St. Laurence's Park Redevelopment

Ecological Appraisal Report

Produced for ABK Architects on behalf of Dun Laoghaire-Rathdown County Council

7 December 2018

Revision 1

Quality information

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		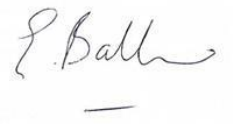	
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Revision History

Revision	Revision date	Details	Authorized	Name	Position
0	02 November 2018	Final for Part 8 Planning Purposes	Yes	Robert Fennelly	Principal Ecologist
1	07 December 2018	Revisions in response to ABK comments (29 November). Amendments to lighting mitigation and other minor amendments	Yes	Robert Fennelly	Principal Ecologist

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1. Introduction

This Ecological Appraisal Report relates to the proposed demolition and redevelopment of the existing Stillorgan Library and derelict housing in St. Laurence's Park (hereafter 'the Proposed Development'). The Proposed Development site is located in a suburban context (Figure 1) along the N11 dual carriageway and currently comprises the existing Stillorgan Library, a terrace of derelict local authority flats (in four blocks; each two stories high, with pitched roofs, c. 100 m long in total), and strips of plantation woodland habitat.

1.1 Aims

This report describes the ecological surveys and assessments carried out to identify the confirmed or potential presence of any protected or otherwise significant ecological features within the Proposed Development site and environs. The specific aims of the Ecology Appraisal are to:

1. Present the results of ecological surveys targeting protected species and habitats and any invasive species potentially occurring within the Zone of Influence (ZoI) of the Proposed Development site;
2. Identify if the construction or operation of the Proposed Development could:
   - disturb or injure any protected species;
   - damage or destroy the breeding or resting sites of any protected species; and/or,
   - result in the planting or dispersal of any 'scheduled' invasive species[1]
3. Detail mitigation measures required to avoid disturbance or injury to protected species, damage or destruction to breeding or resting sites of protected species, or spread of 'scheduled' invasive species.

1.2 Legal Context

The proponent of the Proposed Development is Dun Laoghaire-Rathdown City Council (DLRCC) who is advancing a development under Part 8 of the Planning and Development (Amendment) Act 2015, as amended (hereafter 'the Planning Acts'), and the Planning and Development Regulations 2001 to 2018 (hereafter 'the Regulations'). 'Part 8' development, which is a reference to Part 8 of the Regulations, relates to proposals by a local authority within their own functional area.

This report will be provided to DLRCC to inform their Part 8 planning determination.

The reader is referred to the statutory Part 8 notices which include drawings of the Proposed Development, and a full description of the Proposed Development.

[1] Defined as those plant species scheduled to the EC (Birds and Habitats) Regulations 2011-2015.

2. Project Description

The Proposed Development comprises 88 apartments, a cycle store and associated car parking, as well as a two-storey public library. The Proposed Development will also incorporate landscaping and public realm improvements.

Subject to the relevant planning approvals, enabling works such as demolition could commence in July 2019, followed by building works in November 2019. The construction programme is estimated to last approximately 25 months.

2.1 Vegetation Removal

As shown in the relevant landscape drawings accompanying the Part 8 planning package, a number of existing (both native and non-native) trees are being removed due to condition and/or the layout of the proposed development. Significant numbers of existing trees will be retained. Additionally, there will be compensatory native tree planting in certain locations, including some planted with a view to buffering the proposed development site from the existing N11 dual carriageway.

2.2 Lighting

During the construction of the Proposed Development, lighting will be required to ensure safe working conditions.

The operational phase of the Proposed Development will include some permanent lighting as determined by public safety and design standards.

2.3 Drainage

Surface water generated during construction will enter the existing public surface water sewer, which eventually discharges to the open coastline of south Dublin Bay c. 2.5 km downstream. Foul water from the existing buildings currently enters the public sewer, and is treated via the existing licensed Ringsend Waste Water Treatment System prior to discharge to Dublin Bay.

During operation, surface water and foul sewer drainage systems will continue to drain into the existing networks. The proposed surface water system will additionally include porous asphalt in paved areas with stone attenuation below and a modular attenuation tank at the rear of the main apartment block to take surface water runoff from the roofs.

3. Methodology

3.1 Scope of Assessment

3.1.1 Approach to Designated Sites

This section explains the rationale for scoping out designated sites (including those illustrated in Figure 1) from this Ecological Appraisal Report.

A Report to Inform Screening for Appropriate Assessment (AA) was produced by the Hayes Higgins Partnership (2018) to inform DLRCC's AA Screening determination under the Planning Acts. As stated by the Hayes Higgins Partnership (2018), the Proposed Development site does not overlap or adjoin any European sites. The nearest European sites to the Proposed Development are the South Dublin Bay Special Area of Conservation (SAC; site code 210), and South Dublin Bay and River Tolka Estuary Special Protection Area (SPA; site code 4024), located c. 1.9 km downstream in Dublin Bay.

Hayes Higgins Partnership (2018) concluded that it *could be* excluded *[emphasis added]* on the basis of objective information that the Proposed Development, either alone or in combination with other plans or projects could have Likely Significant Effects (LSEs) on European sites.

There are no national sites (i.e. Natural Heritage Areas (NHA) or proposed Natural Heritage Areas (pNHAs) within, or adjacent to the Proposed Development site. The nearest nationally designated site is the South Dublin Bay NHA (site code 210) which is 1.9 km downstream in Dublin Bay. The South Dublin Bay NHA is coincident with, and designated for the same features as the South Dublin Bay SAC, and South Dublin Bay and River Tolka Estuary SPA. The finding of no likely significant effects to European sites in the Report to Inform Screening for Appropriate Assessment (Hayes Higgins Partnership, 2018), is extended to apply equally to nationally designated sites within Dublin Bay (including the South Dublin Bay NHA), given they overlap the European sites in question. No significant effects are predicted to impact nationally designated sites. Designated sites are not discussed further within this Ecological Appraisal Report.

3.1.2 Zone of Influence

The field and/or desktop survey areas together encompassed the relevant 'zones of influence' for different ecological features. The ZoI will vary with different ecological features, depending on their sensitivities to an environmental change. As recommended by CIEEM (2018), professionally accredited or published studies were used to determine the ZoI for different habitat and fauna species (see Appendix A).

3.2 Desktop Survey

The potential for protected species (and species identified on relevant Irish Red Lists[2]) to occur within the ZoI of the Proposed Development was assessed using a desktop exercise with reference to:

- Ordnance Survey Ireland historical mapping[3] and Bing aerial photography[4];
- Records from the online portal of the National Biodiversity Data Centre (NBDC) within 5 km of the Proposed Development site[5] (the NBDC compiles data from various sources such as the National Vegetation Database, the Online Atlas of Vascular Plants 2012-2020, the Irish Butterfly Monitoring Scheme, and the National Bat Database of Ireland); and,
- Locations of Tree Preservation Orders within c. 100 m of the Proposed Development site in the DLRCC Tree Preservation Strategy (DLRCC, 2011).

[2] Available online from NPWS Publications page https://www.npws.ie/publications [Accessed 10 October 2018].
[3] Available from https://www.osi.ie/ [Accessed 10 October 2018]
[4] Available from https://mvexel.dev.openstreetmap.org/bing/ [Accessed on 10 October 2018].
[5] Available at: www.biodiversityireland.ie/ [Accessed 10 October 2018].

3.3 Field Survey

Field surveys were carried out by suitably experienced AECOM ecologists on 27 September 2018, and on 3 and 17 October 2018.

All field surveys had regard for the National Roads Authority's (NRA)[6] *Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes* (NRA, 2009). The NRA guidelines are commonly referenced in Ireland for non-transport projects due to the unavailability of similar guidance for other development types. The scoping exercise in Section 3.1identified the requirement for several surveys, having regard for the available survey windows for different species and habitats. The following surveys were completed during a multi-disciplinary walkover survey of the Proposed Development site:

- Habitat surveys to identify the potential presence of European protected 'Annex 1' habitats[7];
- Surveys to identify potential for any nationally protected plant species[8] to occur in areas likely to be damaged and/or disturbed given known habitat preferences available from the online Atlas of the British and Irish Flora[9];
- Visual inspections of vegetated areas to identify potential or confirmed breeding or resting sites of protected mammal, amphibian, or reptile species;
- Visual assessment of habitats to assess their potential value to nesting bird species[10], including any European protected 'Annex 1' bird species[11] and species of 'Medium' or 'High' conservation concern in Ireland (Colhoun and Cummins, 2013);
- Walkover surveys to identify potential presence of 'scheduled' invasive species[12]; and,
- Walkover surveys to identify the potential for Ireland's two legally protected butterfly species (marsh fritillary *Euphydryas aurinia* and small blue *Polyommatus icarus*) to occur, based on whether the larval food plants of these species could occur in habitats present (i.e. devils-bit scabious *Succisa pratensis* and kidney vetch *Anthyllis vulneraria*, respectively).

3.3.1 Bat Surveys

The following bat surveys were also undertaken by competent surveyors, using close focusing binoculars, full spectrum 'Elekon Batscanner' and 'BatLogger' (model 'M') handheld detectors, and static (i.e. stationary automated) bat detectors ('Song Meter 2+' (SM2)) , where appropriate:

- Visual inspections of trees and buildings (by two surveyors) which could be damaged and/or disturbed by the Proposed Development, to determine their suitability to host bat roosts with reference to the "High", "Moderate" and "Low" ranking system[13] adopted by the Bat Conservation Trust (BCT) in the United Kingdom (UK) (Collins, 2016). This BCT guidance is widely recognised as the most up-to-date reference source for assessing potentially suitable bat roost features in Ireland and the UK;
- Visual inspections of loft spaces for signs of bat usage (e.g. live or dead bats, bat feeding remains, bat droppings) of the buildings (excluding the library) were carried out by surveyors licensed to enter potential bat roosts on 27 September and 3 October 2018;
- A bat 'emergence survey' (by four surveyors) commencing 15 minutes prior to sunset on 27 September 2018[14] (and lasting until 1.5 hours after sunset), on all buildings shown in Figure 2 identified during the multi-disciplinary walkover survey as having Low or Moderate suitability for roosting bats;

[6] The NRA has since been subsumed into Transport Infrastructure (TII).
[7] I.e. Habitats identified listed under Annex 1 of the EC Habitats Directive as those under threat of disappearance and/or of restricted occurrence within the European Union.
[8] Under the Flora Protection Order 2015 S.I 356 of 2015.
[9] Available at: https://www.brc.ac.uk/plantatlas [Accessed on 12 September 2018].
[10] In the light of the scope of the Ecological Appraisal, wintering birds are not considered because it is not illegal to disturb non-breeding birds (i.e. excluding direct injury).
[11] I.e. Annex 1 to the Birds Directive 2009/147/EEC.
[12] Defined as those scheduled to the EC (Birds and Habitats) Regulations 2011 S.I. 477 of 2011.
[13] "High" defined as a structure or tree with one or more potential roost sites obviously suitable for use by larger numbers of bats on a more regular basis and for longer time periods; "Moderate" is defined as before but unlikely to support a roost of high conservation status; "Low" is defined as a structure or a tree with one or more potential roost sites suitable for individual bats but not for use on a regular basis or by larger numbers of bats; and "Negligible" is defined as habitat features on site likely to be used by roosting bats.
[14] Refer to Section 4.2.8 Survey Limitations.

- An additional bat 're-entry survey' (by two surveyors) commencing 1.5 hours prior to sunrise on 3 October 2018 (and lasting 15 minutes after sunrise), of No. 62 and 63, identified during the multi-disciplinary walkover survey as having Moderate suitability for roosting bats; and,
- Placement of a 'static' detector from 3 October 2018 for 14 nights to capture bat activity on the Proposed Development site on top of a shed roof at No. 62, and within woodland, where bat activity was expected based on the visual assessment of potential bat habitats during the multi-disciplinary walkover survey.

3.4 Limitations

Refer to Section 4.2.8.

3.5 Naming Conventions

Vascular plant nomenclature used in this Report follows that of the Botanical Society of Britain and Ireland's *Checklist of the Flora of Britain & Ireland*[15] and as such, any name changes since 2007 (including Stace, 2010) are not included. Bryophyte nomenclature follows the 2009 Checklist of British and Irish bryophytes 2009 available online from the British Bryological Society[16].

Acronyms and abbreviations are spelled in full first time, and in full in tables and figures.

[15] Available online at https://bsbi.org/resources Accessed 10 October 2018.
[16] Available online at http://www.britishbryologicalsociety.org.uk/ Accessed 10 October 2018.

4. Results

4.1 Desktop Survey

4.1.1 Historical Mapping

There were no potentially significant ecological features identified within, or adjacent to, the footprint of the Proposed Development in Ordnance Survey Ireland historical mapping (e.g. areas of 'bog land', quarries, mines, or areas of ancient woodland).

4.1.2 Records of Protected Flora

There were several records for protected flora, and species identified on the Irish Red-list (Wyse-Jackson et al., 2016) on the online NBDC database within the vicinity of the Proposed Development (i.e. c. 5 km) from the past 50 years. These species are presented in Table 1, which also identifies their habitat preferences. Coastal species have been excluded as the Proposed Development is located inland.

Table 1 Habitat preferences of protected flora, and flora of conservation concern returned from desk study

Common Name	Scientific Name	Red-listed (excluding Least Concern)	Flora Protection Order	Habitat preferences
Blunt-leaved earwort	*Diplophyllum obtusifolium*	✓	–	Open, crumbling acidic soil, disused quarries, path sides, iron-stained soil on banks by forestry plantations[17]
Bright silk-moss	*Plagiothecium laetum*	✓	–	Mainly in woodland[17]
Corncockle	*Agrostemma githago*	✓	–	Arable and farm land[18]
Cornflower	*Centaurea cyanus*	✓	–	Arable and farm land[18]
Great burnet	*Sanguisorba officinalis*	✓	✓	Damp, unimproved grassland*
Meadow barley	*Hordeum secalinum*	✓	✓	Damp grassland[5]
Megapolitan feather-moss	*Rhynchostegium megapolitanum*	✓	–	Open places such as sand dunes, chalk, on well-drained soil on banks, cliff tops and accumulated soil on walls[17]
Round-fruited flapwort	*Jungermannia sphaerocarpa*	✓	–	Damp, gritty ledges by streams in gullies or on cliff ledges[17]
Shady beard-moss	*Didymodon umbrosus*	✓	–	Soil, bricks, mortar and gardens[19]
Showy feather-moss	*Eurhyncium speciosum*	✓	–	Wet woodland and carr, in seepages, marshes and on the banks of streams[17]

[17] Available at: http://rbg-web2.rbge.org.uk [Accessed on 10 October 2018]
[18] Available at: www.plantlife.org.uk [Accessed on 8 October 2018]
[19] Available at: www.npws.ie [Accessed on 10 October 2018]

Common Name	Scientific Name	Red-listed (excluding Least Concern)	Flora Protection Order	Habitat preferences
Slender pocket-moss	*Fissidens exilis*	✓	–	Clay in low-lying woodland, neutral or acidic loam, on sheltered (often shady) banks, stream sides, molehills, and in damp fields and grassland[17]

*Stace, 2010

There is potentially suitable habitat for shady beard-moss as it can be found in gardens. The nearest shady beard-moss records are from the grounds of Royal Dublin Society and gateway of Thomas Prior House in Ballsbridge, 5 km to the north from the Proposed Development. These records are from 1988. There are three more records in Ireland for shady beard-moss, two of which are from Co. Dublin and from 1988, and one which is from Co. Kilkenny from 2010.

There is potentially suitable habitat for bright silk-moss, which is a woodland species. The nearest record for bright silk-moss is from the northern slope of the Killakee Mountain, Co. Dublin. This record is from 1969. There are three more records from mountains in Co. Limerick and Co. Wicklow from between 2003 and 2012.

There was no suitable habitat for any of the other species in Table 1, which are all either species of arable or farm land, or of damp habitats.

4.1.3 Records of Invasive Flora

There were a number of widespread 'scheduled' invasive species within the vicinity of the Proposed Development on the online NBDC database (within 5 km, in the last 50 years):

- American skunk-cabbage *Lysichiton americanus;*
- Canadian waterweed *Elodea canadensis;*
- Giant hogweed *Heracleum mantegazzianum;*
- Himalayan balsam *Impatiens glandulifera;*
- Japanese knotweed *Fallopia japonica;*
- Nuttall's waterweed *Elodea nuttallii;*
- Parrot's feather *Myriophyllum aquaticum;*
- Rhododendron *Rhododendron ponticum;* and,
- Water fern *Azolla filiculoides.*

Field survey on 27 September 2018 did not record any of the terrestrial invasive plant species for which suitable habitat is potentially present (i.e. giant hogweed, Japanese knotweed). These species are perennial and would have been visible at the time of survey. There was no potentially suitable habitat for Himalayan balsam (i.e. streamsides).

4.1.4 Records of Protected Fauna

Within the vicinity of the Proposed Development (i.e. c. 5 km), the online NBDC database has records for the following protected fauna species which are common and widespread nationally:

- Common frog and smooth newt;
- Otter *Lutra lutra*, badger *Meles meles*, pygmy shrew *Sorex minutus*, and European hedgehog *Erinaceus europaeus*;
- Numerous breeding and wintering bird species (all of which are subject to national protection); and,

- Numerous red-listed invertebrates.

Regarding records of bats within a 5 km radius from the Proposed Development site, the online NBDC database records a minimum of six species as shown in Table 2.

Table 2 Records of foraging bats held by NBDC for 5 km radius from Proposed Development site[5].

Common name	Scientific name	Irish Red List (Marnelle et al., 2009)	EU Habitats Directive
Common pipistrelle	*Pipistrellus pipistrellus*	Least Concern	Annex IV
Soprano pipistrelle	*Pipistrellus pygmaeus*	Least Concern	Annex IV
Brown long-eared bat	*Plecotus auritus*	Least Concern	Annex IV
Daubenton's bat	*Myotis daubentonii*	Least Concern	Annex IV
Natterer's bat	*Myotis nattereri*	Least Concern	Annex IV
Leisler's bat	*Nyctalus leisleri*	Near Threatened	Annex IV

There is no wetland habitat within the Proposed Development site and therefore no potential for Daubenton's bat.

4.1.5 Watercourses and Aquatic Species

This section should be read with Figure 1. There are no watercourses or any other wetland features within or adjacent to the Proposed Development site. There are two streams within the local river catchment[20] , both of which are potentially downstream of, and hydrologically connected to the Proposed Development. The Priory Stream and Brewery Stream are located c. 200 m to the northeast and c. 400 m to the southeast of the Proposed Development, respectively.

It is unclear whether the surface water sewers which currently carry, and will continue to carry surface water run-off to Dublin Bay during construction and operation of the Proposed Development outfall to the Priory Stream and/or Brewery Stream. However, neither of these watercourses is a 'Designated Salmonid River' under the European Communities (Quality of Salmonid Waters) Regulations 1988, as amended. The Priory Stream is not known to contain significant fish populations as significant culverting has made it unsuitable for many fish species including salmonids or (any) lamprey species (RPS, 2015). The Brewery Stream is also culverted extensively through urban areas, and is also not likely to have significant populations of other native fish including brown trout *Salmo trutta.*

4.1.6 Tree Preservation Orders

No Tree Preservation Orders were identified by DLRCC for trees within the Proposed Development site (DLRCC, 2011).

4.2 Field Survey Results

The past tense is intentionally employed in this section, due to the potential for site conditions to change in the course of this Ecological Appraisal report being considered during the Part 8 planning process. Relevant features discussed below are identified on Figure 2.

4.2.1 Overview of Habitats Affected

At the time of survey, the Proposed Development site and environs were dominated by unmanaged former amenity grassland, plantation woodland and gardens including ornamental hedgerows (Photograph 1 - Photograph 3),

[20] Local catchment here refers to the Water Framework Directive 'River Sub-Basin', available online from the EPA https://gis.epa.ie/EPAMaps/. Accessed October 2018.

Photograph 1. Unmanaged amenity grassland and hedgerows in gardens to rear of St. Laurence's Park within the Proposed Development site.

Photograph 2. Neglected front gardens within the Proposed Development site.

Photograph 3. Plantation woodland within the Proposed Development site.

The unmanaged amenity grassland within the gardens was dominated by perennial ryegrass *Lolium perenne*; with some cock's foot *Dactylis glomerata*. The sward height ranged from 5 cm to 20 cm.

Grassland forb diversity was greatest within the footprint on the western side of the Proposed Development. Ribwort plantain *Plantago lanceolata*, dandelion *Taraxacum* agg. and white clover *Trifolium repens* were present frequently. Occasional species included ragwort *Senecio jacobaea*, daisy *Bellis perennis*, creeping buttercup *Ranunculus repens*, and autumn hawkbit *Leontodon autumnalis*. Other species noted were: self-heal *Prunella vulgaris*, broad-leaved dock *Rumex obtusifolius*, herb Robert *Geranium robertianum*, musk mallow *Malva moschata*, petty spurge *Euphorbia peplus*, Persian speedwell *Veronica persica*, red clover *Trifolium pratense*, creeping cinquefoil *Potentilla reptans*, cleavers *Galium aparine*, and common bird's-foot trefoil *Lotus corniculatus*.

The ornamental hedgerows consisted of frequent bramble *Rubus fruticosus* agg. and Atlantic ivy *Hedera hibernica*, with occasional sycamore *Acer pseudoplatanus*, dog rose *Rosa canina*, ornamental privet *Ligustrum ovalifolium*, ornamental laurel *Laurus* sp., wild cherry *Prunus avium* and wall cotoneaster *Cotoneaster horizontalis*.

Mixed plantation woodland was dominated by Corsican pine, with abundant common lime *Tilia europaea*, Norway maple *Acer platanoides* and ash *Fraxinus excelsior*.

4.2.2 Protected Habitats

There were no 'Annex 1' habitats within the Proposed Development site or environs.

4.2.3 Invasive Plant Species

No 'scheduled' invasive species were recorded within the Proposed Development site or environs.

4.2.4 Badger and Otter

There were no potential otter or badger breeding or resting sites identified within the Proposed Development footprint, or environs. Neither species is likely to be present given the intensely developed nature of the locality, and the absence of significant areas of semi-natural vegetation.

4.2.5 Bats

Flats (excluding flat numbers 62 and 62) were deemed of Low suitability for roosting bats. No. 62 and 63 were deemed of Moderate suitability for roosting bats within the footprint of the Proposed Development site. The library was deemed of Negligible suitability for roosting bats. The roofs of the flats (excluding No. 62 and 63) had multiple gaps in soffit panels and at the base of ridge tiles providing potential entry points for bats. No. 62 had relatively large openings in meeting points of fasciae (Photograph 4). However no signs of bats, such as live or dead bats or bat droppings, were recorded within the lofts of the buildings during loft inspections.

Photograph 4. Openings in the fasciae of No. 62.

None of the mature trees were found to have Potential Roosting Features (PRFs) within the ZoI of the Proposed Development site.

No bats were recorded emerging from any buildings before or after dusk on 27 September 2018, or re-entering them before or after dawn on 3 October 2018. The weather was calm and mild (Wind Force[21] 0-1 variable; 15 °C; with light rain at times) during the dusk emergence, and mild and breezy (Wind Force 4-5 variable; 13 °C) during the dawn re-entry.

One species of bat (common pipistrelle) was recorded using the Proposed Development site for foraging and/or commuting during the dusk emergence survey on 27 September 2018.

Data from the (unmanned) SM2 static detector located on the shed roof at No. 62 and within the plantation woodland over a total of a 14 night period from 3 October 2018 indicated that the area of the Proposed Development site was, during the period surveyed, most significant as a foraging and commuting resource for common pipistrelle (85% of a total of 40 calls recorded), with relatively few records of foraging Leisler's bat (10% of calls), soprano pipistrelle (2.5% of calls) and Nathusius' pipistrelle recorded (2.5% of calls).

4.2.6 Amphibians

There was no suitable habitat within the Proposed Development site for common frog (e.g. wetland habitats such as wet grassland, marsh, peatland or ponds[5]) or for smooth newt (e.g. weakly shaded, fish-free ponds or ditches likely to remain wet throughout the summer which contain broad-leaved vegetation[22]). As there are also no wetland features within at least 50 m of the Proposed Development site boundary, there is also no potential for hibernating amphibians (which adopt a terrestrial lifecycle in winter) to occur within the Proposed Development site.

4.2.7 Other Protected Species

All vegetated areas have the potential to contain nesting birds.

There were no confirmed field and/or desktop records for swift *Apus apus* or house sparrow *Passer domesticus* (both of which nest within structures) within or adjacent to the Proposed Development site. House sparrow are likely to be present year-round in urban sites and are likely to have been recorded (if they nest there), despite surveys taking place at the end of the nesting bird season. Swifts, which migrate to Africa in mid to late summer, would not have been present during field surveys. There are recent NBDC desktop records of swift nesting at several nearby sites in the Stillorgan area, and the species could breed in the gaps afforded by the rotten fasciae and soffits of No. 62 St. Laurence's Park.

No visual sightings or field signs were found within the Proposed Development site for hedgehog or pygmy shrew. Hedgehogs are nocturnal, and although pygmy shrews are both diurnal and nocturnal, they are rarely observed as they live in dense vegetation. Field signs for both species are less frequently observed during field surveys in comparison to other mammals.

In the absence of evidence to the contrary and having regard for their potential territory sizes (Hayden and Harrington, 2001) and solitary nature, at least one pygmy shrew pair and/or individual, and at least one hedgehog pair and/or individual are predicted to nest and/or hibernate within dense hedgerow, or plantation woodland scrub understorey vegetation within the Proposed Development site.

There was no potential for the food plants of the marsh fritillary or common blue butterfly (i.e. Ireland's only two protected butterfly species) to occur within the Proposed Development site or environs.

4.2.8 Field Survey Limitations

Surveys were generally completed at an acceptable time of year, having regard for the NRA (2009) and BCT (Collins, 2016) or so-determined by professional judgement.

Buildings with Moderate suitability for roosting bats were surveyed twice, while buildings with Low suitability for roosting bats were surveyed once, in accordance with BCT (Collins, 2016) guidance. A two week interval was not allowed to pass between the first and second survey for the Moderate suitability buildings (No. 62-63) as required by BCT (Collins, 2016) , due to the peak bat activity season having ended.

[21] Beaufort wind force scale: 0 - No wind, 1 – Light air*; smoke drifts*, 2 - Light breeze; *leaves rustle*, 3 - Gentle breeze; *small twigs move*, 4 – Moderate breeze; *small branches move*, 5 – Fresh breeze; *small trees sway*, 6 – Strong breeze, *large branches move*, 7 – Moderate gale; *whole trees in motion.*
[22] Available at: https://freshwaterhabitats.org.uk [Accessed on 13 September 2018]

The weather during the bat emergence and re-entry surveys on 27 September 2018 and 3 October, respectively, and static detector recording period (3 to 17 October 2018) was suitable for bat activity, as evidenced by the four species of bats recorded. According to the BCT guidelines (Collins, 2016), optimal conditions for bat activity are when sunset temperature is 10°C or above, with no strong winds or rain. At the time of the bat emergence and re-entry surveys there was no heavy rain and the temperature was between 13°C and 15°C. The weather remained relatively mild (above 10°C) during the static detector recording period. Relatively strong winds (Force 4-5) were recorded during the bat re-emergence survey.

In order to mitigate the limitations inherent in the bat survey seasonality, a precautionary approach has been adopted to presume roosting bats could be present, and mitigation has been proposed on this basis. As such, the survey limitations are not likely to significantly undermine the approach adopted in this Ecological Appraisal.

Whilst surveys for protected plants were completed at the end of or outside the flowering periods for most plant species, the field survey, and intensive desk study (including reference to habitat preferences of species potentially occurring) are deemed adequate to rule out the potential presence of protected species, and species of conservation concern. Additionally, perennial species can be identified vegetatively outside of the flowering period.

Bird surveys were completed at the transition from the breeding season to the migratory/wintering season. However, predictions on the breeding bird population potentially present could be made using professional judgement, based on habitats present, and the identification of nests using the descriptions in the British Trust for Ornithology's Field Guide to Monitoring Nests (Ferguson-Lees et al., 2011). Similarly to bats, a precautionary approach has been adopted to assume presence, triggering mitigation, specifically regarding one species which could not have been identified during the survey window (e.g. swift).

5. Impacts and Mitigation Requirements

The following aspects of the Proposed Development have the potential to damage and/or disturb protected ecological features during construction or operation of the Proposed Development, and require mitigation:

- Vegetation removal across the Proposed Development site during construction to include hedgerows, trees, and amenity grassland;
- Demolition of structures with potential suitability for roosting bats;
- Noise and physical disturbance of areas potentially containing protected species during construction; and,
- Lighting of vegetated areas used by bats and other protected species during construction and operation

5.1 Habitats

Several trees will be removed (including several mature trees), because they are within the footprint of the Proposed Development. There will also be loss of localized areas of amenity grassland and other ornamental areas associated with gardens.

To partially compensate for the loss of this vegetation, planting with nursery grown, native plant species will be implemented across the Proposed Development site.

Where it is safe to do so, the following measures from DCC's *Dublin City Tree Strategy 2016-2020* (DCC, 2016), which are equally applicable to trees in DLRCC, will be implemented by an arboriculturalist appointed by DLRCC for retained trees, namely:

- Standing deadwood will be left in situ to provide a habitat for native species; and,
- Ivy should be retained on trees where possible as it provides shelter to roosting bats as well as several other species such as invertebrates. Where possible it should be left intact.

5.2 Badger and Otter

Given the urban location, no pre-construction surveys or mitigation measures are required for badgers or otters.

5.3 Bats

5.3.1 Buildings with Roost Suitability

Buildings, classified as being of Negligible suitability to roosting bats (Stillorgan Library) or Low suitability to bats (other structures excluding No. 62 and 63) , may be demolished without further surveying or licensing. The removal of tiles, soffits, and fasciae in the Moderate structure should be done by hand (where safe to do so), and under supervision of a suitably experienced bat ecologist[23]. If bats are found during demolition, works will cease and the Contractor(s) will contact the NPWS (Office 01-888 3242), to minimise further disturbance to bats, ant the potential for committing an offence.

As a precautionary measure, a minimum of two bat bricks, such as those found at www.habibat.co.uk, should be installed in the new buildings of the Proposed Development. They should be positioned away from overhanging vegetation to allow unimpeded approach, and away from direct light sources at a height of 2-7 m (BCT, 2012). Each brick should be installed in a different orientation to the sun.

5.3.2 Lighting

5.3.2.1 Construction

Night working is likely to be limited, due to the residential location. As such, construction-phase lighting is not likely to be frequently required and is determined not to pose a significant risk to bats.

[23] The bat ecologist needs to be licensed with experience of supervising removal of roofing materials.

5.3.2.2 Operation

Cowls have been incorporated into the proposed lighting design. The existing lighting regime at the proposed development site[24] reflects its location in an urban area adjacent to a busy dual carriageway. There is therefore no significant benefit, due to the relatively high extant light levels, in limiting the (additive) lux levels from the proposed development site. Furthermore, none of the tree bat species recorded are "highly" sensitive to lighting, in accordance with relevant guidance (Stone, 2013).

5.4 Nesting Birds

5.4.1 Vegetated Areas

All nesting birds are subject to (broadly similar) legal protection from disturbance and/or injury to nest, eggs, and young.

To avoid committing an offence by disturbing nesting birds, their eggs or their young, vegetation clearance will be restricted to the non-breeding season (i.e. clearance must be carried out from September to February inclusive). For the avoidance of doubt, it should be noted that birds may nest in overgrown amenity grassland and hedgerows, in addition to trees.

Where clearance is required during the restricted period (March to August inclusive), a suitably experienced ecologist will carry out surveys where necessary, and advise the Contractor on measures required to avoid disturbing nesting birds, eggs or young (e.g. establishing temporary species specific exclusion areas around probable nesting locations (until nesting is complete) around which clearance may proceed). The ecologist carrying out such surveys must have experience of finding bird nests in hedgerows and woodland habitats present, and demonstrate knowledge of the species-specific search methods and nesting behaviours in the British Trust for Ornithology's *Field Guide to Monitoring Nests* (Ferguson-Lees et al., 2011). Where carried out, nesting surveys will have a 'shelf-life' of two days within which clearance must be completed, after which surveys must be repeated.

The extent of vegetated areas requiring seasonal clearance is shown as a hatched area in Figure 2.

5.4.2 Buildings

If demolition of No. 62 and/or 63 St. Laurence's Park is proposed during the swift nesting season (May to July inclusive), DLRCC will appoint a suitably experienced ecologist[25] to carry out one evening vantage point watch in calm, dry conditions (lasting two hours duration, comprising an hour before and after sunset). Where swifts are present, demolition will be delayed until birds have departed upon migration, or visual checks of nesting spaces confirm that young have fledged.

5.5 Other Protected Species

There were no hedgehog or pygmy shrew individuals (or field signs of these species) observed during field surveys. However both species are largely nocturnal, and are presumed to occur within drier grassy areas.

Implementation of construction management measures for breeding birds will avoid vegetation removal during March-August inclusive where practicable. This existing measure will simultaneously avoid the majority of the main breeding season for both pygmy shrew and hedgehog species, which run from April-October (Hayden & Harrington, 2001). There are no construction management measures available for hibernating hedgehog and pygmy shrew whose hibernation sites cannot be readily identified in dense vegetation.

[24] Using handheld lux meters in November 2018, ABK Architects recorded lux levels of 60 Lux beneath existing street lighting, and 10 lux at wooded habitats within 2 m of these street lights.
[25] Who can demonstrate experience of having completed nesting swift surveys

6. Concluding Remarks

AECOM conducted a suite of ecological surveys to confirm or identify the potential for protected or invasive species and protected habitats within the Proposed Development site and environs.

Mitigation measures were proposed to limit the potential disturbance to habitats and species to acceptable levels. Measures included:

- Seasonal clearance for vegetation to protect nesting birds;
- Incorporation of bat bricks in one of the proposed structures;
- Pre-demolition surveys by a suitably experienced ecologist of a building with the potential to contain swift nests, to inform delays in demolition as required; and,
- Appropriate directional lighting, and appropriate luminaire types, locations, and fittings, landscaping and vegetated screens to protect known bat foraging habitats from light spill as determined by a suitably experienced bat ecologist.

7. References

BCT and ILP (2018). Bats and artificial lighting in the UK. Bats and the Built Environment series. Guidance Note 08/18. Available online at file:///C:/Users/Robert.Fennelly/Downloads/ilp-guidance-note-8-bats-and-artificial-lighting-compressed.pdf Accessed October 2018.

BCT (2012). Bats and buildings. Bats and the Built Environment series. Available online at: http://www.bats.org.uk/pages/bats_and_buildings.html Accessed October 2018.

CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, freshwater, coastal, and marine. Chartered Institute of Ecology and Environmental Management, Winchester.

Collins, J. (ed.) (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Edn). The Bat Conservation Trust, London.

Colhoun, K. and Cummins, S. (2013). 'Birds of Conservation Concern in Ireland', 2014-2019, Irish Birds, 9, 523 – 544.

Díaz, M., Møller, A. P., Flensted-Jensen, E., Grim, T., Ibáñez-Álamo, J. D., Jokimäki, J., and Tryjanowski, P. (2013). The geography of fear: a latitudinal gradient in anti-predator escape distances of birds across Europe. PloS one, 8(5), e64634.

DLRCC (2011). A Tree Strategy for Dún Laoghaire-Rathdown County Council 2011-2015. Available online at https://www.dlrcoco.ie/sites/default/files/atoms/files/trees_strategy.pdf

Hayden, T., Harrington, R. (2001). Exploring Irish Mammals, Town House, Dublin.

Hayes Higgins Partnership. (2018). Habitats Directive Screening for a Proposed Development at Stillorgan Library, St. Laurence's Park, Stillorgan, Co. Dublin A94 XTO2. Dublin: Hayes Higgins Partnership. [Unpublished report provided by the design team for the Proposed Development]

Marnell, F., Kingston, N. & Looney, D. (2009). Ireland Red List No. 3: Terrestrial Mammals, National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.

Møller, A. P. (2009). Basal metabolic rate and risk-taking behaviour in birds. Journal of evolutionary biology 22.12: 2420-2429.

NRA (2006). Guidelines for the Treatment of Bats prior to the Construction of National Road Schemes. National Roads Authority: Ireland.

NRA (2009). Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes. National Roads Authority: Ireland.

Rees, E. C., Bruce, J. H., and White, G. T. (2005). Factors affecting the behavioural responses of whooper swans (Cygnus c. cygnus) to various human activities. Biological conservation, 121(3), 369-382.

RPS (2015). Blackrock Local Area Plan (2015-2021)Strategic Environmental Assessment Screening Report. Available online at https://www.dlrcoco.ie/sites/default/files/atoms/files/appendixb.pdf Accessed October 2018.

Shiels, C.B, Shiel, R.E, and Fairley, J.S. (2006). Seasonal changes in the foraging behaviour of Leisler's bats (Nyctalus leisleri) in Ireland as revealed by radio telemetry. Journal of Zoology 249, 347-358.

Smit, C. J. and Visser, G. J. (1993). Effects of disturbance on shorebirds: a summary of existing knowledge from the Dutch Wadden Sea and Delta. Wader Study Group Bulletin. 68: 6-19.

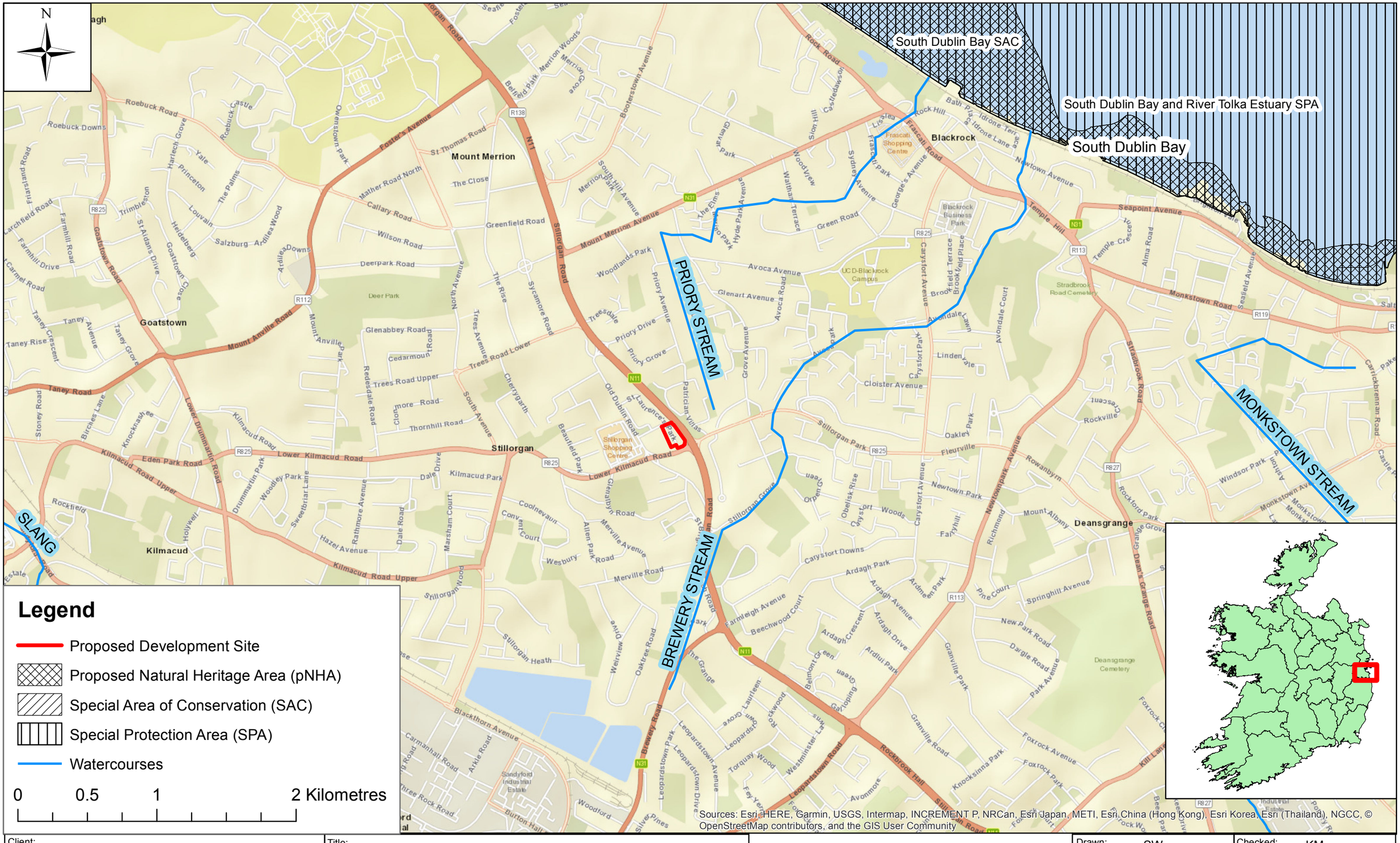
Spoelstra, K., van Grunsven, R. H., Ramakers, J. J., Ferguson, K. B., Raap, T., Donners, M., ... & Visser, M. E. (2017). Response of bats to light with different spectra: light-shy and agile bat presence is affected by white and green, but not red light. Proceedings of the Royal Society B 284(1855), 20170075.

Stace, C.A. (2010) New Flora of the British Isles. Third Edition, Cambridge University Press.

Stone, E.L. (2013) Bats and lighting: Overview of current evidence and mitigation guidance. Report published by University of Bristol in conjunction with Natural England and the Bat Conservation Trust . Available online at file:///C:/Users/Robert.Fennelly/Downloads/Bats_and_Lighting_EStone_2014%20(1).pdf Accessed July 2018.

Whitfield, D. P., Ruddock, M., and Bullman, R. (2008). Expert opinion as a tool for quantifying bird tolerance to human disturbance. Biological Conservation, 141(11), 2708-2717.

Appendix A Figures



Client: Dún Laoghaire-Rathdown County Council	Title: Figure. 1. Location of Proposed Development Site, Watercourses and Designated Sites	Drawn: SW	Checked: KM
Project: St. Laurence's Park		Verified: XX	Approved: XX
		Date: 24/10/2018	Scale at A3: 1:25,000
		Drawing Number: 20181019_Fig1_Designated_Sites	A3

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Client: Dún Laoghaire-Rathdown County Council

Project: St. Laurence's Park

Title: Figure. 2. Ecological Constraints and Mitigation Requirements

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Drawn:	SW	Checked:	KM
Verified:	XX	Approved:	XX
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Drawing Number: 20181023_Fig2_Ecological Constraints and Mitigation Requirements			A3

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Appendix B Zones of Influence

Table A: Zones of Influence informing the Ecology Appraisal – habitats and flora

Habitats	Type of potential impact	ZoI (m) for potentially significant effects	Rationale
Terrestrial' habitats and plant species without significant groundwater or surface-water dependency (i.e. relative to examples in the next two rows of this table)	Direct habitat loss.	Footprint of construction including temporary works	No habitat loss / damage predicted beyond this area. Assumes no indirect and / or far-field effects, e.g. from flooding or shading arising as a result of the Proposed Development.
	Indirect effects resulting from spread of weedy species into terrestrial habitats during construction work (note: invasive species are present within the working area)	Footprint of construction including temporary works, plus a precautionary buffer of at least 100 m	Significant passive spread of weedy species (e.g. by wind-borne seed or plant fragments, or 'creep' of stoloniferous or rhizomatous perennials) is not predicted beyond 100 m from the working area.
Habitats and plant species with relatively high ground-water dependency relative to 'terrestrial' habitats (e.g. turloughs, petrifying springs, petalwort)	Direct habitat loss or indirect impacts to groundwater supply or yield.	Groundwater body in which the development is located.	Assumes no significant impacts predicted on flow or yield of groundwater to groundwater-dependent habitats beyond this area.
Habitats and plant species with relatively high surface-water dependency relative to 'terrestrial' habitats above (e.g. rivers, mudflats, saltmarsh, reefs)	Direct habitat loss.	Footprint of construction for direct impacts.	No habitat loss / damage predicted beyond this area.
	Indirect pollution impacts.	Entire catchment downstream of Proposed Development (i.e. Catchment Management Unit as defined in the River Basin Management Plan for Ireland 2018-2021[26])	Assumes pollutants will settle and/or be adsorbed such that significant volumes/concentrations of pollutants do not cross CMU boundaries.

[26] DoHGLP (2018). River Basin Management Plan for Ireland. Prepared by the Department of Housing, Planning, and Local Government. Available online at https://www.housing.gov.ie/water/water-quality/river-basin-management-plans/river-basin-management-plan-2018-2021

Table B: Zones of Influence (ZoI) informing the EIAR – Fauna

Fauna species and their habitat features	Type of potential impact	ZoI (m) for potentially significant effects	Rationale
Bats and their roosts (direct effects)	'Direct' disturbance of roost sites including noise, vibration, or light spill.	Typically estimated as a minimum of 50 m from potential or confirmed roost sites, but informed by on a case-by-case basis by relevant data (e.g. isoline drawings of lux levels in the case of light spill).	Professional judgement, having regard for guidance including Collins (2016), BCT and ILP, 2018).
Bats and their roosts (indirect effects)	Fragmentation of foraging / commuting habitats.	Varies by bat species; at least 13 km in the case of long-distance foraging of Irish Leisler's bats.	Leisler bats have been radio-tracked to demonstrate movements of at least 13 km from nursery roost to feeding site (Shiels *et al*., 2006).
Breeding or resting sites of otter, badger, hedgehog, pygmy shrew	Physical disturbance to breeding or resting sites including 'entombment 'in the case of otter and badger (i.e. following collapse of hole / nest due to vibration).	Breeding/resting sites within up to 150 m of disturbance in the case of blasting/rock-breaking/piling. Breeding/resting sites within 50 m of other works.	150 m is the potential limit of disturbance from blasting and piling from NRA (2006). Distances are subject to case-by-case assessment of local ground conditions (e.g. holes in unstable clay substrates are more sensitive than those protected from vibration from sheet rock).
Birds: Birds of prey potentially present: Barn owl	Disturbance to nest site from noise or physical disturbance.	Nests within 100 m of disturbance.	Mean flush (or so-called 'Flight Initiation Distance') from Whitfield *et al*. (2008).
Birds: Birds of prey potentially present: sparrowhawk	Disturbance to nest site from noise or physical disturbance.	Nests within 50 m of disturbance.	Precautionary use of highest mean Flush (or so-called 'Flight Initiation Distance') from peer-reviewed literature (Moller (2009); Diaz et al., 2013))
Birds: Passerines	Nesting birds including any singing males potentially affected by noise.	Territories within 150 m of disturbance.	Professional judgement for distance within which territorial singing may be impacted by noise from construction and operation
Hibernating common frog	Disturbance to hibernating individuals	50 m from hibernation sites.	Professional judgement using application of Precautionary Principle, in

Fauna species and their habitat features	Type of potential impact	ZoI (m) for potentially significant effects	Rationale
			absence of published estimates, and subject to case-by-case assessment of local ground conditions.
Invertebrates including butterflies	Direct loss of habitat or injury.	Footprint of construction for direct impacts.	Similarly to habitats; no habitat loss / direct injury predicted beyond this area.
Fish (pollution impacts)	Siltation or other pollution effects on spawning, feeding, or nursery areas.	Entire Catchment Management Unit downstream of Proposed Development	Professional judgement.
Non-breeding (wetland) birds	Feeding or roosting birds disturbed by noise or visual presence of humans.	Generally assessed within 500 m of the Proposed Development footprint for wintering birds.	Professional judgement applied to data from Madsen (1985); Smit and Visser (1993) and Rees *et al*. (2005).

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