation
- Use of detectors alone may not be sufficient to record bat emergence and re-entry in darkness. Therefore, prior to felling of confirmed and potential tree roosts, an emergence survey using infra-red illumination and video camera(s) and bat detectors will be carried out on the night immediately preceding the felling operation to determine if bats are present
- Where it is safe and appropriate to do so for both bats and humans, such trees may 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 should then be pushed to the ground slowly and should remain in place until it is inspected by a bat specialist
- Trees should only be felled "in section" where the sections can be rigged to avoid sudden movements or jarring of the sections
- Where remedial works (e.g. pruning of limbs) is to be undertaken to trees deemed to be suitable for bats, 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
- If any bat tree roosts are confirmed, and will be removed by the proposed felling works, then a derogation licence will be required from the NPWS and appropriate alternative roosting sites will be provided in the form of bat boxes.

5.6.1.5 Mitigation Measures for Badgers during Construction Stage

Before works to clear any of the habitat features suitable to supporting badgers commence, checks will be undertaken of all mammal holes within the subject lands, in advance (approximately one month) of commencement of construction works. This will involve monitoring of holes by remote infra-red cameras for a period of 14 days each at minimum. This measure is proposed in order to account for potential changes to badger activity within the lands between granting of planning and commencement of construction activities. Monitoring will involve checks for signs of breeding activity at setts. This will require a licence from the NPWS permitting filming to assess locations of activity.

Guidelines for the treatment of badgers prior to the construction of national road schemes (National Roads Authority, 2009) recommends against the use of heavy machinery within 30m of badger sett entrances, and the exclusion of light machinery (generally wheeled vehicles) from within 20m of a badger sett entrance. This is not feasible in this instance in light of the location of blocks E1 and E2, which are within 20m of the badger sett entrance. Accoridngly, it is proposed that the northernmost of the six sett entrances, which is inactive, will be closed permanently, and that the remaining sett entrances in the lands will be closed temporarily for the duration of the construction phase of the proposed development.

The closure of sett entrances will be undertaken between July and November inclusive, in order to avoid the peak breeding season for badger (December to June), and therefore avoid the risk of disturbance or mortality of cubs. Works may proceed during the breeding season for badger following the successful closure of the sett entrances.

In order to close each sett entrance, a one-way badger gate (or a similar device) will be installed at each sett entrance. The gates will be soft blocked with stones after their installation and will be monitored for a 21-day period for signs of activity. Where no activity takes place, further stones or similar materials will be used to reinforce the closure of the sett entrance. The sett entrance will be monitored for activity throughout construction. The sett entrances may need to be closed several times over the duration of the project if badgers reopen the sett entrances. All sett entrances, with the exception of the northernmost sett entrance will be reopened following the completion of works by removal of badger gates.

At the landscaping stage of the proposed development, a dense planting of evergreen ground cover species such as *Luzula sylvatica* and native evergreen woodland shrubs/trees such as *Ilex aquifolium, Euonymus europaeus, Crataegus monogyna* and *Viburnum opulus* will be established around the badger sett entrances. The intention of this planting is to minimise the requirement maintenance machinery (*i.e.* lawnmowers) within the vicinity of sett entrances, and to provide a level of screening of them from residential dwellings. These measures are intended to reduce the levels of disturbance to badgers and their setts at the operational phase of the proposed development.

In addition, to protect individual badgers from direct harm, all open excavations on site will be covered when not in use and backfilled as soon as possible. Excavations will also be covered at night and any deep excavations left open will have appropriate egress ramps in place to allow mammals to safely exit excavations should they fall in.

5.6.2 Operational Stage

5.6.2.1 Mitigation Measures for Habitats during Operational Stage

The landscape plans (see Chapter 12) of the proposed development site will implement appropriate measures such as using plants of native origin in planting/meadows and by leaving unmanaged and/or enhanced areas for biodiversity. To offset the loss of habitats, the proposed landscape plans include the planting of a dense ground flora in the area of woodland in the vicinity of the badger setts (i.e. south of proposed blocks E1 and E2). This will involve planting of a mix of ornamental varieties of *Luzula sylvatica* and occasional specimen shrubs of *Ilex aquifolium* and other evergreen shrubs suitable for shady environments. A one metre wide grass verge will be maintained between the edge of amenity space and treelines, hedgerows and woodland habitats. This will allow the development of edge habitat for wildlife of tall grasses and forbs. The verge will be managed through a single annual cut in August/September. No fertilisers or herbicides will be applied to the verge or in the vicinity of the verge, in order to ensure maximum species diversity. The verge will be allowed to develop naturally from the soil seedbank as opposed to being sown from imported seed.

The aforementioned measures are included within a Woodland Management Plan that accompanies this report.

5.6.2.2 Mitigation Measures for Bats during Operational Stage

Lighting

The lighting plans take into consideration sensitive wildlife areas (*e.g.* Rockfield Park), and are downlighting, and time limited where possible.

The following mitigation measures are proposed and have been considered in relation to the detailed operational lighting design, and have been reviewed by a suitably qualified and experienced ecologist:

- Lighting levels will be the minimum required for health and safety requirements.
- Vertical light spill shall be minimized by the use of suitable cut off luminaires.
- No floodlighting shall be used, as this causes a large amount of light spillage into the sky. The spread of light shall be kept below the horizontal.
- Lights shall be of low intensity. It is better to use several low intensity lights than one strong light spilling light across the entire area.
- Narrow spectrum lighting shall be used with a low UV component (UV filters can be used to reduce the UV component emitted by lights). Glass also helps reduce the UV component emitted by lights.
- The use of LED directional lighting (through the use of hoods, louvres, shields, or cowls) to restrict light to those areas shall be implemented where it is needed.
- Consideration shall be given to the use of automatic sensor or dimming systems to minimise the duration and intensity of lighting on the site.

The technical details of the lighting plans for the proposed development include the following:

- Lighting will be restricted to the building perimeter, plant areas, roadways and car parking;
- All pathways will be illuminated using bollards;
- All columns will be a maximum of 5 metres high with sharp cut off luminaires, located to minimise light back spill; and,
- LED-based lighting.

These are in adherence with the guidance presented in relation to bats and lighting in Section 5.6.1.4.

5.7 Additional Planting

5.7.1.1 Compensation Measures for Habitats

In order to mitigate the impacts of the the loss of *c.* 173m of hedgerow and *c.* 300m of treeline, a new hedgerow will be planted along the western boundary of the lands at the interface between the lands and the Alzheimer Society of Ireland and St. Louise's Park. The total length of new hedgerow will be *c.* 100m and will conform to the following:

- Species selected will be native to the locality *i.e. Prunus spinosa*, *Crataegus monogyna*, *Quercus petraea*, *Ilex aquifolium* and *Sambucus nigra*. The hedgerow mix will include a minimum of five woody species over a space of 30m and will include the planting of emergent tree species; and,
- Plants will be closely spaced (50cm maximum) and will be planted in a herringbone/zigzag line.

5.8 Residual Impacts of the Proposed Development

5.8.1 Proposed Development

5.8.1.1 Construction and Operational Stages

Following the implementation of the mitigation measures outlined in Section 5.6 above, the proposed development will not result in any significant residual effects on the Key Ecological Receptors identified (see Table 5.6) on its own, or cumulatively together with other proposed developments.

Ecological Receptor	Ecological Valuation	Impacts with Potentially Significant Effects	Potential Significance of Effects	Mitigation Measures	Significance of Residual Effects
South Dublin Bay pNHA	National	Water pollution events	National	Water pollution mitigation measures outlined in section 5.6.1.2	Local non-significant effects
Dry meadows and grassy verges (GS2)	Local importance (higher value)	Permanent loss of habitat Introduction of non-native invasive species	Local importance (higher value)	Removal of non-native invasive species prior to construction outlined in Section 5.6.1.1	Local non-significant effects
Hedgerows (WL1)	Local importance (higher value)	Permanent loss of habitat Introduction of non-native invasive species	Local importance (higher value)	Removal of non-native invasive species prior to construction outlined in Section 5.6.1.1 Landscape planting outlined in Chapter 12 of the EIAR	Local non-significant effects
Treelines (WL2)	Local importance (higher value)	Permanent loss of habitat Introduction of non-native invasive species	Local importance (higher value)	Removal of non-native invasive species prior to construction outlined in Section 5.6.1.1 Landscape planting outlined in Chapter 12 of the EIAR	Local non-significant effects

Scattered trees and parkland (WD5)	Local importance (higher value)	Permanent loss of habitat Introduction of non-native invasive species	Local importance (higher value)	Removal of non-native invasive species prior to construction outlined in Section 5.6.1.1 Landscape planting outlined in Chapter 12 of the EIAR	Local non-significant effects
(Mixed) broadleaved woodland (WD1)	Local importance (higher value)	Permanent loss of habitat Introduction of non-native invasive species Introduction of non-native invasive species	Local importance (higher value)	Removal of non-native invasive species prior to construction outlined in Section 5.6.1.1 Landscape planting outlined in Chapter 12 of the EIAR	Local non-significant effects
Scrub (WS1)	Local importance (higher value)	Permanent loss of habitat Introduction of non-native invasive species	Local importance (higher value)	Removal of non-native invasive species prior to construction outlined in Section 5.6.1.1	Local non-significant effects
Badger	Local importance (higher value)	Habitat loss, disturbance and sett closures	Local importance (higher value)	Pre-construction checks and camera trapping Sett closures Landscape planting outlined in Chapter 12 of the EIAR	Local non-significant effects
Small mammals	Local importance (higher value)	Habitat loss	Local importance (higher value)	None	Local non-significant effects

Birds	Local importance (higher value)	Habitat loss	Local importance (higher value)	Seasonal vegetation clearance (Section 5.6.1.3) Breeding bird surveys prior to vegetation clearance in breeding season These measures are in adherence with Wildlife Acts 12 no. 1B Schwegler nest boxes or similar to be installed across the subject lands The nest boxes will be installed at a minimum of 3m above ground level to ensure against disturbance from humans and domestic animals such as cats	Local non-significant effects
Bats	Local importance (higher value)	Habitat loss	Local importance (higher value)	Bat sensitive lighting plans (Section 5.6.1.4)	Local non-significant effects

Table 5.6: Summary of the significant residual ecological effects of the proposed development during construction and operational stages.

5.9 Potential Cumulative Impacts

This section of the report presents the assessment carried out to examine whether any other proposed developments have the potential to act cumulatively with the potential impacts identified in respect of the proposed development to give rise to likely significant effects on biodiversity.

As set out in the *Dun Laoghaire-Rathdown Development Plan 2016-2022*, the majority of the lands are zoned as '*R2 - Existing residential*' under *Objective A – to protect and-or improve residential amenity* in the *Dún Laoghaire-Rathdown County Development Plan 2016-2022* (Dún Laoghaire-Rathdown County Council, 2016). The exception to this is part of the southwestern corner of the lands which is zoned as '*G1 - Open space, park*' under *Objective F – to preserve and provide for open space with ancillary active recreational amenities*. The lands include objectives to protect and preserve trees and woodland.

Furthermore, lands at St. Teresa's and Dunardagh (St. Catherine's), the former of which encompasses the subject lands, form an area earmarked as '*potential development areas*' within the *Blackrock Local Area Plan* (Dún Laoghaire-Rathdown County Council, 2015).

Lands to the west, east and north are similarly zoned for '*R2 - Existing residential*', with smaller areas of '*C2.1 - Industrial, enterprise, employment*' and '*M3 - District, neighbourhood centre'*. Undeveloped lands to the south are zoned as '*G1 - Open space, park*', surrounded by further '*R2 - Existing residential*.

5.9.1 Construction Stage and Operation Stage

Surface and Foul Water

There is potential for cumulative or "in-combination" effects on water quality in Dublin Bay from any other projects carried out within the functional areas of the *Dun Laoghaire-Rathdown County Development Plan 2016-2022* (Dun Laoghaire-Rathdown County Council, 2016) and any other county level land use plans which can influence conditions in Dublin Bay via rivers and other surface water features: *Dublin City Development Plan 2016-2022* (Dublin City Council, 2016), the *Dún Laoghaire-Rathdown County Development Plan 2016-2022* (Dún Laoghaire-Rathdown County Council, 2016), the *Fingal Development Plan 2017-2023* (Fingal County Council, 2017), *South Dublin County Council Development Plan 2016-2022* (South Dublin County Council, 2016), and any other relevant plans.

Dublin Bay

The proposed development will not impact on the water quality in Dublin Bay, as concluded by the associated Appropriate Assessment screening report (Scott Cawley, 2021) and the Hydrological and Hydrogeological Risk Assessment (AWN, 2021). As noted under Section 5.5.2.1 above, Dublin Bay is currently unpolluted, and the proposed development will not result in any measurable effect on water quality in Dublin Bay. There are also protective policies and objectives in place at a strategic planning level to protect water quality in Dublin Bay (as outlined below and in Appendix 5.5). The pollutant content of future surface water discharges to Dublin Bay is considered likely to decrease in the long-term for the following reasons:

- An Bord Pleanála granted planning permission for an upgrade to the Ringsend Waste Water Treatment Plant (WWTP) in April 2019, which will increase capacity at the plant; and,
- It is also an objective of the Greater Dublin Strategic Drainage Study, and all development plans within the catchment of Ringsend WWTP, to include Sustainable Urban Drainage Systems (SUDS) within new developments. The relevant development plans also have protective policies/objectives in place to protect water quality in the receiving freshwater and marine environments, and to implement the Water Framework Directive in achieving good water quality status for Dublin Bay.

Therefore, there is no possibility of any other plans or projects acting in combination with the proposed development to undermine the conservation objectives of any of the qualifying interests or special conservation interests of proposed Natural Heritage Areas or European sites in, or associated with, Dublin Bay as a result of water quality effects.

Habitat Loss and Disturbance and/or Displacement

In the event that habitat loss of dry meadows and grassy verges (GS2), (mixed) broadleaved woodland (WD1), treelines (WL2), scattered trees and parkland (WD5), scrub (WS1) and hedgerows (WL1) coincided with the loss of similar habitats in the vicinity of the proposed development, the geographic scale of the effects could rise from local level only to county level, as these types of habitats may be scarce at the county level (particularly broadleaved woodland habitat), and in addition, linear habitats create ecological corridors throughout the wider landscape. The adjacent lands around the proposed development are likely to continue to be developed for residential purposes in the future, however areas to the south of the proposed development site are zoned for '*G1 - Open space, park*' in the *Dun Laoghaire-Rathdown County Development Plan 2016-2022* and are therefore likely to remain in their current use, and therefore it is unlikely that potential cumulative effects will occur.

There are predicted impacts on fauna as a result of habitat loss arising from the development. In addition, there is potential for cumulative impacts on fauna in the area to arise as a result of habitat loss, if further hedgerows, treelines and broadleaved woodland in the locality are removed, or semi-natural grassland areas are replaced by areas of hard standing or buildings and artificial surfaces.

However, given the presence of existing residential lands (and their residential zoning) to the immediate west, north and east and the already developed urban nature of the remaining surrounding environment, no significant cumulative effects are predicted that would increase the magnitude of the residual impacts associated with the proposed development as a result of habitat loss, in conjunction with the proposed development.

Indeed, the vast majority of the Blackrock area is built up with a mix of residential, commercial and amenity developments. The vast majority of planning applications in the locality comprise small scale extensions to existing residential units. Several larger scale-developments are also occurring in the area, including:

- D17A/0137 - Site of 0.49ha (1.23 acres) at Newtown Avenue, Blackrock, Co. Dublin known as the 'Former Europa Garage site. Permission was granted to Crekav Trading GP Ltd. by Dún Laoghaire-Rathdown County Council for the demolition of the former garage and construction of 51 no. residential units;
- D16A/0418 and D18A/0211 - Enterprise House, Blackrock Shopping Centre, Blackrock, Co Dublin. Permission was granted to Friends First Life Assurance Co DAC for the demolition and rebuild of Enterprise House, off the Frascati Road. Permission was also granted for minor modifications to the proposal;
- D14A/0134; D15A/0751; D16A/0843; D17A/0950; and, D18A/0130 - Frascati Shopping Centre, Frascati Road (N31), Blackrock, Co Dublin. Permission was granted by Dún Laoghaire-Rathdown County Council for the expansion/rejuvenation of Frascati Shopping Centre, including the construction of a multi-storey carpark, additional retail units, and apartment units. This development is at an advanced stage.

Therefore, there are developments for which permission has been granted, some of which may be in construction at the same time as the proposed development. There is potential for cumulative impacts to arise with other local developments that would also result in the increased noise, vibration, human presence and lighting. Any disturbance effects from other such local developments are likely to be relatively minor nature, temporary, localised and over a similarly short duration, they are not likely to cumulatively affect the bird or bat populations in conjunction with the proposed development considering that they have to adhere to the same policies and objectives of the Dun Laoghaire-Rathdown County Council Development Plan as the proposed development.

Protective Policies and Objectives and Conclusion

Any long-term effects on biodiversity are likely to be moderated by the environmental protective policies and objectives of the *Dun Laoghaire-Rathdown County Development Plan 2016-2022* and *Draft Biodiversity Action Plan for Dun Laoghaire-Rathdown County 2022-2028.*

There are general overarching policies in the *Dun Laoghaire-Rathdown County Development Plan 2016-2022* to ensure that proposals for development integrate the protection and enhancement of biodiversity (Policy

LHB19) and to identify and protect sites of local biodiversity importance, including proposed national heritage areas (Policy LHB22). There are also specific objectives to protect European sites and to prevent development that would adversely affect the integrity of any European site(s) (Policy LHB20). The *Dun Laoghaire-Rathdown County Development Plan 2016-2022* also has specific policies and objectives relating to the protection of surface water and groundwater resources (e.g. Policies EI2 and IE3).

Land use plans for the other local authorities (*e.g.* Meath County Council, Kildare County Council, Wicklow County Council and the Dublin local authorities) whose functional areas also include the Liffey and Dublin Bay catchment or other surface water catchments that drain to Dublin Bay, were examined and analysed and those land use plans also include protective environmental policies to protect biodiversity, designated sites for nature conservation and the receiving surface water, estuarine and marine environments.

Considering the predicted impacts associated with the proposed development, the mitigation measures proposed to protect the local biodiversity resource and the receiving environment (see section 5.8 below), and the protective policies and objectives on the land-use plans that will direct future development locally, significant cumulative negative effects on biodiversity are not predicted.

5.10 Do Nothing Scenario

The continuation of the existing management practices at the proposed development site in a "do-nothing" scenario, would maintain the current habitats present. The proposed development site would continue to provide suitable foraging and breeding habitat for badgers, as well as bird and small mammal species and suitable foraging and roosting habitat for common bat species. The grasslands within the lands, if left unmanaged, would lead to scrub encroachment over time, as has already occurred in the west of the site in recent years.

As set out in the *Dun Laoghaire-Rathdown Development Plan 2016-2022*, the majority of the lands are zoned as '*R2 - Existing residential*' under *Objective A – to protect and-or improve residential amenity* in the *Dún Laoghaire-Rathdown County Development Plan 2016-2022* (Dún Laoghaire-Rathdown County Council, 2016). The exception to this is part of the southwestern corner of the lands which is zoned as '*G1 - Open space, park*' under *Objective F – to preserve and provide for open space with ancillary active recreational amenities*. The lands include objectives to protect and preserve trees and woodland. Therefore, the majority of the lands would likely be developed for residential purposes in the future or maintained in its current semi-residential status.

5.11 Monitoring

5.11.1 Proposed Development

Monitoring of measures for habitats and invasive species, lighting and bats, and for badgers is proposed as follows. A programme of monitoring shall be undertaken in the manner set out below. A report detailing the methodology, results and recommendations arising from monitoring surveys undertaken will be prepared at the end of each monitoring year. Reports will be submitted to Dún Laoghaire-Rathdown County Council.

5.11.1.1 Monitoring of Habitats and Invasive Species

- Monitoring of new hedgerow habitat planting and enhancement measures for habitats and invasive species will be undertaken after one, three and five years post-completion to assess the success of these measures.
- With regards to the establishment of new hedgerow habitat, monitoring checks will report on the species planted, the presence of at least five woody species over a 30m section, and the presence of standard trees. Monitoring will also check for the presence of dead specimens. If necessary, supplementary planting will be implemented, and changes to management based on the outcome of monitoring. Monitoring will take place between April and October to facilitate identification of all woody species.
- With regards to invasive species, monitoring will involve surveys for presence/absence of Spanish bluebell and/or three-cornered garlic. Surveys will take place when both species are either in flower or in leaf and therefore easily identifiable. Measures may be recommended for further treatment of these species if they persist after completion of construction.

- With regards to the establishment of dense ground cover and evergreen shrubs around the existing badger setts, monitoring will assess the success of establishment of these plantings. Recommendations for supplementary planting may be required depending on the outcome of monitoring surveys.
- With regards to the establishment of a 1m wide verge between grassland and woodland habitats, monitoring will document presence/absence of the verge and will also document signs of use of herbicide and/or fertilisers. Monitoring will be undertaken between June and September when most grass species are in flower or in seed.

5.11.1.2 *Monitoring of Lighting and Bats*

- Monitoring of lighting within the lands and bat activity will be undertaken at one, three and five years post completion to assess the success of measures to avoid, minimise and reduce effects on bats.
- Monitoring of bats will include taking readings of light spill at ground level and at 2m height above ground at 10 locations within retained woodland habitat within the lands. The 10 locations will be determined in year 1 of the monitoring surveys. Where readings exceed 3 lux at either or both ground level and 2m above ground level, recommendations will be made for the adjustment of lighting within the lands.
- In addition to monitoring of light spill within the lands, it is proposed that two separate manual bat activity transects be undertaken within the lands during the season of peak bat activity (*i.e.* between May and August). Each survey will be separated by a period of at least one month to maximise spread through the survey season.

5.11.1.3 *Monitoring of Badger*

Ongoing monitoring is being undertaken at the badger sett entrances to determine frequency of visits and the activity of badgers within the lands.
It is proposed that retained setts be monitored by infra-red motion triggered cameras throughout construction and for a period of six months following completion of the proposed development to determine if the sett is re-occupied by badgers.

5.12 Cumulative

Not applicable for biodiversity.

5.13 Reinstatement

No reinstatement measures are proposed.

5.14 Survey Limitations

Breeding bird surveys were not carried out due to the timing of surveys outside the breeding bird season (March to August inclusive). However, the timing of the surveys does not pose any limitations on the ecological assessment of the subject lands, as the site is semi-urban and holds mostly common agricultural and garden species which can be identified after the end of the bird breeding season. No dedicated wintering bird or raptor surveys were undertaken within the lands, however, wintering birds and raptors were searched for extensively and recorded during the multidisciplinary field visits in 2018 and 2021. Therefore, this is not considered to have posed any significant limitations on the ecological assessment of the subject lands.

While bat activity surveys were undertaken during the appropriate season in accordance with the practices outlined in *Bat Survey Guidelines for Professional Ecologists* (Collins, 2016), the scale and complexity of the buildings means that there is a low risk of an occasionally-used roost of individual bats being overlooked. In light of this, mitigation measures have been provided for compliance with legislation protecting bats and their roots during construction/demolition within the lands.

Not all identified potential roost features (PRFs) for bats on trees within the site were investigated in detail using an endoscope, however, the mitigation measures recommended in Section 5.6.1.4 ensure that such detailed investigations (using infra-red illumination and video camera(s) and bat detectors) must take place

before removal of trees on site, and therefore the former is not considered to pose any significant limitation on the ecological assessment of these PRFs within the subject lands.

The surveys in January 2021 also did not include dedicated amphibian presence/absence surveys, due to sub-optimal survey timings for these species. Common frog surveys are typically carried out in February and March and include searches for their spawn, while smooth newt surveys include specialist surveys involving trapping and/or night-time torching of suitable waterbodies between March and June. The aforementioned factors are not considered to pose any significant limitations on the ecological assessment of the subject lands due to lack of suitable habitat within the lands for smooth newt, and due to the mitigation recommendations proposed in this assessment for amphibians within the site.

5.15 References

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