Appendices

Lissenhall East

Local Area Plan

January 2023

Appendix 7: Ecology and Green Infrastructure Report

Prepared by RPS Group Ltd.

Appendices

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LISSENHALL EAST LOCAL AREA PLAN

Ecology Survey and Green Infrastructure

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REPORT

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RPS

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Fingal County Council

Dublin | Cork | Galway | Sligo
rpsgroup.com

RPS Group Limited, registered in Ireland No. 91911
RPS Consulting Engineers Limited, registered in Ireland No. 161581
RPS Planning & Environment Limited, registered in Ireland No. 160191
RPS Engineering Services Limited, registered in Ireland No. 99795
The Registered office of each of the above companies is West Pier Business Campus, Dun Laoghaire, Co. Dublin, A96 N6T7

REPORT

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1 INTRODUCTION

1.1 Background

Fingal County Council has as an objective of its current County Development Plan (CDP) 2017-2023 including variation number 1, adopted in December 2019, the development of a Local Area Plan (LAP) in respect to lands which the Planning Authority considers suitable, in particular for areas which require economic, physical and social renewal and for areas likely to be the subject of large-scale development within the lifetime of the Plan. There is an overarching objective for plans arising out of the CDP, which includes Lissenhall East:

> *"Prepare and/or implement the following Local Area Plans and Masterplans during the lifetime of this Plan:*
>
> - Lissenhall East Local Area Plan (see Map Sheet 8, LAP 8.B)"

In accordance with this a LAP has been progressed, informed by a number of assessments including the findings of the current ecological characterisation and green infrastructure assessment covered by this report. This report was initially drafted during 2018, updated during 2020 and finalised in 2022.

1.2 Objectives

The purpose of this study was to:

- Survey, map and assess habitats within the development boundary of the LAP lands;
- Identify green infrastructure;
- Liaise with Fingal Council staff in the development of policies and objectives to protect and conserve the green infrastructure; and
- Raise awareness about the biodiversity of the LAP lands.

In this regard, it is the intention that this report will inform the design and layout of the development and amenity lands within the LAP boundary as they are bought forward in due course.

1.3 LAP Study Area

The LAP lands are constrained along its western and eastern perimeter by public roads – the R132 on the western side and the M1 along the eastern. Both of which come together at the northern-most point of the LAP lands at the roundabout. The Southern part of the LAP lands are defined by commercial properties as well as the wooded perimeter of Lissen Hall House (**Figure 1-1**).

The varied land use within the LAP lands includes a number of existing commercial properties including the logistics/refrigeration company, the HSE ambulance centre and a veterinary facility. The lands at the northern-most part of the LAP lands once housed the motorway compound. A large portion of the lands are given over to agriculture – mostly arable crops at the time of survey. However other notable features include boundary hedgerows and woodland copses comprising some mature trees. The remainder of the lands are characterised by remnant woodland and scrub vegetation. The main wooded areas are associated with a small watercourse which crosses the site in the northern half as well as well-established copse immediately north of the largest commercial warehouse. These are remnant woodland patches that would have formerly been associated with Lissen Hall House.

Figure 1-1: Lissenhall East LAP lands

2 METHODOLOGY

2.1 Desktop Study

A desk study was carried out to collect any available information on the local ecological environment. The following resources were consulted:

- Ordnance Survey of Ireland mapping and aerial photography available from www.osi.ie;
- Online data available on European Sites (Natura 2000 Sites) and protected species as held by the National Parks and Wildlife Service (NPWS) from www.npws.ie;
- National Biodiversity Data Centre (NBDC) records available from http://maps.biodiversityireland.ie/#/Map;
- Environmental Protection Agency map view https://gis.epa.ie/Envision;
- Bat Conservation Ireland http://www.Batconservationireland.org/;
- Inland Fisheries Ireland http://www.fisheriesireland.ie/;
- *Fingal County Development Plan 2017-2023*;
- *Fingal Biodiversity Action Plan 2011-2015*; and
- *Draft Fingal Biodiversity Action Plan 2022-2030.*

In addition, a review of accessible survey data from infrastructural projects was investigated to add further context and understanding to the biodiversity potential of the site and its environs. Documents that were found to contain information pertinent to the study area included:

- Original Metro North EIS- Although now superseded by the MetroLink project, the data in the EIS nonetheless is useful in providing some information on recorded ecology in areas adjacent to the proposed LAP lands.

2.1.1 Rare and Protected Species

A review of the National Biodiversity Data Centre (NBDC) database during 2018 (and updated in August 2022) identified a considerable number of records within 5km of the LAP lands over the past 10 years. It is recognised that the records do not necessarily mean that a species occurs within the LAP lands.

2.2 Consultation

2.2.1 Initial Consultation Responses

A number of organisations were contacted in 2018 in order to obtain additional information for this study. A summary of the responses received are provided below**.** Where a written response was provided, it is included in **Appendix A**.

A telephone discussion was held with the *Fingal Council Biodiversity Officer* to discuss Local Authority preferred requirements relating to development of the LAP and its biodiversity enhancement/green infrastructure. The key requirement was a practical approach in terms of undertaking and managing proposed measures. This included for designation of where appropriate larger swathes of wildflower meadows or similar rather than small discrete patches.

A response to a consultative query from the *Development Applications Unit (DAU) of the Department of Culture, Heritage and the Gaeltacht*, in respect of the proposed Lissenhall East LAP, dealt with issues to be considered in the plan (summarised below) as well as in the Strategic Environmental Assessment (SEA) and Appropriate Assessment (AA). Some examples of protected species that were highlighted in this response included badger (*Meles meles*), Irish hare (*Lepus timidus hibernicus*), bat species, otter (*Lutra lutra*), and birds including peregrine falcon (*Falco peregrinus*) and kingfisher (*Alcedo atthis*). Other elements that the DAU identified as being worthy of consideration included:

- Wetland habitats and supporting resources for otter, Atlantic salmon (*Salmo salar*), kingfisher and crayfish (*Austropotamobius pallipes*);
- Floodplains;
- Alien Invasive Species such as Japanese knotweed (*Fallopia japonica*) and giant hogweed *(Heracleum mantegazzianum)*;
- Amenity developments and impacts to protected species;
- Enhancing existing green infrastructure rather than adding built infrastructure along biodiversity corridors; and
- Incorporation of objectives from All Ireland Pollinator Plan 2015-2020 such as species mixes to increase food source and creation/retention where possible of less intensively managed areas.

A number of consultation responses identified issues relating to wintering wildfowl and their use of the LAP lands. A response from the *NPWS Conservation Officer* highlighted that, based on local information and existing records, light-bellied brent goose (*Branta bernicla hrota*) and golden plover (*Pluvialis apricaria*) (both Special Conservation Interest species for the Malahide Estuary Special Protection Area (SPA)) are known to make use of the site. A representative from *Birdwatch Ireland* indicated that there was no I-WeBS data for the LAP lands. However, it was considered likely that brent goose might use this area as they use other grass fields and winter crops further east along the north shore of Malahide estuary. A consultative response from the re-sightings coordinator of the *Irish Brent Goose Research Group* (IBGRG) stated that the IBGRG database had no records for the LAP lands. However, based on experience elsewhere in Dublin area, it is considered likely that Brent geese move inland for some distance, particularly when disturbed.

The *Senior Fisheries Environmental Officer from Inland Fisheries Ireland* provided a consultative response which highlighted issues relating to the aquatic environment. It was noted that the Broadmeadow and Ward Rivers were important salmonid systems - the Ward River supporting both Atlantic salmon (Annex II of EU Habitats Directive) and brown trout (*Salmo trutta*) populations and provides a particularly important nursery function for salmonid species. The Broadmeadow supports Brown trout populations throughout. The Lissenhall stream or Staffordstown 08 stream (EPA name) is currently non-salmonid probably due to a combination of pressures including extensive culverting, poor water quality and the general impacts of urbanisation, none the less there are sections with varied, diverse habitat and fisheries potential.

The consultative response from *Bat Conservation Ireland* noted that there were no recorded roosts within 1km of the LAP lands centre point grid reference. Known individual roosts from a 10km search of the database are provided in **Appendix A**, with grid references shortened to four figures to ensure protection of known roosts.

2.2.2 SEA Screening Consultation Responses

Statutory consultees were also contacted in June 2022 to request advice on the SEA Screening for the LAP. The responses received from statutory bodies which highlighted issues relevant to ecology and green infrastructure are summarised below. Where a written response was provided, it is included in **Appendix A**.

A response from *Geological Survey Ireland* (GSI) recommended the use of and reference to available GSI datasets and resources which may be useful during the environmental assessment and planning process. These include:

- Groundwater data and maps[1] providing information on groundwater distribution, quality and use. These maps include wells; drinking water source protection areas; the national map suite - aquifer, groundwater vulnerability, recharge and subsoil permeability. Information on Groundwater Protection Schemes is also available;
- Online datasets of geotechnical mapping, bedrock and subsoils geological mapping and minerals/ aggregate potential mapping viewer; and

[1] Groundwater Map Viewer: https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228

- Baseline geochemistry data on soils, surface waters and sediments, as part of the Tellus programme. Data of soils, surface waters and sediment.

A response from the *DAU of the Department of Housing, Local Government and Heritage* (DHLGH) highlighted that the Department's principal concerns with regards to the development of the lands to which the LAP relates are to how such development might affect the nearby Malahide Estuary Special Area of Conservation (SAC) and Malahide Estuary SPA. The response noted that hydrological pathways exist between the LAP lands and the Malahide Estuary SAC/SPA and potential impacts from future developments within the LAP lands could affect the Qualifying Interests/Special Conservation Interests (QIs/SCIs for which the sites are designated. The possibility of *ex-situ* ecological effects on the SAC/SPA was also highlighted, including those on SCI bird species which have the potential to be present within the LAP boundaries whilst frequenting areas outside the SPA.

The DAU also recommended that measures to avoid impacts arising as a result of development should be set out in the LAP. These measures could include a restriction of any developments on the LAP lands to only using nature based sustainable drainage systems (SuDS) and the designation of an ecological corridor along the Lissenhall Stream through the LAP lands, due to the proximity of the European sites downstream to these lands and the sensitivity of such Natura sites' Qis/SCIs. Mitigation measures are also recommended to prevent impacts on other significant elements of flora and fauna which may be present, such as otter and bat species. It is noted that character of the LAP lands would suggest they should be used by bats for at least foraging and commuting, and both otter and kingfisher are known to occur along the stretch of the Broadwater Stream and are likely to occur at times in addition along the Lissenhall Stream within these lands.

The *Environmental Protection Agency* (EPA) recommended the use of and reference to a number of guidance documents, datasets and other resources which may be relevant to the LAP. These include the State of the Environment Report[2], Environmental Sensitivity Mapping Webtool[3], SEA WebGIS Tool[4] and AA GeoTool[5]. The EPA's response also highlighted the need for the LAP to be consistent with the need for proper planning and sustainable development. The Plan should align with national commitments on climate change mitigation and adaptation and incorporate any relevant recommendations in sectoral, regional and local climate adaptation plans.

2.3 Field Surveys

The assessments comprised of a number of visits to the LAP lands as indicated in **Table 2-2**. They commenced in July 2017 and finished in August 2022. The bulk of the original surveys were carried out in 2017 and 2018. Following on from consultative responses, further surveys were carried out to understand the potential usage of the site by wintering birds and in particular SCI species from the adjacent Malahide Estuary SPA. Owing to the passage of time since the original surveys (more than 12 months), a mammal resurvey was conducted in January 2020 and a final ecological walkover survey was conducted in August 2022. A summary of the results is presented in **Section 3.2.**

Table 2-1: Surveys and Dates

Survey	Dates	Comments
Breeding Bird Survey	20th and 27th July 2017	The original breeding bird survey was supplemented with ad hoc records from 2018 and 2019 surveys.
Bat Activity Survey	28th and 5th July 2017	Original survey carried out by 2 ecologists over 2 different nights
Habitat, Invasive Alien Plant and Mammal Survey	1st and 5th August 2018	Preliminary walkover survey
Habitat and Mammal Survey	30th October 2018	Follow on confirmatory survey

[2] EPA State of the Environment Report: https://www.epa.ie/our-services/monitoring--assessment/assessment/irelands-environment/state-of-environment-report-/

[3] https://enviromap.ie/

[4] https://gis.epa.ie/EPAMaps/SEA

[5] https://gis.epa.ie/EPAMaps/AAGeoTool

Survey	Dates	Comments
Wintering Bird Surveys	Season 1 Oct 30th 2018, Dec 7th 2018, Dec 28th 2018, Jan 29th 2019, Feb 25th 2019, March 27th 2019. Season 2 Dec 5th 2019, Dec 29th 2019, Jan 31st 2020, Feb 28th 2020, March 25th 2020	Modified survey protocol covering two wintering seasons at the LAP lands was undertaken as well as some studies in the wider Malahide Estuary SPA territory to check for presence on SCI species.
Mammal Resurvey	Jan 2020	Owing to the passage of time between the original mammal survey (more than 12 months), a resurvey was undertaken in accordance with standard guidance (NRA, 2005).
Ecological Walkover Resurvey	11th August 2022	General ecological walkover resurvey which provided updated information on habitats, protected species, invasive alien plant species and mammal evidence.

2.3.1 Habitat Survey

The aim of the primary survey was to characterise within the study area, the habitats and flora that are either protected or of conservation importance. The methodology employed was that outlined in the Heritage Council's *Best Practice Guidance for Habitat Survey and Mapping* (Smith *et al.* 2011). All habitat types were identified and classified using the Heritage Council's *A Guide to Habitats in Ireland* (Fossitt, 2000).

For clarity, the colour scheme used on the map has been selected to highlight contrast, particularly for linear habitats. Within each habitat the dominant plant species that were recorded accompany the habitat description. Species of note are also indicated where appropriate.

The habitat survey comprised visiting all accessible parts of the site, being cognisant of the presence of arable crops, and recording the vegetation for the various habitats. Areas inside or outside the LAP lands that were not accessible were observed from peripheral locations which informed preliminary characterisation of aerial photography of the site. The classification scheme used corresponds to the widely used Heritage Council 2000 publication. As no Annex I habitats were recorded within the LAP lands, reference to this classification system is not used.

One of the main aims of a habitat survey is to identify its ecological value. Criteria for such evaluation may include noting its rarity, the abundance and diversity of its species, the level of human interference/modification and/or management of an area, their connectivity to other natural habitats and their size. Through gathering such information, a summary description of each of the habitats identified within the study area has been provided in **Section 3**. The habitats in this study were evaluated according to the NRA Guidelines provided in **Appendix B**. Habitats of conservation importance which should be offered greater protection than those of less value are identified.

Often serving as boundary treatments, hedgerows are recognised for their potential biodiversity not alone in terms the floristic assemblage but also their intrinsic value as commuting corridors or habitation/nesting/roosting potential for fauna, as well as linkages to the wider landscape which, in urban settings can be highly fragmented. The protocol for hedgerow appraisal (Foulkes *et al*. 2006) refers to assessment in the wider landscape units, which is not applicable to the LAP lands. Many of the hedgerows are highly managed, having been planted as boundary treatments or occurring along roads. There is limited development of hedgerow within the central part of the LAP lands, some having been removed to enlarge the arable fields as evidenced from a review of aerial imagery. Hedgerows are intimately linked with wooded vegetation at this site and are nonetheless assessed in keeping with the Heritage Council classification. The results are shown mapped in **Appendix C**.

2.3.2 Flora and Invasive Alien Plant Species

The key flora associated with each habitat is also described within each habitat. Species, where recorded in this report are given both their common and Latin and names, following the nomenclature as given in the '*New flora of the British Isles'* (Stace, 2010).

Given the potential environmental and project risk associated with the presence of Invasive Alien Plant Species (IAPS), all visits were cognisant of identifying their presence, particularly third schedule species such as Japanese knotweed and Himalayan balsam (*Impatiens glandulifera*).

2.3.3 Mammal Survey (other than Bat)

The habitats were also considered for their potential to support protected fauna. Where definitive evidence of this was found during the survey (such as tracks, habitats, markings, feeding signs, droppings and by direct observation), this was recorded as 'Target Notes' which have been incorporated into the mapping data. These are discussed further in **Section 3**. It should be noted however that owing to the ecological sensitivity of some species, that some records may be excluded from public viewing, prior to the publication of the LAP, on the grounds of preventing unwarranted disturbance to wholly protected species.

The LAP lands are constrained by the surrounding network of roads including the M1 motorway as well as commercial premises which reduces the likely suitable range or territory for some mammals. Owing to this, the mammal survey was undertaken largely within the confines of the LAP lands, with the exception of privately-owned/commercial/non-farming land such as Lissen Hall House or commercial premises along the western side of the LAP lands as well as a section of the site at the northern tip, which at one time served as the site compound for the motorway construction. These areas were assessed, as far as was practical from peripheral areas along the edge of accessible LAP lands or footpaths outside the LAP lands.

2.3.4 Bat Activity Survey

Two manual transect dusk activity surveys were undertaken using direct observation and handheld ultrasound detectors (Pettersson D200 and Bat Box Duet). The Lissenhall East LAP area was walked in a slow manner, focusing on habitat features deemed suitable for bats, namely field boundaries and woodland areas. During the second survey visit, the transect surveys were carried out in the opposite direction to ensure good coverage of the area.

Consultation on the bat activity in the wider area was sought from BCI and is discussed along with the results of the activity surveys.

2.3.5 Breeding Bird Surveys

The surveys involved the Lissenhall East LAP area being walked in a slow manner, enabling the surveyor to come within 50m of all suitable habitat features. Birds were identified by sight and song and plotted on field maps indicating activity observed using standard notation (British Trust for Ornithology (BTO) species codes and symbology).

Ad hoc records during 2018 and 2019 surveys further supplemented the bird survey. This included expanding the survey beyond the limits to include the upper extent of the Malahide estuary and the Ward River to the south of the LAP lands to survey for kingfisher, etc.

2.3.6 Wintering Bird Surveys

Owing to the proximity of the LAP lands to adjacent designated coastal sites, notably Malahide Estuary SPA and following on from consultative responses received, additional surveys were required to understand if the site supported potential usage of by SCI Bird species, particularly light-bellied brent goose (and other wintering water birds).

The thrust of the survey protocol focussed on the LAP lands, which is outside the SPA territory. A modified approach was developed by RPS ecologists[6], based of the two guidance documents, the standard I-WeBS methods and NPWS low tide water bird surveys: methods and guidance notes (Lewis & Tierney, 2014),

[6] The modified methodology was developed by Colin Heaslip, a member of the Irish Brent Goose Research team to overcome practical issues with surveys across the entire SPA.

effectively comprised a “Look see” approach as per (Bibby *et al*, 2000). The survey elements, although modified to take account of the nature of the LAP lands, included:

- Site walkover prior to site scan sampling survey to check for droppings – used as an indicator of site usage;
- Site scan sampling surveys to count all target species birds seen and consequently confirm usage, regularly repeated over their season. Scan sampling surveys were conducted until an appropriate commentary of birds present and their numbers count were established per survey point;
- Flight lines upon arrival/departure, where possible, to identify if commuting from other nearby sites (To or from adjacent wetlands); and
- Identification of known satellite sites or high tide roost activity locations associated with the LAP study area, as well as distal comparative site.

Malahide Estuary SPA is designated for a considerable number of SCI bird species, many of which commute between a number of adjacent coastal sites. It has a number of overlapping conservation designations and its importance as a water bird area is apparent as indicted by yearly I-WeBS bird counts (**Appendix F**). The entire site (0U408 Broadmeadow (Malahide) Estuary) for which the bird counts are applicable has been separated into a number of subsites[7] owing to the distribution of distinct flocks of birds. The following subsites are recognised, although the current scan survey provides qualified data in respect of subsites 0U411 and 0U484 only.

- Subsite 0U411 Inner Malahide Estuary;
- Subsite 0U412 Outer Malahide Estuary;
- Subsite 0U483 Outer Malahide Estuary;
- Subsite 0UL23 Outer Malahide Estuary;
- Subsite 0UL22 Outer Malahide Estuary;
- Subsite 0U484 Outer Malahide Estuary;
- Subsite 0UL25 Outer Malahide Estuary; and
- Subsite 0U485 Outer Malahide Estuary.

Scan sampling surveys at four sites (SP1-4, **Appendix F**) were typically conducted within the low tide period allowing for counts to be made to gather data regarding numbers and usage. Surveys were also scheduled during the rising/high tide to establish whether the target species (brent geese) could utilise the study area as secondary foraging or loafing habitat outside of low-tide conditions. However, the survey strategy was modified owing to the tasked objective to identify usage of the LAP lands by brent goose and other species and foraging habitat availability to confirm usage of open grassland areas within the larger range/territory of the SPA for the species. It was not possible to survey all I-WeBS subsites and therefore the survey identified key areas likely to host brent geese and confirm whether the sites are being utilised by the target species.

Survey count points 1 and 2 (SP1, SP2) were selected to provide clear observation of the four large fields within the LAP lands. These lands are separated from the SPA territory by the M1 motorway and Lissen Hall House grounds. Survey count point 3 (SP3) corresponds to the upper estuarine area of the SPA (IWeBS subsite 0U411). This subsite is the closest proximal estuarine site to the LAP for which brent geese and additional waterfowl are known from. The area (Seatown West) is well known for considerable numbers of mute swan (*Cygnus olor*)[8]. Survey count point 4 (SP4) was located in the outer estuary in I-WeBS subsite 0U484 but the transect (PW4) extended towards subsite 0U483.

[7] https://bwi.maps.arcgis.com/apps/View/index.html?appid=1043ba01fcb74c78bc75e306eda48d3a (Accessed March 28th 2019)

[8] http://www.bwifingal.ie/birding-sites/site-guides/#Seatown

The repeat surveys were consistently carried out by a single surveyor, although an accompanying scientist in a private capacity visited the seaward side of the SPA on December 28th, 2018 (Visit #3) whilst the scan surveys of the LAP lands were being undertaken.

The thrust of the modified survey effort focussed on the LAP lands and comprised walking the perimeter of the 2 and half of the 4 large agricultural fields. Thereafter, a suitable survey point (SP1) watch was maintained over the 2 larger fields. This accounted for the bulk of the LAP site survey owing to the nature and potential of these fields and their relative proximity to SPA territory on the eastern side of the M1 motorway. Following on from SP1, the perimeter search of the last 1.5 fields was undertaken followed by a second survey watch (SP2) to cover the two western most fields.

Thereafter, the survey moved to the upper estuary location to the east of the LAP lands. A two-hour survey point (SP3) survey was conducted at this point and included as far as was practical identification bird flightpaths to and from the SP area. The area of the Scan Point count is popular with the public who occasionally stopped to feed birds. For this reason and particularly during the latter series of visits in 2020, the survey was carried out on the opposite side of the estuary, in an area which provided similar viewing are as SP3

The final area of the survey was towards the inner mudflats around Corballis Golfcourse in the outer estuarine area e.g. seaward side of the railway embankment that divides the SPA (SP4). The survey at this point was modified at times depending on tides and disturbance from vehicles and a number of survey points were visited on occasion to provide more data on bird presence.

2.4 Designated Sites within close proximity of the LAP Lands

The European Commission has identified the prime habitats of conservation importance across Europe. Of these habitat types, 59 exist in Ireland and a number of these are qualifying features for designated sites in the wider landscape.

Special Areas of Conservation (SACs) are designated under the Habitats Directive (92/43/EEC). This Directive enables the protection, conservation and restoration of certain habitats and/ or species (habitats listed on Annex I, and species listed on Annex II/IV of the Habitats Directive). Designated SACs are compiled within a framework of protected areas known as European sites (Natura 2000 network of sites).

SPAs are designated under the Birds Directive (79/409/EEC). SPAs are designated to protect birds listed on Annex I of the Birds Directive, as well as for populations of regularly occurring migratory species. The Birds Directive obliges member states to conserve wetlands, especially those of international importance.

The Birds and Habitats Directives are principally transposed into Irish law by the European Union (Birds and Natural Habitats) Regulations 2011 to 2015.

Separately, National conservation designations also exist and are afforded protection under the Wildlife Act 1976 (as amended). These are primarily Natural Heritage Areas (NHAs) although others include national parks, areas of refuge etc., none of which are applicable to the Lissenhall East LAP lands. Proposed Natural Heritage Areas (pNHAs) are not afforded any statutory protection under the Wildlife Act 1976 (as amended) although they are captured under planning by means of Local Authority County development plans.

The LAP lands do not occur within any nature designation area. There are however, a number of designated sites within close proximity of or with connectivity to the Lissenhall East LAP lands are detailed in **Table 2-3**. It is recognised that other European sites other than those listed in **Table 2-3** are known to occur along much of the Fingal coastline, southwards towards Dublin City and Dun Laoghaire Rathdown, and northwards towards Meath and Louth. They are purposely not included in this report, as it is not primarily an impact assessment report in terms of Appropriate Assessment or Ecological Impact Assessment.

Of the proximal (and overlapping) European sites, Malahide Estuary (alternatively referred to as Broadmeadow/Swords Estuary) SPA is a site of considerable international importance for wintering waterfowl and supports a good diversity of species. The feeding and roosting, particularly within the inner lagoon is considered of particular value.

2.4.1 Fingal County Biodiversity Plan 2010-2015 (Still in operation)

Malahide estuary is a "core site" under the *Fingal Biodiversity Plan 2010-2015* (and the *Draft Fingal Biodiversity Plan 2022-2030*) for consideration. The LAP lands are located in areas designated in the Fingal Biodiversity plan as Buffer zones, zones that surround core sites where it is intended to protect the integrity of the designated sites for key flora and fauna. Buffer zones around the estuaries aim to protect the existing land uses and may provide opportunities for flood protection, erosion control, and amenity use.

The LAP lands are not currently designated as a Nature Development Areas, although the objectives for same should be applied in keeping with the strategy of the County's Biodiversity Plan as reinforced in the current County Development Plan 2017-2023 (variation number 1 adopted). In particular, the presence of woodland in two key areas is recognised as being ecologically important. However, the biodiversity plan also recognises that the establishment of smaller woodland copses between 2-4ha. to provide strategic ecological stepping stones for woodland flora and fauna. The draft plan for the 2022-2030 period also sets out a number of new objectives, including to '*develop and maintain the Fingal Ecological Network and increase the resilience of the network by restoring degraded habitats and habitat creation*.' These objectives will be integral, as far as is practical in the development and layout of the LAP design.

A further objective is the retention of, and further development of as appropriate, of ecological corridors and stepping stones. The key corridors in Fingal are recognised as the river network and associated floodplain and adjacent agricultural lands or parkland. Thirty (30) to fifty (50) metres is the typical width of watercourses identified in the biodiversity plan, although wider floodplains exist. This is the case for some watercourses in the area so as to ensure that the Otter territory is suitably accounted for including the potential for breeding or natal holts to be established away from disturbance or predation.

Table 2-2: Designated Sites within or in close proximity to the LAP lands

Site Name & Code	Qualifying Feature/Reason for Designation	Approximate Distance from LAP	Connectivity to Site & Potential Vulnerability
European Sites			
Malahide Estuary SAC (000205)	**Annex I Habitats** • Mudflats and sandflats not covered by seawater at low tide [1140] • *Salicornia* and other annuals colonizing mud and sand [1310] • *Spartina* swards (*Spartinion maritimae*) [1320]** • Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] • Mediterranean salt meadows (*Juncetalia maritimi*) [1410] • Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes") [2120] • Fixed coastal dunes with herbaceou s vegetation ("grey dunes") [2130]* *A priority Habitat	~100m (closest point in South East corner of LAP lands)	• Broadmeadow River flows to the south of the LAP lands. No direct connectivity to this river but a portion of the LAP lands are within the flood risk area which overlaps with the SAC. • Staffordstown_08 (or Lissenhall) river crosses the northern half of the site, before flowing under the M1 motorway and entering Malahide Estuary SAC at Seapoint. • Although direct connectivity to the SAC exists by virtue of Staffordstown_08 river crossing the LAP lands, it is dry for periods. Also, the nature of the project and the proposed SuDS design should result in no deterioration of water arriving Annex I habitats, which are nonetheless coastal.
Malahide Estuary SPA (004025)	**Special Conservation Interests** • Great crested grebe (*Podiceps cristatus*) [A005] • Light-bellied brent goose (*Branta bernicla hrota*) [A046] • Shelduck (*Tadorna tadorna*) [A048] • Pintail (*Anas acuta*) [A054] • Goldeneye (*Bucephala clangula*) [A067] • Red-breasted merganser (*Mergus serrator*) [A069] • Oystercatcher (*Haematopus ostralegus*) [A130]	~100m (closest point in South East corner of LAP lands)	• Broadmeadow River flows to the south of the LAP lands. • Staffordstown_08 (or Lissenhall) river crosses the northern half of the site, before flowing under the M1 motorway and entering Malahide Estuary SAC at Seapoint. • Disturbance to or loss of open fields that could be used by wintering wildfowl including SPA listed bird species. The loss of lands owing to the construction, may be countered over time by the development a large wetland feature.

Site Name & Code	Qualifying Feature/Reason for Designation	Approximate Distance from LAP	Connectivity to Site & Potential Vulnerability
	• Golden plover (*Pluvialis apricaria*) [A140] • Grey plover (*Pluvialis squatarola*) [A141] • Knot (*Calidris canutus*) [A143] • Dunlin (*Calidris alpina alpina*) [A149] • Black-tailed godwit (*Limosa limosa*) [A156] • Bar-tailed godwit (*Limosa lapponica*) [A157] • Redshank (*Tringa totanus*) [A162] • Wetlands [A999]		
RAMSAR Site			
The Broadmeadow Estuary (833)	An estuary cut off from the sea by a large sand spit. The site includes well-developed saltmarshes, salt meadows, rocky shores, a well-developed outer dune ridge and sand/mud-flats exposed at low tide. Vegetation consists of a large bed of eelgrass (*Zostera noltii* and *Z. angustifolium*) and extensive mats of green algae (*Enteromorpha* spp., and *Ulva lactuca*). The estuary is an important wintering site for numerous species of waterbirds. The light-bellied brent goose population is of international importance. The high numbers of diving birds reflects the lagoon-type nature of the inner estuary. Human activities include water sports. There is a marina and some housing (Source www.rsis.ramsar.org)	132m (boundary dataset taken from Marine Irish Digital Atlas data, as boundary mapping of RAMSAR sites for Ireland not officially provided.	Connectivity and potential vulnerability to the RAMSAR site is similar that described for Malahide Estuary SPA.
National Sites			
Malahide Estuary pNHA (000205)	The NPWS do not provide online description for the pNHA. However, the site largely overlaps with the Special Area of Conservation.	~100m (closest point in South East corner of LAP lands)	
Shellfish Area			
Malahide	All beds classified for Live Bivalve production. No seasonal classification identified.	N/A	Razor Clam conservation area. No predicted impacts from proposed development of LAP lands.

2.5 Constraints

A range of surveys were undertaken over the course of a number of years as the project was re-scoped (wintering bird survey). The surveys were undertaken within the appropriate season and in accordance with standard protocols. Breeding bird survey data undertaken in 2017 has been supplemented with further ad hoc observations arising out of the habitat survey, as well as data responses where necessary.

Consultative response from BCI in relation to known roosts in the immediate surrounds augmented the original survey and understanding of bat activity within the LAP lands.

Not all areas of the LAP lands were accessible, as they are in private ownership. Thus, a parcel of lands at the northern end of the site could only be visually observed from peripheral areas. Much of the evidence pertaining to badger was noted in close proximity to this area, but it is uncertain if they were foraging or commuting from as yet unidentified setts.

Although some other areas/subsites within the SPA and elsewhere were visited, it was not possible to confirm use/range and/or quantification of numbers at all subsites. As the site and Malahide Estuary SPA is

in-between South Dublin Bay and River Tolka Estuary SPA, North Bull Island SPA and Rogerstown Estuary SPA, (all of which host important numbers of Light-bellied Brent Geese), there is a high risk of movement between these, which could lead to double counts when visiting satellite/secondary sites – more than 1 surveyor may be required in this case. In terms of understanding satellite/secondary sites and a single surveyor, it was not possible to conduct high tide surveys at all areas/satellite sites. Similarly, the data based on the survey is deficient in respect of arrival/departure flight lines from adjacent areas within the SPA or other sites in Dublin Bay.

Although the surveys were aimed at encompassing high tide, this was not practical for the LAP lands. The upper estuarine area was timed as far as was possible to capture high tide and receding tide to establish brent geese movements adjacent to the LAP lands. The survey at the outer estuary did not capture all geese activity in the wider area, merely confirmed presence/absence of some. Thus, the survey provides an ecological snapshot overview of potential usage of the study area and immediate surrounds for brent goose species (and other bird species).

2.6 Green Infrastructure

There is no standard definition for green infrastructure. As such, Comhar have conducted studies in Ireland using the following definition; "*Green Infrastructure is a strategically planned and managed network featuring areas with high quality biodiversity (uplands, wetlands, peatlands, rivers and coast), farmed and wooded lands and other green spaces that conserve ecosystem values which provide essential services to society.*" (Page 11, Comhar 2010). An alternative, but closely related definition provided by Benedict *et al*. (2002) suggests that green infrastructure is the ecological framework needed for environmental, social and economic sustainability – in short it is a nation's natural life sustaining system.

The green Infrastructure within the LAP East lands was mapped by paying regard to the two definitions above. The field surveys and desktop research identified areas of high local importance and where appropriate, included other habitats that provided important ecosystem services or acted as ecological corridors or stepping stones for wildlife, these included habitats such as unmanaged grassland or scrub, and low intensity farmland. These areas were recorded as 'Key Green Infrastructure' and is illustrated on the maps (refer to **Appendix E**) and within **Section 4.2** of this report.

Areas which are of lower ecological value, but which may provide useful stepping stones (as required by Article 10 of the Habitat Directive and specific objectives within the County Development Plan) for wildlife, included amenity areas and parks. Generally, these are not included in the 'Key Green Infrastructure' unless they consisted of significant areas of woodland, hedgerow or scrub, which are readily mapped. However, these areas are nonetheless important, particularly in urban landscapes owing to their ability to support certain flora and fauna and to encourage wildlife into areas where through development their natural range may have been fragmented. Consequently, they contribute in part to the connectivity of the wider green infrastructure.

The developing LAP document includes for a range of high level (in that they are not fully designed) green infrastructure measures to be incorporated into the developing design e.g. SUDS – Green roofs, swale and attenuation ponds, and planting. Arising out of the surveys and consultation responses further measures such as pollinator friendly planting, areas of wildflower/dereliction are dealt with in **Section 4.**

3 RESULTS

3.1 Desktop Study Results

The desktop study results give an indication of what notable species might be found within 5km of the LAP lands. These details, which were accessed in January 2018 (and updated as necessary in March 2020 and August 2022) can be found in **Table 3-1** of this report, which includes the protective status/designations for each species.

Table 3-1: NBDC Records of Rare and Protected Species within the last 10 years

Common Name	Scientific Name	Record Count	Date of Last Record	Designation
Birds				
Barn owl	*Tyto alba*	28	24/08/2021	BoCCI - Red List
Brambling	*Fringilla montifringilla*	10	04/02/2018	BoCCI - Amber List
Brent goose	*Branta bernicla*	18	15/10/2017	BoCCI - Amber List Birds Directive Annex II
Common kestrel	*Falco tinnunculus*	37	02/03/2013	BoCCI - Red List
Common kingfisher	*Alcedo atthis*	27	10/01/2013	BoCCI - Amber List Birds Directive Annex I SCI Bird Species
Common linnet	*Carduelis cannabina*	37	20/01/2019	BoCCI - Amber List
Common redshank	*Tringa tetanus*	30	31/07/2014	BoCCI - Red List SCI Bird Species
Common shelduck	*Tadorna tadorna*	36	19/06/2017	BoCCI - Amber List
Common starling	*Sturnus vulgaris*	61	15/05/2016	BoCCI - Amber List Birds Directive Annex II
Common swift	*Apus apus*	35	17/07/2017	BoCCI - Red List
Common wood pigeon	*Columba palumbus*	66	15/05/2016	Birds Directive Annex II & III
Eurasian curlew	*Numenius arquata*	32	28/02/2020	BoCCI - Red List Birds Directive Annex II SCI Bird Species
Eurasian oystercatcher	*Haematopus ostralegus*	30	19/05/2012	BoCCI - Red List Birds Directive Annex II SCI Bird Species
Eurasian tree sparrow	*Passer montanus*	40	16/03/2013	BoCCI - Amber List
European greenfinch	*Carduelis chloris*	51	20/01/2019	BoCCI - Amber List
Goldcrest	*Regulus regulus*	43	26/05/2019	BoCCI - Amber List
Great cormorant	*Phalacrocorax carbo*	20	15/10/2017	BoCCI - Amber List SCI Bird Species
Grey heron	*Ardea cinerea*	44	10/01/2013	SCI Bird Species
Herring gull	*Larus argentatus*	36	19/05/2012	BoCCI - Amber List Birds Directive Annex II SCI Bird Species
House sparrow	*Passer domesticus*	54	02/05/2014	BoCCI - Amber List
Lesser black-backed gull	*Larus fuscus*	19	19/05/2012	BoCCI - Amber List Birds Directive Annex II SCI Bird Species
Little egret	*Egretta garzetta*	23	13/06/2017	Birds Directive Annex I
Little grebe	*Tachybaptus ruficollis*	20	15/10/2017	SCI Bird Species
Merlin	*Falco columbarius*	9	04/02/2018	BoCCI - Amber List Birds Directive Annex I SCI Bird Species
Mute swan	*Cygnus olor*	33	13/08/2017	BoCCI - Amber List Birds Directive Annex II
Northern lapwing	*Vanellus vanellus*	33	13/08/2017	BoCCI - Red List Birds Directive Annex II
Northern shoveler	*Anas clypeata*	9	22/02/2019	BoCCI - Red List SCI Bird Species
Northern wheatear	*Oenanthe oenanthe*	8	14/05/2021	BoCCI - Amber List
Peregrine falcon	*Falco peregrinus*	14	01/06/2021	Birds Directive Annex I

Common Name	Scientific Name	Record Count	Date of Last Record	Designation
				SCI Bird Species
Red kite	*Milvus milvus*	3	02/03/2013	BoCCI - Red List Birds Directive Annex I
Stock pigeon	*Coumba oenas*	42	16/03/2013	BoCCI - Red List
White-tailed eagle	*Haliaeetus albicilla*	1	04/05/2021	BoCCI - Red List Birds Directive Annex I
Whooper swan	*Cygnus cygnus*	9	10/12/2018	BoCCI - Amber List Birds Directive Annex I
Yellowhammer	*Emberiza citronella*	54	29/07/2021	BoCCI - Red List
Mammals				
European badger	*Meles meles*	10	09/08/2015	Wildlife Acts
European otter	*Lutra lutra*	14	14/02/2017	Wildlife Acts Habitats Directive Annex II & IV
Irish hare	*Lepus timidus subsp. hibernicus*	12	27/10/2018	Wildlife Acts Habitats Directive Annex V
Irish stoat	*Mustela erminea subsp. hibernica*	2	04/04/2017	Wildlife Acts
Pine marten	*Martes martes*	4	05/07/2021	Wildlife Acts Habitats Directive Annex V
West European hedgehog	*Erinaceus europaeus*	55	16/06/2021	Wildlife Acts
Invasive Species				
Australian flatworm	*Australoplana sanguinea*	1	06/02/2020	Medium Impact Invasive Species
Butterfly-bush	*Buddleja davidii*	13	11/12/2017	Medium Impact Invasive Species
Cherry laurel	*Prunus laurocerasus*	8	11/12/2017	High Impact Invasive Species
Common cord-grass	*Spartina anglica*	4	23/08/2017	Third Schedule (S.I. 477) High Impact Invasive Species
Eastern grey squirrel	*Sciurus carolinensis*	16	27/05/2018	Third Schedule (S.I. 477) High Impact Invasive Species
-	*Elminius modestus*	1	31/10/2017	Medium Impact Invasive Species
European rabbit	*Oryctolagus cuniculus*	3	09/07/2012	Medium Impact Invasive Species
Evergreen oak	*Quercus ilex*	2	07/05/2020	Medium Impact Invasive Species
Field penny-cress	*Thlaspi arvense*	1	22/06/2020	Medium Impact Invasive Species
Giant hogweed	*Heracleum mantegazzianum*	4	06/07/2018	Third Schedule (S.I. 477) High Impact Invasive Species
Himalayan honeysuckle	*Leycesteria formosa*	4	11/12/2017	Medium Impact Invasive Species
House mouse	*Mus musculus*	1	03/09/2012	High Impact Invasive Species
Indian balsam	*Impatiens glandulifera*	2	11/07/2018	Third Schedule (S.I. 477) High Impact Invasive Species
Japanese knotweed	*Fallopia japonica*	6	20/04/2021	Third Schedule (S.I. 477) High Impact Invasive Species
Japanese rose	*Rosa rugosa*	1	20/08/2020	Medium Impact Invasive Species
Jenkin's spire snail	*Potamopyrgus antipodarum*	8	31/10/2017	Medium Impact Invasive Species
New Zealand flatworm	*Arthurdendyus triangulatus*	6	29/10/2019	High Impact Invasive Species
Red-eared terrapin	*Trachemys scripta*	1	31/03/2021	Medium Impact Invasive Species
Ruddy duck	*Oxyura jamaicensis*	2	31/12/2014	High Impact Invasive Species
Sea-buckthorn	*Hippophae rhamnoides*	1	19/06/2012	Medium Impact Invasive Species
Sycamore	*Acer pseudoplatanus*	14	29/11/2021	Medium Impact Invasive Species
Three-cornered garlic	*Allium triquetrum*	8	29/11/2021	Third Schedule (S.I. 477) Medium Impact Invasive Species
Traveller's-joy	*Clematis vitalba*	1	13/08/2012	Medium Impact Invasive Species
Turkey oak	*Quercus cerris*	1	24/03/2022	Medium Impact Invasive Species
Wall cotoneaster	*Cotoneaster horizontalis*	3	20/08/2020	Medium Impact Invasive Species
Wild parsnip	*Pastinaca sativa*	1	23/08/2017	Medium Impact Invasive Species
Amphibians				
Common frog	*Rana temporaria*	20	10/08/2020	Wildlife Acts Habitats Directive Annex V
Smooth newt	*Lissotriton vulgaris*	5	04/05/2018	Wildlife Acts
Reptiles				

Common Name	Scientific Name	Record Count	Date of Last Record	Designation
Common lizard	*Zootoca vivipara*	2	01/07/2018	Wildlife Acts
Flora				
Smooth brome	*Bromus racemosus*	1	31/07/2014	Threatened Species: Near Threatened
Insects				
Dark green fritillary	*Argynnis aglaja*	5	22/07/2019	Threatened Species: Vulnerable
Small heath	*Coenonympha pamphilus*	18	12/06/2021	Threatened Species: Near Threatened
Wall butterfly	*Lasiommata megera*	14	20/08/2019	Threatened Species: Endangered
Wood white	*Leptidea sp.*	25	29/05/2021	Threatened Species: Near Threatened
Large red tailed bumble bee	*Bombus (Melanobombus) lapidarius*	12	25/03/2022	Threatened Species: Near Threatened
Moss carder-bee	*Bombus (Thoracombus) muscorum*	6	15/05/2021	Threatened Species: Near Threatened

A considerable number of bird species are noted from the wider area including Bird Directive Annex I species, particularly those listed as qualifying interests for the proximal Malahide Bay SPA and others of conservation concern including red-listed barn owl (*Tyto alba*) and yellowhammer (*Emberiza citrinella*).

In terms of mammals, records are available for a number of mammal species including badger (*Meles meles*), otter (*Lutra lutra*) and the invasive grey squirrel (*Sciurus carolinensis*) – a non-native species that has largely been pushing the native red squirrel westwards across the River Shannon.

The only plant of note which is included in the NBDC database is smooth brome (*Bromus racemosus*), which the NBDC database records from the surrounding area in 2014. However, this record is more than 5km to the south west of the LAP lands and there are no further known records of its presence in recent times.

No records for Annex II insects were found within the environs of the LAP lands. Four butterfly species and two bee species listed on the Irish Red List were recorded within 5km of the LAP lands.

The distribution of and/or confirmation of presence of protected species is discussed under the various headings in the following sections.

3.2 Survey Results

3.2.1 Habitats

The habitat descriptions are based on field surveys primarily undertaken in summer 2018, but supplemented during others surveys whereby changes in agricultural management etc. impacted the study area. Where access was not possible, owing to density of vegetation (some scrub in woodland dominated centre of the LAP lands or lands being in private ownership, a visual assessment was made of the habitat, along with an estimation of habitat distribution for mapping purposes. In general terms the floristic diversity of the site is not exceptional, with agriculture dominating the central parts and variety of wood-rich assemblages around the perimeter except where the land is built upon. The flora is typical of similar habitats elsewhere in the county. The habitats that were recorded from the LAP lands are listed in **Table 3-2** along with the ecological evaluation. A description of the individual habitat is presented thereafter arranged in broad habitat groupings.

Although a number of the habitats described from the site have links to Annexed habitats of the Habitats Directive, owing to the nature and composition of the habitats, none of the habitats within the LAP lands correspond to Habitats Directive Annex I habitats.

The intrinsic value of the vegetation mosaic present is that the area is relatively sheltered, despite it being largely encircled by built environment and has remnant vegetation, particularly around the derelict buildings in the central part of the LAP lands that would rarely be encountered in the built/managed environment. Notwithstanding the limited ecological value of the flora, it offers refuge and potential breeding locations for fauna. Fauna are dealt with separately in **Section 3.2.4** onwards.

During the period July 2017 to March 2020, there was little change in habitat distribution or extent across the LAP lands, other than for annual crop rotation within the four main open fields on site, or as storm events damaged trees etc. However, in winter 2019, works by a private utilities contractor were undertaken along the eastern perimeter whereby some scrub was removed and ground was levelled and a works corridor around the two eastern-most fields to enable the installation of buried maintenance chambers for installed utilities piping. This also included the construction of a larger chamber the easternmost point of the Staffordstown_08 watercourse where it is culverted under the M1 motorway. Some minor changes to the habitats within the LAP area were noted during the final ecological walkover survey in August 2022. This included the removal of small areas of spoil and hard ground (ED2) and recolonising bare ground (ED3), which were replaced by arable crop land (BC1).

Table 3-2: Habitat Evaluation (based on NRA criteria, Appendix B)

Habitat name (After Fossit 2000)	European Protection	Evaluation (as per NRA 2009)	Rationale
Arable Crops (BC1)	No	Local (Lower value)	Habitat is of low botanical importance; However, it may provide a foraging habitat for some species of fauna e.g. Fox, rabbits and Birds (passerine and wintering).
Dry Calcareous and Neutral Grassland (GS1)	No	Local (Higher value)	These grasslands, which are limited in extent and often show gradations into other managed or periodically disturbed habitats at the edge of arable fields. They tend to be more botanically diverse than surrounding grasslands. The habitat provides foraging habitat for some species of fauna e.g. fox, rabbit and passerine birds.
Improved Agricultural Grassland (GA1)	No	Local (Lower value)	Limited in extent, this habitat is of low botanical importance; However, it may provide a foraging habitat for some species of fauna e.g. Fox, rabbits and Birds (passerine and wintering).
Amenity Grassland (GA2)	No	Local (Lower value)	Limited in extent, this habitat is largely associated with landscaped land around commercial properties.
Dry Meadows and Grasslands (GS2)	No	Local (Higher value)	There is limited development of this habitat and it typically occurs in mosaic with other grasslands swards or edge of bramble scrub.
Wet Grassland GS4	No	Local (Higher value)	These grasslands generally tend to be associated with depression among drier grasslands, although a discrete fragment was recorded at a damp hollow to the east of the arable crops. This habitat is more botanically diverse than surrounding arable crops.
Mixed Broadleaf Woodland (WD1)	No	Local (Higher value)	A large portion of the wooded vegetation is characterised by the habitat. Variation is not uncommon, although a small number of tree species predominate. In terms of structural and biodiversity potential two key areas, namely the wooded area in the centre of the LAP lands and the woodland strip through which the Lissenhall/Staffordstown 08 stream flows.
Treelines (WL2)	No	Local (Higher value)	Much of the linear woodland, particularly along the western part of the LAP lands has been planted with a range of trees as screening. However other linear features, particularly in the central part of the site, separating the arable fields are characterised by long established and mature trees rather than hedgerow.
Wet Pedunculate Oak-Ash Woodland (WN4)	No	Local (Higher value)	This habitat is not mapped, although elements of it occur in mosaic with Mixed Broadleaf Woodland through which the Lissenhall/Staffordstown 08 stream flows.
Immature Woodland (WS2)	No	Local (Lower value)	This habitat represents linear woodland, largely of relatively recent origin which was planted as screening alongside the M1 road-scheme. The habitat does contain a number of mature trees, some of which may have been retained at the time of construction.
Hedgerows (WL1)	No	Local (Lower value)	Ordinarily hedgerows would be assigned a rating of Local (Higher Value) by virtue of their ecological

Habitat name (After Fossit 2000)	European Protection	Evaluation (as per NRA 2009)	Rationale
			importance in the landscape. However, in terms of the LAP lands, whilst linear wooded vegetation occurs across the site, there is little development of hedgerow. It is typically characterised by short, remnant fragments for which scrub vegetation is outcompeting.
Scrub (WS1)	No	Local (Lower value)	Scrub generally tends to be dominated by dense Bramble but may also include of a range of species such as gorse and rose. Scrub provides habitat for commuting and foraging birds and mammals.
Buildings and Artificial surfaces (BL3)	No	Local (Lower value)	This habitat is of limited botanical importance and owing to the disturbance, may offer restricted territory for much fauna other than common birds or foxes.
BL1 Stone Walls and Other Stonework	No	Local (Lower Higher)	This habitat is of limited botanical importance although it is associated with the woodland copse in the central part of the site. The nature of the stonework and the associated ivy cover on the derelict buildings may provide habitat for fauna e.g. roosting bats.
Spoil and Bare Ground (ED2)	No	Local (Lower value)	This habitat is of limited botanical importance. Owing to yearly preparation of fields, the extent of the habitat can vary seasonally. The habitat may provide foraging habitat for fauna.
Recolonising Bare Ground (ED3)	No	Local (Lower value)	This habitat is of limited botanical importance with an assemblage of successional ruderal species which typically become established. The habitat may provide foraging habitat for fauna.
Drainage Ditches (FW4)	No	Local (Lower value)	Many ditches are dry, largely characterised by overhanging dense bramble-dominated scrub.
Reed & large sedge swamps (FS1)	No	Local (Lower value)	This habitat is limited to a single narrow linear ditch. Species poor, it nonetheless affords cover to birds.
Depositing/Lowland Rivers (FW2)	No	Local (Lower value)	The evaluation reflects the nature and condition of this stream, and its apparent lack of aquatic diversity. However, it is recognised that it provides direct connectivity to the Malahide estuary which is of international importance.

3.2.1.1 Cultivated Land and Grasslands

The majority of the larger fields were given over to **Arable Crops (BC1),** with wheat and barley noted in summer 2017, although this changed annually, as is typical of rotational sowing. In 2017, the eastern most fields along the M1 boundary were sown with winter barley whilst the fields to the west were sown with peas. There is limited floristic diversity associated with such habitats, which are often regularly treated with pesticides to discourage development of weed species. In following years grass and crops went in, although the two western most fields were characterised by oil seed rape in winter 2020.

Non-agricultural grasslands account for a smaller portion of the LAP lands. There are a number of variants. One such distinctive variant occupies a single field located between the kennels and a mature beech treeline on the western side of the study area is not intensively managed. A single isolated mature tree stands within the grassland. The field was not surveyed as it is in private ownership. However, a visual assessment of the habitat suggest that it conforms to **Dry Calcareous and Neutral Grassland (GS1)** habitat owing to the greater range of plant species including grasses and an obvious absence of intense management practices.

A small area of disturbed ground dominated by the presence of perennial ryegrass (*Lolium perenne*) was noted in the south-eastern part of the study area. This ground which leads from a narrow access trail out into the large arable field is subject to ephemeral waterlogging as evidenced by moss that lay beneath the ryegrass. There is limited development of **Improved Agricultural Grassland (GA1),** from the site and it largely occurs in mosaic with **Dry calcareous and neutral grassland (GS1),** is land that is not under agricultural production or represents a former hedgeline that has been scrubbed out.

A closely linked habitat is noted around built land and gardens. **Amenity Grassland (GA2**) is typical of such areas and holds little floristic value.

There are areas of rough grassland for which no obvious active management is being undertaken. This includes much of the land to the northern part of the site, which was not previously given over to the motorway construction compound. It contains characteristics of some of the above grasslands with elements of **Dry Meadows and Grasslands (GS2),** although scrub both bramble and Butterfly bush were noted to be patchily distributed across it.

There is some development of **Wet Grassland (GS4)** vegetation. It is not widespread owing to the managed agricultural nature of the site. It is dealt with separately under **Section 3.2.1.4**.

3.2.1.2 Woodland-dominated Vegetation

There is a noticeable diversity of tree composition and age throughout the site. While some of it is considered semi-native, by virtue of its age, the majority of woodland establishment has been through planting. For much of the eastern boundary between the LAP lands, a band of maturing mixed deciduous landscape tree planting screens the site. Similarly, the boundary planting along much of the western boundary is or recent origin and was established as screening from the road.

Wooded Areas

Older stands of trees, copses and linear features including veteran trees occur, relicts of the old estate. Other small areas of woodland copse or narrow linear screening have been retained and this is particularly evidence towards the southern half of the LAP lands. A greater number of mature or well stablished trees is found here. Much of the vegetation is tentatively classified as Mixed Broadleaf Woodland (WD1), although it is recognised that a detailed habitat study would likely unveil a number of distinct woodland habitats.

Individual parcels of LAP lands would have historically been bounded by hedgerows. Many hedgerows have been intensively managed through regular cutting or indeed removed to increase field size, with the result that they are mostly located in peripheral areas. Floristically, the hedgerows were largely comprised of a small number of commonly occurring species. The gradation to scrub in places is not uncommon. Elsewhere, more mature retained hedgerows have a greater tree component and can grade variously between hedgeline to mixed treeline to discrete treeline habitats. Many of the mature tree species are indicative of former planting with Beech (*Fagus sylvatica*) abundant. Others species include Sycamore (*Acer pseudoplatanus*), Ash (*Fraxinus excelsior*).

The WD1 woodland that occurs along either side of the Lissenhall/Staffordstown 08 stream, has elements of Wet Pedunculate Oak-Ash Woodland (WN4). This habitat is not mapped and does not correspond to the Annex I alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-padion, Alnion incanaem Salicion albae* (91E0), a priority Annex I habitat. The fragmentary wet woodland vegetation is locally distributed along the low-lying ground on the southern side of the stream as well as topographical depressions.

Hedgerows, Treelines and Scrub

While the development of linear wooded vegetation around and within the LAP lands is obvious, it is difficult at times to identify long established **hedgerow (WL1),** and most are characterised by characterised by linear rows of closely planted trees, sometimes native in origin but often planted. Character species include commonly occurring hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*) and immature ash (*Fraxinus excelsior*). Owing to the management of the vegetation and various developments that surround the LAP lands, no hedgerows are mapped and none of the very small remnant hedgerow vegetation would be considered of high conservation worth in terms of their history and diversity. For this reason, the vegetation is mapped as treelines.

The linear woodlands surrounding the agricultural fields in the centre of the LAP lands are intimately associated with and grade into tree-dominated vegetation. Indeed, the presence of mature deciduous trees is a notable feature of the linear vegetation. Like hedgerows, linear woodlands have an intrinsic value in that they provide support features/shelter for birds, bats and mammals.

The treelines are for the most part poorly managed and species poor, the sub-canopy species reflect the surrounding agricultural ground. The remnant hedges are characterised by mixed planting which have little or no development of understorey vegetation other than brambles by virtue of the shading and density of the planting, as well as management practices which result in regular cutting to improve sightlines along roads.

Linear woodland around the periphery of the site, particularly along the old Swords road are characterised by planted screening, which often camouflages walls. All of the treelines that were noted comprised mature (although not always tall trees) or veteran trees, with many identified as important features capable of supporting bat roost features. One notable treeline comprised veteran beech trees was noted along the western part of the study area separating the Lap lands from the R132 road.

A long linear swathe of mixed planting along boundary between the LAP lands and the M1 motorway boundary is described as **Immature Woodland (WS2).** The mixed assemblage is typically of similar age class, having been planted towards the end of the construction phase of the motorway. There are outliers of apparently self-seeded poplars, willows and ash trees becoming established inside the paladin fencing, whilst in the derelict lands to the north of the LAP lands, it appears that parts of the land have had linear drainage ridges created which has allowed for planting of considerable number of ash trees. It is likely that the trees were planted rather than having been self- sown, given the number and also same height (approximately 1.25metres).

Scrub (WS1) vegetation occurs widely across the site, typically as an edge component of woodland copses/treelines particularly along the perimeter or having replaced boundary vegetation that might have previously supported hedgerows. This habitat is typically, although not always characterised by low botanical diversity. In many instances is characterised by single shrubby species, mostly bramble (*Rubus fruticosus* agg.) but occasionally blackthorn (*Prunus spinosa*) or non–native of garden escape including butterfly bush (*Buddleia davidii*). There is some development of rose (*Rosa* spp.) in linear woodland, but it is often a distinctive component around the central woodland copse.

Individual trees occur throughout the site, some remnants possibly of former **Parkland (WD5)** setting, whilst other are of recent origin having become established in areas with little or no active management. Given the relative paucity of such mature individual trees, however the habitat is not mapped and occurs within lands mapped as GA2 which are located to the west of the HSE facility.

3.2.1.3 Disturbed and Artificial Habitats

There are a number of areas of permanently unvegetated areas – mapped as **Buildings and Artificial surfaces (BL3**). These include buildings – residential and commercial, roadway and paths and structures/walls of modern construction. This habitat comprises all man-made surfaces within the study area and for the most part is of limited botanical value. Invariably there is little or no vegetation occurring on these areas except as distinct areas of planting. There is another category of built land, albeit much limited in extent which is classified as **Stone Walls and Other Stonework (BL1).** It includes derelict old buildings and remnant stone walls. The greatest expression of this man-made habitat is beneath the central woodland copse. The old masonry has in places been overgrown with ivy (*Hedera helix*) or scrub including some development of butterfly bush (*Buddleia davidii*). As this habitat is overshadowed by other vegetation – woodland and scrub, it has not been mapped. However, it should not be interfered with as a result of the development of the open LAP lands.

There is some occurrence of both of **Spoil and Bare Ground (ED2)** and **Recolonising Bare Ground (ED3)** habitats around the site, although the majority is intimately linked with areas of disturbance such as the abandoned motorway construction compound at the northern end of the site. Bunded ground is often transient in nature. Over time and with a reduction in disturbance, the seedbank within the bared ground can develop. Typically, the species are ruderals or fast growing pioneer species which may or may not be replaced over time by more stable graminoids species typical of the surrounding landscape. Smaller patches occur in shaded and disturbed ground around buildings depending on the nature of the exposed ground.

3.2.1.4 Watercourses, Ditches and Wetlands

There are a number of narrow linear features mapped within the LAP lands which can drain water. Most of these features are classified as **Drainage Ditches (FW4),** mostly occurring on field margins or outside the LAP lands alongside the existing M1. The drains vary between dry or wet, mostly dry, although those towards the eastern boundary contained some water or had vegetation indicative of wet conditions.

There was limited linear development of common reed (*Phragmites australis*) separating the two large arable fields to the east of the LAP lands. The species poor vegetation although corresponding to **Reed and large sedge Swamp (FS1)**, is likely a remnant of winter flooding in the low lying ditch in this area.

While the LAP lands are located in close proximity to the Broadmeadow river which flows into the transitional coastal waters of Malahide Estuary, only one EPA-named watercourse occurs in the LAP lands. The Staffordstown_08 stream flows through the northern part of the study area. Although narrow and modified, it is classified as a **Depositing/Lowland Rivers (FW2).** There is little development of riparian vegetation other than pioneer plants such as nettles (*Urtica dioica*) and thistles (*Cirsium* spp.) and rank grasses along the edge of the arable crops. The northernmost bank of the watercourse is characterised by hedge and narrow woodland habitats which separate the arable fields from the abandoned motorway construction compound. No discernible flow was noted during the surveys, although some standing water was present in places. Were the watercourse to flow, it would be in an easterly direction towards the M1 motorway where it passes through a culvert before continuing eastwards towards Seapoint where it discharges into Malahide estuary.

Much of the LAP lands are characterised by agricultural or wooded habitats. However, the narrow watercourse running west to east across the LAP lands (Staffordstown_08 or Lissenhall stream) is characterised by an absence of instream vegetation owing to the overshadowing of the linear wooded feature along both banks. The low riparian vegetation was typically characterised not by aquatic vegetation, but rather by admixtures of agricultural crops and their associated weed coupled with **wet grassland (GS4**) vegetation. This species-poor assemblage of this mosaic, in which the ground was largely dry during summer 2018, is indicative of territory that is prone to conditions whereby the water table is closer to the ground during winter periods or for when standing water may persist owing to poor drainage. This was confirmed in Winter 2019 and 2020 when the ground was wet but not flooded underfoot. Owing to the works in Winter 2019, parts of this ground were heavily tracked during the installation of utility ducting.

3.2.2 Flora

Historically, meadow barley (*Hordeum secalinum)* was identified from the surrounding area with a number of records between 1903 to 1960. It has not since been knowingly identified. This is a species which is typically found in clay-rich soils in floodplains and coastal marshes where livestock graze. Given the considerable change in the surrounding landscape agricultural regime of the LAP lands, it is unlikely to occur here.

Smooth brome (*Bromus racemosus*), which is listed on the Irish Red List as ‘Near Threatened’, was recorded on the NBDC database from the surrounding area in 2014. However, this record is more than 5km to the south west of the LAP lands and this species was not recorded from suitable habitat within the accessible parts of the LAP lands.

One species of local interest was noted during early surveys from beneath the woodland copse, between derelict buildings. Further surveys confirmed that ivy broomrape (*Orobanche hederacae*) was locally abundant throughout the central woodland copse.

3.2.3 Invasive Alien Plant Species

The NBDC notes a number of records of IAPS from the vicinity of the LAP East lands including common cordgrass (*Spartina anglica*) – a species locally abundant in the estuarine saltmarsh and further upstream along the brackish areas of the Broadmeadow river. Other records include two third schedule species namely; giant hogweed and Japanese knotweed, although neither were recorded from within the study area.

While no third schedule IAPS were recorded during the field surveys, two medium impact species butterfly bush (*Buddleia davidii*) and sycamore (*Acer pseudoplatanus*) were noted. Two distinct clumps of the butterfly bush are mapped, whilst the Sycamore which is occasional along the site perimeter and some internal woodland copses. Butterfly bush was not recorded in this area during the ecological walkover survey in August 2022. However, due to access issues the entire area was not covered and therefore it is likely that this species is still present on site.

3.2.4 Mammals

3.2.4.1 Badger

Despite the fact that the LAP lands are enclosed by urban setting, there was evidence of mammals utilising the area, although the evidence was often old. Secondary evidence included prints, old droppings and discontinuous sections of well-defined trails. The majority were noted towards the north of the site, although further visits in 2019, 2020 and 2022 noted that both fox and badger overlapping in territories.

One mammal underpass under the motorway was noted. While there was no sign of activity around it, its construction does not conform to NRA (2005) guidance and there is no connectivity between it and the LAP. Improvement works would need to be undertaken as part of the potential development of the LAP lands.

Aside from a single area within the central wooded part of the LAP lands, which has been subject of potential interference including the dumping of corrugated roofing material over holes, no other sett or indications of burrows of size suitable to accommodate badger were identified in accessible parts of the LAP lands, but it must be noted that the land to the north of the site were not accessed and as such confirmation of badger habitation within the site cannot be ruled out at this point.

Evidence of badger activity in terms of prints, trails or was regularly noted during surveys, but rarely continuous except in the northern part of the site in Winter 2019/2020. Trails comprising well defined prints were obvious is wet mud around the northern periphery of the field alongside the North eastern interface to unsurveyed lands were noted. While occasional or individual faecal deposits were noted from across the site, no latrines were found noted.

Other areas where a number of trails were noted but could not be followed led towards the eastern perimeter of Lissen Hall House where it interfaces with the LAP lands. Parts of the boundary are fenced but access is possible and some of the fencing is pulled up. Much of the evidence pointed towards fox and rabbit by virtue of the deviating trails and remains of predated birds and rabbits, as well as the central wooded area surrounding the derelict Meudon House, where fox trails were abundant throughout.

3.2.4.2 Otter

Otter (*Lutra lutra*) are known from the area, particularly along the Ward and Broadmeadow rivers (personal observation as part of this survey and discussions with other ecologists on other undisclosed projects). Documentary evidence from NBDC database, as well as the original EIS for Metro North repeatedly also noted evidence of otter commuting along these watercourses. The NBDC includes a number of records for live sightings of otter along the Broadmeadow river and the upper stretches of Malahide estuary, as recently as 2013. A walk along to the upper transitional coastal stretches of the watercourse at low flow reveals that the Broadmeadow River and its riparian zone along each bank has potential places for holt or couchés, though none were confirmed when visited in Summer and Autumn 2018. However, evidence of otter activity was noted in gravels along the Broadmeadow river into which the Ward river flows, before discharging into Malahide estuary.

Notwithstanding the fact that the presence of otter habitation features – holts or couchés were not confirmed along the southern boundary of the LAP lands, the proposed lands to be developed are considerably further inland than otter might usually roam unless in search of prey such as frogs, evidence of spawn in low-lying wet ground never been recorded during any visits.

There was no evidence of otter activity from within the LAP lands in summer and autumn of 2018. The absence of significant water flow in the Lissnehall/Staffordstown 08 watercourse within the site for much of its length within the LAP lands at that time and hence the lack of food resource would suggest that the LAP lands would not endear otter to commute or forage in this area, certainly in the summer months.

Repeat search for evidence of otter activity carried out during 2020 surveys noted an increase in water levels for many of the site visits. Access to some previously densely vegetated areas of the watercourse, where it flows under the M1 culvert was possible owing to removal of scrub to facilitate utilities pipeline installation. The water levels in the watercourse were higher than noted in previous surveys with noticeable flow, although with little obvious improvement in water quality. Areas of gravel were noted, but no evidence of holting structures nor prints were found during any visit. The presence "downstream" of a motorway culvert could also deter otter activity, as it is suggested that otters do not ordinarily like passing through man-made tunnels, particularly if they cannot see the opposite end.

3.2.4.3 Bats

Bat activity surveys were undertaken in summer 2018 to assess potential use of the Lissenhall East LAP area by bats. Survey details are outlined in **Table 3-3.**

Table 3-3: Bat Activity Survey Dates and Details

Survey Details	Dates	Comments
Sunset	21.40	21.30
Survey Start/End Time	21.25 – 00.30	21.15 – 00.00
Temperature	12- 13°C	12- 13°C
Other Notes	Overcast and warm conditions, with one light shower at *c.* 22.30. It was noted that the eastern side of the LAP lands near the M1motorway were relatively bright as a result of light spill from the motorway lighting.	Dry and slightly overcast conditions. It was noted that the eastern side of the LAP lands near the M1motorway were relatively bright as a result of light spill from the motorway lighting.

Bat records recorded within the area are detailed in **Table 3-4** and illustrated in **Appendix D.** Two bat species were recorded foraging and commuting within the LAP lands on both survey occasions, soprano pipistrelle (*Pipistrellus pygmaeus*) and common pipistrelle (*Pipistrellus pipistrellus*).

On 20th of July, the first activity was recorded relatively late, 23.00, with the last activity recorded at approximately 00.15. On 27th July the first activity was recorded at 21.45 with the last being noted at 23.55.

Activity surveys for the section of the (now superseded) Metro North EIS did not locate bat roosts in the area, but noted that the Ward and Broadmeadow Rivers were important commuting and foraging habitats. Specifically, the metro north EIS survey findings reported that Leisler's bat and Daubenton's bats were recorded along the Broadmeadow River east of the R132 road in close proximity of the Lissenhall site. The current activity surveys did not confirm any roosts within the LAP lands, merely activity across the site, mostly along vegetated features but also across open land in the case of Leisler's bat.

Records kindly supplied by Bat Conservation Ireland in respect of the LAP lands and surrounding areas and personal experience of some proximal survey areas indicate that while bat activity can be more common than usually thought of in urban areas, roosts are particularly associated with areas of well-developed woodland. Although no roosts were recorded during the surveys, it is possible given the nature of the findings particularly towards the southern half of the site, where the greatest concentration of structures (not including the modern commercial premises along the old Swords road) and mature trees could support a roost.

Table 3-4: Bat Survey Results

Survey	Time Area	Ref# on Figure 3.1	Findings

20th July	23.00	1	Soprano pipistrelle heard but not seen, feeding over treeline in the northern section of the LAP lands (to the south west of the smaller wheat crop fields). The bat returned every few minutes and so it is thought it was feeding over the Lissenhall Veterinary/HSE lands.
	23.45	2	Soprano pipistrelle and common pipistrelle were heard but not seen commuting/feeding over the strip of woodland to the north of the LAP lands, adjoining the old motorway compound. They were active for several minutes, moving away and then coming back to the area.
	00.15	3	A single common pipistrelle was detected but not seen commuting over the treeline to the north of the Swords Ambulance Station.
27th July	21.45	4	Soprano pipistrelle seen and heard feeding up and down along the treeline dividing the two small wheat crop fields in the northern portion of the LAP lands. The bat was repeatedly feeding for *c.* 25mins.
	22.05	5	Common pipistrelle seen and heard feeding over the strip of woodland to the north of the LAP lands, adjoining the old motorway compound. The bat returned every few minutes for *c.* 10mins, and so it is thought that it was feeding over the compound area and other and returning.
	22.55	6	Soprano pipistrelle heard briefly at eastern end of strip of woodland to the north of the LAP lands, adjoining the old motorway compound.
	23.00	7	Soprano pipistrelle heard at end of treeline. Possibly the same Soprano that was feeding up and down the treeline repeatedly earlier in the night.
	23.20	8	Soprano pipistrelle heard very briefly feeding in the south east corner of the LAP area, feeding over trees within the Lissenhall House lands.
	23.30	9	Soprano pipistrelle heard briefly commuting in the southern part of the LAP area.
	23.35	10	Soprano pipistrelle heard briefly over trees to the north of Lissenhall House.
	12.00	11	Common pipistrelle heard feeding over the woodland in the centre of the LAP lands.

3.2.4.4 Other Mammals

Despite the presence of well-developed woodland in places in or in close proximity to the LAP lands, there were no sightings of any mammals. Secondary evidence was found in the form of prints, trails, scat and burrows etc., of fox and rabbit. There was no sighting of grey squirrel or hedgehog, for which review of roadkill records indicate that they are known from the wider area. There was evidence of rabbit, particularly towards the northern half of the site, but no hares were observed. A single grey squirrel was noted alongside Lissen Hall House grounds, outside of the LAP lands.

3.2.5 Avifauna

3.2.5.1 Breeding Birds

The aim of the breeding bird survey was to determine the breeding bird species present within the Lissenhall East LAP area, whether there is any evidence of breeding behaviour and to map distribution. Survey details are presented in **Table 3-5.**

All birds and their nests are protected under the Wildlife Act (as amended). There is substantial suitable habitat for breeding birds within the LAP area including hedgerows, trees/treelines, woodland, scrub and buildings. Breeding birds recorded within the area are detailed in **Table 3-6** and are illustrated in **Appendix D**.

Table 3-5: Breeding Bird Survey Dates and Details

Survey Details	Dates	Comments
Start/End Time	04.30/09.00	04.30/09.00
Wind (Force 1-5)	1	1
Cloud (1-8)	7	7
Rain	1	0
Temperature	13°C	13°C

Visibility	Good	Excellent
Other Notes	Light drizzle to begin with, one or two light showers during survey, slightly overcast but good visibility. Activity noticeably tapered off from *c.* 7.30am.	Calm, dry conditions. Noticeably less activity than the previous survey, with activity tapering off from *c.* 7.30am.

No Birds Directive Annex I bird species were recorded from the LAP lands during breeding bird surveys in 2017 or 2018, although the red listed yellowhammer was noted during summer surveys and later in winter alongside the M1 embankment on the eastern side of the LAP lands. These species are discussed further in **Section 3.2.5.2**.

The Ward River lies to the south of Lissenhall house south, was visited on a number of occasions. A number of species were noted including - mallard (*Anas platyrhynchos*), grey wagtail (*Motacilla cinerea*) and kingfisher (*Alcedo atthis*). At least one pair of kingfisher were noted downstream of the road bridge perching on a low hanging branch. They later flew downstream out of sight. A single kingfisher also flew upstream under the road bridge, but it is not known if it was one of the earlier pair.

Table 3-6: Bird Species recorded during Breeding Bird Survey

Species	Conservation BoCCI[9]	Importance Annex I[10]	Adhoc records
Blackbird (*Turdus merula*)		No	Yes
Bullfinch (*Pyrrhula pyrrhula*)		No	Once
Buzzard (*Buteo buteo*)		No	Yes
Blackcap (*Sylvia atricapilla*)		No	
Blue tit (*Parus caeruleus*)		No	Yes
Chaffinch (*Fringilla coelebs*)		No	Yes
Chiffchaff (*Phylloscopus collybita*)		No	
Coal tit (*Parus ater*)		No	
Dunnock (*Prunella modularis*)		No	
Goldfinch (*Carduelis carduelis*)		No	Yes
Greenfinch (*Carduelis chloris*)		No	
Jackdaw (*Corvus monedula*)		No	Yes
Magpie (*Pica pica*)		No	Yes
Long-tailed tit (*Aegithalus caudatus*)		No	
Pheasant (*Phasianus colchicus*)		No	Twice
Robin (*Erithacus rubecula*)		No	Yes
Rook (*Corvus frugilegus*)		No	Yes
Great tit (*Parus major)*		No	
Swallow (*Hirundo rustica*)		No	
Song thrush (*Turdus philomelos*)		No	
Treecreeper (*Certhia familiaris*)		No	
Wood pigeon (*Columba palumbus*)		No	Yes
Wren (*Troglodytes troglodytes*)		No	Yes
Yellowhammer (*Emberiza citronella*)		No	Yes

While it was past the breeding bird survey period, the final ecological walkover survey in August 2022 recorded birds on an adhoc basis. No additional bird species were recorded onsite to those already listed. Yellowhammer were not recorded, however they may have bred and fledged by this time. Two buzzards, an adult and juvenile, were recorded soaring, calling and perched in two trees around the site (to both the north and south of the LAP lands) throughout the survey.

[9] Conservation status sourced from the Birds of Conservation in Ireland (BoCCI) list (Colhoun & Cummins, 2013) compiled by BirdWatch Ireland and the RSPB NI. Red List (high conservation concern for either breeding or wintering populations) , Amber List (medium conservation concern) , Green List (not threatened)

[10] Annex I of the EU Birds Directive

3.2.5.2 Wintering Birds

With the exception of Pintail (*Anas acuta*), the National Biodiversity Data Centre indicate the presence of all of the Special Conservation Interests (SCI) species in the general territory in which the LAP lands are located. The presence of SCIs from the proximal Malahide Estuary SPA (004025) are indicated on the NBDC database as being recorded from the vicinity although no site specific records were identified from within the LAP lands for the following SCI species.

- Great crested grebe (*Podiceps cristatus*) [A005]
- Light-bellied brent goose (*Branta bernicla hrota*) [A046]
- Shelduck (*Tadorna tadorna*) [A048]
- Pintail (*Anas acuta*) [A054]
- Goldeneye (*Bucephala clangula*) [A067]
- Red-breasted (*Merganser Mergus serrator*) [A069]
- Oystercatcher (*Haematopus ostralegus*) [A130]
- Golden plover (*Pluvialis apricaria)* [A140]
- Grey plover (*Pluvialis squatarola*) [A141]
- Knot (*Calidris canutus*) [A143]
- Dunlin (*Calidris alpina alpina*) [A149]
- Black-tailed godwit (*Limosa limosa*) [A156]
- Bar-tailed godwit (*Limosa lapponica*) [A157]
- Redshank (*Tringa totanus*) [A162]

The findings of the modified wintering bird surveys (**Appendix F** for description of methodology) undertaken in support of the LAP are presented in **Appendix F**. No SCI bird species of the Malahide Estuary SPA were noted using the LAP lands. Site requirements vary as food resources change throughout the season. The preferred forage for brent geese is of eelgrass (*Zostera marina*) and other fine saltmarsh vegetation although this can be supplemented by graminoids including agricultural land as the estuarine resource become depleted and waterfowl often move inland. Golden plover typically occur as large flocks and although normally associated with coastal sites, can move inland where conditions dictate, and resources are available. The survey of the four agricultural fields was the focus of the survey to determine usage by light-bellied brent goose, golden plover and any other SCI species.

During the course of the visits over two seasons, there was no evidence of brent geese having used the LAP fields. There were no signs of their characteristic faecal pellets. While three duck were noted flying across the northern tip of the site in a westerly direction, no geese were observed overflying or landing on the site during the course of the surveys.

The proximal area to the LAP lands where brent geese were noted was east of the M1 Motorway bridge which crosses the upper estuary (**SP3**). Some geese occasionally came in close or were noted grazing on saltmarsh sward east of the M1 Motorway bridge during 2018, but most were observed in the central part of the estuary until the tide turned, when they departed for other areas. It is likely that subsets of the species exist and that they can utilise other areas, based on at least 1 observation by accompanying surveyor on December 28th visit. The numbers of brent geese noted at **SP3** in 2019/2020 survey season far outnumbered the observations from the first season's visits.

Golden plover were not recorded at any time from the LAP lands, overflying or grazing. Small flocks were noted interspersed with gulls, terns and geese in upper estuarine areas of the SPA, particularly as the turning tide exposed mudflats.

3.2.6 Insects

A review of the NBDC in 2018 returned an historical record for marsh fritillary from 1960's. The walkover surveys and follow on visits did not record this Habitats Directive Annex II species. Given the intensive agricultural development of the LAP lands, no suitable derelict or infrequently managed habitats were identified and the host plant for its larvae, devils bit scabious (*Succisa pratensis*) was not recorded.

3.2.7 Amphibians

The early surveys were undertaken during summer months and hence did not confirm the presence of frog spawn. Evidence of frogs was not found during any subsequent winter surveys, despite searching all established and ephemeral water-features including low-lying land in the larger agricultural fields alongside the ditch. No spawn was noted and indeed the shallow water pools were typically located in exposed agricultural fields with little vegetation other than remnant stalks from previous harvest and a build-up of algal material, which would not be conducive as spawning territory.

3.2.8 Aquatic Ecology Assessment

Inland Fisheries Ireland (IFI) note that the Lissenhall or Staffordstown 08 stream, which crosses the LAP lands, is classified as non-salmonid, by virtue of pressures of agricultural inputs, urban expansion and physical rearranging of the watercourse through culverting interfering with water quality. This narrow watercourse, which starts upstream of the LAP lands, flows under the M1 motorway at the eastern side of the LAP lands before eventually flowing into Malahide estuary at Seapoint.

A visual assessment of the Lissenhall or Staffordstown 08 stream confirmed that is was for most of its length within the LAP lands dry or with little water during the summer season with little evidence of potential to support fish or crayfish. Stagnant water, with an obvious scum on much of its surface was noted in October 2018. There was little or no flow. Follow-on wintering visits in 2019 and 2020, noted, not surprisingly increased water depths, with improved flow noted in winter 2020. There is some connectivity to seasonally wet ground in the flood zone to the east of the site, however the culvert leading from the LAP lands under the M1 motorway is partially impeded by a build-up of sediment as well as instream vegetation. The agriculturally-managed land is unlikely to support a diverse range of aquatic macroinvertebrates given the nature of the watercourse.

Separately, the Ward and Broadmeadow have been identified by IFI consultation as important salmonid systems in that they both support Brown trout populations whilst the Ward supports Atlantic salmon – an Annex II EU Habitats Directive Species. The Broadmeadow River, into which the Ward River flows, before discharging into Malahide estuary is not directly impacted by the proposed LAP lands. For that reason, it was not subjected to detailed survey. However, as noted elsewhere, it was visited two occasions and notable faunal confirmations included perching/commuting kingfisher and as well as secondary evidence of otter – prints and 1 X spraint noted in other sections.

4 GREEN INFRASTRUCTURE

It is an aim of this report to raise the awareness and understanding of the biodiversity of the LAP lands so that all relevant ecological information will be used by the project proposer in the development of the design and Fingal County Council planning staff in the development of policies and objectives to protect and conserve the Key Green Infrastructure of the area. It is envisaged that the recommendations to help in achieving this goal have been outlined below. This advice should inform discussion, and feed into the policies and objectives for the Lissenhall Local Area Plan.

4.1 Policy Guidance

One of the main development challenges in Fingal is maintaining the agricultural capacity with growth and protecting natural and cultural resources with increasing urbanisation. Under objective GI19, all new developments are required to contribute to the protection and enhancement of existing green infrastructure and the delivery of new green infrastructure, as appropriate.

In keeping with the high level policies and objectives of the *Fingal County Development Plan 2017-2023*, consideration should be given when drafting planning policy and objectives to the ecological, social and economic benefits that can be reached by conserving and improving habitats and green spaces. Five (5) main themes are identified with relevant objectives to the Lissenhall East project as well as separate group that includes other GI specific Objectives pertinent to Lissenhall East LAP as follows:

4.1.1 Biodiversity

The biodiversity potential of the site is mixed. On the one hand the proximity to a number of overlapping conservation designations coupled with the Local Authority identified ecological networks areas would suggest considerable potential or a desire to realise/further that through mainstreaming biodiversity with the planning process. In reality the site is relatively small, surrounded on most sides by development and other infrastructural encroachments that further isolate the lands.

Notwithstanding this fact, the site has its own inherent ecological value, and the features therein indicate that the biodiversity potential is somewhat greater than surrounding developed areas. The proximity of the relatively small refuge to Malahide estuary and the compliment of wintering wildfowl for which the SPA site has been designated for, increases this intrinsic biodiversity ranking as the lands potentially provide isolated and disturbance-free forage land for species such as Brent Geese as suggested by consultative response.

The Fingal Development Plan (as varied) includes a number of objectives in respect of green infrastructure which are pertinent to enhancing biodiversity during the development of the Lissenhall East LAP and any subsequent implementation once adopted.

- Objective GI23 - Ensure biodiversity conservation and/or enhancement measures, as appropriate, are included in all proposals for large scale development such as road or drainage schemes, wind farms, housing estates, industrial parks or shopping centres.
- Objective GI24 - Integrate provision for biodiversity with public open space provision and sustainable water management measures (including SuDS) where possible and appropriate.
- Objective GI32 - Seek the provision of green roofs and green walls as an integrated part of SuDS and which provide benefits for biodiversity, wherever possible.

4.1.2 Parks, Open Space and Recreation

Currently there is no publicly accessible, open ground associated with the proposed LAP territory, as art of it already developed or is privately owned and managed largely for agricultural purposes. Accessibility to and the need for the provision of a range of open spaces is an integral requirement of the Fingal Green Infrastructure policy, providing community connectivity to surrounding areas. In this respect, the Fingal Development Plan (as varied) includes objectives that must be considered in the context of the developing LAP. These include:

- Objective GI26 - Provide a range of accessible new parks, open spaces and recreational facilities accommodating a wide variety of uses (both passive and active), use intensities and interests.
- Objective GI27 - Provide attractive and safe routes linking key green space sites, parks and open spaces and other foci such as cultural sites and heritage assets as an integral part of new green infrastructure provision, where appropriate and feasible.
- Objective GI28 - Provide opportunities for food production through allotments, community gardens and permaculture food forests in new green infrastructure proposals where appropriate.
- Objective G29 - Develop a Cycle/ Pedestrian Network Strategy for Fingal that encompasses the Fingal Way and other proposed routes which will be screened for Appropriate Assessment and Strategic Environmental Assessment.

4.1.3 Sustainable Water Management

The proposed LAP lands contain both Flood Zones A and B (RPS 2019). Following from this, some of the agricultural lands are within Zone A and as such the justification test would be prohibited. In respect of watercourses, riverine floodplains and vulnerable coastal flood zones, there is a 0.1% (1 in 1000 chance per year) flood risk in east zone of site (RPS, 2019), with hydrological connectivity to downstream coastal zones. The Fingal Development Plan (as varied) includes a number of key requirements that must be considered in all plans and developments, namely:

- Objective GI30 - Ensure the provision of new green infrastructure addresses the requirements of functional flood storage, the sustainable management of coastal erosion, and links with provision for biodiversity, Sustainable Drainage Systems (SuDS) and provision for parks and open space wherever possible and appropriate; and
- Objective GI31- Seek the creation of new wetlands and/or enhancement of existing wetlands through provision for Sustainable Drainage Systems (SuDS).

4.1.4 Archaeological and Architectural Heritage

All plans and/or projects arising from them must be cognisant of a site's heritage and due consideration be given to the features such as Recorded Monument or Place (RMP), Protected Structure (RPS) Architectural Conservation Areas (ACAs) and historic graveyards.

While some of the LAP lands have already been developed, the remainder is largely isolated agricultural lands with some wooded areas. Within the lands, the cultural assessment of the LAP lands (Courtney Deery, 2018) noted the absence of RMP, although Lissen Hall House (RPS 342) is adjacent. Much of the surrounding would have in historical times formed part of the demesne territory. The undesignated remains of Meudon House and associated outhouses lies within the LAP lands in central wooded area. The geophysical survey of the site (Leigh, 2018) has identified an irregular rectilinear ditched enclosure in one part of the site, with another smaller potential curved feature in fields along the western extent of the application area.

In this respect the applicable objectives from the Fingal Development Plan (as varied) include:

- Objective GI33 - Ensure, wherever possible and appropriate, that elements of the archaeological and architectural heritage are fully integrated into proposals for new developments at the project design stage; and
- Objective GI34 - Seek to provide and/or enhance access to archaeological and architectural heritage assets in a sustainable manner, where appropriate, thus facilitating opportunities for education and understanding.

4.1.5 Landscape

The proposed LAP lands is classed as a 'Highly Sensitive Landscape' as per GI development plan. While much of the open lands are given over to Agriculture with peripheral areas are managed/planted, much of

recent origin, nonetheless, it is envisaged that the landscaping will focus on existing tree belts/hedges and water features as part of the wider landscaping recommendations reinforcing proposed green corridors and public open space. In this regard the Fingal Development Plan (as varied) requires the following:

- Objective GI35- Ensure green infrastructure provision responds to and reflects landscape character including historic landscape character, conserving, enhancing and augmenting the existing landscapes and townscapes of Fingal which contribute to a distinctive sense of place.

4.1.6 Other Relevant Objectives

The following objectives are pertinent to the preparation of Lissenhall East LAP.

- Objective GI08: Increase public awareness in relation to green infrastructure in Fingal and its importance for communities and the local economy by publishing information and holding seminars and events;
- Objective GI09 - Develop and implement a Green Infrastructure Strategy for Fingal in partnership with key stakeholders and the public;
- Objective GI11 - Ensure the Green Infrastructure Strategy for Fingal reflects a long-term perspective, including the need to adapt to climate change;
- Objective GI12- Ensure the Green Infrastructure Strategy for Fingal protects the County's natural coastal defences, such as beaches, sand dunes, salt marshes and **estuary lands**, and promotes the use of soft engineering techniques as an alternative to hard coastal defence works wherever possible; and
- Objective GI16 - Ensure the Green Infrastructure Strategy connects and integrates existing and new communities through appropriate planning, ongoing management and governance.

4.2 Draft Design

The draft design has been cognisant of local and national objectives. In Lissenhall East, the design of the LAP lands including the layout of the various elements such as drainage, landscaping and biodiversity enhancements are evolving as an iterative process. The following strategic recommendations should be an integral component of the LAP as they will satisfy the objectives of the higher tier Fingal Development Plan (as varied) and other plans such as the National Biodiversity Action Plan:

- The proposed layout for the site will in the first instance protect existing ecological receptors and where possible enhance or suitably manage the areas so that corridors/linkages to the wider environment are maintained – The key areas are identified in **Appendix E**, but it is recognised that the evolving design may result in additional green infrastructure elements being incorporated in the final design;
- All habitats should be protected appropriately according to their ecological value – Thus woodland and hedgerows in particular must be retained, protected and enhanced where possible;
- Those responsible for managing green infrastructure and ecologically-valuable habitats within the LAP territory should undertake best practice in conservation management including day to day operations and or monitoring the efficacy of the measures with quantifiable metric. A practical management plan must be developed and ownership of same agreed, to ensure the successful implantation of the measures;
- Ensuring that all developments are shown to pay due consideration to the flood risk and that they include Sustainable Urban Drainage Systems (SUDS);
- Planting of riparian buffer zones (to be confirmed with more detailed, and guidance from organisations such as EPA and IFI) adjacent to the watercourses;
- The potential for establishment of Invasive Alien Species (IAS) should be managed from the inception of the adopted LAP, so that the threat including outcompeting of retained vegetation including the woodland as well as water features. Any establishment of third schedule IAS, in particular as well as being potentially costly to manage and damaging to habitats and flora, has the potential owing to

hydrological connectivity to spread to European sites which could result in a qualifying feature not achieving favourable conservation status, as is required under EU legislation;

- The lighting design should be cognisant of bat commuting trails. The design of lighting should follow the guidance of recent 2018 guidance (BCT 2018) including the location and type of lighting and the need for continuously lit areas;
- If there is any further evolution of the LAP design, the landscaping proposals should identify areas of habitat and associated features, that could be practically managed, to benefit bees and other pollinators;
- There is potential for reinforcing planting and screening particularly around perimeter areas such as the western perimeter of the LAP lands. In the spirit of the objectives arising from the Fingal Development Plan (as varied), careful consideration must be given to species selection and the use of species of local origin would be preferable; and
- In the absence of conclusive evidence, the poorly installed Mammal underpass along the eastern boundary should be rectified, so that in the event that badger did make use of the underpass that they would not be forced up onto the motorway.

In light of the findings of the ecological survey and the areas of key ecological importance identified in **Appendix E**, as well as complimentary assessments e.g. Flood risk, landscape assessment it is hoped that the indicative draft design will be reviewed and that the recommendations provided for above will enhance the biodiversity potential of the site.

4.3 Additional Recommendations for Lissenhall East LAP lands

4.3.1 Appropriate Assessment

In accordance with legislative requirements, the LAP will be subject to Appropriate Assessment. The LAP, beneath the Fingal Development Plan 2017-2023 (as varied), is nonetheless subject to certain vagaries such as phasing of the development and in-combination impacts of subsequent or adjacent plans or projects. All phases and/or individual developments arising out of the LAP design shall be subject to Screening for Appropriate Assessment in the first instance. Given the proximity of the lands to, and direct connectivity to European sites, and the notified usage of the lands by Brent Geese, it is likely that the LAP will be subject to stage II AA, necessitating the production of a Natura Impact Report.

4.3.2 Monitoring and Evaluation

The following steps could be undertaken to add further value to the studies which have been carried out to date: Monitoring of bird species, particularly SCI species from the adjacent SPA, that might utilise open spaces within the LAP;

- Owing to the fact that some lands could not be visited, it is recommended that a preconstruction survey for badger be undertaken to identify if setts occur within or adjacent to the proposed development lands;
- Monitoring of bat activity particularly around the derelict Meudon House – to determine that local populations are maintained and that the efficacy of mitigation measures is benefitting the population;
- Monitoring of the wildflower areas and its management regime to ensure successful establishment; and
- Monitoring of wildflower, ponds features and derelict areas to ensure that vegetation development replicates as far as is possible floristic assemblages and niches to the benefit greater biodiversity.

4.3.3 Education and Public Engagement

Despite the largely commercial nature of the design for much of the proposed LAP lands and its proximity to a proposed public transport network e.g. MetroLink station; the provision of green infrastructure and open

spaces as well as the retention of areas of semi-natural vegetation could encourage local residents and visitors to walk through the area, particularly if the walkway to the estuary road is maintained. There is potential for increasing the level of public awareness of habitats and biodiversity within the LAP lands and the contribution to the wider Fingal area.

With that in mind, a number of further measures are recommended:

- Where appropriate, and where it has not already been undertaken, educational signs and posters highlighting the wildlife resource could be put up in locations of ecological interest within the LAP lands and along existing or proposed pedestrian routes etc. to inform the general public;
- The records of all surveys including any future monitoring should be shared with the NBDC; and
- Engaging with the developer and their landscape designer, as well as current occupiers regarding planting assemblages. Issues such as replanting/reinforcing existing hedgerow planting and management or replanting with more suitable, native wildlife appropriate species to promote a greater understanding of intrinsic wildlife value of the site.

5 CONCLUDING REMARKS

The proposed Lissenhall East LAP lands occupy a strategic location within the Dublin Region. The lands act as the northern gateway to Swords, the administrative centre of Fingal. The LAP lands, which are comprised of agricultural and commercial operations are bounded by the R132 and the M1 motorway, and within close proximity of the planned MetroLink route. Thus, it is considered that the lands could provide for the sustainable integration of land use, transportation and economic development in the region, as identified in the *Fingal Development Plan 2017-2023* (as varied) and the vision for High technology zoned land.

It is an aim of this report that findings will be used in developing policies and objectives to protect and enhance the biodiversity potential and green infrastructure of the site.

The findings of this report confirm that the LAP lands does not occur within any nature designation area i.e., SACs designated under the Habitats Directive (92/43/EEC), SPAs designated under the Birds Directive (79/409/EEC), NHAs or pNHAs afforded protection under the Wildlife Act 1976 (as amended). The LAP lands are however spatially separated from the adjacent Malahide estuary European sites by the M1 motorway.

The lands are designated as a buffer zone under the Fingal Biodiversity Plan as they are proximally located to the overlapping designations of Malahide Estuary, separated to the east by the M1 motorway and to the south by the sylvan-rich lands of Lissenhall House. There is direct hydrological connectivity between the LAP lands to Malahide Estuary via the Lissenhall or Staffordstown_08 stream.

The ecological potential of the LAP lands reflects the setting and management of the lands, nestled among major roads and edge of urban development. No part of the site has been untouched by human intervention at some time, although there is evidence of dereliction or recent absence of management including the around the central woodland copse or the lands to the north of the site.

In terms of plants, no rare or protected species were recorded, a fact which reflects the agricultural management across the central part of the site. Owing to the relative floristic paucity and management of the lands, none of the habitats (Fossit, 2000) correspond to Annex I habitats. Notwithstanding this fact, there are habitats and corridors and stepping stones across the LAP lands which by virtue of their relative isolation and dereliction increases their ecological value.

Evidence of mammal activity largely relates to non-protected species such as fox and to a lesser extent, rabbit. And despite the presence of a poorly constructed mammal underpass leading from the site under the M1 motorway, there is evidence of badger activity across the site, although it was not possible to locate any active setts. Bats make use of the site, commuting and foraging although it would appear for most of the LAP lands that roosting potential is limited. Mature trees and derelict buildings in the centre of the site would be retained, but potential disturbances will require sensitive design to ensure reducing displacement.

Owing to the proximity to Malahide Estuary, two seasons of wintering surveys around accessible LAP lands were undertaken. The modified surveys included searches in adjacent parts of the Malahide Estuary SPA to confirm the presence of the SCI species on the same day. While the presence of SCI species including brent geese was confirmed from within SPA territory, there was no evidence of wintering wildfowl using the large open fields.

It is hoped that the recommendations provided will inform the discussion and development of the LAP document as well as the final ecologically sensitive design for the lands. The design and development of the LAP offers the potential to retain and indeed enhance ecological features in a landscape that is fast quickly developing. This is in keeping with the objectives of the *Fingal Development Plan 2017-2023* (as varied). The draft green infrastructure proposals presented in **Chapter 4** should provide the basis from which the detailed design for the LAP lands will be developed.

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Appendix A
Written Response to Consultation

A1: Development Applications Unit Response GPre00133/2018) dated 26/06/18

A2: Inland Fisheries Ireland email dated 29/05/18

A3: Bat Conservation Ireland Consultation Letter dated 28/08/18

A4: Irish Brent Goose Research Group email dated 23/05/18

A5: Birdwatch Ireland email response dated 23/05/18

A6: EPA Response to SEA Screening Request dated 15/07/22

A7: DECC GSI Response to SEA Screening Request dated 21/07/22

A8: DHLGH Response to SEA Screening Request dated 25/07/22

Appendix A1: Development Applications Unit Response GPre00133/2018) 26th June 2018

An Roinn Cultúir,
Oidhreachta agus Gaeltachta
Department of Culture,
Heritage and the Gaeltacht

Our Ref: **G Pre00133/2018** *(Please quote in all related correspondence)*
Your Ref: **MH17018_Lt001_DAU**

26 June 2018

Tim Ryle B.Sc., Ph.D., MIEnvSc
Senior Ecologist – RPS,
West Pier Business Campus,
Dún Laoghaire,
Co. Dublin

Via email: tim.ryle@rpsgroup.com

Re: Consultation regarding the ecological surveys for the proposed Lissenhall East Local Area Plan. Lissenhall is an area east of Swords in North County Dublin.

A chara,

On behalf of the Department of Culture, Heritage and the Gaeltacht, I refer to correspondence received in connection with the above.

Outlined below are heritage-related observations/recommendations of the Department under the stated heading.

Nature Conservation:

Please note for future reference that you should consult the requirements of this Department in relation to pre-planning at https://www.npws.ie/development%20consultations, in particular the section entitled pre-application consultation/engagement.

This Department notes the request in your letter dated 22nd May last for an opinion and advice in relation to the proposed plan. Please find below some issues to be considered in the Plan as well as in the Strategic Environmental Assessment (SEA) and appropriate assessment screening/appropriate assessment (AA).

Plan

Legislation

The Plan and SEA should take account of the Biodiversity Convention, the Ramsar Convention, the EC Habitats Directive (Council Directive 92/43/EEC), the EC Birds Directive (Directive 2009/147 EC), the Wildlife Acts of 1976 to 2012, and the European Communities (Birds and Natural Habitats) Regulations 2011 to 2015. The Planning Authority should also refer to the relevant circular letters which have been circulated to Local Authorities and which are available at http:/www.npws.ie/guidance-appropriate-assessment-planning-authorities.

Designated sites

The Plan should include a natural heritage section. All designated sites within or adjoining the Plan area should be listed and mapped, including, if applicable, candidate Special Areas of Conservation (cSAC) designated under the Habitats Directive, Special Protection Areas (SPA) designated under the Birds Directive, Natural Heritage Areas (NHA), Proposed Natural Heritage Areas (pNHA), Nature Reserves, and Refuges for Fauna, designated under the Wildlife Acts. Details of these sites are available on http://www.npws.ie/. All such sites should be zoned appropriately and policies and objectives should be devised to ensure their protection. The Plan should take cognisance of boundary changes to sites made during the lifetime of the Plan. For information on Geological and Geomorphological NHAs the Geological Survey of Ireland should be consulted. Where designated sites are within more than one Planning Authority area the relevant Planning Authorities should ensure they do not have conflicting policies for such a site.

Protected species

The proposed Plan should recognise that protected species also occur outside designated sites and should take note of the National Biodiversity Plan and the need to protect the County's biodiversity. Examples of protected species include protected plants listed in SI 355 of 2015, mammals such as badgers (*Meles meles*) and the Irish Hare (*Lepus timidus hibernicus*), protected under the Wildlife Acts and listed on Appendix III of the Berne Convention, and bat species and otters, protected under the Wildlife Acts and listed on Annex IV of the Habitats Directive. All birds are protected under the Wildlife Acts and some, such as the peregrine falcon (*Falco peregrinus*) and kingfisher (*Alcedo atthis*), are listed on annex I of the Birds Directive.

Article 10 of Habitats Directive

In accordance with Article 10 of the Habitats Directive, Plans should include provisions to encourage the management of features of the landscape which are of major importance to wild fauna and flora. This includes linear landscape features which act as ecological corridors, such as watercourses (rivers, streams, canals, ponds, drainage channels, etc.), woodlands, hedgerows and road and railway margins, and features which act as stepping stones, which include marshes and woodlands. These provide pathways for the dispersal and genetic exchange of wild species and can help improve the coherence of the Natura 2000 network. Such features should be maintained and, where possible, enhanced.

Hedgerows, bats and other protected species

Hedgerows form important wildlife corridors and provide areas for birds to nest in. In addition badger setts may be present. If suitable trees are present bats may roost there and they use hedgerows as flight routes. Hedgerows also provide a habitat for woodland flora. Where a hedgerow forms a townland or other historical boundary it generally is an old hedgerow. Such hedgerows will contain more biodiversity than a younger hedgerow. Hedgerows should be maintained where possible. Where trees or hedgerows have to be removed there should be suitable planting of native species in mitigation. Where possible hedgerows and trees should not be removed during the nesting season (i.e. March 1st to August 31st).

Bat roosts may be present in trees, buildings and bridges. Bat roosts can only be destroyed under licence under the Wildlife Acts and a derogation under the Birds and natural Habitats Regulations and such a licence would only be given if suitable mitigation measures were implemented.

Rivers and wetlands

Wetland habitats such as rivers are an important source of biodiversity and contain species such as otters (*Lutra lutra*), Salmon in freshwater (*Salmo salar*), kingfishers (*Alcedo atthis*), crayfish (*Austropotamobius pallipes*) and Lamprey species, all protected under the Wildlife Acts of 1976 to 2012 and/or listed on the annexes of the EC Habitats Directive and Birds Directive. It is important

that the proposed Plan should recognise the importance of wetland habitats and ensure that such sites are protected.

Flood plains, if present, should be identified in the Plans and left undeveloped to allow for the protection of these valuable habitats and provide areas for flood water retention. The Plan should take account of the guidelines for Planning Authorities entitled "The Planning System and Flood Risk Management" and published by the Department of the Environment, Heritage and Local Government in November 2009.

Inland Fisheries Ireland (IFI) should be consulted with regard to impacts on fish species and the Local Authority may find it useful to consult their publication entitled "Planning for watercourses in the urban environment" which can be downloaded from their website at http://www.fisheriesireland.ie/fisheries-management-1/86-planning-for-watercourses-in-the-urban-environment-1/file.

Water

Ground and surface waters should be protected from pollution and the Planning Authority should ensure that adequate sewage treatment facilities are or will be in place prior to any development proposed in the Plan. The Planning Authority should also ensure that adequate water supplies are present prior to development. Care should be taken to ensure that any proposed water abstractions or waste water discharges do not negatively impact on Natura 2000 sites.

Roads

Where roads are listed for improvement and upgrading in the Plan the opportunity should be taken to address inadequate existing mitigation measures or impeded passage (e.g. include mammal underpasses or dry ledges where there is poor culvert design). In making provision at plan level for transport, including reserving lands and integrating or upgrading routes, this should be based on information on ecological constraints, and should allow sufficient flexibility for impacts to be avoided or mitigated.

Alien invasive species

Alien invasive species such as Japanese Knotweed and Giant Hogweed can be damaging to local biodiversity. The Plan should have a policy to protect against the accidental introduction of such species during development. Information on alien invasive species in Ireland can be found at http://invasives.biodiversityireland.ie/ and at http://invasivespeciesireland.com/.

Amenity developments

Negative impacts on biodiversity and designated sites, particularly in the mountains, by the coast and along rivers, can occur as a result of development such as walking routes, cycleways, seating, lighting, canoe trails, loss of riparian zone and mowing of riparian zone, and can lead to habitat loss, erosion and added disturbance by humans and dogs. Such developments along waterways for example could impact on species such as otters and bats which are strictly protected under the Habitats Directive and Kingfishers listed on Annex I of the Birds Directive. One of the main threats identified in the threat response plan for otter is habitat destruction (see http://www.npws.ie/sites/default/files/publications/pdf/2009_Otter_TRP.pdf).

In addition a 10m riparian buffer on both banks of a waterway is considered to comprise part of the otter habitat. Any proposed walkways, cycletracks or greenways marked on the Plan maps along rivers should therefore be a suitable distance from the water's edge. In general, pedestrian and cycle routes need ecological assessment in their planning and design and should not target sensitive ecological sites or parts of sites, as such routes have potential for disturbance to habitats and species, including as a result of noise, lighting, etc. Otherwise their development may not be consistent with nature conservation objectives and legal compliance requirements.

Green Infrastructure

From a biodiversity point of view it is important to take note of the EU Green Infrastructure Strategy. Further information on this can be found in the EU commission's document of 2013 which can be accessed at http://ec.europa.eu/environment/nature/ecosystems/docs/green_infrastructure_broc.pdf.
Care should be taken to ensure that green infrastructure involves greening existing infrastructure rather than adding built infrastructure to existing biodiversity corridors.

Pollinators

It is recommended that the natural heritage section of the Plan should also contain a policy on implementing the All-Ireland Pollinator Plan 2015-2020. In particular uncut road verges, where safety allows it, can provide wild flowers as food for pollinators, and should be encouraged.

SEA

Integrated assessment

In line with the EPA publication on integrated biodiversity impact assessment it is particularly important that the SEA process should take place in consultation with the teams working on the draft Plan and appropriate assessment, as each process can help inform the other to ensure that the objectives and policies in the draft Plan will have no significant effects on the natural heritage. The SEA should examine the effects of policies, objectives and any indicative maps or zonings, as well as cumulative impacts with other plans and projects both within and outside of the Plan area.

Legislation

The SEA should take account of the Biodiversity Convention, the Ramsar Convention, the Birds and Habitats Directives, the Wildlife Acts of 1976 to 2012, and the European Communities (Birds and Natural Habitats) Regulations, 2011 to 2015. A revised (consolidated) version of the Wildlife Act 1976 (in PDF and HTML) is now available on the Law Reform Commission website http://revisedacts.lawreform.ie/revacts/alpha#W. It is annotated to show the source of all changes, and for convenience an un-annotated PDF is also available.

Baseline data

With regard to the scope of baseline data, details of designated sites can be found at http://www.npws.ie/. For flora and fauna in the SEA, the data of the National Parks and Wildlife Service (NPWS) should be consulted at http://www.npws.ie/. Where further detail is required on any information on the website http://www.npws.ie/, a data request form should be submitted. This can be found at https://www.npws.ie/sites/default/files/general/Data%20request%20form.doc. Further information may be found at http://dahg.maps.arcgis.com/home/index.html.

Other sources of information relating to habitats and species include that of the National Biodiversity Data Centre (www.biodiversityireland.ie),Inland Fisheries Ireland (www.fisheriesireland.ie), BirdWatch Ireland (www.birdwatchireland.ie) and Bat Conservation Ireland (www.batconservationireland.org). Data may also exist at a County level within the Planning Authority.

Strategic Environmental Objectives (SEOs)

It is recommended that the Biodiversity SEOs in the SEA cover habitats and species both within and outside of designated sites as below where applicable;

- Natura 2000 sites, i.e. Special Areas of Conservation (SAC) designated under the EC Habitats Directive (Council Directive 92/43/EEC) and Special Protection Areas designated under the EC Birds Directive (Directive 2009/147 EC),
- Other designated sites, or sites proposed for designation, such as Natural Heritage Areas and proposed Natural Heritage Areas, Nature Reserves and Refuges for Fauna or Flora, designated under the Wildlife Acts 1976 to 2012,
- Species protected under the Wildlife Acts including protected flora,
- '*Protected species and natural habitats*', as defined in the Environmental Liability Directive (2004/35/EC) and European Communities (Environmental Liability) Regulations, 2008, including Birds Directive – Annex I species and other regularly occurring migratory species, and their habitats (wherever they occur) and Habitats Directive – Annex I habitats, Annex II species and their habitats, and Annex IV species and their breeding sites and resting places (wherever they occur),
- Important bird areas such as those as identified by Birdlife International,
- Features of the landscape which are of major importance for wild flora and fauna, such as those with a "stepping stone" and ecological corridors function, as referenced in Article 10 of the Habitats Directive,
- Other habitats of ecological value in a national to local context (such as those identified as locally important biodiversity areas within Local Biodiversity Action Plans and County Development Plans),
- Red data book species,
- and biodiversity in general.

With regard to the SEOs for Water in the SEA it is important that the needs of protected species such as freshwater pearl mussels, crayfish, salmon and lamprey species, all protected under the Wildlife Acts of 1976 to 2012 and/or listed on the annexes of the EC Habitats Directive, are considered in relation to water quality. The SEOs and targets should be also compatible with the relevant River Basin Management Plans.

Water issues and wetland habitats

The impact of any water abstraction and wastewater discharge schemes that result from the Plan should be fully assessed.

Impacts on surface water or groundwater should be assessed on a catchment or aquifer basis. In addition where a proposed policy would result in a development in or alongside a river or other waterway the cumulative impact on species and habitats would need to be assessed cumulatively on a catchment basis.

Indicators, targets and monitoring

Indicators, targets and monitoring should be realistic, measurable and achievable.

Appropriate Assessment (AA)

Guidance

Guidance is available in the Departmental guidance document on Appropriate Assessment (AA), which is available on the NPWS website at
http://www.npws.ie/sites/default/files/publications/pdf/NPWS_2009_AA_Guidance.pdf
and in the EU Commission guidance entitled "*Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*" which can be downloaded from
http://ec.europa.eu/environment/nature/natura2000/management/docs/art6/natura_2000_assess_en.pdf

However CJEU and Irish case law has clarified some issues and should also be consulted.

Conservation objectives

In order to carry out the appropriate assessment screening and/or prepare a Natura Impact Report (NIR) information about the relevant Natura 2000 sites including their conservation objectives will need to be collected. Details of designated sites and species and conservation objectives can be found on http://www.npws.ie/. Site-specific, as opposed to generic, conservation objectives are now available on the website for some sites. Each conservation objective for a qualifying interest (QI) is defined by a list of attributes and targets and is often supported by further documentation. Where these are not available for a site, an examination of the attributes that are used to define site-specific conservation objectives for the same QIs in other sites can be usefully used to ensure the full ecological implications of a proposal for a site's conservation objective and its integrity are analysed and assessed. It is advised, as per the notes and guidelines in the site-specific conservation objectives, that any reports quoting conservation objectives should give the version number and date, so that it can be ensured and established that the most up-to-date versions are used in the preparation of Natura Impact Statements and in undertaking appropriate assessments.

Integrated assessment

In line with the EPA publication on integrated biodiversity impact assessment it is particularly important that the appropriate assessment procedure, commencing with screening, should take place in consultation with the teams working on the draft Plan and SEA as each process can help inform the other to ensure that the objectives and policies in the draft Plan will have no significant effects on any Natura 2000 site. The appropriate assessment should examine the effects of policies, objectives and any indicative maps or zonings, as well as cumulative impacts with other plans and projects both within and outside of the Plan area.

Cumulative and ex-situ impacts

Other relevant Local Authorities should be consulted to determine if there are any projects or plans which, in combination with this proposed Plan, could impact on any Natura 2000 sites.

A rule of thumb often used is to include all Natura 2000 sites within a distance of 15km. It should be noted however that this will not always be appropriate. In some instances where there are hydrological connections a whole river catchment or a groundwater aquifer may need to be included. Similarly where bird flight paths are involved the impact may be on an SPA more than 15 km away.

The above observations/recommendations are based on the papers submitted to this Department on a pre-planning basis and are made without prejudice to any observations that the Minister may make in the context of any consultation arising on foot of any development application referred to the Minister, by the planning authority, in her role as statutory consultee under the Planning and Development Act, 2000, as amended.

You are requested to send further communications to this Department's Development Applications Unit (DAU) at **manager.dau@ahg.gov.ie** (team monitored); if this is not possible, correspondence may alternatively be sent to The Manager, Development Applications Unit (DAU), Department of Culture, Heritage and the Gaeltacht, Newtown Road, Wexford, Y35 AP90

Is mise, le meas

Sinéad O' Brien
Development Applications Unit

Appendix A2: Inland Fisheries Ireland Email Response dated 29/05/18

Tim,

The Broadmeadow and Ward are important salmonid systems, The Ward River supports both Atlantic salmon (Annex II of EU Habitats Directive) and Brown trout populations and provides a particularly important nursery function for salmonid species. The Broadmeadow supports Brown trout populations throughout. The Lissenhall is currently non salmonid probably due to a combination of pressures including extensive culverting , poor water quality and the general impacts of urbanisation , none the less there are sections with varied ,diverse habitat and fisheries potential.

Watercourses are natural corridors for fish and wildlife movement. To insure that impacts from development/change in land use practices (including flood plain development) do not interfere with the aquatic environment it is essential that those areas adjacent to waterways (riparian buffer zones) are managed in a manner which will lessen impacts to these habitats. A riparian/buffer zone is a vegetated area near a stream, which helps shade and partially protect a stream from the impact of adjacent land uses. It is a discrete ecological and geographical entity. It is the point of contact between the land (i.e. the terrestrial ecosystem) and the freshwater body (i.e. the aquatic ecosystem). It plays a key role in protecting/improving water quality in associated watercourses (streams, rivers, and lakes), thus providing environmental benefits. With the decline of many aquatic ecosystems due to development (both urbanisation and agricultural production), riparian buffers have become a common conservation measure aimed at improving water quality and lessening pollution impacts. The riparian/buffer zone must be sufficiently wide to protect the watercourse. Riparian buffers promote water quality benefits (bank stabilisation, interception of nutrients, sediments and pesticides).They also provide habitat benefits in terms of providing shade, enhancing instream diversity (overhanging vegetation creates niches and supplies invertebrates and leaf-litter into the aquatic zone) and help mitigate habitat fragmentation by providing connectivity i.e. as linear features in the landscape. Riparian zones can reduce fragmentation by connecting isolated habitats thereby creating greater structural diversity and critical mass. Protection of aquatic zones can require riparian/buffer zones of up to 50m. The width of the riparian/buffer zone will depend on factors such as land use, land topography (e.g. slope), soil type, channel width/gradient and critical habitats to be protected.

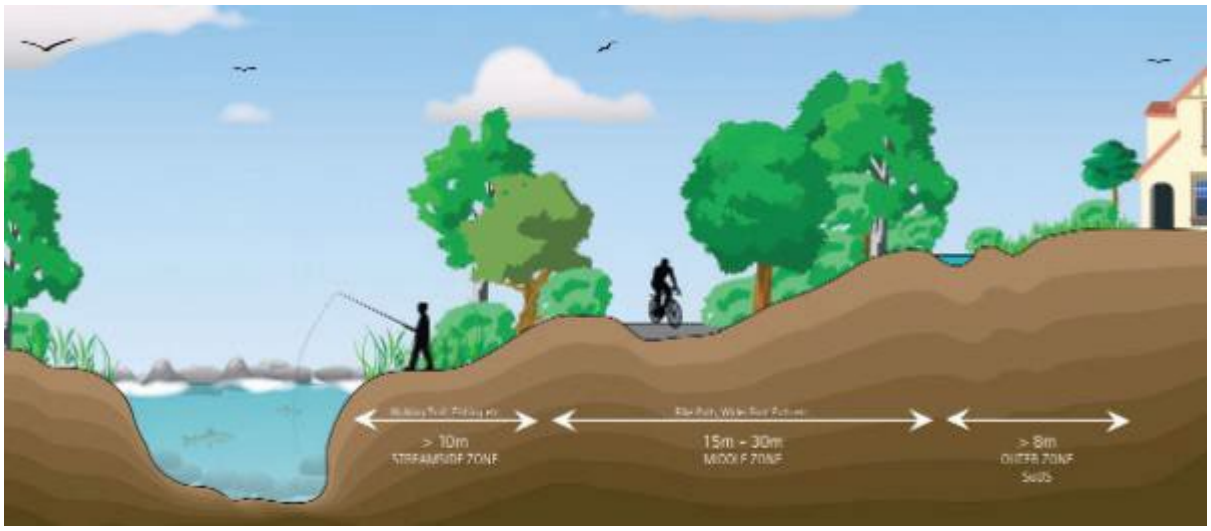

Diagram illustrating riparian buffer sub zones (from IFI guidance document - Planning for watercourses in the urban environment - http://www.fisheriesireland.ie/Download-document/86-Planning-for-Watercourses-in-the-Urban-Environment.html

Further information on fish data available on www.wfdfish.ie Rivers Ward and Broadmeadow in Rivers survey 2011 and Broadmeadow Estuary Transitional surveys 2008 and 2010.

Any further queries ,give me a call.

Kind regards,

Gretta

Gretta Hannigan

Senior Fisheries Environmental Officer

Inland Fisheries Ireland- Dublin

Iascach Intíre Éireann

Inland Fisheries Ireland

Tel +353 (0)1 8842693

Email gretta.hannigan@fisheriesireland.ie

Web www.fisheriesireland.ie
3044 Lake Drive, City West, Dublin 24, IRELAND.

Appendix A3: Bat Conservation Ireland Response

Bat Conservation Ireland Ltd., Ulex House, Drumheel, Lisduff, Virginia, County Cavan

Charitable Company Limited by Guarantee No. 494343

www.batconservationireland.org info@batconservationireland.org

27th August 2018

Tim Ryle B.Sc., Ph.D., MIEnvSc
Senior Ecologist
RPS
West Pier Business Campus,
Dun Laoghaire, County Dublin.
Ireland
T +353 (0) 1 488 2900
D 00353 1 4882983
E tim.ryle@rpsgroup.com
W www.rpsgroup.com/ireland

RE: Grid Reference – O1914148331

Dear Tim,

Thank you for contacting Bat Conservation Ireland in relation your data request. Records for the quoted grid references within 10km radius of the grid reference listed. And excel file has been provided with the bat records for this search area.

The seriousness of the decline of bat population across Europe has led to the establishment of conservation programmes and appropriate legislation to stablise population numbers. The following should be considered in relation to developments or proposals that may impact on bat populations:

a. Bats and their bat roosts are protected by Irish (Wildlife Act 1976 and 2000 Amendment) which make it an offence to willfully interfere with or destroy the breeding or resting place of these species. All species of bats are listed in Schedule 5 of the 1976 Act and therefore are subject to the provisions of Section 23. The Wildlife Amendment Act 2000 improves the conservation of both species and their habitats and gives statutory protection to Natural Heritage Areas (NHAs).
b. Potentially the most important legislation for the protection and conservation of flora and fauna and their natural habitat is the EC Habitats Directive 1992 (EEC 92/43), which lists habitats and species of European conservation importance. This directive seeks to protect rare and vulnerable species, including all species of bats. All ten species of bat are protected with the lesser horseshoe bat listed as an Annex II species while all other bats (commonly known as vesper bats) are listed as Annex IV species.
c. Local Planning Authorities are required to give consideration to nature conservation interests under the guidance of the SEA Directive 2001/42/EC. This directive states that the protected status afforded to bats means that planning authorities must consider their presence in order to reduce the impact of developments through mitigation measures.
d. The National Biodiversity Plan confers general responsibilities on all participants in the development process to take into account of protected species. "*The overall objective is to secure the conservation, and where possible the enhancement, and sustainable use*

of biological diversity in Ireland and contribute to conservation and sustainable use of biodiversity globally".

Member States must achieve a favourable conservation status for bat species. This involves measures that will stabilize the population dynamics of the species, so that it maintains itself on a long-term basis as a viable component of the natural habitat. Therefore, each Member State must prevent the natural range of the species from reducing and thus takes measures to ensure suitable habitat remain in the long-term.

There are total of nine species of bat known to roost in the Republic of Ireland: soprano pipistrelle, common pipistrelle, Nathusius' pipistrelle, Natterer's bat, Daubenton's bat, whiskered bat, lesser horseshoe bat, Leisler's bat and brown long-eared bat. Each bat species have particular ecological requirements in relation to roosting, commuting and foraging habitats. A tenth species of bat, the Brandt's bat, was recorded once in 2001 and is considered a vagrant species. In addition, a single male Greater Horseshoe bat was also recorded once in 2012 and is also considered a vagrant. The NPWS Conservation Assessment for each species can access via www.npws.ie as well as a number of documents listed below.

NPWS Conservation Status Assessment report for each of the species recorded is presented below:

a. Natterer's bat *Myotis nattereri* (Species Code 1322)
This species is given a Favourable Status in Republic of Ireland.
b. Whiskered bat *Myotis mystacinus* (Species Codes 1330)
This species is given a Favourable Status in Republic of Ireland.
c. Leisler's bat *Nyctalus leisleri* (Species Code 1331)
This species is given a Favourable Status in Republic of Ireland. Ireland is the stronghold for this species and is given a status of International Importance.
d. Daubenton's bat *Myotis daubentoni* (Species Code 1314)
This species is given a Favourable Status in Republic of Ireland.
e. Brown long-eared bats *Plecotus auritus* (Species Code 1326)
This species is given a Favourable Status in Republic of Ireland.
f. Common pipistrelle *Pipistrellus pipistrellus* (Species Code 1309)
This species is given a Favourable Status in Republic of Ireland.
g. Nathusius' pipistrelle *Pipistrellus nathusii* (Species Code 1317)
This species is given a Favourable Status in Republic of Ireland.
h. Lesser horseshoe bat *Rhinolophus hipposideros* (Species Code 1303)
This species is given a Favourable Status in Republic of Ireland.
i. Brandt's bat *Myotis brandtii* (Species Code 1320)
This species is given a Favourable Status in Republic of Ireland.
j. Soprano pipistrelle *Pipistrellus pygmaeus* Species Code 1309)
This species is given a Favourable Status in Republic of Ireland.

The principal pressures on Irish bat species are 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

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- management of aquatic and bank vegetation for drainage purposes
- abandonment of pastoral systems
- spieleology and vandalism
- communication routes: roads
- forestry management

For information on population trends, distribution and threats please consult the Bat Conservation Ireland publication *Irish Bats in the 21st Century* (Roche *et al.,* 2014).

Bat Conservation Ireland officially came into existence in 2004 and now acts as the national umbrella group for all county bat groups. Bat Conservation Ireland is affiliated with the Irish Wildlife Trust and works closely with many NGOs, The Heritage Council and NPWS Conservation Rangers. Bat Conservation Ireland manages the All Ireland Bat Monitoring Programme in conjunction with Bat Conservation Trust UK and under the funding and assistance of the Heritage Council, NPWS (Department of Environment, Heritage and Local Government), EHS (Department of Environment Northern Ireland) and Waterways Ireland. We provide information on the conservation of bats to all public enquires and will assist the general public in their needs in relation to bats. The group is also involved in providing training in the use of bat detectors through organising bat detector workshops. The erection of bat boxes, field surveys and the collection of data on bat distribution in the country are on-going group projects.

If you have any further queries, please do not hesitate to contact me.

Yours sincerely,

Dr Tina Aughney

_____

Dr Tina Aughney
Bat Conservation Ireland

Bat Conservation Ireland Ltd., Ulex House, Drumheel, Lisduff, Virginia, County Cavan

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Conditions of data usage:

❑ Data is provided at a spatial level deemed appropriate for the sensitivity of the data. Only 4 figures grid reference should be reported in public reports for roost sites with no name or address of the roost site listed.
❑ Data is supplied for consultation purpose. The lack of records for a particular area does not mean that there are no bats present.

 Data are not passed to a third party.

 Data are supplied only for the uses or specific analyses stated on the Data Sharing Agreement. A further form must be completed for any uses additional to those originally described.

 The respective project will be acknowledged wherever the data provided are used, in publications, reports, papers etc. as follows: “Bat Data from XXX project (e.g. BATLAS 2010) was supplied by Bat Conservation Ireland” or similar wording depending on the dataset. BCIreland will specify a wording if a different one is required to the above.

 Raw data are not to be given verbatim in any presentation, publication, report etc. without prior written permission from Bat Conservation Ireland.

 No data will be published on the internet without prior written permission from Bat Conservation Ireland.

 Up to four copies of any report or publication will be supplied, free of charge, to Bat Conservation Ireland In the case of confidential reports, only relevant sections using the bat data provided will be required. This requirement may be waived under certain conditions, e.g. student dissertations, at the discretion of the project partners.

 Permission to use the data supplied expires 12 months after approval, unless otherwise agreed. All copies of the data, including those on database, should be destroyed/ removed at this time.

 Failure by the User to abide by the conditions above may jeopardise the release of data in future requests. Project partners may impose further conditions of use of the data or substitutions for them where specific exemptions are agreed. In such cases, applicants will be notified before data are released.

 Additional bat data collated by the surveying bodies should be submitted to BCIreland to include on the database thereby ensuring the continued high level of bat data available for future datasets.

Whilst every effort is made to ensure data held are correct, Bat Conservation Ireland cannot accept responsibility for any errors in data provided. We will always seek to provide the most recent data available. Bat Conservation Ireland cannot be held responsible for any misuse or misrepresentation of the data supplied.

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Consultation Documents:

Anon (2002) National Biodiversity Plan. Department of Arts, Heritage, Gealtacht and the Islands.

Anon (2008) The status of EU protected habitats and species in Ireland: Conservation status in Ireland of habitats and species listed in the European Council Directive on the Conservation of Habitats, Flora and Fauna 92/43/EEC. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government.

Kelleher, C. and Marnell, F. (2006) Bat Mitigation Guidelines for Ireland. Irish Wildlife Manuals, No. 25. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

Limpens, H. J. G. A., Twist, P., & Veenbaas, G. 2005 Bats and road construction. *Brochure about bats and the ways in which practical measures can be taken to observe the legal duty of care for bats in planning, constructing, reconstructing and managing roads.* Rijkwaterstaat, Dienst Weg-en Waterbouwkunde, Delft, the Netherlands and the Vereniging voor Zoogdierkunde en Zoogdierbescherming, Arnhem, The Netherlands. 24 pages. DWW-2005-033.

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.

National Roads Authority (2004 & 2009) *Guidelines for assessment of ecological impacts of National road schemes.* NRA, Dublin.

National Roads Authority (2006) Best Practice *Guidelines for the Conservation of Bats in the planning of National Road Schemes.* NRA, Dublin.

National Roads Authority (2006) G*uidelines for the Treatment of Bats during the construction of National Road Schemes.* NRA, Dublin.

NPWS (2009) Threat Response Plan: Vesper Bats (2009-2011). National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland

Roche, N., Aughney, T., Marnell, F. and Lundy, M. (2014) *Irish Bats in the 21st Century*. Cavan: Bat Conservation Ireland.

Whilde, A. 1993 *Threatened mammals, birds, amphibians and fish in Ireland. Irish Red Data Book 2: Vertebrates.* Belfast: HMSO.

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Lisduff, Virginia, County Cavan

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www.batconservationireland.org info@batconservationireland.org

Bat Conservation Ireland Database

The BCIreland Database contains the following datasets:

a. Car-based Bat Monitoring Scheme 2003-2015

The Car-Based Bat Monitoring Scheme was first piloted in 2003 and targets the two most abundant pipistrelle species (common and soprano pipistrelles) and the Leisler's bat. The car based survey makes use of a broadband bat detector which picks up a range of ultrasound which can be recorded in the field and analysed post-survey. Car survey teams survey pre-mapped routes within 30km squares (28 designated squares) across the island of Ireland. This monitoring scheme is jointly funded by NPWS and NIEA.

b. All Ireland Daubenton's Bat Waterways Scheme 2006-2015

This scheme follows a survey methodology devised by the Bat Conservation Trust (BCT UK). Narrow band, heterodyne detectors are used by volunteers who conduct a 1km river/canal survey on the activity level of Daubenton's bat at chosen waterways. Surveyors count the number 'bat passes' of this bat species for 4 minutes at each of the ten fixed points on linear waterways across the island of Ireland. This monitoring scheme is jointly funded by NPWS and NIEA.

c. Brown Long-eared Bat Roost Monitoring Scheme 2007-2015

This scheme concentrates on counts of brown long-eared bats at specified roosts in the Republic of Ireland only. The roost survey protocol involves at least two counts per annum (mid-May to August) using three potential survey methods depending on the structure, access and location of bats within, and emerging from, the roost. This monitoring scheme is funded by NPWS.

d. BATLAS 2010

The BATLAS 2010 survey of the Republic of Ireland and Northern Ireland was conducted during two field survey years (2008 and 2009) to ascertain the distribution of four targeted bat species. The targeted species were; common and soprano pipistrelle, Daubenton's and Leisler's bats. This survey was funded by The Heritage Council, NPWS and NIEA.

e. Landscape conservation for Irish bats & species specific roosting characteristics

Using the 2000-2009 database of species records, collated and maintained by Bat Conservation Ireland, analysis of the habitat and landscape associations, using Corine, of all species that commonly occur in Ireland namely; common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, Leisler's bat, Daubenton's bat, Natterer's bat, whiskered bat, brown long-eared bat and the lesser horseshoe bat, was undertaken. Through this project BCIreland aims to provide a guide to the key habitat associations of bats to help understand their habitat requirements in Ireland. This model is available as a GIS shape-file on a county by county basis.

f. Ad Hoc Bat Records

Ad Hoc Records submitted by various groups including Bat Groups, BCIreland members, Ecological Consultants, etc. 2000-2013 are compiled on the BCIreland database. BCIreland accepts and verifies bat records from known groups and individuals. Such records consist of roost and bat detector records.

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DATA SEARCH 27TH AUGUST 2018
10KM RADIUS: O1914148331 – ROOSTS ONLY

Name	Grid reference	Address	Species
15DITA12WC	O2550	Bat Box Scheme	Nyctalus leisleri
15DITA8WC	O2550	Bat Box Scheme	Pipistrellus spp. (45kHz/55kHz)
15DITA9WC	O2550	Bat Box Scheme	Pipistrellus spp. (45kHz/55kHz)
Private	O1745	Swords, County Dublin	Pipistrellus spp. (45kHz/55kHz)
Private	O0939	Finglas West, Dublin 11, County Dublin	Nyctalus leisleri
Private	O2550	Donabate, County Dublin	Pipistrellus pygmaeus, Plecotus auritus
Private	O1355	Ballyboughal, County Dublin	Pipistrellus spp. (45kHz/55kHz)
Private	O1346	St Margarets County Dublin	Nyctalus leisleri
Private	O1953	Lusk Fingal Dublin	Plecotus auritus
Private	O1247	Fingal Co. Dublin	Pipistrellus pipistrellus (45kHz)
Private	O1150	Rolestown Fingal County Dublin	Nyctalus leisleri, Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus
Private	O2450	Donabate, County Dublin	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Plecotus auritus
Private	O2241	Portmarnock Fingal Co. Dublin	Pipistrellus pygmaeus
Private	O2050	Fingal, County Dublin	Pipistrellus spp. (45kHz/55kHz)
Private	O2256	Lusk Fingal Co. Dublin	Pipistrellus pipistrellus (45kHz)
Private	O2350	Donabate, County Dublin	Unidentified bat
Private	O2254	Richardstown, County Dublin	
Private	O1640	Santry Court, Dublin	Unidentified bat
Private	O2345	Malahide Fingal Co. Meath	Pipistrellus pipistrellus (45kHz)
Private	O2345	Malahide Fingal Co. Dublin	Plecotus auritus
Private	O2739	Howth, County Dublin	Plecotus auritus
Private	O2353	Lusk, County Dublin	Unidentified bat
Private	O2050	Fingal, County Dublin	Pipistrellus spp. (45kHz/55kHz)

Appendix A4: Irish Brent Goose Research Group Email Response 23/05/18

Hi Tim,

I have taken a look at your map, and I don't think that we have any records from that area.

However, having said that, our database concentrates specifically on records of birds which we have marked. We do **not** attempt to carry out regular counts of given areas, but merely rely on records which are submitted to us either "casually" by observers, or as part of our own research processes. Looking at your map area on Google Earth, it appears to include an area of grassland, which could render it entirely possible as a site, given the proximity of locations at Malahide Estuary which can hold large numbers of brent geese. The experience elsewhere in the Dublin area indicates that birds can move inland, even quite large distances, particularly when disturbed, and I note Niall Harmey's local knowledge (which I obviously have no reason to doubt) that the geese do indeed use the area.

I'm sorry, therefore, that I am unable to help in this instance. I will, however, circulate this email to some of our active local observers, to see whether any of them have any even anecdotal evidence of usage of this area, and will get back to you if they do.

Cheers,

Graham

Graham McElwaine,
Re-sightings Co-ordinator,
Irish Brent Goose Research Group,
100, Strangford Road,
DOWNPATRICK,
Co. Down,
Northern Ireland
BT30 7JD
(H) +44 (0)28 44612915
(M) +44 (0)7980 986544
http://irishbrentgoose.blogspot.co.uk
http://irishbrentgoose.com.

Appendix A5: Birdwatch Ireland email Response Dated 23/05/18

Hi Tim,

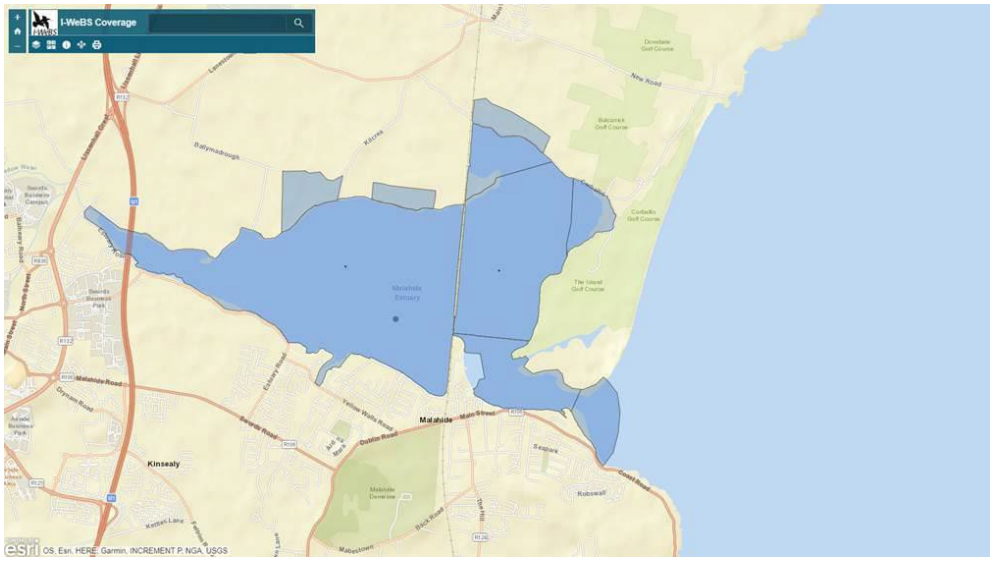
And thanks, Graham. The count boundaries of the Irish Wetland Bird Survey (shown below, areas marked in blue), do not include the precise area the LAP refers to and so I'm afraid there are no I-WeBS data aside from of the estuary itself and fields further east. However, it is very possible/likely that Brent do use it as they use other fields of grass and winter crops a little further east along that north shore of Malahide Estuary. And sounds like Niall has seen them there also. I wonder has he recorded this information.

Like Graham, I've sent a message to the local I-WeBS counter of Malahide Estuary to see if he has any additional information. And there was a special waterbird survey of the Malahide/Broadmeadow carried out two winters ago which I will look up to see if the relevant area was covered. I'll let you know if there is anything that may help you. I'm afraid it sounds like specific surveys likely need to be carried out in the relevant months to satisfy this work, though I know you stated the deadline was in advance of autumn bird arrivals.

Sorry I can't be of more help just now. But I will investigate further for that additional information.

Very best wishes,

Helen.



Appendix A6: Environmental Protection Agency Response to SEA Screening Request 15/07/22

Environmental Protection Agency
An Ghníomhaireacht um Chaomhnú Comhshaoil

Regional Inspectorate,
Inniscarra,
County Cork, Ireland
Cigireacht Réigiúnach, Inis Cara
Chontae Chorcaí, Éire

T: +353 21 487 5540
F: +353 21 487 5545
E: info@epa.ie
W: www.epa.ie
LoCall: 1890 33 55 99

Dónall Ó Ceallaigh,
Planning and Strategic Infrastructure Department,
Fingal County Council,
County Hall,
Main Street,
Swords,
Co. Dublin, K67 X8Y2

15th July 2022 Our Ref: 220602

Re. SEA Screening for Draft Lissenhall East Local Area Plan

Dear Mr Ó Ceallaigh,

We acknowledge your notice, dated 26th June 2022, in relation to the Draft Lissenhall East Local Area Plan (the 'Plan') and associated Strategic Environmental Assessment (SEA) screening.

The EPA is one of the statutory environmental authorities under the SEA Regulations. In our role as an SEA environmental authority, we focus on promoting the full and transparent integration of the findings of the Environmental Assessment into the Plan and advocating that the key environmental challenges for Ireland are addressed as relevant and appropriate to the plan. Our functions as an SEA environmental authority do not include approving or enforcing SEAs or plans.

As a priority, we focus our efforts on reviewing and commenting on key sector plans. For land use plans at county and local level, we provide a 'self-service approach' via our guidance document '*SEA of Local Authority Land Use Plans – EPA Recommendations and Resources*'. This document is updated regularly and sets out our key recommendations for integrating environmental considerations into Local Authority land use plans. In finalising your SEA screening determination, we suggest that you take this guidance document into account and incorporate the relevant recommendations as relevant and appropriate to the Plan.

Proposed SEA Determination
Fingal County Council should determine whether implementing the proposed Plan would be likely to have significant effects on the environment.

We refer you to Schedule 2A of the SEA Regulations (S.I. No. 436 of 2004 as amended by S.I. No. 201 of 2011) which sets out the '*Criteria for determining whether a Plan is likely to have significant effects on the environment*', to use to determine whether the Plan would be likely to have significant effects on the environment.

Guidance on the SEA process, including an SEA pack and checklist available on our website at: https://www.epa.ie/our-services/monitoring--assessment/assessment/strategic-environmental-assessment/sea-resources-and-guidance-/ .

We recommend that you take the available guidance into account in making your SEA Screening Determination and incorporate the relevant recommendations as relevant and appropriate to the Plan.

Sustainable Development

In proposing and in implementing the Plan, Fingal County Council should ensure that the Plan is consistent with the need for proper planning and sustainable development. Adequate and appropriate critical service infrastructure should be in place, or required to be put in place, to service any development proposed and authorised during the lifetime of the Plan.

In considering the Plan, Fingal County Council should take into account the need to align with national commitments on climate change mitigation and adaptation, as well as incorporating any relevant recommendations in sectoral, regional and local climate adaptation plans.

Fingal County Council should also ensure that the Plan aligns with key relevant higher-level plans and programmes and is consistent with the relevant objectives and policy commitments of the National Planning Framework and the Eastern and Midlands Regional Spatial and Economic Strategy.

State of the Environment Report – Ireland's Environment 2020

In preparing the Plan and associated SEA screening, the recommendations, key issues and challenges described in our published State of the Environment Report *Ireland's Environment – An Integrated Assessment 2020 (EPA, 2020)* should be considered, as relevant and appropriate to the Plan. It should also be taken into account, in preparing the Plan.

Available Guidance & Resources

Our website contains various SEA resources and guidance, including:

- SEA process guidance and checklists
- Inventory of spatial datasets relevant to SEA
- topic specific SEA guidance (including *Good practice note on Cumulative Effects Assessment* (EPA, 2020), Guidance on SEA Statements and Monitoring (EPA, 2020), *Integrating climatic factors into SEA* (EPA, 2019), *Developing and Assessing Alternatives in SEA* (EPA, 2015), and *Integrated Biodiversity Impact Assessment* (EPA, 2012))

You can access these guidance notes and other resources at: https://www.epa.ie/our-services/monitoring--assessment/assessment/strategic-environmental-assessment/sea-topic-and-sector-specific-guidance-/

Environmental Sensitivity Mapping (ESM) WebTool

This new tool was launched recently by the EPA. It is a new decision support tool to assist SEA and planning processes in Ireland. It is available at www.enviromap.ie. The tool brings together over 100 datasets and allows users to create plan-specific environmental sensitivity maps. These maps can help planners examine environmental considerations, anticipate potential land-use conflicts, and help identify suitable development locations while also protecting the environment.

EPA SEA WebGIS Tool

Our SEA WebGIS Tool has been updated recently and is now publicly available at https://gis.epa.ie/EPAMaps/SEA. It allows public authorities to produce an indicative report on key aspects of the environment in a specific geographic area It is intended to assist public authorities in SEA screening and scoping exercises.

EPA WFD Application

Our WFD Application provides access to water quality and catchment data from the national WFD monitoring programme. The Application is accessed through EDEN https://wfd.edenireland.ie/ and is available to public agencies. Publicly available data can be accessed via the www.catchments.ie website.

Future amendments to the Plan

Where changes to the Plan are made prior to finalisation, or where modifications to the Plan are proposed following its adoption, these should be screened for potential for likely significant effects in accordance with the criteria set out in Schedule 2A of the SEA Regulations (S.I. No. 436 of 2004).

Appropriate Assessment

You should ensure that the Plan complies with the requirements of the Habitats Directive where relevant. Where Appropriate Assessment is required, the key findings and recommendations should be incorporated into the SEA and the Plan.

EPA AA GeoTool

Our AA GeoTool application has been developed in partnership with the NPWS. It allows users to a select a location, specify a search area and gather available information for each European Site within the area. It is available at: https://gis.epa.ie/EPAMaps/AAGeoTool .

Environmental Authorities

Under the SEA Regulations, prior to making your SEA determination you should consult with:

- Environmental Protection Agency;
- Minister for Housing, Local Government and Heritage

- Minister for Environment, Climate and Communications; and
- Minister for Agriculture, Food and the Marine.
- any adjoining planning authority whose area is contiguous to the area of a planning authority which prepared a draft plan, proposed variation or local area plan.

SEA Determination
As soon as practicable after making your determination as to whether SEA is required or not, you should make a copy of your decision, including, as appropriate, the reasons for not requiring an environmental assessment, available for public inspection in your offices and on your website. You should also send a copy of your determination to the relevant environmental authorities consulted.

If you have any queries or need further information in relation to this submission, please contact me directly. I would be grateful if you could send an email confirming receipt of this submission to: sea@epa.ie.

Yours sincerely,

Suzanne Wylde
Scientific Officer
Office of Evidence and Assessment

Appendix A7: DECC Geological Survey Ireland Response to SEA Screening Request 21/07/22

An Roinn Comhshaoil,
Aeráide agus Cumarsáide
Department of the Environment,
Climate and Communications

Geological Survey
Suirbhéireacht Gheolaíochta
Ireland | Éireann

Dónall Ó Ceallaigh
Planning and Strategic Infrastructure Department
Fingal County Council
County Hall, Main Street
Swords
Co. Dublin, K67 X8Y2

21 July 2022

Re: SEA Screening for Draft Lissenhall East Local Area Plan
Your Ref: n/a
Our Ref: 22/285

Dear Dónall,

Geological Survey Ireland is the national earth science agency and is a division of the Department of the Environment, Climate and Communications. We provide independent geological information and advice and gather various data for that purpose. Please see our website for data availability. We recommend using these various data sets, when conducting the EIAR, SEA, planning and scoping processes. Use of our data or maps should be attributed correctly to 'Geological Survey Ireland'.

With reference to your email received on the 27 June 2022, concerning the SEA Screening for Draft Lissenhall East Local Area Plan, Geological Survey Ireland would encourage use of and reference to our datasets. This data can add to the content and robustness of the SEA process. With this in mind please find attached a list of our publicly available datasets that may be useful to the environmental assessment and planning process. We recommend that you review this list and refer to any datasets you consider relevant to your assessment. The remainder of this letter and following sections provide more detail on some of these datasets.

Geoheritage

A national inventory of geoheritage sites known as County Geological Sites (CGSs) is managed by the Geoheritage Programme of Geological Survey Ireland. CGSs, as adopted under the National Heritage Plan, include sites that are of national importance which have been selected as the very best examples for NHA (Natural Heritage Areas) designation. NHA designation will be completed in partnership with the National Parks and Wildlife Service (NPWS). CGSs are now routinely included in County Development Plans and in the GIS of planning departments, to ensure the recognition and appropriate protection of geological heritage within the planning system. CGSs can be viewed online under the Geological Heritage tab on the online Map Viewer.

The County Geological Heritage Audit for Fingal was completed out in 2007. The full report details can be found here. **Our records show that there are no CGSs in the vicinity of the proposed Lissenhall East LAP.**

Groundwater

Geological Survey Ireland's Groundwater and Geothermal Unit, provides advice, data and maps relating to groundwater distribution, quality and use, which is especially relevant for safe and secure drinking water supplies and healthy ecosystems.

Proposed developments need to consider any potential impact on specific groundwater abstractions and on groundwater resources in general. We recommend using the groundwater maps on our Map viewer which should include: wells; drinking water source protection areas; the national map suite - aquifer, groundwater vulnerability, groundwater recharge and subsoil permeability maps. For areas underlain by limestone, please refer to the karst specific data layers (karst features, tracer test database; turlough water levels (gwlevel.ie). Background information is also provided in the Groundwater Body Descriptions. Please read all disclaimers carefully when using Geological Survey Ireland data.

The Groundwater data viewer indicates the development site is underlain by an aquifer classed as a 'Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones'. The Groundwater Vulnerability map indicates the area covered is 'Low' to 'Moderate' vulnerability.

GWClimate is a groundwater monitoring and modelling project that aims to investigate the impact of climate change on groundwater in Ireland. This is a follow on from a previous project (GWFlood) and the data may be useful in relation to Flood Risk Assessment (FRA) and management plans. Maps and data are available on the Map viewer.

Geological Survey Ireland has completed Groundwater Protection Schemes (GWPSs) in partnership with Local Authorities, and there is now national coverage of GWPS mapping. A Groundwater Protection Scheme provides guidelines for the planning and licensing authorities in carrying out their functions, and a framework to assist in decision-making on the location, nature and control of developments and activities in order to protect groundwater. **The Groundwater Protection Response overview and link to the main reports is here: https://www.gsi.ie/en-ie/programmes-and-projects/groundwater/projects/protecting-drinking-water/what-is-drinking-water-protection/county-groundwater-protection-schemes/Pages/default.aspx**

Geological Mapping

Geological Survey Ireland maintains online datasets of bedrock and subsoils geological mapping that are reliable and accessible. We would encourage you to use these data which can be found here, in your future assessments.

Our 3D models can help stakeholders visualize, understand and characterise geology, for deposit and resource mapping, for flooding and for urban geology applications including basement impact assessment, Sustainable Drainage Systems (SuDS), and subsurface management. Our 3D models offer a key element of geotechnical risk management by identifying areas requiring further site investigation. **Please note we have recently launched QGIS compatible bedrock (100K) and Quaternary geology map data, with instructional manuals and videos. This makes our data more accessible to general public and external stakeholders. QGIS compatible data can be found in our downloadable bedrock 100k .zip file on the Data & Maps section of our website.**

Further information on the bedrock and Quaternary 3D models of Dublin is available here and here.

Geotechnical Database Resources

Geological Survey Ireland continues to populate and develop our national geotechnical database and viewer with site investigation data submitted voluntarily by industry. The current database holding is over 7500 reports with 134,000 boreholes; 31,000 of which are digitised which can be accessed through downloads from our Geotechnical Map Viewer. We would encourage the use of this database as part of any baseline geological assessment of the proposed development as it can provide invaluable baseline data for the region or vicinity of proposed development areas. This information may be beneficial and cost saving for any site-specific investigations that may be designed as part of the project.

Natural Resources (Minerals/Aggregates)

Geological Survey Ireland is of the view that the sustainable development of our natural resources should be an integral part of all development plans from a national to regional to local level to ensure that the materials required for our society are available when required. Geological Survey Ireland highlights the consideration of mineral resources and potential resources as a material asset which should be explicitly recognised within the environmental assessment process.

Geological Survey Ireland provides data, maps, interpretations and advice on matters related to minerals, their use and their development in our Minerals section of the website. The Active Quarries, Mineral Localities and the Aggregate Potential maps are available on our Map Viewer.

We would recommend use of the Aggregate Potential Mapping viewer to identify areas of High to Very High source aggregate potential within the area. In keeping with a sustainable approach we would recommend use of our data and mapping viewers to identify and ensure that natural resources used in any proposed developments within the LAP are sustainably sourced from properly recognised and licensed facilities, and that consideration of future resource sterilization is considered.

Geochemistry of soils, surface waters and sediments

Geological Survey Ireland provides baseline geochemistry data for Ireland as part of the Tellus programme. Baseline geochemistry data can be used to assess the chemical status of soil and water at a regional scale and to support the assessment of existing or potential impacts of human activity on environmental chemical quality. Tellus is a national-scale mapping programme which provides multi-element data for shallow soil, stream sediment and stream water in Ireland. At present, mapping consists of the border, western and midland regions. Data is available at https://www.gsi.ie/en-ie/data-and-maps/Pages/Geochemistry.aspx. This page also hosts urban **geochemistry mapping (Dublin SURGE project)**, Geochemical Mapping of Agricultural and Grazing Land Soil of Europe (GEMAS) and lithogeochemistry (rock geochemistry) from southeast Ireland datasets. Geological Survey Ireland and partners are undertaking applied geochemistry projects to provide data for agriculture (Terra Soil), waste soil characterisation (Geochemically Appropriate Levels for Soil Recovery Facilities) and mineral exploration (Mineral Prospectivity Mapping).

I hope that these comments are of assistance, and if we can be of any further help, please do not hesitate to contact me Clare Glanville, or my colleague Trish Smullen at GSIPlanning@gsi.ie.

Yours sincerely,

Clare Glanville
Senior Geologist
Geological Survey Ireland

Enc: Table - Geological Survey Ireland's Publicly Available Datasets Relevant to Planning, EIA and SEA processes.

Geological Survey Ireland's Publicly Available Datasets Relevant to Planning, EIA and SEA processes

following European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018
(S.I. No. 296 of 2018)

Geological Survey Ireland Programme	Dataset	Relevant EIA Topic	Coverage	Description / Notes / Limitations	Link to Geological Survey Ireland map viewer
Geohazards	Landslide: National landslide database and landslide susceptibility map	Land & Soil/Climate/Landscape	National	Associated guidance documentation relating to the National Landslide Susceptibility Map is also available.	https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=b68cf1e4a9044a5981f950e9b9c5625c
Geohazards	Groundwater Flooding (Historic)	Water	Regional	Provide information of historic flooding, both surface water and groundwater. [A lack of flooding presented in any specific location of the map only indicates that a flood has not been detected. It does not indicate that a flood cannot occur in that location at present or in the future]	https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=848f83c85799436b808652f9c735b1cc
Geohazards	Groundwater Flooding (Predictive)	Water	Regional	Provides information on the probability of future karst groundwater flooding (where available). [The maps do not, and are not intended to, constitute advice. Professional or specialist advice should be sought before taking, or refraining from, any action on the basis of the flood maps]	https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=848f83c85799436b808652f9c735b1cc
Geohazards	Radon Map	Land & Soils/Air	National		http://www.epa.ie/radiation/radonmap/
Geoheritage	County Geological Sites as adopted by National Heritage Plan and listed in County Development Pla	Land & Soils/Landscape	Regional	All geological heritage sites identified by Geological Survey Ireland are categorised as CGS pending any further NHA designation by NPWS.	https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228
Geological Mapping	Bedrock geology:	Land & Soils	National	1:100,000 scale and associated memoirs.	https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=de7012a99d2748ea9106e7ee1b6ab8d5&scale=0
Geological Mapping	Bedrock geology:	Land & Soils	Regional	1:50,000 scale	https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=de7012a99d2748ea9106e7ee1b6ab8d5&scale=0
Geological Mapping	Quaternary geology: Sediments	Land & Soils	National	1:50,000 scale	https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=de7012a99d2748ea9106e7ee1b6ab8d5&scale=0
Geological Mapping	Quaternary geology: Geomorphology	Land & Soils	National	1:50,000 scale	https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=de7012a99d2748ea9106e7ee1b6ab8d5&scale=0
Geological Mapping	Physiographic units:	Land & Soils	National	Broad-scale physical landscape units mapped at 1:100,000 scale in order to be represented as a cartographic digital map at 1:250,000 scale	https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=afa76a420fc54877843aca1bc075c62b
Geological Mapping	GeoUrban: Spatial geological data for the greater Dublin and Cork areas	Land & Soils	Regional	includes 3D models	https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=9768f4818b79416093b6b2212a850ce6&scale=0
Geological Mapping	Geotechnical database	Land & Soils	National	Digitised geotechnical and Site Investigation Reports and boreholes which can be accessed through online downloads	https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=a2718be1873d47a585a3f0415b4a724c
Goldmine	Historical data sets including geological memoirs and 6" to 1 mile geological mapping records	land & Soils/Water	National	available online	https://secure.dccae.gov.ie/goldmine/index.html
Groundwater & Geothermal	Groundwater resources (aquifers)	Water	National	Data limited to 1:100,000 scale; sites should be investigated at local scale	https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=7e8a202301594687ab14629a10b748ef
Groundwater & Geothermal	Groundwater recharge.	Water	National	Data limited to 1:40,000 scale; sites should be investigated at local scale; long term annual average recharge	https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=7e8a202301594687ab14629a10b748ef
Groundwater & Geothermal	Groundwater vulnerability.	Water	National	Data limited to 1:40,000 scale; sites should be investigated at local scale	https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=7e8a202301594687ab14629a10b748ef
Groundwater & Geothermal	Group scheme and public supply source protection areas.	Water	National	Not all PWS / GWS have SPZ / ZOC. Check with IW / coco / NFGWS for private supplies.	https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=7e8a202301594687ab14629a10b748ef
Groundwater & Geothermal	Groundwater Protection Schemes	Water	National	Data is limited to scale of 1:40,000. Data does not include all of the source protections areas	https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=7e8a202301594687ab14629a10b748ef
Groundwater & Geothermal	Catchment and WFD management units.	Water	National		https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=7e8a202301594687ab14629a10b748ef
Groundwater & Geothermal	karst specific data layers	water	National	For areas underlain by limestone, includes karst features, tracer test database; turlough water levels (gwlevel.ie).	https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=7e8a202301594687ab14629a10b748ef
Groundwater & Geothermal	Wells and Springs	Water	National	Not comprehensive, there may be unrecorded wells and springs	https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=7e8a202301594687ab14629a10b748ef
Groundwater & Geothermal	Groundwater body Descriptions	Water	National	Not exhaustive; only those in designated SACs; could be other GWDTEs; for more information contact NPWS / EPA / site investigations	https://www.gsi.ie/en-ie/programmes-and-projects/groundwater-and-geothermal-unit/activities/understanding-ireland-groundwater/Pages/Groundwater-bodies.aspx
Groundwater & Geothermal	Geothermal Suitability maps	land & Soils/Water	National	Also, Roadmap for a Policy and Regulatory Framework for Geothermal Energy, November 2020	https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=9ee46bee08de41278b90a991d60c0b9e
Marine & Coastal Unit	INFOMAR - Ireland's national marine mapping programme; providing key baseline data for Ireland's	Water	National		https://secure.dccae.gov.ie/GSI/INFOMAR_VIEWER/
Marine & Coastal Unit	CHERISH - Coastal change project (Climate, Heritage and Environments of Reefs, Islands, and Headla	Water	Regional		http://www.cherishproject.eu/en/
Marine & Coastal Unit	Coastal Vulnerability Index (CVI).	water /Land & Soils	Regional	Currently the project is being carried out on the east coast and will be rolled out nationally	https://www.gsi.ie/en-ie/programmes-and-projects/marine-and-coastal-unit/projects/Pages/Coastal-Vulnerability-Index.aspx
Minerals	Aggregate potential	Land & Soils/Material Assets	National	Consideration of mineral resources and potential resources as a material asset which should be explicitly recognised within the environmental assessment process	https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=ee8c4c285a49413aa6f1344416dc9956
Minerals	Active quarries	Land & Soils	National		https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=ee8c4c285a49413aa6f1344416dc9956
Minerals	Historic mines	Land & Soils/Cultural Heritage	National	Inventory and Risk Classification 2009. Environmental Protection Agency, Economic Minerals Division and Geological Survey Ireland (DECC).	https://gis.epa.ie/EPAMaps/default?easting=?&northing=?&lid=EPA:LEMA_Facilties_Extractive_Facilities https://www.epa.ie/enforcement/mines/
Tellus	Geochemical data: multi-element data for shallow soil, stream sediment and stream water	Land & Soils	Regional	A national mapping programme	https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=6304e122b733498b99642707ff72f754
Tellus	Airborne geophysical data including radiometrics, electromagnetics and magnetics	Land & Soils	Regional	A national mapping programme	https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=6304e122b733498b99642707ff72f754
Tellus	urban geochemistry mapping (Dublin SURGE project),	Land & Soils	Regional		https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=6304e122b733498b99642707ff72f754

Notes:

1. The maps and data listed above are available on the Geological Survey Ireland map viewer https://www.gsi.ie/en-ie/data-and-maps/Pages/default.aspx

2. Please read all disclaimers carefully when using Geological Survey Ireland data

3. Geological Survey Ireland and Irish Concrete Federation published guidelines for the treatment of geological heritage in the extractive industry in 2008.

Appendix A8: Department of Housing, Local Government and Heritage Response to SEA Screening Request 25/07/22

An Roinn Tithíochta,
Rialtais Áitiúil agus Oidhreachta
Department of Housing,
Local Government and Heritage

Planning Ref: **FP2022-037**
(Please quote in all related correspondence)

25th July 2022

Dónall Ó Ceallaigh,
Planning and Strategic Infrastructure Department,
Fingal County Council,
County Hall, Main Street,
Swords,
Co. Dublin,
K67 X8Y2.

Via email: donall.oceallaigh@fingal.ie

Re: Notice to Environmental Authorities under the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (SI No. 435 of 2004) amended by the European Communities (Environmental Assessment of Certain Plans and Programmes) (Amendment) Regulations 2011 (SI No. 200 of 2011)

Re: Strategic Environmental Assessment (SEA) Screening for the Draft Lissenhall East Local Area Plan (LAP)

A chara

I refer to correspondence on 24th June received in connection with the above.

Outlined below are heritage-related observations/recommendations co-ordinated by the Development Applications Unit under the stated headings.

Archaeology

It is noted that the proposed development is located in an area of high archaeological potential and contains or is in the vicinity of a number of monuments of archaeological interest, Sites and Monuments Record Nos DU012-102----, enclosure; DU012-015----, enclosure) which are/will be subject to statutory protection in the Record of Monuments and Places, established under section 12 of the National Monuments (Amendment) Act 1994.

There are no archaeological objections to the development of the Lissenhall East lands. It is the Department's recommendation that Archaeological Impact Assessments should be prepared to assess the impacts and potential impacts, if any, on archaeological remains in the area where development is proposed to take place. Such assessments should address the infrastructural developments within and the individual components of proposed developments when planning permissions are lodged. It is likely that future recommendations

could include conditions relating to preservation in situ, preservation by record, archaeological testing and archaeological monitoring.

Reason:
To ensure the continued preservation (either *in situ* or by record) of places, caves, sites, features or other objects of archaeological interest.

Nature Conservation

Having considered the overview and description of the contents and main objectives of the Draft LAP included in Fingal County Council's letter of notification of the screening of the Lissenhall East Draft LAP, it is noted that the Draft LAP relates to a roughly triangular area of 27.7 ha between the R132 Road to the west, the M1 Motorway to the east and properties on the northern bank of the Broadwater River to the south. Most of the LAP lands are currently being used for arable agriculture and are laid out in fields separated by well-developed hedges and tree rows. A former depot used during the construction of the M1 and a veterinary clinic are also located within the LAP lands. In both the current 2017-2023 and Draft 2023-2029 Fingal Development Plans the LAP lands are zoned 'HT' for High Technology.

The Department's principal concerns with regards to the development of the lands to which the Draft LAP relates are to how such development might affect the nearby Malahide Estuary Special Area of Conservation (SAC) and Malahide Estuary Special Protection Area (SPA). According to the Council's letter of notification, surface water runoff from the bulk of the LAP lands drains to the Lissenhall Stream, which traverses the northern end of the LAP lands and having been culverted under the M1, flows approximately a kilometre south east before entering the Malahide Estuary. The rest of the LAP lands drain to a tidal stretch of the Broadmeadow, at its closest running circa 160m south of the LAP and included in the Malahide Estuary SAC.

Direct and relatively short hydrological pathways therefore exist between the Lissenhall East LAP lands and the Malahide Estuary SAC and Malahide Estuary SPA and pollutants which may be mobilised from any future developments within the LAP lands, could easily reach these sites and potentially detrimentally affect the Qualifying Interests (QIs) for which they are designated.

The possibility of *ex-situ* effects of the development of the LAP lands on the Malahide Estuary SPA could also arise if QI/Special Conservation Interest (SCI) bird species for this site were affected by developments within the LAP in areas whilst frequenting areas outside the SPA. It is stated in Fingal county Council's letter of notification that bird surveys of the LAP lands over two winter seasons found no evidence of their use by SCI bird species. But approximately the last 250m of the course of the Lissenhall Stream before it enters the Malahide Estuary adjacent to Newport House is through an area of wet grassland and marsh which would appear to be subject to a regime of flooding by this

stream. The use of this area by Blacktailed Godwit and Redshank, which are SCI species for the Malahide Estuary SPA, has been noted by a staff member of the National Parks and Wildlife Service of this Department, and any impacts on it through alteration of its hydrological regime or its pollution arising from the development of the LAP lands could therefore consequently possibly result in *ex-situ* effects on these and possibly other SCI species for the SPA using this area, which would require evaluation in any assessment of the potential impacts of the adoption of a LAP for the Lissenhall East lands by the County Council on European sites.

The potential for significant ecological effects on the Malahide Estuary SAC and Malahide Estuary SPA, including *ex-situ* effects on the latter, arising from development of the Lissenhall East lands consequent on the adoption of a LAP for these lands by Fingal County Council as outlined above would therefore appear likely to constitute significant environmental effects on the environment sufficient to justify the SEA of the Draft Lissenhall East LAP.

Appropriate Assessment (AA) proceeds parallel with and informs the SEA process to evaluate the scale of any possible detrimental effects on European sites and allows the incorporation into any plan subject to SEA of measures to avoid adverse effects on these sites. In the present case AA should therefore facilitate the incorporation in the Draft Lissenhall East LAP of measures to avoid detrimental effects on the Malahide Estuary SAC and Malahide Estuary SPA.

Obviously to prevent any adverse effects on the Malahide Estuary SAC and Malahide Estuary SPA consequent on the adoption of the Lissenhall East LAP the principal impacts to be avoided are hydrological impacts and impacts resulting from pollutants, such as silts or hydrocarbons, mobilised from developments within the LAP lands. Measures to avoid such impacts arising as a result of development should be set out in the Draft LAP. Most useful would be the designation in the latter document of a corridor along the Lissenhall Stream system within the LAP lands where no development shall occur, and a requirement that only nature based sustainable drainage systems (SuDS) could be installed in any developments to be permitted within the area subject to the LAP.

In the sections of both the current 2017-2022 and Draft 2023-2027 Fingal Development Plans dealing with ‘Ecological Corridors and Stepping Stones Including Trees and Hedges’, respectively on p323 and p333, and considering such corridors along major river courses in Fingal, including the Broadmeadow River, it is pointed out that “To be ecologically effective corridors need to be a minimum of 30m in width measured from the top of each river bank.” While the Lissenhall Stream cannot be considered a major water course, the adoption of a similar approach to the designation of a corridor along its route through the LAP lands would seem justified due to the proximity of the European sites downstream to these lands and the sensitivity of such Natura sites’ QIs to adverse effects which might result from development.

Similarly, the proximity and sensitivity of the European sites would seem to justify the restriction of any developments on the Lissenhall East LAP lands to only using nature based SuDs in line with this Department's document published in March of this year 'Nature-based Solutions to the Management of Rainwater and Surface water Runoff in Urban Area-Best Practice Interim Guidance Document', and not permitting SuDs based on the use of underground storage tanks to attenuate water runoff within the LAP lands. The designation of a corridor along the Lissenhall Stream and utilisation of only nature based SuDS within the LAP as recommended would be in conformity of the vision for the Lissenhall East LAP set out in the Council's letter of notification:
"To establish a location for high end, high quality value-added businesses, blending sustainable urban design and architecture with nature to create a distinct, enjoyable sense of place".

The Draft LAP should also provide for the mitigation in the lands covered by it of detrimental effects on any other significant elements of flora and fauna which may be present, such as otter and bat species, subject to a system of strict protection under the Habitats Directive, and the kingfisher included in Annex I of the Birds Directive. The character of the Lissenhall East lands would suggest they should be used by bats for at least foraging and commuting, and both otter and kingfisher are known to occur along the stretch of the Broadwater Stream located just south of the LAP lands, and are likely to occur at times in addition along the Lissenhall Stream within these lands.

Though the County Council's letter of notification mentioned that various surveys have been carried out to assess the green infrastructure and enable ecological characterisation of the LAP lands, unfortunately the results of these surveys, as also the winter bird surveys referred to above, were not made available to this Department with the letter of notification, and consequently it has not been possible to make as full an evaluation of the possible effects of the drawing up of the Lissenhall East Draft LAP from a biodiversity conservation perspective as would have been possible if the results of these various surveys had been forwarded by Fingal County Council.

You are requested to send any further communications to this Department's Development Applications Unit (DAU) at manager.dau@housing.gov.ie, where used, or to the following address:

The Manager, Development Applications Unit (DAU), Government Offices, Newtown Road, Wexford, Y35 AP90

Is mise, le meas

Sinéad O' Brien
Development Applications Unit
Administration

Appendix B
NRA Guidelines

Ecological Valuation Criteria

International Importance:
• 'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation.
• Proposed Special Protection Area (pSPA).
• Site that fulfils the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended).
• Features essential to maintaining the coherence of the Natura 2000 Network.[3]
• Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive.
• Resident or regularly occurring populations (assessed to be important at the national level)[4] of the following:
  ○ Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and / or
  ○ Species of animal and plants listed in Annex II and/or IV of the Habitats Directive.
• Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971).
• World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972).
• Biosphere Reserve (UNESCO Man and the Biosphere Programme).
• Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979).
• Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979).
• Biogenetic Reserve under the Council of Europe.
• European Diploma Site under the Council of Europe.
• Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).[5]

National Importance:
• Site designated or proposed as a Natural Heritage Area (NHA).
• Statutory Nature Reserve.
• Refuge for Fauna and Flora protected under the Wildlife Acts.
• National Park.
• Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park.
• Resident or regularly occurring populations (assessed to be important at the national level)[6] of the following:
  ✓ Species protected under the Wildlife Acts; and/or
  ✓ Species listed on the relevant Red Data list.
• Site containing 'viable areas'[7] of the habitat types listed in Annex I of the Habitats Directive.

[3] See Articles 3 and 10 of the Habitats Directive.

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

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

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

Ecological Valuation Criteria

County Importance:
• Area of Special Amenity.[8]
• Area subject to a Tree Preservation Order.
• Area of High Amenity, or equivalent, designated under the County Development Plan.
• Resident or regularly occurring populations (assessed to be important at the County level)[9] of the following:
  ○ Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
  ○ Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
  ○ Species protected under the Wildlife Acts; and/or
  ○ Species listed on the relevant Red Data list.
• Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance.
• County important populations of species, or viable areas of semi-natural habitats or natural heritage features identified in the National or Local Biodiversity Action Plan (BAP) if this has been prepared.
• Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county.
• Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.

Local Importance (higher value):
• Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared;
• Resident or regularly occurring populations (assessed to be important at the Local level)[10] of the following:
  ○ Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
  ○ Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
  ○ Species protected under the Wildlife Acts; and/or
  ○ Species listed on the relevant Red Data list.
• Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality;
• Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.

Local Importance (lower value): • Sites containing small areas of semi-natural habitat that are of some local importance for wildlife; • Sites or features containing non-native species that are of some importance in maintaining habitat links.

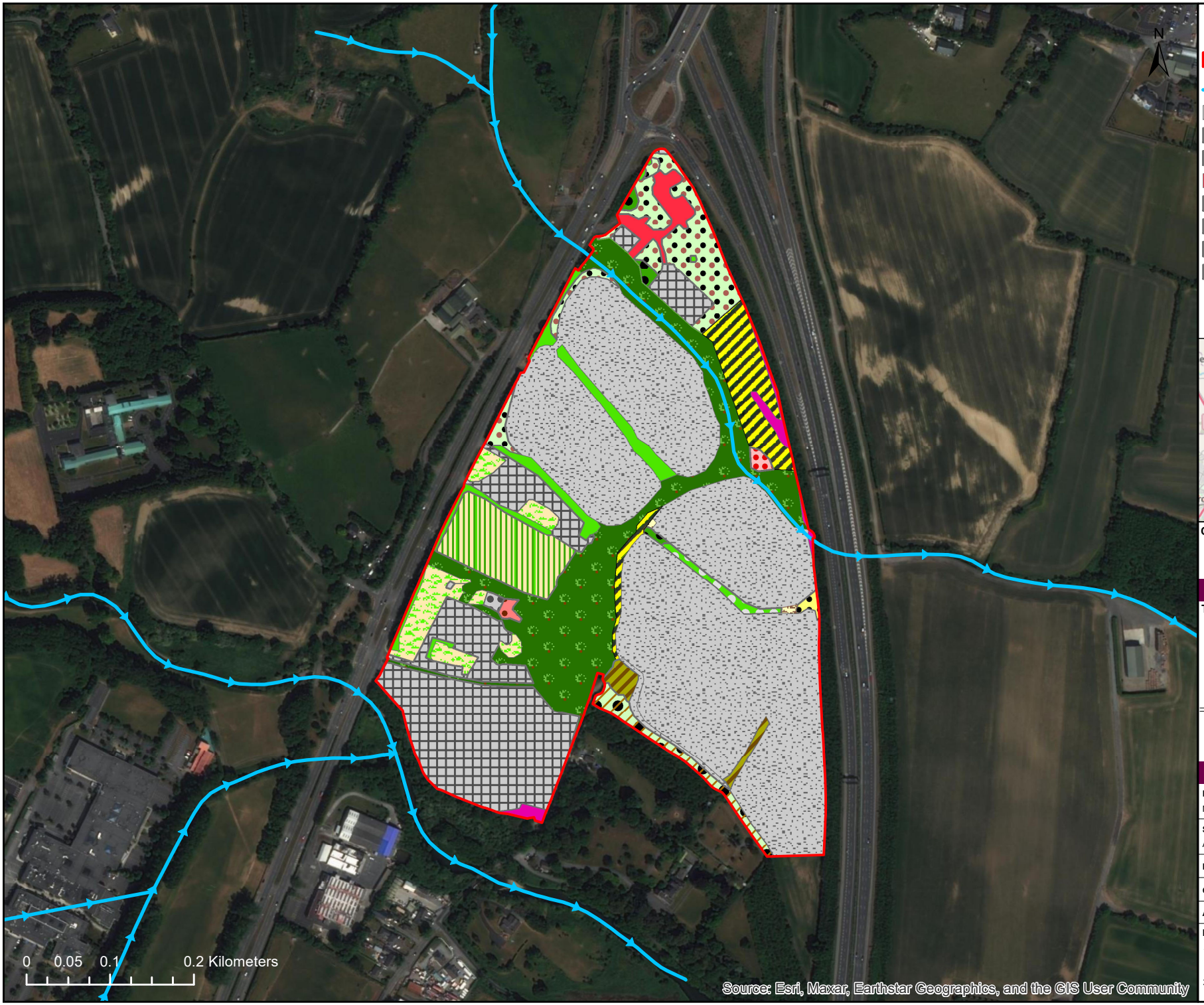
[7] A 'viable area' is defined as an area of a habitat that, given the particular characteristics of that habitat, was of a sufficient size and shape, such that its integrity (in terms of species composition, and ecological processes and function) would be maintained in the face of stochastic change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

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

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

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

Appendix C
Habitat Map

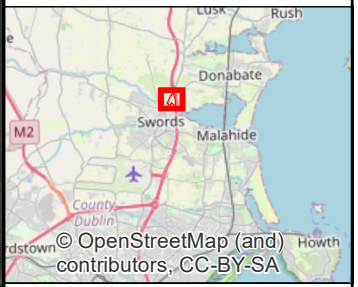


Legend

- LAP Boundary
- FW2
- BC1
- BC2
- BL3
- ED2
- ED2/BL3
- ED3
- ED3/WS1
- FS1
- GA1/GS1
- GA2
- GS1
- GS1/GS4
- GS2
- GS4
- WD1
- WL2
- WS1
- WS1/GS1
- WS2

*Habitat codes follow Fossit (2000)

Data Sources: Fingal County Council, EPA



Client

Fingal County Council

Lissenhall East LAP

Title

Appendix C

rps
West Pier Business Campus, Dun Laoghaire, Co Dublin, Ireland.
T +353 (0) 1 4882900
E ireland@rpsgroup.com
W rpsgroup.com/ireland

Issue Details

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Status:	Rev:	Model File Identifier:
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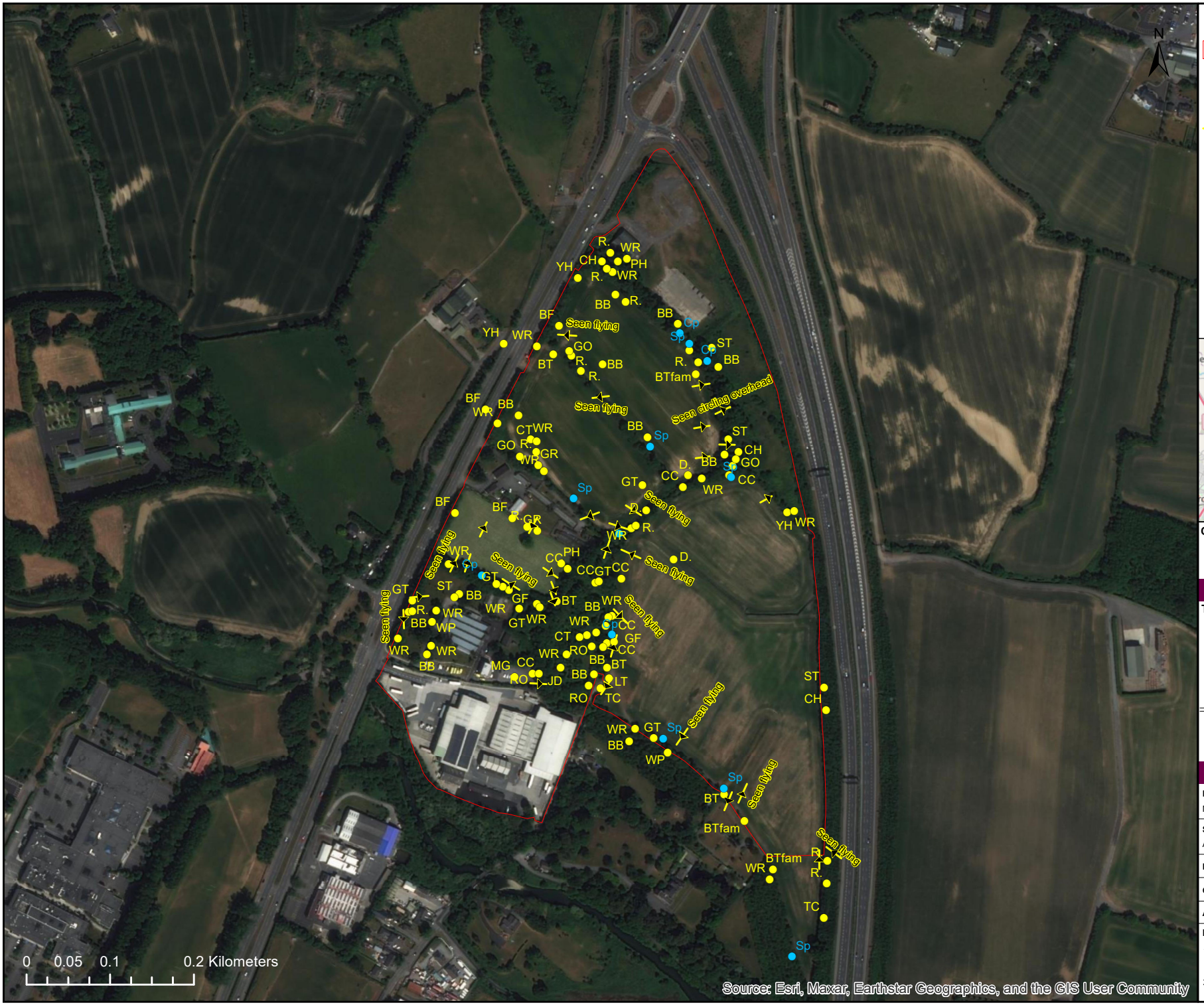
Appendix D
Ecological Target Notes



Legend

- LAP Boundary
- Bats
- Breeding Birds
- Breeding Birds Activity

Data Sources: Fingal County Council

Client

Fingal County Council

Lissenhall East LAP

Title

Appendix D

rps
West Pier Business Campus, Dun Laoghaire, Co Dublin, Ireland.
T +353 (0) 1 4882900
E ireland@rpsgroup.com
W rpsgroup.com/ireland

Issue Details

File Identifier: MH17018Arc10022D01		
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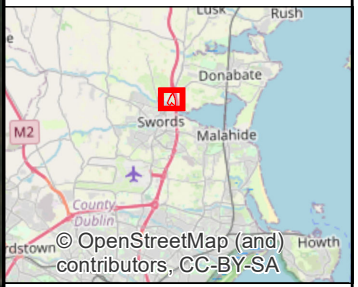
Appendix E
Green Infrastructure Map

Legend

- LAP Boundary
- Rivers
- Green Infrastructure

Data Sources: Fingal County Council, EPA



Client

Fingal County Council

Lissenhall East LAP

Title

Appendix E

rps
West Pier Business Campus, Dun Laoghaire, Co Dublin, Ireland.
T +353 (0) 1 4882900
E ireland@rpsgroup.com
W rpsgroup.com/ireland

Issue Details

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A	01	

Drawn: NR	**Date:** 17/08/2022
Checked: END	**Scale:** 1:6,000 @A4
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NOTE:

Appendix F
Wintering Bird Survey

Lissenhall East Local Area Plan

Wintering Bird Survey – Addendum to Ecology Survey and Green Infrastructure Report

Document Control Sheet

Client:	Fingal County Council
Project Title:	Lissenhall East Local Area Plan
Document Title:	Wintering Bird Survey – Addendum to Ecology Survey and Green Infrastructure Report
Document No:	MH17018Rp0015

Text Pages:	15	Appendices:	1	Current Revision:	A01

Rev.	Status	Date	Author(s)		Reviewed By		Approved By	
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A01	For Client Comment	3 April 2019	TR	Tim Ryle	CH	Ch Heaslip	LK	Leary Kenny

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1 INTRODUCTION

1.1 BACKGROUND

Fingal County Council have as an objective of its current County Development Plan (CDP) 2017-2023, the development of a Local Area Plan (LAP), in respect of lands which the Planning Authority considers suitable, in particular for areas which require economic, physical and social renewal and for areas likely to be the subject of large-scale development within the lifetime of the Plan. There is an overarching objective for plans arising out of the CDP, which includes Lissenhall East:

"Prepare and/or implement the following Local Area Plans and Masterplans during the lifetime of this Plan: Lissenhall East Local Area Plan (see Map Sheet 8, LAP 8.B)"

With this in mind, a draft LAP has been progressed which has been informed by a number of assessments.

The findings of the ecological surveys and recommend Green Infrastructure measures were detailed in a separate report[1] issued to the Local Authority.

A key constraint identified in the report was the lack of wintering water bird survey, which was the due to the original timeframe for the publication of the pre-draft LAP document. Given the proximity of the LAP lands to Malahide Estuary SPA and the potential for the site to support Special Conservation Interest (SCI) Bird species, it was recommended that additional survey be carried out.

1.2 SCOPE

This addendum report details the findings from a full winter season of visits to the LAP lands. It was a non-standard general ecology survey that adopted some standards to determine usage of the LAP lands for Light-bellied Brent Goose (*Branta bernicla hrota*). The survey area was extended to identify areas with known Light-bellied Brent Goose (and other wintering water birds) activity, to confirm presence in the wider landscape.

[1] RPS (2018). Report MH17018Rp0013 - *Lissenhall East Local area Plan – Ecology Survey and Gren Infrastructure*

2 METHODOLOGY

2.1 CONSULTATION

Organisations that were contacted in respect of the project are listed in **Table 2.1** of the earlier Ecology and Green infrastructure report prepared in support of the LAP document. Pertinent consultations in relation to bird data are reproduced for clarity below in **Table 2.1**.

Table 2.1: Consultees and Summary response

Consultee	Issue	Summary Response
Development Applications Unit at the Department of Culture, Heritage and the Gaeltacht.	General Query	A response to a consultative query to DAU in respect of the proposed Lissenhall LAP was received on the 26th May 2018 (G Pre00133/2018). The response dealt with issues to be considered in the plan as well as in the Strategic Environmental Assessment (SEA) and Appropriate Assessment (AA). Examples of protected species were noted for consideration, but with the exception of Kingfisher (*Alcedo atthis*), nothing specific in relation to wintering birds or waterfowl.
NPWS Conservation Officer Niall Harmey	Local Information particularly use of LAP lands by Wintering birds & waterfowl	Telephone conversation on 22/05/2018 Identified from his records that Brent Goose and Golden Plover (*Pluvialis apricaria*) (both SCI species for the SPA) make use of the site.
Birdwatch Ireland (Helen Boland)	Brent Goose usage of LAP lands	Email response dated 23/05/18 indicated that there was no Irish Wetland Bird Survey (I-WeBS) data for the LAP lands. However, considered likely that Brent Goose might use this area as they use other grass fields and winter crops further east along the north shore of Malahide estuary.
Irish Brent Goose Research Group (IRBG) (Graham McElwaine – resightings Coordinator)	Brent Goose usage of LAP lands	Email response dated 23/05/18 stated that the IBGRG database has no records for usage of the LAP lands by Brent geese. However, based on experience by the IBRG, elsewhere in Dublin area, it is considered likely that Brent geese move inland for some distance, particularly when disturbed.

2.2 FIELD SURVEYS

The thrust of the modified survey protocol focussed on the LAP lands, which is outside the SPA territory. The modified approach, based of the two guidance documents, the standard I-WeBS methods[2] and NPWS low tide water bird surveys: methods and guidance notes (Lewis & Tierney, 2014[3]), effectively comprised a "Look see" approach as per (Bibby *et al*, 2000)[4]. The survey elements, although modified to take account of the nature of the LAP lands, included:

- Site walkover prior to site scan sampling survey to check for droppings – used as an indicator of site usage;
- Site scan sampling surveys to count all target species birds seen and consequently confirm usage, regularly repeated over their season. Scan sampling surveys were conducted until an appropriate commentary of birds present and their numbers count were established per survey point;
- Flight lines upon arrival/departure, where possible, to identify if commuting from other nearby sites (To or from adjacent wetlands); and
- Identification of known satellite sites or high tide roost activity locations associated with the LAP study area, as well as distal comparative site.

Malahide Estuary SPA is designated for a considerable number of SCI species. It has a number of overlapping conservation designations and its importance as a water bird area is apparent as indicted by yearly I-WeBS bird counts (**Appendix A**). The entire site (0U408 Broadmeadow (Malahide) Estuary) for which the bird counts are applicable has been separated into a number of subsites[5] owing to the distribution of distinct flocks of birds. The following subsites are recognised, although the current scan survey provides qualified data in respect of subsites 0U411 and 0U484 only.

- Subsite 0U411 Inner Malahide Estuary;
- Subsite 0U412 Outer Malahide Estuary;
- Subsite 0U483 Outer Malahide Estuary;
- Subsite 0UL23 Outer Malahide Estuary;
- Subsite 0UL22 Outer Malahide Estuary;
- Subsite 0U484 Outer Malahide Estuary;
- Subsite 0UL25 Outer Malahide Estuary; and
- Subsite 0U485 Outer Malahide Estuary.

The current survey was undertaken over the course of six (6) visits in the over-wintering period, October 2018 to March 2019 (**Table 2.2**).

[2] I-WeBS Counters Manual (Birdwatch Ireland): https://www.birdwatchireland.ie/LinkClick.aspx?fileticket=Ih2CTtw9bjs=&tabid=112
[3] Lewis, L. J. & Tierney, T. D. (2014) Low tide waterbird surveys: survey methods and guidance notes. *Irish Wildlife Manuals*, No. 80. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Ireland. https://www.npws.ie/sites/default/files/publications/pdf/IWM80.pdf
[4] Bibby, C.J., Burgess, N.D., Hill,D.A. & Mustoe, S.H. (2000). *Bird Census techniques*. Academic Press.
[5] https://bwi.maps.arcgis.com/apps/View/index.html?appid=1043ba01fcb74c78bc75e306eda48d3a (Accessed March 28th 2019)

Scan sampling surveys were conducted within the low tide period allowing for counts to be made to gather data regarding numbers and usage. Surveys were also scheduled during the rising/high tide to establish whether the target species (Brent Geese) will utilise the study area as secondary foraging or loafing habitat outside of low-tide conditions. However, the survey strategy was modified owing to the tasked objective to identify usage of the LAP lands by Brent Goose species and foraging habitat availability to confirm usage of open grassland areas within the larger range/territory of the SPA for the species. It was not possible to survey all I-WeBS subsites and therefore the survey identified key areas likely to host Brent Geese and confirm whether the sites are being utilised by the target species.

Survey count points 1 and 2 (SP1, SP2) were selected to provide clear observation of the four large fields within the LAP lands. These lands are separated from the SPA territory by the M1 motorway and Lissenhall house grounds. Survey count point 3 (SP3) corresponds to the upper estuarine area of the SPA (IWeBS subsite 0U411). This subsite is the closest proximal estuarine site to the LAP for which Brent Geese and additional waterfowl are known from. The area (Seatown West) is well known for considerable numbers of Mute swan (*Cygnus olor*)[6]. Survey count point 4 (SP4) was located in the outer estuary in I-WeBS subsite 0U484 but the transect (PW4) extended towards subsite 0U483.

The repeat surveys were consistently carried out by a single surveyor, although an accompanying environmental scientist visited the seaward side of the SPA on December 28th, 2018 (Visit #3) whilst the scan surveys of the LAP lands were being undertaken.

The thrust of the modified survey effort focussed on the LAP lands and comprised walking the perimeter of the 2 and half of the 4 large agricultural fields. Thereafter, a suitable survey point (SP1) watch was maintained over the 2 larger fields. This accounted for the bulk of the LAP site survey owing to the nature and potential of these fields and their relative proximity to SPA territory on the eastern side of the M1 motorway. Following on from SP1, the perimeter search of the last 1.5 fields was undertaken followed by a second survey watch (SP2) to cover the two western most fields.

Thereafter, the survey moved to the upper estuary location to the east of the LAP lands. A two-hour survey point (SP3) survey was conducted at this point and included as far as was practical identification bird flightpaths to and from the SP area. The area of the Scan Point count is popular with the public who occasionally stopped to feed birds.

The final area of the survey was towards the inner mudflats around Corballis Golfcourse in the outer estuarine area e.g. seaward side of the railway embankment that divides the SPA (SP4).

The locations of the survey areas and extent of perimeter searches are included in **Figure 2.1**.

Table 2.2: Surveys and Dates

Survey Number	Date	Survey duration (at each station)
#1	30/10/18	▪ LAP lands VP - 2hrs ▪ Upper estuary VP – 2.5hrs (includes lower river stretch near Lissenhall House) (Incoming tide)

[6] http://www.bwifingal.ie/birding-sites/site-guides/#Seatown

		▪ Outer estuary Windshield Survey and observation – 2.25hr (outgoing tide)
#2	7/12/18 *	▪ LAP lands VP - 2hrs ▪ Upper estuary VP - 2hrs (incoming and High Tide) Outer estuary Windshield Survey and observation – 2hrs (Lowering tide)
#3	28/12/18	▪ LAP lands VP - 2hrs ▪ Upper estuary VP - 2hrs (Outgoing tide) Outer estuary Windshield Survey and observation – 2hrs (Low &returning tide)
#4	29/01/19	▪ LAP lands VP - 2hrs ▪ Upper estuary VP - 2hrs (Incoming tide) Outer estuary Windshield Survey and observation – 2hrs (Lowering tide)
#5	25/05/19	▪ LAP lands VP - 2hrs ▪ Upper estuary VP - 2hrs (Middling to high tide, outgoing) Outer estuary Windshield Survey and observation – 1.75hrs (Lowering tide)
#6	27/03/19	▪ LAP lands VP - 2hrs ▪ Upper estuary VP - 2hrs (High and outgoing tide) ▪ Outer estuary Windshield Survey and observation – 1.75hrs (Low & incoming tide)

*Second survey originally scheduled for 29/11/19 but was delayed owing to attendance at Oral Hearing on separate project.

2.2.1 Constraints

The tasked survey was undertaken by a single surveyor (except for limited accompaniment on December 28th) and was carried out over the course of a single season. It comprised a total of six visits, equally spaced except for visit 2, although it was considered to be within acceptable survey parameters. The survey provides an ecological snapshot overview of potential usage of the study area and immediate surrounds for Brent Goose species and Golden Plover only.

Although some other areas/subsites within the SPA and elsewhere were visited, it was not possible to confirm use/range and/or quantification of numbers at all subsites. As the site & Malahide Estuary SPA is in-between South Dublin Bay and River Tolka Estuary SPA, North Bull Island SPA and Rogerstown Estuary SPA, (all of which host important numbers of Light-bellied Brent Geese), there is a high risk of movement between these, which could lead to double counts when visiting satellite/secondary sites – more than 1 surveyor may be required in this case.

In terms of understanding satellite/secondary sites and a single surveyor, it was not possible to conduct high tide surveys at all areas/satellite sites. Similarly, the data based on the survey is deficient in respect of arrival/departure flight lines from adjacent areas within the SPA or other sites in Dublin Bay.

Although the surveys were aimed at encompassing high tide, this was not practical for the LAP lands. The upper estuarine area was timed as far as was possible to capture high tide and receding tide to establish Brent geese movements adjacent to the LAP lands. The survey at the outer estuary did not capture all geese activity in the wider area, merely confirmed presence/absence of some.

Figure 2.1: Extent of LAP lands and survey locations

3 RESULTS

The findings of the surveys are presented in **Table 3.1**. Site requirements vary as food resources change throughout the season. The preferred forage for Brent geese is of eelgrass (*Zostera marina*) and other fine saltmarsh vegetation although this can be supplemented by graminoids as the estuarine resource become depleted and waterfowl often move inland. Golden Plover typically occur as large flocks and although normally associated with coastal sites, can move inland where conditions dictate, and resources are available. The survey of the four agricultural fields was the focus of the survey to determine usage by Brent Goose (and Golden Plover) species.

During the visits, there was no evidence of Brent Geese having used the LAP fields. There were no signs of the characteristic faecal pellets. No geese were observed overflying or landing on the site. The proximal area to the LAP lands where Brent Geese were noted was east of the M1 Motorway bridge which crosses the upper estuary (**SP3**). Some geese occasionally came in close or were noted grazing on saltmarsh sward east of the M1 Motorway bridge, but most were observed in the central part of the estuary until the tide turned, when they departed for other areas. It is likely that subsets of the species exist and that they can utilise other areas, based on at least 1 observation by accompanying surveyor on December 28th visit.

Golden Plover (*Pluvialis apricaria*) were not recorded at any time from the LAP lands, overflying or grazing. Flocks were noted interspersed with gulls, terns and geese in upper estuarine areas of the SPA, particularly as the turning tide exposed mudflats.

No other SCI bird species of the Malahide Estuary SPA were noted using the LAP lands.

Other bird species of note included Yellowhammer (*Emberiza citrinella*) and Buzzard (*Buteo buteo*). A flock of yellowhammer were perching in a tree alongside the LAP boundary with the M1. This species typically nests in hedges and forages in stubble fields.

The Buzzard has greatly expanded its range over the past two decades and there are healthy number in North County Dublin, particularly around Dublin airport and larger wooded areas in Fingal (personal observation).

Table 3.1: 2018/2019 wintering survey of LAP lands and additional areas

Visit	Survey Date	Lissenhall Lands – perimeter walk and SP 1 and 2)	East of Motorway Bridge SP3	SP4 in estuary around Corballis Golf Club	Other (Supplemental Findings, not specifically related to Birds)
#1	**30/10/18**	This survey and those which followed comprised walking to perimeter of all four fields and spending 1.25 hour of conducting scan sampling survey across largest fields (those nearest to M1 side) (SP1) and 0.5 hrs. at Swords road gate to capture the 2 smaller fields (SP2). No Geese in any of the of the four fields, but it is early in the season and it could be expected, that with them having only recently arrived (based on personal sightings across Dublin Bay), that they would head straight for the good quality food resource in the estuary. The only birds that landed in the fields were a pair of hooded crow (*Corvus cornix*).	2-hour scan sampling survey. Tide was in but starting to turn. About 80 light-bellied Brent Goose along with sizable numbers of Mute swan, Mallard (*Anas platyrhynchos*), Gull species, Dunlin (*Calidris alpina*), Oystercatcher (*Haematopus ostralegus*), Grey Heron (*Ardea cinerea*) and a single Moorhen (*Gallinula chloropus*). Within an hour, a large number of geese had taken off in 2 different directions. Majority headed down the estuary, out of view. A small number also took off in direction of Swords (South), but unable to confirm if they looped back.	Windshield Survey visit around the area along northern side of Malahide Estuary to identify readily accessible vantage point areas. No access onto privately owned large agricultural pasture.	Kingfisher (*Alcedo atthis*), Grey Wagtail (*Motacilla cinerea*) and Mallard along the Ward river immediately south of Lissenhall House. No evidence of Otter (*Lutra lutra*) activity but water levels were high precluding thorough search along banks.
#2	**7/12/18**	Survey comprised walking to perimeter of all four fields and spending 1 hour of conducting scan sampling survey across largest fields (those nearest to M1 side) and 0.5 hours at Swords road gate to capture the 2 smaller western fields.	2hr scan sampling survey. High tide and road became flooded. (Car moved 100metres west of survey point).	Plentiful large open agricultural fields noted. 2 large area of Brent geese noted on mudflats as tide receded – mudflats opposite Corballis golfcourse and in	The Reed-dominated ditch that bisects the large fields towards the M1 motorway was water filled (stagnant as not

		No geese in any of the four fields, and no distinctive pellets noted around the perimeter and in patches of accessible rank and fine grassland mosaic. Some unattributed white faecal staining of 2 placed along rank grass-dominated vegetation alongside scrubby hedgeline.	No Brent Geese noted at upper part of the estuary where the Ward river discharges into the estuary. Mostly large flock of mute swan (and gulls on opposite side of estuary) with duck species, Grey Heron as other regular occurrences.	centre of estuary opposite Malahide. Brent Geese numbers were relatively large, approximately 90 (or approximately 10% of the I-WeBS mean 2010-2015 counts for the Malahide Estuary[7] although that is subjective as it is unknown what the likely population and distribution of in subsites within the SPA.	connected to a watercourse). Too early to confirm frog (*Rana temporaria*) activity. Small area of flooded agricultural land in area of proposed LAP water feature. Buzzard noted perching in taller trees in Lissenhall house grounds. Evidence of fox (*Vulpes vulpes*) usage – droppings, trails and bird kill. Grey squirrel (*Sciurus carolinensis*) along estuary road fronting Lissenhall house.
#3	**28/12/18**	2 hour survey – cold, frosty ground, but improving. Ground remained wet however. No geese in any of the four fields, and no distinctive pellets noted around the	2-hour survey. Outgoing tide, wet conditions. It was not possible to clearly observe birds on opposite side of Estuary e.g. along Estuary	Windshield Survey of northern side of Estuary, but no Brent Geese observed in large open fields.	Fox evidence around perimeter particularly near Lissenhall house.

[7] **Appendix A**

		perimeter and in patches of accessible rank and fine grassland mosaic. 1 round-ended pellet noted along M1 perimeter and faecal staining noted around the site despite the rain. Typically, the faecal deposits were noted alongside hedgeline and on longer, fine grass areas near Lissenhall house perimeter and beside central oval woodland. Not considered to be goose owing to the habitat and proximity to hedgeline. Little passerine bird activity landing on fields, but some evidence of birdkill in 2 areas, as well as 2 buzzard activity with taller trees in Lissenhall house estate. Overflying birds included woodpigeon, crows. Chirping in hedges and some in overwintering reeds in ditch.	road leading to Malahide, owing to rain. Mixture of water birds, with Mute Swan congregating alongside the road, as passengers from several cars stopped to feed them. Brent Geese – After about 1 hour, 20 Brent geese arrived surreptitiously and landed among main cluster of birds in centre estuary section of scan survey area. They left in 3 groups, within a narrow time frame (25 minutes) and headed in the direction of the wider estuary, as noticeable change in receding waters. Mute swan (*Cygnus olor*) – 53+ birds. Black headed gull (*Larus ridibundus*) – 4 regularly standing in shallow water in centre of estuary among other birds. Mallard (*Anas platyrhynchos*) – 30+. Grey Heron (*Ardea cinerea*) – 2 moving about and 1 other, largely immobile on estuarine saltmarsh island. Herring Gull (*Larus argentatus*) – 2 in close proximity to VP	2 clusters of geese in open estuary towards Malahide. None in close towards exposed intertidal mudflats unlike oystercatchers (*Haematopus ostralegus*) and other smaller waders (0.45hr walk along shoreline to watch location). Difficult to distinguish different birds at that distance. Also, cannot be certain that Brent Geese sub-groups occurred in other areas.	

			location, 3 others flying and others in central estuarine channel. Common Gull (*Larus canus*) – 30+ observed but scattered and prone to sudden movement. Moorhen (*Gallinula chloropus*) – 1 pair + 4 individuals. Little Egret (*Egretta garzetta*) – 2– one on saltmarsh island and other moving around. Could be same one that was noted moving further upstream along river when departing site. Common Gull (*Larus canus*) – large numbers. Clustered when people fed swans. Oystercatcher (*Haematopus ostralegus*) – abundant throughout, although seemed to arrive midway through VP survey.		
#4	**29/01/19**	2hr visit. No faecal pellets identified around perimeter, but agricultural fields are maturing and did not cross into them. No Brent Geese or wintering waterfowl observed using the fields. Flock of ~25 Yellowhammer perching on trees at base of LAP perimeter fence along base of motorway embankment.	2hr visit on outgoing tide. No Brent Geese observed at upper end of estuary. Mostly Swans, Ducks, Gulls, with Oystercatcher and other wading birds further out in estuary towards Estuary road side.	Mixed cluster of waders sighted on mudflats, but no Brent Geese observed inshore in visible sections of outer estuary towards railway track embankment /Malahide direction.	No frog spawn in watercourse/ditches. Evidence of Fox activity.

			Swan, Ducks and Gulls swarmed the scan sampling point when public came to feed them.		
#5	**25/02/19**	2hr Survey -mild conditions. No faecal pellets identified around perimeter. No Brent Geese or other SCI bird species of Malahide Estuary SPA identified using the four fields. Agricultural fields recently sprayed as evidenced by new tractor trails in maturing sward. Chemical odour still noticeable. Plentiful activity by overflying woodpigeon (*Columba palumbus*) and corvid species. Some Buzzard activity in NW corner over M1 motorway. Plentiful activity and calling including alarm calls in hedges in centre of LAP lands in particular.	2hr survey on incoming tide (nearly high tide). Plentiful bird activity mostly swans and ducks alongside road but 4 Brent geese grazing on upper estuarine saltmarsh island adjacent to scan sampling location. Other Brent geese further out in estuary among gulls and terns. Remained for duration of scan sampling despite turning tide (unlike previous results).	1.5hrs survey – outgoing tide. Plentiful mixed bird activity including several distinct groupings of Brent Geese closer to shore then heretofore recorded around this area (60m at closest point). (On previous visits they are usually further out in outer estuary in direction of Malahide.	No frog spawn in ditches or the watercourse at northern end of site. Wet ground in flood prone area dry. 3 small dogs noted roaming the fields at back of Lissenhall house. This would deter any activity of waterbirds using the area.
#6	**27/03/19**	2 hr survey – mild to improving, sunny conditions. No Brent Geese activity including forage, overfly of faecal deposit signs observed. Key birds noted – Woodpigeon, Crow along with Robin (*Erithacus rubecula*), Wren (*Troglodytes troglodytes*), Blue Tit (*Parus caeruleus*) and Goldcrest (*Regulus regulus*). Breeding/nesting activity within hedgelines was considerably greater than earlier visits. Buzzard were present and a single one seen flying westwards towards Swords. Near the end of the visits, one buzzard	2hr survey on outgoing tide. Few Brent Geese noted for duration. Other species included: Shelduck (*Tadorna tadorna*) 6+, Mute Swan (*Cygnus olor*) 43, Mallard (*Anas platyrhynchos*) 24, Heron (*Ardea cinerea*) 1, Little Egret (*Egretta garzetta*) 1, Oyster Catcher (*Haematopus ostralegus*) 54+, Ringed Plover (*Charadrius hiaticula*)75+, Herring Gull (*Larus argentatus*) 36, Moorhen (*Gallinula*	1.75hr survey on incoming tide. Individuals or pairs of Brent Geese along shoreline/receding tide interface - up to 38 noted in proximity to scan survey point 4 position. Birds moved around coast and became interspersed with other waders/birds – Oystercatchers (*Haematopus ostralegus*), Curlew (*Numenius arquata*), Ringed Plover (*Charadrius hiaticula*)	Fox kill near Kennels, and 1 print in mud near scan survey point 1 field ditch No evidence of Frog spawn or tadpoles. Birds calling and Nesting activity well established along scrubby hedgelines and central wooded copse.

		was gliding over the Motorway at the north eastern end of the site.	*chloropus*)1, Curlew (*Numenius arquata*) 3 and Redshank (*Tringa totanus*)75+.	and BlackTailed Godwit (*Limosa limosa*) with some gull species (*Larus* spp). Group tightened up as tide flowed in.	

4 CONCLUSION

With the exception of the NPWS consultative discussion, other non-governmental organisations (Birdwatch Ireland and Irish Brent Goose Research Group) had no records of Brent Geese (or Golden Plover) from the LAP lands. However, they could not rule out their presence in suitable fields.

The focus of this study in the first instance was on confirming the activity or utilisation of the LAP lands by Brent Geese (and Golden Plover), during the over-wintering period, and secondly, on confirming activity in a number of other areas.

The Inspectors report[8] at section 14.2 from a recent An Bord Pleanála (ABP) ruling noted that applicants would likely need to not only demonstrate the level/frequency of use on the site, but also the capacity of the known surrounding sites to absorb any lost foraging habitat in determining *ex-situ* impacts.

Notwithstanding the identified constraints and the absence of full understanding of bird movements, the survey data revealed that no Brent Geese or Golden Plover were noted from the LAP lands during any of the six visits in winter 2018/2019. Despite the considerable pressure and intensification of development in Fingal and in particular within the Swords to Donabate/Portrane corridor, the extent of the SPA is considerable and the concentration of terrestrial feeding territory within the SPA territory remains considerable. Suitable territory within the proposed LAP lands is confined to four large fields currently in agricultural production. They are surrounded by well developed, rank hedgelines and treelines which are isolated from the SPA lands by the M1 Motorway. Thus, whilst foraging/grazing activities cannot be completely ruled out, it is suggested based on the results of the scan sampling surveys and perimeter walkabouts that Brent Geese do not ordinarily use these fields. Having regard to consultation with appropriate stakeholders and surveys undertaken over the 2018/2019 winter bird season, it is considered reasonable to consider that the development of the lands for the LAP is unlikely to result in a loss of *ex-situ* territory for Brent Geese or Golden Plover.

[8] http://www.pleanala.ie/documents/reports/300/R300559.pdf

APPENDIX A

I-WeBS Data Malahide Estuary Site (March 28th, 2019)

https://f1.caspio.com/dp/f4db3000060acbd80db9403f857c

Species Common Name	1% national	1% international	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	Mean (2010/11 to 2014/15
Mute Swan	90		97	112	110	114	108	90	47	50	89	58	67
Whooper Swan	150	270			9			2		1			2
Black Swan											1		1
Greenland White-fronted Goose	110	240					1						
Bar-headed Goose						1	1						
Barnacle Goose	150	710					1						
Light-bellied Brent Goose	360	400	1927	2000	1856	898	1411	943	1980	710	464	824	984
Shelduck	120	3000	247	273	246	341	479	8	262	120	222	303	183
Wigeon	630	15000	95	187	150	42	168		157		2	67	75
Gadwall	20	600					2		120	4			62
Teal	340	5000	65	176	142	99	670	41	112	119	87	141	100
Mallard	290	20000	146	340	178	176	379	95	220	112	92	92	122
Pintail	20	600	74	40	72	66	72		29	6		15	17
Shoveler	30	400			14	6	50					9	9
Pochard	160	3000	16	40	18	35	8		2				2
Tufted Duck	310	12000			2	15	8				1		1
Scaup	65	3100	2		1		4				3		3
Long-tailed Duck		17250					1		3				3
Common Scoter	140	5500	240	520	300	278			30				30
Goldeneye	60	11500	104	184	105	126	93	51	66	36	92	31	55
Red-breasted Merganser	20	1700	65	51	39	161	78	87	57	80	35	26	57
Ruddy Duck							1						
Red-throated Diver	20	3000		4	8				4				4
Great Northern Diver	20	50				3				3		2	2

Species Common Name	1% national	1% international	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	Mean (2010/11 to 2014/15
Little Grebe	20	4000	4	7	8	13	28	23	21	8	33	26	22
Great Crested Grebe	40	3500	89	61	96	54	44	34	120	60	72	84	74
Slavonian Grebe		55	2										
Cormorant	120	1200	155	133	58	42	28	6	101	101	42	86	67
Shag		2000	2		130	66	30		32	8	9	5	14
Little Egret	20	1300	26	23	26	17	3	2	17	13	16	35	17
Grey Heron	25	2700	25	39	28	77	20	12	19	19	27	26	21
Moorhen		20000	1	5	3	7	12	4	4	6	9	4	5
Coot	220	17500	1		2		12						
Oystercatcher	690	8200	1102	1519	1529	1285	1471	78	1300	1833	1355	1291	1171
Ringed Plover	100	730	94	15	16	14	25		71			13	42
Golden Plover	1200	9300	500	2300	1310	72	1000	260	1000	200	5		366
Grey Plover	30	2500	139	163	155	150	169	3	140	9	6	100	52
Lapwing	1100	20000	1196	570	434	315	642	1180	900	590	681	63	683
Knot	280	4500	250	200	331	354	870	4	440	110	49	9	122
Sanderling	60	1200		8	4		1		2	80	46		43
Curlew Sandpiper		10000							2				2
Dunlin	570	13300	490	310	1173	416	1365	23	480	94	121	300	204
Ruff		12200	8	1	4	1	1	4	1	2	5		3
Jack Snipe		20000							1				1
Snipe		20000	20	15	44	5	46	20	25	56	25	36	32
Black-tailed Godwit	190	610	428	397	366	478	258	296	355	206	167	121	229
Bar-tailed Godwit	150	1200	262	101	200	358	286	62	213	133	14	60	96
Curlew	350	8400	301	390	240	545	330	1	500	244	83	246	215
Common Sandpiper					6	3	4	1	17		1		6

Species Common Name	1% national	1% international	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	Mean (2010/11 to 2014/15
Green Sandpiper		15500								27			27
Spotted Redshank		900	1	1	1						1		1
Greenshank	20	2300	52	78	59	29	26	26	43	64	30	34	39
Redshank	300	3900	442	927	589	459	364	87	374	171	130	363	225
Turnstone	95	1400	140	220	139	175	175	23	221	94	85	75	100
Mediterranean Gull		770		1									
Little Gull		1100			1								
Black-headed Gull		20000	510	902	1072	930	565	479	368	659	571	496	515
Common Gull		16400	71	180	221	187	228	149	70	71	16	184	98
Lesser Black-backed Gull		5500	2	3	28	5	5	4	3	15	8	196	45
Herring Gull		10200	20	217	77	66	68	55	139	110	95	118	103
Iceland Gull		1600						2					2
Great Black-backed Gull		4200	10	10	18	20	20	15	44	93	9	42	41
Sandwich Tern			237	152	26	84	3	2	50	12		2	16
Common Tern				20		1							

Appendices

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