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Project <h2 style="margin: 0;">Ecology Assessment for a proposed development at Rialto, South Circular Road, Dublin 8</h2>				
Client ShipseyBarry				
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1. Introduction

Dixon.Brosnan Environmental Consultants have assessed the potential impacts from the proposed development of student accommodation at the Rialto, South Circular Road, Dublin 8, on terrestrial and aquatic flora and fauna. This report describes and evaluates the habitats with their representative flora and fauna and addresses the potential ecological impacts of the development on the ecology of the site and the surrounding area.

2. Methodology

2.1 Introduction

This appraisal is based on surveys of the proposed works area and a review of desktop data. Although not part of an environmental impact assessment report (EIAR) this report follows the structure and protocols detailed in Advice notes for preparing Environmental Impact Statements (EPA Draft, 2015) and Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' (EPA, May 2017).

2.2 Desktop Review

A desktop study was carried out identify features of ecological value occurring within the proposed development site and those occurring in close proximity to it. A desktop review also allows the key ecological issues to be identified early in the appraisal process and facilitates the planning of surveys. Sources of information utilised for this report include the following:

- National Parks & Wildlife Service (NPWS) - www.npws.ie
- Environmental Protection Agency (EPA) – www.epa.ie
- National Biodiversity Data Centre – www.biodiversityireland.ie
- Dublin City Biodiversity Action Plan 2015-2020 (Dublin City Council, 2015);
- Bat Conservation Ireland – <http://www.batconservationireland.org>
- Birdwatch Ireland - <http://www.birdwatchireland.ie/>
- BirdWatch Ireland's Action Plan for Urban & Suburban Birds in Ireland 2011-2020
- British Trust for Ornithology (BTO)-www.BTO.ie
- Invasive Species Ireland - <http://www.invasivespeciesireland.com/>
- Best Practice Guidance for Habitat Survey and Mapping (Heritage Council, 2011)
- Guidelines for Assessment of Ecological Impacts of National Road Schemes (National Roads Authority, 2009).

The appraisal of impacts follows the protocols outlined in guidelines for Assessment of Ecological Impacts of National Road Schemes (National Roads Authority, 2009) and CIEEM (2016) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition. Potential impacts on designated Natura 2000 sites (SAC/cSAC/SPA) are specifically addressed in an Appropriate Assessment (AA) Screening Report, which have been submitted as part of this application.

2.3 Survey Overview

The likelihood of additional ecological impacts occurring, which have not been identified in this report, is considered remote. The following surveys were carried out at the site:

- Habitats were mapped according to the classification scheme outlined in the Heritage Council publication '*A Guide to Habitats in Ireland (Fossitt, 2000)*' and following the guidelines contained in '*Best Practice Guidance for Habitat Survey and Mapping (Heritage Council, 2011)*'.
- The proposed development area was surveyed for invasive species.
- All bird species recorded during the walkover survey and habitat survey were recorded.
- A general mammal survey was carried out in conjunction with walkover and habitat survey.
- A bat emergence survey was undertaken on the 18th of July 2018 using a Batbox Duet bat detector and Echo Meter Touch 2 PRO bat detector.
- No surface water features occur within the proposed development site and thus no specialised aquatic surveys were considered necessary.

The lack of evidence of any one particular protected species does not necessarily preclude its presence at the site either at this current time or in the future. It is considered however, that the timing of the site visit was suitable for protected species and their habitat-based assessment, as most species would have been active during this time and provided evidence of their presence.

This report was prepared by Carl Dixon MSc. (Ecological Monitoring) and Ian McDermott MSc. (Ecological Monitoring). Carl Dixon MSc (Ecology) is a senior ecologist who has over 20 years' experience in ecological and water quality assessments with particular expertise in freshwater ecology. He also has experience in mammal surveys, invasive species surveys and ecological supervision of large scale projects. Projects in recent years include the Waste to Energy Facility Ringaskiddy, Shannon LNG Project, supervision of the Fermoy Flood Relief Scheme, Skibbereen Flood Relief Scheme, Upgrade of Mallow WWTP Scheme, Douglas Flood Relief Scheme, Great Island Gas Pipeline etc.

Ian McDermott MSc (Ecology) is an experienced ecologist with particular expertise in surveying for invasive species, mammal and bird surveys. He carries out ongoing water quality surveys for a range of projects including quarries, WWTPs etc. Likewise, he has carried out ecological surveys for a range of projects including industrial developments, pipelines, quarries, agricultural units etc.

3. Receiving Environment

3.1 Proposed development

The Development is for a new student accommodation scheme at No. 355 South Circular road Dublin 8 at the current derelict Rialto Motors building (formerly the Rialto Cinema). The site Extends to approximately 0.3 ha (0.75 acres) and zoned Z4 under the Dublin City Council Development Plan. The proposal consists of 317 student Beds contained in 314 bedrooms with communal facilities on the Ground floor and Basement. The Scheme is a mix of a retained Art Deco Element to the Front (South Circular road) and a new build over 7 in a cruciform shape. The development requires the demolition of the rear former auditorium element of the old cinema composition with the 'head' Deco element fully restored. This provides for 4 distinct courtyard areas for recreational uses. The development has no parking with approximately 160 bikes spaces provided for on site. Sustainable design is incorporated in building systems and envelope to NZEB standards with extensive green roof areas and

arrays of PV panels. It is anticipated the project will have an 18 month build phase for occupation September 2021

Surface Water Discharge

At present the existing building and hardstanding surround drains by gravity to a combined public sewer in the South Circular Road. However, once constructed storm water from the upper roof areas will drain, via RW outlets, gullies, downpipes and suspended SW drainage pipework, to a gravity network of below ground surface water sewers on the perimeter of the site at Upper Ground floor level. These sewers will drain by gravity to an onsite attenuation facility proposed on the north western side of the site. Attenuation capacity is designed for a 1 in 100year storm event + 20% allowance for climate change. Attenuation will be provided by a 75m³ below ground storage tank. Attenuated outfall from this system will fall by gravity to the public combined sewer in the South Circular Road. Surface water outfall from the attenuation tank is to be restricted by a hydrobrake. The small site area (0.297 Ha.) gives a theoretical greenfield run-off rate less than 2 l/s and as such a 2 l/s value was used to calculate the required attenuation storage volume. The peak stormwater discharge is therefore to be restricted to 2 l/s (or as per lowest commercially available restriction hydrobrake requirement).

Sustainable Drainage System (SuDS)

The Greater Dublin Strategic Drainage Study (GDSDS) Vol. 2 Section E2.1 requires provision of interception and/or treatment volume for River Water Quality Protection. It is intended to provide interception for first 5-10mm of rainfall within the site by incorporation of Green Roof to approx. 70% of total roof area.

The following 'soft' SuDS measures are proposed within the site;

- Green Roofs system to upper roofs

It is intended to provide an overall area of Green Roof of just under 70% of new roof areas (1,264m²). The system proposed for majority of green roof area will incorporate a Sedum type Blanket over a Bauder DSE40 water retention/drainage and protection layer green roof system (or similar approved). This is an Extensive type of green roof which provides a water storage capacity of 13.5 Litres/m² and will provide interception storage for the first 5-10mm of rainfall. As well as improving water quality by providing surface water interception and infiltration, green roofs improve biodiversity by providing habitat for wildlife.

- Permeable paving to courtyards 2,3 & 4

It is intended to provide permeable paving (pervious paving and porous asphalt) within the courtyard areas (circa 650m²) to provide Interception in the courtyard paving and landscaping area by means of provide inherent storage capacity within the voided sub-base of the Courtyard area at Level 0. This will act to trap suspended solid and filter pollutants from stormwater

- Water Butts and Rainwater Harvesting

A small local water butt at Ground level and larger Rainwater Harvesting storage tank at basement level are to be provided within the site to provide non-potable water storage for serving landscaping and general irrigation and maintenance needs. Rainwater harvesting will

reduce the quantity of rainwater entering the surface water system and reduce the water demand on mains water supply.

- Attenuation

Attenuation is to be provided by means of a below ground Storage Tank to restrict outflow from the development to 2 l/sec/Hectare, in accordance with the requirements of the Greater Dublin Strategic Drainage Study (GDSDS). Attenuation is to be designed for a 1 in 100 year storm event + 20% for climate change. The attenuation volume required is 75m³.

Foul Water Discharge

There is an existing foul sewer network on site serving the cinema and latterly the Motor company. This will be mostly removed as part of the demolition works and replaced by a new Foul Drainage system which will largely discharge from the accommodation units at each level, via vertical shafts, to a foul water collection system at Upper Ground Floor level (Level 1). As the Lower Ground Floor level (Level 0) is below the invert of the combined sewer in the South Circular Road, a Foul Water pumping station is required at this level, for any outfall foul drainage from the leisure facilities at this level, with duty and stand-by pumps and with volume of chamber sized for 24-hour storage of surface water. Foul outfall will be pumped to a transition manhole on site at Upper Ground floor level and then fall by gravity to the combined sewer in South Circular Road.

4. Designated Conservation Areas

Special Areas of Conservation (SACs) and candidate SACs are protected under the Habitats Directive 92/43/EEC and the European Communities (Birds and Natural Habitats) Regulations 2011, as amended. Special Protection Areas (SPAs) are protected under the Birds Directive 2009/147/EC and European Communities (Birds and Natural Habitats) Regulations 2011, as amended. Collectively, these sites are referred to as Natura 2000 or European sites. Natural Heritage Areas (NHAs/pNHAs) are national designations under the Wildlife Act 1976, as amended. A Natural Heritage Area (NHA) is designated for its wildlife value and receives statutory protection. A list of proposed NHAs (pNHAs) was published on a non-statutory basis in 1995, but these have not since been statutorily proposed or designated. Consultation with the NPWS is still required if any development is likely to impact on a pNHA.

There are no environmental designations pertaining to the study area. Thus, the site of the proposed development does not form part of any Natural Heritage Area (NHA), Special Protection Area (SPA), Special Area of Conservation (SAC) or candidate Special Area of Conservation (cSAC), Nature Reserve, or National Park.

The proposed development site is located within 15km of a number of these designated sites. Designated sites, along with their distance from the site of the proposed development, are listed in **Table 1**. Relevant Natura 2000 sites are shown in **Figure 1 - 2**.

Potential impacts on designated Natura 2000 sites (SAC/cSAC/SPA) are specifically addressed in an Appropriate Assessment Screening Report '*Appropriate Assessment Screening Report for a proposed development at Rialto, South Circular Road, Dublin 6 (Dixon.Brosnan, 2018)*' which has been submitted as part of this application. This report notes

that following a comprehensive evaluation of the potential impacts on the qualifying interests and conservation objectives for Natura 2000 sites, it has been concluded that the proposed development will not have an adverse effect on the integrity of Natura 2000 sites.

Table 1. Designated sites and their location relative to the proposed work site.

Site	Code	Distance at closest point (As the Crow Fly's)
Special Area of Conservation (SAC)		
South Dublin Bay	000210	5.3km E
North Dublin Bay	000206	7.9km ENE
Glenasmole Valley	001209	9.7km SSW
Wicklow Mountains	002122	10.5km S
Rye Water Valley/Cartron	001398	13.4km WNW
Baldoyle Bay	000199	12.9km NE
Rockabill to Dalkey Island	003000	13.5km E
Howth Head	000202	13.6km ENE
Knocksink Wood	000725	14.5km SE
Special Protection Area (SPA)		
Wicklow Mountains	004040	10.6km S
South Dublin Bay & River Tolka Estuary	004024	5.0km E
North Bull Island	004006	7.9km ENE
Baldoyle Bay	004016	13.1km NE
Dalkey Islands	004172	14.5km SE

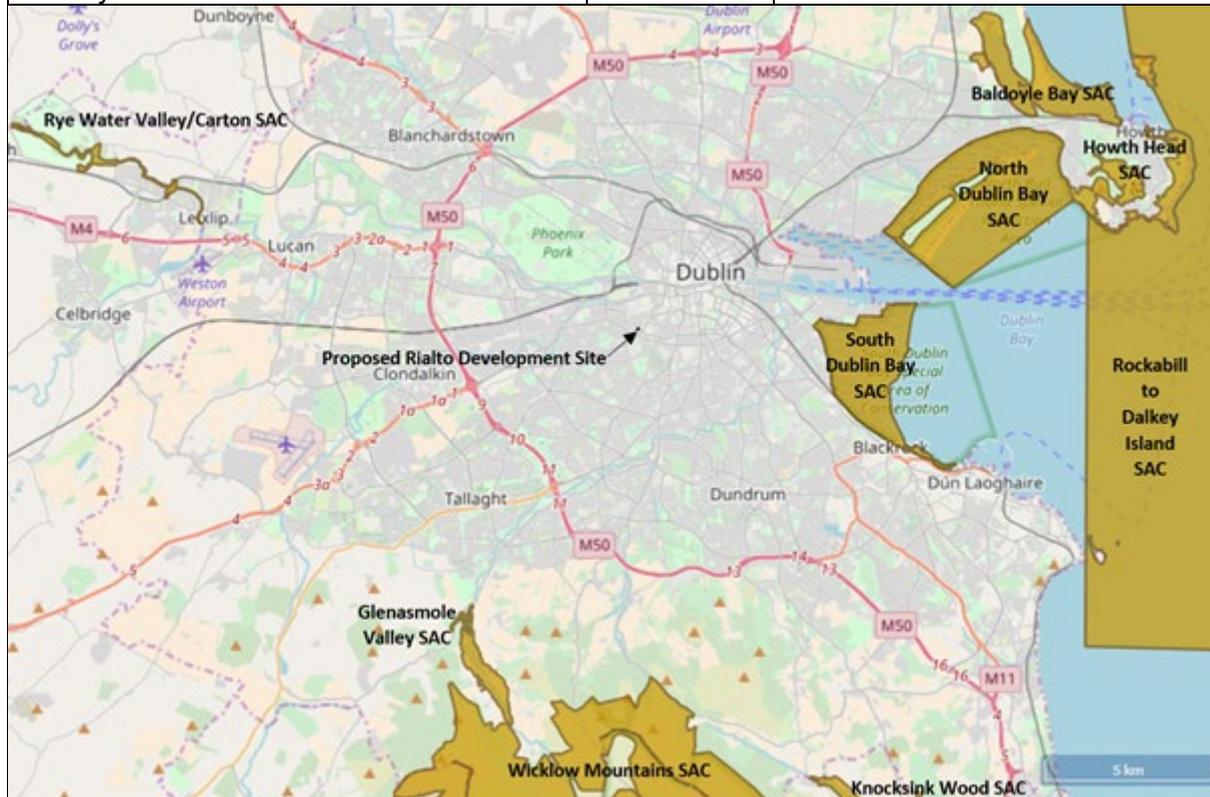


Figure 1: Special Areas of Conservation (SAC) within 15km of the proposed Rialto development site.



Figure 2: Special Protection Area (SPA) within 15km of the proposed Rialto development site.

4.1 Ramsar Sites

The Convention on Wetlands, called the Ramsar Convention, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. A key commitment of Ramsar Contracting Parties is to identify and place suitable wetlands onto the List of Wetlands of International Importance. Baldoye Bay, North Bull Island and Sandymount Strand/Tolka Estuary are listed as Ramsar sites. This is a non-statutory designation.

4.2 Important Bird Areas – Dublin Bay, Baldoye Bay, Howth Head & Wicklow Mountains

Important Bird and Biodiversity Areas (IBAs) are sites selected as important for bird conservation because they regularly hold significant populations of one or more globally or regionally threatened, endemic or congregator bird species or highly representative bird assemblages. The European IBA programme aims to identify, monitor and protect key sites for birds all over the continent. It aims to ensure that the conservation value of IBAs in Europe (now numbering more than 5,000 sites or about 40% of all IBAs identified globally to date) is maintained, and where possible enhanced. The programme aims to guide the implementation of national conservation strategies, through the promotion and development of national protected-area programmes. Through their designation they aim to form a network of sites ensuring that migratory species find suitable breeding, stop-over and wintering places along their respective flyways.

The function of the Important Bird Area (IBA) Programme is to identify, protect and manage a network of sites that are important for the long-term viability of naturally occurring bird populations, across the geographical range of those bird species for which a site-based approach is appropriate. The proposed Rialto development site lies in proximity to a number of IBA sites, mainly Dublin Bay (Site Code; IE109), Baldoyle Bay (Site Code; IE112), Howth Head (Site Code; IE110) and Wicklow Mountains (Site Code; IE106).

These sites qualify for designation under a number of IBA Criteria (2000) as shown below in **Table 2**.

Table 2: IBA Criteria met for each site.

IBA Selection Criteria		Site Which IBA Criteria met
Category	Criterion	
A4i	The site is known or thought to hold, on a regular basis, $\geq 1\%$ of a biogeographic population of a congregatory waterbird species.	Dublin Bay
A4iii	The site is known or thought to hold, on a regular basis, $\geq 20\,000$ waterbirds or $\geq 10\,000$ pairs of seabirds of one or more species.	Dublin Bay
B1i	The site is known or thought to hold $\geq 1\%$ of a flyway or other distinct population of a waterbird species.	Dublin Bay, Baldoyle Bay
B2	The site is one of the most important in the country for a species with an unfavourable conservation status in Europe and for which the site-protection approach is thought to be appropriate.	Dublin Bay, Baldoyle Bay, Howth Head & Wicklow Mountains
C2	The site is known to regularly hold at least 1% of a flyway population or of the EU population of a species threatened at the EU level (listed on Annex I of The Birds Directive).	Dublin Bay
C3	The site is known to regularly hold at least 1% of a flyway population or of the EU population of a species threatened at the EU level (not listed on Annex 1 of The Birds Directive).	Dublin Bay, Baldoyle Bay
C4	The site is known to regularly hold at least 20,000 migratory waterbirds and/or 10,000 pairs of migratory species of one or more species.	Dublin Bay
C6	The site is one of the five most important in the European region in question for a species or subspecies considered threatened in the European Union.	Dublin Bay, Wicklow Mountains
C7	The site has been designated as a Special Protection Area (SPA) or selected as a candidate SPA based on ornithological criteria (similar to but not equal to C1–C6) in recognized use for identifying SPAs	Dublin Bay

5. Site Surveys

5.1 Habitat survey

A site inspection was carried out on the 18th of July 2018. Habitat mapping was carried out in line with the methodology outlined in the Heritage Council Publication, Best Practice Guidance for Habitat Survey and Mapping (Heritage Council, 2011). The terrestrial and aquatic habitats within or adjacent to the proposed development site was classified using the classification scheme outlined in the Heritage council publication *A Guide to Habitats in Ireland* (Fossitt, 2000) and cross referenced with Annex 1 Habitats where required.

A current overview of habitats recorded within the site is shown in **Figure 3** and the habitats recorded on site are described below in **Table 3**. The ecological value of habitats has been defined using the classification scheme outlined in the *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (National Roads Authority, 2009) which is included in **Appendix 1**. It should be noted that the value of a habitat is site specific and will be partially related to the amount of that habitat in the surrounding landscape.

Table 3. Habitat present and their relative value.

Habitat	Comments	Ecological value (NRA guidelines)
Buildings and artificial surfaces (BL3)	<p>The most prominent feature of the proposed works area of the 0.2973ha site is the former Rialto Cinema.</p> <p>The National Inventory of Architectural Heritage describes the Rialto Cinema as '<i>Detached three-bay three-storey former cinema, dated 1936, having recessed second floor to front (north-east) elevation with pedimented central bay. Later in use as retail outlet, now disused. Pitched metal roof having stepped rendered parapet with concrete capping to front elevation. Flat roof to projecting first floor front. Painted brick walls to ground and first floors of front elevation, banded brick piers to upper floors of front elevation. Render date and name lettering to pediment. Rendered walls to second floor of front elevation. Red and brown brick walls to side elevations. Square-headed window and door openings, now boarded up. Metal framed window to first floor front elevation. Paving to forecourt</i>'. This still holds true to the time of this report.</p> <p>The site is largely enclosed by a concrete wall with a security anti-climb fence on top. Large sections of the wall are in a state of disrepair and a number of holes, cracks and crevices have developed.</p> <p>Overall, the site is considered a highly modified and disturbed habitat, with low species diversity and minimal ecological value.</p>	Local importance (Lower value)
Recolonising bare ground (ED3)	Surrounding the old Rialto Cinema building is a concrete yard. Sections of this yard have been invaded by a number of herbaceous plants as the site has been left derelict for a number of years.	Local importance (Lower value)

	<p>Species noted include; Great Willowherb (<i>Epilobium hirsutum</i>), Coltsfoot (<i>Tussilago farfara</i>), Clover (<i>Trifolium spp.</i>), Dandelions (<i>Taraxacum officinale agg.</i>), Nettle (<i>Urtica dioica</i>), Ribwort Plantain (<i>Plantago lanceolate</i>), Broad Dock (<i>Rumex obtusifolius</i>), Herb-robert (<i>Geranium robertianum</i>) and Wall Barley (<i>Hordeum murinum</i>).</p> <p>Butterfly Bush/Buddleja (<i>Buddleja davidii</i>), Bramble (<i>Rubus fruticosus agg.</i>) and sapling Ash (<i>Fraxinus excelsior</i>), Elder (<i>Sambucus nigra</i>) and Sycamore (<i>Acer pseudoplatanus</i>) were also noted.</p> <p>This is generally a highly modified habitat with low species diversity and little value for wildlife. However, if left unmanaged recolonising bare ground can be of local value for wildlife and may support a diverse flora.</p>	
Scrub (WS1)	<p>Concentrated in the northeast corner of the site is an area dominated by Butterfly Bush/Buddleja (<i>Buddleja davidii</i>) scrub. Due to the invasive nature of this species it can colonise derelict sites and bare ground rapidly, forming mono-typic stands, thus displacing native species. Bramble (<i>Rubus fruticosus agg.</i>) was also noted.</p> <p>Butterfly Bush is found throughout the site, including growing from cracks and crevices within the external wall structure of the former Rialto Cinema itself.</p> <p>Native scrub can be ecologically important, providing foraging for small mammals including bats. Scrub also provides feeding and nesting sites for small birds and for invertebrates. However, the scrub habitat which will be impacted by the proposed development is of poor quality and is of very limited ecological value.</p>	Local importance (Lower value)

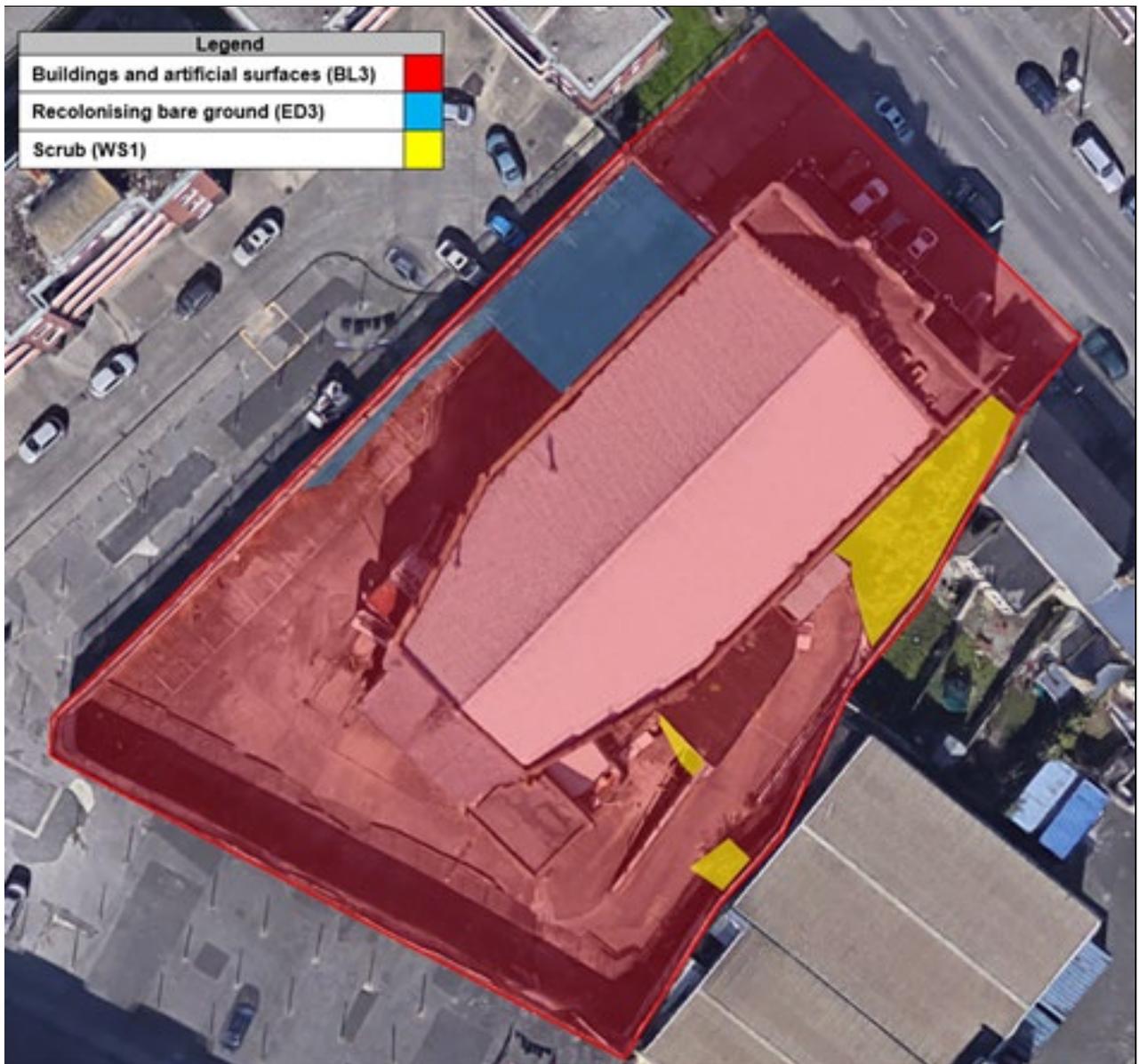


Figure 3: Habitat map providing an overview of habitats.

6. Flora

The site of the proposed development lies within Ordnance Survey National Grid 10km square O13. The National Parks and Wildlife Service (NPWS) rare plant database notes the presence of six protected plant species within grid square O13; Hairy Violet (*Viola hirta*), Opposite-leaved Pondweed (*Groenlandia densa*), Tufted Salt-marsh Grass (*Puccinellia fasciculata*), Meadow Barley (*Hordeum secalinum*), Hairy St. John's Wort (*Hypericum hirsutum*) and Red Hemp Nettle (*Galeopsis angustifolia*). These species are protected by the Flora Protection Order 2015 (S.I. No. 356 of 2015)). These species were not recorded within study area during site survey.

The National Biodiversity Data Centre (NBDC) online database provides data on the distribution of mammals, birds, and invertebrates within the 10km grid squares. Some 599 flowering plants are listed by the NBDC as present in the grid square O13. **Table 4** lists threatened species and designations. No rare species were recorded during the site survey, nor are they expected to occur given that the habitats within the study area are common.

Table 4: NBDC flowering and endangered flowering plants for grid square O13.

Flowering plant Species	Latin Name	Designations
Betony	<i>Stachys officinalis</i>	Protected Species: Flora Protection Order & Threatened Species: Endangered
Blue Fleabane	<i>Erigeron acer</i>	Threatened Species: Endangered
Great Burnet	<i>Sanguisorba officinalis</i>	Protected Species: Flora Protection Order & Threatened Species: Endangered
Hairy Violet	<i>Viola hirta</i>	Protected Species: Flora Protection Order & Threatened Species: Endangered
	<i>Lamiastrum galeobdolon subsp. montanum</i>	Threatened Species: Vulnerable
Meadow Barley	<i>Hordeum secalinum</i>	Protected Species: Flora Protection Order & Threatened Species: Endangered
Opposite-leaved Pondweed	<i>Groenlandia densa</i>	Protected Species: Flora Protection Order & Threatened Species: Endangered
Purple Spurge	<i>Euphorbia peplis</i>	Threatened Species: Regionally Extinct
Small Cudweed	<i>Filago minima</i>	Protected Species: Flora Protection Order & Threatened Species: Vulnerable
Spring Vetch	<i>Vicia lathyroides</i>	Threatened Species: Vulnerable
Water-violet	<i>Hottonia palustris</i>	Threatened Species: Vulnerable

7. Fauna

7.1 Otter

Otters, along with their breeding and resting places are protected under the provisions of the Wildlife Act 1976, as amended by the Wildlife (Amendment) Act, 2000. Otters have additional protection because of their inclusion in Annex II and Annex IV of the Habitats Directive which is transposed into Irish law in the European Communities (Natural Habitats) Regulations (S.I. 94 of 1997), as amended. Otters are also listed as requiring strict protection in Appendix II of the Berne Convention on the Conservation of European Wildlife and Natural Habitats and are included in the Convention on International Trade of Endangered species (CITES).

Although rare in parts of Europe they are widely distributed in the Irish countryside in both marine and freshwater habitats. Otters are solitary and nocturnal and as such are rarely seen. Thus, surveys for otters rely on detecting signs of their presence. These include spraints (faeces), anal gland secretions, paths, slides, footprints and remains of prey items. Spraints are of particular value as they are used as territorial markers and are often found on prominent locations such as grass tussocks, stream junctions and under bridges. In addition, they are relatively straightforward to identify.

A review of existing records within a 10km radius of the study site (Grid Square O13) showed that otter or signs of otter have been recorded on 23 occasions, the most recent being in September 2017. Of these recordings, one of a live animal was recorded at Dolphins Barn Bridge (2014), over the Grand Canal, some 168m south-southeast of the proposed development site. However, no signs of otter were recorded during the site survey and there is no habitats within the proposed development site suitable for otter. No signs of otter (i.e. spraints, track, holts, couches, feeding signs etc.) were recorded within 150m of the former Rialto Cinema site.

7.2 Bats

In Ireland, nine species of bat are currently known to be resident with the residency of the tenth recorded species yet to be proven. These are classified into two Families: the Rhinolophidae (Horseshoe bats) and the Vespertilionidae (Common bats). The lesser horseshoe bat *Rhinolophus hipposideros* is the only representative of the former Family in Ireland. All the other Irish bat species are of the latter Family and these include three pipistrelle species: common *Pipistrellus pipistrellus*, soprano *P. pygmaeus* and Nathusius' *P. nathusii*, four *Myotis*: Natterer's *Myotis nattereri*, Daubenton's *M. daubentonii*, whiskered *M. mystacinus*, Brandt's *M. brandtii*, the brown long-eared *Plecotus auritus* and Leisler's *Nyctalus leisleri* bats.

A review of existing bat records within a 10km radius of the study site (sourced from Bat Conservation Ireland's National Bat Records Database and Mammals of Ireland 2016-2025) indicated that the Irish bat species listed in **Table 5**, have been recorded locally. Lesser horseshoe bat (*Rhinolophus hipposideros*) is the only species of bat listed on Annex II of the Habitats Directive. Lesser horseshoe bat does not occur within the wider Dublin area.

Table 5: Presence of Irish bat species within a 10km radius

Common name	Scientific name	Presence
Lesser Noctule	<i>Nyctalus leisleri</i>	Present
Pipistrelle	<i>Pipistrellus pipistrellus sensu lato</i>	Present
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	Present
Daubenton's Bat	<i>Myotis daubentonii</i>	Present
Lesser Horseshoe	<i>Rhinolophus hipposideros</i>	Absent
Natterer's Bat	<i>Myotis nattereri</i>	Present
Brown Long-eared Bat	<i>Plecotus auritus</i>	Present
Whiskered Bat	<i>Myotis mystacinus</i>	Present
Nathusius's Pipistrelle	<i>Pipistrellus nathusii</i>	Present

All bat species are protected under the Wildlife Acts (1976 & 2000) which make it an offence to wilfully interfere with or destroy the breeding or resting place of all species; however, the Acts permit limited exemptions for certain kinds of development. All species of bats in Ireland are listed in Schedule 5 of the 1976 Act and are therefore subject to the provisions of Section 23 which make it an offence to:

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

All bats are listed on Annex IV of the EU Habitats Directive. The domestic legislation that implements this Directive gives strict protection to individual bats and their breeding and resting places. It should also be noted that any works interfering with bats and especially their roosts, including for instance, the installation of lighting in the vicinity of the latter, may only be carried out under a licence to derogate from Regulation 23 of the Habitats Regulations 1997, (which transposed the EU Habitats Directive into Irish law) issued by NPWS. The details with regards to appropriate assessments, the strict parameters within which derogation licences may be issued and the procedures by which and the order in relation to the planning and development regulations such licences should be obtained, are set out in Circular Letter NPWS 2/07 "Guidance on Compliance with Regulation 23 of the Habitats Regulations 1997 - strict protection of certain species/applications for derogation licences" issued on behalf of the Minister of the Environment, Heritage and Local Government on the 16th of May 2007.

Furthermore, on 21st September 2011, the Irish Government published the European Communities (Birds and Natural Habitats) Regulations 2011 which include the protection of the Irish bat fauna and further outline derogation licensing requirements.

The first aim of the developer should be to entirely avoid or minimise the potential impact of a proposed development on bats and their breeding and resting places. Current NPWS advice is that there should be no net loss in local bat population status taking into account factors such as population size, viability and connectivity. Hence when it is unavoidable that a development will affect a bat population the mitigation should aim to maintain a population of equivalent status in the area.

7.2.1 Bat Emergence Survey

DixonBrosnan were commissioned to undertake a bat survey and recommend any necessary mitigation measures to ensure that bats, if present, are protected during and subsequent to the proposed works on the former Rialto Cinema. These works will involve significant changes to the existing structures and landscape and thus it is deemed that a bat survey was required to determine the likely negative impacts, if any, that the proposed development will have on bats.

Habitat & Roosts

Bats that use buildings can generally be divided into four categories, although there is regional variation and some species can occupy more than one category.

- Crevice-dwelling bats (which tend to be hidden from view) include the common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, Brandt's bat and whiskered bat.
- Roof-void dwelling bats (that may be visible on roof timbers) are Leisler's bat and Daubenton's bat.
- Bats that need flight space in certain types of roost are Natterer's bat, and brown long-eared bat.
- Bats that need flight space and flying access into the roost include the lesser horseshoe bat.

An overview of each species typically found in buildings is as follows:

Pipistrelle species

Common and Soprano pipistrelles are crevice dwellers. They use many features on and in a building but relatively rarely enter the roof void. Features used in summer include soffits, fascia's, barge-boards, weather boarding, between roof felt/membrane and tiles/slates, around window frames, in cavity walls, under hanging tiles and lead flashing. In winter, pipistrelle species may use cavity walls or crevices deep in solid walls.

Brown Long-eared bat

During summer, Brown long-eared bats will use crevices in the roof structure and under the ridge during the day - although they occasionally roost in the open within the roof void and frequently fly within the roof void. They can also be found in roofs during the winter. Long-eared bats tend to prefer older buildings.

Lesser Horseshoe bat

Lesser horseshoe bats use buildings during the summer months. Usually they are found using roof spaces where they need flight access (due to their poor ability to crawl) but they can also use boiler rooms, often situated in cellars or in separate buildings. In the winter, lesser horseshoe bats can make use of unheated cellars for periods of torpor.

Brandt's bat and whiskered bat

These species of bats are crevice dwellers. In the summer months they may use crevices formed by the structure within a roof space. They might also enter roof spaces to fly around. These bats also make use of external features such as hanging tiles soffits, cavity walls and ridge tiles.

Leisler's bat

Leisler's can be found using crevices within buildings during the summer. They are not usually evident within the roof void. In winter, Leisler's make use of cavity walls.

Natterer's bat

In summer, Natterer's bats are frequently found in the crevices of the substantial types of timbers often found in old barns and other buildings.

Bats generally require a variety of elements, that need to be taken into consideration when roosting within a building, these range from temperature and humidity regime within the roost, aspect and orientation of the roost, size of roost, access points, lighting, materials and perching points. Important roosting sites for bats in buildings include crevices in stone work of old and modern structures, crevices in brick work of chimneys, attics of buildings – old and modern buildings – often behind roofing felt, under ridge tiles or in wall cavities and underground structures associated with older buildings (**Figure 4**).

Possible roosting sites and access points for bats in buildings

- 1 Barge board
- 2 Roofing felt
- 3 Roof joists
- 4 Ridge tiles
- 5 Soffit
- 6 Attic
- 7 Lead flashing
- 8 Dormer window
- 9 Barges
- 10 Gable end
- 11 Broken tiles
- 12 Space between downpipe
- 13 Sash window
- 14 Lose mortar between bricks
- 15 Quoins
- 16 Wood cladding
- 17 End tiles
- 18 Facia board
- 19 Eaves
- 20 Guttering
- 21 Window sill
- 22 Porch
- 23 Valley

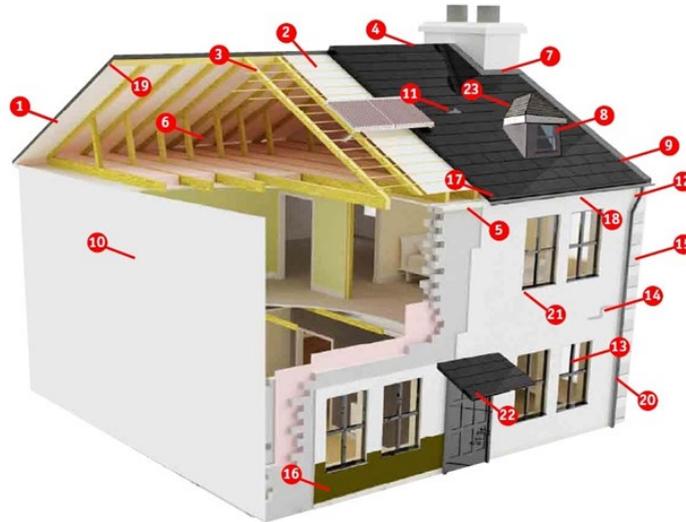


Figure 4: Possible roosting sites for bats in buildings.

To maximise warmth, maternity roosts for example are often located on the south and west of houses or close to sources of heat such as chimneys and boilers. Most species prefer to roost in quite small spaces and are not usually found in open draughty areas like barns. Common and soprano pipistrelles for example are generally found in the inaccessible parts of the roof structure and around its edges and rarely enter the loft space. Where bats are seen in buildings during the winter, they tend to be alone or in small scattered groups, hidden in crevices or under slates and away from sources of heat.

Bats will also often use features such as hedgerows, treelines, woodland edges and waterways as commuting pathways between roosts and foraging areas. Sheltering vegetation, such as treelines, not only acts as cover from potential predators and the weather, but also provides structure for acoustic orientation and navigation. Sheltered areas also allow insects to gather and therefore support bat foraging. Activities which affect these bat flyways are likely to have consequences for bats.

It is noted that within the development site there are no such features. A small area of scrub does exist along the eastern boundary of the site; however it lacks any form of connectivity to the wider landscape and thus provides no potential as a commuting pathway. In addition, most of the immediate surrounding area is heavily urbanised with high light levels and is known that even heavily lit road ways will act as a barrier to commuting bats.

The Grand Canal, located approximately 165m south/southwest of the site has the potential to form an important habitat for bats. It acts as a vegetated corridor along which bats can commute from the wider countryside into the urban environment and vice versa. The riparian habitat also provides a sheltered foraging area, a breeding site for invertebrate prey and, at night, screening from the surrounding artificial lighting of the surrounding urban environment. As a result, the buildings along and in close proximity to these habitats offer potential roosting sites for bats.

Lighting within the development site

All bat species are nocturnal, resting in dark conditions in the day and emerging at night to feed. Many species of bats are known to sample the light levels before emerging from their roost; only emerging for their night's hunting when the light intensity outside reaches a critical level after sunset (Swift 1980). When bats emerge from roosts early in the evening, they tend not to echolocate but rely on eyesight to fly from the roost to adjoining treelines or hedgerows. Where there is too much luminance near exist points, a bats vision can be reduced resulting in disorientation. Light near a roost access point will delay bats from emerging and shorten the amount of time available to them for foraging. Any delays of emergence can reduce feeding periods and affect the overall survival rate of bats. Bright light may reduce social flight activity and cause bats to move away from the light area to an alternative dark area. Illuminating a bat roost creates disturbance and may cause the bats to desert the roost. In addition to causing disturbance to bats in the roost, artificial lighting can also affect the feeding behaviour of bats. In most bat species, there is an evening period of activity followed by another at dawn. These two flights correlate with the peak flight times of nocturnal insect prey. Insects are attracted to light particularly if it is a single light source in a dark area. Artificial lighting can also increase the chances of predation. It is believed that *Myotis* species shun bright light as a predator avoidance strategy. Many avian predators will hunt bats which may be one reason why bats avoid flying in the day. Lighting can be particularly harmful to bat populations along river corridors, woodland edges, along hedgerows and treelines and at lake edges.

Studies have shown that illumination levels as low as 0.06 lux can have an effect on the behaviour of bats. Even a full moon night (0.02 lux) can reduce bat activity to more sheltered, darker wildlife corridors and foraging areas (e.g. woodlands). The slower flying broad-winged species (Natterer's bats, Daubenton's bats, whiskered bats, Brandt's bats, lesser horseshoe bats and brown long-eared bats) have been shown to avoid street lights. In a study of a roost in Suffolk, UK, the numbers of Natterer's bats, whiskered bats, Daubenton's bats and brown long-eared bats fell after the installation of street lights adjacent to the roost being monitored.

It is noted that due to the location of the development site, which is situated within a heavily urbanised area and at the periphery of a large flat complex, the area is heavily lit by street lighting, security lighting, amenity lights, passing car head lights and is also illuminated by light coming from the flats of the Dolphin's Barn housing complex itself.

Survey Methodology

An emergence survey was undertaken on the 18th of July 2018 using a Batbox Duet bat detector and Echo Meter Touch 2 PRO bat detector. In addition, an onsite day-time preliminary roost assessment survey of external structures was undertaken. This survey followed the guidelines set out in '*Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)*' (Collins, J. (ed.), 2016) and '*Bat Survey Guidelines: Traditional Farm Buildings Scheme*' (Aughney *et al.*, 2008).

The focus of the survey was primarily to determine if bats were roosting in the building to be affected by site works. The presence of bats is often shown by grease staining, droppings, urine marks, corpses, feeding signs such as invertebrate prey remains and/or the presence of bat fly *Nycteribiidae* pupae, although direct observations are also occasionally made. Bat

droppings are often identifiable to species-level based on their size, shape and content and those of certain species, for example brown long-eared (*Plecotus auratus*) and lesser horseshoe (*Rhinolophus hipposideros*) bats, are very distinctive and unmistakable.

Potential roost sites in cavities, cracks, crevices, and under loose paint, render, tiles etc. were examined from the ground and aided by close focusing binoculars for the potential presence of bats at higher elevations from the ground. A high-powered torch was also used to view crevices and other spaces potentially used by resting bats.

The survey was conducted during suitable weather conditions (air temperature of $\geq 8^{\circ}\text{C}$, little wind and dry (**Table 6**)). Any visual observations of bats were recorded as part of the assessment, with notes made where possible relating to the activity of the bat, or bats observed. The site survey was also supplemented by reviews of Bat Conservation Ireland's (BCIreland) National Bat Records Database.

Table 6: Dates, times and weather conditions.

Date	Time	Sunset	Dusk	Weather
18/07/2018	21.00 – 01.00	21.42	22.29	Dry, Scattered cloud cover, 17° to 19°C, Gentle breeze.

Bat Emergence Survey Results

The focus of the survey was primarily to determine if bats were roosting in the buildings on site. The site was deemed to be of 'Low to Moderate' suitability as a roosting habitat based on the The Bat Conservation Trust Guidelines (Collins, J. (ed.) (2016)). While the site does have some potentially suitable high-quality roosting habitat, it lacks a continuous habitat connection to the wider landscape that could be used by bats, for commuting and foraging, thus isolating it from similar habitats in the wider landscape.

Two species were identified during the survey;

1. Common pipistrelle (*Pipistrellus pipistrellus*),
2. Leisler's bat (*Nyctalus leisleri*).

During the survey period there was little activity encountered within the site, however observations were made of single bats i.e. Common pipistrelle, foraging within the south-eastern corner of the site (**Figure 5**). It is likely that these bats came from an east/south-easterly direction. Leisler's bat were recorded commuting over the site on two occasions. No bats were recorded emerging from the building onsite.

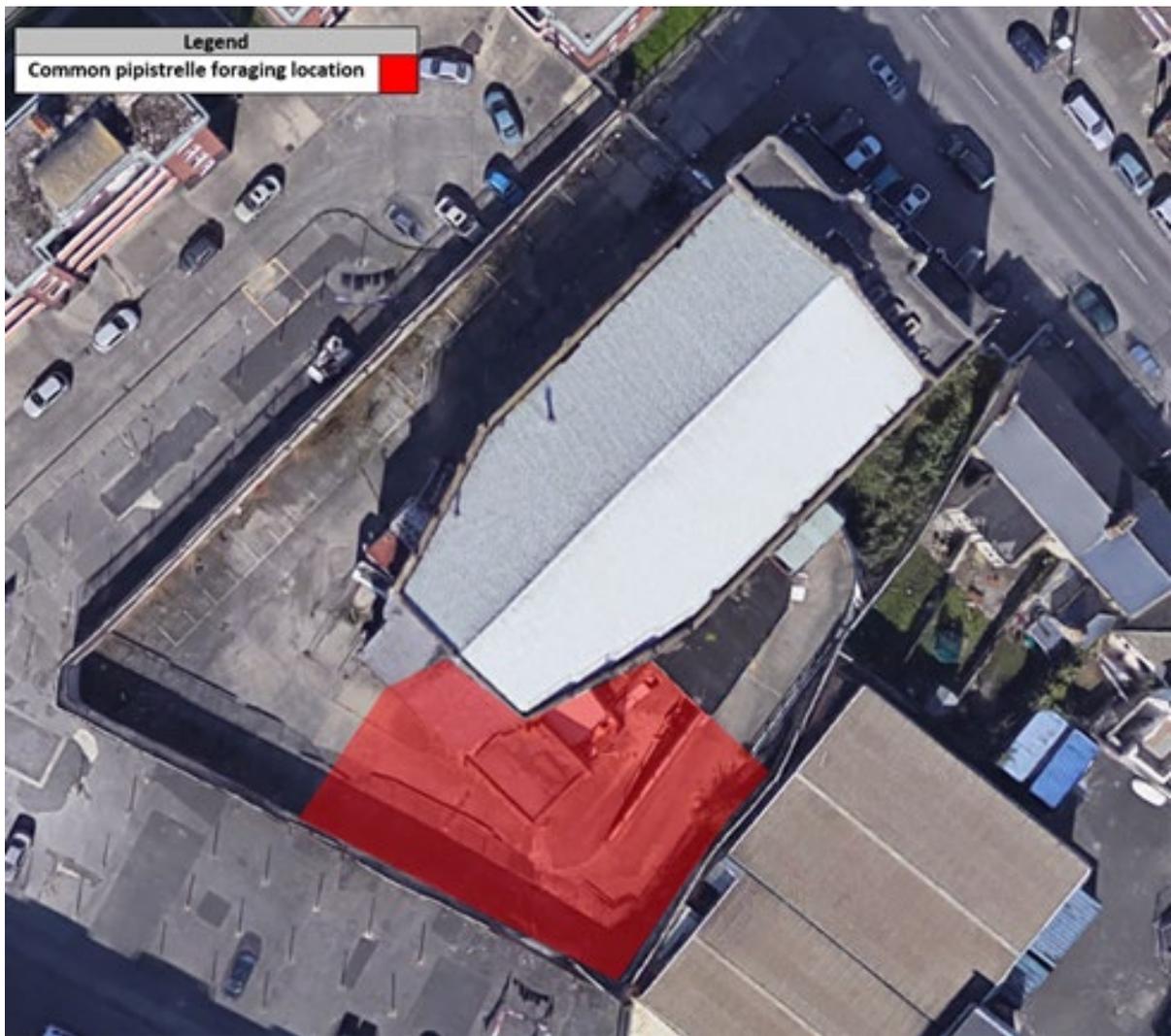


Figure 5: Location of Common Pipistrelle foraging within the proposed development site.

Low numbers of bats were recorded throughout the emergence survey; with Common Pipistrelle being the most common species. This finding would suggest the site has low importance for bats, restricted to a site-specific level of importance only.

No bats were recorded emerging or re-entering from the former Rialto Cinema building. This indicates that there are no bat roosts located within the building itself. In addition, first contact with both species was recorded outside the typical emergence times for each species, thus indicating that they roost outside the immediate vicinity of the building and have to travel to reach the site.

Overall, it is concluded that the site is not important in a geographic context with respect to bats. The site is considered of minor to negligible value to local bat populations.

7.3 Other terrestrial mammals

Sixteen other species of terrestrial mammal have been recorded within a 10km radius of the proposed development site. Seven of which are protected under the Irish Wildlife Act; namely Fallow Deer, Badger, Hedgehog, Irish Hare, Irish Stoat, Red Squirrel & Pygmy Shrew.

7.3.1 Badger (*Meles meles*) and their setts are protected under the provisions of the Wildlife Act 1976, as amended. Badgers are known to occur within the wider landscape (NBDC), with over twenty badger setts which are occupied by at least six social groups known from within the Phoenix Park, which is located approximately 1.7km northeast of the site. However, no signs of badger, were recorded during the site surveys.

7.3.2 Fallow Deer (*Dama dama*) Fallow deer are Ireland's second largest deer species and are the most widespread of the deer, found in nearly every county of the island. A population of Fallow deer has existed in the Phoenix Park since the seventeenth century with a herd of between 400-450 present. Phoenix Park is located approximately 1.7km northwest of the site however no signs of Fallow deer were recorded within the site and the species is not likely to occur within or in the vicinity of the proposed site due to the habitats present.

7.3.3 Pygmy shrew (*Sorex minutus*) is common throughout mainland Ireland and has a preference for habitats such as hedgerows and grasslands. Due to the habitats present within the proposed site it is unlikely that pygmy shrew occur.

7.3.4 Hedgehog (*Erinaceus europaeus*), also listed on Appendix III of the Berne Convention can be found throughout Ireland, with male hedgehogs having an annual range of around 56 hectares. It is unlikely that hedgehog occurs within the proposed development site.

7.3.5 The Irish hare (*Lepus timidus hibernicus*) is one of three lagomorphs found on the Island of Ireland and the only native lagomorph. It is listed on Appendix III of the Berne Convention, Annex V(a) of the EC Habitats Directive (92/43/EEC) and as an internationally important species in the Irish Red Data Book. Irish hare will not occur within the proposed development site.

7.3.6 Irish Stoat (*Mustela erminea hibernica*) is one of the species protected under regulations (Protection of Wild Animals) in 1980 which enabled Ireland to comply with the provisions of the Bern Convention of European Wildlife and Natural Habitats, which was ratified by Ireland in April 1982. Irish stoats occur in most habitats with sufficient cover, including urban areas. It is likely that stoat occurs in this area given the presence of prey species.

7.3.7 Red Squirrel (*Sciurus vulgaris*) also listed on Appendix III of the Berne Convention can be found throughout Ireland. They can also survive in monoculture coniferous woodland. Red squirrels feed mainly on tree seeds, although they can utilise fungi, fruit and buds as they become available in the woodland. Due to the habitats recorded within the site, Red Squirrel will not occur.

7.5 Amphibians and Reptiles

According to records held by the NBDC, Common Frog (*Rana temporaria*) and Smooth Newt (*Lissotriton vulgaris*) are the only amphibians recorded in grid square O13. These species will not occur within the proposed development site. The Common Lizard (*Zootoca vivipara*) is the only reptile species protected under the Wildlife Act, it will not occur within the proposed development site.

7.6 Birds

The National Biodiversity Centre online data base lists 181 species of bird recorded within grid square O13. Of these 181 species, 16 are listed under Annex I of the Birds Directive, namely, Corn Crake, Arctic Tern, Little Tern, Kingfisher, Little Egret, Peregrine Falcon, Red-footed Falcon, Mediterranean Gull, European Golden Plover, Kentish Plover, Hen Harrier, Bar-tailed Godwit, Dunlin, Great Northern Diver, Red-throated Diver, and Common Tern. An additional 18 species are Red Listed Birds of Conservation Concern in Ireland; Barn Owl, Common Pochard, Corn Crake, Northern Shoveler, Twite, Yellowhammer, Herring gull, Black-headed gull, Eurasian Curlew, European Golden Plover, Common Redshank, Northern Lapwing, Eurasian Woodcock, Grey Wagtail, Dunlin, Common Goldeneye, Tufted Duck and Eurasian Wigeon.

A bird survey was carried out in conjunction with habitat survey in July 2018. During the survey, all birds seen or heard within the development site were recorded. The majority of birds utilising the proposed works areas were common in the local landscape. Feral Pigeon were noted to be breeding within the building.

Birds species listed in Annex I of the Birds Directive are considered a conservation priority. During the survey, all birds seen or heard within the development site were recorded. Certain bird species are listed by BirdWatch Ireland as Birds of Conservation Concern in Ireland (BOCCI). These are bird species suffering declines in population size. BirdWatch Ireland and the Royal Society for the Protection of Birds have identified and classified these species by the rate of decline into Red and Amber lists. Red List bird species are of high conservation concern and the Amber List species are of medium conservation. Green listed species are regularly occurring bird species whose conservation status is currently considered favourable. Birds species listed in Annex I of the Birds Directive (2009/147/EC) are considered a conservation priority. No Annex I bird species were recorded during the site survey. Species recorded within the site are shown in **Table 8**.

Table 8: Bird Species recorded during the site visit on the 18th of July 2018.

Species		Birds Directive Annex			BOCCI	
		I	II	III	Red List	Amber List
<i>Larus ridibundus</i>	Black-headed Gull				X	
<i>Larus fuscus</i>	Lesser black-backed Gull					X
<i>Larus argentatus</i>	Herring Gull				X	
<i>Passer domesticus</i>	House Sparrow					X
<i>Columba livia f. domestica</i>	Feral Pigeon					
<i>Turdus merula</i>	Blackbird					
<i>Corvus frugilegus</i>	Rook					
<i>Pica pica</i>	Magpie					
<i>Hirundo rustica</i>	Barn Swallow					X
<i>Apus apus</i>	Swift					X
Symbol	Description					
I	Annex 1: species and sub-species are particularly threatened. Member States must designate Special Protection Areas (SPAs) for their survival and all migratory bird species.					
II	Annex 2: bird species can be hunted. However, the hunting periods are limited and hunting is forbidden when birds are at their most vulnerable: during their return migration to nesting areas, reproduction and the raising of their chicks.					

III

Annex 3: overall, activities that directly threaten birds, such as their deliberate killing, capture or trade, or the destruction of their nests, are banned. With certain restrictions, Member States can allow some of these activities for species listed here.

Overall, the study area is of local value for a range of terrestrial bird species that are relatively common in Ireland. The presence of gulls within the site is largely due to their opportunistic behaviour. Scavenging is an increasingly important feeding strategy: discarded takeaways, rubbish bins, flimsy black sacks containing food waste on the streets, green spaces in coastal cities and towns. In addition, the urban environment provides houses, offices etc with flat roofs which offer a safe place for gulls to nest. However, no gulls were noted nesting within the proposed development site, they were only recorded scavenging in the vicinity of the site.

7.7 Invasive Species

Non-native plants are defined as those plants which have been introduced outside of their native range by humans and their activities, either purposefully or accidentally. Invasive non-native species are so-called as they typically display one or more of the following characteristics or features: (1) prolific reproduction through seed dispersal and/or re-growth from plant fragments; (2) rapid growth patterns; and, (3) resistance to standard weed control methods.

Where a non-native species displays invasive qualities and is not managed it can potentially: (1) out compete native vegetation, affecting plant community structure and habitat for wildlife; (2) cause damage to infrastructure including road carriageways, footpaths, walls and foundations; and, (3) have an adverse effect on landscape quality.

The NBDC lists a number of both aquatic and terrestrial high impact invasive species which have been recorded within grid square O13 (**Table 9**).

Table 9: NBDC list of high impact invasive species.

Common Name	Latin Name
Japanese Knotweed	<i>Fallopia japonica</i>
Cherry Laurel	<i>Prunus laurocerasus</i>
Rhododendron	<i>Rhododendron ponticum</i>
Flatworm species	<i>Arthurdendyus triangulatus</i>
Canadian Waterweed	<i>Elodea canadensis</i>
Curly Waterweed	<i>Lagarosiphon major</i>
Giant Hogweed	<i>Heracleum mantegazzianum</i>
Giant Knotweed	<i>Fallopia sachalinensis</i>
Giant-rhubarb	<i>Gunnera tinctoria</i>
Indian Balsam	<i>Impatiens glandulifera</i>
New Zealand Pigmyweed	<i>Crassula helmsii</i>
Nuttall's Waterweed	<i>Elodea nuttallii</i>
Parrot's-feather	<i>Myriophyllum aquaticum</i>
American Mink	<i>Mustela vison</i>
Hybrid Knotweed	<i>Fallopia japonica x sachalinensis = F. x bohemica</i>
Eastern Grey Squirrel	<i>Sciurus carolinensis</i>
Fallow Deer	<i>Dama dama</i>
Harlequin Ladybird	<i>Harmonia axyridis</i>
Ruddy Duck	<i>Oxyura jamaicensis</i>

Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 make it an offence to plant, disperse, allow dispersal or cause the spread of certain species e.g. Japanese knotweed, keep the plant in possession for purpose of sale, breeding, reproduction, propagation, distribution, introduction or release, keep anything from which the plant can be reproduced or propagated from, without a granted licence and keep any vector material for the purposes of breeding, distribution, introduction or release. The Wildlife (Amendment) Act 2000 states that anyone who plants or otherwise causes to grow in a wild state in any place in the State any species of (exotic) flora, or the flowers, roots, seeds or spores of (exotic) flora shall be guilty of an offence.

There is a statutory obligation under S.I. 477 of 2011 of the European Communities (Birds and Natural Habitats) Regulations 2011 to address invasive species in Ireland. With relation to this particular project high risk invasive species like Japanese knotweed (*Fallopia japonica*) are of particular interest. This species for example is listed under the *3rd Schedule: Part 1 – Plants; Non-native species subject to restrictions under Regulations 49 & 50*. Regulation 49 deals with the '*Prohibition on introduction and dispersal*' while Regulation 50 deals with the '*Prohibition on dealing with and keeping certain species*'. Regulation 50 has yet to be brought into Irish law. Regulation 74 is a transitional provision in relation to Regulation 49 and 50.

No high risk invasive species were noted during the site inspection, within the site boundary, however Butterfly Bush/Buddleja (*Buddleja davidii*) has become established.

Buddleja was recorded in high abundance and scattered throughout the site. This species is classified as Amber Threat species by Invasive Species Ireland. Buddleja under the right ecological conditions may have a negative impact on native species or habitats. Theoretically, the spread of such species could impact on Natura 2000 sites although it is noted that the ecological risk from the spread of this species is minimal.

Buddleja or butterfly bush is native to temperate central and south-western China, brought to Europe in the nineteenth century for use as a garden shrub owing to its profusion of flowers which tend to attract a considerable diversity of butterflies.

Buddleja is a medium to large perennial shrub that grows up to 5m tall. It is a very fast-growing species which can reach 2m in its first year, producing flowers and setting seed. It has long arching branches with lilac/purple (sometimes white) flowers, which occur in dense pyramidal shaped panicles during the period June to September. These produce large quantities of nectar. The opposite leaves are lance shaped, deep green above and white-tomentose below.

The seeds produced are very small and numerous with up to 3 million produced per plant. Seeds show lengthy dormancy, remaining in the seed bank for several years. Seeds are adapted for wind dispersal and to a lesser extent dispersal by water. Seeds can be distributed over long distances using wind currents. Additional dispersal can be facilitated by the air currents generated by cars. Stem cuttings can also regenerate new plants and these can be dispersed via waterways. It colonises bare ground very rapidly and can quickly form monotypic stands. These shrubs also alter the nitrogen and phosphorous amounts in the soil, giving it an advantage that displaces native species, particularly in riparian areas.

Spreading rapidly by windburn seed, butterfly bush displaces native vegetation in disturbed, open areas. It tolerates very poor soils and is capable of growing on walls, rock outcrops or sub-soil. Buddleja can cause structural damage when plants get a foothold in walls, pavements, chimneys etc. Listed and historic buildings can damaged by this species.

7.8 Other species listed by NBDC as present within grid square O13.

Table 10 below lists other species recorded within grid square O13, along with any species considered under threat and provided with legal protection.

Table 10: Other species listed by NBDC as present within grid square O13

Species Group	Named species
Other Mammals	Wood mouse, Red fox, Greater White-toothed Shrew, European rabbit
Acarine (Acari)	7 species recorded. None protected
Alga	7 species recorded. None protected
Annelid	35 species recorded. None protected
Bacterium	1 species recorded. Not protected.
Bony fish (Actinopterygii)	7 species recorded. European Eel - Threatened Species: OSPAR Convention & Threatened Species: Critically Endangered
Centipede	9 species recorded. None protected.
Conifer	13 species recorded. None protected.
Crustacean	11 species recorded. None protected.
Diatom	8 species recorded. None protected.
False Scorpion (Pseudoscorpiones)	6 species recorded. None protected.
Fern	15 species recorded. None protected.
Flatworm (Turbellaria)	3 species recorded. None protected.
Fungoid	3 species recorded. None protected.
Fungus	88 species recorded. None protected.
Harvestman (Opiliones)	10 species recorded. None protected.
Hornwort	1 species recorded. Not protected.
Horsetail	4 species recorded. None protected.
Beetle (Coleoptera)	100 species recorded. <i>Bagous (Hydronomus) alismatis</i> listed as Critically Endangered. <i>Macrolea appendiculate</i> listed as Near Threatened. <i>Nebrioporus (Nebrioporus) depressus</i> Data deficient
Butterflies	24 species recorded. Small Blue & Wall listed as Endangered. Grayling & Small Heath listed as Near Threatened. Dark Green Fritillary listed as Vulnerable. Marsh Fritillary Protected Species: EU Habitats Directive Annex II & Threatened Species: Vulnerable
Caddis fly (Trichoptera)	30 species recorded. None protected.
Dragonfly (Odonata)	15 species recorded. Scarce Blue-tailed Damselfly listed as Vulnerable
Earwig (Dermaptera)	3 species recorded. None protected.
Flea (Siphonaptera)	13 species recorded. None protected.
Hymenopteran	48 species recorded. Trimmer's Mining Bee listed as Critically Endangered. Barbut's Cuckoo Bee, Gooden's Nomad Bee, Great Yellow Bumble Bee, Hill Cuckoo Bee & <i>Hylaeus (Prosopis)</i>

	<i>brevicornis</i> listed as Endangered. <i>Halictus (Seladonia) tumulorum</i> , Large Red-Tailed Bumble Bee, Moss Carder-bee, <i>Megachile (Delomegachile) willughbiella</i> & <i>Megachile (Megachile) centuncularis</i> listed as Near Threatened. <i>Andrena (Melandrena) nigroaenea</i> & Field Cuckoo Bee listed as Vulnerable. <i>Andrena (Taeniandrena) wilkella</i> & <i>Bombus (Bombus) magnus</i> Data deficient
Lacewing (Neuroptera)	7 species recorded. None protected.
Louse (Phthiraptera)	20 species recorded. None protected.
Mayfly (Ephemeroptera)	15 species recorded. <i>Labiobaetis atrebatinus</i> listed as Endangered. <i>Procloeon bifidum</i> & <i>Rhithrogena germanica</i> listed as Vulnerable.
Moths	198 species recorded. None protected.
Orthopteran	3 species recorded. None protected.
Hemiptera	80 species recorded. None protected.
True fly (Diptera)	118 species recorded. None protected.
Lichen	42 species recorded. None protected.
Liverwort	17 species recorded. Fringed Heartwort listed as Near Threatened
Millipede	21 species recorded. None protected.
Mollusc	99 species recorded. Glutinous Snail, Smooth Ramshorn, <i>Pisidium pseudosphaerium</i> & <i>Pisidium pulchellum</i> listed as Endangered. Globular Pea Mussel, Mauge's Shelled Slug & Silky Snail listed as Near Threatened. Common Shelled Slug, Ear Pond Snail, English Chrysalis Snail, Heath Snail, Lake Orb Mussel, Smooth Grass Snail & Swan Mussel listed Vulnerable.
Moss	126 species recorded. Crisp Beardless-moss protected species under Flora Protection Order. Chalk Screw-moss, Oval-leaved Pottia, Spiral Chalk-moss, Starke's Pottia & Rigid Aloe-moss listed as Regionally Extinct. Lance-leaved Pottia listed as Critically Endangered. Tall Aloe-moss listed as Endangered. Common Extinguisher-moss, Tiny Feather-moss, Tufted Feather-moss & Showy Feather-moss listed as Near Threatened. Blunt-fruited Pottia, Twisting Thread-moss & Shady Beard-moss listed as Vulnerable. Hair-pointed Grimmiopsis, Tight-tufted Thread-moss & Lesser Screw-moss Data deficient
Slime Mould	10 species recorded. None protected.
Spider (Araneae)	10 species recorded. None protected.
Springtail (Collembola)	46 species recorded. None protected.

8. Evaluation of Potential Impacts

During construction, potential impacts could arise from increased noise and disturbance during works on land and from the spread of the invasive species. During the operational phase of the proposed development, there will be a large net, permanent loss of areas of terrestrial habitat. Increased traffic and noise associated with the construction works could potentially increase levels of disturbance which could result in the disturbance/displacement of birds and mammals such as otter and bats. Increased dust levels during construction could have localised impacts on local vegetation and habitats.

Potential impacts on designated Natura 2000 sites (SAC/cSAC/SPA) are specifically addressed in an Appropriate Assessment Screening Report which has been submitted as part

of this application. This report concluded the following “*the proposed development will not have a significant impact on qualifying interests and conservation objectives for Natura 2000 sites, and that the integrity of these sites will not be adversely affected. No significant direct, indirect or cumulative impacts on Natura 2000 sites have been identified. A stage 2 Appropriate Assessment is not considered necessary*”.

8.1 Do Nothing’ Impact

All of the habitats to be affected have been significantly modified from the natural state by human activity. If the site were to be left unmanaged, a general pattern of succession would be expected to occur e.g. grassland to scrub to woodland. If sufficient time elapsed without development, the unused areas of the site would be expected to develop a covering of woodland with a mix of native and introduced species. However, non-native species like Butterfly bush would be likely to spread if active control measures are not implemented.

8.2 Magnitude, Probability and Significance of Impacts

When describing changes/activities and impacts on ecosystem structure and function, important elements to consider include magnitude, duration and probability of occurrence (IEEM, 2006).

Magnitude refers to the 'size' or 'amount' of an impact, determined on a quantitative basis if possible. Duration refers to the time for which the impact is expected to last prior to recovery or replacement of the resource or feature. This should be defined in relation to ecological characteristics (for example species’ lifecycles) rather than human timeframes. Appropriate criteria for the assessment of magnitude and duration for this project are provided in **Tables 11 & 12** below.

Table 11: Criteria for Determining the Magnitude of Ecological Impacts

Magnitude	Examples
Very High	e.g. The proposal (either on its own or with other proposals) will result in – The total loss of or very major alteration to key elements/features of the baseline conditions such that post-development/character/composition/attributes will be fundamentally changed and may be lost from the site altogether.
High	e.g. The proposal (either on its own or with other proposals) will result in – Major alterations to key elements/features of the baseline (predevelopment) conditions such that post-development/character/composition/attributes will be fundamentally changed.
Medium	e.g. The proposal (either on its own or with other proposal) will result in – The loss of or alteration to one or more key elements/features of the baseline conditions such that post-development/character/composition/attributes of baseline would be partially changed.
Low	e.g. The proposal (either on its own or with other proposals) will result in – A minor shift away from baseline conditions. Change arising from the loss/alteration will be discernible but underlying character/composition/attributes of baseline conditions would be similar to predevelopment circumstances/patterns.
Negligible	e.g. The proposal (either on its own or with other proposals) will result in – A very slight change from baseline condition. Change barely distinguished approximating to the “no change” situation.

Table 12: Criteria for assessment of duration

Duration	Criteria
Permanent	Effects continuing beyond one human generation (c.25 years) are expected. There is likely to be a substantial improvement after this period, whereby these would be described as "very long-term effects."
Temporary	Long term-(15-25 years) Medium (5-15 years) Short term (0-5 years)

8.3 Probability of occurrence

It is important to consider the likelihood that a change/activity will occur as predicted and also the degree of confidence in the assessment of the impact on ecological structure and function. The following scale (IEEM, 2006) is often utilised in ecological assessment:

- Certain/near-Certain: probability estimated at 95% chance or higher.
- Probable: probability estimated above 50% but below 95%.
- Unlikely: probability estimated above 5% but less than 50%.
- Extremely Unlikely: probability estimated at less than 5%.

9.4 Significance of impacts

Based on the above and the value of habitats and species a matrix of significance can be used to determine specific impacts. This matrix is shown below in **Table 13**.

Table 13: Impact Significance Matrix

Impact Significance		Ecological Value				
		Very High	High	Medium	Low	Negligible
Magnitude	Very High	Major	Major	Major	Moderate	Minor
	High	Major	Major	Moderate	Minor	Negligible
	Medium	Major	Moderate	Minor	Minor	Negligible
	Low	Moderate	Minor	Minor	Negligible	Negligible
	Negligible	Minor	Negligible	Negligible	Negligible	Negligible

9. Potential Impacts on Terrestrial Habitats

Impacts on terrestrial habitats are generally restricted to direct removal of habitats and possible impacts from the spread of invasive species. Levels of dust during construction are predicted to be low and effectively managed by mitigation. The impact on vegetation in adjoining habitats from wind-blown dust is predicted to be negligible. No rare floral species were recorded within the study area.

Overall, the habitats to be affected are generally common and no Annex 1 habitats or rare or uncommon habitats or floral species will be directly affected. Based on the criteria outlined by the IEEM, as described above, the predicted impacts are detailed in **Table 14**.

Table 14 Impacts on Terrestrial Habitats

Habitat	Ecological value (NRA guidelines)	Predicted Impact
Buildings and artificial surfaces (BL3)	Local importance (Lower value)	Minor
Recolonising bare ground (ED3)	Local importance (Lower value)	Minor
Scrub (WS1)	Local importance (Lower value)	Minor

9.1 Non-native invasive species

Following best practice guidance any amber listed species found on site i.e. Butterfly bush, will be removed through standard eradication/control methods including digging out and post construction herbicide treatment if necessary. On the basis of its invasive qualities, the ecological value and types of habitats recorded during the walkover survey and its Amber Listing by Invasive Species Ireland, this species is unlikely to have a significant ecological impact. However, if not eradicated, Butterfly bush is likely to further invade adjacent semi-natural habitats and disturbed ground associated with construction activities and cause long-term landscape maintenance issues with associated costs.

10. Potential Impacts on Fauna

10.1 Protected Mammals

The habitats on the site are not rare, threatened nor do they require any special protection under existing or pending legislation and are considered relatively common in the local landscape. There will be significant loss of common habitat types surfaces, located within the development site and thus there will be some negative impacts on fauna. Some increased noise and disturbance is predicted to occur during construction and during subsequent occupancy, however the impact on local populations is predicted to be minor to negligible.

A bat survey did detect limited usage of proposed development area by Common Pipistrelle and Leisler's Bat overflew the site. There will be a small net loss of foraging habitat for this species based on the survey results, however there is no evidence that the site provides critical resources for bats in the context of the local landscape. There is also no evidence that the site provides significant connective routes within the wider landscape. No evidence of breeding bats was recorded by the emergence survey. Overall the impact will be localised and is unlikely to significantly impact on overall bat populations as there will no loss of critical resources for bats. The impact is predicted to be permanent and of minor significance.

Although the highly modified habitats to be directly affected may form part of the territories of various mammal species, they do not provide critical resources and direct impacts on these habitats will be localised and temporary. Whilst increased noise and disturbance is predicted to occur during construction and to a lesser degree during occupancy, the impact to local populations is predicted to be minor to negligible. The predicted noise level will not be excessive in the context of normal domestic and road traffic levels.

10.2 Birds

The terrestrial bird species recorded within the development site during the bird survey are typical of the types of habitat noted on site and are generally common. No rare or uncommon species or species of high conservation value were recorded.

Some displacement of feeding birds may occur during construction due to increased noise and disturbance. Disturbance can cause sensitive species to deviate from their normal, preferred behaviour, resulting in stress, increased energy expenditure and, in some cases, species mortality. Birds living in the urban & suburban environment need to develop a tolerance to increased levels of human disturbance. However, disturbance is still an important factor that can cause birds to abandon nest sites & breeding attempts & take on less food. However, this will be short-term in duration. The impact is therefore predicted to be a short-term, minor impact.

It is noted that the area in proximity to the proposed development is subject to high levels of disturbance and that, to a degree, any birds which utilise this area will have habituated to high levels of daytime disturbance. Whilst works could potentially disrupt feeding patterns, given the availability of similar habitat in the surrounding area and the ability of birds to move away from disturbance, the impact on the feeding behaviour of these species is predicted to be negligible.

During the operational phase, the levels of activity will stabilise and birds in the surrounding landscape will be expected to habituate to any increased noise and disturbance levels. The impact on terrestrial birds including gull species, in habitats adjoining the proposed development site is therefore predicted to be permanent and minor to negligible during operation.

10.3 Impacts on other fauna

Rabbit, Fox, American Mink, Pygmy Shrew, Badger, Brown Rat etc have all been recorded with a 10km grid square of the site. Mammal species which are protected under the Irish Wildlife Act 1976, as amended, such as Hedgehog and Stoat etc could potentially occur within the proposed development site, although no signs of these species were recorded. No habitats suitable for amphibians or reptiles were recorded. The proposed development area is only likely to support common invertebrate species. Given that the habitats which will be affected are relatively common in the surrounding landscape, any impact on these species will be minor to negligible.

11. Cumulative Impacts

Cumulative impacts on fauna chiefly relate to increased noise and activity levels and potential impacts on water quality. In-combination impacts from noise/disturbance are likely to be most pronounced during construction. This is a short-term impact which will be localised. During operation, only a slight localised increase in traffic and noise is predicted. There are no watercourses in proximity to the site and no impact on water quality is predicted to occur.

The works will take place in the context of an urban area with relatively high levels of background noise to which fauna to a degree will be habituated. In this context no significant cumulative noise and disturbance impacts are predicted. As this proposed development is not

predicted to significantly increase long term noise and disturbance levels or impact on water quality, no significant cumulative impacts have been identified.

12. Mitigation Measures

The likely success of the proposed mitigation measures is high, either in their current form or as they will be adapted on-site to achieve the desired result. The mitigation measures have been drawn up in line with current best practice and include an avoidance of sensitive habitats at the design stage. It is clear that the mitigation measures are designed to achieve a lowering or reducing of the risk of impact to acceptable levels. Whilst the proposed methods of mitigation may be amended and supplemented, the risk that the mitigation measures will not function effectively in preventing significant ecological impacts is low. The following mitigation measures will be implemented.

12.1 Construction Phase Mitigation Measures

A detailed Construction and Environmental Management Plan (CEMP) will be developed by the appointed Contractor. This CEMP will comprise all of the construction mitigation measures, which are set out AA Screening Report and this report and where relevant conditions of planning. The principal measures which will be set out in the CEMP are summarised below.

Construction best practice measures (of relevance in respect of any potential ecological impacts) will be implemented throughout the project, including the preparation and implementation of detailed method statements. The works will incorporate the relevant elements of the guidelines outlined below:

- NRA (2010) *Guidelines for the Management of Noxious Weeds and Non- Native Invasive Plant Species on National Roads*. National Roads Authority, Dublin.
- Murphy, D. (2004) *Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites*. Eastern Regional Fisheries Board, Dublin.
- H. Masters-Williams et al (2001) *Control of water pollution from construction sites. Guidance for consultants and contractors (C532)*. CIRIA.
- E. Murnane, A. Heap and A. Swain. (2006) *Control of water pollution from linear construction projects. Technical guidance (C648)*. CIRIA.
- E. Murnane et al., (2006) *Control of water pollution from linear construction projects. Site guide (C649)*. CIRIA.

All personnel involved with the project will receive an on-site induction relating to operations and the environmentally sensitive nature of Natura 2000 sites and to re-emphasize the precautions that are required as well as the precautionary measures to be implemented. All staff and subcontractors have the responsibility to:

- Work to agreed plans, methods and procedures to eliminate and minimise environmental impacts,
- Understand the importance of avoiding pollution on-site, including noise and dust, and how to respond in the event of an incident to avoid or limit environmental impact;
- Respond in the event of an incident to avoid or limit environmental impact;
- Report all incidents immediately to their line manager;

- Monitor the work place for potential environmental risks and alert the immediate line manager if any are observed; and
- Co-operate as required, with site inspections.

12.1.1 Protection of habitats

Habitats that are damaged and disturbed will be left to regenerate naturally or will be rehabilitated and landscaped, as appropriate, once construction is complete. Disturbed areas will be seeded or planted using appropriate native grass or species native to the areas where necessary.

To prevent Japanese Knotweed from outside the site being inadvertently being brought in to the site, the contractor will be required to inspect vehicles before using them on site, and will pay particular attention to caterpillar tracks and where trucks and dumpers are stowed. The supplier of fill will be required to provide a guarantee that the fill to be imported does not contain knotweed. In addition, the fill will be inspected for signs of knotweed, prior to importation to site. The UK Environmental Agency's publication *Managing Japanese knotweed on development sites - The Knotweed Code of Practice* (EA 2013), states that inspection of topsoil brought into the site, should be carried out using the guidance in appendix I-IV of the code BS 3882:2007 '*The British Standard Specification for topsoil and requirements for use*'. This Standard was replaced subsequently by BS3882:2015 *Specification for Topsoil*. The inspection of fill will be carried out according to this Standard.

12.1.2 Protection of Water Quality

The employment of good construction management practices will minimise the risk of pollution of soil, storm water run-off, seawater or groundwater. The Construction Industry Research and Information Association (CIRIA) in the UK has issued a guidance note on the control and management of water pollution from construction sites, *Control of Water Pollution from Construction Sites, guidance for consultants and contractors* (Masters-Williams et al 2001).

The working area used during construction will be clearly outlined prior to the commencement of works and will be kept to the minimum area necessary to effectively complete the works. Vegetation should be retained where possible.

All construction support activities will be controlled within the site construction compound including office facilities, toilets, canteen etc. Materials and waste handling and storage will be within the confines of the site.

All site personnel will be trained and aware of the appropriate action in the event of an emergency, such as the spillage of potentially polluting substances. In the event of spillage of any polluting substance and/or pollution of a watercourse, Dublin City Council, Inland Fisheries Ireland and the NPWS shall be notified.

Spill kits will be retained on site to ensure that all spillages or leakages are dealt with immediately and staff are trained in their proper use.

All equipment will be maintained in good condition to prevent impacts on water quality. All equipment and machinery will have regular checking for leakages and quality of performance.

All vehicles used on site will be inspected on a daily basis to ensure there are no minor leaks of hydrocarbons. Refuelling of machinery will occur in designated areas on an impermeable surface away from any drains or watercourses.

Concrete pouring will not take place during heavy rain when run off is likely due to excess water. Shuttering will be designed to accommodate small increases in the volume of material contained within the shuttered area due to rainfall.

Wash down and washout of concrete transporting vehicles will not be permitted at the location of construction. Such wash down and washout activities will take place at an appropriate facility offsite or at the location where concrete was sourced.

Major construction works should be scheduled during dry conditions where practical. Works will be suspended during severe flood events or when such events are forecast. This makes all activities and measures easier to implement and manage and limits the potential for generation of sediment and mobilisation of both sediment and pollutants downstream.

Cleaning chemicals will only be used where necessary. Trigger-operated spray guns, with automatic water-supply cut-off will be utilised where possible to avoid excess water usage.

Storm water will be managed carefully during construction. In general, storm water will be infiltrated to ground via silt traps and managed soakaways. The laydown areas will be suitably drained and any areas which will involve the storage of fuel and refueling will be paved and bunded.

It is possible that there will be some surface water ingress into the excavations. Should water ingress occur, water from the excavations will be pumped to a silt settlement tank as necessary. Pumps are to be set-up in such a manner so as to avoid the removal of an excessive number of fines i.e. within a filter pipe/clean stone etc. Clean water exiting the primary settlement tank will be discharged into the local surface water network following appropriate settlement and suitable filtration.

Stockpiles will be graded to a <1:4 profile. Topsoil and subsoils will be stored separately. Stockpiles of mineral soils and peat will be <2m and <1m respectively. Stockpiles will be covered with plastic sheeting during wet weather to prevent run-off of silt and will be located on flat ground where possible. Where topsoil is stored for long periods it should be allowed to vegetate naturally or reseeded to prevent run-off.

A method statement will be implemented for the cleaning and maintenance of the proposed storm drainage system during the operation phase.

The proposed storm network will be inspected following construction to ensure that no cross connection between the proposed foul and storm network exists.

The storm drainage system will be cleaned appropriately and inspected prior to being fully commissioned i.e. before being allowed to discharge to the existing stream network.

Oil, petrol and other fuel containers will be double-skinned and bunded to be able to contain 110% volume to guard against potential accidental spills or leakages. Bund specification will conform to the current best practice for oil storage such as Enterprise Irelands Best Practice Guidelines.

Dedicated fuel storage areas will be introduced on-site or fuelling should take place offsite.

12.1.3 Air Quality

Construction activities have the potential to generate dust emissions, particularly during the site clearance and excavation stages. The potential for dust to be emitted depends on the type of construction activity being carried out in conjunction with ambient conditions, including rainfall, wind speed, wind direction and on the distance to potentially sensitive locations.

Most of the dust would be deposited close to the potential source and any impacts from dust deposition would typically be within a hundred metres or so of the construction area. A dust minimisation plan will be prepared and implemented by the building contractor during the construction phase of the project. The following avoidance, remedial or reductive measures will be implemented as part of the dust minimisation plan:

- During very dry periods when dust generation is likely, construction areas will be sprayed with water.
- Exhaust emissions from vehicles operating within the site, including trucks, excavators, diesel generators or other plant equipment, will be controlled by the contractor through regular servicing of machinery.
- Vehicle speeds will be limited in the construction site.
- Surrounding roads used by trucks for access to and egress from the site will be cleaned regularly using an approved mechanical road sweeper. Roads will be cleaned subject to local authority requirements. Site roads will be cleaned on a daily basis.
- During construction wheel-wash facilities will be provided with rumble grids to remove excess mud from wheels. These facilities will be located at the exit from the site and away from sensitive receptors, where possible. Wheel wash run off will be stored in an onsite storage tank and will be disposed of by permitted waste haulage company at a permitted or licensed facility
- Materials carried on vehicles to site will be enclosed or covered with tarpaulins.
- Daily visual inspections will be carried out at locations around the site boundary as required. These inspections will monitor the effectiveness of dust mitigation measures.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind.

12.1.4 Noise

Best practice noise and vibration control measures will be employed by the contractor. The best practice measures set out in BS 5228 (2009) Parts 1 and 2 will be complied with. This includes guidance on several aspects of construction site environmental measures, including, but not limited to the following:

- The potential for any item of plant to generate noise will be assessed prior to the item being brought onto the site. The least noisy item should be selected.
- If replacing a noisy item of plant is not a viable or practical option, consideration will be given to noise control "at source". This refers to the modification of an item of plant or the application of improved sound reduction methods in consultation with the supplier. For example, resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and

grinding noises can often be controlled by fixing resilient materials in between the surfaces in contact.

- Mobile plant will be switched off when not in use and will not be left idling.
- All items of plant will be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures

12.1.5 Waste Management

A construction and demolition waste management plan will be developed and maintained by the main contractor prior to construction works commencing on site. The Plan will meet the requirements of the DoEHLG *Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects*.

All wastes generated as part of the construction process will be controlled and managed to ensure environmental protection. All site wastes (hazardous and non-hazardous), will be stored in designated areas and taken off site frequently to prevent large quantities accumulating. Careful ordering of materials will be undertaken to minimise quantities present on-site.

Wastes which cannot be recycled will be removed from site by a licensed waste contractor to an appropriate licensed landfill facility ensuring adherence to the Environmental Protection (Duty of Care) Regulations 1991.

Segregated waste for recycling will be removed from site to an appropriate Materials Recycling Facility for reprocessing.

All waste removed from the site will be collected only by contractors with valid waste collection permits, under the Waste Management (Collection Permit) Regulations 2007 and 2008. All facilities to which waste will be taken will be audited in advance, to ensure that they have appropriate waste licences or permits, under the Waste Management Act 1996 as amended by the Protection of the Environment Act 2003, and the regulations thereunder, allowing them to accept the type of waste that is to be sent there. Hazardous waste generation will be minimised, and such waste will be recovered where feasible, and only disposed of if recovery is not feasible. Hazardous waste will be managed in accordance with the relevant legislation.

12.1.6 Invasive species

Prior notification will be given to all contractors that parts of the site are contaminated with Butterfly Bush/Buddleja and that they must adhere to this protocol to avoid the spread of the plant within and more importantly, outside of the works area. The spread of the species may cause long-term landscape maintenance issues with associated costs.

As buddleia is a plant that favours disturbed sites, physical grubbing of plants can provide ideal conditions for the germination of seeds. Care needs to be taken to ensure revegetation of controlled areas is undertaken swiftly. The branches of buddleia are capable of rooting as cuttings, so care should also be taken to ensure material is disposed of in a manner to avoid this risk. Because stem and root fragments readily regenerate, debris piles should be burned, composted or otherwise treated in such a way to kill all seeds, stems and root fragments.

Care must be taken when treating plants that are emerging from existing masonry and structures.

A number of different methodologies employed to treat Butterfly Bush/Buddleja are summarised below (**Table 15** summarises the physical and chemical control measures for Buddleja as recommended by the National Roads Authority). These include the following:

Physical/mechanical control

Physical removal on a small spatial scale may help in the early stages of invasion. Young shrubs can be dug up, but this method is not recommended for mature plants. Hand-picking of young plants is feasible.

During the physical removal of the species care should be taken to avoid soil disturbance which can give rise to a flush of new seedling. Grubbing of mature stands as a sole attempt at control is not recommended for the same reason. After uprooting, it is essential to plant the ground in order to prevent a flush of new seedling growth. Remaining stumps should be treated with a herbicide.

Movement control

Dead-heading is the recommended method to reduce the spread of the species by seed. In particular, where the removal of mature plants is not feasible in the short term, the flower heads should be cut off in June before seed set.

Chemical control

Recommended practice for the application of herbicides requires cutting back of plants to a basal stump during active growth (late spring to early summer) which is then treated (brushed on) immediately with a systemic weed killer mix (Starr et al, 2003). Foliar application of triclopyr or glyphosate may be adequate for limited infestations of younger plants but should be followed up at 6 monthly intervals. Direct and precise application, such as painting cut stumps or inject/plug herbicide into the plant is more effective than spraying (Ream, 2006; Zazirska and Altland, 2006).

Table 15: Summary of Physical and Chemical Control Measures for Buddleja (NRA 2010, Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads)

Physical Control		
Method	Season	Follow-up
Grubbing	Any time of year when the soil is suitably dry. Small plants can be pulled by hand. Large stems cut and roots grubbed out.	Regular follow-up to deal with re-growth or seedlings which can result from exposure of soil.
Chemical Control		
Method	Season	Follow-up
Systemic weed-killer mix (Starr et al 2003)	During active growth in late spring or summer.	Brushed on to cut back stumps.
Triclopyr or Glyphosate	During active growth in summer of limited infestations of young plants	Foliar spray. Requires follow-up at 6 monthly intervals.
All Plant Protection Products should be used in accordance with the product label and with Good Plant Protection Practice as prescribed in the European Communities (Authorization, Placing on the Market, Use and Control of Plant Protection Products) Regulations, 2003 (S.I. No. 83 of 2003). It is an offence to use Plant Protection Products in a manner other than that specified on the label.		

13. Conclusions

Overall the development will impact primarily on low value and highly modified habitats. No impact on aquatic habitats is predicted. There will be a minor loss of foraging habitat for bats. No particular difficulties in the effective implementation of the prescribed mitigation measures have been identified.

With the exception of localised impacts and short-term impacts during construction, no significant impacts on fauna are envisaged. No impact from the spread of invasive species will occur. No adverse impact on designated sites or their conservation objectives will occur.

During construction, there will be increased noise and disturbance which could potentially impact on fauna. However, such impacts will be temporary and negligible to minor.

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Appendix 1 NRA 2009 Guidelines

Table 1: Examples of valuation at different geographical scales

Ecological valuation: Examples
<p>International Importance:</p> <ul style="list-style-type: none">• 'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation.• Proposed Special Protection Area (pSPA).• Site that fulfills the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended).• Features essential to maintaining the coherence of the Natura 2000 Network.⁴• Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive.• Resident or regularly occurring populations (assessed to be important at the national level)⁵ of the following:<ul style="list-style-type: none">○ Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or○ Species of animal and plants listed in Annex II and/or IV of the Habitats Directive.• Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971).• World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972).• Biosphere Reserve (UNESCO Man & The Biosphere Programme).• Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979).• Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979).• Biogenetic Reserve under the Council of Europe.• European Diploma Site under the Council of Europe.• Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).⁶
<p>National Importance:</p> <ul style="list-style-type: none">• Site designated or proposed as a Natural Heritage Area (NHA).• Statutory Nature Reserve.• Refuge for Fauna and Flora protected under the Wildlife Acts.• National Park.• Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park.• Resident or regularly occurring populations (assessed to be important at the national level)⁷ of the following:

- Species protected under the Wildlife Acts; and/or
- Species listed on the relevant Red Data list.
- Site containing 'viable areas'⁸ of the habitat types listed in Annex I of the Habitats Directive.

County Importance:

- Area of Special Amenity.⁹
- Area subject to a Tree Preservation Order.
- Area of High Amenity, or equivalent, designated under the County Development Plan.
- Resident or regularly occurring populations (assessed to be important at the County level)¹⁰ of the following:
 - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
 - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
 - Species protected under the Wildlife Acts; and/or
 - Species listed on the relevant Red Data list.
- Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance.
- County important populations of species, or viable areas of semi-natural habitats or natural heritage features identified in the National or Local BAP, 11 if this has been prepared.
- Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county.
- Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.

Local Importance (higher value):

- Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared;
- Resident or regularly occurring populations (assessed to be important at the Local level)¹² of the following:
 - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
 - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
 - Species protected under the Wildlife Acts; and/or
 - Species listed on the relevant Red Data list.
- Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality;
- Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.

Local Importance (lower value):

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

4 See Articles 3 and 10 of the Habitats Directive.

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

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

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

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

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

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

11 BAP: Biodiversity Action Plan

12 It is suggested that, in general, 1% of the local population of such species qualifies as a locally important population.

However,

a smaller population may qualify as locally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle