



**Natura Impact Statement
Appendix 1
WINTERING BIRD, BAT, AND BADGER REPORT**

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Wintering Bird, Bat & Badger Report

GC Media Park

Grange Castle



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DOCUMENT DETAILS

Client: Awn Consulting

Project Title: Grange Castle Media Park

Address: Brownstown, Co. Dublin

Document Title: Bird and Bat Report

Prepared By: John Curtin - Consultant Ecologist

Date: 21/11/2023

RECEIVED: 19/04/2023

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1 INTRODUCTION

Eire Ecology was commissioned by Awn Consulting to carry out an assessment of birds and bat usage of lands located at Brownstown, Co. Dublin.

The present report was compiled by John Curtin of Eire Ecology providing information on flora and fauna. John Curtin B.Sc. is the principal ecologist with Eire Ecology and has over 10 years of experience in ecological impact assessment.

The report concentrates on ecological features within the development area of particular significance, primarily designated habitats and species, including habitats/species listed in Annex I, II and IV of the EU Habitats Directive, rare flora listed in the Flora Protection Order along with other semi-natural habitats of conservational value.

The report has been compiled in compliance with the European Communities Legal requirements and follows guidance outlined in the following documents:

- EPA Revised Guidelines on the Information to be contained in Environmental Impact Statements Draft September 2015.
- EPA Advice Notes on for Preparing Environmental Impact Statements Draft September 2015.

The European Habitats Directive 92/43/EEC (Article 6) indicates the need for plans and projects to be subject to Habitats Directive Assessment (also known as Appropriate Assessment) if the plan or project is not directly connected with or necessary to the management of a Natura 2000 site (which includes SACs and SPAs) but which has the potential to have implications on a site's conservation objectives. These implications can be significant effects either individually or in combination with other plans or projects.

2 ASSESSMENT METHODOLOGY

2.1 POLICY & GUIDANCE

2.1.1 EU Habitats Directive

The “Habitats Directive” (Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna) is the main legislative instrument for the protection and conservation of biodiversity within the European Union and lists certain habitats and species that must be protected within wildlife conservation areas, considered to be important at a European as well as at a national level. A “Special Conservation Area” or SAC is a designation under the Habitats Directive. The Habitats Directive sets out the protocol for the protection and management of SACs.

The Directive sets out key elements of the system of protection including the requirement for “Appropriate Assessment” of plans and projects. The requirements for an Appropriate Assessment are set out in the EU Habitats Directive. Articles 6(3) and 6(4) of the Directive.

2.2 EU Birds Directive

The “Birds Directive” (Council Directive 79/409/EEC as codified by 2009/147/EC) provides for a network of sites in all member states to protect birds at their breeding, feeding, roosting and wintering areas. This directive identifies species that are rare, in danger of extinction or vulnerable to changes in habitat and which need protection (Annex I species). Appendix I indicates Annex I bird species as listed on the Birds Directive. A “Special Protection Area” or SPA, is a designation under The Birds Directive.

SACs and SPAs form a pan-European network of protected sites known as Natura 2000 sites and any plan or project that has the potential to impact upon a Natura 2000 site requires Appropriate Assessment (AA). As outlined previously, an AA Screening Report was prepared for this project and is presented as a separate report to the planning application.

2.2.1 Wildlife Acts 1976 – 2012

The primary domestic legislation providing for the protection of wildlife in general, and the control of some activities adversely impacting upon wildlife is the Wildlife Act of 1976, as amended. The aims of the wildlife act according to the National Parks and Wildlife Service are “... to provide for the protection and conservation of wild fauna and flora, to conserve a representative sample of important ecosystems, to provide for the development and protection of game resources and to regulate their exploitation, and to provide the services necessary to accomplish such aims.” All bird species are protected under the act. The Wildlife (Amendment) Act of 2000 amended the original Act to improve the effectiveness of the Act to achieve its aims.

2.3 SURVEY METHODOLOGY

The assessment was carried out in three stages, firstly through desktop assessment to determine existing records in relation to habitats and species present in the study area. This included research on the NPWS metadata website, the National Biodiversity Data Centre (NBDC) database and a literature review of published information on flora and fauna occurring in the development areas.

The second phase of the assessment involved site visits to establish the existing environment in the footprint of the proposed development with particular reference to birds, bats and mammals. Signs of mammals were searched while surveying the study area at several occasions throughout winter of 2022 and spring 2023 noting any sights, signs or any activity in the vicinity especially along adjacent boundaries. The potential to host bat roosts was examined at the time of an walkover survey. A photographic record was made of the main features of interest. A static bat detector survey was conducted in May 2023, in addition to a walked night bat survey on the 6th of June. Wintering and migratory bird surveys were conducted from November 2022 to March 2023. The final part of the assessment involves an evaluation of the proposed development area and determination of the potential impacts on the fauna of the area. This part of the assessment forms the basis for Impact Assessment and is based on the following guidelines and publications:

- Assessment of plans and projects significantly affecting Natura 2000 sites (EC, 2002);
- Managing Natura 2000 Sites (EC, 2000);
- Guidance document on Article 6(4) of the Habitats Directive 92/43/EEC (EC, 2007);
- Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (DEHLG, December 2009, Rev 2010);
- Guidelines for Planning Authorities & An Bord Pleanála on carrying out Environmental Impact Assessments (March 2013)
- EPA Revised Guidelines on the Information to be contained in Environmental Impact Statements Draft September 2015.
- EPA Advice Notes on for Preparing Environmental Impact Statements Draft September 2015.
- Bat Mitigation Guidelines for Ireland V2 (National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, 2022).
- Hen Harrier Survey 2015 results (Irish Wildlife Manuals No. 93, Ruddock et al 2016)
- Institute of Ecology and Environmental Management's Guidelines for Ecological Impact Assessment (2006)
- Natura Scheme for evaluating ecological sites (Nairn & Fossitt, 2004)
- Colhoun, K., and Cummins, S. (2013). Birds of Conservation Concern in Ireland 2014–2019. Irish Birds 9:523–544
- BirdWatch Ireland and the National Parks and Wildlife Service of the Department of the Environment, Heritage and Local Government. Counter Manual. Guidelines for Irish Wetland Bird Survey Counters

- NRA (2009) 'Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes'
- Mc Guinness, S., Muldoon, C., Tierney, N., Cummins, S., Murray, A., Egan, S. & Crowe, O. (2015) Bird Sensitivity Mapping for Wind Energy Developments and Associated Infrastructure in the Republic of Ireland. BirdWatch Ireland, Kilcoole, Wicklow
- Crowe, O (2005) Ireland's wetlands and their waterbirds: Status and Distribution. BirdWatch Ireland, Newcastle, Co Wicklow
- Scottish Natural Heritage (2017) Recommended bird survey methods to inform impact assessment of onshore wind farms, Version 2, SNH, Perth
- Natural England Guidance for bird surveys in relation to development <https://www.gov.uk/guidance/wild-birds-surveys-and-mitigation-for-development-projects#survey-methods>
- Natural England Guidance for bird surveys in relation to onshore windfarms <https://www.gov.uk/guidance/wild-birds-surveys-and-monitoring-for-onshore-wind-farms>
- Wetland Bird Survey (WeBS): Numbers and Trends
- British Trust for Ornithology. Bird Atlas 2007-11, Field Methods.

The location of the proposed development in the townland of Brownstown, Co. Dublin is presented in Figure 2-1 below.

GC Media Park Site Outline

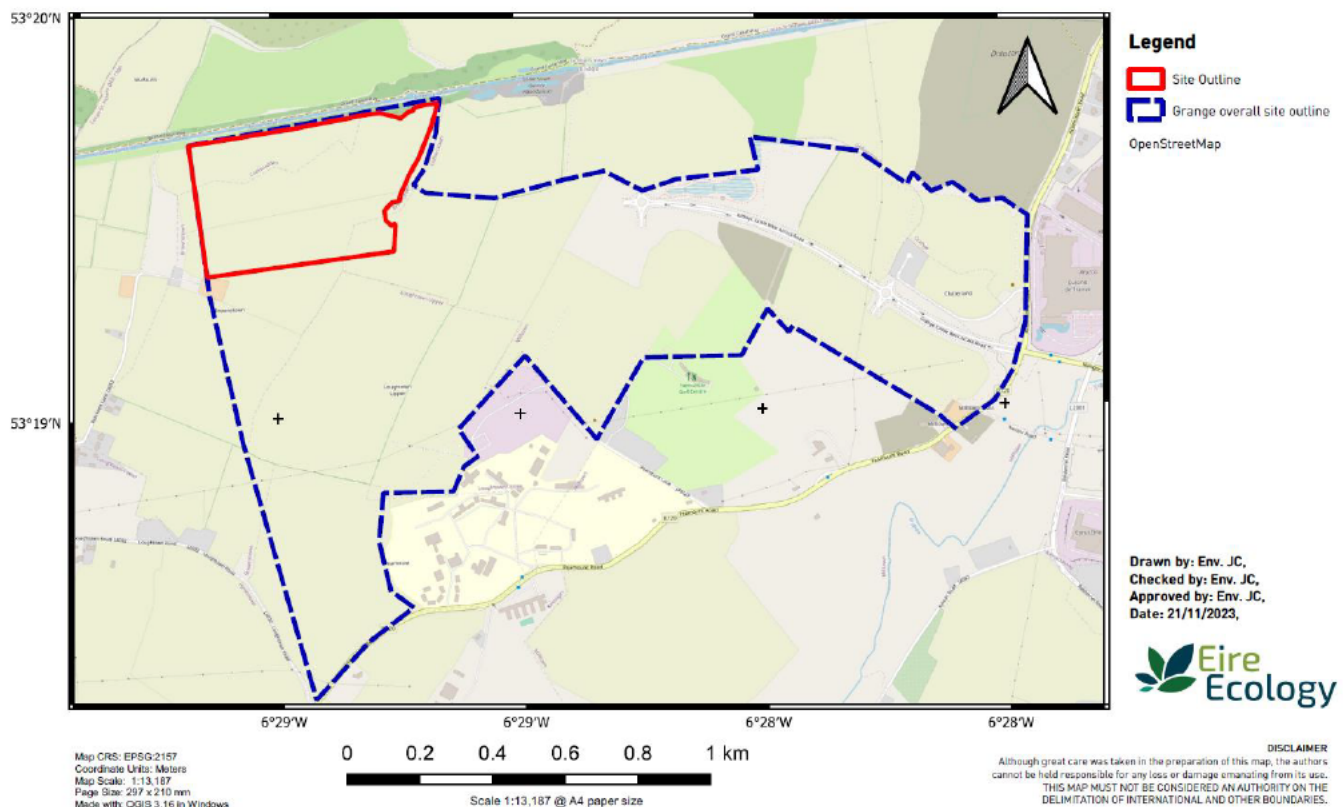


Figure 2-1 Showing the indicative site location at Brownstown, Co. Dublin.

3 PROJECT DESCRIPTION

The site in question is located within agricultural lands. While the site is located in the townland of Brownstown it forms part of a larger Grange Castle West site owned by South Dublin County Dublin and set for development as an industrial park.

4 EXISTING ENVIRONMENT

4.1 DESIGNATED CONSERVATION AREAS

The site for the proposed development lies approximately 300m from the Grand Canal pNHA. The closest European designate site is Rye Water Valley/Carton SAC situated 4.2km to the north, at the far side of the Liffey River (see Figure 4-1).

No Special Protection Areas (Birds Directive) are located within a 15km zone of the subject site with the closest Wicklow Mountains SPA (Site Code: 004040) located 15.1km to the south.

GC Media Park 15km Buffer

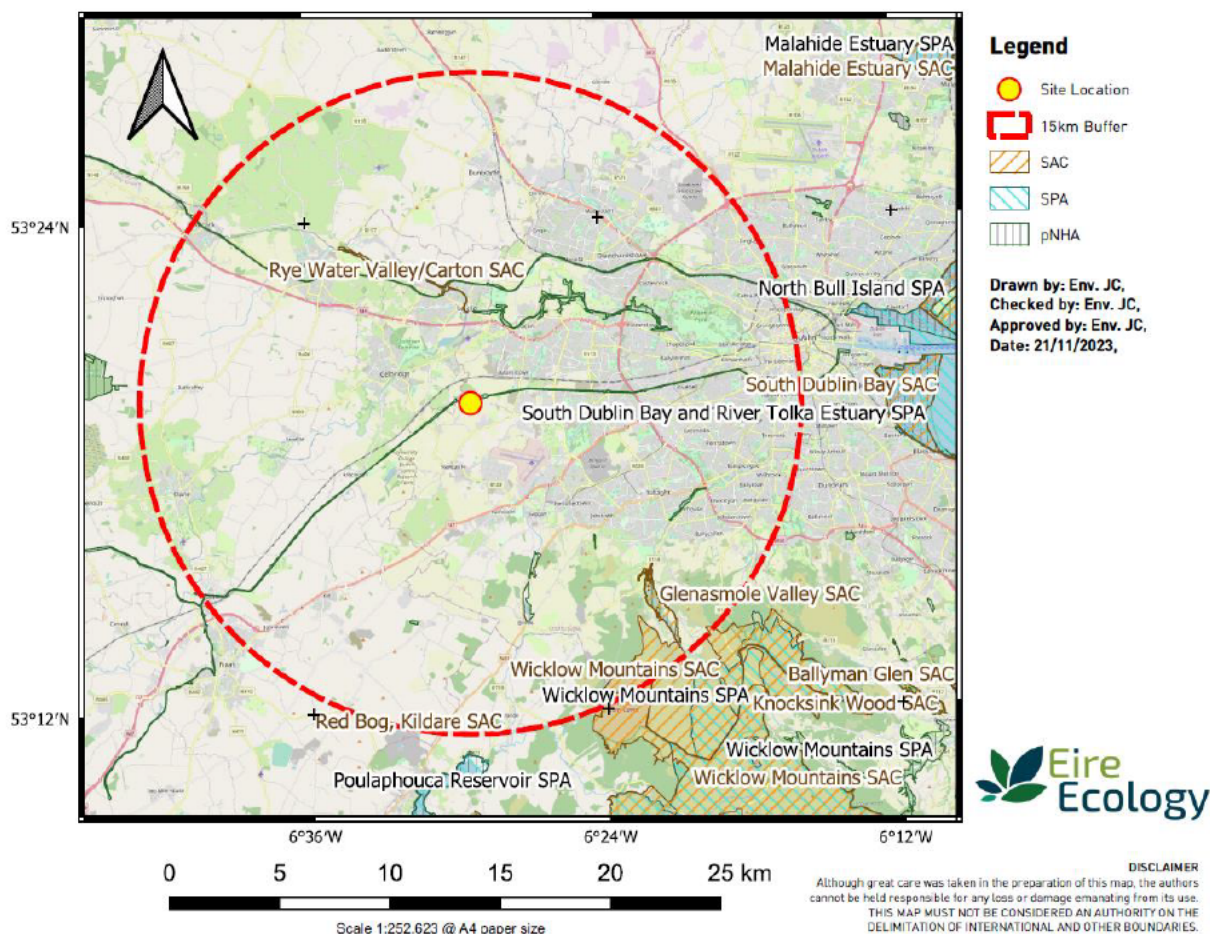


Figure 4-1: Indicative site location in relation to SAC's and pNHA's.

Table 4-1 Protected habitats with ornithological & mammal value in the vicinity of the proposed development

Site	Site Code	Distance	Has the designated site a high ornithological / mammal value?	Has the site ornithological / mammal connectivity to the subject site?
Proposed National Heritage Areas (pNHA's)				
Grand Canal pNHA	002104	0.3km	Yes. Provides an ecological corridor for bird and bat species.	Located to the north of the subject site. Potential connectivity.
Liffey Valley pNHA	000128	3.8km	Although birds and bats are not noted within the Site Synopsis document for this site, Daubenton's bats have been recorded here.	Connectivity to subject site impacted by M4 and railway line.
Royal Canal pNHA	002103	5.1km	Otter are noted from the Site Synopsis document. Although birds and bats are not noted within the Site Synopsis document for this site, Daubenton's bats have been recorded here.	Lacks connectivity to subject site.
Slade Of Saggart & Crooksling Glen pNHA	000211	6.8km	Yes. Wildfowl species mentioned in site description.	Lacks connectivity to subject site. The Naas Roads provides a barrier between the site. Carmac River flows NE, away from the subject site.
Lugmore Glen pNHA	001212	7.7km	Birds and bats are not noted within the Site Synopsis document for this site	Lacks connectivity to subject site.
Kilteel Wood pNHA	001394	9.6km	Birds and bats are not noted within the Site Synopsis document for this site	Lacks connectivity to subject site.
Dodder Valley pNHA	000991	10.0km	Yes. Forty-eight bird species have been recorded in the area, including Little Grebe, Kingfisher, Dipper and Grey Wagtail. Part of the river bank supports a Sand Martin colony of up to 100 pairs.	Lacks connectivity to subject site.
Special Protected Areas (SPA's) / Special Areas of Conservation (SAC's)				
Rye Water Valley/Carton SAC	001398	4.2km	Blackcap, Woodcock, Long-eared Owl, Little Grebe, Coot, Moorhen, Tufted Duck, Teal and Kingfisher have been recorded from the site.	Located to the north of the site with M4 and railway line separating sites.
Glenasmole Valley SAC	001209	10.3km	Bats, otter and kingfisher are mentioned in the site synopsis.	Lacks connectivity to subject site. The Naas Roads provides a barrier between the site. Dodder River flows NE, away from the subject site.
Wicklow Mountains SAC	002122	11.8km	Meadow Pipit, Skylark, Raven and Red Grouse are resident throughout the site. Wheatear, Whinchat and the scarce Ring Ouzel are summer visitors. Wood Warbler and Redstarts are rare breeding species of the woodlands. Dipper and Grey Wagtail are typical riparian	Many of the bird species noted are unlikely to utilise the subject site given the distances involved. Merlin and Peregrine move to the lowlands during the winter months in order to hunt wintering birds so its possible birds from here could hunt within the site.

Site	Site Code	Distance	Has the designated site a high ornithological / mammal value?	Has the site ornithological / mammal connectivity to the subject site?
			species. Merlin and Peregrine, both Annex I species of the E.U. Birds Directive, breed within the site. Recently, Goosander has become established as a breeding species.	
Red Bog, Kildare SAC	000397	13.9km	Mute Swan, Mallard, Tufted Duck, Coot, Moorhen, Snipe and Black-headed Gull have been recorded breeding within the site	Lacks connectivity to subject site.
Wicklow Mountains SPA	004040	15.3km	Designated for Merlin (<i>Falco columbarius</i>) and Peregrine (<i>Falco peregrinus</i>)	The subject site sits over 15km from the SPA. It is possible these species move to the lowlands during the winter months in order to hunt wintering birds
Poulaphouca Reservoir SPA	004063	15.5km	Designated for Greylag Goose (<i>Anser anser</i>) and Lesser Black-backed Gull (<i>Larus fuscus</i>)	The subject site sits over 15km from the SPA. Unlikely CO's from this site utilise the subject site.

4.1.1.1 Designated species recorded in the surrounding area

The NBDC database was consulted for details on designated records held for the site and the surroundings. The database was consulted on the 30/05/2023 and rechecked on the 21/11/2023 for details on historical records from the site and the surrounding 2km square; 003A. Results are outlined in Table 4-2.

Table 4-2: Designated birds and mammals recorded in the 003A 2km grid

Species name	No. of records	Date of last record	Designation
Birds			
European Golden Plover (<i>Pluvialis apricaria</i>)	1	31/12/2011	Wildlife Acts II EU Birds Directive Annex I, II & III II BoCCI - Red List
Common Pheasant (<i>Phasianus colchicus</i>)	2	31/12/2011	Wildlife Acts II EU Birds Directive >> Annex II & III
Common Wood Pigeon (<i>Columba palumbus</i>)	2	31/12/2011	Wildlife Acts II EU Birds Directive >> Annex II & III
Northern Lapwing (<i>Vanellus vanellus</i>)	1	31/12/2011	Wildlife Acts II EU Birds Directive Annex II, Section I Bird Species II BoCCI - Red List
Barn Swallow (<i>Hirundo rustica</i>)	2	27/08/2017	Wildlife Acts II BoCCI - Amber List
Common Grasshopper Warbler (<i>Locustella naevia</i>)	1	31/12/2011	Wildlife Acts II BoCCI - Amber List
Common Linnet (<i>Carduelis cannabina</i>)	1	31/12/2011	Wildlife Acts II BoCCI - Amber List
Common Starling (<i>Sturnus vulgaris</i>)	2	31/12/2011	Wildlife Acts II BoCCI - Amber List
Common Swift (<i>Apus apus</i>)	1	31/12/2011	Wildlife Acts II BoCCI - Amber List
Eurasian Tree Sparrow (<i>Passer montanus</i>)	2	31/12/2011	Wildlife Acts II BoCCI - Amber List
House Martin (<i>Delichon urbicum</i>)	1	31/12/2011	Wildlife Acts II BoCCI - Amber List
House Sparrow (<i>Passer domesticus</i>)	2	31/12/2011	Wildlife Acts II BoCCI - Amber List
Little Grebe (<i>Tachybaptus ruficollis</i>)	1	31/12/2011	Wildlife Acts II BoCCI - Amber List
Mute Swan (<i>Cygnus olor</i>)	2	31/12/2011	Wildlife Acts II BoCCI - Amber List
Sky Lark (<i>Alauda arvensis</i>)	1	31/12/2011	Wildlife Acts II BoCCI - Amber List
Black-headed Gull (<i>Larus ridibundus</i>)	1	31/12/2011	Wildlife Acts II BoCCI - Red List
Yellowhammer (<i>Emberiza citrinella</i>)	2	31/12/2011	Wildlife Acts II BoCCI - Red List
Mammals			
European Otter (<i>Lutra lutra</i>)	2	10/06/1980	EU Habitats Directive - Annex II & Annex IV II Wildlife Acts
Eurasian Badger (<i>Meles meles</i>)	2	14/05/1992	Wildlife Acts

5 Field Survey

5.1 Survey Personal

John Curtin is an experienced ecologist having conducted plant, habitats, birds, bats and mammal surveys since 2010 including at windfarm and solar sites. John conducted bird, bat and badger surveys. Shane O'Neill is an experienced ornithologist (Co-author Hen Harrier Survey, NPWS 2015) with a broad knowledge of breeding birds, waders and all aspects of ornithology. Shane has previously conducted I-WeBS surveys and taken part in the Shannon estuary wintering wader surveys. Karolina Illien M.S.c has a range of ecological experience surveying birds including waterbirds counts and development sites, bats and habitats. Karolina conducted bat surveys on site.

5.2 Baseline surveys

Table 5-1 provides a summary of surveys conducted within and surrounding the site.

Table 5-1 Summary of survey dates

Date	Survey type		Start Time	End Time	Details	Sunset / sunrise	Surveyor
29/11/2022	Thermal transect	T1	06:50	07:22	Thermal transect of tilled field. 2 x black headed gulls noted in field with 16 golden plover recorded in field within boundary	08:22	JC
	VP	1	07:22	10:22	By sheds. Overall low level of activity, highlight being 8 x Lapwing circling around rear of site		
	Hinterland		11:00	13:40	Black headed gulls in fields to SE		
	Transects	T2	13:40	14:10	Northern field. Nothing to highlight		
	Hinterland		14:10	15:00	Low activity by Grand Canal		
15/12/2022	Hinterland		09:00	13:30		16:06	SON
	Transect	2	14:00	14:41	Common species observed		
	Vantage Point watches	1	14:45	17:45	9 x Lapwing recorded perched within field in subject site. 7 x Golden plover also landed and perched in field		
	Thermal transect	1	17:45	18:30	Lapwing x 9 roosting overnight in southern field . 4 x Sn also recorded here.		
20/01/2023	2 Vantage Point watches	1	08:10	14:40	Golden Plover were the most numerous birds recorded on sight during VP a total of 9 flocks were recorded numbering from 1 to 169 these flocks were recorded both on and off the site. Snipe were also recorded 4 in total.	08:27	SON
25/01/2023	Transects	2	14:45	16:00	Transects of the rough pasture to the north of the site were carried in the afternoon only common species were recorded.	16:55	SON

Date	Survey type		Start Time	End Time	Details	Sunset / sunrise	Surveyor
25/01/2023	Thermal transect	1	17:30	18:40	There was a total of 32 Golden Plover recorded during this survey. Snipe and Lapwing were heard but not seen.		
22/02/2023	Preliminary inspection of buildings and trees for bat roosts				Four farm buildings located to west of site. 3 medium potential and 1 of low potential to host a bat roost.		SON
22/02/2023	Badger transect				No evidence of badger was recorded		
24/02/2023	2 Vantage Point watches	2	08:00	14:30	In February Golden Plover were the most numerous birds recorded on site with 6 flocks recorded from 30 to 400 birds.		SON
28/03/2023	2 Vantage Point watches	2	14:00	20:30	March saw a significant drop-off in Golden Plover no flocks were recorded on or near the site on this date. Only common species were recorded.		SON
26/05/2023 – 06/06/2023	Static bat survey. 2 statics; 1 placed in				4 bat species identified over the course of 12 nights.		KI
06/06/2023	Emergence bat survey		21:17	23:20	Two surveyors conducted emergence surveys at sheds to west of site. No roosting bats found.	21:47	JC & KI
06/06/2023	Transect		23:20	00:17	Transect through site and to Grand Canal.		
07/06/2023	Re-entry bat survey		02:58	04:58	Re-entry survey by derelict dwelling to west of site.	04:58	

5.3 Limitations of Survey

All of the surveys were carried out in good weather conditions. Migratory bird surveys would normally include an October survey however due to the late appointment of Eire Ecology, this survey was not carried out, however most of the autumn and spring migratory period was covered.

The location of the bird Vantage point (VP) was chosen as it provided the optimum visibility of the study site. The Vantage point surveys was conducted outside the site. Bat surveys were carried out within the bat active season while evidence of badger was sought in February, before bramble obstructed view. 1

5.4 FAUNA

5.4.1 Bats

There are nine resident bat species in Ireland accounting for nearly a third of Irelands mammal populations. Bats are protected by EU Habitats Directive as well as the 1976 Wildlife Act and 2000 Amendment (BCI, 2010). Lesser Horseshoe bats have an additional protection under the EU Habitats Directive. In order to comply with legislation that bats are not killed or

injured, it is essential to ensure that measures to reduce risk to bats are undertaken or that the presence of bats can be ruled out.

A preliminary walkover survey was carried out by John Curtin on the 22nd of February 2023 to examine the potential for any features suitable to host a bat roost. Buildings to the west were assessed as even if they were not demolished as part of the development; the development could impact roosting bats should they be found here. Three sheds were ranked moderate for bat roosting potential while another was ranked low potential. Hedgerows within the site have no potential to host a bat roost. A tree located just outside the boundary also had no potential.

To ascertain bat activity on a static detector survey was conducted on site from the 26th of May to the 06th of June 2023. A night time detector emergence survey was conducted at sheds and to the west of the site while a dawn survey was conducted at a derelict house further west.

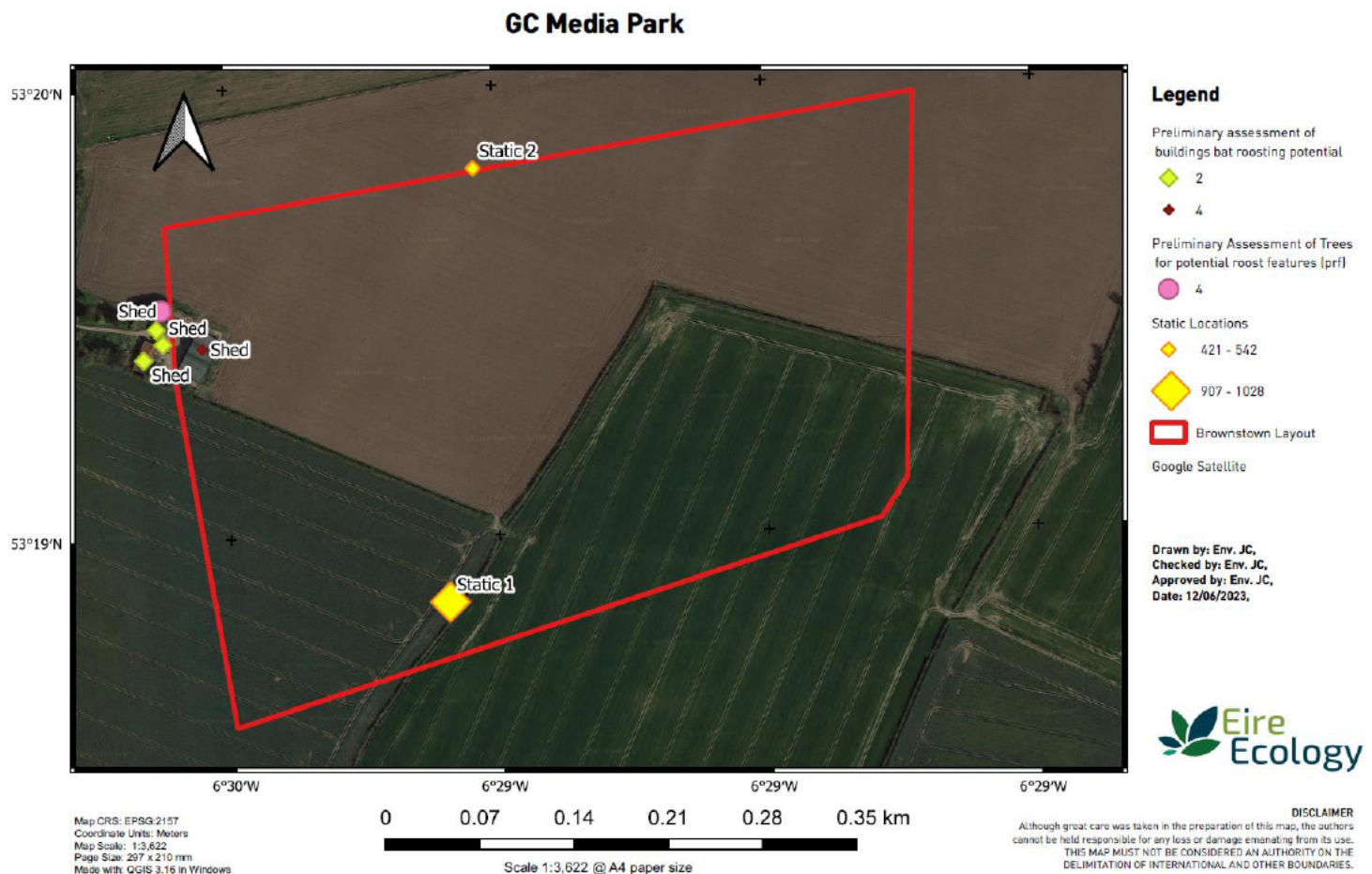


Figure 5-1: Preliminary assessment of trees and buildings within the site alongside locations of static detectors (size of detectors displays difference in activity levels between hedgerow and open habitats).

5.4.1.1 *Fixed site recordings made during 2023*

Two Song Meter Mini (Wildlife Acoustics, Inc; Massachusetts, USA) 16-bit full spectrum time-expansion recording bat detectors were placed within the study area (Static 1; 53.32155941, -6.48957151. Static 2; 53.32443145, -6.48921833) on the evening of the 26th of May to the 06th of June 2023. These static detectors were installed according to the guidelines as set out in Bat Conservation Ireland's 'Bat Survey Guidelines.'

Detector 1 was placed adjacent to a hedgerow; a habitat feature favoured by bats while the 2nd detector was placed in the open. These devices were set to record from 30 minutes prior to sunset to half an hour after sunrise and automatically adjusts itself each day thus in position and recording giving a total of 101 hours 05 minutes each over the twelve nights.

Registrations as described below follow the Bat Conservation Trusts definition of a bat pass; 'two or more bat calls in a continuous sequence; each sequence or pass is separated by one second or more in which no calls are recorded. The number of bat passes for each species or species group identified is counted for each' point. (BCT Good Practice Guidelines 2nd Ed 2012). Detectors were in place during the peak bat active season.. Weather information is provided by Met Eireann from the weather station located in Dublin Airport. Lowest sunset temperatures was 10 degrees or above. Sunset windspeeds were on average 6.4 mph (2.8m/s). Rainfall was low barring rain on the 03rd. Overall, these conditions were good for bat activity.

5.4.1.2 *Emergence bat survey 6th of June 2023*

A dusk mobile detector survey was carried out within the site during the dusk period to survey for emerging bats. Surveys commenced at 21:27; half an hour before sunset. Each contact with a bat was recorded. Where possible, a positive identification to species level was made. Information on the behavior was also recorded where available.

The bat detectors used during the walked surveys were Wildlife Acoustics Inc. (Massachusetts, USA) Echo Meter Touch Pro 2 bat detector which is triggered to record when a bat call is emitted louder than 18dB for 1sec. These detectors use full spectrum sampling; detecting all frequencies simultaneously, meaning that multiple bat calls can be recorded at the same time.

In addition to the bat detector one surveyor used a Track IR Pro 19mm thermal imaging scope while the other used a Canon XA10 night vision camcorder supplemented with two nightfox IR torches. Video footage was analysed using Motion Meerkat alongside manual verification.

A contact as shown below describes a bat observed by the surveyor. This contact can range from a commuter passing quickly to a foraging bat circling a feature lasting for several minutes. Some observations contain multiple bats. When several bats of the same species are encountered together, they are recorded under the one contact. A separate contact is recorded for each species. A contact finishes when the recorder assumes the bat is no longer

present. It is likely that the same bat is recorded in several contacts throughout the night. This survey type cannot estimate abundance of bats, rather activity; the amount of use bats makes of an area / feature. The survey followed the guidelines as set out in bat conservation Ireland's 'Bat Survey Guidelines'.

Sunset on the 06th of June occurred at 21:47. A northwest wind of 0.8m/s was recorded through the survey. The air temperature was recorded as 13.5 degrees at 21:17 dropping to 7.5 degrees by 00:20. Overall, these conditions were good for bat survey work.

5.4.1.3 Results of dusk survey

During the survey, two bat species were identified to species level; Common Pipistrelle (*Pipistrellus pipistrellus*) and Leisler's bat (*Nyctalus leisleri*) were recorded during the emergence periods. During the transect survey Soprano Pipistrelle (*Pipistrellus pygmaeus*) and Brown Long-eared (*Plecotus auritus*) were recorded by the grand canal to the north of the site.

GC Media Park Emergence Surveys



Figure 5-2: Location of sheds and position of surveyors.

At dusk surveyors were positioned by sheds 1 to 4 using torches thermal and night vision camcorder. No bats were recorded emerging from any shed. The first bat recorded was at 22:22 some 35 minutes after sunset when a brief unseen Common Pipistrelle was recorded. Surveyor 2's first contact was recorded at 22:39; 52 minutes after sunset. After this point a couple of contacts were recorded from Common Pipistrelle and Leisler's bat. At 22:48 a

Common Pipistrelle was noted entering and flying within the large metal shed 1. This bat was hunting rather than roosting.



Plate 5-1: Emergence survey location 1. Shed 2 to right, shed 4 to left.



Plate 5-2: Emergence survey location 2 by shed 3



Plate 5-3: Re-entry survey building 5 (location3)

At 23:20 a transect was conducted through the site and north to the grand canal. Activity was low with no records of Daubenton's. A Brown Long-eared bat and Soprano Pipistrelle were recorded. A dawn survey (02:58 to 04:58) was conducted by a derelict dwelling to the west

(building 5). Common Pipistrelle and Leisler's bat were again recorded, however no roosting bats were found.

5.4.1.4 Results of static bat survey 2023

Analysis of recorded registrations was made using Wildlife Acoustic's Kaleidoscope Pro; version 5.6.0c. This software identifies many of the calls made by Irish bats. All calls not labelled Soprano or Common Pipistrelle Bats were also manually verified.

The results of the static detector survey are summarised in **Table 5-2**. Over the course of twelve nights a total of 1449 registrations were recorded from both detectors.

Detector 2's highest-level activity on the first night, which saw 94 individual calls recorded. Detector 1 showed a marked higher average rate of bat calls, peaking at 109 between the 28th and 31st May. Leisler bats made up the majority of the calls recorded, most likely due to being located in open spaces. Lowest activity occurred on the 6th of June with 10 registrations from detector 1 and 1 registration recorded on detector 2.

Of particular interest is the lack of Myotis recordings given the site is located relatively close to the Grand Canal. Results indicate that lands within the site outline are not utilised by Daubenton's bats or other woodland bat species that may be using the canal corridor.

Table 5-2: Summary of both statics

	Leisler's Bat	Common Pipistrelle	Soprano Pipistrelle	Pipistrelle 40 kHz	Brown Long-eared	Unidentified Myotis	Total	Minutes recorded	Bat passes per hour
1	947	43	16	19	3	0	1028	6065	10.2
2	386	23	7	4	0	1	421	6065	4.2
Total	1333	66	23	23	3	1			
Bat passes per hour	6.6	0.3	0.1	0.1	0.0	0.0	1449	12130	7.2

5.4.1.5 Bat Discussion

Four species of bat were positively identified during the various bat surveys: Common Pipistrelle (*Pipistrellus pipistrellus*), Soprano Pipistrelle (*Pipistrellus pygmaeus*), Brown Long-eared bat (*Plecotus auritus*) and Leisler's bat (*Nyctalus leisleri*). In addition, several unidentified Myotis bat species were recorded, these being either Whiskered, Natterers or Daubenton's bats. Finally several Pipistrelle calls recorded from the static detectors had a peak frequency of 40kHz thus could be either Common or Nathusius Pipistrelle.

An emergence survey conducted at buildings to the west of the site showed no evidence of roosting bats and a preliminary assessment of trees showed no trees within the site suitable for hosting a bat roost.

The development of the site is unlikely to impact the local bat population given the low levels of activity recorded.

5.4.2 Badgers

Badgers and their setts are protected under the provisions of the Wildlife Act, 1976, and the Wildlife Amendment Act, 2000. It is an offence to intentionally kill or injure a protected species or to wilfully interfere with or destroy the breeding site or resting place of a protected wild animal.

In order to ascertain if badgers were using the site and surrounding area, a preliminary walkover survey was carried on the 22nd February 2023. Evidence such as sett, trails with hair evidence, latrines or snuffle holes were sought. No evidence of badgers were found.

GC Media Park Badger Transect

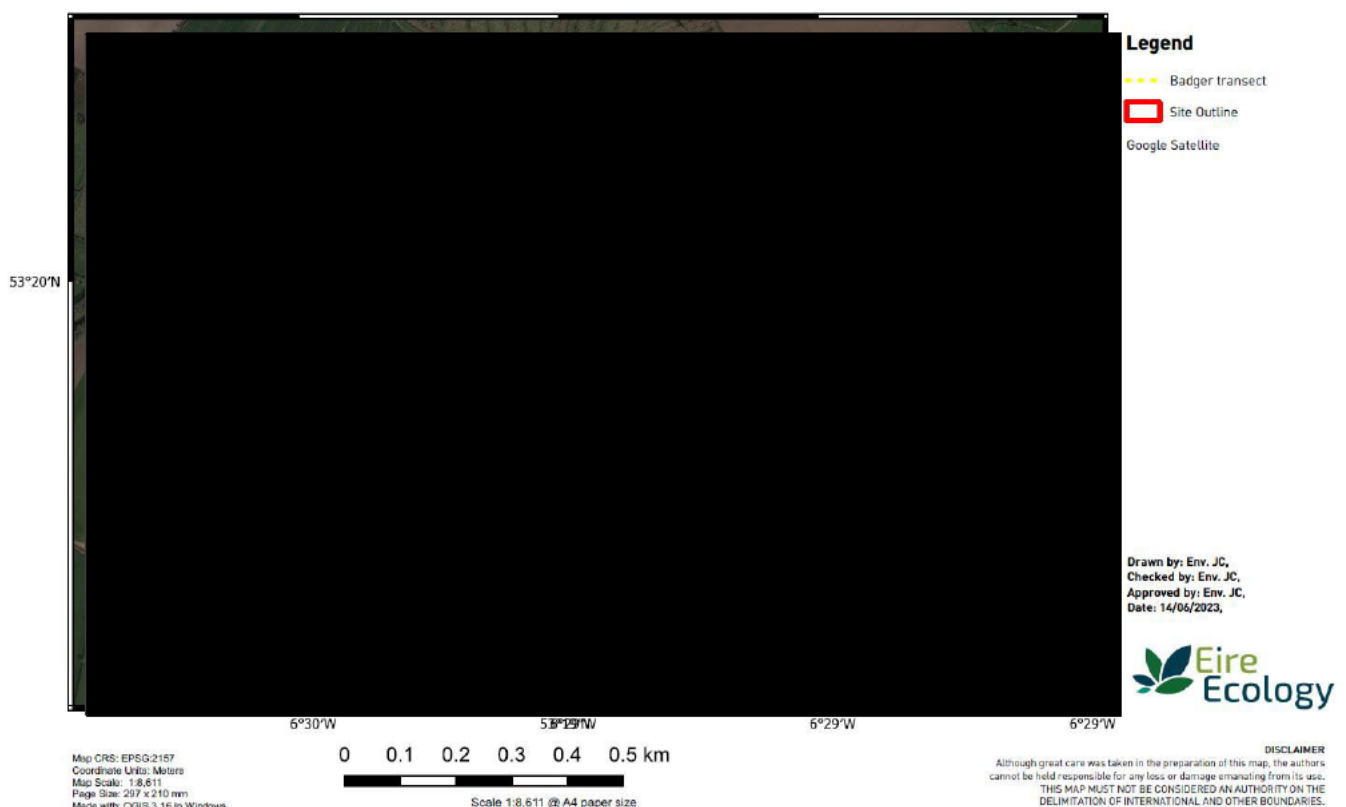


Figure 5-3: Badger transects

5.4.3 Birds

All species of birds are protected under the Wild life Act 1976/Wild life Amendment Act 2000. Every autumn and spring several billions of birds undergo migratory journeys between their breeding and non-breeding grounds. These migratory movements link ecosystems and biodiversity on a global scale and their protection require international efforts. The impact of direct anthropogenic changes, including light pollution that reroutes migrants and collisions with manmade structures cause fatalities (Nussbaumer, 2019). In order to ascertain if the proposed site is used as a wintering or migration route either during the main migratory period or as a commuter route between feeding and roosting sites, bird surveys were conducted from November 2022 to March 2023.

Six days of Vantage point (VP) surveys and transects were conducted on the site. In addition, to better understand the relationship between the site and the surrounding areas, hinterland point counts were conducted in the surrounding area between November 2022 and March 2023. Target species for the surveys included all migratory birds such as swans and geese given the close proximity to peatland (possible roosting site) and grassland as these species graze on grass. In addition, birds of prey, ducks, plovers, lapwings, sandpipers, gulls and terns. For the purposes of the survey raptors were also considered to be target species. In line with I-WeBS methodology, Cormorant, Shag, Little Egret, Grey Heron, and Kingfisher were also included (Lewis L. J., 2017).

To further support the survey effort three thermal imaging night time transects were conducted to identify birds roosting within the site. These surveys took guidance from the methodologies described in Gilbert, G., Gibbons, D.W. & Evans, J. (1998) Bird Monitoring Methods, the Scottish Natural Heritage 'Recommended bird survey methods to inform impact assessment of onshore wind farms 2014' and Wild birds: surveys and monitoring for onshore wind farms - GOV.UK (www.gov.uk).

5.4.3.1 Thermal imaging

Thermal imaging is a method for observing how birds use habitats at night, as watching those behaviours is difficult in low light environments. *The circumstances in which a nocturnal survey might be required, and indeed the specific methodology, should be informed by the behaviour of priority species, and habitats present, on a survey site. For example: During non-breeding surveys on arable land, where inland wintering waders (golden plover, woodcock, redshank, curlew etc.) have been recorded on the land, either as part of survey efforts or as identified at desk study; In areas where migratory geese are likely to roost and forage in arable fields overnight, for example, pink-footed geese in the Northwest of England, or barnacle geese in parts of Scotland etc.* (<https://birdsurveyguidelines.org/>)

Table 5-3 Elements of the following guidelines were used to decide survey methods

Type of survey	Reference/ Source
Vantage point survey	Gilbert, G., Gibbons, D.W. & Evans, J. (1998) Bird Monitoring Methods - a Manual of Techniques for Key UK Species. RSPB: Sandy.
VP survey is designed to quantify the level of flight activity and its distribution over the survey area. Its primary purpose is to provide input data for the Collision Risk Model (Band et al. 2007), which predicts mortalities from collision with turbines. Data can also be used to provide an overview of bird usage of the site, which may help to inform an overview of potential disturbance and displacement. Where new above-ground grid connections are planned, the proposed connection route should be covered by VP observations to assess potential collision risk. We recommend a minimum of 72 hours per VP location divided between seasons (36 hours breeding and 36 hours non-breeding) per year, as a standard for species where vantage point survey is required	
Type of survey	Reference/ Source
WeBS	Wild birds: surveys and monitoring for onshore wind farms - GOV.UK (www.gov.uk)
Important movements of birds can take place at any time of year but usually you should survey from: <ul style="list-style-type: none"> • March to July for breeding birds • November to March for wintering birds • March and October for passage birds 	
Type of survey	Reference/ Source
Wintering and migratory waterfowl	Scottish Natural Heritage - Recommended bird survey methods to inform impact assessment of onshore wind farms
Disturbance or displacement to wintering and migrant waterfowl can occur on both roost sites and feeding areas, so surveys for both of these should be considered. In addition, searching the survey area for signs of wildfowl presence (counts of droppings) can help determine if feeding birds are using the site by night or on days previous to survey visits. The spring migration, period is defined as March – mid-May but this will vary depending on species and location. The autumn migration period is defined as September – November but again varies with species.	

A Leica Trinovid 10 x 42 HD binoculars and Leica televid 77 20-60x 80mm spotting scope were used to scan the vantage area. Particular attention was focused on species such as waders, waterbirds, gulls, raptors, and red listed species. Flight lines were drawn for these. Other species observed were noted as present. In addition, point counts and hinterland surveys were conducted on the same dates, as well as an examination of pitches of proposed development searching for geese droppings. The hinterland surveys were conducted throughout the surrounding area, focusing on open tillage fields, lakes and canals.

Vantage point surveys were conducted at 53.323277, -6.492279 from a mound of soil located to the east of the subject site. Give the flat nature of the topography, this mound provided the best viewshed of the site. Bird surveys were conducted by John Curtin (B.Sc.) and Shane O'Neill. John is the principal ecologist for Eire Ecologist and has been conducting bird surveys since 2013. Shane has been conducting bird surveys since 2012 including Shannon estuary wintering wader surveys.

5.4.3.2 Birds within the site of the proposed development

The site of the proposed development consists of tillage, hedgerows and built land.

Species of note found within the site include Black-headed Gull, Buzzard, Golden Plover, Great Black-backed Gull, Herring Gull, Kestrel, Meadow Pipit, Mew Gull, Northern Lapwing, Redwing and Snipe.

5.4.3.3 Vantage Point Results

Five vantage point surveys were conducted between November 2022 and March 2023. The development site has an area of 18.4ha.

Table 5-4 summaries results from the transect surveys showing no of times species were observed and highest numbers recorded. Flocks of Golden Plover were noted on 15 occasions from 4 surveys with highest flock recorded at 169 individuals within the site and 400 just outside to the south. This species was observed perched on the ground feeding. Lower numbers of Lapwing were also recorded (peaking at 9). Mute swan, cormorant and mallard were observed flying along the canal and not associating themselves with the subject site. Gulls were typically observed overflying the site. Snipe were observed twice, flushed by hunters. Redwing; a red listed wintering passerine were noted on one occasion from the VP surveys. No flocks of numbers equating to national importance were recorded.

Table 5-4: Species list of target species recorded from VP

Species	BOCCI4 ¹	Number of observations	Highest numbers observed	1% National Population	Nationally Important numbers?
Buzzard	Green	7	2	Unknown	-
Cormorant	Green	2	1*	110	No
Golden Plover	Red	16	400	920	No
Great Black-backed Gull	Red	3	25	Unknown	-
Grey Heron	Green	1	1*	25	
Herring Gull	Green	4	24	Unknown	-
Kestrel	Red	3	2	Unknown	-
Mallard	Amber	1	2*	280	No
Mew Gull	Green	1	2	Unknown	-
Mute Swan	Amber	2	1*	90	No
Northern Lapwing	Red	5	9	850	No
Redwing	Red	1	22	Unknown	-
Snipe	Red	2	2	Unknown	-

Table 5-5: Species list of non-target species recorded from VP.

Species	BOCCI4	Sum of sightings
Blackbird	Green	11
Dunnoek	Green	2
Fieldfare	Green	15
Hooded Crow	Green	18
Jackdaw	Green	37

¹ Birds of Conservation Concern 2020 - 2026

Species	BOCCI4	Sum of sightings
Jay	Green	2
Magpie	Green	11
Marsh Tit	Green	2
Meadow Pipit	Red	7
Pheasant	Green	1
Raven	Green	6
Robin	Green	3
Rook	Green	78
Sky Lark	Green	6
Song Thrush	Green	1
Stonechat	Green	2
Winter Wren	Green	5
Wood Pigeon	Green	45

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5.4.3.4 Daylight Transect Survey

Daylight transects were conducted within and surrounding the site on three occasions; 29th November, 15th December 2022 and 25th January 2023. Species of interest recorded included Black headed gull (max 2 observed), Buzzard, Golden Plover (max 37 observed), Meadow Pipit (max 14 observed) and a snipe.

5.4.3.5 Thermal Survey

Night-time thermal surveys were conducted on the 29th of November, 15th of December 2022 and 25th of January 2023 using a Track IR Pro 19mm thermal imaging scope. On the first survey 2 x Black headed gulls were recorded roosting within the site while 9 Golden plover were found in a field to the south of the site (outside the site boundary). The second survey showed 9 Lapwing and 4 Snipe roosting while the final survey recorded 30 Golden plover while snipe and lapwing were heard but not seen. Table 5-6 provides a summary of results from all transect surveys.

Table 5-6: Species of interest recorded during all transect surveys

Species	Highest numbers observed	Number of observations	Highest numbers observed	Number of observations
Within site boundary			Outside site but within 300m	
Black-headed Gull	2	2	-	-
Buzzard	1	2	-	-
Golden Plover	37	2	30	3
Meadow Pipit	14	5	-	-
Northern Lapwing	9	2	-	-
Redwing	2	1	-	-
Snipe	4	3	4	2

Table 5-7: Species list from transect surveys

Species	
Blackbird	Northern Lapwing
Black-headed Gull	Redwing

Buzzard	Reed Bunting
Dunnock	Rook
Fieldfare	Sky Lark
Golden Plover	Snipe
Goldfinch	Song Thrush
Greenfinch	Starling
Hooded Crow	Stonechat
Jackdaw	Winter Wren
Jay	Wood Pigeon
Meadow Pipit	

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Plate 5-4: Golden Plover recorded 25th of January 2023

GC Media Park Transect Results: Species of Interest

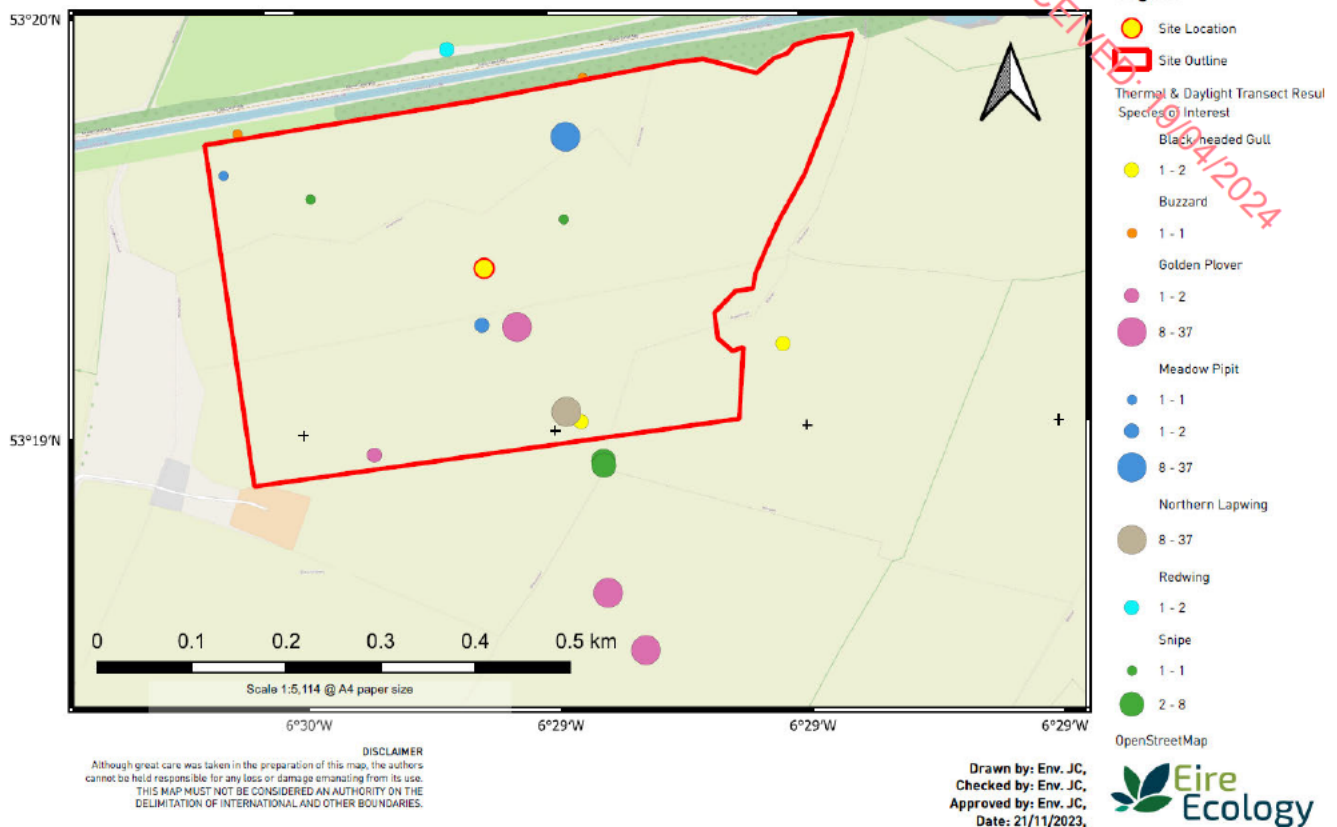


Figure 5-4: Species of interest recorded during transect surveys. Size of point represents flock size.

5.4.3.6 Hinterland Results

Table 5-7 provides a summary of results from the hinterland surveys. Numerous species of interest were recorded from the surrounding pasture, the artificial lake located within the Grange Castle Business Park located to the north-east of the site and along the Grand Canal. No nationally important flocks were recorded.

Table 5-8 Summary of Hinterland surveys

Species	Times observed	BOCCI4	Season	Max No. Obs	1% National Population	Nationally Important numbers?
Black-headed Gull	5	Amber	Breeding/Wintering	150	Unknown	-
Buzzard	3	Green	N/A	1	Unknown	-
Coot	4	Amber	Breeding/Wintering	35	190	No
Golden Plover	2	Red	Breeding/Wintering	400	920	No
Great Cormorant	2	Green	N/A	8	110	No
Herring Gull	4	Green	N/A	70	Unknown	-
Kestrel	1	Red	Breeding	0	Unknown	-
Little Grebe	2	Green	N/A	10	20	-

Species	Times observed	BOCCI4	Season	Max No. Obs	1% National Population	Nationally Important numbers?
Mallard	4	Amber	Breeding/Wintering	43	280	
Mew Gull	1	Green	N/A	50	Unknown	-
Moorhen	2	Green	N/A	3	Unknown	-
Mute Swan	4	Amber	Breeding/Wintering	12	90	No
Northern Lapwing	2	Red	Breeding/Wintering	165	850	No
Redwing	2	Red	Wintering	23	Unknown	-
Shag	1	Red	Wintering	2	Unknown	-
Snipe	1	Red	Breeding/Wintering	1	Unknown	-
Teal	1	Amber	Breeding/Wintering	30	360	No
Tufted Duck	2	Amber	Breeding/Wintering	5	270	No

Figure 5-6 below shows the locations where species of interest were noted within the hinterland. Grassland / tillage to the south of the site showed good numbers of species of interest alongside the artificial lake located within the Grange Castle Business Park.

GC Media Park Hinterland Results

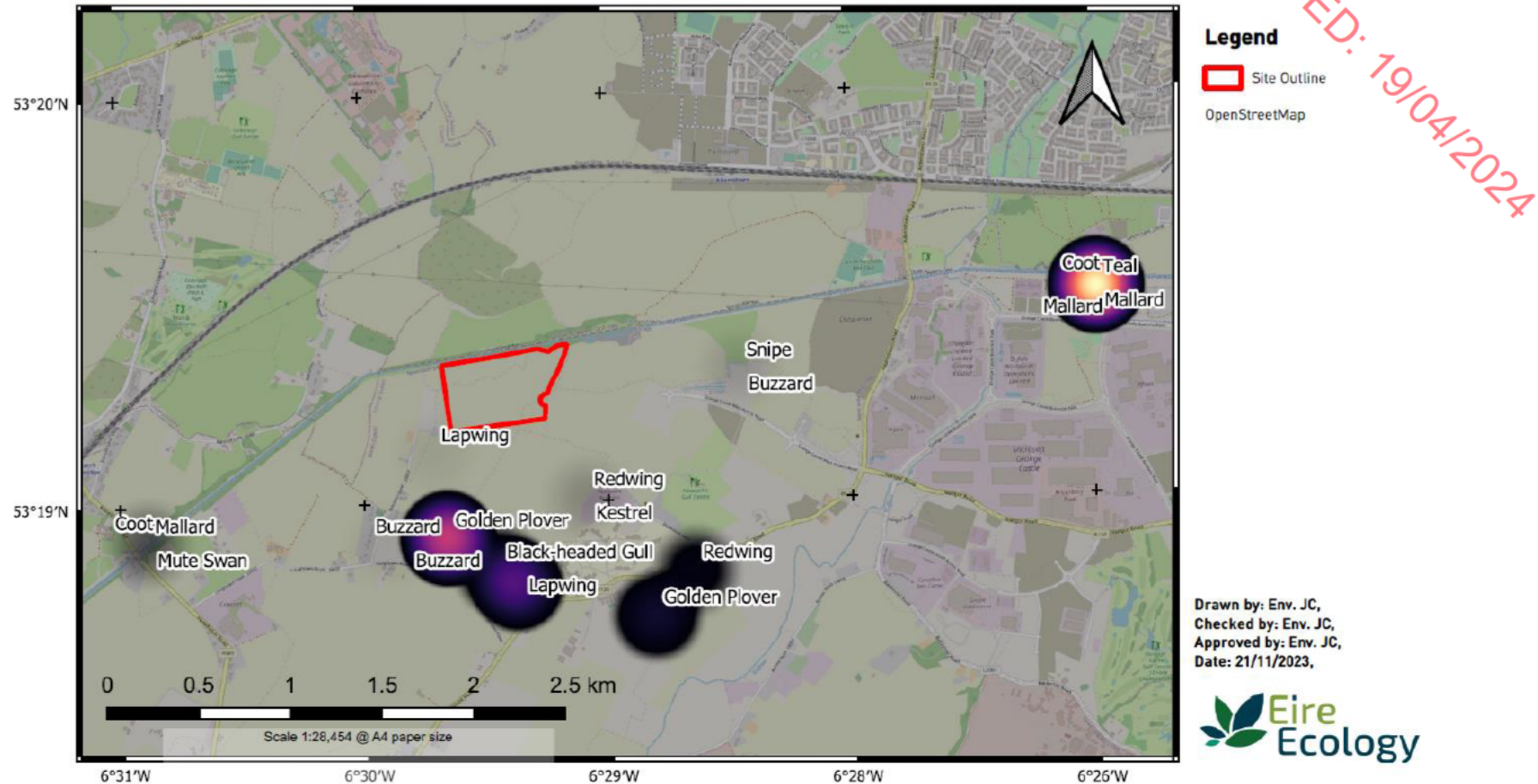


Figure 5-5: Heat map of hinterland. Artificial ponds within Grange Castle Business Park to the NE showed highest numbers

5.4.3.7 Summary per species

The following sections provides a summary of all sightings from across the various surveys related to species of interest. Further details can be found in Appendix 1.

5.4.3.7.1 Buzzard

Buzzard is a widespread bird of prey best adapted to hunt over lowland pasture. Buzzard was seen on 8 occasions hunting within or adjacent to the site and in the hinterland. This species nests in treelines. The site does not contain suitable breeding habitat but the surrounds are highly suitable.

5.4.3.7.2 Golden plover

Large flocks of Golden plover overwinter in Ireland before returning to Iceland to breed. These can be found in a variety of habitats including coastal and inland and are often associated with wetlands as well as tilled fields. In addition, Ireland hosts a small breeding population limited to the acidic uplands of NW counties.

(S. Gillings, 1999) states this species avoids lands over 200m in winter and have a preference for winter cereals, bare till and grassland with a sward height of 7cm or less. They are also renown for cold weather movements, likely moving towards the coast during cold snaps to avoid frozen ground. (Gilling, 2007) found that Golden plover tend to ignore seemingly suitable lands more than Lapwing and can often be found repeatedly utilising the same fields in preference to other similar fields.

The closest SPA with Golden Plover as a Conservation Objective is Bull Island SPA located 20.3km to the east. Iwebs data collating high tide counts for waterbirds from the Bull Island areas shows this species has highly variable counts thus does not remain at the SPA regularly but avails of surrounding terrestrial habitats. The peak count from the seven subsites surrounding Bull Island varied from 7548 total in 2018/2019 to a low of 35 in 2021/2022. In addition to the coastal sites, Golden plover can be found to the west, with a small breeding population located in the Curragh and wintering flocks in the wider Kildare area. Wintering surveys conducted in grasslands at Clonburris, 3.5km to the east did not find Golden Plover. This is unsurprising as the grasslands here are rank and typically over 7cm in sward height thus unfavourable for this species.

Highest numbers of this species observed within the site was 169 (feeding during daylight) with smaller numbers roosting at night (max. 37). Highest numbers (400) were observed during hinterland surveys in fields to the south of the site. Figure 5-6 below shows all sightings of Golden Plover from VP and transect surveys, with the majority of recordings taking place to the south of the site.

The subject site is situated within a block of land under the South Dublin County Council ownership with other developments either proposed or at planning stage. Additional bird

surveys conducted in the overall landholding have also been conducted from February 2023 and are still ongoing. These surveys show Golden plover regularly using the overall landbank during the winter months particularly from November to March with peak flock observations of 560 observed to the west of the site. This species utilises winter grain fields for feeding and roosting, in this location favouring grain tillage. The 2023 winter crop for much of the site is potatoes, thus may negatively impact on numbers however preliminary findings from November 2023 showed a peak of 300 birds circling the site.

The most favoured fields within the overall landbank lies outside the Media Park site to the south.

GC Media Park VP Golden Plover Sightings

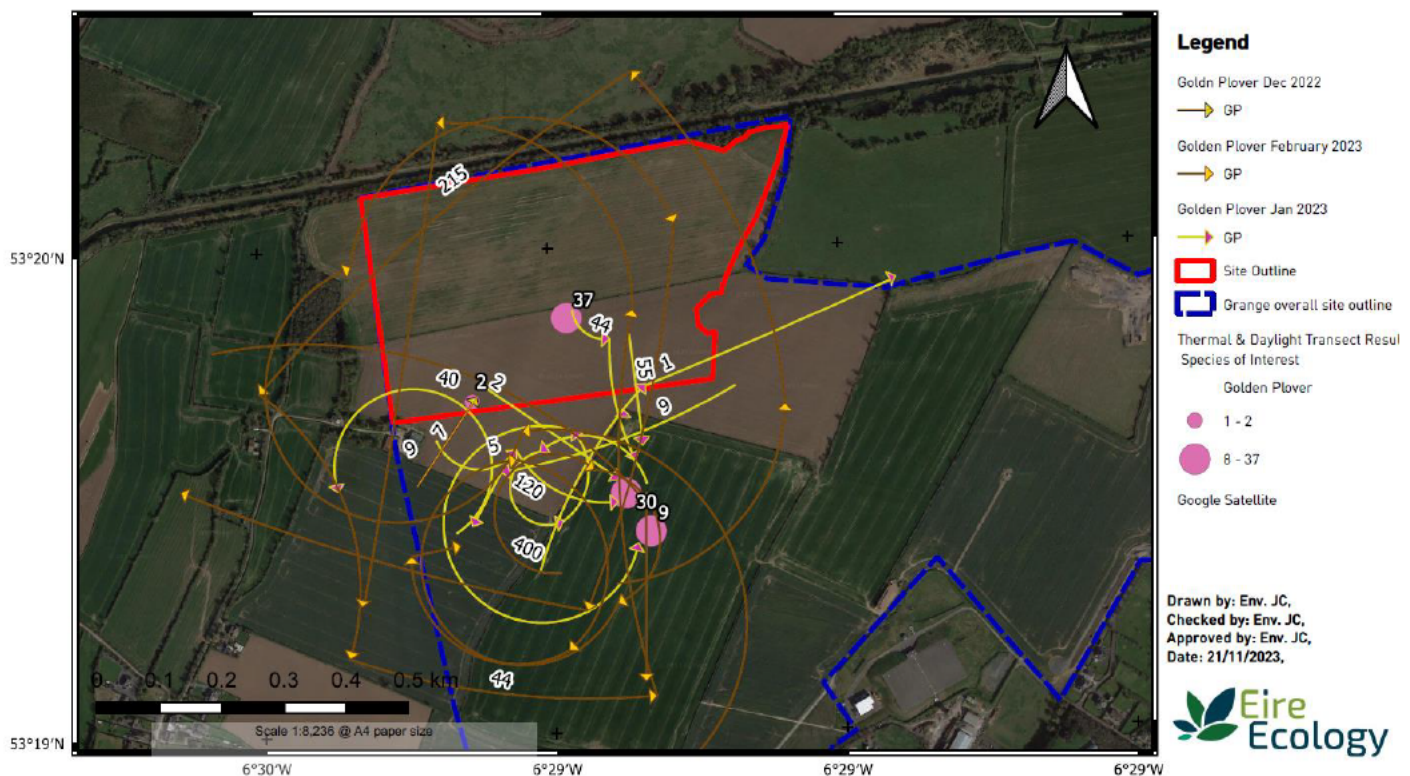


Figure 5-6: All Golden Plover sightings

5.4.3.7.3 Gulls

Black-headed Gull is our most widespread and numerous wintering gull, being found regularly on inland and coastal wetlands throughout the winter. Based on colour-ring resightings, the Irish wintering population is likely comprised of a mix of Irish-breeding birds as well as individuals from the UK, Scandinavia and Baltic states (Wernham et al., 2002). Most Irish-breeding Black-headed Gull remain here throughout the year but a small proportion of predominantly juvenile birds move south to Europe or north Africa (Wernham et al., 2002; McGreal, 2014). (Lewis L. J., Irish Wetland Bird Survey: Waterbird Status and Distribution 2009/10-2015/16., 2019). A single sighting of two black-headed Gulls were observed during a

night time transect within the site. This species was observed more frequently in the hinterland, particularly on improved grass with 150 being highest numbers observed.

Three sightings of Great Black Backed gulls were noted from VP surveys with highest numbers recorded being 25. All observations were of flying birds. This species did not interact with the site.

Herring gull was recorded both within and outside the site. All hinterland sightings were from the ponds at GC Business park. VP sightings were from birds overflying. This species did not interact with the site.

Mew or Common gull once within the site (2 birds overflying) and once in the hinterland (50 birds feeding by the pond at GC Business Park). This species did not interact with the site.

5.4.3.7.4 Grey Heron

The grey plumage and stature of Grey Herons make them unmistakable. It is a very familiar species being widely distributed and a year-round resident in Ireland. Resident in Ireland, wintering numbers are augmented by birds moving in from the north and east (Wernham et al., 2002). Grey Heron numbers have shown a gradually increasing trend throughout I-WeBS. Widely distributed in Ireland, Grey Heron are found in a variety of freshwater wetlands as well as estuaries and rocky shores. (Lewis L. J., Irish Wetland Bird Survey: Waterbird Status and Distribution 2009/10-2015/16, 2019). Grey Heron was seen once during surveys, flying along parallel to the Grand Canal. This species did not interact with the site.

5.4.3.7.5 Kestrel

Similar to Buzzard, several observations of Kestrel were made during vantage point and walkover surveys. Birdwatch Ireland's publication; *'Countryside Bird Survey: Status and Trends of Common and Widespread Breeding Birds 1998-2016'* states the kestrel population was estimated at 13,500, a decrease of 44.9% over the 18-year period, 1998-2016 and a 22.1% decrease in distribution over the 25-year period 1991-2016. Kestrel are a BoCCI red listed species. 3 observations of kestrel were found from within the site alongside another in the hinterland. Kestrel were observed hunting and on the 28th of March a pair were observed circling together. This species nests in treelines and woodland (previously a ground nesting bird). The site does not contain suitable breeding habitat but the surrounds are suitable.

5.4.3.7.6 Mallard

Mallard are the most widespread species, although not quite as numerous as Wigeon or Teal. They occur in almost all available wetland habitats in Ireland. Mallard that occur in Ireland belong to the population that breed across northern Europe and these have a non-breeding range that extends across north-west Europe, east to the Baltic. This population is stable (Wetlands International, 2018). Irish-breeding birds are resident, and are augmented each winter by migrants, possibly some from the Icelandic breeding population (Wernham et al.,

2002). Numbers of Mallard have declined throughout I-WeBS, as well as in Northern Ireland and Britain. Frost et al. (2018) suggest that the declines in wintering Mallard could be related to fewer releases by shooting estates and/or perhaps short-stopping by Russian birds. (Lewis L. J., Irish Wetland Bird Survey: Waterbird Status and Distribution 2009/10-2015/16-2019) Mallard were observed on four occasions by ponds within the GC business park. A pair were noted flying parallel to the Grand Canal also. This species did not interact with the site.

5.4.3.7.7 Mute Swan

During the winter period swan species graze on grassland and typically roost in peatland and lakes. They regularly use the same grazing lands over multiple years and can be seen flying the same route between feeding and roosting grounds each dusk and dawn. During the breeding season mute swans can be found breeding on wetlands.

Two sighting of Mute swan were recorded during onsite surveys flying along the Grand Canal. In addition this species was also observed by the pond at the GC Business park. **No grazing swans (Whooper, Bewick's or Mute) was recorded within the site from any survey.**

Given the low levels of activity noted from the site, no loss of swan grazing or roosting land is predicted from the proposed development.

5.4.3.7.8 Lapwing

The lapwing population of Ireland contains residents, summer and winter visitors. Large flocks overwinter in Ireland on wetlands and wet pasture throughout the country. A smaller breeding population can be found ground-nesting on grass particularly by wet grassland. Given the reduction of this habitat over time the species has started to utilise peatland habitats as a breeding site alternative. In Ireland, this wader has shown a decline overall throughout I-WeBS; consistent with both Britain and Northern Ireland (Frost et al., 2018). Lapwing are sensitive to severe winters, and movements IWM 106 (2019) Irish Wetland Bird Survey 2009/10 – 2015/16 118 westward from northern Europe into Britain and Ireland, and south to France and Iberia during particularly cold periods are known (Wernham et al., 2002). Furthermore, a relatively large proportion of Lapwing are known to spend winter away from coastal wetlands, often in non-wetland habitats such as agricultural land. Therefore, this species is considered poorly monitored by wetland waterbird monitoring methods and assigning accurate national estimates of wintering populations is difficult (Delaney et al., 2009). Lapwing was recorded on seven occasions within and adjacent to the site with highest numbers recorded being 9. Given Nationally Important wintering numbers are 850, numbers onsite represent local significance. Within the hinterland, highest number of sightings occurred on the 25th of January 2023 with 165 birds.

5.4.3.7.9 Snipe

Common snipe is a small cryptic wader mostly found in bog, marshy wetland, and rough ground in both upland, lowland regions, and lakeshores. The population trend for Snipe in

Ireland remains uncertain as they are very difficult to monitor and are almost certainly undercounted. They are a skulking species with a widely dispersed distribution, and many remain undetected unless flushed. Snipe were encountered most frequently during transect surveys (both within and surrounding the site). On the 15th December 2022 5 snipe were observed during daylight and night time surveys while on the 25th of January 2023 5 snipe were again observed. A single observation of snipe was also observed during hinterland while hunters flushed two snipe twice during a VP survey.

5.4.3.7.10 Other species

Coot, Little Grebe, Moorhen, Shag, Teal, Tufted Duck were all recorded during hinterland surveys but not onsite while Cormorant was noted twice during VP surveys flying parallel to the Grand Canal and not interacting to the subject site.

5.4.3.8 Significance of Birds

The significance of potential ecological effects on birds was determined using Percival (2003) together with professional judgement. The effects were further described with reference to EPA (2017) and CIEEM (2019) criteria for characterising ecological impacts.

Table 5-9: Criteria for assessing impacts based on CIEEM (2019) and (EPA, 2017)

Parameter	Description
Quality	Positive effect: A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
	Neutral effect: No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative effect: A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).
Extent	The area over which an impact occurs
Duration	<ul style="list-style-type: none"> • Momentary – effects lasting from seconds to minutes • Brief – effects lasting less than a day • Temporary – effects lasting less than a year • Short-term – effects lasting 1 to 7 years • Medium term – effects lasting 7 to 15 years • Long term – effects lasting 15 to 60 years • Permanent – effects lasting over 60 years • Reversible
Reversibility	<p>Irreversible impacts: permanent changes from which recovery is not possible within a reasonable time scale or for which there is no reasonable chance of action being taken to reverse it.</p> <p>Reversible impact: temporary changes in which spontaneous recovery is possible or for which effective mitigation (avoidance/cancellation/reduction of effect) or compensation (offset/recompense/offer benefit) is possible.</p>
Frequency and Timing	Frequency –How often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)

Parameter	Description	
	Timing –the timing of an activity or change may result in an impact if it coincides with critical life-stages or seasons e.g. bird nesting season.	
Describing the significance of effects (EPA, 2017)	Imperceptible	An effect capable of measurement but without significant consequences.
	Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
	Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
	Significant	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
	Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
	Profound	An effect which obliterates sensitive characteristics

The combination of desk study and the field study has determined that the site in question does not lie within a 15km buffer of any Special Protection Area (SPA) for birds with closest SPA's found 15.1km; Wicklow Mountains SPA; Site Code 004040 (designated for Merlin and Peregrin) and 15.3km Poulaphouca Reservoir SPA; Site Code 004063 (designated for Greylag Goose and Lesser Black-backed gull). None of these species were noted from the subject site.

The site is of ecological value for wintering Golden Plover who can be found within the site and the surrounds in regionally important numbers. The closest designated site for this species is the Bull Island SPA. Determining if the Golden Plover using the site constitute an ex-situ population associated with this SPA is difficult. (SNH, 2016) provides foraging range to a maximum of 11km during the breeding season but does not provide foraging distances for the winter season. An examination of I-WeBS data for the Dublin bay sub-sites surrounding Bull Island shows a lot of variation month to month and year to year for the designated flock suggesting they remain ex-situ for extended periods. Large swathes of similar habitat can be found in the surrounds, particularly to the west with suitable foraging habitat highly limited to the east. As previously stated, survey work is continuing through the 2023/2024 winter season for the overall Grange Castle land bank (encompassing the media park site) with surveys particularly focusing on Golden plover numbers and behaviours not only within the site but also ion the hinterland. Given, the difficulty in assess where the Bull Island Golden Plover flock is at any one time, and following the precautionary approach we consider the Zone of Influence for this development can encompass Bull Island SPA when considering its Conservation Objective; Golden Plover.

Lower numbers of other species of interest can also be found such as wintering Lapwing, snipe, the passerines; redwing and meadow pipit as well as Buzzard and Kestrel; both likely to breed outside the site, within the locality.

5.4.3.8.1 Significance values for birds

Table 5-11 evaluates the importance of species of interest found within and surrounding the site. The table provides a sensitivity value based on (Percival 2003) although this was designed to examine impacts on birds by wind energy.

Table 5-10 Determination of Sensitivity in study area

Sensitivity	Determining factor
Very High	Species that form the cited interest of SPAs and other statutorily protected nature conservation areas. Cited means mentioned in the citation text for the site as a species for which the site is designated.
High	Species that contribute to the integrity of an SPA but which are not cited as species for which the site is designated. Ecologically sensitive species including the following : divers, common scoter, hen harrier, golden eagle, red-necked phalarope, roseate tern and chough. Species present in nationally important numbers (>1% Irish population)
Medium	Species on Annex 1 of the EC Birds Directive Species present in regionally important numbers (>1% regional (county) population) Other species on BirdWatch Ireland's red list of Birds of Conservation Concern
Low	Any other species of conservation interest, including species on BirdWatch Ireland's amber list of Birds of Conservation Concern not covered above.

Table 5-11 Evaluation of importance for species of interest found interacting with site

Species	Species information	Found within site?	Found in Hinterland surveys?	Designation (BOCCI4)	Sensitivity (Percival 2003)	Value of overall Grange Castle Landbank	Value of subject site
Buzzard	Green listed in BoCC 2020-2026. Regularly found both within and outside the site. Habitats within the site are not suitable for breeding.	Yes	Yes	Green	Low	Local High	Local
Golden Plover	Red listed species. Following the precautionary approach these birds are considered an ex-situ component of the Bull Island CO flock. While the Media Park site is not the area of lands of highest value for this species within the overall Grange Castle landbank, the species were noted within the site on multiple occasions. Higher numbers found in Hinterland.	Yes	Yes	Red	Very high	Regional	Local High
Kestrel	BoCCI 4: Red listed species. Countryside bird survey shows an overall downward trend since 1998 however the index has trended up since a 2014 low (https://c0cre470.caspio.com/dp/4bae3000b62efcaae08e4f4da8bd). The 2011-2016 population was estimated at 13,500 (Lewis 2019). This species was found to hunt within the site. Given a pair was observed in March it is likely to breed in the locality.	Yes	Yes	Red	Medium	Local High	Local
Meadow Pipit	This species is red-listed on the Birds of conservation concern in Ireland 2020-2026 list (BOCCI). The listing of this species as of high conservation concern is due to a large decline in population following the unusually cold winters of 2009/2010. According to BirdWatch Ireland, the species has undergone a significant recovery since that period (Countryside bird survey data trend showed 2019 with highest peak since index started in 1998. Slight decline occurred from this peak in 2020 and 2021; https://c0cre470.caspio.com/dp/4bae3000b62efcaae08e4f4da8bd) Found occasionally within the site but highest numbers noted within grassland adjacent to Grand Canal (14 birds) where bird crop cover was planted.	Yes	Yes	Red	Medium	Local High	Local
Lapwing	This species is Red listed according to Birds of Conservation Concern in Ireland 2020-2026 and is of high conservation value as a result. The last IUCN Red List assessment, carried out in 2016, notes the Lapwing as a 'Near Threatened' species on a global scale. Additionally, the population was assessed as decreasing. Highest numbers found on site was 9 while a flock of 165 was observed during hinterland surveys.	Yes	Yes	Red	Medium	Local	Local
Redwing	Common winter visitor to Ireland with birds from the Icelandic and Scandinavian breeding populations arriving in October and departing again between mid-March and early-April. Observed within the site on 3 occasions with highest numbers of 23.	Yes	Yes	Red	Medium	Local	Local Low

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Species	Species information	Found within site?	Found in Hinterland surveys?	Designation (BOCCI)	Sensitivity (Percival 2003)	Value of overall Grange Castle Landbank	Value of subject site
Snipe	This species is Red-listed according to Birds of Conservation Concern in Ireland 2020-2026 and is of high conservation value as a result. Severe declines have been recorded in Snipe breeding and wintering populations in Ireland, resulting in its move to the Red-List in the most recent BoCCI assessment (Gilbert, Stanbury and Lewis, 2021). According to the last IUCN Red List assessment in 2016, the Snipe is a species of 'Least Concern' on a global scale. However, a decreasing global population trend was noted. This ground nesting species finds suitable breeding habitat where there is grassy tussocks within or adjacent to boggy areas. Bogs and wet grassland can be suitable habitat for this species. The habitat on site is suitable for wintering birds however given the intensive agriculture currently in place within the site, breeding snipe are unlikely to be found here. not suitable for this species.	Yes	Yes	Red	Medium	Local	Local Low

6 ASSESSMENT OF IMPACTS

Determination of impacts is derived with guidance from (Percival, 2003). Table 6-1 provides definitions for magnitude of effect. This data alongside the previously assigned significance value is imputed into Table 6-2; significance matrix to provide a final significance impact of the development per species.

Table 6-1 Determination of Magnitude of Effects.

Magnitude	Description
Very High	Total loss or very major alteration to key elements/ features of the baseline conditions such that the post development character/ composition/ attributes will be fundamentally changed and may be lost from the site altogether. Guide: < 20% of population / habitat remains
High	Major loss or major alteration to key elements/ features of the baseline (pre-development) conditions such that post development character/ composition/ attributes will be fundamentally changed. Guide: 20-80% of population/ habitat lost
Medium	Loss or alteration to one or more key elements/features of the baseline conditions such that post development character/composition/attributes of baseline will be partially changed. Guide: 5-20% of population/ habitat lost
Low	Minor shift away from baseline conditions. Change arising from the loss/alteration will be discernible but underlying character/composition/attributes of baseline condition will be similar to pre-development circumstances/patterns. Guide: 1-5% of population/ habitat lost
Negligible	Very slight change from baseline condition. Change barely distinguishable, approximating to the "no change" situation. Guide: < 1% population/ habitat lost

Table 6-2 Significance matrix

Significance		Sensitivity			
		Very high	High	Medium	Low
	Very High	Very high	Very high	High	Medium
	High	Very high	Very high	Medium	Low
	Medium	Very high	High	Low	Very Low
	Low	Medium	Low	Low	Very Low
	Negligible	Low	Very Low	Very Low	Very Low

Table 6-3 Impacts on species of interest

Potential Impacts		Duration and Magnitude of potential impact	Frequency and reversibility	Magnitude and Significance of effect	
	Direct Habitat Loss	No evidence of badgers sets or general activity was recorded from the subject site.	No direct habitat loss.	N/A	The magnitude of the impact is assessed as Very Low. Medium sensitivity species (est population of 84,000) + Very Low potential Impact = No likely significant effects at a local level are predicted
	Displacement and barrier effect	Post construction it is unlikely the proposed development will have any impact on the local population.	Permanent and of negligible magnitude and will not result in long-term adverse effects.	Occurs once, long term	The magnitude of the impact is assessed as Very Low. Medium sensitivity species + Negligible Impact = Very Low effect significance. No likely significant effects at a local level are predicted
	Direct Habitat Loss	This species was noted hunting within the site. No suitable breeding habitat can be found. Based on baseline data the proposed development will have a medium impact on the local buzzard population with a loss of some hunting habitat	Permanent and of medium magnitude	Occurs once, long term	The magnitude of the impact is assessed as Very Low. Low sensitivity species + Medium Impact = Very Low effect significance. No likely significant effects at a local level are predicted
	Displacement and barrier effect	Foraging and commuting birds may temporarily avoid construction areas owing to the noise and increased activity. Based on continued bird surveys through the construction phase it is proposed to identify breeding sites within the surrounds and create a 150m buffer surrounding the zone (Goodship, 2022). Construction will be avoided here until fledging has occurred.	Temporary and of low magnitude and will not result in long-term adverse effects.	Occurs during construction phase	The magnitude of impact is assessed as Low. Low sensitivity species + Low Impact = Very Low effect significance. No likely significant effects at a local level are predicted
Brown Long-eared bat	Direct Habitat Loss	The proposed development will result in the permanent transformation of grassland / tillage and bare ground to built land. In addition, 750m of hedgerow could also be removed. Static surveys show this hedgerow habitat is of higher value to Brown Long-eared bats than the open habitat (3 recordings over a 12 night period) however activity is very low for this species. No roosting bats were found.	Permanent and of negligible magnitude and will not result in long-term adverse effects (given the levels of activity from this species).	Occurs once, long term	The magnitude of the impact is assessed as Very Low. Medium sensitivity species + Negligible Impact = Very Low effect significance. No likely significant effects at a local level are predicted
	Displacement and barrier effect	It is unlikely construction activity will occur during night time within the bat active season. As such it is highly unlikely the construction phase will have an impact on this species.	Temporary and of negligible magnitude and will not result in long-term adverse effects.	Occurs during construction phase	The magnitude of the impact is assessed as Very Low. Medium sensitivity species + Negligible Impact = Very Low effect significance. No likely significant effects at a local level are predicted
	Direct Habitat Loss	The proposed development will result in the permanent transformation of grassland / tillage and bare ground to built land. In addition, 750m of hedgerow could also be removed. Static surveys show this hedgerow habitat is of marginally higher value to this species than the open habitat (43 recordings compared to 23 over a 12 night period) however activity is very low for this species (average of 0.3 bat passes per hour BP/Hr). No roosting bats were found.	Permanent and of negligible magnitude and will not result in long-term adverse effects.	Occurs once, long term	The magnitude of the impact is assessed as Very Low. Medium sensitivity species + Negligible Impact = Very Low effect significance. No likely significant effects at a local level are predicted

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	Potential Impacts		Duration and Magnitude of potential impact	Frequency and reversibility	Magnitude and Significance of effect
	Displacement and barrier effect	It is unlikely construction activity will occur during night time within the bat active season. As such it is highly unlikely the construction phase will have an impact on this species.	Temporary and of negligible magnitude and will not result in long-term adverse effects.	Occurs during construction phase	The magnitude of the impact is assessed as Very Low. Medium sensitivity species + Negligible Impact = Very Low effect significance. No likely significant effects at a local level are predicted
	Direct Habitat Loss	Twenty sightings from within site; Higher numbers observed in the hinterland. Within the overall Grange Castle West landbank, Golden Plover appear to favour fields to the west, and were never recorded perched on lands to the east where a halting site is located. It is likely this species avoids the higher anthropological activity associated with this area. The development will result in the permanent loss of feeding and roosting habitat within the site. This proposal constitutes one portion of a larger scheme (Grange Castle West) where much of the landbank will be transformed from till age to built lands. A road network to the east alongside other developments within the landbank will likely result in the eventual loss of all the Grange Castle lands for use by Golden Plover as even if the fields to the south are not developed, the location of an industrial unit close to a favoured field will likely lead to too much disturbance.	Permanent and of very high magnitude and will result in long-term effect.	Occurs once, long term	The magnitude of the impact is assessed as very high. Medium sensitivity species + very high Impact = very high effect significance.
	Displacement and barrier effect	The IECS Toolkit26 (EU, 2010) suggests that golden plover is of moderate sensitivity to disturbance. There is the potential of disturbance to wintering Golden Plover located in the hinterland through construction phase activities. Based on continued bird surveys through the construction phase it is proposed to identify wintering sites and create a 300m buffer surrounding the zone (buffer size is based on IECS Toolkit26). Activity in this zone will be limited to time when the species is not present.	Temporary and of low to negligible magnitude and will not result in long-term adverse effects.	Occurs during construction phase	The magnitude of impact is assessed as Low. Medium sensitivity species + Low Impact = Low effect significance. No likely significant effects at a local level are predicted
	Direct Habitat Loss	The development footprint is dominated by improved grassland with associated hedgerows, providing suitable foraging habitat for the species. Kestrel can nest in a variety of substrates such as rock ledges, old corvid stick nests, bird boxes, buildings etc. Whilst no suitable breeding sites were found within the development footprint it is possible this species is breeding within treelines closeby. Based on baseline data the proposed development will have a medium impact on the local buzzard population with a loss of some hunting habitat	Permanent and of medium magnitude	Occurs once, long term	The magnitude of the impact is assessed as Very Low. Low sensitivity species + Medium Impact = Very Low effect significance. No likely significant effects at a local level are predicted
	Displacement and barrier effect	Foraging and commuting birds may temporarily avoid construction areas owing to the noise and increased activity. Based on continued bird surveys through the construction phase it is proposed to identify breeding sites and create a 150m buffer surrounding the zone (Goodship, 2022) state the species has a Low/Medium sensitivity to disturbance and recommend a breeding zone of 100 – 200m. Construction will be avoided here until fledging has occurred.	Temporary and of low magnitude and will not result in long-term adverse effects.	Occurs during construction phase	The magnitude of impact is assessed as Low. Medium sensitivity species + Low Impact = Low effect significance. No likely significant effects at a local level are predicted

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Potential Impacts			Duration and Magnitude of potential impact	Frequency and reversibility	Magnitude and Significance of effect
	Direct Habitat Loss	The development footprint is dominated by tillage, which provides some suitable nesting, roosting and foraging habitat for the species. Highest suitable Meadow Pipit habitat was found where bird cover planting occurs on a strip of land adjacent to the Grand Canal. This will remain unaffected by the proposed development.	Long term slight Negative	Occurs once, irreversible	The magnitude of the impact is assessed as Low. Medium sensitivity species + Low to medium Impact = Low effect significance. No likely significant effects at a local level are predicted
	Displacement and barrier effect	There is the potential of disturbance to breeding meadow Pipit because the construction activities will disturb birds and displace them from the area. Based on continued bird surveys through the construction phase it is proposed to identify breeding sites and create a 50m buffer surrounding the zone (50m buffer is based on IECS Toolkit26). Works will avoid key breeding periods with works continuing after fledging.	Temporary and of negligible magnitude and will not result in long-term adverse effects.	Occurs during construction phase	The magnitude of the impact is assessed as Very Low. Medium sensitivity species + Negligible Impact = Very Low effect significance. No likely significant effects at a local level are predicted
	Direct Habitat Loss	Seven sightings from within site with a max of 9 observed. Higher numbers observed in the hinterland (165). The development will result in the permanent loss of feeding and roosting habitat within the site. It should be noted that the site is surrounded by similar tillage particularly to the west and it is highly likely displaced bids will utilise similar habitats offsite	Long-term Imperceptible Negative	Occurs once, irreversible	The magnitude of the impact is assessed as Medium. Medium sensitivity species + medium Impact = Low effect significance.
	Displacement and barrier effect	The IECS Toolkit26 (EU, 2010) suggests that lapwing is of moderate sensitivity to disturbance. There is the potential of disturbance to wintering Lapwing located in the site during the construction phase leading to disturbance and displacement. Based on continued bird surveys through the construction phase it is proposed to identify wintering sites and create a 200m buffer surrounding the zone (buffer size is based on IECS Toolkit26.).	Temporary and of low to negligible magnitude and will not result in long-term adverse effects.	Occurs during construction phase	The magnitude of impact is assessed as Low. Medium sensitivity species + Low Impact = Low effect significance. No likely significant effects at a local level are predicted
	Direct Habitat Loss	The proposed development will result in the permanent transformation of grassland / tillage and bare ground to built land. In addition, 750m of hedgerow could also be removed. Static surveys show this hedgerow habitat is of higher value to this species than the open habitat (947 recordings compared to 386 over a 12 night period) with good activity levels for this species (average of 6.6 bat passes per hour BP/Hr). This species flies high over habitats and are the most adept Irish bat species at hunting over artificial surfaces thus the transformation of the site may result in only a medium negative to neutral impact. No roosting bats were found.	Permanent and of medium magnitude. Unlikely to result in long-term adverse effects.	Occurs once, long term	The magnitude of the impact is assessed as Medium. Medium sensitivity species + medium Impact = Low effect significance. No likely significant effects at a local level are predicted
	Displacement and barrier effect	It is unlikely construction activity will occur during night time within the bat active season. As such it is highly unlikely the construction phase will have an impact on this species.	Temporary and of negligible magnitude and will not result in long-term adverse effects.	Occurs during construction phase	The magnitude of the impact is assessed as Very Low. Medium sensitivity species + Negligible Impact = Very Low effect significance. No likely significant effects at a local level are predicted

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	Potential Impacts	Duration and Magnitude of potential impact	Frequency and reversibility	Magnitude and Significance of effect
	<p>Direct Habitat Loss</p> <p>The proposed development will result in the permanent transformation of grassland / tillage and bare ground to built land. In addition, 750m of hedgerow could also be removed. Static surveys show very low activity for this species with a single recording from the detector placed in the open over a 12 night period. This suggests the subject site is not utilised by woodland or Daubenton's bats using the Grand Canal. No roosting bats were found.</p>	Permanent and of negligible magnitude and will not result in long-term adverse effects.	Occurs once, long term	The magnitude of the impact is assessed as Very Low. Medium sensitivity species + Negligible Impact = Very Low effect significance. No likely significant effects at a local level are predicted
	<p>Displacement and barrier effect</p> <p>It is unlikely construction activity will occur during night time within the bat active season. As such it is highly unlikely the construction phase will have an impact on this species.</p>	Temporary and of negligible magnitude and will not result in long-term adverse effects.	Occurs during construction phase	The magnitude of the impact is assessed as Very Low. Medium sensitivity species + Negligible Impact = Very Low effect significance. No likely significant effects at a local level are predicted
Snipe	<p>Direct Habitat Loss</p> <p>The development footprint is dominated by tillage, which provides some suitable nesting, roosting and foraging habitat for the species. Given the intensive agriculture practiced on the site it is unlikely breeding Snipe are present.</p>	Long term moderate Negative	Occurs once, irreversible	The magnitude of the impact is assessed as moderate. Medium sensitivity species + Low Impact = Low effect significance. No likely significant effects at a local level are predicted
	<p>Displacement and barrier effect</p> <p>Some displacement may occur. Construction activities will be limited to the development footprint so direct disturbance effects will not extend beyond the works areas. There is potential for indirect disturbance to roosting and breeding snipe from noise and visual stimuli associated with construction activities. However, given the low number of snipe that use the site in the context of the estimated national breeding population of 4,275, it is not considered to be a significant effect.</p>	Temporary and of low to negligible magnitude and will not result in long-term adverse effects.	Occurs during construction phase	The magnitude of impact is assessed as Medium. Medium sensitivity species + Low Impact = Low effect significance. No likely significant effects at a local level are predicted
	<p>Direct Habitat Loss</p> <p>The proposed development will result in the permanent transformation of grassland / tillage and bare ground to built land. In addition, 750m of hedgerow could also be removed. Static surveys show this hedgerow habitat is of marginally higher value to this species than the open habitat (16 recordings compared to 7 over a 12 night period) however activity is very low for this species (average of 0.1 1 BP/Hr). No roosting bats were found.</p>	Permanent and of negligible magnitude and will not result in long-term adverse effects.	Occurs once, long term	The magnitude of the impact is assessed as Very Low. Medium sensitivity species + Negligible Impact = Very Low effect significance. No likely significant effects at a local level are predicted
	<p>Displacement and barrier effect</p> <p>It is unlikely construction activity will occur during night time within the bat active season. As such it is highly unlikely the construction phase will have an impact on this species.</p>	Temporary and of negligible magnitude and will not result in long-term adverse effects.	Occurs during construction phase	The magnitude of the impact is assessed as Very Low. Medium sensitivity species + Negligible Impact = Very Low effect significance. No likely significant effects at a local level are predicted
	<p>Direct Habitat Loss</p> <p>This species was observed feeding on the site on several occasions however highest activity was noted offsite to the north where grassland has been planted with bird cover crops. In addition this species typically roosts in treelines; none of which are found on the site.</p>	Permanent and of negligible magnitude and will not result in long-term adverse effects.	Occurs once, irreversible	The magnitude of impact is assessed as Low. Medium sensitivity species + Negligible Impact = Very Low effect significance. No likely significant effects at a local level are predicted

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	Potential Impacts		Duration and Magnitude of potential impact	Frequency and reversibility	Magnitude and Significance of effect
	Displacement and barrier effect	There is the potential of disturbance to Redwing during construction phase. Foraging birds may temporarily avoid construction areas owing to the noise and increased activity.	Temporary and of Low magnitude and will not result in long-term adverse effects.	Occurs during construction phase	The magnitude of the impact is assessed as Low. Medium sensitivity species + Low Impact = Low effect significance.

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7 MITIGATION MEASURES

7.1 Badger

No measures are required.

7.2 Bats

No loss of bat roosts will occur due to the development. The development of the site will not impact bats utilising the Grand Canal however may have a slight impact on feeding bats. Highest activity recorded was from Leisler's bat; a species adept at hunting over artificial surfaces thus the transformation of the site may result in only a medium negative to neutral impact. It is important to limit artificial lighting within the site to ensure no additional light pollution occurs on bat friendly habitat features.

7.2.1.1 Effects of lighting on bats

BCI's Bats & Lighting document (BCI, 2010) states 'Brown Long-eared bats (*Plecotus auritus*) and *Myotis* species, commute and forage along dark wildlife corridors such as treelines and consequently shies away from highly illuminated sections. Therefore, illumination can impede their flight to suitable feeding areas. Consideration should be given to ensure that dark wildlife corridors remain in the landscape to allow bats and other wildlife to travel safely to and from feeding habitats.' The report also states 'each species of bat has an optimum level of light for emergence. For example, Daubenton's bats prefer a light level of less than 1 lux.' While the BCT guidelines do not give a recommended level of acceptable lux levels on commuting habitats it notes 'significant effects (on bat activity) have been recorded from as low as 3.6 lux'. Eurobats guidelines state *Myotis daubentonii* and *M. mystacinus*/*M. brandtii* consistently avoided their preferred habitats, i.e. lakes and forest gaps, in response to the brightness of the Nordic midsummer nights.

Table 7-1 provides a site specific response to the 2018 BCT flowchart which provides best practice guidance when considering effects of lighting schemes on bats.

Table 7-1: Application of BCT, 2018 Flowchart

Step	Query	Response
1	Could bats be present on site?	Yes.
2	Determine the presence of roosting / commuting / feeding habitats	The site is used by feeding and commuting Common Pipistrelle, Soprano Pipistrelle and Leisler's bats. Low level activity was recorded from brown long-eared bat, 40kHz Pipistrelle and unidentified <i>Myotis</i> species
3	Avoid lighting on key habitats and features all together.	The subject development will result in changes to the site including transformation of tillage and hedgerows to built land. Given the nature of the site; avoidance of lighting is not possible.

Step	Query	Response
4	In other locations of value to bats apply mitigation measures to reduce lighting to a minimum.	<p>The lighting plan is designed so that there is a maximum of 1 lux light spill in areas to the north and west where Canal and treelines are located. This will be achieved by using well controlled optics, and mounting the luminaires without any tilt, or with a small 5 degree tilt – away from the boundaries in question. This will result in an overall upward light ratio of 0%.</p> <p>All lights will use an amber white spectrum which does not contain any blue light component. This color type has less of a negative effect on invertebrates and bats in comparison to older models. In other areas of the site with less potential for disturbance 3000k warm white lighting has been proposed (instead of typical 4000k neutral white).</p>
5	Demonstrate compliance with lux levels and buffers	<p>Dark zone will be established to the north of the site.</p> <p>A static monitoring program and Lux survey should be completed in the grassland to the north of the site, adjacent to the Grand Canal prior and after construction.</p> <p>Should issues arising from the planning permission pertaining to bat activity occur further steps can be implemented in order to further reduce light levels.</p>

7.3 Birds

Multiple surveys demonstrate the site will have a low impact any species of note.

- An Ornithologist ECoW will be employed during the construction phase to micromanage construction locations to avoid disturbance on key species.
- The loss of lands usable by Golden plover is of concern and it is essential the flocks utilising the site have alternative, suitable lands they can use going into the future, particularly as development continues westwards. These lands need to be identified and farming practices managed in such a way that Golden Plover can utilise them. Ideally, these lands will already be used by Golden plover as the species appears faithful to existing sites.
- Queries with South Dublin County Council have identified that such lands are available. SDCC are making available an area of land in its ownership within an overall landholding comprising 37 hectares in provision with the policies and objectives set out in the South Dublin County Development Plan 2022-2028 and the South Dublin Biodiversity Action Plan. The grazing lands at this location, which are within a distance of 9.1 km from the Grange Castle West lands contain large scale field systems and short sward management grassland, that can be maintained as a short sward during the winter months, thereby providing optimal conditions to support winter feeding birds. Land management strategies will be agreed with farmers and will form part of the conditions of relevant land management licences issued by the Council to farmers managing the relevant lands.
- Whilst halting the construction to times outside the wintering period was considered, the scale of works was not considered impactful enough to negatively impact wintering birds both within the site and in the surrounds. Rather, an ECoW will be involved in the construction and limit construction in areas based on when they are of value to birds. The monitoring section below outlines how bird surveys will continue during the construction phase and based on these results micro exclusion zones can be put in place. Table 6-3 goes through potential buffer zones and timings when works may need to be halted here. For Golden Plover, a 300m buffer zone will be set in place surrounding the typical resting place of identified flocks. Figure 7-1 below shows the usual feeding grounds for Golden plover. A 300m buffer surrounding this area marginally encroaches within the development site. In order to reduce visual impacts on the species it is proposed to erect 3m high hoarding along the southern and eastern edge of the site prior to the wintering period. The appointed ECoW should regularly visit the site during the wintering period and map flocks behaviour. Should flocks of Golden plover be noted within 300m of the southern or western edge of the site this person should have the authority to halt noisy works temporarily. This method based on co-operation between overseeing ornithologist, site manager and NPWS / Local Authority representative will allow works to continue throughout the year whilst also avoiding disturbances to key species at vulnerable times.

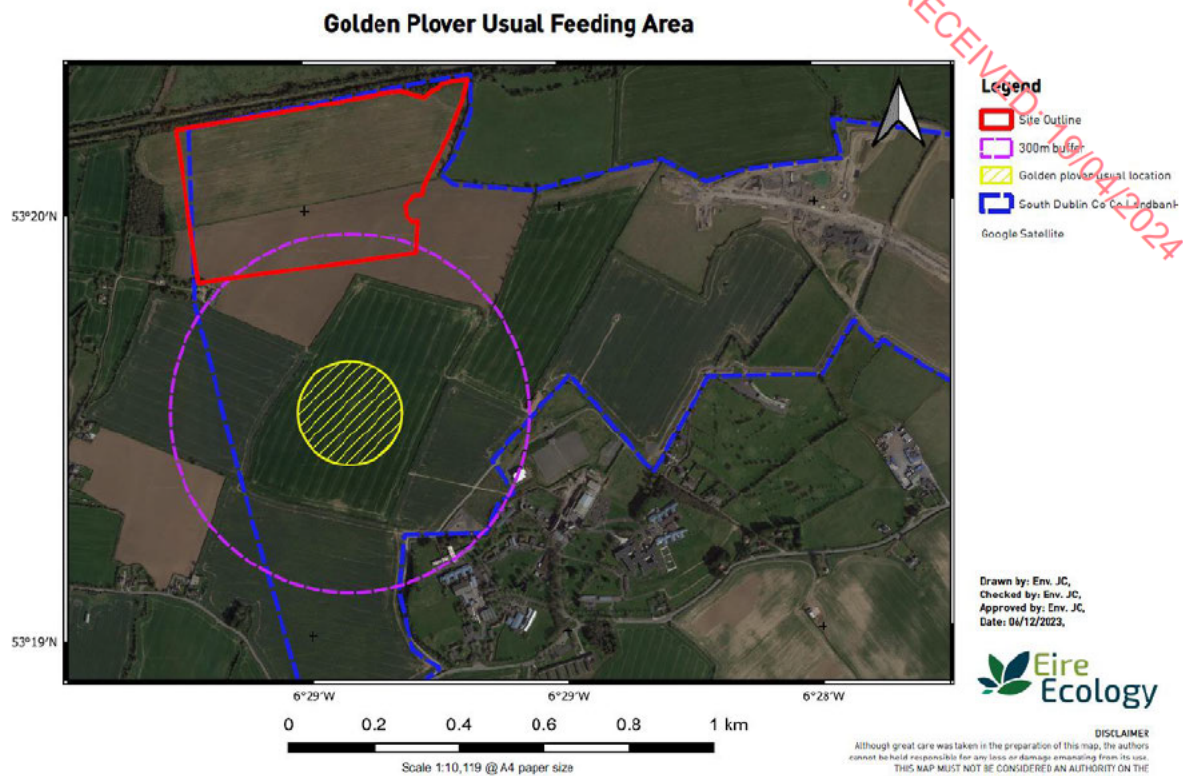


Figure 7-1: Typical feeding ground of Golden Plover

- Vegetation removal could impact on nesting passerines such as blackbird and wren thus ideally this activity should be carried out only outside the bird-nesting season March 1st – August 31st in order to avoid impacts on nesting birds. In the event this work is required earlier an ecological clerk of works should be onsite to ensure no nesting birds are present. Should an occupied nest be found the clearance works will have to wait until after fledging.
- Newer equipment will be utilised where possible, newer equipment is generally quieter than older equipment. When older equipment is used consideration will be given to potential modifications that are available to reduce noise levels.
- All equipment will be well maintained which is known to reduce noise levels.

8 RESIDUAL IMPACTS

Residual impacts are those that occur after the mitigation measures have taken effect. If the mitigation measures listed above are employed during construction, then there will be no residual impact on the local ecology.

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APPENDIX 1 – Tables and Figures

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Survey dates and environmental data

Date	Sunset / sunrise	Start	Finish	Cloud	Wind speed (F)	Wind direction	Visibility	Rain
29/11/2022	08:22	06:50	07:22	3	0		2	0
29/11/2022	08:22	07:22	10:22	3	0		5	0
29/11/2022	08:22	11:00	13:40	3	0		5	0
29/11/2022	08:22	13:40	14:10	2	1	SE	5	0
29/11/2022	08:22	14:10	15:00	3	1	SE	5	0
15/12/2022	08:33	09:00	13:30	1	0		5	0
15/12/2022	08:33	14:00	14:41	1	0		5	0
15/12/2022	16:06	14:45	17:45	1	0		5	0
15/12/2022	16:06	17:45	18:30	1	0		2	0
20/01/2023	08:27	08:10	11:10	1	1	SE	5	0
20/01/2023	08:27	11:40	14:40	1	1	SE	5	0
25/01/2023	16:55	10:00	15:00	3	2	SW	3	1
25/01/2023	16:55	15:30	17:30	2	1	SW	5	0
25/01/2023	16:55	17:30	18:40	2	1	SW	5	0
24/02/2023	07:26	08:00	11:00	3	1	W	4	1
24/02/2023	07:26	11:30	14:30	3	2	NW	4	2
28/03/2023	19:30	14:00	17:00	3	3	SW	5	3
28/03/2023	19:30	17:30	20:30	3	3	SW	5	3

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Table 9-1: VP results

Date	VP	Survey No.	Obs No.	Species Name	No. of Birds	Habitat Code	In / Out	Activity
29/11/2022	1	1	1	Great Cormorant	1	Tilled	Out	flying W
29/11/2022	1	1	2	Mallard	2	FW	Out	flying W along edge of canal
29/11/2022	1	1	3	Northern Lapwing	8	GA1	In	Circling around rear of site
29/11/2022	1	1	4	Herring Gull	1	GA1	Out	offsite to SE
29/11/2022	1	1	5	Herring Gull	8	GA1	In	Flying to SE near others
29/11/2022	1	1	6	Buzzard	1	WL2	In	Perched on tree to the east
29/11/2022	1	1	7	Redwing	22	GA1	In	To east
15/12/2022	1	2	1	Northern Lapwing	9		In	Didnt see them fly in just saw them land
15/12/2022	1	2	2	Golden Plover	7		In	flew from S possibly flushed by walker also landed on site.
15/12/2022	1	2	3	Northern Lapwing	9		In	Flushed by a walker flew NE
15/12/2022	1	2	4	Northern Lapwing	9		In	Flew in from the W landed inside the site.
15/12/2022	1	2	5	Mute Swan	1		Out	Flying E-W over canal not same Bird as first MS that flew opposite direction
15/12/2022	1	2	6	Northern Lapwing	1		In	Flying over SW-NE
15/12/2022	1	2	7	Mute Swan	1		Out	Flying W-E over canal looked to be Juvenile
20/01/2023	2	3	1	Buzzard		GA1	In	Perched on Bush between fields
20/01/2023	2	3	2	Golden Plover	30		In	Circled around field to the SE landed again
20/01/2023	2	3	3	Golden Plover	5		In	Flew in from W landed with birds from number 2 record
20/01/2023	2	3	4	Golden Plover	2	Tilled	In	Flew in from NW landed with others
20/01/2023	2	3	5	Golden Plover	44	Tilled	In	Flew in from N/NW landed with others
20/01/2023	2	3	6	Golden Plover	55	Tilled	In	Flew in from the N, landed with others
20/01/2023	2	3	7	Golden Plover	120	Tilled	In	Flushed off field to the S circled and landed again
20/01/2023	2	3	8	Golden Plover	169	Tilled	In	A total of 169 GP are roosting/feeding in field to the S of VP. VP AT 53.323646,-6.487200
20/01/2023	2	3	9	Snipe	2	GA1	In	Flushed by 3 hunters 2 guns 1 dog]
20/01/2023	2	3	10	Snipe	2	GA1	In	same as above
20/01/2023	2	3	11	Buzzard	2	GA1	In	Both flying together possible pair bonding
20/01/2023	2	3		#N/A			In	169 Golden Plover that were in field to the S were not there when second 3 hour VP was started. 3 hunters were present the dog was in field that had GP in it.
20/01/2023	2	3	12	Buzzard	1	GA1	In	Flew from the N landed in long grass on edge of tilled field most lightly hunting perched on fence 12:35.

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Date	VP	Survey No.	Obs No.	Species Name	No. of Birds	Habitat Code	In / Out	Activity
20/01/2023	2	3	13	Golden Plover	9	Tilled	In	Flew in from the E landed in field S of the site.
20/01/2023	2	3	14	Golden Plover	1	Tilled	In	Flying S-N through the site turned NE
20/01/2023	2	3	15	Buzzard	1	GA1	In	Flew W along canal on edge of site.
20/01/2023	2	3	16	Buzzard	1	GA1	In	Flew in from SW landed on edge of site.
20/01/2023	2	3	17	Kestrel	1	GA1	In	Flew E-W over overgrown GA1 turned back E.
24/02/2023	2	4	18	Golden Plover	44	Tilled	In	Circling over the site flew S
24/02/2023	2	4	19	Golden Plover	30	Tilled	In	Flew over the site from S-N.
24/02/2023	2	4	20	Buzzard	1	Tilled	In	Flyers N-S along hedge row E of VP
24/02/2023	2	4	21	Golden Plover	215	Tilled	In	Flew in from S circled flew out to the west.
24/02/2023	2	4	22	Golden Plover	40	Tilled	In	Flew back in from W turned S
24/02/2023	2	4	23	Golden Plover	400	Tilled	In	Circled in from SW flock grew from approx 150-400e circled for 18 minutes before landing in field just S of VP vi's poor due to misty showers.
24/02/2023	2	4	24	Great Cormorant	1	Canal	Out	Flying E along canal.
24/02/2023	2	4		Golden Plover		Tilled	In	Heard flying over calling small flock cloud low didn't see them.
28/03/2023	2	5	25	Herring Gull	24	Tilled	In	Flew SW-NE through the site 25-75 m 180 sec
28/03/2023	2	5	26	Great Black-backed Gull	12	Tilled	In	Flying W-E through the site 25-75 90 sec
28/03/2023	2	5	27	Herring Gull	3	Tilled	In	Flying NE to S/SW 10-25 through the site 120sec
28/03/2023	2	5	28	Great Black-backed Gull	25	Tilled	In	Circling to NE of VP 10-25 m flew NE 240sec
28/03/2023	2	5	29	Mew Gull	2	Tilled	In	Flying through the site NE-SW 0-10 m 60sec
28/03/2023	2	5	30	Great Black-backed Gull	5	Tilled	In	Flying E-W 10-25 m on site 70 sec
28/03/2023	2	5	31	Herring Gull	1	Tilled	In	Flew through the site from E-W 10-25 m on site 50 sec
28/03/2023	2	5	32	Grey Heron	1	Canal	Out	Flying W along canal 0-10 m 60 sec
28/03/2023	2	5	33	Kestrel	2	GA1	In	Male and Female circling together 10-25 m flew N 300 sec
28/03/2023	2	5	34	Kestrel	1	GS4	In	On site hunting 2 sticks no kills 0-10 m 360 sec
28/03/2023	2	5	35	Buzzard	1	Tilled	In	Circled before flying SE through the site 10-25m 30 sec 0-10 m. On off site 240 sec

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Table 9-2: Non Target VP species

Survey No	Date:	VP No.	Species	Est no. individuals (if recorded)	Notes
1	29/11/2022	1	Rook	6	Over to SE by farmyard
1	29/11/2022	1	Hooded Crow	1	
1	29/11/2022	1	Jackdaw	10	Perched on tree offsite
1	29/11/2022	1	Blackbird	4	By hedge
1	29/11/2022	1	Hooded Crow	4	At periphery
1	29/11/2022	1	Wood Pigeon	2	
3	20/01/2023	2	Hooded Crow	5	Feeding on tilled field to the west
3	20/01/2023	2	Meadow Pipit	1	Flying through the site 3 times during the 6 hours watched
3	20/01/2023	2	Rook	50	At least 50e flew the edge of the site along the canal during the vps.
3	20/01/2023	2	Jackdaw	15	15e
3	20/01/2023	2	Stonechat	2	
3	20/01/2023	2	Blackbird	5	5e
3	20/01/2023	2	Wood Pigeon	20	20e
3	20/01/2023	2	Robin	3	3 seen
3	20/01/2023	2	Jay	2	2
3	20/01/2023	2	Winter Wren	2	2
3	20/01/2023	2	Magpie	3	3
3	20/01/2023	2	Dunnock	1	1 seen
4	24/02/2023	2	Sky Lark	4	4 heard displaying
4	24/02/2023	2	Winter Wren	2	
4	24/02/2023	2	Rook	20	20 +
4	24/02/2023	2	Raven	6	
4	24/02/2023	2	Jackdaw	12	12
4	24/02/2023	2	Song Thrush	1	1
4	24/02/2023	2	Blackbird	1	
4	24/02/2023	2	Magpie	6	6
4	24/02/2023	2	Hooded Crow	5	5
5	28/03/2023	2	Sky Lark	2	
5	28/03/2023	2	Meadow Pipit	6	
5	28/03/2023	2	Wood Pigeon	23	
5	28/03/2023	2	Winter Wren	1	
5	28/03/2023	2	Hooded Crow	3	
5	28/03/2023	2	Rook	2	
5	28/03/2023	2	Magpie	2	
5	28/03/2023	2	Dunnock	1	
5	28/03/2023	2	Pheasant	1	
5	28/03/2023	2	Marsh Tit	2	
5	28/03/2023	2	Fieldfare	15	
5	28/03/2023	2	Blackbird	1	

Table 9-3: Bird transect results

	Date	Start time	Finish	Species	No's	Observations	Survey type	Lat	Lon
1	29/11/22	06:50	07:22	Black-headed Gull	2	Roosting by wet section of tilled field	Walked thermal (S field)	53.324077	-6.487587
1	29/11/22	06:50	07:22	Dunnock	1	Hedge	Walked thermal (S field)	53.32357	-6.486658
1	29/11/22	06:50	07:22	Golden Plover	16	Sound of birds confirms ID from field to S	Walked thermal (S field)	53.321894	-6.486632
1	29/11/22	06:50	07:22	Meadow Pipit	2	By rough grassland verge	Walked thermal (S field)	53.325014	-6.489129
1	29/11/22	06:50	07:22	Starling	9	Roosting in tilled field	Walked thermal (S field)	53.324173	-6.482853
1	29/11/22	06:50	07:22	Winter Wren	2	By fence	Walked thermal (S field)	53.325302	-6.4859
2	29/11/22	13:40	14:10	Black-headed Gull	2	Flying over field	Walked survey (N field)	53.32478	-6.484357
2	29/11/22	13:40	14:10	Fieldfare	2		Walked survey (N field)	53.327631	-6.489596
2	29/11/22	13:40	14:10	Hooded Crow	1	Flying over field	Walked survey (N field)	53.32478	-6.484357
2	29/11/22	13:40	14:10	Redwing	2	Mixed flock perched on tree, disturbed and circling subject field than back into tree. Northern field is fallow with grass gone to seed	Walked survey (N field)	53.32764	-6.489596
2	29/11/22	13:40	14:10	Starling	2		Walked survey (N field)	53.32764	-6.489596
2	29/11/22	13:40	14:10	Winter Wren	2	Rank grass	Walked survey (N field)	53.326499	-6.491335
2	29/11/22	13:40	14:10	Winter Wren	2		Walked survey (N field)	53.325495	-6.486002
2	15/12/2022	14:00	14:41	Blackbird	1		Walked survey (N field)	53.325017	-6.489083
2	15/12/2022	14:00	14:41	Blackbird	1		Walked survey (N field)	53.327327	-6.487796
2	15/12/2022	14:00	14:41	Fieldfare	1		Walked survey (N field)	53.325592	-6.491393
2	15/12/2022	14:00	14:41	Golden Plover	1		Walked survey (N field)	53.326509	-6.49547
2	15/12/2022	14:00	14:41	Greenfinch	1		Walked survey (N field)	53.327054	-6.492571
2	15/12/2022	14:00	14:41	Jackdaw	6		Walked survey (N field)	53.324654	-6.491309
2	15/12/2022	14:00	14:41	Jackdaw	1		Walked survey (N field)	53.326844	-6.493433
2	15/12/2022	14:00	14:41	Jay	1		Walked survey (N field)	53.325794	-6.494852
2	15/12/2022	14:00	14:41	Meadow Pipit	2		Walked survey (N field)	53.326452	-6.485665
2	15/12/2022	14:00	14:41	Meadow Pipit	3		Walked survey (N field)	53.326525	-6.488826

	Date	Start time	Finish	Species	No's	Observations	Survey type	Lat	Lon
2	15/12/2022	14:00	14:41	Reed Bunting	1		Walked survey (N field)	53.326556	-6.486468
2	15/12/2022	14:00	14:41	Rook	1		Walked survey (N field)	53.327634	-6.484985
2	15/12/2022	14:00	14:41	Rook	1		Walked survey (N field)	53.326381	-6.487256
2	15/12/2022	14:00	14:41	Rook	1		Walked survey (N field)	53.325275	-6.488072
2	15/12/2022	14:00	14:41	Snipe	1		Walked survey (N field)	53.325355	-6.488774
2	15/12/2022	14:00	14:41	Song Thrush	4		Walked survey (N field)	53.325662	-6.486605
2	15/12/2022	14:00	14:41	Song Thrush	2		Walked survey (N field)	53.326087	-6.484882
2	15/12/2022	14:00	14:41	Winter Wren	2		Walked survey (N field)	53.324923	-6.488088
2	15/12/2022	14:00	14:41	Winter Wren	2		Walked survey (N field)	53.326829	-6.484853
2	15/12/2022	14:00	14:41	Winter Wren	1		Walked survey (N field)	53.326561	-6.485317
2	15/12/2022	14:00	14:41	Winter Wren	3		Walked survey (N field)	53.326725	-6.487082
2	15/12/2022	14:00	14:41	Winter Wren	1		Walked survey (N field)	53.326621	-6.488044
2	15/12/2022	14:00	14:41	Winter Wren	1		Walked survey (N field)	53.326029	-6.489616
2	15/12/2022	14:00	14:41	Winter Wren	3		Walked survey (N field)	53.326458	-6.490143
2	15/12/2022	14:00	14:41	Winter Wren	1		Walked survey (N field)	53.326515	-6.493933
2	15/12/2022	14:00	14:41	Winter Wren	2		Walked survey (N field)	53.326285	-6.4933
2	15/12/2022	14:00	14:41	Wood Pigeon	1		Walked survey (N field)	53.324974	-6.493858
1	15/12/2022	17:45	18:30	Blackbird	1	-	Walked thermal (S field)	53.323699	-6.487244
1	15/12/2022	17:45	18:30	Northern Lapwing	9	Calling in this area; roosting in southern field	Walked thermal (S field)	53.324174	-6.487816
1	15/12/2022	17:45	18:30	Snipe	4	4 SN flushed	Walked thermal (S field)	53.323699	-6.487244
2	25/01/2023	14:45	16:00	Blackbird	-		Walked survey (N field)	53.324989	-6.488574
2	25/01/2023	14:45	16:00	Buzzard	1	Fame bird as earlier	Walked survey (N field)	53.327343	-6.487449
2	25/01/2023	14:45	16:00	Buzzard	1	Flew off ground into Ash tree	Walked survey (N field)	53.326877	-6.492945
2	25/01/2023	14:45	16:00	Golden Plover	37	Circling 50-100m to the south	Walked survey (N field)	53.324989	-6.488574
2	25/01/2023	14:45	16:00	Goldfinch	3	Feeding on ground	Walked survey (N field)	53.32711	-6.484992
2	25/01/2023	14:45	16:00	Meadow Pipit	14	Flushed circled flew W	Walked survey (N field)	53.326789	-6.487739
2	25/01/2023	14:45	16:00	Meadow Pipit	1	Flying SW	Walked survey (N field)	53.326484	-6.493179
2	25/01/2023	14:45	16:00	Rook	2	Flying W	Walked survey (N field)	53.326959	-6.492491
2	25/01/2023	14:45	16:00	Rook	1	Flying west	Walked survey (N field)	53.324718	-6.492315
2	25/01/2023	14:45	16:00	Sky Lark	2	Perched alarm calling	Walked survey (N field)	53.325612	-6.494081

	Date	Start time	Finish	Species	No's	Observations	Survey type	Lat	Lon
2	25/01/2023	14:45	16:00	Snipe	1	Alarm calling didnt get up	Walked survey (N field)	53.326243	-6.491808
2	25/01/2023	14:45	16:00	Stonechat	2	Flew SW landed again	Walked survey (N field)	53.326194	-6.485055
2	25/01/2023	14:45	16:00	Winter Wren	2		Walked survey (N field)	53.327178	-6.486334
2	25/01/2023	14:45	16:00	Winter Wren	1		Walked survey (N field)	53.326663	-6.490574
2	25/01/2023	14:45	16:00	Wood Pigeon	1	Flying W along canal	Walked survey (N field)	53.327462	-6.488533
2	25/01/2023	14:45	16:00	Wood Pigeon	4	Flying south	Walked survey (N field)	53.325654	-6.494226
2	25/01/2023	14:45	16:00	Reed Bunting	4		Walked survey (N field)	53.326266	-6.488068
2	25/01/2023	14:45	16:00	Sky Lark	3	Flew off ground flew N landed again	Walked survey (N field)	53.325996	-6.48653
2	25/01/2023	14:45	16:00	Snipe	1	Flew NW landed again	Walked survey (N field)	53.326003	-6.487793
1	25/01/2023	17:30	18:40	Golden Plover	2	2 GP roosting in transect field I flushed them trying to get close	Walked thermal (S field)	53.323802	-6.490879
1	25/01/2023	17:30	18:40	Golden Plover	30	30e GP in field could see them with scope	Walked thermal (S field)	53.322446	-6.487215
1	25/01/2023	17:30	18:40	Northern Lapwing	1		Walked thermal (S field)	53.323657	-6.48723
1	25/01/2023	17:30	18:40	Snipe	3	Nothing seen but 3 SN 1 L.heard on tilled field should have been able to see them.	Walked thermal (S field)	53.323658	-6.487239
1	25/01/2023	17:30	18:40	No birds seen at this Thermal VP			Walked thermal (S field)	53.325084	-6.486213
1	25/01/2023	17:30	18:40	No birds seen at this thermal VP. 1 SN could be heard to the north			Walked thermal (S field)	53.324463	-6.493374

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Table 9-4: Hinterland locations

Point	lat	long	Description
1	53.31668	-6.489047818	Field S of site
2	53.320166	-6.481805854	Field SE of site
3	53.31827	-6.51779037	Grand Canal
4	53.330092	-6.439786	Ponds to east of site in industrial estate.
5	53.314307	-6.476251	In field to the south of site
6	53.317897	-6.498493	S of site. Peamount.
7	53.322476	-6.494218	S of site
8	53.32592	-6.472508	Pond on site east of Brownstown
9	53.326361	-6.469077	Reedbeds on site
10			Roaming records
11	53.318288	-6.493221	south of Brownstown west of Peamont

Table 9-5: Hinterland results

Date	Time	Location Number	Species	Numbers	Observations
29/11/2022	12:37:00	1	Black-headed Gull	46	feeding on recently reseeded grasslands
29/11/2022	14:28:00	3	Coot	2	-
29/11/2022	12:48:00	2	Kestrel	-	-
29/11/2022	14:29:00	3	Mallard	4	-
29/11/2022	14:28:00	3	Mute Swan	2	-
29/11/2022	12:49:00	2	Redwing	2	-
15/12/2022	11:55	4	Black-headed Gull	80	feeding and preening on pond (numbers estimated)
15/12/2022	12:46	6	Buzzard	1	Flying across the Rd mobbed by RO
15/12/2022	11:55	4	Coot	35	feeding and preening on pond (numbers estimated)
15/12/2022	12:28	5	Golden Plover	61	Feeding and roosting in field.
15/12/2022	11:55	4	Herring Gull	1	feeding and preening on pond
15/12/2022	11:55	4	Herring Gull	70	feeding and preening on pond (numbers estimated)

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Date	Time	Location Number	Species	Numbers	Observations
15/12/2022	11:55	4	Little Grebe	10	feeding and preening on pond (numbers estimated)
15/12/2022	11:55	4	Mallard	43	feeding and preening on pond
15/12/2022	11:55	4	Mew Gull	50	feeding and preening on pond (numbers estimated)
15/12/2022	11:55	4	Mute Swan	12	feeding and preening on pond
15/12/2022	13:20	7	Northern Lapwing	1	Flying SW-NE just S of site.
15/12/2022	13:13	10	Redwing	23	Feeding in field.
15/12/2022	11:55	4	Teal	30	feeding and preening on pond
25/01/2023	13:00	9	Snipe	1	Heard not seen
25/01/2023	10:15	6	#N/A		Nothing of interest recorded.
24/02/2023	15:13	4	Black-headed Gull	47	all on pond east side of industrial estate.
24/02/2023	15:13	4	Coot	17	all on pond east side of industrial estate.
24/02/2023	15:13	4	Great Cormorant	1	all on pond east side of industrial estate.
24/02/2023	15:13	4	Herring Gull	39	all on pond east side of industrial estate.
24/02/2023	15:13	4	Mallard	14	all on pond east side of industrial estate.
24/02/2023	15:13	4	Moorhen	3	all on pond east side of industrial estate.
24/02/2023	15:13	4	Mute Swan	11	all on pond east side of industrial estate.
24/02/2023	15:13	4	Shag	2	all on pond east side of industrial estate.
24/02/2023	15:13	4	Tufted Duck	4	all on pond east side of industrial estate.
25/01/2024	13:49	10	Northern Lapwing	165	circling to the SE of sight
25/01/2025	1545	11	Buzzard	1	flying W along Rd S of Brownstown
25/01/2023.	12:00	4	Black-headed Gull	150	This is an estimated number
25/01/2023.	13:12	9	Buzzard	1	mobbed by RO
25/01/2023.	12:00	4	Coot	23	Feeding andvroosting on ponds
25/01/2023.	15:41	11	Golden Plover	400	estimated circling over fields to S of the site 75-100m
25/01/2023.	12:00	4	Great Cormorant	8	Roosting on and in ponds

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Date	Time	Location Number	Species	Numbers	Observations
25/01/2023.	12:00	4	Herring Gull	55	This is an estimate
25/01/2023.	12:00	4	Little Grebe	1	feeding on pond
25/01/2023.	12:00	4	Mallard	34	feeding and roosting
25/01/2023.	12:00	4	Moorhen	3	Feeding and roosting on pond.
25/01/2023.	12:00	4	Mute Swan	7	5 adults 2 Juveniles
25/01/2023.	12:00	4*	Tufted Duck	5	Feeding on ponds

Table 9-6: Static Detector 1

Date	Leisler's Bat	Common Pipistrelle	Soprano Pipistrelle	Pipistrelle 40 kHz	Brown Long-eared	Total
26th May	86	4	3	0	0	93
27th May	75	6	1	3	0	85
28th May	104	3	0	1	0	108
29th May	103	1	1	1	0	106
30th May	98	4	3	4	0	109
31st May	99	6	1	1	1	108
1st June	78	0	0	0	0	78
2nd June	79	4	0	5	0	88
3rd June	88	3	1	1	1	94
4th June	69	4	2	2	0	77
5th June	61	5	4	1	1	72
6th June	7	3	0	0	0	10
Total	947	43	16	19	3	1028

Table 9-7: Static Detector 2

Date	Leisler's Bat	Common Pipistrelle	Soprano Pipistrelle	Pipistrelle 40 kHz	Unidentified Myotis	Total
26th May	88	2	2	1	1	94
27th May	84	4	0	0	0	88
28th May	43	1	1	1	0	46
29th May	34	4	1	0	0	39
30th May	27	2	0	0	0	29
31st May	22	1	0	0	0	23
1st June	20	1	1	1	0	23
2nd June	24	1	0	1	0	26
3rd June	15	0	0	0	0	15
4th June	15	5	1	0	0	21
5th June	14	2	1	0	0	17
6th June	0	0	0	0	0	0
Total	386	23	7	4	1	421

Table 9-8: Emergence survey results Karolina 06th June 2023 Sheds 3, rear of 2 and 4.

Contact No.	Lat	Lon	Species	Details	Time
-	53.32341	-6.49275	Survey starts. Emergence survey by shed 3, rear of shed 2 and 4. Using Canon.		21:45
-	53.32339	-6.49275	Single bat dropping found on inside wall of shed 2 on a cobweb		21:52
1	53.32341	-6.49282	Common Pip	First call recorded with no sightings.	22:39

Contact No.	Lat	Lon	Species	Details	Time
2	53.32340	-6.49284	Leisler's bat	flying high with no clutter	22:45
3	53.32340	-6.49287	Leisler's bat	Occasional Leisler's calls	22:46
4	53.32339	-6.49290	Leisler's bat	Many Leisler's calls, frequency increasing the longer after sunset.	22:56
-	Emergence survey over. No roosting bats found.				23:20

Table 9-9: Emergence survey results John 06th June 2023. Sheds 2, 3, 4 and 1.

Contact No.	Lat	Lon	Species	Details	Time
-	53.32329	-6.4926	Survey starts. Emergence survey by shed 2, rear of shed 2 and 4. Using Track IR Pro 19. While thermal recording sheds surveyor also checked out shed 1		21:45
1	53.32328	-6.49259	Common Pip	Brief unseen	22:22
2	53.32329	-6.49262	Common Pip	Brief unseen. No activity from sheds	22:46
3	53.32329	-6.49258	Leisler's bat	Brief unseen	22:56
4	53.32329	-6.49258	Common Pip	hunting within large shed (1) for five minutes before flying off. not roosting	22:56
5	53.32328	-6.49265	Leisler's bat	Hutting	22:53
-	Emergence survey over. No roosting bats found.				23:20

Table 9-10: Re-entry survey results Karolina, 07th June 2023 @ building 5

Contact No.	Lat	Lon	Species	Details	Time
-	53.32361	-6.49400	Survey starts. Emergence survey by derelict dwelling 5 using Canon.		02:58
	53.32357	-6.49434	No recordings of any type detected from handheld recorder at start of survey		03:45
1	53.32359	-6.49401	Common pipistrelle	First call of Dawn Survey	03:47
2	53.32352	-6.49400	Common pipistrelle	Flying overhead, call recorded but no video	03:57
3	53.32356	-6.49398	Leisler's Bat	Unable to get visual	04:23
-	Re-entry survey over. No roosting bats found.				04:58