Lucan Demesne Public Realm
Upgrade of Park Access

Lucan Demesne, Lucan, Co. Dublin

Ecological Impact Assessment Report

FINAL REPORT

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1. INTRODUCTION

1.1 Background

Faith Wilson Ecological Consultant was commissioned by Cunnane Stratton Reynolds Landscape Architects conduct ecological surveys to inform the design of an upgraded access to Lucan Demesne and to prepare an Ecological Impact Assessment Report for same as part of a Part VIII Application by South Dublin County Council. The location of the development of the lands at Lucan Demesne, Lucan, Co. Dublin is shown on **Figure 1.1** below.

Figure 1.1 Location of the proposed public realm development at Lucan Demesne, Lucan, Co. Dublin.

This report has been completed by Faith Wilson BSc CEnv MCIEEM. Faith is a highly experienced and qualified ecologist, with over twenty five years of experience in ecological and environmental surveys and consultancy, across a wide range of sectors. Faith is a Chartered Environmentalist (CEnv) and a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM).

1.2 Relevant Legislation

1.2.1 Nature Conservation Designations

International Conservation Designations
Special Areas of Conservation (SACs) are habitats of international significance that have been identified by NPWS and submitted for designation to the EU. SAC is a statutory designation, which has a legal basis under the EU Habitats Directive (92/43/EEC) as transposed into Irish law through the European Communities (Natural Habitats) Regulations, 1997, which were amended in 1998, 2005 and 2011. The European Communities (Birds and Natural Habitats) Regulations 2011 consolidate the European Communities (Natural Habitats) Regulations 1997 to 2005 and the European Communities (Birds and Natural Habitats)(Control of Recreational Activities) Regulations 2010, as well as addressing transposition failures identified in the Court of Justice of the European Union (CJEU) judgements.

A Special Protection Area (SPA) is a statutory designation, which has a legal basis under the EU Birds Directive (79/409/EEC). The primary objective of SPAs is to maintain or enhance the favourable conservation status of the birds for which the SPAs have been designated.

National Conservation Designations
Proposed NHAs are habitats or sites of interest to wildlife that have been identified by NPWS. These sites become NHAs once they have been formally advertised and land owners have been notified of their designation. NHAs are protected under the Wildlife (Amendment) Act, 2000, from the date they are formally proposed. NHA is a statutory designation according to the Wildlife (Amended) Act, 2000 and requires consultation with NPWS if any development impacts on a pNHA.

1.2.2 Bats

Eleven species of bats occur in Ireland and all are protected under both national and international law.

Wildlife Act 1976
In the Republic, under Schedule 5 of the Wildlife Act 1976, all bats and their roosts are protected by law. It is unlawful to disturb either without the appropriate licence. The Act was amended in 2000.

Bern and Bonn Convention
Ireland has also ratified two international conventions, which afford protection to bats amongst other fauna. These are known as the 'Bern' and 'Bonn' Conventions. The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982), exists to conserve all species and their habitats, including bats. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979, enacted 1983) was instigated to protect migrant species across all European boundaries, which covers certain species of bat.

EU Habitats Directive

All bat species are given strict protection under Annex IV of the EU Habitats Directive, whilst the lesser horseshoe bat (*Rhinolophus hipposideros*) and greater horseshoe bat (*Rhinolophus ferrumequinum*) are given further protection under Annex II of the EU Habitats Directive. Both are listed as a species of community interest that is in need of strict protection and for which E.U. nations must designate Special Areas of Conservation (SACs). The latter is only known from a single site and no breeding populations have been recorded to date. The former are a species of the western seaboard of Ireland and have not yet been recorded on the east coast.

The principal pressures on Irish bat species have been identified as follows:

- urbanized areas (e.g. light pollution);
- bridge/viaduct repairs;
- pesticides usage;
- removal of hedges, scrub, forestry;
- water pollution;
- other pollution and human impacts (e.g. renovation of dwellings with roosts);
- infillings of ditches, dykes, ponds, pools and marshes;
- management of aquatic and bank vegetation for drainage purposes;
- abandonment of pastoral systems;
- speleology and vandalism;
- communication routes: roads; and
- inappropriate forestry management.

1.2.3 Badgers

Badgers (*Meles meles*) are common and widespread in Ireland, and are found in all lowland habitats where the soil is dry and not subject to flooding (Hayden and Harrington, 2000). Badgers are social animals that live in complex underground tunnel systems called setts. Badger territories may vary in size from about 60-200 ha (Smal, 1995).

Badgers and their setts legally are protected under the provisions of the Wildlife Act, 1976, and the Wildlife Amendment Act, 2000. It is an offence to intentionally kill or injure a protected species or to wilfully interfere with or destroy the breeding site or resting place of a protected wild animal. It is standard best practice to ensure that mitigation measures are taken to limit impacts on badgers and badger populations during developments.

1.2.4 Otter

The otter (*Lutra lutra*) is a legally protected species under the EU Habitats Directive (where it is listed under Annex II) and is found throughout Ireland (Hayden and Harrington, 2000). The otter is listed as internationally important in the Irish Red Data book (Whilde, 1993), is classified as 'near threatened' in Ireland (Marnell, et al. 2009), on a European scale (Temple & Terry, 2007) and on a global scale by the IUCN (2009). It is listed as a strictly protected species under Appendix II of the Bern convention (Council of Europe, 1979). Because it is listed in Appendix 1 of CITES (1979), trade in otter specimens is permitted only in exceptional circumstances.

Annexes II and IV of the E.U. Habitats Directive (92/43/EEC) list the otter as a species of community interest that is in need of strict protection and for which E.U. nations must designate Special Areas of Conservation (SACs). The E.U. Habitats Directive was transposed into Irish law in the European Union (Natural Habitats) Regulations, (SI 94/1997) and 40 candidate SACs have been designated for the otter in Ireland (NPWS (2008)). A Species Action Plan and a Threat Response Plan has been prepared for the otter by NPWS (2008 & 2009). Otters tend to occupy linear territories along watercourses and are rarely found far away from water.

1.2.5 Kingfisher

The kingfisher (*Alcedo atthis*) is a species listed under Annex I of the EU Birds Directive for which EU nations must designate Special Protection Areas (for birds) (SPAs).

1.2.6 Invasive Species

The Birds and Natural Habitats Regulations (2011) provide a legal framework for the control or eradication of non-native invasive species in the Republic of Ireland. Invasive and non-native species are dealt with in Sections 49 and 50.

Since then the EU Regulation on Invasive Alien Species (EU Regulation 1143/2014) also came into force on the 3rd August 2016.

The plant and animal species to which the Birds and Habitats Regulations (2011) apply are presented in Schedule Three. Part 1 details the plants species, while Part 3 outlines those animal or plant vector materials and are presented below.

Third Schedule: Part 1 Plants

Non-native species subject to restrictions under Regulations 49 and 50.

First column	**Second column**	**Third column**
Common name	**Scientific name**	**Geographical application**
American skunk-cabbage	*Lysichiton americanus*	Throughout the State
A red alga	*Grateloupia doryphora*	Throughout the State
Brazilian giant-rhubarb	*Gunnera manicata*	Throughout the State
Broad-leaved rush	*Juncus planifolius*	Throughout the State
Cape pondweed	*Aponogeton distachyos*	Throughout the State
Cord-grasses	*Spartina* (all species and hybrids)	Throughout the State
Curly waterweed	*Lagarosiphon major*	Throughout the State
Dwarf eel-grass	*Zostera japonica*	Throughout the State
Fanwort	*Cabomba caroliniana*	Throughout the State
Floating pennywort	*Hydrocotyle ranunculoides*	Throughout the State
Fringed water-lily	*Nymphoides peltata*	Throughout the State
Giant hogweed	*Heracleum mantegazzianum*	Throughout the State
Giant knotweed	*Fallopia sachalinensis*	Throughout the State
Giant-rhubarb	*Gunnera tinctoria*	Throughout the State

First column	Second column	Third column
Common name	**Scientific name**	**Geographical application**
Giant salvinia	*Salvinia molesta*	Throughout the State
Himalayan balsam	*Impatiens glandulifera*	Throughout the State
Himalayan knotweed	*Persicaria wallichii*	Throughout the State
Hottentot-fig	*Carpobrotus edulis*	Throughout the State
Japanese knotweed	*Fallopia japonica*	Throughout the State
Large-flowered waterweed	*Egeria densa*	Throughout the State
Mile-a-minute weed	*Persicaria perfoliata*	Throughout the State
New Zealand pigmyweed	*Crassula helmsii*	Throughout the State
Parrot's feather	*Myriophyllum aquaticum*	Throughout the State
Rhododendron	*Rhododendron ponticum*	Throughout the State
Salmonberry	*Rubus spectabilis*	Throughout the State
Sea-buckthorn	*Hippophae rhamnoides*	Throughout the State
Spanish bluebell	*Hyacinthoides hispanica*	Throughout the State
Three-cornered leek	*Allium triquetrum*	Throughout the State
Wakame	*Undaria pinnatifida*	Throughout the State
Water chestnut	*Trapa natans*	Throughout the State
Water fern	*Azolla filiculoides*	Throughout the State
Water lettuce	*Pistia stratiotes*	Throughout the State
Water-primrose	*Ludwigia* (all species)	Throughout the State
Waterweeds	*Elodea* (all species)	Throughout the State
Wireweed	*Sargassum muticum*	Throughout the State

EU Regulation 1143/2014 on Invasive Alien Species

On 14 July 2016 the European Commission published Commission Implementing Regulation 2016/1141 which sets out an initial list of 37 species to which EU Invasive Alien Species Regulation 1143/2014 will apply. The associated restrictions and obligations came into force on 3rd August 2016.

Three distinct types of measures are envisaged under the Directive, which follow an internationally agreed hierarchical approach to combatting IAS:

- Prevention: a number of robust measures aimed at preventing IAS of Union concern from entering the EU, either intentionally or unintentionally.
- Early detection and rapid eradication: Member States must put in place a surveillance system to detect the presence of IAS of Union concern as early as possible and take rapid eradication measures to prevent them from establishing.
- Management: some IAS of Union concern are already well-established in certain Member States and concerted management action is needed so that they do not spread any further and to minimize the harm they cause.

Plant species listed on the directive include:

- American skunk cabbage *Lysichiton americanus*
- Asiatic tearthumb *Persicaria perfoliata* (*Polygonum perfoliatum*)
- Curly waterweed *Lagarosiphon major*
- Eastern Baccharis *Baccharis halimifolia*
- Floating pennywort *Hydrocotyle ranunculoides*

- Floating primrose willow *Ludwigia peploides*
- Green cabomba *Cabomba caroliniana*
- Kudzu vine *Pueraria lobata*
- Parrot's feather *Myriophyllum aquaticum*
- Persian hogweed *Heracleum persicum*
- Sosnowski's hogweed *Heracleum sosnowskyi*
- Water hyacinth *Eichhornia crassipes*
- Water primrose *Ludwigia grandiflora*
- Whitetop weed *Parthenium hysterophorus*

Animal species listed on the directive include:

- Amur sleeper *Perccottus glenii*
- Asian hornet *Vespa velutina*
- Chinese mitten crab *Eriocheir sinensis*
- Coypu *Myocastor coypus*
- Fox squirrel *Sciurus niger*
- Grey squirrel *Sciurus carolinensis*
- Indian house crow *Corvus splendens*
- Marbled crayfish *Procambarus* spp.
- Muntjac deer *Muntiacus reevesii*
- North american bullfrog *Lithobates (Rana) catesbeianus*
- Pallas's squirrel *Callosciurus erythraeus*
- Raccoon *Procyon lotor*
- Red swamp crayfish *Procambarus clarkii*
- Red-eared terrapin/slider *Trachemys scripta elegans*
- Ruddy duck *Oxyura jamaicensis*
- Sacred ibis *Threskiornis aethiopicus*
- Siberian chipmunk *Tamias sibiricus*
- Signal crayfish *Pacifastacus leniusculus*
- Small Asian mongoose *Herpestes javanicus*
- South American coati *Nasua nasua*
- Spiny-cheek crayfish *Orconectes limosus*
- Topmouth gudgeon *Pseudorasbora parva*
- Virile crayfish *Orconectes virilis*

On 13 July 2017 the European Commission published Commission Implementing Regulation 2017/1263 which added a further 12 species to the current list of 37 species regulated under the EU Invasive Alien Species Regulation (1143/2014). These are:

Plant species

- Alligator weed (*Alternanthera philoxeroides*)
- Milkweed (*Asclepias syriaca*)
- Nuttall's waterweed (*Elodea nuttallii*)
- Chilean rhubarb (*Gunnera tinctoria*)
- Giant hogweed (*Heracleum mantegazzianum*)
- Himalayan balsam (*Impatiens glandulifera*)
- Japanese stiltgrass (*Microstegium vimineum*)
- Broadleaf watermilfoil (*Myriophyllum heterophyllum*)
- Crimson fountaingrass (*Pennisetum setaceum*)

Animal species

- Egyptian goose (*Alopochen aegyptiacus*)
- Raccoon dog (*Nyctereutes procyonoides*)
- Muskrat (*Ondatra zibethicus*)

The associated restrictions and obligations came into force from 2 August 2017 for all these species apart from the Raccoon dog, which came into force on 2 February 2019.

Other Invasive Species

The main guidance document that has been prepared dealing with invasive species/noxious weeds on sites is the TII *'Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads'* which was published in 2010. This document details other non-native species of note.

A detailed survey for such species was conducted.

1.3 Project Description

South Dublin County Council are proposing the development of a public realm amenity consisting of a new all ability boardwalk at the Sluice Car Park to provide access to Lucan Demesne, Lucan, Co. Dublin. The proposed all ability boardwalk, is located adjacent to the River Liffey (see **Figure 1.2**) and will be a timber structure that will be built on stilts through the woodland in Lucan Demesne.

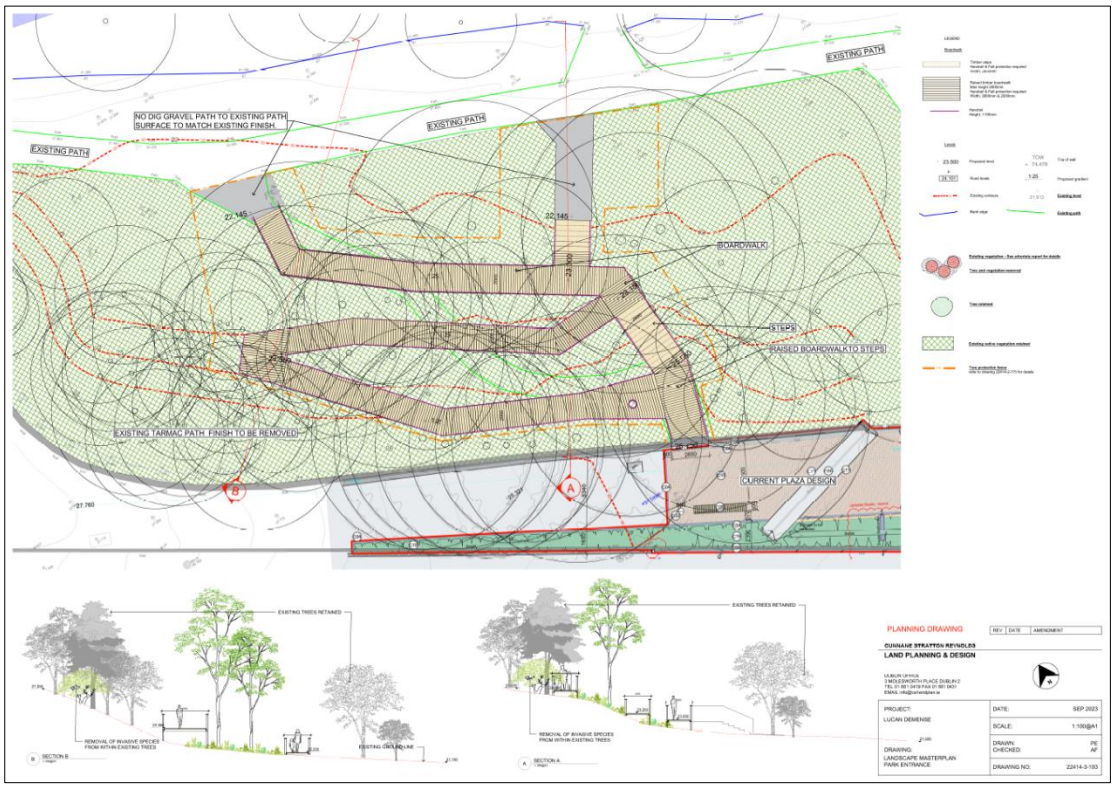

Figure 1.2 Proposed new all ability boardwalk access.

The potential ecological impacts of this development coupled with two previously permitted new car parking areas adjacent to Celbridge Road (R835) to service Lucan Demesne is assessed. The western car park is located south and west of the N4 (see

Figure 1.3) while the eastern car park is located north and east of the N4 (see **Figure 1.4**).

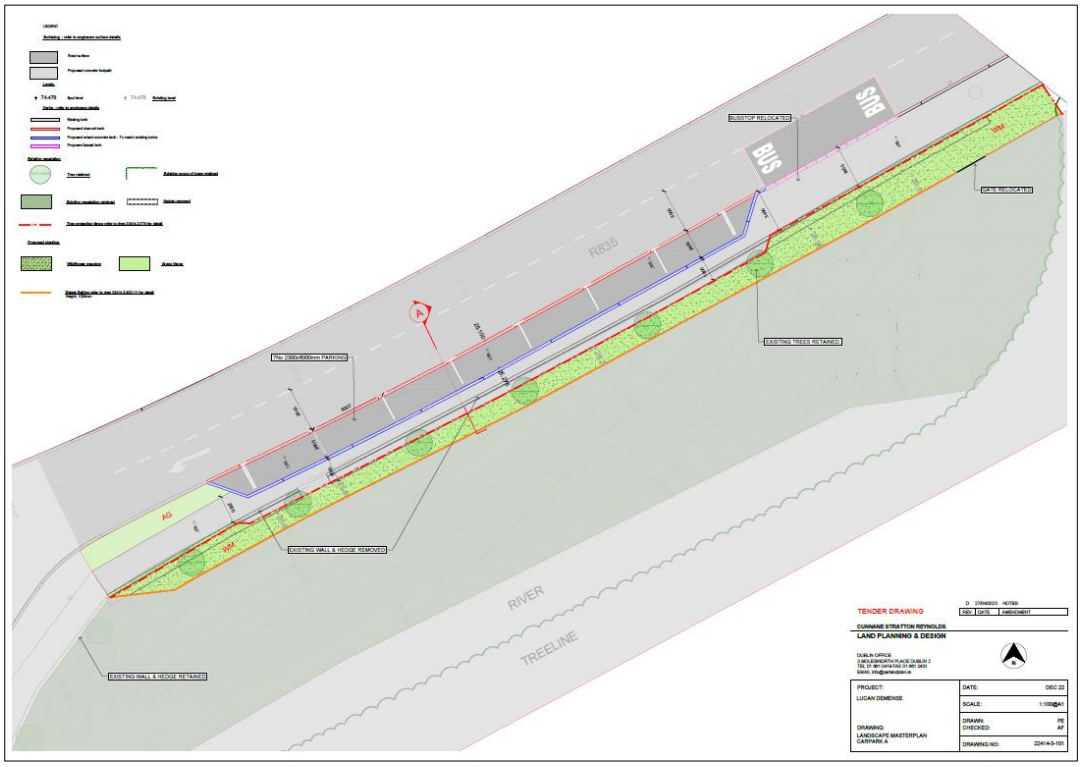

Figure 1.3 Western Car Park.

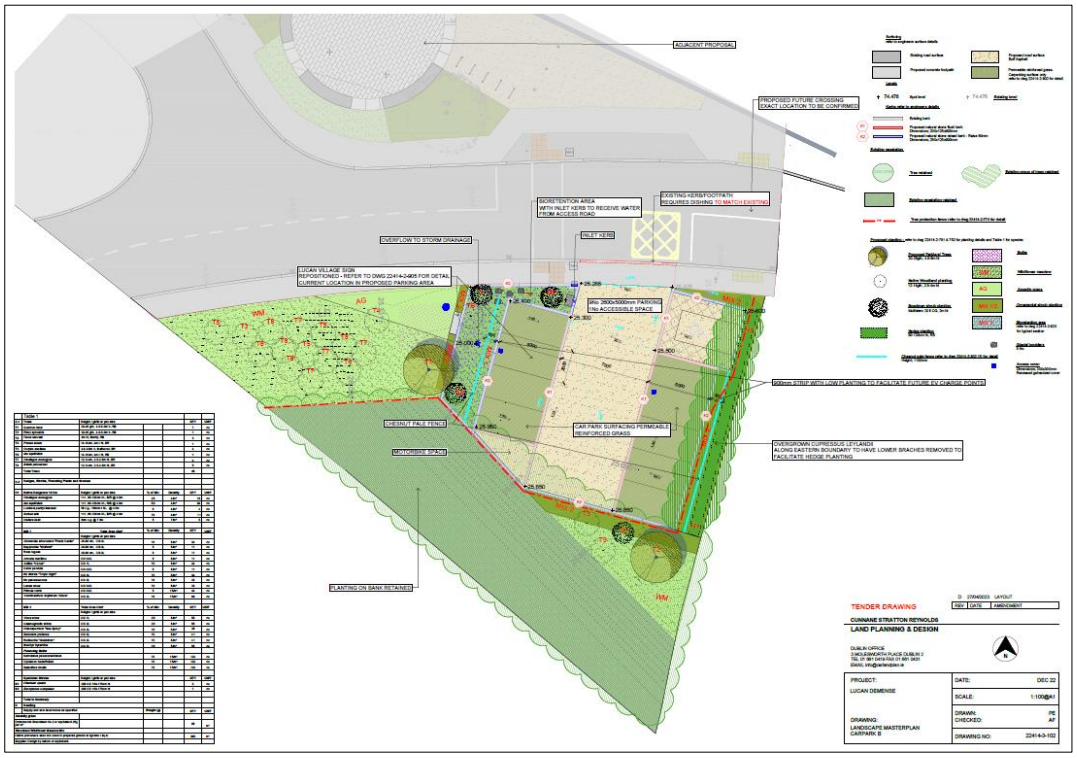

Figure 1.4 Eastern Car Park.

2. METHODOLOGY

2.1 Desk Study

A desk study was carried out to collate the available information on the ecological environment potentially impacted by the proposed development at Lucan Demesne and to determine the proximity of the proposed development to designated areas for conservation.

A review of existing information on European sites, their Qualifying Interests and Conservation Objectives, and other available information on the terrestrial and ecology in the vicinity of the proposed development was conducted.

Data sources relevant to each European site include the Site Synopsis, Conservation Objectives, the Conservation Objectives backing documents, and the Natura 2000 Standard Data Form, all of which are publicly available online at www.npws.ie were also reviewed.

The National Parks and Wildlife Service (NPWS) of the Department of Housing, Local Government and Heritage database of designated conservation areas and NPWS records of rare and protected plant species as listed under the Irish Red List - Vascular Plants (Wyse Jackson, *et al.* 2016) were checked with regard to the location of the lands at Lucan Demesne.

Information on protected species of fauna and flora listed for protection under Annex II of the EU Habitats Directive (92/43/EEC), Annex I of the Birds Directive (79/409/EEC) and the Wildlife (Amendment) Act (2000) was also sought from NPWS, the National Biodiversity Data Centre and published sources.

Further ecological information was gathered in relation to the study area by examining GIS datasets, maps and aerial photographs, and by drawing on other existing information.

A review was also completed of the ecological and faunal interest from the general environs of Lucan Village.

2.2 Field Surveys - Habitat & Botanical Survey

The site was surveyed to describe and map the habitats present using the habitat survey and mapping techniques described by Smith *et al.* (2011). The habitats within the site were described to level three using the Heritage Council Guide to Habitats of Ireland (Fossitt (2000)). Plant species within the site were identified using Parnell and Curtis (2012). Field surveys were completed on the 30th August and the 3rd and 19th October 2023.

A particular focus of the surveys was to determine if any protected species of plant under the Flora (Protection) Order 2022 or listed in the Irish Vascular Plants Red Data Book are present on the site or if any of the habitats present correspond to any of the habitats listed under Annex I of the EU Habitats Directive.

Invasive species present in the site were also identified. A particular focus of the surveys was for those invasive species listed in the Birds and Natural Habitats Regulations 2011 and the EU.

2.3 Field Surveys - Fauna

2.3.1 Bat Survey

The bat survey consists of several elements – a desktop review and consultation with Bat Conservation Ireland, an inspection of trees within the site for their potential to support roosting bats, an inspection of structures which could offer bats roosting opportunities and a bat detector activity survey of the general environs of the site.

The aims of the surveys were to:

a) To determine what species of bats are known from the site and the immediate environs.
b) To identify any roosting sites in suitable structures within the site.
c) To determine the use of any mature trees and other habitats in the site as feeding and commuting areas for bats.
d) To ensure that bats are considered and protected in the development.

Bat activity is usually detected by the following signs (though direct observations are also occasionally made):

- bat droppings (these will accumulate under an established roost or under access points);
- insect remains (under feeding perches);
- oil (from fur) and urine stains;
- scratch marks; and
- bat corpses.

The nature and type of habitats present are also indicative of the species likely to be present.

Trees within the site were assessed for their potential to support roosting bats on 3rd October 2023 by completing a preliminary ground level roost assessment. Potential tree roosts were identified using the following standard criteria, which were created by bat specialists from Bat Conservation Ireland for use in the assessments of tree roosts on large infrastructural projects and are summarised in NRA (2006):

- Presence or absence of bat droppings (these can be hard to find amongst leaf litter or may be washed away following periods of wet weather),
- Bat droppings may also be seen as a black streak beneath holes, cracks, branches, etc.,
- Presence or absence of smooth edges with dark marks at potential entrances to roosts,
- Presence or absence of urine stains at potential entrances to roosts,
- Presence of natural cracks and rot holes in the trunk or boughs of the tree,
- Hollow trees,
- Presence or absence of creepers such as ivy or honeysuckle on trees (ivy clad trees are often used by bat species such as pipistrelles as roosts),
- Presence or absence of loose bark such as that of sycamore, or flaky bark on coniferous species such as cedars, cypress and Scot's pine,

- Presence or absence of bracket fungi which may indicate a rotten or potentially hollow centre to the tree,
- Known bat roosts previously identified,
- Trees with storm or machinery damage or broken boughs,
- Clutter level - where the branches and trunk are easily accessible, this is considered a better tree for bat roosts,
- Adjoining habitat - if there are a variety of feeding opportunities for bats, this increases the potential of a tree as a bat roost,
- Adjoining potential roosts / known roosts. This raises the likelihood of a tree being of benefit as bats may move roosts if the roost becomes too hot or cold during roosting and a nearby alternative roost is highly desirable.

The arboricultural features described in the Bat Tree Habitat Key (Andrews, 2013) also informed the survey.

A bat activity survey of the property was conducted on 3rd October 2023.

Bat activity is predominantly bi-modal, with bats taking advantage of increased insect numbers on the wing during the periods after dusk and before dawn, (there is usually a lull in activity in the middle of the night). While this holds true for 'hawking' species (bats that capture prey in the open air), 'gleaning' species such as brown long-eared (*Plecotus auritus*), Natterer's (*Myotis nattereri*) and Whiskered/Brandt's bats (*Myotis mystacinus/brandtii*) remain active throughout the night, as prey is available on foliage for longer periods.

2.3.2 Badger Survey

A speedy and productive means of determining the mammal fauna within a site is to walk the entire site concerned, paying particular attention to all hedgerow, woodland, watercourses, fence lines, paths etc. to locate mammal signs. These include setts, old bedding material, feeding signs, latrines, badger tracks or paw prints, badger paths and badger hair caught on vegetation or fences.

Badger surveys of the lands proposed for development were conducted on 30th August and the 3rd and 19th October 2023.

The survey was carried out by an experienced mammal specialist (Faith Wilson) in accordance with best practice as described in the 'Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes' (TII 2009) and 'Guidelines for the treatment of badgers prior to the construction of National Road Schemes' (TII 2005).

2.3.3 Otter Survey

An otter survey was conducted along the banks of the River Liffey and the Tobermaclugg Stream during the site visits conducted on the 30th August and the 3rd and 19th October 2023 in accordance with best practice as described in the 'Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes' (TII 2009), 'Otter Breeding Sites. Conservation and Management. Conserving Natura 2000 Rivers Conservation Techniques Series No. 5, (Liles, 2003)'

and 'Guidelines for the treatment of otters prior to the construction of National Road Schemes' (TII 2006).

Other Mammals

A dedicated survey for other mammals was carried out during the site visits on 30th August and the 3rd and 19th October 2023 using the techniques as prescribed in Ecological Survey Techniques for Protected Flora and Fauna (TII, 2008). This entailed searching for and identification of signs, tracks and droppings of various mammals (including pine marten, Irish stoat, Irish hare, red squirrel, hedgehog and pygmy shrew along with non-native species such as fallow deer, American mink, grey squirrel and rabbit) within the site.

Bird Survey

All birds seen and heard during the walkover surveys of the site on 30th August and the 3rd and 19th October 2023 were recorded.

2.4 Survey Constraints

The bat survey was competed on the 3rd October 2023, which is outside the optimum time for surveying bats as shown on **Figure 2.1** and detailed below.

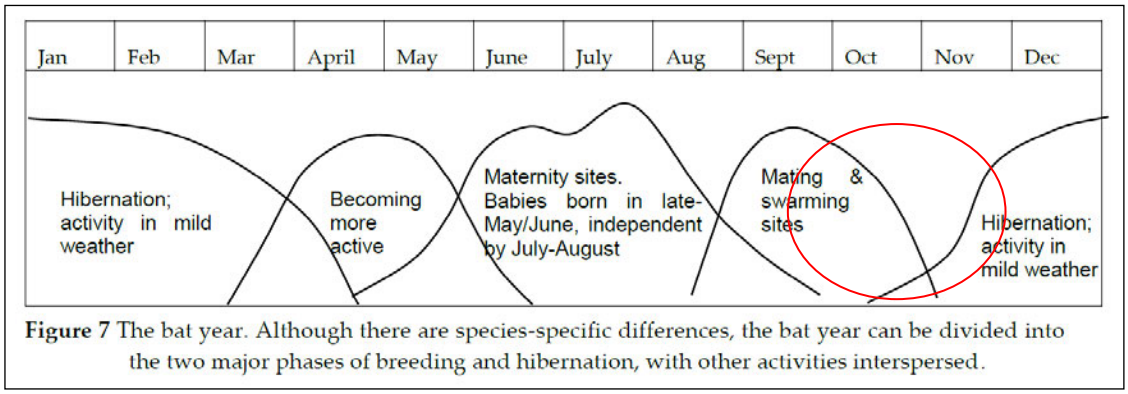

Figure 7 The bat year. Although there are species-specific differences, the bat year can be divided into the two major phases of breeding and hibernation, with other activities interspersed.

Figure 2.1. The Bat Year. (Source: Marnell *et al.*, 2022).

The breeding season for birds was complete and winter migrants had not yet arrived.

3. RESULTS

3.1 Description of the site, its environs, habitats and fauna

The lands proposed for development under the Public Realm Development application in the environs of the Sluice Car Park consist of three proposed development sites as shown on **Figure 3.1** below.

Figure 3.1. The three proposed development sites at Sluice Car Park, Lucan.

These include the Boardwalk Site where new access is being proposed to Lucan Demesne and the two new car parking areas which are described as the Western and Eastern sites. The Western and Eastern car parking sites are bounded by the R835 regional road, known locally as the Celbridge Road to the north and are bisected by the N4.

The Boardwalk Site is located on the southern banks of the River Liffey within the Liffey Valley in a wooded area within Lucan Demesne, which is currently bisected by a footpath. The Tobermaclugg Stream is found in close proximity to this footpath (to the east) and the confluence of the Tobermaclugg Stream and the River Liffey is found to the north east of the site.

3.1.1 Nature Conservation Designations

The lands proposed for development in Lucan Demesne are not currently the subject of any nature conservation designations. Many of the woodlands within the Liffey Valley are included within the boundaries of the Liffey Valley pNHA (Site Code: 000128) which is a site of national conservation importance. The boundaries of this site are shown on **Figure 3.2** and **Figure 3.3** below.

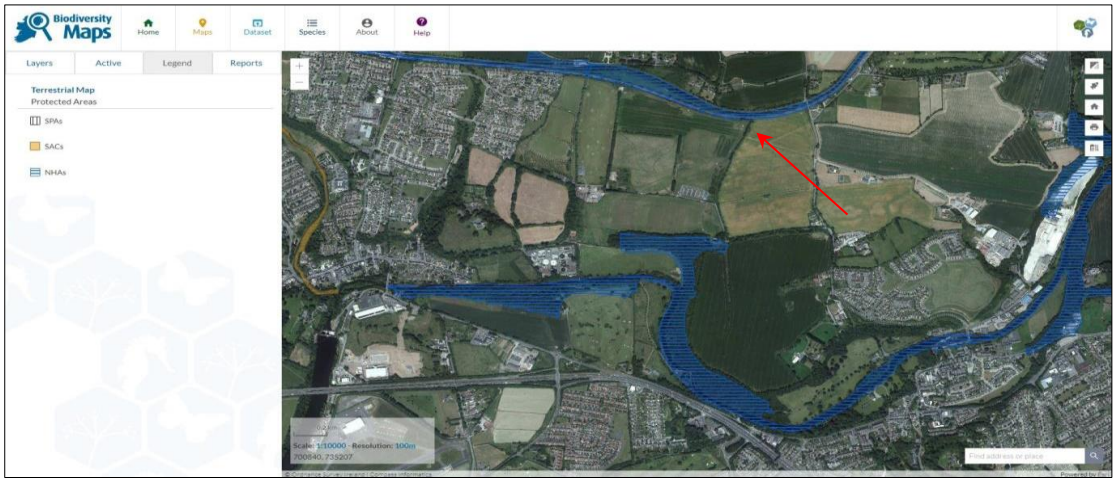

Figure 3.2. Nature Conservation Designations in the vicinity of Lucan Village. Liffey Valley pNHA (Site Code: 000128) adjoins the site. The Royal Canal pNHA is indicated by the red arrow (Source: National Biodiversity Data Centre).

Figure 3.3. Site boundary of the Liffey Valley pNHA (Site Code: 000128) which adjoins the site at Lucan Demesne.

3.1.2 Soils and Geology

The soils of Lucan Demesne are described as a river alluvium (see **Figure 3.5**), and are underlain by dark limestone and shale – see **Figure 3.4**. This bedrock of Carboniferous limestone and shales is known as the Lucan Formation.

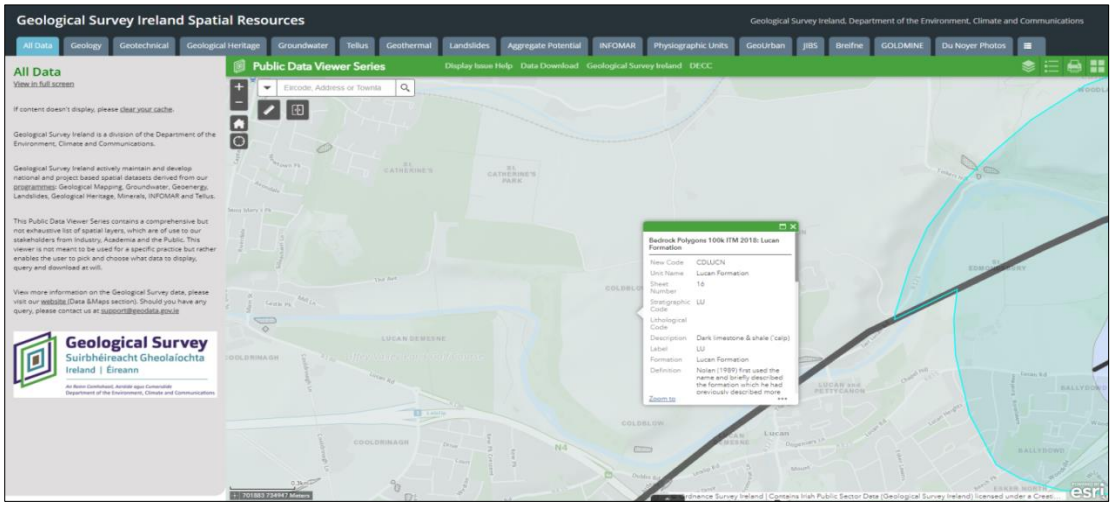

Figure 3.4. Underlying geology of Lucan (Source: Geological Survey Ireland).

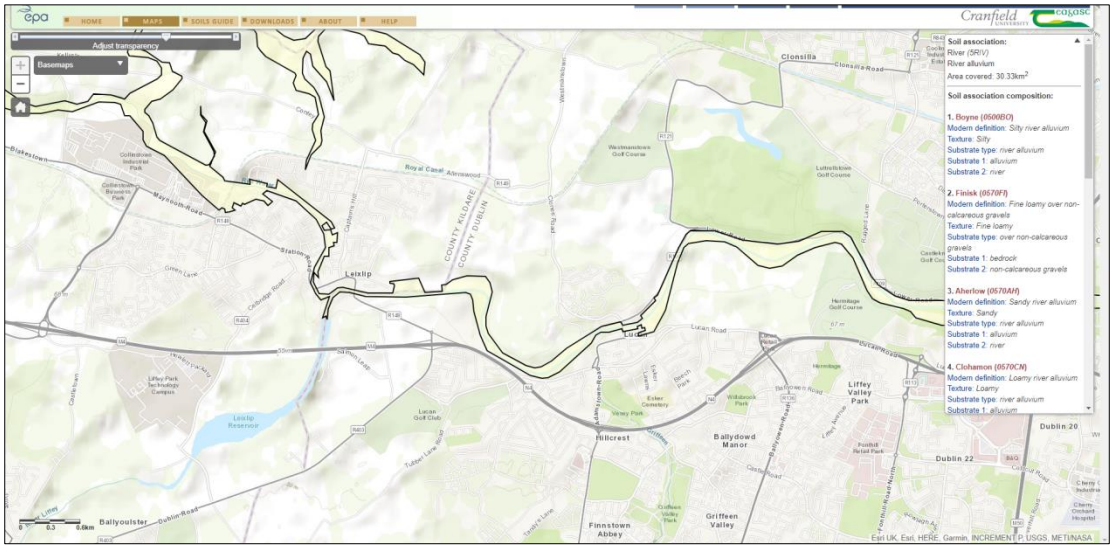

Figure 3.5. Soils at Lucan Demesne (Source: Teagasc).

3.1.3 Watercourses and Hydrology

Lucan Demesne is located within the Liffey and Dublin Bay catchment in Hydrometric Area 09 and in the Liffey Sub-Catchment (Liffey_SC_100). The River Liffey flows through the Demesne. Water samples are taken from the river upstream of the Demesne at Leixlip Bridge and within the Demesne in Liffey Valley Park as shown on **Figure 3.6.** Water quality upstream of the park is currently classified as 'Good' (i.e. Q 4), whereas within the park it is classified as 'Poor' (i.e. Q 3).

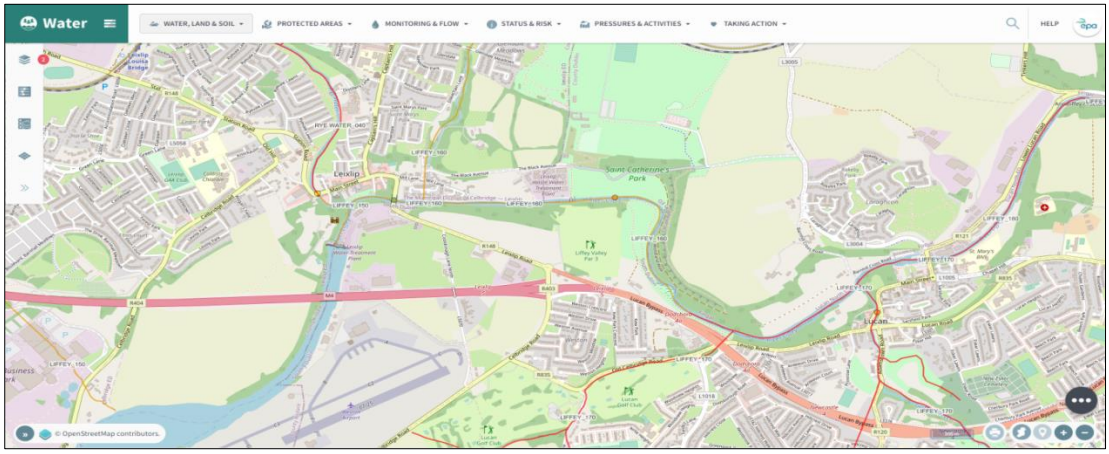

Figure 3.6. Water quality within the River Liffey is currently assessed as 'Poor' and it is listed as a watercourse 'At Risk' of not achieving 'Good Water Status' under the Water Framework Directive.

The section of the River Liffey within the Demesne is currently listed as a watercourse 'At Risk' of not achieving 'Good Water Status' under the Water Framework Directive. It was previously listed between both 2013 – 2018 and 2016-2021 as a watercourse of 'Poor' water quality 'and At Risk' of not achieving 'Good Water Status'.

3.1.4 Habitats

A review of historic mapping for the area was completed. The woodlands at Lucan Demesne are remnants of former demesne planting. The current extent and condition of the woodland in the park has been much reduced since the First Edition of the Ordnance Survey of Ireland 6" mapping as shown on **Figures 3.7, 3.8, 3.9, 3.10** and **3.11.** This is on account of the development of the village and the construction of the Lucan Bypass, which opened in November 1988 and forms part of the N4 road – the main artery for traffic heading west from Dublin.

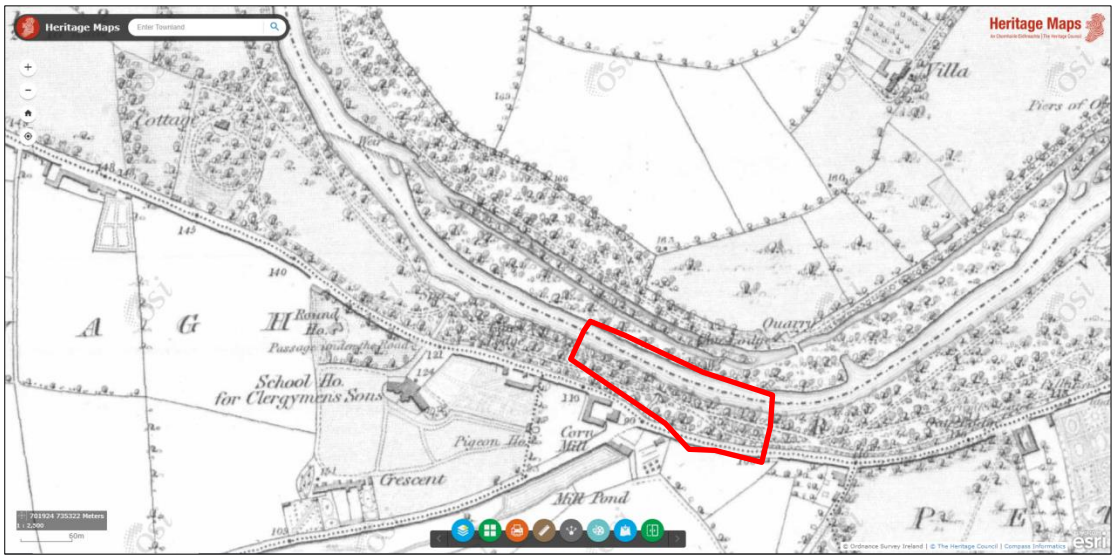

Figure 3.7. Parkland and woodland at Lucan Demesne in the 1840s (Source: OSI 6" Mapping First Edition).

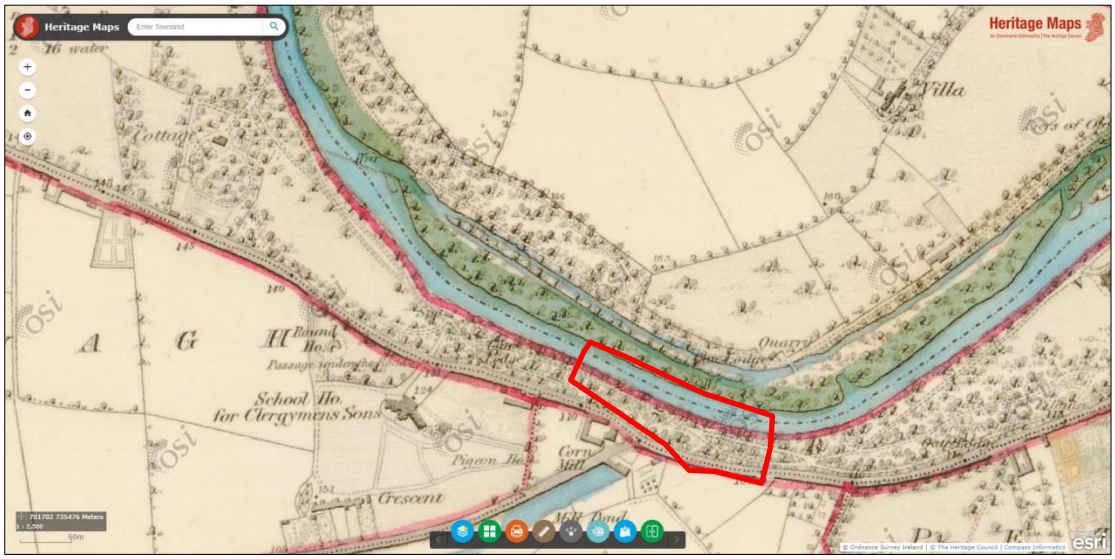

Figure 3.8. Parkland and woodland at Lucan Demesne in the 1840s (Source: OSI 6" Mapping First Edition – colour series).

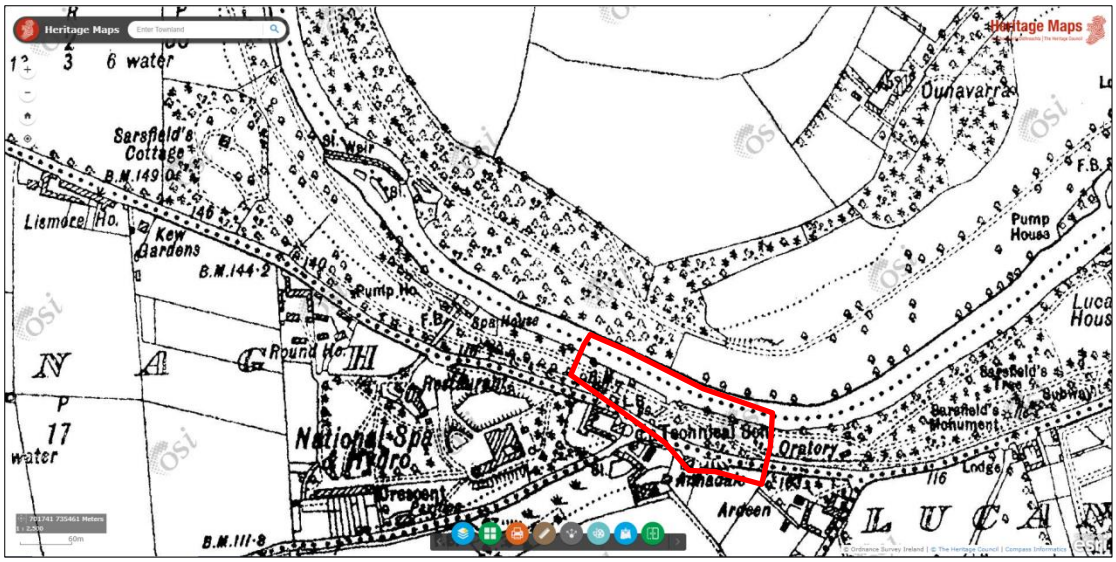

Figure 3.9. Parkland and woodland at Lucan Demesne in the early 1900s (Source: OSI 6″ Mapping Second Edition).

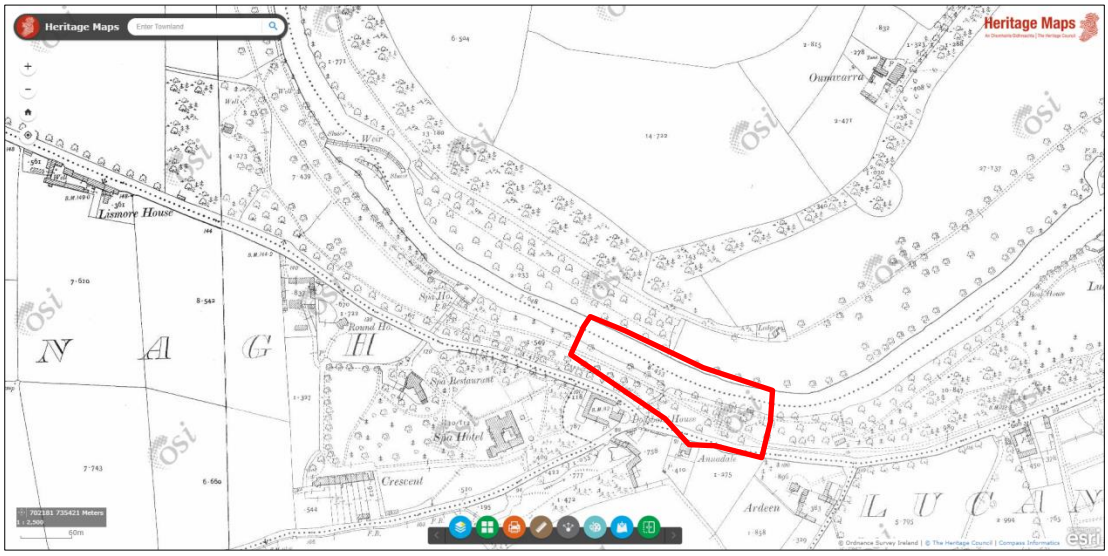

Figure 3.10. Parkland and woodland at Lucan Demesne in the early 1900s (Source: OSI 25″ Mapping).

Figure 3.11. The N4 can be clearly seen in the Ordnance Survey Ireland aerial imagery from 1995.

The woodland block to the east of the proposed development site has been mapped by National Parks and Wildlife Service as Ancient and Long Established Woodland as can be seen on **Figure 3.12** below. Some of the trees along the river bank and within the woodland remain extant from the former demesne planting, while other planting in the area is associated with landscaping for the N4 road.

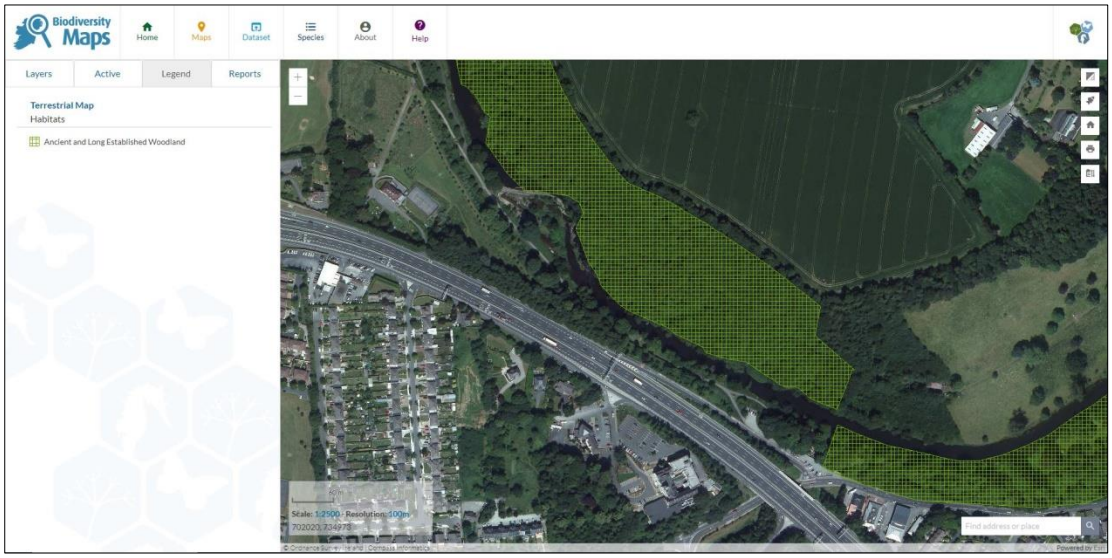

Figure 3.12. Woodland adjacent to the site and in St. Catherine's Park on the northern bank of the River Liffey has been mapped as Ancient and Long Established Woodland by National Parks and Wildlife Service.

The woodlands through which the boardwalk are proposed are dominated by Beech (*Fagus sylvatica*), Sycamore (*Acer pseudoplatanus*), Lime (*Tilia cordata*), Poplars (*Populus* sp.) and Horse chestnut (*Aesculus hippocastanum*). The understorey is dominated by Hawthorn (*Crataegus monogyna*), Elder (*Sambuccus nigra*), young Beech, Wych elm (*Ulmus glabra*). Large portions of the woodland understorey are dominated by the invasive non-native species Snowberry bush (*Symphoricarpos alba*).

The ground flora is poor in some parts on account of the deep shade cast by the Beech and is limited to Ivy (*Hedera helix*) and Bramble (*Rubus fruticosus* agg.). Elsewhere Nettles (*Urtica dioica*), Lesser burdock (*Arctium minus*), Pendulous sedge (*Carex pendula*), Wood sedge (*Carex sylvatica*), Wood avens (*Geum urbanum*), Herb robert (*Geranium robertianum*), and Hogweed (*Heracleum sphondylium*). These woodlands are best described as the habitat WD1 (Mixed) Broadleaved Woodland. A population of Ivy broomrape is found to the west of the proposed works area within the woodland.

The woodland contains some standing deadwood (mostly dead Wych elm) which is an important habitat from a biodiversity perspective and in some parts is in need of thinning. The woodland is well trampled and a series of trails arising from people and dogs criss cross the area reducing ground flora and compacting soils.

Along the banks of the River Liffey is a band of tall herbaceous vegetation indicative of annual flooding – species recorded here include the non-native invasive species Himalayan balsam (*Impatiens glandulifera*), which is a Third Schedule Invasive Species and significant stands of Snowberry bush (*Symphoricarpos alba*).

Native species typical of a river bank such as Meadowsweet (*Filipendula ulmaria*), Nettle, Hoary Willowherb (*Epilobium hirsutum*), Rosebay Willowherb (*Epilobium angustifolium*), Hedge bindweed (*Calystegia sepium*), Cleavers (*Galium aparine*), Spear thistle (*Cirsium arvense*), Creeping bet grass (Agrostis stolonifera), Field horsetail (*Equisetum arvense*), Cock's-foot grass (*Dactylis glomerata*), Wild angelica (*Angelica sylvestris*), Creeping thistle (*Cirsium repens*), Common figwort (*Scrophularia nodosa*), Creeping buttercup (*Ranunculus repens*), Tufted vetch (*Vicia cracca*), Sow thistle (*Sonchus* sp.), Hemp agrimony (*Eupatorium cannabinum*), Bush vetch (*Vicia sepium*), Cow parsley (*Anthriscus sylvestris*), Meadow vetchling (*Lathyrus pratensis*), Ground elder (*Aegopodium podagraria*), Bramble, and Coltsfoot (*Tussilago farfara*). There are informal tracks to the river through these areas.

No observations of the Green Figwort (*Scrophularia umbrosa*) were made along the river bank and it is thought that the habitat for this species is compromised by the invasive non-natives.

A treeline of mature Alder (*Alnus glutinosa*), Willow (*Salix cinerea*), Ash (*Fraxinus excelsior*), Crack willow (*Salix fragilis*) and Oak (*Quercus robur*), with Wych elm and Hawthorn is found on the river bank. This is a narrow example of Riparian Woodland (WN5) and may have affinities to the priority Annex I habitat 91EO* alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*. This habitat is compromised by the Snowberry bush and Wayfaring tree (*Viburnum tinus*).

There are remnants of calcareous grassland (GS1) along the river margin in places with Knapweed (*Centaurea nigra*), Hoary ragwort (*Senecio erucifolius*), Coltsfoot – the mowing of grass in these areas and allowing the cuttings to remain reduces the diversity of this area.

Along the Tobermaclugg Stream Hart's tongue fern (*Phyllitis scolopendrium*) and Ivy was frequent on the bank.

There is dumping of sweepings from the tracks into the woodland and the riparian habitat. Along the edge of the existing tracks Greater plantain (*Plantago major*) was recorded.

There are signs of anti-social behaviour with littering and fires.

3.1.5 Rare and Scarce Plants

Flora (Protection) Order 2022
There are a number of plant species which are legally protected under the Flora (Protection) Order 2022 found within the 1okm square in which the Liffey Valley is located (O03). These include:

- Red Hemp-nettle (*Galeopsis angustifolia*)
- Hairy St. John's-wort (*Hypericum hirsutum*)
- Opposite-leaved Pondweed (*Groenlandia densa*)
- Meadow Barley (*Hordeum secalinum*)
- Betony (*Betonica officinalis*)
- Hairy violet (*Viola hirta*)

Old Woodland Specialists
The woodlands in the Liffey Valley (and particularly at St. Catherine's on the north bank of the River Liffey opposite the development site) are very important for the rich variety of rare woodland plants, which have been recorded there.

These include Yellowbird's nest (*Monotropa hypopitys*). This species was first recorded here by Wade 'under beech trees in St. Catherine's' (pers. comm. to J.T. Mackay) as recorded in Mackay's Catalogue (Mackay, 1825) and Flora Hibernica (Mackay, 1836). The species was recorded by Robert Lloyd Praeger in St. Catherine's in 1934 – see **Figure 3.13** but has not been seen since.

The presence of this species coupled with others such as Bird's-nest orchid (*Neottia nidus-avis*), Toothwort (*Lathraea squamaria*) (which is also known from St. Catherine's), Sword-leaved helleborine (*Cephalanthera longifolia*), Wood Millet (*Millium effusum*), Wood Fescue (*Festuca altissima*), Intermediate Wintergreen (*Pyrola media*) and Common Wintergreen (*Pyrola minor*) were proposed by Praeger as species associated with older woodland.

Other indicator species of old woodland present in the Liffey Valley Woods in this area are mostly recorded from St. Catherine's Woods on the north side of the River Liffey from the proposed development site.

These include; Yellow Archangel (*Lamiastrum galeobdolon*) and Hairy St. John's-wort (*Hypericum hirsutum*), while Green figwort (*Scrophularia umbrosa*) was first recorded along the Liffey banks at 'St. Catherine's of Lucan Demesne' between 1901 and 1904 (Colgan, N., 1904).

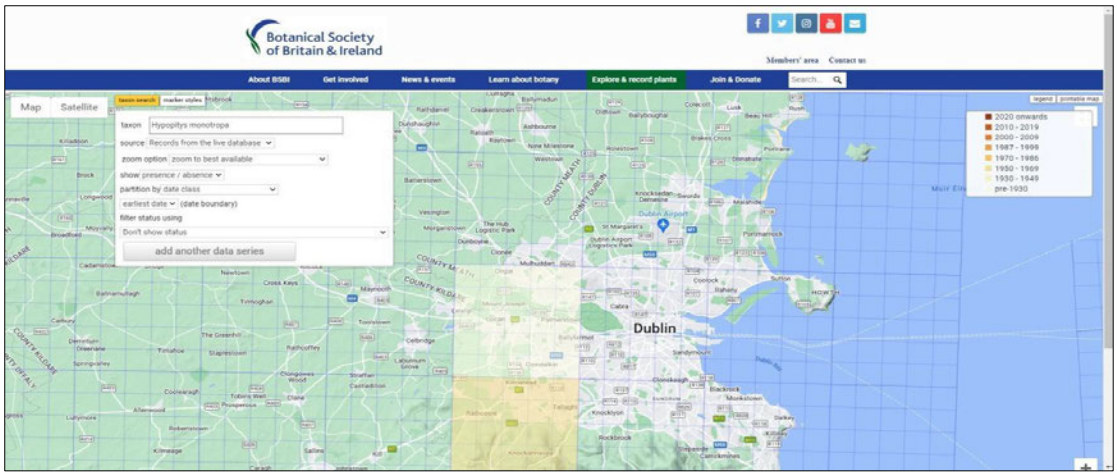

Figure 3.13. Records of Yellowbird's nest (*Monotropa hypopitys*) from the Lucan area (Source: Botanical Society of Britain and Ireland).

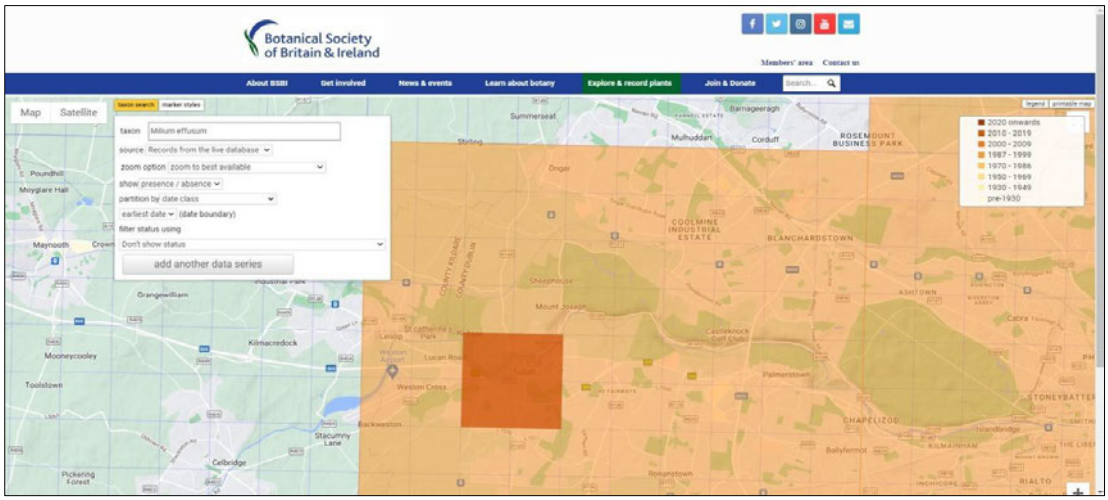

Figure 3.14. Records of Wood Millet (*Milium effusum*) from the Lucan area (Source: Botanical Society of Britain and Ireland).

Hairy St. John's-wort (*Hypericum hirsutum*)

The National Biodiversity Data Centre contains a number of records of Hairy St. John's-wort (*Hypericum hirsutum*) from this section of the Liffey Valley Woodlands. These include records to within 100m which are shown on **Figure 3.15** below.

Jamie O'Neill recorded a population of Hairy St. John's-wort within Lucan Demesne as indicated by the red circle on **Figure 3.15** below. The population here was recorded;
'Growing in a shady hedgerow near the pond'.

The majority of the records are found in St. Catherine's Park. None of them are found in the proposed development site.

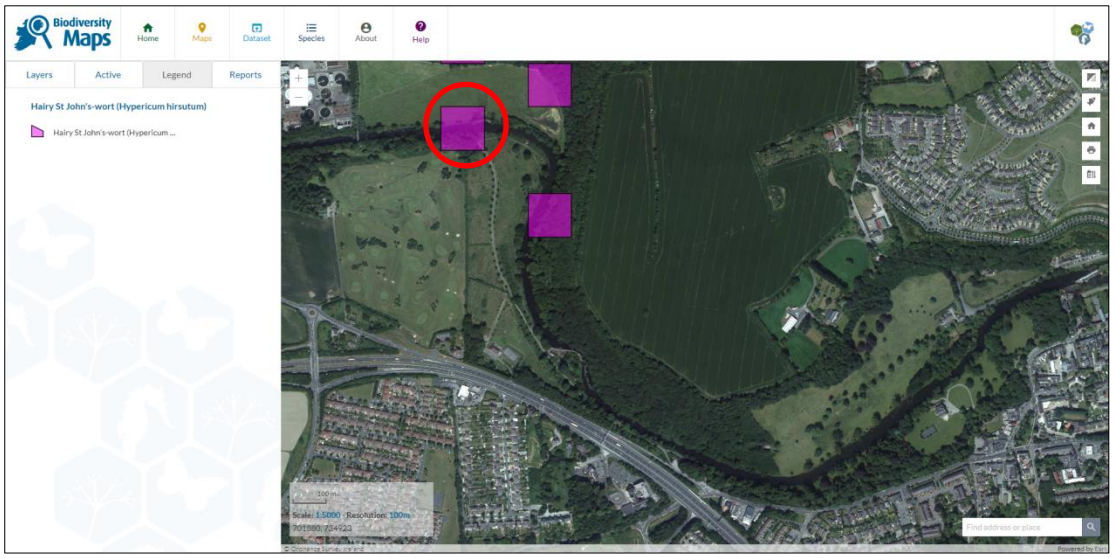

Figure 3.15. Records of Hairy St. John's-wort (*Hypericum hirsutum*) from this section of the Liffey Valley Woodlands (Source: National Biodiversity Data Centre). The population found in Lucan Demesne is circled in red.

Toothwort (*Lathraea squamaria*)

The National Biodiversity Data Centre contains a number of records of Toothwort (*Lathraea squamaria*) from this section of the Liffey Valley Woodlands. These records all relate to the woodlands in St. Catherine's Park as opposed to Lucan Demesne. These include records of Toothwort held by the Botanical Society of Britain and Ireland which are at a 2km level as well as records to within 100m. These are shown on **Figure 3.16** below.

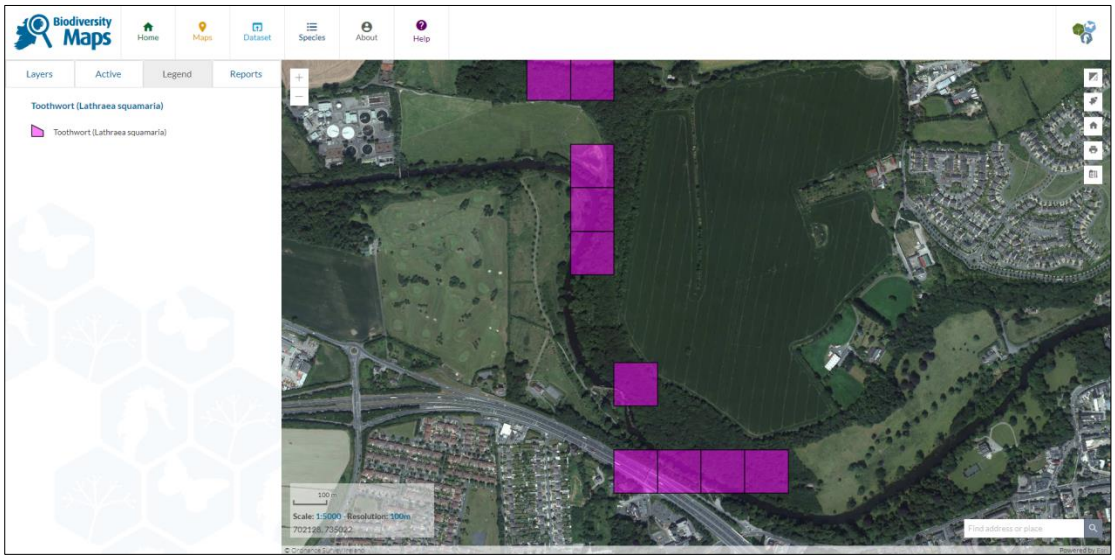

Figure 3.16. Records of Toothwort (*Lathraea squamaria*) from the Lucan area (Source: National Biodiversity Data Centre).

Yellow Archangel (*Lamiastrum galeobdolon*)

The National Biodiversity Data Centre contains a number of records of Yellow Archangel (*Lamiastrum galeobdolon*) from this section of the Liffey Valley Woodlands. The majority of these are from the environs of St. Catherine's Park as shown on **Figure 3.17**. There are no records of this species from the proposed development area.

Figure 3.17. Records of Yellow Archangel (*Lamiastrum galeobdolon*) from the Lucan area (Source: National Biodiversity Data Centre).

Green Figwort (*Scrophularia umbrosa*)

Populations of Green Figwort (*Scrophularia umbrosa*) are known from the wider River Liffey as shown on **Figure 3.18**. The National Biodiversity Data Centre contains a number of records of Green Figwort from St. Catherine's Park on the other side of the Liffey as shown on **Figure 3.18**. None of these records relates to the proposed development area. These include records held by the Botanical Society of Britain and Ireland which are at a 2km level as well as records to within 100m made by Jamie O'Neill who recorded 5 plants of Green Figwort on 13/07/2017, 10 plants on 15/07/2018, 49 plants on 20/07/2019, 11 plants on 10/07/2020 all from the area of the Sluice within St. Catherine's Park.

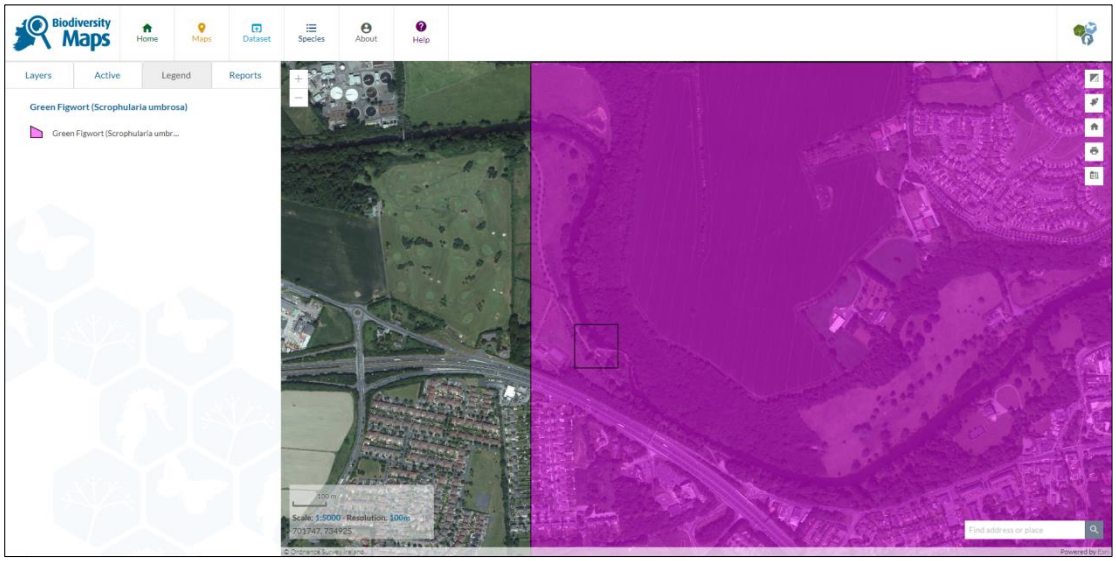

Figure 3.18. Records of Green Figwort (*Scrophularia umbrosa*) from Lucan (Source: National Biodiversity Data Centre).

Ivy Broomrape (*Orobanche hederae*)

Populations of Ivy Broomrape (*Orobanche hederae*) are known from the wider River Liffey as shown on **Figure 3.19**. The National Biodiversity Data Centre contains a number of records of Ivy Broomrape from St. Catherine's Park as shown on **Figure 3.19**. None of these records relates to the proposed development area. Doherty (2021) noted a population of Ivy Broomrape growing along the bankside of the River Liffey within the footprint of the Demesne Park Entrance.

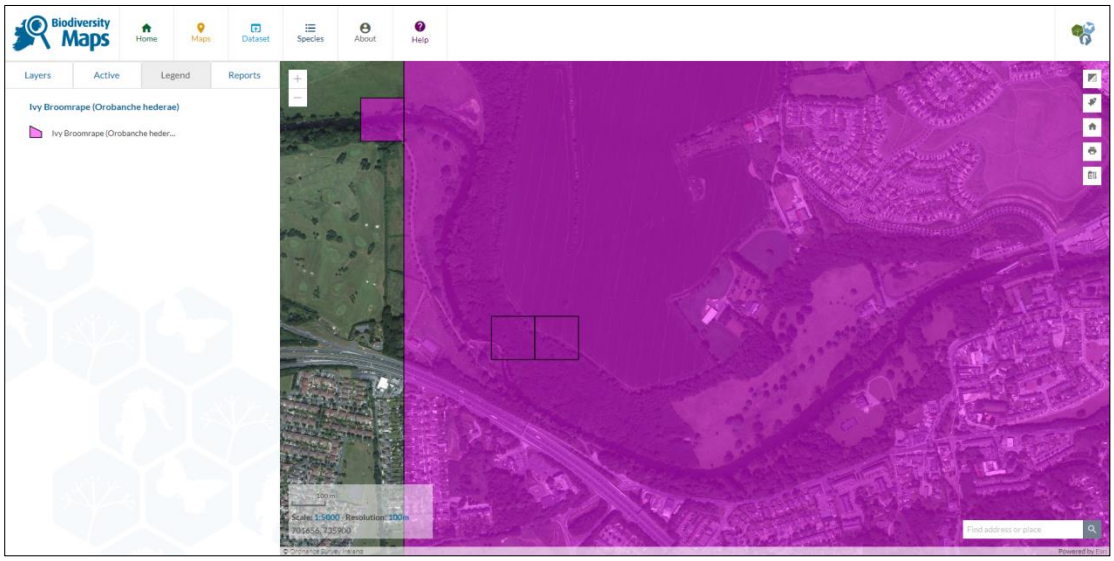

Figure 3.19. Records of Ivy Broomrape (*Orobanche hederae*) from Lucan (Source: National Biodiversity Data Centre).

The current surveys recorded a population of Ivy broomrape just inside the stone wall beside the car park during the site visit on 30th August 2023.

Plate 1. Ivy broomrape near the proposed works area.

3.1.6 Invasive Species

The main invasive species noted in the general vicinity of the site include large stands of Himalayan balsam (*Impatiens glandulifera*) which were found on the bank of the River Liffey.

Other species recorded include:

- Snowberry bush (*Symphoricarpos alba*),
- Old man's beard (*Clematis vitalba*), and
- Buddleia (*Buddleia davidii*).

There are also historical records of Giant Hogweed (*Heracleum mantegazzianum*) so this species may turn up in the works area.

3.1.7 Faunal Interest

3.1.7.1 Badger

There was no evidence of badger (*Meles meles*) using the section of woodland in which the works are proposed. No tracks, setts, latrines, snuffle holes or other signs of badger were observed.

3.1.7.2 Bats

Desktop Research

Records of known roosts, ad hoc observations and transects recorded during the All Ireland Daubenton's Monitoring Scheme, Irish Car Based Bat Monitoring Survey and projects such as the BATLAS 2010 and 2020 projects are recorded in the Bat Conservation Ireland database, which was accessed.

A variety of species have been recorded either foraging or commuting from the wider landscape within a 10km radius of St. Catherine's Park and Lucan Demesne, and these include:

- Brown long eared bats (*Plecotus auritus*),
- Natterer's bat (*Myotis nattereri*),
- Whiskered bat (*Myotis mystacinus*),
- Daubenton's bat (*Myotis daubentonii*),
- Leisler's bat (*Nyctalus leisleri*)
- Soprano pipistrelle (*Pipistrellus pygmaeus*),
- Common pipistrelle (*Pipistrellus pipistrellus*),
- Unidentified pipistrelle species, and
- Unidentified *Myotis* species.

This data search revealed a number of other bat roosts in the general vicinity of Lucan including records from St. Catherine's Park but very few from Lucan Demesne.

A survey conducted in July 2002 by Dr Niamh Roche confirmed a roost of common pipistrelle in a lime tree in St. Catherine's Park in the vicinity of O 016 360, and also detected common pipistrelle, soprano pipistrelle, Leisler's bat and brown long-eared

bat at the western end of the park in Co. Kildare. The BATLAS 2010 project recorded Leisler's bat, Daubenton's bat and soprano pipistrelle in this general area also.

A previous survey of the mammalian fauna of St. Catherine's was conducted in 2003 by Brian Keeley (Keeley, 2003) who confirmed the presence of six species of bats in the park. These included:

- Common pipistrelle (*Pipistrellus pipistrellus*)
- Soprano pipistrelle (*Pipistrellus pygmaeus*)
- Leisler's bat (*Nyctalus leisleri*)
- Daubenton's bat (*Myotis daubentonii*)
- Brown long-eared bat (*Plecotus auritus*)
- Whiskered/ Brandt's bat (*Myotis mystacinus/ brandtii*)

A number of confirmed and potential bat roosts were also confirmed in St. Catherine's park during that study including:

- A transitional roost for common pipistrelle in the derelict house at the commencement of the wooded valley that leads on from the entrance lane on the Lucan-Clonee road,
- A Daubenton's bat roost in a mature beech tree along a pathway leading towards the Italian Ambassador's Residence,
- Brown long-eared bat activity was noted in the path between the mature beech and ash leading from the Lucan-Clonee road and mature oak trees with significant damage and crevices in this area may serve as a roost site for bats.
- Buildings such as St. Catherine's Chapel, the buildings to the west of the church and the derelict house to the east of the valley path, were noted as all offering very good potential for bats for different periods of the year.

The study confirmed that the woodlands at St. Catherine's Park are of high importance for bats in particular with six species of bats recorded to date all of which are known to roost in trees so the retention of large mature trees with standing deadwood, hollows, crevices, cracks and dense ivy is of importance for their conservation.

A bat survey conducted by Faith Wilson of St. Catherine's Park in 2013 examined the derelict bungalow and St. Catherine's Church within the park (2013). A survey on the 7th May 2013 confirmed the presence of two bat species using the northern section of the park and no bats emerging from the derelict bungalow. These were the common and soprano pipistrelle bat. The derelict bungalow was subsequently demolished under a bat derogation licence granted under Regulation 54 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S. I. Nos 477 of 2011) by National Parks and Wildlife Service on behalf of the Minister of the Arts, Heritage and the Gaeltacht. Monitoring took place following the building demolition and the 2013 monitoring survey in August recorded good levels of soprano pipistrelle foraging activity along the old avenue which leads to the lower yard in the park and both common and soprano pipistrelle were recorded along the lane leading from the lower yard to the upper yard. The playing pitches and open ground between the upper yard, the railway line and the eastern car park were all walked and common pipistrelle, soprano pipistrelle and Leisler's bat were recorded in this area. There was a single pass of a brown long-eared bat detected in the woodland and pipistrelle activity was high here. Social calls of pipistrelle bats were

recorded near the upper yard and it is possible that bats are roosting in buildings in this area.

The final monitoring detector survey of St. Catherine's Park was conducted by Faith Wilson on the 27th August 2014. The survey recorded the presence of three species of bats as previously documented and the woodlands and newly created wetland area in the floodplain of the River Liffey proved especially favourable to foraging bats.

Potential Tree Roosts
A total of thirty-six individual trees were recorded within the site area. The development design will not require the removal of any tree. Some of these trees have the potential to support roosting bats so if this were to change they should be further assessed.

Detector Survey
The bat survey of the proposed development area was completed on the 3rd October 2023. The survey recorded lots of bat activity in the vicinity of the proposed works area where the river corridor remains dark. The survey began at 19:00 and concluded at 21:00. The first bat was detected at 19:24.

Six species in total were recorded. These were:

- Common pipistrelle (*Pipistrellus pipistrellus*)
- Soprano pipistrelle (*Pipistrellus pygmaeus*)
- Leisler's bat (*Nyctalus leisleri*)
- Daubenton's bat (*Myotis daubentonii*)
- Brown long-eared bat (*Plecotus auritus*)
- Possible Whiskered/ Brandt's bat (*Myotis mystacinus/ brandtii*)

Sonograms of some of the bats detected are presented below on **Figures 3.20** to **3.25**. Bats were recorded foraging within proposed ramp location as well as over the Liffey River.

It was noted that there is already quite a lot of light spill impacting on the river from the adjoining N4 road and the proposed development should not add to that as these lit areas were avoided by Daubenton's bats as a result.

A large number of social calls were recorded. The underside of the small bridge over the Tobermaclugg Stream was also examined and has roosting potential.

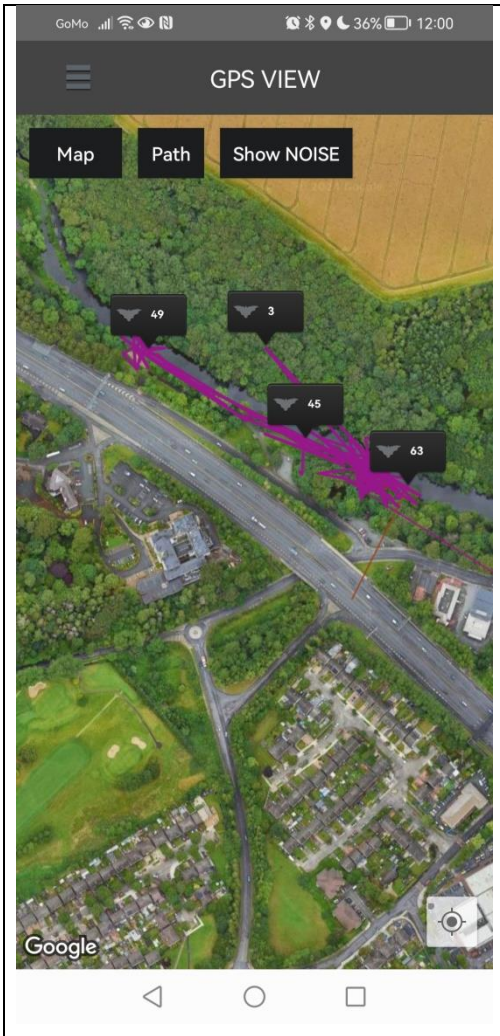

Figure 3.20. Bat registrations in Lucan Demesne.

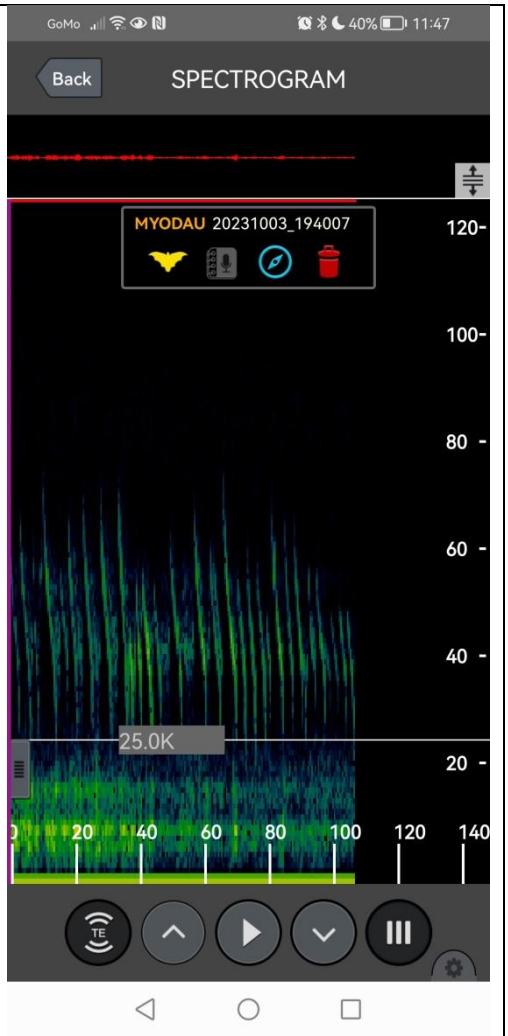

Figure 3.21. Sonogram of Daubenton's bat.

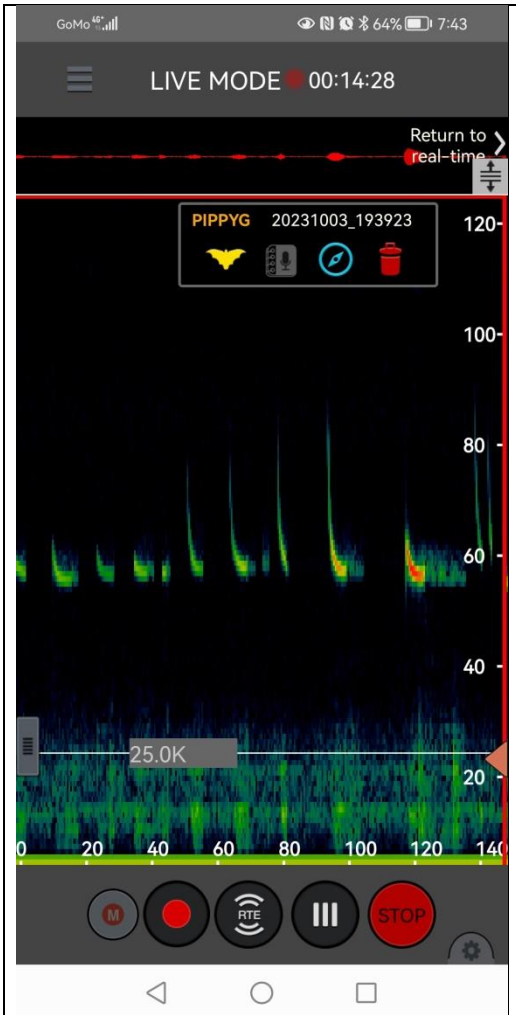

Figure 3.22. Sonogram of Soprano pipistrelle bat.

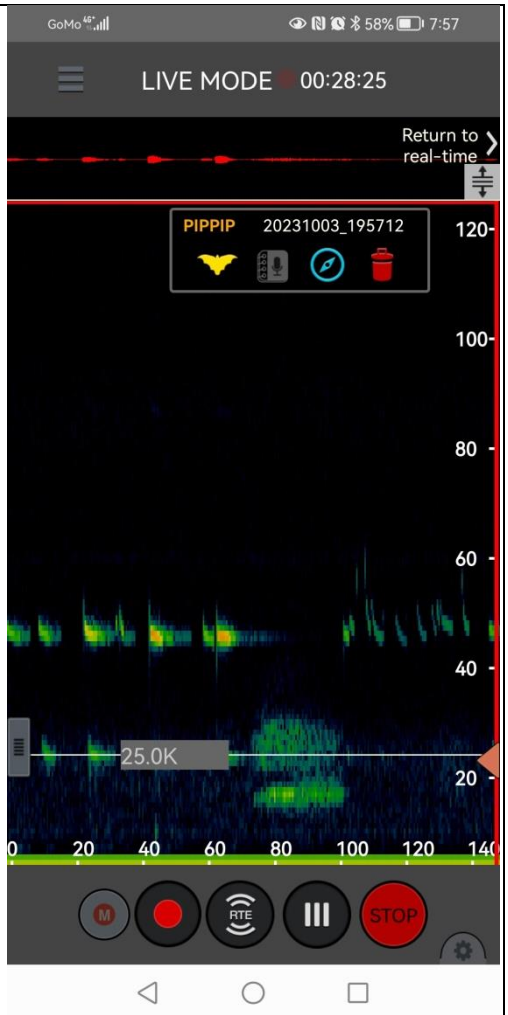

Figure 3.23. Sonogram of Common pipistrelle bat.

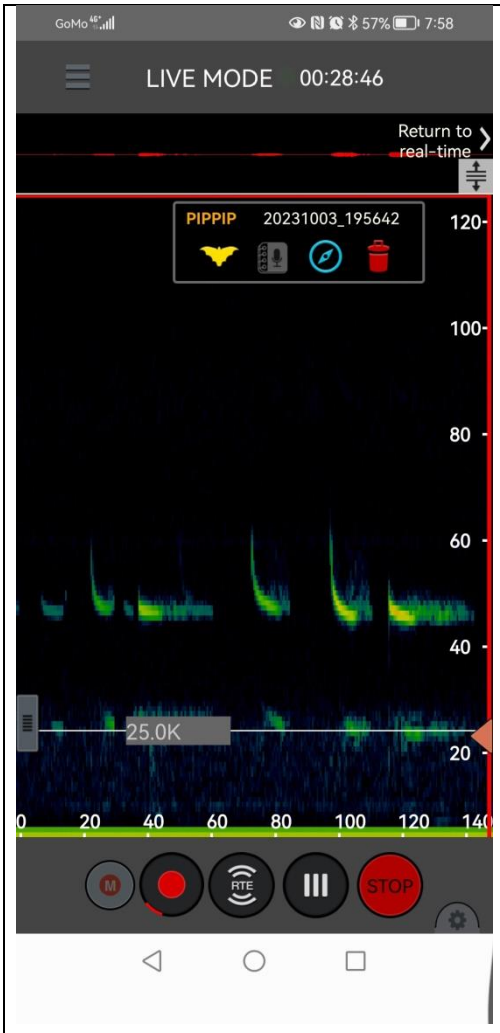

Figure 3.24. Sonogram of Leisler's bat and Common pipistrelle bat.

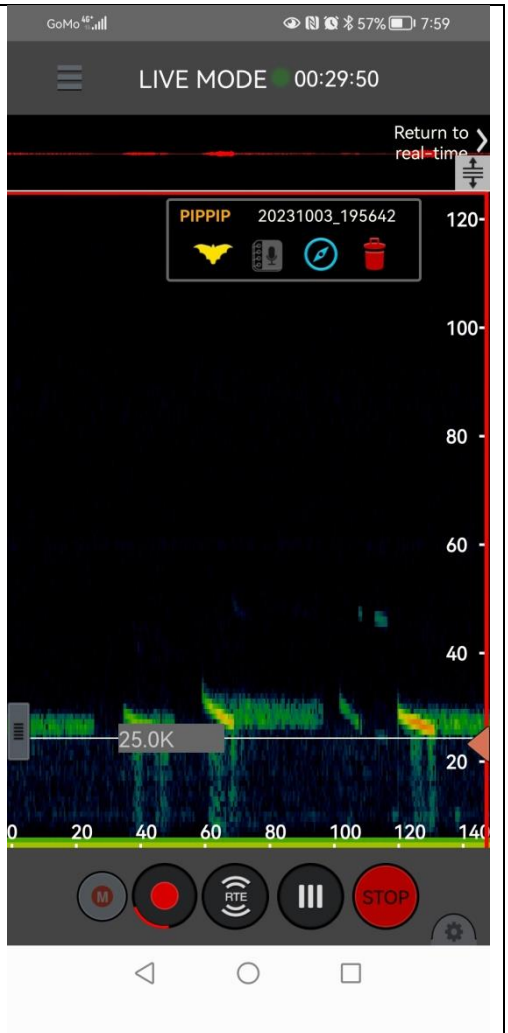

Figure 3.25. Sonogram of Leisler's bat.

3.1.7.3 Otter

A national survey of otters in Ireland (Bailey (2006)) surveyed 37 sites within the Eastern River Basin District, of which 22 (59.46%) recorded the presence of otter, the lowest rate in the country. A more recent survey published in 2013 (Reid, *et al.* (2013)) did not include the River Liffey.

The Dublin Otter Survey (Macklin *et al.* (2019)) surveyed the River Liffey, downstream of the M50 at Waterstown Park (Palmerstown), through Chapelizod, Islandbridge and Dublin City centre as far as the East Link Toll Bridge (Tom Clarke Bridge) at Ringsend. This survey noted that Otter signs were poorly distributed along the survey sections of the study area, with several extended reaches of channel failing to record any signs of Otter. This survey did not include Lucan but there are records of Otter both downstream and from upstream in Lucan Demesne.

Otter was confirmed from within the environs of the boardwalk site by Doherty (2021) during the Assessment for Lucan Public Realm Liffey Promenade & Demesne Park Entrance who noted;

'An otter spraint was observed at the opening of the Tobermaclugg Stream a short distance upstream of its confluence with the Liffey during a field visit to the site in April 2021'.

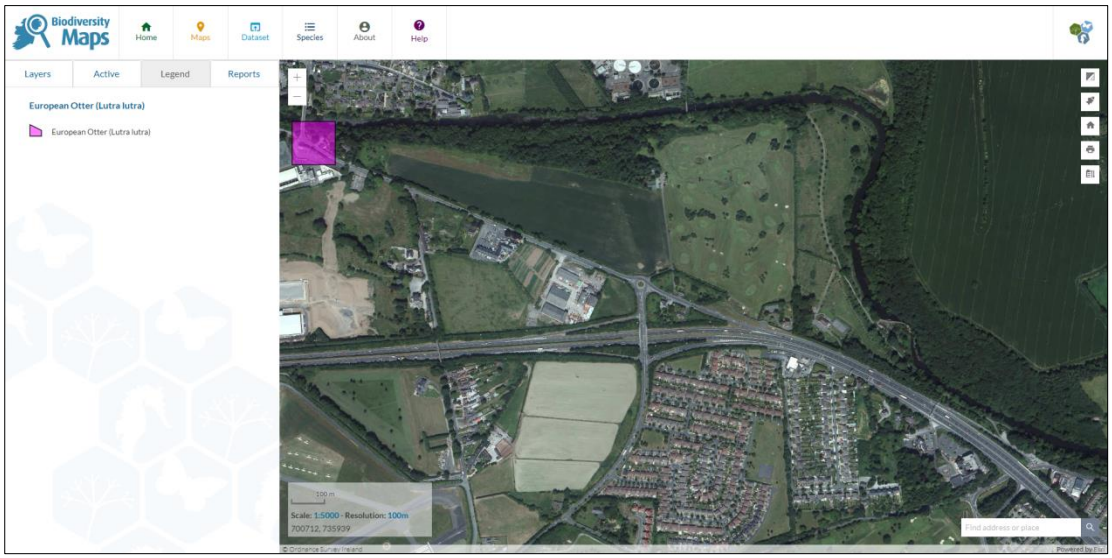

Figure 3.26. Otter records from Lucan (NBDC).

As a species Otter require undisturbed sections of river with good water quality and abundant availability of prey with secluded areas and 'cover' in which to hunt, rest and breed.

The 2019 survey noted that 'Both banks of the Liffey featured relatively high (sometimes very high) levels of human disturbance in terms of human activity, modified land use and or a lack of otter seclusion. In the middle survey reaches, most otter signs were associated with instream islands, away from direct human disturbance pressures'.

The section of the river adjoining the woodland where the boardwalk is proposed for has large amounts of both human and canine activity all of which reduce it's favourable condition for Otter. Furthermore there is a lack of riparian woodland in much of this area which would help to provide cover for Otter as well as non-native invasive species such as Himalayan balsam, which outcompete native vegetation and further reduce cover for Otter when they die back in the winter.

The presence of otter was confirmed during the site visit on 3rd October 2023 when a spraint was noted on a stone at the river margin near the proposed boardwalk development.

3.1.7.4 Other Mammals

There are no records of Pine marten (*Martes martes*) from Lucan Demesne at present but there are both live sightings and road kill records of this species from both upstream and downstream of Lucan held by the National Biodiversity Data Centre (see **Figure 3.27**) so the species is present within the Liffey Valley.

The NBDC holds records of Sika deer (*Cervus nippon*) from the Liffey Valley, while further downstream Fallow deer (*Dama dama*) are present as shown on **Figure 3.28**

below. The most recent study completed by Morera-Pujol, *et al.* (2023) also has records of both species from the Liffey Valley.

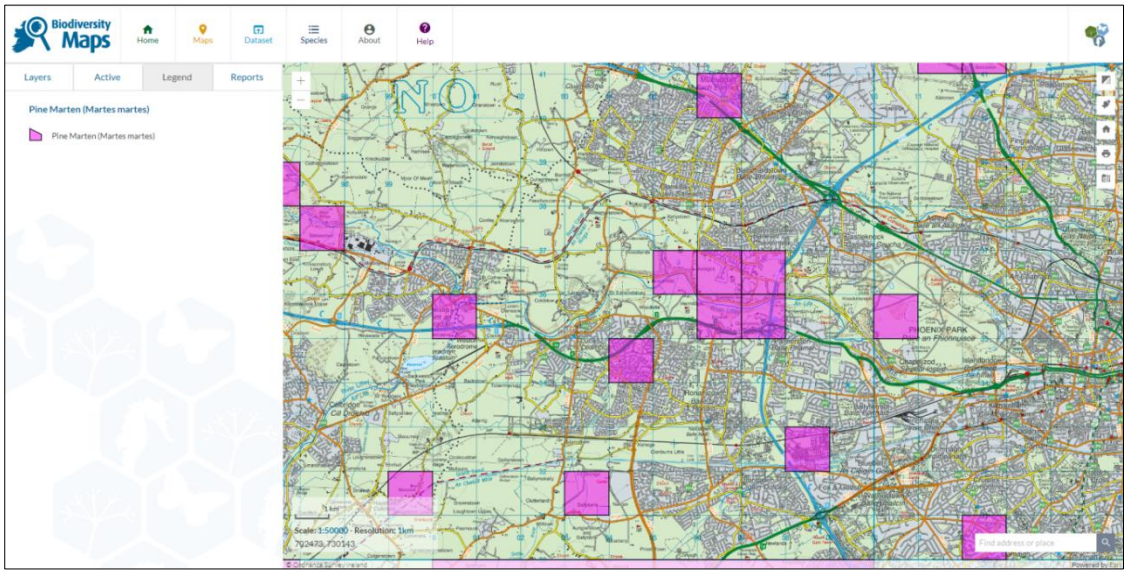

Figure 3.27. Pine marten records from the Liffey Valley (Source: NBDC).

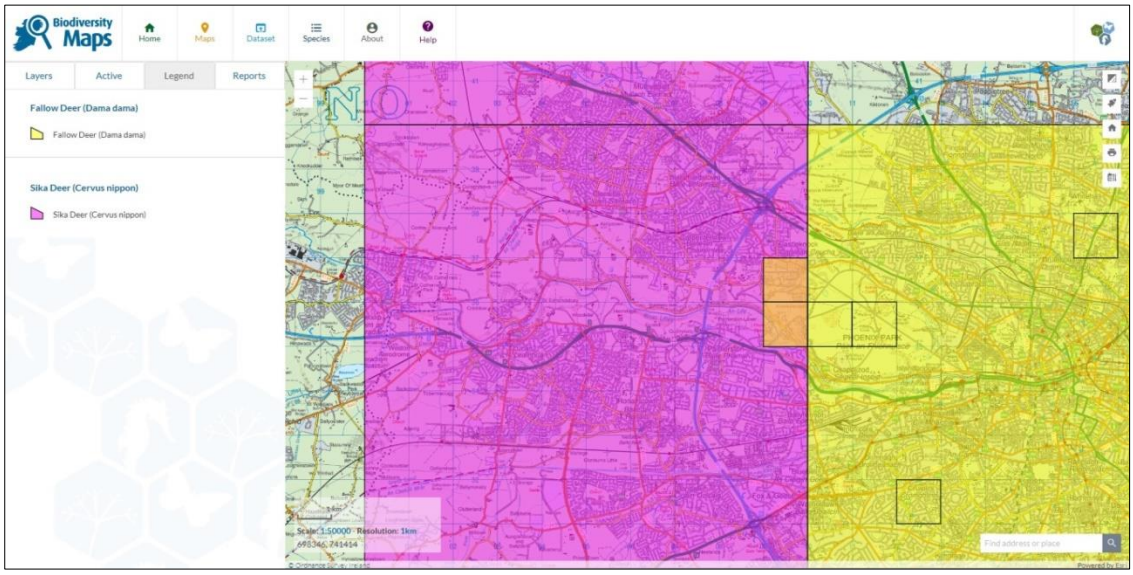

Figure 3.28. Deer records from the Liffey Valley (Source: NBDC).

A fox (*Vulpes vulpes*) was both seen and heard during the site visits.

Other common fauna that would be expected include brown rat (*Rattus norvegicus*), long tailed field mouse (*Apodemus sylvaticus*), house mouse (*Mus musculus*), hedgehog (*Erinaceus europaeus*), and pygmy shrew (*Sorex minutus*). Irish stoat (*Mustela erminea hibernica*) may also occur.

The non-native and invasive grey squirrel (*Sciurus carolinensis*) is also frequent in the Liffey Valley as is American mink (*Mustela vison*).

3.1.7.5 Birds

The bird fauna recorded was rich and a good variety of species associated with woodland and scrub were recorded. Species recorded include blackbird, robin, goldfinch, wren, blue tit, song thrush, bullfinch, chaffinch, starling, woodpigeon, dunnock, jackdaw, and greenfinch.

Corvid species recorded include; rook, magpie, hooded crow and jackdaw.

Birds of prey such as buzzard and sparrowhawk have been confirmed using the general area and summer visitors, such as willow warbler and swallow may occur.

Species such as redwing and fieldfare may visit during the winter months.

Waterbirds associated with the River Liffey include Mallard, Grey heron, Cormorant and Kingfisher (see below).

Kingfisher

Kingfisher have been recorded regularly on this section of the River Liffey including as recently as 23/02/2023 from Lucan Demesne. Kingfishers require an undisturbed river in which to breed, roost and hunt, as well as excellent water quality.

3.1.7.6 Amphibians

There are no ponds or other suitable water features within the red line boundary of the site that could support breeding frogs and newts – these species require areas of standing water as opposed to areas of flowing water.

3.1.7.7 Fisheries

Eleven fish species have been recorded in total from surveys conducted by Inland Fisheries Ireland of the River Liffey. These are: Brown trout, Three-spined stickleback, Minnow, Stone loach, Eel, Lamprey, Salmon, Pike, Perch, Roach, and Gudgeon (Donovan et al. (2022)).

The River Liffey is a highly modified watercourse which has been subject to anthropogenic influences for many hundreds of years. These include the development of mills with associated weirs all of which pose a barrier to fish migration.

Donovan et al. (2022) note;

'Individually, the barriers were generally found to be major impediments to fish passage. This sequence of barriers presents a challenge for species movement, which becomes cumulatively harder as biota move through the system. Considered together as a complex, they completely block migratory fish species from accessing most of the river and degrade/impound the habitat they need to complete their life cycles. Interventions are now required to improve the Liffey's fish community. The easing of fish passage at the structures outlined in this report will help migratory species such as salmon, sea trout, eel, and lamprey spp. to freely utilize upstream environments. Consequently, this will improve the fish community status as

required under the WFD and return iconic fish species to places where they have become absent'.

Their study examined the barriers to fish migration along the Liffey as part of the study. The proposed development site is located between two weirs – the Lucan Weir and the Lucan West Weir.

The closest of these to the boardwalk is the Lucan West Weir, which is just upstream and is described as follows:

'Lucan West Weir
This weir is 1.49km upstream from Lucan Weir, and 12.96km upstream from the tidal limit at Island Bridge. It is located just north of the N4, on the border between the townlands of Lucan Demesne and Coldblow. The structure was built in the late 18th century and is constructed from pre-cast concrete and limestone masonry'.

This weir was assessed as impassable to most species as shown on **Figure 3.29** below.

Table 8: Final Passability Assessment for Lucan West Weir

		UPSTREAM MIGRATION				DOWSTREAM MIGRATION			
		No barrier 1	Partial barrier Low impact 0.6	Partial barrier High impact 0.3	Complete barrier 0.0	No barrier 1	Partial barrier Low impact 0.6	Partial barrier High impact 0.3	Complete barrier 0.0
Adult Salmon (AS)	current conditions			✗		✗			
	high flows			✗		✗			
Adult Trout (AT)	current conditions			✗		✗			
	high flows			✗		✗			
Cyprinids (C)	current conditions				✗	✗			
	high flows				✗	✗			
Adult Lamprey (AL)	current conditions				✗				
	high flows				✗				
Juvenile Eel (JE)	current conditions				✗				
	high flows				✗				
Juvenile Salmonids (JS)	current conditions				✗	✗			
	high flows				✗	✗			
Juvenile Lamprey (JL)	current conditions					✗			
	high flows					✗			
Adult Eel (AE)	current conditions					✗			
	high flows					✗			

Figure 3.29. Passability Assessment for Lucan West Weir (Donovan *et al.* 2022).

3.2 Description of European Sites

In line with the European Commission Methodological Guidance (EC (2001) and EC (2021)) and the DoEHLG Guidance (DoEHLG (2010)) a review of all European sites that could be potentially affected by the proposed project was made using the NPWS online map viewer. These included any European sites within or adjacent to the land at Lucan and any European sites within the likely zone of impact of the proposed development (using the source – pathway – receptor criteria) including any downstream. These are summarised in **Table 3.2.1** below and shown on **Figure 3.30**.

In addition to the identified European sites consideration was also given to relevant species listed under Annexes I and II and IV of the Birds and Habitats Directives respectively.

The lands at Lucan are not currently designated for any nature conservation purposes at either National or International level.

Three European sites have been identified. These are all Special Areas of Conservation (SACs) as follows:

- 001398 Rye Water Valley/Carton SAC
- 001209 Glenasmole Valley SAC
- 002122 Wicklow Mountains SAC

Hydrological Links to Natura 2000 sites:
There are no Natura 2000 sites located either within or directly adjacent to the proposed development lands at Lucan. The most relevant of the protected sites are the European Sites downstream in Dublin Bay as they are hydrologically connected to the site via the River Liffey but they are excluded on account of distance and the nature of the development.

3.3 Appropriate Assessment

A report for Screening for Appropriate Assessment was prepared to accompany this report.

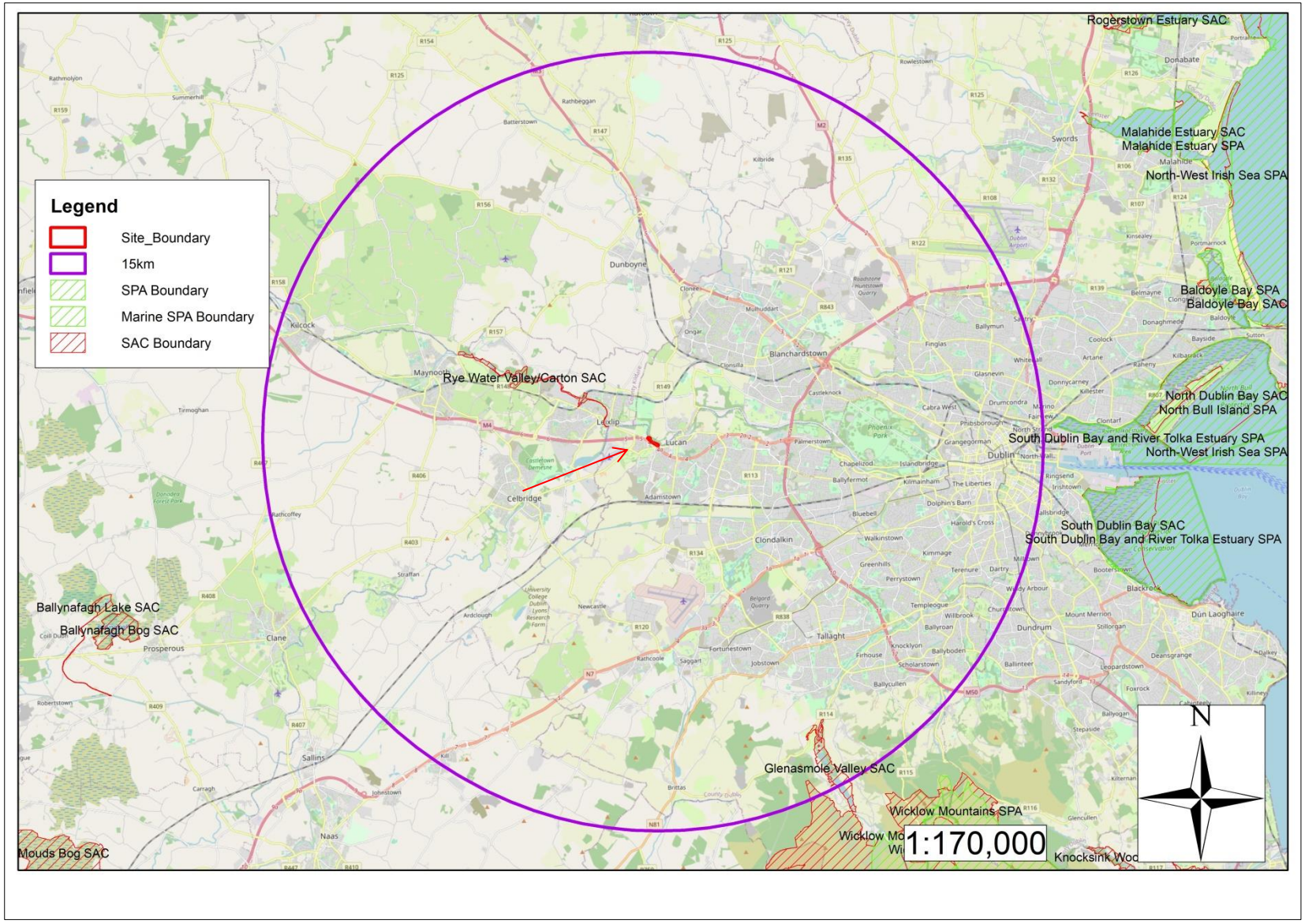

Figure 3.30. Identified sites of international conservation importance. Lucan Demesne is indicated by the red arrow.

Table 3.2.1. Designated European Sites of relevance to the proposed development at Lucan Demesne.

Site Code	Site Name and Designation	Approximate distance from Lucan Demesne	Qualifying Interest and Conservation Objectives	Discussion of Source-Pathway-Receptor Link/Potential for Likely Significant Effects
001398	Rye Water Valley/Carton SAC	2.1km NW and upstream	Source: NPWS (2021) Conservation Objectives: Rye Water Valley/Carton SAC 001398. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage. Accessed 8th May 2024. To maintain the favourable conservation condition of the Annex I habitats and species for which the SAC has been selected: • Petrifying springs with tufa formation (Cratoneurion) [7220] • Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] • Vertigo moulinsiana (Desmoulin's Whorl Snail) [1016]	The surface waters (i.e. the run-off from the site) currently discharge to the River Liffey which forms a Source-Pathway-Receptor Link between the proposed development and this European Site which is upstream of Lucan Demesne. The QI of the Rye Water Valley/Carton SAC are the tufa springs and the *Vertigo* snails associated with them which would not be impacted by any discharges from the site which would be carried downstream. Therefore there is no possibility of any likely significant effects and there is no reasonable scientific doubt in relation to this conclusion.
001209	Glenasmole Valley SAC	12.3km SE	Source: NPWS (2021) Conservation Objectives: Glenasmole Valley SAC 001209. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage. Accessed 8th May 2024. To maintain the favourable conservation condition of the Annex I habitats for which the SAC has been selected: • (6210) Semi-natural dry grasslands and scrubland facies on calcareous substrates	There is no direct or in-direct Source-Pathway-Receptor link between this site and the proposed development. Therefore there is no possibility of any likely significant effects and there is no reasonable scientific doubt in relation to this conclusion.

Site Code	Site Name and Designation	Approximate distance from Lucan Demesne	Qualifying Interest and Conservation Objectives	Discussion of Source-Pathway-Receptor Link/Potential for Likely Significant Effects
			(*Festuco Brometalia*) (*important orchid sites) • (6410) *Molinia* meadows on calcareous, peaty or clavey-silt-laden soils (*Molinion caeruleae*) • (7220) Petrifying springs with tufa formation (*Cratoneurion*)	
002122	Wicklow Mountains SAC	14.3km SE	Source: NPWS (2017) Conservation Objectives: Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed 8th May 2024. To maintain the favourable conservation condition of the Annex I habitats for which the SAC has been selected: • (3130) Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoeto-Nanojuncetea* • (3160) Natural dystrophic lakes and ponds, • (4010) Northern Atlantic wet heaths with *Erica tetralix*, • (4030) European dry heaths, • (4060) Alpine and Boreal heaths, • (6230) Species-rich *Nardus* grasslands, on siliceous substrates in mountain areas, • (7130) Blanket bog (*active only), • (8110) Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*), • (8210) Calcareous rocky slopes with chasmophytic vegetation, • (8220) Siliceous rocky slopes with chasmophytic vegetation,	There is no direct or in-direct Source-Pathway-Receptor link between this site and the proposed development. Therefore there is no possibility of any likely significant effects and there is no reasonable scientific doubt in relation to this conclusion.

Site Code	Site Name and Designation	Approximate distance from Lucan Demesne	Qualifying Interest and Conservation Objectives	Discussion of Source-Pathway-Receptor Link/Potential for Likely Significant Effects
			• (9990) Blanket bog (not active), • (1355) Otter (*Lutra lutra*), • Peregrine falcon *(Falco peregrinus*), • Merlin (*Falco columbarius*)	

4. CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

This application relates to a proposed new pedestrian access within Lucan Demesne Park in Lucan, County Dublin. The new access will consist of a new raised boardwalk within the woodland at Lucan Demesne as shown on **Figures 4.1. 4.2** and **4.3** below.

The proposed development involves the construction of a timber boardwalk from the plaza to the existing river side path. The boardwalk comprises a largely wooden structure measuring approximately 120m in length, approximately 2.5m in width, and is elevated to variable degree depending on topography. The boardwalk proposed is made of timber predominantly, steel and stainless mesh. There will be railings on either side of the boardwalk to a height of 1.1m. The wood is treated to be weather durable and the wood itself is timber which is known for its highly variable properties. It is noted that part of the proposal involves the removal of invasive species.

The boardwalk proposed meanders between the existing car park and the existing path along the River Liffey and follows the route of an existing tarmacked pedestrian path. It is intended to have the boardwalk a predominant height of 0.15mm above the existing path but variable to spot topography. The proposal is set out in the landscape masterplan submitted by Cunnane Stratton Reynolds. The existing path will be removed and that original area will be allowed to revert to its original state. There will be a short area of no dig gravel at the end/start of the proposed boardwalk. The boardwalk will be sufficiently above the existing terrain to allow such regrowth occur, there will be slats within the boardwalk itself to allow natural sunlight penetrate and the board walk itself will be sufficiently narrow to allow regrowth.

The boardwalk will be suspended above the ground by a number of semi submerged pylons. These will typically be 1.5m long and will be submerged into the ground to a distance of 1m. The pylons are 400mm in diameter. There are no significant earthworks required, no significant excavations nor trenches or foundations. The boardwalk will not be lit.

It is anticipated that the board walk will be assembled on site over a period of 2 weeks and this is taken to be the construction period. It is not anticipated that there will be any heavy machinery deployed in the construction of the board walk.

The use of the boardwalk will be over the same periods of opening as the existing park. Opening hours will not be extended to accommodate any additional use of the proposed park visitor amenities.

A benefit of the proposed boardwalk is that users will not be able to stray off the board walk in the manner that they would be able to stray off the existing tarmacadam path.

The boardwalk itself does not in any way stray closer to the river than the existing tarmac path and certainly does not reach or overhang the river.

During construction the digging will be done by hand and the equivalent of buggies and parks maintenance vehicles.

The current access to the Liffey Valley Park consists of a steep tarmac path from the carpark to the riverside pathway. The proposal will improve access for the less mobile and will greatly enhance appreciation of this part of the wider park. It is possible that as a result of the proposed development that numbers of visitors will increase but the proposed boardwalk and its guard rails will significantly deter members wandering through undergrowth in a manner that the existing path would not.

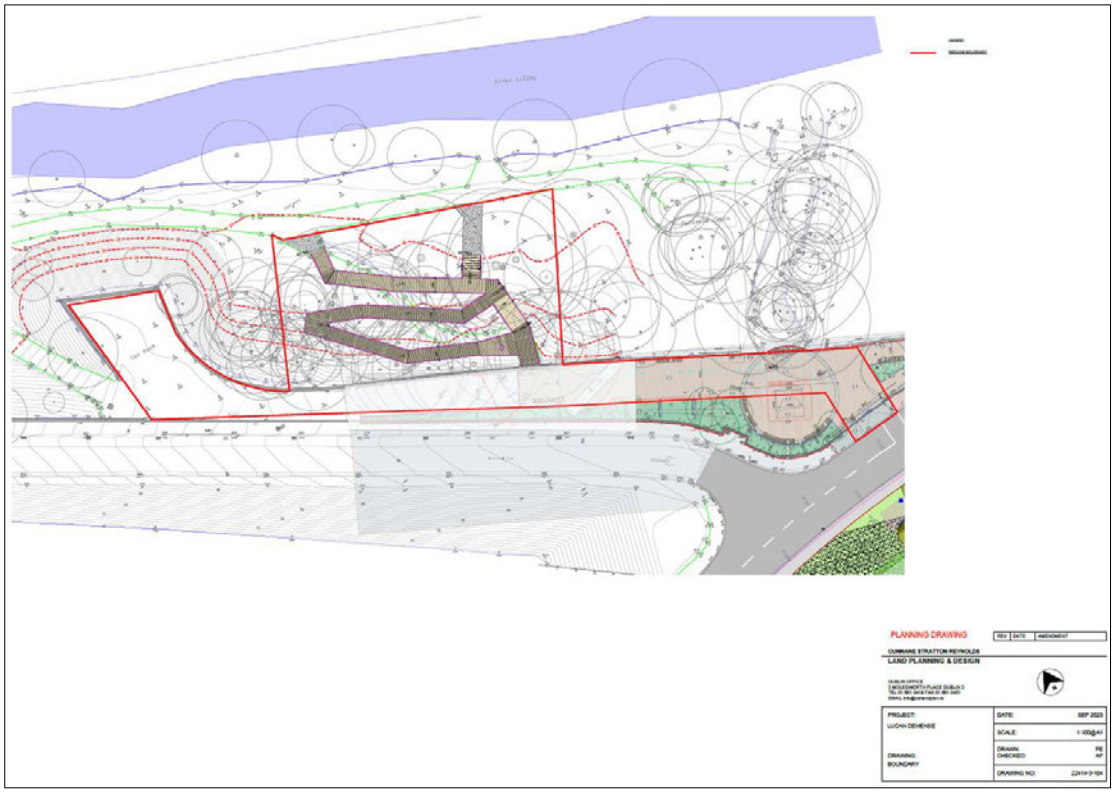

Figure 4.1. Proposed new access at Lucan Demesne – the site boundary is shown in red.

No trees are proposed to be removed as part of the proposed development. No construction vehicles will enter the application site, and digging for pylons will be undertaken by hand.

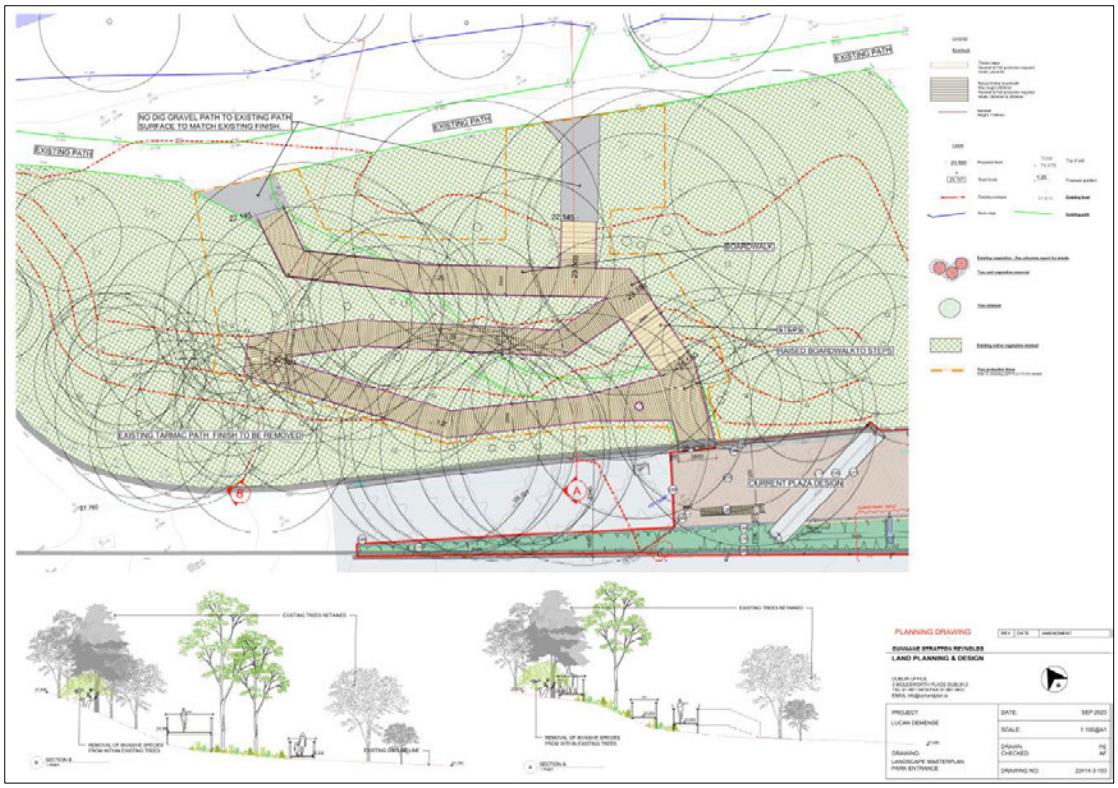

Figure 4.2 Boardwalk design.

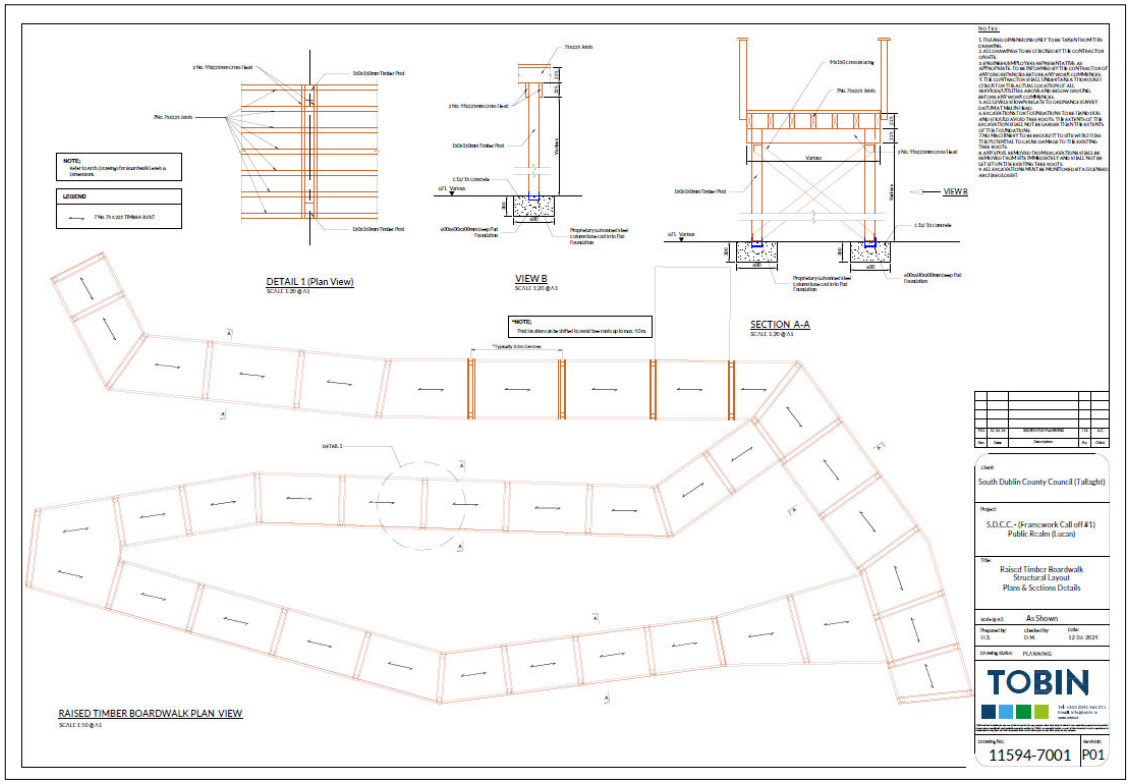

Figure 4.3. Boardwalk design.

5. POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

Potential impacts on flora and fauna arise during both the Construction and Operational Phases of the proposed development.

The activities associated with the proposed development that has the potential to affect the ecology of the site and surrounding area during the construction phase include:

- Direct Habitat Loss;
- Disturbance;
- Potential for the Introduction of Invasive Species;
- Fragmentation;
- Potential Water Pollution.

The development of the new boardwalk and access at Lucan Demesne once operational will result in:

- Permanent loss of habitat;
- Increased pressure on trees within the woodland area which will not be allowed to naturally age and decay as health and safety risks will come into play;
- Increased visitor pressures on Lucan Demesne;
- Increased disturbance to the fauna of the River Liffey;
- Lighting impacts if the boardwalk is lit.

5.1 Potential Impacts on Habitats

Potential impacts on habitats arise during both the construction and operational phase.

Construction Phase:

As detailed in the arboricultural impact assessment the proposed development will impact on the root zone of the trees in this area but will not require the removal of any individual trees.

The other potential impacts during the construction phase arise from the risk of damage to areas of retained vegetation and habitats within the environs of the site. These include other mature trees and the bankside vegetation of the River Liffey.

The populations of Ivy broomrape could directly impacted by the works, but could also be impacted if their host plant (Ivy) is removed.

There is potential for the introduction and spread of invasive species within the site during the works.

The physical disturbance of the soil within the site during the works will result in the potential for silt laden run-off from soil disturbance on the site to the adjoining River Liffey unless some remedial measures are put in place.

There is also some potential for leaks of oil and petrol from machinery and equipment used on site to enter the River Liffey via this pathway.

Operational Phase:
During the operational phase of the development there is potential for increased disturbance to habitats along the River Liffey arising from increased use, trampling, etc. with subsequent impacts on flora and habitat. There is also potential for increased littering in the River Liffey valley. As access is improved pressures to light these areas will be increased.

5.2 Potential Impacts on Fauna

Potential impacts on species arise during both the construction and operational phase. There are potential impacts on bats and otter, both of which are a legally protected species as well as on other fauna associated with the River Liffey and occurring in Lucan Demesne arising from the development of this site.

5.2.1 Bats

The potential impacts on bats arising from the development of the site include:

- Potential barrier to bat activity on the site from increased lighting emitting from the N4 and adjoining areas should canopy cover be reduced.
- Loss of foraging areas along the River Liffey for bats (6 species have been recorded on the site) should this area be disturbed.
- Loss of foraging areas along the River Liffey if water quality is impacted as this impacts their invertebrate prey.
- Loss of potential roosts in trees as they age should they be removed to protect the structure in the future.
- Injury/death during any tree removal.
- The use of non-native species in landscaping proposals which don't support their invertebrate prey.

5.2.2 Otter

The potential impacts on otter arising from the development of the site include:

- Potential barrier to otter movements on the River Liffey from increased lighting emitting from the N4 and adjoining areas should canopy cover be reduced.
- Loss of foraging areas along the River Liffey for otter arising from increased human activity and use of the park.
- Loss of foraging areas along the River Liffey if water quality is impacted as this impacts otter prey.
- Increased disturbance to otters utilising the River Liffey from dogs.
- Risk of injury or death of otters from dogs.
- Increased littering in the River Liffey valley.

There is potential for the loss of foraging areas, commuting routes and resting sites for bats which use the River Liffey as lighting from the adjoining N4 slipway may reach the river should the canopy cover in this area be reduced. Lighting could also interfere with the movement of bats and other fauna through the site.

During the operational phase of the development there is potential for increased disturbance to protected species using the River Liffey including bats and otter as well as trampling and other impacts on flora and habitat.

6. A DO NOTHING SCENARIO

Under a 'do-nothing' scenario the existing access path to the park would remain in it's current state and would not be upgraded/developed.

7. REMEDIAL OR REDUCTIVE MEASURES

7.1 Mitigation by Avoidance

The principal mitigation that should be considered in any development is avoidance of impact. As part of the design process three options for the new boardwalk were considered and two of these (Options B and C) were ruled out from a biodiversity perspective on account of loss of trees and impact on habitat

The final Option for the proposed boardwalk (Option A) has been designed to ensure that there is no direct loss of trees arising from it's construction. All trees will be retained and measures to protect the root zone of the trees during the works are set out in the arboricultural impact assessment and are summarised below.

7.2 Tree and Vegetation Protection

Some of the trees may require pruning in advance of the works and this pruning work should be performed prior to project commencement, by reputable contractors in accordance with BS 3998:2010 and current best practice.

Protective fencing will be erected in advance of any construction works commencing outside the drip-line of the canopy of retained trees and vegetation near the entrance to Lucan Demesne in order to prevent damage by machinery, compaction of soil, etc. in accordance with BS 5837:2012. This will be signed off on by a qualified arborist or ecologist to ensure it has been erected properly before any machinery is allowed on site. No ground clearance, earth moving, stock-piling or machinery movement will occur within these protected areas.

A proposal method statement for the use of specialist protective ground mats in proposed area of work / traffic shall be submitted for review by the project arborist / landscape architect prior to commencement. Depending on the construction plan it may be possible to relocate mats on an ongoing basis to follow the work activity.

The proposed excavation of ground for post foundations shall be undertaken by hand and monitored by an arborist / landscape architect to ensure significant structural roots are not severed and root loss is kept to a negligible level. The location of post foundations may have to be adjusted on site if significant conflict with roots positions arise.

It is critical that the excavation area is limited to the minimum required footprint. The size of the individual excavations for each post shall be 400mm square by 1.2m deep or 600mm square by 300mm deep, and shall have a level of flexibility in location in order to avoid significant structural tree roots if present.

7.3 Protection Measures for Birds

Section 40 of the Wildlife Act 1976, as amended by Section 46 of the Wildlife (Amendment) Act 2000, restricts the cutting, grubbing, burning or destruction by

other means of vegetation growing on uncultivated land or in hedges or ditches during the nesting and breeding season for birds and wildlife, from 1 March to 31 August. **No clearance of vegetation suitable for nesting birds within the site (shrubs, bramble tangles, etc.) will take place during this period. Should such clearance be required than the area proposed for clearance should be inspected by an ecologist to ascertain if any nesting birds are present.**

The boardwalk will be fenced on either side to keep people and dogs to it and reduce trampling of vegetation and disturbance of birds in this area.

7.4 Protection Measures for Woodland Flora

The boardwalk will be fenced on either side to keep people and dogs on it and to reduce trampling of vegetation in this area.

There will be no clearance of ivy from within the woodland as this is the host plant for Ivy broomrape which is found in the environs of the works.

7.5 Protection Measures for Bats – Trees

Should the proposed development require the removal of any trees in the future these must be assessed by a bat specialist who will advise on whether they are suitable for roosting bats. This will determine if a bat derogation licence is required and how they should be felled or removed.

7.6 Provision of Roosting and Nesting Opportunities

Nesting and roosting opportunities will be provided for both bats and birds within the site. These will include the provision of a bat and dipper box under the pedestrian bridge over the Tobermaclugg Stream.

Provision of Bat Boxes

In order to provide roosting locations for bats within the park a number of bat boxes will be provided. These will be specified by the ecologist and installed by the contractor under ecological supervision to ensure they are correctly sited.

It is also proposed to modify the existing information shelter at the park entrance to provide roosting opportunity for bats within this structure. This will be designed by the bat specialist in collaboration with the project architect, the design team and contractor and installed under their supervision.

Provision of Bird Boxes

In line with best practice it is recommended that a series of bird nesting boxes are provided within the park. These will be specified by the ecologist and installed by the contractor under ecological supervision to ensure they are correctly sited.

7.7 Protection Measures for Bat Foraging Habitat

The measures set out under **Section 7.2** will also protect bat foraging habitat. Areas of natural vegetation support large numbers of invertebrates on which both bats and birds rely for feeding and foraging and also provide cover and shelter for a variety of species.

7.8 Lighting Design

Many species of bats and other mammals such as otter are sensitive to lighting and will avoid areas which are illuminated. **There will be no lighting of the proposed boardwalk access route.**

7.9 Planting of Native Species

The restoration of native species along the riparian corridor of the River Liffey is required to provide cover for fauna using the river. Suitable species include Alder, Willows, Birch and oak. The slopes of the N4 embankment should be planted with native shrub species such as hawthorn, blackthorn, spindle, Wych elm, holly, hazel, or guelder rose. The species used will be native and of local origin, certified stock is available from nurseries who supply stock for the Native Woodland Scheme.

7.10 Sediment Control

Sediment control practices are used on building sites to prevent sand, soil, cement and other building materials from reaching waterways and water dependent habitats such as the adjoining drainage ditches, reedbeds and saltmarshes. Even a small amount of pollution from a site can cause significant environmental damage by killing aquatic life, silting up streams and blocking storm water pipes. Storm water can contain many pollutants which can enter our local drainage ditches, streams, rivers and marine systems, causing harm to native animals, plants, fish breeding habitats and recreational areas.

Soil erosion, sediment and litter from building sites can be major sources of storm water pollution, and can cause:

- significant harm to the environment e.g. loss of valuable foraging areas in adjoining mudflats for wintering birds
- weed infestation of waterways caused by sediment settling on the creek beds and transporting nutrients
- loss of valuable topsoil
- significant public safety problems when washed onto roads and intersections
- blocked drains creating flooding and increased maintenance costs
- damage to recreational and commercial fishing.

Sediment control usually requires little effort and results in:

- Cleaner waterways and healthier aquatic life.
- Improved site conditions.
- Improved wet weather working conditions.
- Reduced wet weather construction delays.
- Reduced losses from material stockpiles.
- Fewer mud and dust problems.

Good site management in relation to sediment control during the construction phase should prevent this from occurring and an appropriate plan for same must be developed and implemented on site by the contractor.

7.11 Contractor Briefing

All site contractors should be briefed regarding the biodiversity value of the retained trees and vegetation and the adjoining River Liffey to ensure that there are no accidental or unintentional actions conducted during the project construction that could lead to a reduction in water quality/damage to same. Such matters often arise through ignorance or by accident rather than as a result of an intentional action.

7.12 Invasive Species

Should earth or other material be brought to site this material should be screened to confirm that no invasive species such as Japanese knotweed or other species as described on http://www.invasivespeciesireland.com/ are present. All machinery and plant entering the site should be cleaned to ensure that no fragments of Japanese knotweed or seeds of other invasive species are brought on to the site in line with the Birds and Natural Habitats Regulations 2011.

A programme of eradication and control of the invasive species noted in the park and on the banks of the River Liffey must be implemented.

7.13 Protection Measures for Fisheries and Water Quality

Various measures will be required to ensure that there is no deterioration in water quality in the River Liffey arising from the proposed development. These relate mainly to the control of silt and sediment runoff during construction.

If any excavations become waterlogged this must be removed and be discharged through a silt bag or similar to ensure no impacts on water quality in the River Liffey.

7.14 Protection Measures for Otter

The mitigation measures set out in **Section 7.10** which protect water quality and fisheries habitat also protect otters.

The issue of disturbance to otters from dogs and people will be addressed through the reduction of access to the River Liffey bank with fencing. This should be a post and sheep wire fence to prevent access to the bank.

Increased planting of native species and the provision of large trees or logs for otter to lie up under on the river bank will improve the suitability of the river corridor for otters.

7.15 Litter Removal

A regular clean up of dumped rubbish and waste in the River Liffey valley will be implemented.

7.16 Ecological Clerk of Works

An ecological clerk of works will be appointed to oversee and sign off on the various mitigation measures outlined in this report.

8. PREDICTED IMPACT OF THE PROPOSED DEVELOPMENT

The overall impact on flora and fauna from the proposed works within this site is deemed to be minor negative once the mitigation measures are implemented in full.

9. CONCLUSION

The proposed construction of a new boardwalk to ensure all ability access to Lucan Demesne has been assessed from the perspective of ecology and detailed mitigation measures have been presented to reduce impacts on same in the vicinity of the proposed development and surrounding lands.

This report recommends that the above mitigation measures be reflected in the final Erosion and Sediment Management Plan/Method Statements prepared for the site and for an ecologist to be engaged to review same prior to the commencement of the development.

10. REFERENCES

Anon. (1996). *Interpretation Manual of European Union Habitats.* Version EUR 15, European Commission, Brussels.

Bat Conservation Ireland (2024). Database containing records of Bat Roosts, Transects (Car Transect Monitoring Records) and Ad Hoc Observations.

Collins, J. Ed (2023). *Bat Surveys for Professional Ecologists - 4th Edition.* The Bat Conservation trust, London.

Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) 1982.

Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) 1979.

Council of the European Communities (1992). *Council Directive of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (92/43/EEC).* O.J. L 206/35, 22 July 1992.

Council of the European Communities (1979). *Council Directive of 02 April 1979 on the conservation of wild birds (79/409/EEC).* O.J.L. 103, 25 April 1979.

Cunnane Statton Reynolds Limited (2024). *Environmental Impact Assessment Screening Report for Proposed Boardwalk at Lucan Demesne.*

Doherty, P. (2021). *Screening Statement for Appropriate Assessment for Lucan Public Realm Liffey Promenade & Demesne Park Entrance.* Unpublished report for South Dublin County Council.

Donovan, R., Coghlan, B., O'Briain, R., & O'Leary, C., (2022). *River Liffey WFD 111 Barrier Assessment – Obstacles to Fish Passage and Mitigation Options.* National Barriers Programme. Inland Fisheries Ireland. Citywest, Dublin.

European Commission (2021). *Assessment of plans and projects in relation to Natura 2000 sites – Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC 2021/C 437/01.* (Commission notice C/2021/6913. Dated 28.10.2021).

Flora (Protection) Order (2022). Government of Ireland.

Fossitt, J. (2000). *A Guide to Habitats in Ireland.* Heritage Council, Kilkenny.

Gilbert G., Stanbury, A. and Lewis L.J. (2021). *Birds of Conservation Concern in Ireland 2020 –2026.* Irish Birds 43, 1-22.

Hayden, T. & R. Harrington (2000). *Exploring Irish mammals*. Dúchas. Town House, Dublin.

Inland Fisheries Ireland (2020). *Planning For Watercourses In The Urban Environment. A Guide to the Protection of Watercourses through the use of Buffer Zones, Sustainable Drainage Systems, Instream Rehabilitation, Climate / Flood Risk and Recreational Planning *Including one-off developments.* A Guideline Developed by Inland Fisheries Ireland.

Kelly, F.L., Matson, R., Connor, L., Feeney, R., Morrissey, E., Wogerbauer, C. and Rocks, K. (2012). *Water Framework Directive Fish Stock Survey of Rivers in the Eastern River Basin District.* Inland Fisheries Ireland, Swords Business Campus, Swords, Co. Dublin, Ireland.

King, J.L., Marnell, F., Kingston, N., Rosell, R., Boylan, P., Caffrey, J.M., FitzPatrick, Ú., Gargan, P.G., Kelly, F.L., O'Grady, M.F., Poole, R., Roche, W.K. & Cassidy, D. (2011). *Ireland Red List No. 5: Amphibians, Reptiles & Freshwater Fish.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

McAney, K. (2006). *A Conservation Plan for Irish Vesper Bats.* Irish Wildlife Manuals, No. 20. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

Macklin, R., Brazier, B. & Sleeman, P. (2019). *Dublin City Otter Survey.* Report prepared by Triturus Environmental Ltd. for Dublin City Council as an action of the Dublin City Biodiversity Action Plan 2015-2020.

Marnell, F., Looney, D. & Lawton, C. (2019). *Ireland Red List No. 12: Terrestrial Mammals*. National Parks and Wildlife Service, Department of the Culture, Heritage and the Gaeltacht, Dublin, Ireland.

Natura 2000 Sites - Site Synopsis. Available online at www.npws.ie

National Parks and Wildlife Service Online Database. Available online at www.npws.ie

Parnell, J. & T.G. Curtis. (1996). *Webb's An Irish Flora.* Cork University Press.

Ramao, C. (2003). *Interpretation Manual of the European Union Habitats Version Eur 25.* European Commission DG Environment Nature and Biodiversity. Brussels.

Reason, P.F. & Wray, S. (2023). *UK Bat Mitigation Guidelines: a guide to impact assessment, mitigation and compensation for developments affecting bats.* Version 1.1. Chartered Institute of Ecology and Environmental Management, Ampfield.

Regan, E.C., Nelson, B., Aldwell, B., Bertrand, C., Bond, K., Harding, J., Nash, D., Nixon, D., & Wilson, C.J. (2010). *Ireland Red List No. 4 Butterflies.* National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Ireland.

Reid, N., Hayden, B., Lundy, M.G., Pietravalle, S., McDonald, R.A. & Montgomery, W.I. (2013). *National Otter Survey of Ireland 2010/12.* Irish Wildlife Manuals No.

76. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

Scannell, M.J.P. and Synnott, D.M. (1987). *Census Catalogue of the Flora of Ireland – Clár de Phlandaí na hÉireann.* The Stationary Office, Dublin.

S.I. No. 477 of 2011. *The European Communities (Birds and Natural Habitats) Regulations 2011.* Irish Government, Government Publications Office, Molesworth Street, Dublin 2.

S.I. No. 293 of 2021. *The European Communities (Birds and Natural Habitats) Regulations 2011-2021.* Irish Government, Government Publications Office, Molesworth Street, Dublin 2.

TII (2006). *Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes.*

TII (2006). *Guidelines for the treatment of otters prior to the construction of National Road Schemes.*

TII (2009). *Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes.*

TII, (2010). *Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads.*

Tobin Consulting Engineers (2024). *South Dublin County Council. Lucan Public Realm - Lucan, Co. Dublin. Flood Risk Assessment.*

Tobin Consulting Engineers (2024). *Preliminary Construction Erosion and Sediment Control Plan for Lucan Demesne.*

Wildlife Act, 1976 including all other amendments 1976–2010 Number 39 of 1976 and Number 38 of 2000. Dublin: Office of the Attorney General. Wildlife (Amendment) Act (2000). Government of Ireland.

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

11. APPENDIX 1. RECORDS HELD BY THE NATIONAL BIODIVERSITY DATA CENTRE FROM O0235.

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
bird	Black-headed Gull (Larus ridibundus)	1	22/10/2020	Birds of Ireland	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
bird	Bohemian Waxwing (Bombycilla garrulus)	1	08/12/2017	Birds of Ireland	
bird	Common Kingfisher (Alcedo atthis)	3	23/02/2023	Birds of Ireland	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive || Protected Species: EU Birds Directive >> Annex I Bird Species || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Common Wood Pigeon (Columba palumbus)	2	22/10/2020	Birds of Ireland	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive || Protected Species: EU Birds Directive >> Annex II, Section I Bird Species || Protected Species: EU Birds Directive >> Annex III, Section I Bird Species
bird	Eurasian Jay (Garrulus glandarius)	1	23/02/2023	Birds of Ireland	
bird	Eurasian Sparrowhawk (Accipiter nisus)	1	16/10/2012	Birds of Ireland	

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
bird	Great Cormorant (Phalacrocorax carbo)	1	16/10/2012	Birds of Ireland	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Grey Heron (Ardea cinerea)	3	23/02/2023	Birds of Ireland	
bird	Grey Wagtail (Motacilla cinerea)	1	05/09/2018	Birds of Ireland	
bird	Hooded Crow (Corvus cornix)	2	22/10/2020	Birds of Ireland	
bird	Mallard (Anas platyrhynchos)	3	23/02/2023	Birds of Ireland	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive || Protected Species: EU Birds Directive >> Annex II, Section I Bird Species || Protected Species: EU Birds Directive >> Annex III, Section I Bird Species
bird	Rock Pigeon (Columba livia)	1	22/10/2020	Birds of Ireland	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive || Protected Species: EU Birds Directive >> Annex II, Section I Bird Species
bird	Winter Wren (Troglodytes troglodytes)	1	23/02/2023	Birds of Ireland	
conifer	Douglas Fir (Pseudotsuga menziesii)	1	02/09/2005	Species Data from the National Vegetation Database	Invasive Species: Invasive Species || Invasive Species: Invasive Species >> Medium Impact Invasive Species
conifer	Norway Spruce (Picea abies)	1	02/09/2005	Species Data from the National Vegetation Database	
conifer	Yew (Taxus baccata)	1	02/09/2005	Species Data from the National Vegetation Database	

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
fern	Broad Buckler-fern (Dryopteris dilatata)	2	14/01/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
fern	Hart's-tongue (Phyllitis scolopendrium)	4	09/04/2022	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
fern	Male-fern (Dryopteris filix-mas)	1	02/09/2005	Species Data from the National Vegetation Database	
fern	Scaly Male-fern (Dryopteris affinis)	1	02/09/2005	Species Data from the National Vegetation Database	
fern	Soft Shield-fern (Polystichum setiferum)	3	14/01/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Alder (Alnus glutinosa)	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Arctium minus agg.	1	10/07/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Arrowhead (Sagittaria sagittifolia)	2	20/07/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Ash (Fraxinus excelsior)	2	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Barren Strawberry (Potentilla sterilis)	1	13/07/2017	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Beech (Fagus sylvatica)	3	14/01/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Bittersweet (Solanum dulcamara)	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Blackthorn (Prunus spinosa)	1	02/09/2005	Species Data from the National Vegetation Database	

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
flowering plant	Blue Anemone (Anemone apennina)	1	10/03/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Bluebell (Hyacinthoides non-scripta)	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Bramble (Rubus fruticosus agg.)	3	09/04/2022	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Branched Bur-reed (Sparganium erectum)	2	10/07/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Broad-leaved Bamboo (Sasa palmata)	3	26/02/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Broad-leaved Helleborine (Epipactis helleborine)	1	23/07/2021	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Broad-leaved Osier (Salix viminalis x caprea = S. x smithiana)	1	04/09/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Broad-leaved Willowherb (Epilobium montanum)	2	05/09/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Bugle (Ajuga reptans)	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Bush Vetch (Vicia sepium)	1	05/09/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Butterbur (Petasites hybridus)	3	09/04/2022	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
flowering plant	Charlock (Sinapis arvensis)	1	10/03/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Cherry Laurel (Prunus laurocerasus)	2	14/01/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Invasive Species: Invasive Species || Invasive Species: Invasive Species >> High Impact Invasive Species
flowering plant	Cleavers (Galium aparine)	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Clustered Dock (Rumex conglomeratus)	2	15/07/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Cock's-foot (Dactylis glomerata)	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Coltsfoot (Tussilago farfara)	1	10/03/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Common Bird's-foot-trefoil (Lotus corniculatus)	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Common Comfrey (Symphytum officinale)	1	13/07/2017	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Common Dog-violet (Viola riviniana)	1	14/04/2021	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Common Figwort (Scrophularia nodosa)	2	11/06/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Common Knapweed (Centaurea nigra)	1	05/09/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Common Nettle (Urtica dioica)	1	02/09/2005	Species Data from the National Vegetation Database	

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
flowering plant	Common Poppy (Papaver rhoeas)	1	15/07/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Common Ragwort (Senecio jacobaea)	1	10/07/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Common Ramping-fumitory (Fumaria muralis)	1	10/03/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Cow Parsley (Anthriscus sylvestris)	1	12/05/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Crack-willow (Salix fragilis)	1	12/05/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Creeping Cinquefoil (Potentilla reptans)	2	21/07/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Creeping Thistle (Cirsium arvense)	1	10/07/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Curled Pondweed (Potamogeton crispus)	1	13/07/2017	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Dipsacus fullonum sensu lato	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Dog-rose (Rosa canina)	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Dog's-tooth-violet (Erythronium dens-canis)	2	10/03/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Dwarf Cherry (Prunus cerasus)	1	02/09/2005	Species Data from the National Vegetation Database	

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
flowering plant	Early Dog-violet (Viola reichenbachiana)	4	21/03/2021	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Elder (Sambucus nigra)	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Enchanter's-nightshade (Circaea lutetiana)	2	21/07/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	English Elm (Ulmus procera)	2	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	False-brome (Brachypodium sylvaticum)	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Feverfew (Tanacetum parthenium)	1	10/07/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Field Forget-me-not (Myosotis arvensis)	1	05/09/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Field Maple (Acer campestre)	2	12/05/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Field-rose (Rosa arvensis)	2	11/06/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Flowering-rush (Butomus umbellatus)	4	10/07/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Fool's-water-cress (Apium nodiflorum)	2	20/07/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Garlic Mustard (Alliaria petiolata)	1	02/09/2005	Species Data from the National Vegetation Database	

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
flowering plant	Germander Speedwell (Veronica chamaedrys)	2	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Giant Hogweed (Heracleum mantegazzianum)	3	14/06/2021	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Invasive Species: Invasive Species || Invasive Species: Invasive Species >> High Impact Invasive Species || Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)
flowering plant	Great Willowherb (Epilobium hirsutum)	3	05/09/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Greater Plantain (Plantago major)	2	20/07/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Greater Stitchwort (Stellaria holostea)	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Green Figwort (Scrophularia umbrosa)	4	10/07/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Threatened Species: Endangered
flowering plant	Grey Poplar (Populus alba x tremula = P. x canescens)	2	11/06/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Ground-elder (Aegopodium podagraria)	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Ground-ivy (Glechoma hederacea)	2	08/04/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Groundsel (Senecio vulgaris)	1	05/09/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Guelder-rose (Viburnum opulus)	1	02/09/2005	Species Data from the National Vegetation Database	

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
flowering plant	Hairy Bitter-cress (Cardamine hirsuta)	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Hairy St John's-wort (Hypericum hirsutum)	5	11/06/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Threatened Species: Endangered
flowering plant	Hairy-brome (Bromopsis ramosa)	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Hawthorn (Crataegus monogyna)	2	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Hazel (Corylus avellana)	2	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Hedge Bindweed (Calystegia sepium)	1	05/09/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Hedge Woundwort (Stachys sylvatica)	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Hemlock Water-dropwort (Oenanthe crocata)	1	13/07/2017	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Hemp-agrimony (Eupatorium cannabinum)	3	05/09/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Herb-Robert (Geranium robertianum)	2	05/09/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Himalayan Honeysuckle (Leycesteria formosa)	1	10/11/2021	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Invasive Species: Invasive Species || Invasive Species: Invasive Species >> Medium Impact Invasive Species
flowering plant	Hogweed (Heracleum sphondylium)	2	05/09/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
flowering plant	Holly (Ilex aquifolium)	4	09/04/2022	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Honeysuckle (Lonicera periclymenum)	3	26/02/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Hornbeam (Carpinus betulus)	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Horse-chestnut (Aesculus hippocastanum)	3	14/01/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Hybrid Black-poplar (Populus nigra x deltoides = P. x canadensis)	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Indian Balsam (Impatiens glandulifera)	4	20/07/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Invasive Species: Invasive Species || Invasive Species: Invasive Species >> High Impact Invasive Species || Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)
flowering plant	Ivy (Hedera helix)	2	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Ivy Broomrape (Orobanche hederae)	2	14/01/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Keeled Garlic (Allium carinatum)	1	10/07/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Knotgrass (Polygonum aviculare)	1	05/09/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Lamiastrum galeobdolon subsp. montanum	2	08/04/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
flowering plant	Lesser Burdock (Arctium minus)	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Lesser Celandine (Ranunculus ficaria)	10	26/02/2024	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Lords-and-Ladies (Arum maculatum)	4	09/04/2022	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Marsh Ragwort (Senecio aquaticus)	3	20/07/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Marsh Thistle (Cirsium palustre)	1	05/09/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Marsh Woundwort (Stachys palustris)	1	13/07/2017	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Marsh Yellow-cress (Rorippa palustris)	3	10/07/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Meadow Buttercup (Ranunculus acris)	1	05/09/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Meadow Vetchling (Lathyrus pratensis)	1	11/06/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Meadowsweet (Filipendula ulmaria)	3	11/06/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Monkeyflower (Mimulus guttatus)	3	10/07/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
flowering plant	Musk-mallow (Malva moschata)	1	13/07/2023	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Nipplewort (Lapsana communis)	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Opium Poppy (Papaver somniferum)	1	15/07/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Opposite-leaved Golden-saxifrage (Chrysosplenium oppositifolium)	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Pedunculate Oak (Quercus robur)	2	12/05/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Pendulous Sedge (Carex pendula)	2	14/01/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Perforate St John's-wort (Hypericum perforatum)	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Pink Water-speedwell (Veronica catenata)	2	10/07/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Portugal Laurel (Prunus lusitanica)	2	08/02/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Primrose (Primula vulgaris)	2	09/04/2022	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Pyramidal Orchid (Anacamptis pyramidalis)	1	21/06/2014	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Ramsons (Allium ursinum)	5	14/04/2021	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
flowering plant	Raspberry (Rubus idaeus)	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Red Clover (Trifolium pratense)	1	05/09/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Red Currant (Ribes rubrum)	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Red-osier Dogwood (Cornus sericea)	1	10/07/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Redshank (Persicaria maculosa)	2	10/07/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Reed Sweet-grass (Glyceria maxima)	1	20/07/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Remote Sedge (Carex remota)	2	21/07/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Rosebay Willowherb (Chamerion angustifolium)	1	05/09/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Rumex sanguineus	2	05/09/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Russian Comfrey (Symphytum officinale x asperum = S. x uplandicum)	2	11/06/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Sand Leek (Allium scorodoprasum)	4	28/06/2022	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
flowering plant	Sanicle (Sanicula europaea)	2	11/06/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Scarlet Pimpernel (Anagallis arvensis)	1	05/09/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Selfheal (Prunella vulgaris)	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Sessile Oak (Quercus petraea)	2	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Small-leaved Lime (Tilia cordata)	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Smooth Sow-thistle (Sonchus oleraceus)	1	05/09/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Snowberry (Symphoricarpos albus)	2	05/09/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Spindle (Euonymus europaeus)	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Stinking Tutsan (Hypericum hircinum)	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Sycamore (Acer pseudoplatanus)	2	12/05/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Invasive Species: Invasive Species || Invasive Species: Invasive Species >> Medium Impact Invasive Species
flowering plant	Taraxacum aggregate	1	02/09/2005	Species Data from the National Vegetation Database	

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
flowering plant	Three-cornered Garlic (Allium triquetrum)	1	09/04/2022	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Invasive Species: Invasive Species || Invasive Species: Invasive Species >> Medium Impact Invasive Species || Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)
flowering plant	Timothy (Phleum pratense)	1	20/07/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Toothwort (Lathraea squamaria)	10	09/04/2022	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Tuberous Comfrey (Symphytum tuberosum)	1	12/05/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Tufted Vetch (Vicia cracca)	2	05/09/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Turnip (Brassica rapa)	1	10/03/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Water Figwort (Scrophularia auriculata)	2	10/07/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Water Forget-me-not (Myosotis scorpioides)	4	20/07/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Water Mint (Mentha aquatica)	3	05/09/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
flowering plant	Water-pepper (Persicaria hydropiper)	1	05/09/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Wild Angelica (Angelica sylvestris)	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Wild Cherry (Prunus avium)	2	08/04/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Wild Privet (Ligustrum vulgare)	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Winter Heliotrope (Petasites fragrans)	1	05/09/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Wood Anemone (Anemone nemorosa)	6	14/04/2021	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Wood Avens (Geum urbanum)	2	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Wood Melick (Melica uniflora)	3	11/06/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Woodruff (Galium odoratum)	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Wood-sedge (Carex sylvatica)	2	11/06/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	
flowering plant	Wych Elm (Ulmus glabra)	1	02/09/2005	Species Data from the National Vegetation Database	
flowering plant	Yarrow (Achillea millefolium)	1	05/09/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
flowering plant	Yellow Archangel (Lamiastrum galeobdolon)	1	26/04/2017	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Threatened Species: Least concern
insect - beetle (Coleoptera)	14-spot Ladybird (Propylea quattuordecimpunctata)	1	12/05/2023	Ladybirds of Ireland	
insect - beetle (Coleoptera)	22-spot Ladybird (Psyllobora vigintiduopunctata)	1	12/05/2023	Ladybirds of Ireland	
insect - beetle (Coleoptera)	7-spot Ladybird (Coccinella septempunctata)	4	07/09/2021	Ladybirds of Ireland	
insect - beetle (Coleoptera)	Haliplus (Haliplinus) fluviatilis	1	28/03/1993	Water Beetles of Ireland	
insect - beetle (Coleoptera)	Haliplus (Haliplinus) sibiricus	1	28/03/1993	Water Beetles of Ireland	
insect - beetle (Coleoptera)	Harlequin Ladybird (Harmonia axyridis)	1	10/07/2023	Ladybirds of Ireland	Invasive Species: Invasive Species || Invasive Species: Invasive Species >> High Impact Invasive Species || Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)
insect - butterfly	Comma (Polygonia c-album)	1	19/08/2021	Butterflies of Ireland pre-2022	
insect - butterfly	Large White (Pieris brassicae)	1	27/04/2013	Butterflies of Ireland pre-2022	
insect - butterfly	Meadow Brown (Maniola jurtina)	1	24/08/2021	Butterflies of Ireland pre-2022	
insect - butterfly	Painted Lady (Vanessa cardui)	1	06/09/2021	Butterflies of Ireland pre-2022	
insect - butterfly	Peacock (Inachis io)	2	26/08/2021	Butterflies of Ireland pre-2022	
insect - butterfly	Red Admiral (Vanessa atalanta)	1	25/08/2021	Butterflies of Ireland pre-2022	
insect - butterfly	Small Tortoiseshell (Aglais urticae)	3	07/09/2021	Butterflies of Ireland pre-2022	
insect - butterfly	Speckled Wood (Pararge aegeria)	4	10/09/2021	Butterflies of Ireland pre-2022	
insect - caddis fly (Trichoptera)	Agapetus ochripes	4	10/05/2018	Caddisflies (Trichoptera) of Ireland	
insect - caddis fly (Trichoptera)	Agraylea multipunctata	1	27/09/2018	Caddisflies (Trichoptera) of Ireland	
insect - caddis fly (Trichoptera)	Athripsodes albifrons	2	31/12/1910	Caddisflies (Trichoptera) of Ireland	

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
insect - caddis fly (Trichoptera)	Athripsodes cinereus	1	15/07/2018	Caddisflies (Trichoptera) of Ireland	
insect - caddis fly (Trichoptera)	Athripsodes commutatus	2	31/12/1910	Caddisflies (Trichoptera) of Ireland	
insect - caddis fly (Trichoptera)	Ceraclea dissimilis	3	31/12/2015	Caddisflies (Trichoptera) of Ireland	
insect - caddis fly (Trichoptera)	Ceraclea nigronervosa	1	27/05/2018	Caddisflies (Trichoptera) of Ireland	
insect - caddis fly (Trichoptera)	Cheumatopsyche lepida	1	15/07/2018	Caddisflies (Trichoptera) of Ireland	
insect - caddis fly (Trichoptera)	Chimarra marginata	3	31/12/2015	Caddisflies (Trichoptera) of Ireland	
insect - caddis fly (Trichoptera)	Glossosoma boltoni	1	31/12/2015	Caddisflies (Trichoptera) of Ireland	
insect - caddis fly (Trichoptera)	Glyphotaelius pellucidus	1	27/05/2018	Caddisflies (Trichoptera) of Ireland	
insect - caddis fly (Trichoptera)	Halesus radiatus	1	18/11/2018	Caddisflies (Trichoptera) of Ireland	
insect - caddis fly (Trichoptera)	Hydropsyche contubernalis	1	27/05/2018	Caddisflies (Trichoptera) of Ireland	
insect - caddis fly (Trichoptera)	Hydropsyche siltalai	1	15/07/2018	Caddisflies (Trichoptera) of Ireland	
insect - caddis fly (Trichoptera)	Hydroptila forcipata	2	27/09/2018	Caddisflies (Trichoptera) of Ireland	
insect - caddis fly (Trichoptera)	Hydroptila simulans	1	29/08/1888	Caddisflies (Trichoptera) of Ireland	
insect - caddis fly (Trichoptera)	Hydroptila sparsa	1	27/09/2018	Caddisflies (Trichoptera) of Ireland	
insect - caddis fly (Trichoptera)	Ithytrichia lamellaris	2	27/09/2018	Caddisflies (Trichoptera) of Ireland	
insect - caddis fly (Trichoptera)	Lepidostoma hirtum	1	15/07/2018	Caddisflies (Trichoptera) of Ireland	

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
insect - caddis fly (Trichoptera)	Limnephilus flavicornis	1	15/07/2018	Caddisflies (Trichoptera) of Ireland	
insect - caddis fly (Trichoptera)	Limnephilus lunatus	1	31/12/2015	Caddisflies (Trichoptera) of Ireland	
insect - caddis fly (Trichoptera)	Lype phaeopa	2	15/07/2018	Caddisflies (Trichoptera) of Ireland	
insect - caddis fly (Trichoptera)	Mystacides azurea	3	15/07/2018	Caddisflies (Trichoptera) of Ireland	
insect - caddis fly (Trichoptera)	Oecetis notata	4	31/12/2015	Caddisflies (Trichoptera) of Ireland	
insect - caddis fly (Trichoptera)	Oxyethira flavicornis	1	31/12/1978	Caddisflies (Trichoptera) of Ireland	
insect - caddis fly (Trichoptera)	Polycentropus flavomaculatus	4	27/09/2018	Caddisflies (Trichoptera) of Ireland	
insect - caddis fly (Trichoptera)	Rhyacophila dorsalis	3	10/05/2018	Caddisflies (Trichoptera) of Ireland	
insect - caddis fly (Trichoptera)	Sericostoma personatum	2	15/07/2018	Caddisflies (Trichoptera) of Ireland	
insect - caddis fly (Trichoptera)	Tinodes waeneri	3	27/09/2018	Caddisflies (Trichoptera) of Ireland	
insect - caddis fly (Trichoptera)	Wormaldia subnigra	2	31/12/1910	Caddisflies (Trichoptera) of Ireland	
insect - dragonfly (Odonata)	Banded Demoiselle (Calopteryx splendens)	4	23/05/2022	Dragonfly Ireland 2019 to 2024	
insect - dragonfly (Odonata)	Brown Hawker (Aeshna grandis)	1	20/07/2020	Dragonfly Ireland 2019 to 2024	
insect - dragonfly (Odonata)	Common Blue Damselfly (Enallagma cyathigerum)	1	27/05/2022	Dragonfly Ireland 2019 to 2024	
insect - dragonfly (Odonata)	Migrant Hawker (Aeshna mixta)	1	23/08/2020	Dragonfly Ireland 2019 to 2024	
insect - hymenopteran	Andrena (Hoplandrena) scotica	1	08/05/2021	Bees of Ireland	

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
insect - hymenopteran	Common Carder Bee (Bombus (Thoracombus) pascuorum)	1	27/04/2013	Bees of Ireland	
insect - hymenopteran	Large Red Tailed Bumble Bee (Bombus (Melanobombus) lapidarius)	1	27/04/2013	Bees of Ireland	Threatened Species: Near threatened
insect - hymenopteran	Marsham's Nomad Bee (Nomada marshamella)	1	08/05/2021	Bees of Ireland	
insect - hymenopteran	Pontania proxima	1	10/07/2020	Sawflies of Ireland	
insect - hymenopteran	Small Garden Bumble Bee (Bombus (Megabombus) hortorum)	1	27/04/2013	Bees of Ireland	
insect - moth	Anthophila fabriciana	2	14/05/2014	Moths Ireland	
insect - moth	Caloptilia syringella	1	14/05/2014	Moths Ireland	
insect - moth	Cocksfoot Moth (Glyphipterix simpliciella)	1	14/05/2014	Moths Ireland	
insect - moth	Common Carpet (Epirrhoe alternata)	1	14/05/2014	Moths Ireland	
insect - moth	Epermenia chaerophyllella	1	14/05/2014	Moths Ireland	
insect - moth	Epinotia immundana	1	14/05/2014	Moths Ireland	
insect - moth	Esperia sulphurella	1	14/05/2014	Moths Ireland	
insect - moth	Incurvaria masculella	1	16/04/2014	Moths Ireland	
insect - moth	Lobesia abscisana	1	14/05/2014	Moths Ireland	
insect - moth	Silver-ground Carpet (Xanthorhoe montanata)	1	14/05/2014	Moths Ireland	
insect - moth	Udea lutealis	1	20/07/2019	Moths Ireland	
insect - true bug (Hemiptera)	Calocoris (Grypocoris) stysi	1	10/07/2020	True Bugs (Heteroptera) of Ireland	
insect - true bug (Hemiptera)	Liocoris tripustulatus	1	15/07/2018	True Bugs (Heteroptera) of Ireland	
insect - true fly (Diptera)	Eristalis tenax	1	27/04/2013	Hoverflies (Syrphidae) of Ireland	
millipede	Adenomeris gibbosa	1	24/11/1981	Millipedes of Ireland	

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terrestrial mammal	American Mink (Mustela vison)	1	21/06/2011	Atlas of Mammals in Ireland 2010-2015	Invasive Species: Invasive Species || Invasive Species: Invasive Species >> High Impact Invasive Species || Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)
terrestrial mammal	Common Pipistrelle (Pipistrellus pipistrellus sensu stricto)	1	01/09/2005	National Bat Database of Ireland	
terrestrial mammal	Eastern Grey Squirrel (Sciurus carolinensis)	2	05/09/2018	Mammals of Ireland 2016-2025	Invasive Species: Invasive Species || Invasive Species: Invasive Species >> High Impact Invasive Species || Invasive Species: Invasive Species >> EU Regulation No. 1143/2014 || Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)
terrestrial mammal	Eurasian Badger (Meles meles)	1	17/02/2013	Road Kill Survey	Protected Species: Wildlife Acts
terrestrial mammal	Eurasian Red Squirrel (Sciurus vulgaris)	1	31/12/1978	Mammal Recording Scheme 1970-1985 (An Foras Forbartha)	Protected Species: Wildlife Acts
terrestrial mammal	House Mouse (Mus musculus)	1	31/12/1981	Mammal Recording Scheme 1970-1985 (An Foras Forbartha)	Invasive Species: Invasive Species || Invasive Species: Invasive Species >> High Impact Invasive Species
terrestrial mammal	Lesser Noctule (Nyctalus leisleri)	2	02/08/2007	National Bat Database of Ireland	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
terrestrial mammal	Pipistrelle (Pipistrellus pipistrellus sensu lato)	1	02/08/2007	National Bat Database of Ireland	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts
terrestrial mammal	Soprano Pipistrelle (Pipistrellus pygmaeus)	2	02/08/2007	National Bat Database of Ireland	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts
terrestrial mammal	Wood Mouse (Apodemus sylvaticus)	1	31/12/1978	Mammal Recording Scheme 1970-1985 (An Foras Forbartha)	