

**Tubber Lane- Phase 3 Residential Development, Tubber Lane Development Area,
Adamstown, Lucan, Co. Dublin**

Ecological Impact Assessment



FINAL REPORT

15th December 2021



Faith Wilson
ECOLOGICAL CONSULTANT

*Faith Wilson Ecological Consultant BSc (Hons) CEnv MCIEEM
Kestrel Ridge, Tigrony West, Avoca, Co. Wicklow*

**Tubber Lane- Phase 3 Residential Development, Tubber Lane Development Area,
Adamstown, Lucan, Co. Dublin**

Ecological Impact Assessment

1.	INTRODUCTION	2
1.1	Project Description	3
1.2	Relevant Legislation	4
1.2.1	Nature Conservation Designations	4
1.2.2	Bats	4
1.2.3	Badgers	5
1.2.4	Invasive Species	6
2.	METHODOLOGY.....	9
2.1	Desk Study	9
2.2	Bat Survey.....	9
2.3	Habitat and Botanical Survey	10
2.4	Bird Survey.....	11
2.5	Badger Survey.....	11
3.	SURVEY RESULTS	12
3.1	Receiving Environment	12
3.2	Conservation Designations	12
3.3	Habitats and Flora.....	14
3.4	Invasive Species	16
3.5	Rare & Protected Flora	16
3.6	Fauna - Bats	17
3.7	Fauna - Badger	20
3.8	Other Fauna.....	20
3.9	Birds.....	21
3.10	Fisheries	21
4.	CHARACTERISTICS OF THE PROPOSED DEVELOPMENT	22
5.	POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT	24
5.1	Potential Impacts on Habitats	24
5.2	Potential Impacts on Fauna	25
6.	A DO NOTHING SCENARIO	26
7.	REMEDIAL OR REDUCTIVE MEASURES	27
7.1	Mitigation by Avoidance	27
7.2	Sediment Control	27
7.3	Contractor Briefing	29
7.4	Protection Measures for Birds	29
7.5	Provision of Nesting Measures for Birds	29
7.6	Protection Measures for Bats	29
7.7	Measures for Bats - Erection of Bat Boxes	32
7.8	Protection Measures for Badger	32
7.9	Soil Handling.....	34
7.10	Invasive Species	35
7.11	Rare Plant Monitoring.....	35
7.12	Planting proposals	35
7.13	Ecological Clerk of Works	37
8.	PREDICTED IMPACT OF THE PROPOSED DEVELOPMENT	37
9.	CONCLUSION.....	38
10.	BIBLIOGRAPHY.....	39
11.	PHOTOGRAPHIC RECORD.....	42

Tubber Lane- Phase 3 Residential Development, Tubber Lane Development Area, Adamstown, Lucan, Co. Dublin

Ecological Impact Assessment

1. INTRODUCTION

Faith Wilson (an independent ecological consultant and licensed bat specialist) was commissioned by Tierra Ltd and Hugh McGreevy & Sons to undertake an ecological baseline survey of lands proposed for development under Phase 3, at Tubber Lane, Adamstown, Lucan, Co. Dublin as outlined in red on **Figure 1** below and to prepare an ecological impact assessment report for same.

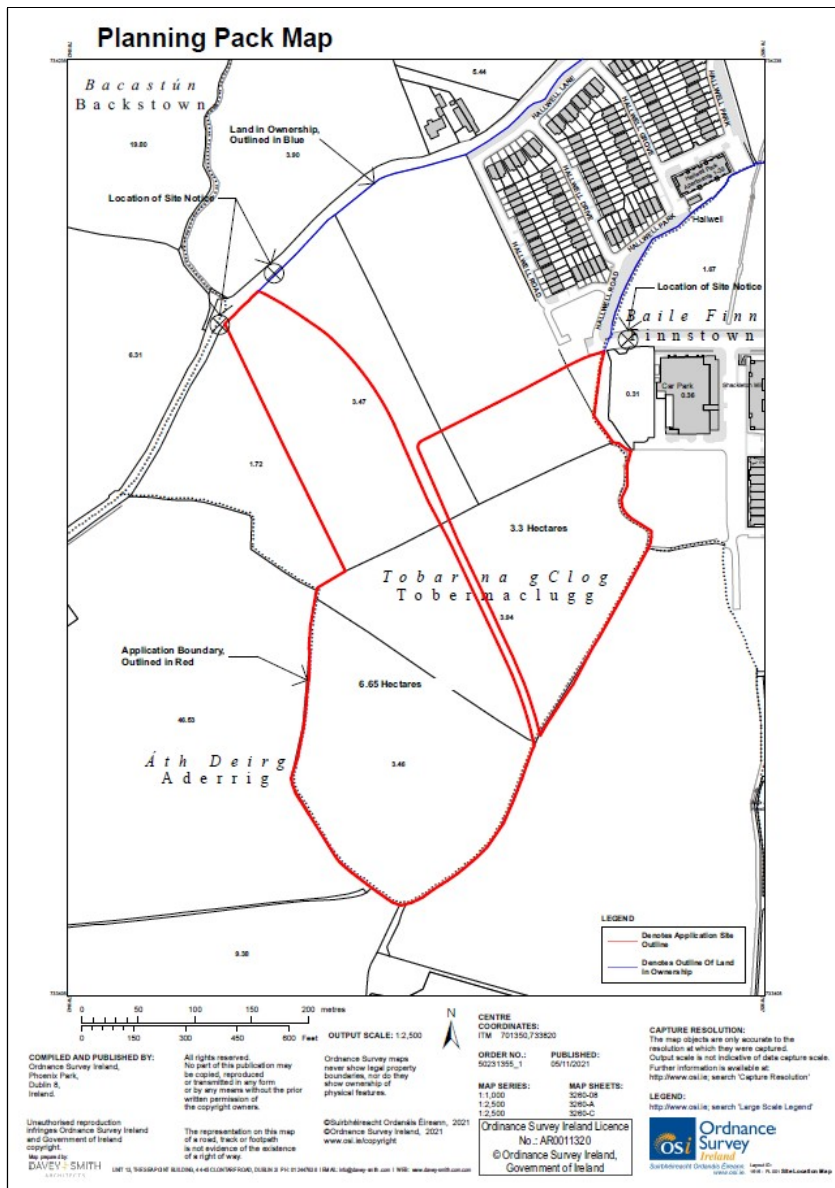


Figure 1. Lands proposed for development in Phase 3 at Tubber Lane, Adamstown (outlined in red).

1.1 Project Description

Hugh McGreevy & Sons Ltd and Tierra Ltd, intend to apply for full planning permission for development on site located in the Tubber Lane Development Area within Adamstown SDZ, Adamstown, Lucan, Co Dublin. The application site is located to the south of Tubber Lane, in the north-west of the Adamstown SDZ lands and to the west and south west of the permitted / under construction Tubber Lane Phase 2 development (Reg. Ref.: SDZ19A/0008, as amended under Reg. Ref.: SDZ20A/0014).

The development will comprise of 455 no. residential units (including a mixture of 2 and 3 storey semi-detached and terraced houses, and duplex units and apartments in 3 and 4 storey blocks), new internal roads and footpaths, site access, public open space, car parking, cycle stores, landscaping, bin stores, foul and surface water drainage, boundary walls and fences, ESB substations and all associated site development works. Private and semi-private open space to serve the proposed units will be provided in the form of balconies, terraces and gardens.

The development also includes the provision of the finishing course to part of the Celbridge Link Road (part of Loop Road 3), permitted under Reg. Ref.: SDZ17A/0009, from the junction with Adamstown Avenue to the southern site boundary, and associated revisions to provide access to the development, parallel parking bays, and public lighting.

The 455 no. residential units are to be provided as follows:

- 58 no. 2 bed, 2 storey, terraced houses (Type E1, E2, E3, J1 & J2);
- 6 no. 3 bed, 2 storey, semi-detached houses (Type I1);
- 190 no. 3 bed, 2 storey, terraced houses (Type A1, A2, A3, B1, B2, C1, C2, C3, D1, D2, F1, F2, I1 & I2);
- 5 no. 3 bed, 3 storey, terraced houses (Type H)
- 6 no. 4 bed, 2 storey, terraced houses (Type K1, K2);
- 7 no. Apartment Blocks (Blocks B, D, E, G, H, I & K) containing 111 no. apartments/duplexes including 50 no. 1 bed apartments, 4 no. 2 bed apartments, 39 no. 3 bed duplex apartments and 18 no. 2 bed duplex apartments over 3 storeys;
- 4 no. Apartment Blocks (Blocks A, C, J & L) containing 37 no. apartments/duplexes including 8 no. 1 bed apartments, 29 no. 3 bed duplex apartments over 4 storeys;
- 1 no. Apartment Block (Block F) containing 42 no. apartments including 2 no. 1 bed apartments and 40 no. 2 bed apartments over 4 storeys.

1.2 Relevant Legislation

1.2.1 Nature Conservation Designations

International Conservation Designations

Special Areas of Conservation (SACs) are habitats of international significance that have been identified by NPWS and submitted for designation to the EU. SAC is a statutory designation, which has a legal basis under the EU Habitats Directive (92/43/EEC) as transposed into Irish law through the European Communities (Natural Habitats) Regulations, 1997, which were amended in 1998, 2005, 2011 and 2021.

The European Communities (Birds and Natural Habitats) Regulations 2011 consolidate the European Communities (Natural Habitats) Regulations 1997 to 2005 and the European Communities (Birds and Natural Habitats)(Control of Recreational Activities) Regulations 2010, as well as addressing transposition failures identified in the Court of Justice of the European Union (CJEU) judgements. The European Communities (Birds and Natural Habitats) Regulations 2011 were further amended in 2021.

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

National Conservation Designations

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

1.2.2 Bats

Eleven species of bats occur in Ireland, nine of which are resident and two are vagrant, and all are protected under both national and international law.

Wildlife Act 1976

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

Bern and Bonn Convention

Ireland has also ratified two international conventions, which afford protection to bats amongst other fauna. These are known as the 'Bern' and 'Bonn' Conventions. The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982), exists to conserve all species and their habitats, including bats. The Convention on the Conservation of Migratory

Species of Wild Animals (Bonn Convention 1979, enacted 1983) was instigated to protect migrant species across all European boundaries, which covers certain species of bat.

EU Habitats Directive

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

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

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

1.2.3 Badgers

The badger (*Meles meles*) is protected under both national and international wildlife legislation, where it is listed under the Wildlife Act 1976 (amended 2000) and the Bern Convention respectively, and is listed as a species of Least Concern in the 2009 Irish Red Data List for Mammals.

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

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

1.2.4 Invasive Species

The Birds and Habitats Regulations (2011) which were signed on 21st September 2011 by the then Minister for Arts, Heritage and the Gaeltacht Jimmy Deenihan, included new legislation on invasive and non-native species in Sections 49 and 50.

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

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

Birds and Natural Habitats Regulations 2011

Third Schedule: Part 1 Plants

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

First column	Second column	Third column
Common name	Scientific name	Geographical application
American skunk-cabbage	<i>Lysichiton americanus</i>	Throughout the State
A red alga	<i>Grateloupia doryphora</i>	Throughout the State
Brazilian giant-rhubarb	<i>Gunnera manicata</i>	Throughout the State
Broad-leaved rush	<i>Juncus planifolius</i>	Throughout the State
Cape pondweed	<i>Aponogeton distachyos</i>	Throughout the State
Cord-grasses	<i>Spartina</i> (all species and hybrids)	Throughout the State
Curly waterweed	<i>Lagarosiphon major</i>	Throughout the State
Dwarf eel-grass	<i>Zostera japonica</i>	Throughout the State
Fanwort	<i>Cabomba caroliniana</i>	Throughout the State
Floating pennywort	<i>Hydrocotyle ranunculoides</i>	Throughout the State
Fringed water-lily	<i>Nymphoides peltata</i>	Throughout the State
Giant hogweed	<i>Heracleum mantegazzianum</i>	Throughout the State
Giant knotweed	<i>Fallopia sachalinensis</i>	Throughout the State
Giant-rhubarb	<i>Gunnera tinctoria</i>	Throughout the State
Giant salvinia	<i>Salvinia molesta</i>	Throughout the State
Himalayan balsam	<i>Impatiens glandulifera</i>	Throughout the State
Himalayan knotweed	<i>Persicaria wallichii</i>	Throughout the State
Hottentot-fig	<i>Carpobrotus edulis</i>	Throughout the State
Japanese knotweed	<i>Fallopia japonica</i>	Throughout the State
Large-flowered waterweed	<i>Egeria densa</i>	Throughout the State
Mile-a-minute weed	<i>Persicaria perfoliata</i>	Throughout the State
New Zealand pigmyweed	<i>Crassula helmsii</i>	Throughout the State
Parrot's feather	<i>Myriophyllum aquaticum</i>	Throughout the State
Rhododendron	<i>Rhododendron ponticum</i>	Throughout the State
Salmonberry	<i>Rubus spectabilis</i>	Throughout the State
Sea-buckthorn	<i>Hippophae rhamnoides</i>	Throughout the State
Spanish bluebell	<i>Hyacinthoides hispanica</i>	Throughout the State
Three-cornered leek	<i>Allium triquetrum</i>	Throughout the State
Wakame	<i>Undaria pinnatifida</i>	Throughout the State
Water chestnut	<i>Trapa natans</i>	Throughout the State
Water fern	<i>Azolla filiculoides</i>	Throughout the State
Water lettuce	<i>Pistia stratiotes</i>	Throughout the State
Water-primrose	<i>Ludwigia</i> (all species)	Throughout the State
Waterweeds	<i>Elodea</i> (all species)	Throughout the State
Wireweed	<i>Sargassum muticum</i>	Throughout the State

EU Regulation 1143/2014 on Invasive Alien Species

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

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

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

Plant species listed on the directive include:

- American skunk cabbage *Lysichiton americanus*
- Asiatic tearthumb *Persicaria perfoliata* (*Polygonum perfoliatum*)
- Curly waterweed *Lagarosiphon major*
- Eastern Baccharis *Baccharis halimifolia*
- Floating pennywort *Hydrocotyle ranunculoides*
- Floating primrose willow *Ludwigia peploides*
- Green cabomba *Cabomba caroliniana*
- Kudzu vine *Pueraria lobata*
- Parrot's feather *Myriophyllum aquaticum*
- Persian hogweed *Heracleum persicum*
- Sosnowski's hogweed *Heracleum sosnowskyi*
- Water hyacinth *Eichhornia crassipes*
- Water primrose *Ludwigia grandiflora*
- Whitetop weed *Parthenium hysterophorus*

Animal species listed on the directive include:

- Amur sleeper *Percottus glenii*
- Asian hornet *Vespa velutina*
- Chinese mitten crab *Eriocheir sinensis*
- Coypu *Myocastor coypus*
- Fox squirrel *Sciurus niger*
- Grey squirrel *Sciurus carolinensis*
- Indian house crow *Corvus splendens*
- Marbled crayfish *Procambarus spp.*
- Muntjac deer *Muntiacus reevesii*
- North american bullfrog *Lithobates (Rana) catesbeianus*
- Pallas's squirrel *Callosciurus erythraeus*
- Raccoon *Procyon lotor*
- Red swamp crayfish *Procambarus clarkii*
- Red-eared terrapin/slider *Trachemys scripta elegans*

- Ruddy duck *Oxyura jamaicensis*
- Sacred ibis *Threskiornis aethiopicus*
- Siberian chipmunk *Tamias sibiricus*
- Signal crayfish *Pacifastacus leniusculus*
- Small Asian mongoose *Herpestes javanicus*
- South American coati *Nasua nasua*
- Spiny-cheek crayfish *Orconectes limosus*
- Topmouth gudgeon *Pseudorasbora parva*
- Virile crayfish *Orconectes virilis*

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

Plant species

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

Animal species

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

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

Other Invasive Species

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

2. METHODOLOGY

2.1 Desk Study

A desk study was carried out to collate the available information on the ecological environment potentially impacted by the proposed development at Tubber Lane and to determine the proximity of the proposed development to designated areas for conservation. The National Parks and Wildlife Service (NPWS) of the Department of Housing, Local Government and Heritage database of designated conservation areas and NPWS records of rare and protected plant species as listed under the Irish Red Data list of Vascular Plants (Wyse Jackson, 2016) were checked with regard to the location of the lands at Tubber Lane.

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

The Bat Conservation Ireland database and other bat specialists were consulted regarding records of bat activity in the area.

Field surveys of the Phase 3 lands were completed on the 23rd October 2018, 7th October 2019, 9th March 2021, and 1st June 2021.

The wider lands within this section of the Adamstown SDZ were first visited in May and June 2006 and more recently in May 2018. The surveys built on previous surveys conducted of the neighbouring Phase 2 lands (including Tobermaclugg Park) in 2018 and a badger survey, which was carried out on the Phase 2 lands on 23rd October 2018.

2.2 Bat Survey

A bat survey was carried out on 7th October 2019 and 1st June 2021 by Faith Wilson. This survey built on previous surveys conducted in the general environs of Tubber Lane and of the Phase 2 lands on 23rd October 2018, and July 2019. There are no buildings present within the red line boundary of the site so the only roosting potential for bats in the site is limited to trees.

Trees within the site were assessed using the following standard criteria, which were created by bat specialists from Bat Conservation Ireland for use in the assessments of tree roosts on large infrastructural projects and are summarised in NRA (2006):

- Presence or absence of bat droppings (these can be hard to find amongst leaf litter or may be washed away following periods of wet weather),
- Bat droppings may also be seen as a black streak beneath holes, cracks, branches, etc.,
- Presence or absence of smooth edges with dark marks at potential entrances to roosts,

- Presence or absence of urine stains at potential entrances to roosts,
- Presence of natural cracks and rot holes in the trunk or boughs of the tree,
- Hollow trees,
- Presence or absence of creepers such as ivy or honeysuckle on trees (ivy clad trees are often used by bat species such as pipistrelles as roosts),
- Presence or absence of loose bark such as that of sycamore, or flaky bark on coniferous species such as cedars, cypress and Scot's pine,
- Presence or absence of bracket fungi which may indicate a rotten or potentially hollow centre to the tree,
- Known bat roosts previously identified,
- Trees with storm or machinery damage or broken boughs,
- Clutter level - where the branches and trunk are easily accessible, this is considered a better tree for bat roosts,
- Adjoining habitat - if there are a variety of feeding opportunities for bats, this increases the potential of a tree as a bat roost,
- Adjoining potential roosts / known roosts. This raises the likelihood of a tree being of benefit as bats may move roosts if the roost becomes too hot or cold during roosting and a nearby alternative roost is highly desirable.

A bat detector survey was carried out at dusk on 7th October 2019 and 1st June 2021 using three types of bat detectors - two *Batbox Duet* Heterodyne/Frequency Division detectors, a Pettersson D100 Heterodyne detector and an Echometer Touch Pro. The potential emergence of bats from trees within the site at dusk was monitored and a walkover survey of the lands to determine bat activity was conducted.

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

2.3 Habitat and Botanical Survey

Part of the site had been previously surveyed on 23rd October 2018 and July 2019, when the lands were walked as part of the Phase 2 development. The lands were resurveyed from the perspective of habitats and flora on the 23rd October 2018, 7th October 2019, 9th March 2021, and 1st June 2021.

The habitats within the site were described to level three using the Heritage Council Guide to Habitats of Ireland (Fossitt (2000)). Plant species within the site were identified using Parnell and Curtis (2012).

A particular focus of the survey was to determine if any protected species of plant under the Flora Protection Order (2015) or listed in the Irish Vascular Plants Red Data Book are present on the site.

The planning team were alerted at a pre-application meeting with South Dublin County Council to the recently discovered presence of a red data vascular plant species (Hairy St. John's-wort *Hypericum hirsutum*, which is a species legally protected under the Flora Protection Order 2015) at the Aderrig lands in Adamstown, which are in close proximity to the proposed development lands. A dedicated survey for this species within the site was therefore conducted.

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

2.4 Bird Survey

Birds present within the site were identified on both sight (Svennson *et. al.* (2010)) and sound. The breeding season for birds was underway during the June survey.

2.5 Badger Survey

The badger survey was undertaken on 7th October 2019 and 9th March 2021 when vegetation cover was reduced. The survey was conducted during the site visit in accordance with best practice as described in the '**Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes**' (NRA 2009) and '**Guidelines for the treatment of badgers prior to the construction of National Road Schemes**' (NRA 2005). Badger activity was rechecked during the site visit on the 1st June 2021.

3. SURVEY RESULTS

3.1 Receiving Environment

The proposed development lands are located to the south of Tubber Lane Road in Adamstown, Lucan. The site is bounded to the north west by Tubber Lane Road, to the north and north east by existing housing (some of which is currently under construction), to the east by additional housing and to the south and west by undeveloped agricultural lands as shown on **Figure 2** below.



Figure 2. Proposed development lands (Google Maps).

3.2 Conservation Designations

The lands proposed for development at Tubber Lane are not designated under any nature conservation designations.

There are three Special Areas of Conservation (SAC) within a 15km radius of the site as shown on **Figure 3** below. These are the Rye Water Valley/Carton SAC (Site Code: 001398), Glenasmole Valley SAC (Site Code: 001209), and the Wicklow Mountains SAC (Site Code: 002122), which are 2km north-west, 12km south-east, and 13.7km south-east of the site respectively. There are no ecological links (source-pathway-receptors) between the lands at Tubber Lane and any of these Natura 2000 sites. Potential impacts on these Natura 2000 sites from the proposed development at Tubber Lane have been considered in the Report for Screening for Appropriate Assessment, which accompanies this planning application.

Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) are habitats of international significance that have been identified by NPWS and submitted for designation to the EU.

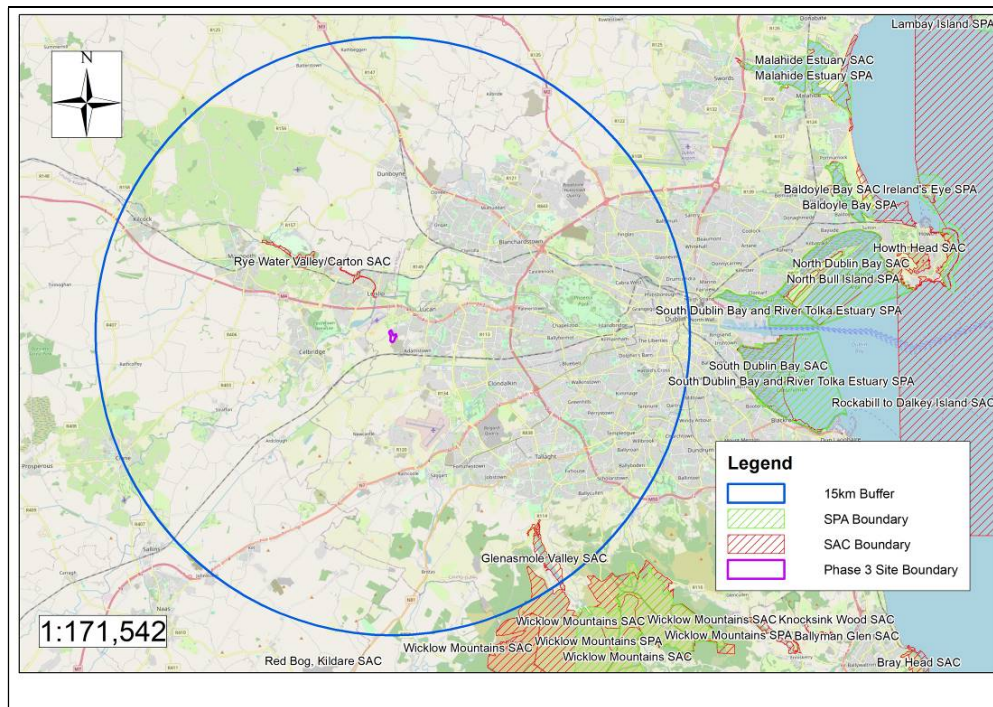


Figure 3. Designated sites within a 15km radius of the Phase 3 lands at Tubber Lane.

The Lucan Stream is the only ecological link (source-pathway-receptors) between the lands at Tubber Lane and any Natura 2000 site as this watercourse is a tributary of the River Liffey and the Natura 2000 sites in Dublin Bay lie within the potential zone of influence of the proposed development. These are:

- North Dublin Bay SAC (000206)
- South Dublin Bay SAC (000210)
- South Dublin Bay and River Tolka Estuary SPA (004024)
- North Bull Island SPA (004006)

As negative impacts on these Natura 2000 sites are highly unlikely by virtue of distance the proposed development at Tubber Lane will have no direct relevance to these protected sites and they are not considered further in this report or in the Report for Screening for Appropriate Assessment, which accompanies this planning application.

There are no other designated biodiversity areas affected by the development at Tubber Lane that have a recognised European Union or International protection status. Some of the Natura 2000 sites and a number of other sites in the area (within 15km of the site at Tubber Lane) are also designated as proposed Natural Heritage Areas. These include:

- Dodder Valley pNHA (Site Code: 000991)
- Glenasmole Valley pNHA (Site Code: 001209)
- Grand Canal pNHA (Site Code: 002104)
- Killeel Wood pNHA (Site Code: 001394)
- Liffey Valley pNHA (Site Code: 000128)
- Lugmore Glen pNHA (Site Code: 001212)
- Royal Canal pNHA (Site Code: 002103)

- Rye Water Valley/ Carton pNHA (Site Code: 001398)
- Slade Of Saggart And Crooksling Glen pNHA (Site Code: 000211)

There are no ecological or hydrological links between the development site at Tubber Lane and these or any other pNHA beyond that of the Lucan Stream as mentioned above, which links the site to the Liffey Valley pNHA (Site Code: 000128), the boundary of which is 1.5km to the north.

3.3 Habitats and Flora

The lands proposed for development are two agricultural fields, which are currently under arable crops (BC1).

The lands in the northern field are bounded by hedgerows (WL1) along the northern and western boundaries, with a drainage ditch (FW4) along the southern boundary of the lands and housing to the east.

The southern field adjoins this field to the south. It is bounded by a treeline (WL2) with a drainage ditch (FW4) at the base along the eastern and southern boundaries and a broken remnant hedgerow/treeline on an earthen bank (BL2) on the south western boundary. The habitats present on the site are show on **Figure 4** below.

The drainage ditches in the site link into the Tobermaclugg/Lucan Stream, which is located c.80m to the east of the site and flows through the Aderrig lands.

Located along the northern boundary with 'Tubber Lane' and along the western and southern boundary of the northern field is a deep open drainage ditch (FW4) adjoining a heavily flailed hedgerow dominated by ash (*Fraxinus excelsior*) and bramble (*Rubus fruticosus* agg.).

The western boundary of the northern field consists of a deep drainage ditch (FW4) and a hedgerow (WL1) growing on an earthen bank (BL2). The dominant species are ash (*Fraxinus excelsior*) and oak (*Quercus* sp.) below which is an understorey of hawthorn (*Crataegus monogyna*), willow (*Salix cinerea*), elder (*Sambucus nigra*), bramble (*Rubus fruticosus* agg.), wild privet (*Ligustrum vulgare*) and dog rose (*Rosa canina*). Large amounts of this hedgerow had been recently removed and lay in the field to the west outside the Phase 3 lands.

The shared boundary hedge with the Phase 2 lands contained hawthorn (*Crataegus monogyna*), ash (*Fraxinus excelsior*), elder (*Sambucus nigra*), bramble (*Rubus fruticosus* agg.), sycamore (*Acer pseudoplatanus*), willows (*Salix* sp.) and dog rose (*Rosa canina*).

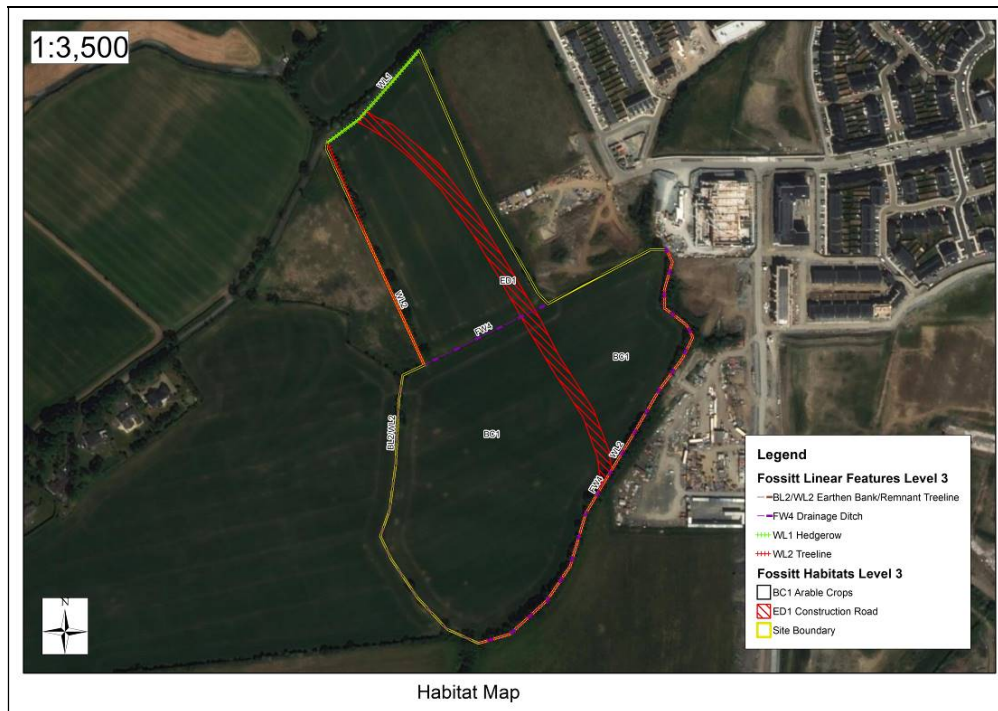


Figure 4. Habitat Map of the Phase 3 lands.

Sparse willow (*Salix* sp.) and immature ash (*Fraxinus excelsior*), along the southern ditch (FW4) of the northern field had been heavily flailed on the first visits and in subsequent visits had been completely removed.

There are two semi-mature ash (*Fraxinus excelsior*) and one mature sycamore (*Acer pseudoplatanus*) within the remnant hedgerow/treeline on an earthen bank (BL2) along the north western corner of the southern field. The main species recorded within the treeline along the eastern, southern and south western boundary of the southern field are mature and semi-mature ash (*Fraxinus excelsior*), sycamore (*Acer pseudoplatanus*) and oak (*Quercus* sp.) below which is an understorey of hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), elder (*Sambucus nigra*), bramble (*Rubus fruticosus* agg.), wild privet (*Ligustrum vulgare*) and dog rose (*Rosa canina*). An unvegetated drainage ditch (FW4) is found at the base of this treeline which is growing on an earthen bank (BL2). Vegetation along this ditch/bank is limited to shade tolerant species such as bramble (*Rubus fruticosus* agg.), lords and ladies (*Arum maculatum*), ivy (*Hedera helix*) and lesser celandine (*Ficaria verna*).

The fields are very intensively managed under arable crops with limited field margins. At the base of treelines and hedgerows and along drainage ditch banks species such as cleavers (*Galium aparine*), dandelion (*Taraxacum* agg.), germander speedwell (*Veronica chamaedrys*), bush vetch (*Vicia sepium*), hogweed (*Heracleum sphondylium*), field bindweed (*Calystegia sepium*), herb Robert (*Geranium robertianum*), lords and ladies (*Arum maculatum*), ivy (*Hedera helix*), cow parsley (*Anthriscus sylvestris*), meadow buttercup (*Ranunculus acris*), creeping buttercup (*Ranunculus repens*), hairy willowherb (*Epilobium hirsutum*), greater willowherb (*Epilobium angustifolium*), nettle (*Urtica dioica*), ivy (*Hedera helix*), creeping thistle (*Cirsium arvense*), lesser celandine (*Ficaria verna*), broad leaved dock (*Rumex*

conglomeratus), spear thistle (*Cirsium vulgare*) and ragwort (*Senecio jacobaea*) were recorded. Grass species recorded include creeping bent (*Agrostis stolonifera*), Yorkshire fog (*Holcus lanatus*), false oat-grass (*Arrhenatherum elatius*), red fescue (*Festuca rubra*), perennial rye-grass (*Lolium perenne*), meadow fescue (*Festuca pratensis*) and cock's-foot grass (*Dactylis glomerata*).

The Celbridge Link Road has been constructed in the interim period and divides the site between 2/3 on the west and 1/3 east. This area is currently unvegetated consisting of a hard core road (ED1). Stored heaps of topsoil are found in the north eastern section of the southern field.

3.4 Invasive Species

No invasive species as listed under Schedule Three - Part 1 of the Birds and Habitats Regulations 2011 were recorded from within the site.

3.5 Rare & Protected Flora

The presence of seven red data book vascular plant species (Wyse Jackson *et al* (2016)) including *Acinos arvensis* (Basil thyme), *Galeopsis angustifolia* (Red hemp-nettle), *Groenlandia densa* (Opposite-leaved pondweed), *Hordeum secalinum* (Meadow barley), *Hypericum hirsutum* (Hairy St. John's-wort), *Stachys officinalis* (Betony) and *Viola hirta* (Hairy violet) are known from the 10km square (O03) in which the proposed development is located. These historic records do not relate to the actual Phase 3 development lands.

Consultation with the ecologists who recorded the Hairy St. John's-wort (*Hypericum hirsutum*) populations nearby in June 2020 was completed to determine the background to this recent discovery, as the species was previously unknown from the immediate area.

Populations of this plant have been long documented by NPWS as a native species from sites on the River Liffey valley (St Catherine's, about Lucan, Luttrellstown, Palmerstown, Knockmaroon, etc.), the Rye Water (Carton) and also near Barnhill some 2.5km north of Lucan, as well as at a site in Santry.

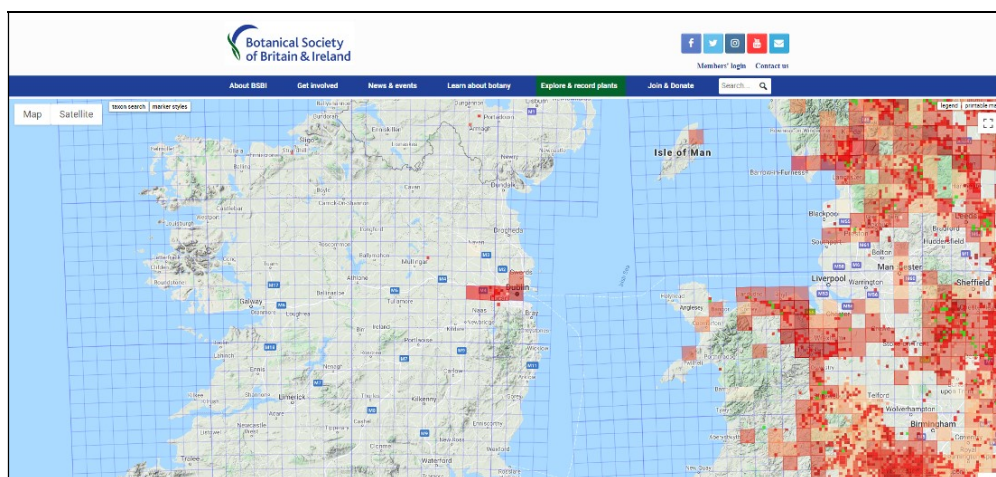


Figure 5. Distribution of Hairy St. John's-wort (*Hypericum hirsutum*) (Source: BSBI Maps).

The population occurs on the remains of a cleared hedgerow bank on the edge of Airlie Park and are c.300m from the Phase 3 lands. They are likely to have emerged from the soil seed bank following this disturbance event. It is considered that they are likely to be present in the seed bank of other hedgerows within and adjacent to the development in the Adamstown area, including those in the Phase 3 lands. Both the species and its habitat are protected under the Flora (Protection) Order, 2015.

A dedicated survey was completed for Hairy St. John's-wort (*Hypericum hirsutum*) in the Phase 3 lands in June 2021 by Faith Wilson. No evidence of the species was recorded at this time.

However, it is possible that further populations may develop once the applications of herbicide and fertiliser associated with intensive agriculture ceases. Mitigation measures to monitor for same are presented below in **Section 7.11**.

3.6 Fauna - Bats

Consultation with Bat Conservation Ireland has identified that several species of bats have been recorded within the 10km square in which the Phase 3 lands are located. These include Common pipistrelle (*Pipistrellus pipistrellus*), Soprano pipistrelle (*Pipistrellus pygmaeus*), Daubenton's bat (*Myotis daubentonii*), Leisler's bat (*Nyctalus leisleri*), Brown long-eared bat and an unidentified pipistrelle species (*Pipistrellus* sp.).

These include records of roosts, ad hoc observations, EIS surveys and the results of surveys such as the BATLAS 2010 project and the All Ireland Daubenton's Monitoring Project.

Previous bat surveys conducted by this author as part of various infrastructural developments associated with the Adamstown SDZ have recorded a number of bat species and roosts from the general environs of these lands.

Detector surveys conducted in June 2008¹ confirmed the presence of a small roost of Leisler's bat (*Nyctalus leisleri*) in a private residence downstream of the pumping station, which is located to the north of the development lands. A minimum of six bats were detected emerging from this house although the owner reported that previous counts conducted by him and his wife documented the presence of up to thirty bats. These bats were recorded foraging over the wooded area and also over the more open habitats of the golf course. This survey also recorded two common pipistrelle bats (*Pipistrellus pipistrellus*) foraging up and down along Tubber Lane.

¹ Wilson, F. (2008). Tobermaclugg, Adamstown, Lucan, West Dublin - Bat survey. Unpublished report.

The route of the Celbridge Link Road was surveyed for bats on the 3rd and 13th August 2017 (Scott Cawley, 2017)². These surveys recorded four species of bats, three of which were recorded within the Phase 3 lands (brown long-eared bat (*Plecotus auritus*), soprano pipistrelle (*Pipistrellus pygmaeus*) and Leisler's bat (*Nyctalus leisleri*)) as shown on **Figure 6** and **7** below. This survey identified three hedgerows within the study area as being of importance for bats. These are shown on **Figure 8** below.

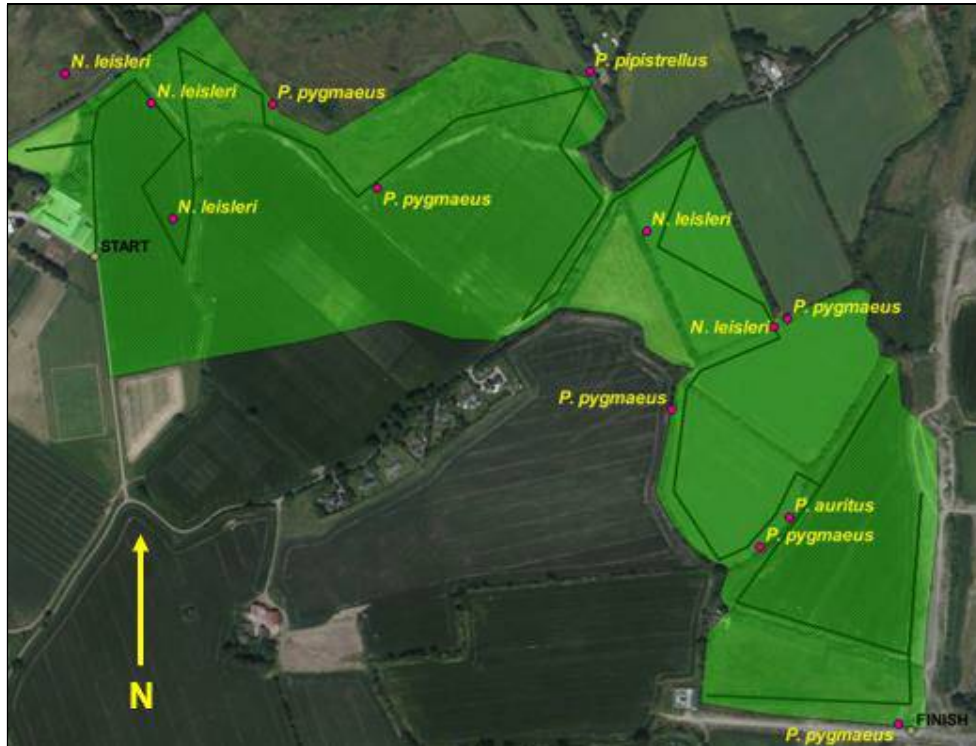


Figure 6. Bat species detected on 3rd August 2017 during field surveys for the Celbridge Link Road (Scott Cawley, 2017).

The lands proposed for development as Tobermaclugg Park to the north of Phase 1 of the development were first surveyed for bats in 2006³ and more recently in June 2018 by the author of this report⁴. Species recorded here include; common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*) and Leisler's bat (*Nyctalus leisleri*).

A detector survey conducted on the Phase 2 lands on the 23rd October 2018 by this author recorded three species of bats using the area for foraging purposes. These were common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*) and Leisler's bat (*Nyctalus leisleri*).

² Scott Cawley (2017). Bat Survey Report Proposed Celbridge Link Road, Adamstown, Co. Dublin. Prepared On Behalf Of Castlethorn Construction Ltd. 23/10/2017.

³Wilson, F. (2006). Tobermaclugg Park, Adamstown, Lucan, West Dublin – Flora and Fauna survey. Unpublished report.

⁴Wilson, F. (2018). Tobermaclugg Park, Adamstown, Lucan, West Dublin – Flora and Fauna survey. Unpublished report.



Figure 7. Bat species detected on 13th August 2017 during field surveys for the Celbridge Link Road (Scott Cawley, 2017).



Figure 8. Notable features identified as being of potential interest for bats during field surveys conducted for the Celbridge Link Road (Scott Cawley, 2017).

Similar results were recorded during the surveys conducted on 7th October 2019 and 1st June 2021 on the Phase 3 lands. The most frequently recorded species was the common pipistrelle (4–6 bats were encountered), followed by soprano pipistrelle and Leisler’s bat. No detections of brown long-eared bat (*Plecotus auritus*) were made (as had been recorded in the Scott Cawley surveys) but this species is difficult to detect on a bat detector given the quiet nature of their echolocation calls.

There are no buildings or structures suitable for bats to avail of and no bat roosts were confirmed in any of the trees within the site, however a number of trees were identified as potential bat roosts. These are shown on **Figure 9** below.

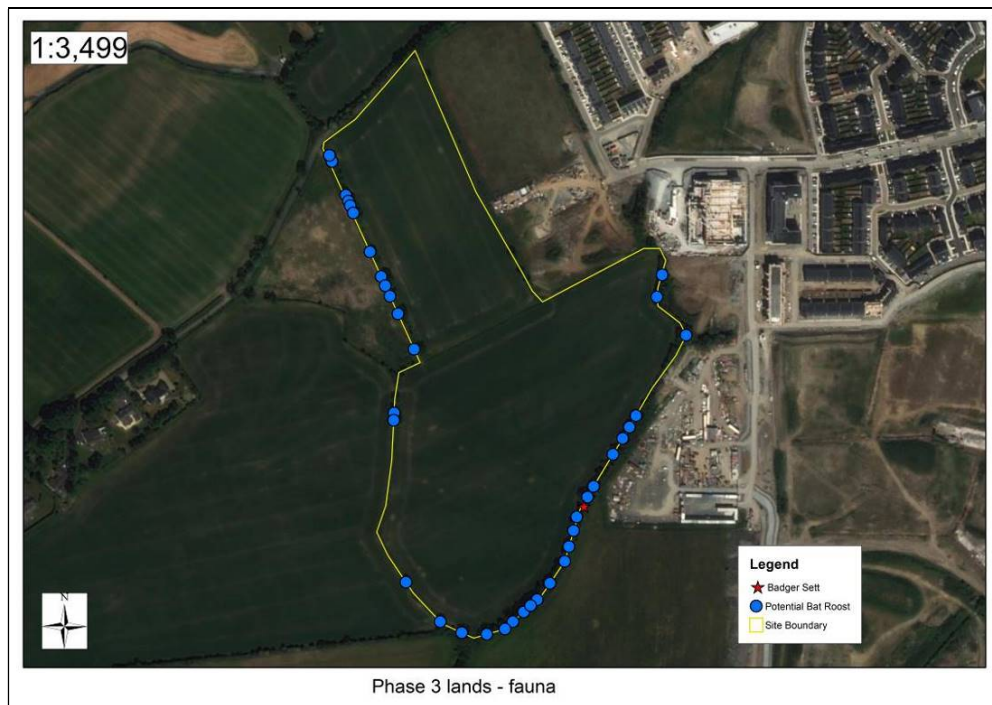


Figure 9. Potential bat roosts identified within the Phase 3 lands during the present surveys.

3.7 Fauna - Badger

An active badger sett with a minimum of two entrances was recorded along the south eastern boundary of the lands (as shown on **Figure 9** above) during the surveys conducted in October 2019. A series of trails lead from the sett along the earthen bank and signs of active digging were recorded.

Activity at the sett was assessed in March and June 2021 during subsequent site visits and no significant changes were recorded with the sett remaining active and in use.

3.8 Other Fauna

Both fox and rabbit were recorded on the site and species such as brown rat, house mouse, and possibly hedgehog would be expected to use the site.

3.9 Birds

The following bird species were recorded during the site visits and all would be expected to breed either within the site hedgerows/treelines or in the local area; blackbird (*Turdus merula*), rook (*Corvus frugilegus*), robin (*Erithacus rubecula*), greenfinch (*Carduelis chloris*), chaffinch (*Fringilla coelebs*), jackdaw (*Corvus monedula*), starling (*Sturnus vulgaris*), coal tit (*Parus ater*), great tit (*Parus ater*), long-tailed tit (*Aegithalos caudatus*), blue tit (*Parus caeruleus*), magpie (*Pica pica*), woodpigeon (*Columba palumbus*), hooded crow (*Corvus corone corvix*) and jackdaw (*Corvus monedula*). Summer migrants such as willow warbler (*Phylloscopus trochilus*), chiffchaff (*Phylloscopus collybita*), and swallows (*Hirundo rustica*) were also recorded. Skylark (*Alauda arvensis*) was holding territory over the southern field during the June 2021 visit. Buzzard (*Buteo buteo*) has been regularly recorded in the area.

3.10 Fisheries

The main ecological sensitivity of the site from a fisheries perspective is the Tobermaclugg/Lucan Stream (IE_EA_09L012100) which is found to the east of the site and to which the lands ultimately drain.

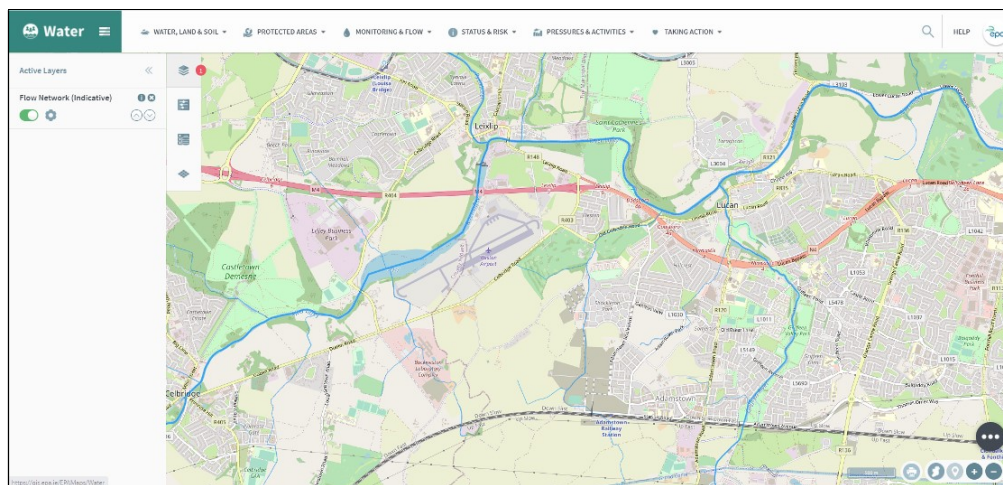


Figure 10. The Tobermaclugg (Lucan) Stream is found to the east of the site (Source: www.catchments.ie).

This is a tributary of the River Liffey and the site is located within the Liffey and Dublin Bay Catchment (Catchment 09) and the Liffey Sub-Catchment (Liffey_SC_090). This stream was identified as a waterbody in ecologically moderate condition in the monitoring round 2013 to 2018 and is under review as part of the 3rd cycle monitoring under the Water Framework Directive (see **Figure 10** above).

4. CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

Hugh McGreevy & Sons Ltd and Tierra Ltd, intend to apply for full planning permission for development on site located in the Tubber Lane Development Area within Adamstown SDZ, Adamstown, Lucan, Co Dublin. The application site is located to the south of Tubber Lane, in the north-west of the Adamstown SDZ lands and to the west and south west of the permitted / under construction Tubber Lane Phase 2 development (Reg. Ref.: SDZ19A/0008, as amended under Reg. Ref.: SDZ20A/0014).

The development will comprise of 455 no. residential units (including a mixture of 2 and 3 storey semi-detached and terraced houses, and duplex units and apartments in 3 and 4 storey blocks), new internal roads and footpaths, site access, public open space, car parking, cycle stores, landscaping, bin stores, foul and surface water drainage, boundary walls and fences, ESB substations and all associated site development works. Private and semi-private open space to serve the proposed units will be provided in the form of balconies, terraces and gardens.

The development also includes the provision of the finishing course to part of the Celbridge Link Road (part of Loop Road 3), permitted under Reg. Ref.: SDZ17A/0009, from the junction with Adamstown Avenue to the southern site boundary, and associated revisions to provide access to the development, parallel parking bays, and public lighting.

The 455 no. residential units are to be provided as follows:

- 58 no. 2 bed, 2 storey, terraced houses (Type E1, E2, E3, J1 & J2);
- 6 no. 3 bed, 2 storey, semi-detached houses (Type I1);
- 190 no. 3 bed, 2 storey, terraced houses (Type A1, A2, A3, B1, B2, C1, C2, C3, D1, D2, F1, F2, I1 & I2);
- 5 no. 3 bed, 3 storey, terraced houses (Type H)
- 6 no. 4 bed, 2 storey, terraced houses (Type K1, K2);
- 7 no. Apartment Blocks (Blocks B, D, E, G, H, I & K) containing 111 no. apartments/duplexes including 50 no. 1 bed apartments, 4 no. 2 bed apartments, 39 no. 3 bed duplex apartments and 18 no. 2 bed duplex apartments over 3 storeys;
- 4 no. Apartment Blocks (Blocks A, C, J & L) containing 37 no. apartments/duplexes including 8 no. 1 bed apartments, 29 no. 3 bed duplex apartments over 4 storeys;
- 1 no. Apartment Block (Block F) containing 42 no. apartments including 2 no. 1 bed apartments and 40 no. 2 bed apartments over 4 storeys.

The proposed site layout is shown on **Figure 11** below.



Figure 11. Site layout.

5. POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

The development of what are currently undeveloped agricultural lands to that of an urban environment dominated by housing and infrastructure will ultimately result in loss of biodiversity in the immediate locality.

Potential impacts on flora and fauna arise during both the Construction and Operational Phases of the proposed development. The activities associated with the proposed development that has the potential to affect the ecology of the site and surrounding area include:

- Direct Habitat Loss;
- Disturbance;
- Fragmentation; and
- Potential Water Pollution.

5.1 Potential Impacts on Habitats

Construction Phase:

No habitat designated for nature conservation purposes will be impacted by the proposed development of these lands, which would be deemed of local importance for biodiversity.

There is potential for new populations of Hairy St. John's-wort (*Hypericum hirsutum*), which is a plant species protected under the Floral Protection Order 2015, to emerge following ground disturbance works as recently occurred on the adjoining lands. This is considered further in **Section 7.11** where mitigation measures to ensure the protection of populations of this plant should they emerge are set out.

In general the development has been sensitively designed in respect to ecology and nearly all of the trees and boundary features have been retained within the site (52 of 69 trees surveyed). Some of the trees are unsuitable for long term retention and these will be removed. As set out in the arboricultural impact assessment there are 17 trees proposed for removal to facilitate the proposed development. These are classified as follows:

- There are no Category A trees proposed for removal to facilitate the proposed development.
- There are 4nr. Category B trees proposed for removal to facilitate the proposed development.
- There are 2nr. Category C trees proposed for removal to facilitate the proposed development.
- There are a total of 52nr. trees proposed for retention.

There is still the potential for the loss of retained habitats and vegetation of importance to wildlife along the site boundaries arising from the site clearance works unless protective measures are put in place prior to the commencement of construction activities on the site.

Areas of open land associated with arable crops will be permanently lost.

The other main potential impacts during this phase arise from the physical disturbance of the soil at and adjacent to the site during construction. There is potential for run-off from the site via drainage ditches to the Tobermaclugg Stream which flows to the east of the site which is an important faunal habitat unless some remedial measures are put in place.

Operational Phase:

All waste water from the development will be discharged to the mains foul water system and the development will be served by the main water supply.

Over time the landscaping plantings will mature and provide cover and habitat for birds, invertebrates and other fauna within the site.

5.2 Potential Impacts on Fauna

There are potential impacts on several legally protected species found within the site arising from its development – these include bats as well as on fauna in general. There are potential impacts on protected fauna such as bats through the loss of roosts in trees, foraging habitats and a decrease in invertebrate diversity within the environs of the site resulting from the loss of vegetation.

Potential Impacts on Bats

The use by four species of bats listed under Annex IV of the EU Habitats Directive, of the lands for foraging and hunting purposes were confirmed from the current and previous surveys conducted.

No tree roosts were confirmed during any of the surveys but a number of trees which are scheduled for removal and have the potential to support roosting bats have been identified. These are shown on **Figure 9** above.

These are considered further in **Section 7.6** and **Section 7.7** where mitigation measures to ensure the protection of bats are set out.

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

- Loss of potential tree roosts within the site.
- Potential barrier to bat activity on the site from inappropriate lighting.
- Loss of foraging areas for four species of bats.

Potential Impacts on Badgers

The presence of an active badger sett was confirmed during the site surveys as shown on **Figure 9** above. This is one of several badger setts known from the general environs of Tubber Lane as shown on **Figure 12** below.

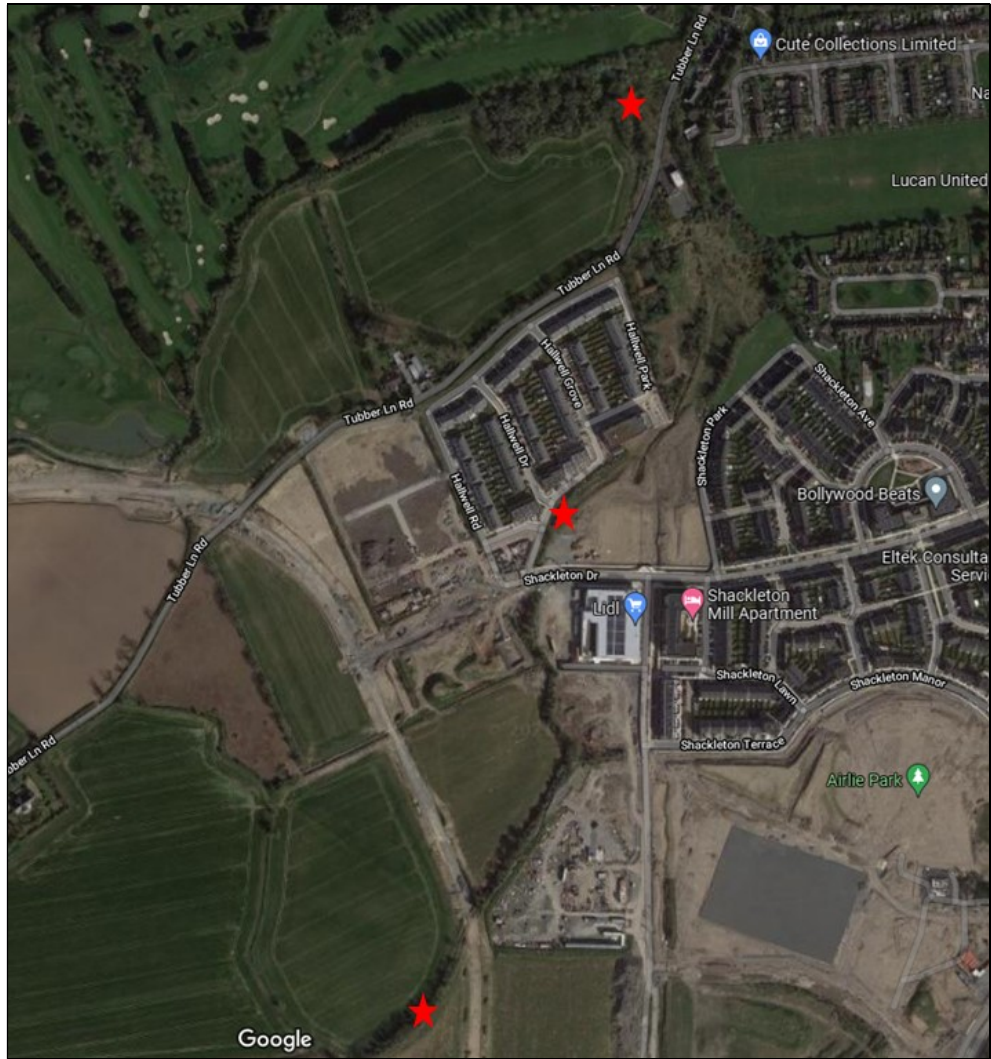


Figure 12. Badgers setts in the environs of Tubber Lane – habitat connectivity between these setts must be protected and enhanced.

Potential Impacts on Birds

There will be losses of breeding habitat and foraging areas for birds as large areas of arable crops and some trees will be permanently lost. The development of an urbanised habitat with houses, gardens, etc. within the site will in the long term favour those species which adapt to garden habitats as they mature such as common garden birds (robin, blackbird, blue tit, etc.) or those associated with buildings and built surfaces (such as pied wagtail, house sparrow, house martins, swallows, etc. once provision for them is made).

6. A DO NOTHING SCENARIO

Under a 'do-nothing' scenario the lands would continue to be farmed or if no longer actively farmed would be colonised by native species to form areas of rank grassland which would be replaced by scrub and ultimately woodland over time.

7. REMEDIAL OR REDUCTIVE MEASURES

7.1 Mitigation by Avoidance

The principal mitigation that should be considered in any development is avoidance of impact. Direct impacts on the majority of trees, treelines and hedgerow species adjoining the site have been avoided.

This has ameliorated some of the potential impacts for both flora and fauna within the red line boundary of the site.

7.2 Sediment Control

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

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

- significant harm to the environment
- weed infestation of waterways caused by sediment settling in watercourses and ditches and transporting nutrients
- loss of valuable topsoil
- significant public safety problems when washed onto roads and intersections
- blocked drains creating flooding and increased maintenance costs
- damage to recreational and commercial fishing downstream.

Sediment control usually requires little effort and results in:

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

Good site management in relation to sediment control during the construction phase should prevent this from occurring and possible mitigation measures for consideration are outlined below. Other measures to be implemented on site include briefing of all site contractors regarding the sensitivity of the watercourse within the site and the need for strict site management in relation to potential run off.

Minimising site disturbance:

Prevention is better than cure. Careful design and an efficient construction sequence will minimise disturbance to the site. This will save money and reduce environmental impact.

There is extensive cut and fill within the site which has been minimised as much as possible at design stage. Clear only those areas necessary for building work to occur. Preserve grassed areas and vegetation where possible. This helps filter sediment from storm water run off before it reaches the drainage system and stops rain turning exposed soil into mud. Delay removing vegetation or commencing earthworks until just before building activities start. Avoid building activities that involve soil disturbance during periods of expected heavy or lengthy rainfall.

Implement sediment control:

Install sediment control measures before commencing any excavation or earth moving. Regularly maintain them until construction is complete and the site is stabilised.

Firstly divert uncontaminated storm water away from the work area.

Avoid contamination of storm water and the watercourse within the site with sediment. Use diversion devices to reduce the volume of storm water reaching the disturbed area. Consideration may need to be given to the creation of a diversion channel to divert uncontaminated storm water around the disturbed area. Construct the channel uphill of the disturbed area with a bank on the lower side. Regularly remove sediment from the channel. Line the channel with erosion control mats or turf to prevent soil erosion or use check dams constructed from sand or gravel filled bags.

Minimise the potential for erosion

Construct a single vehicle entry/exit pad to minimise tracking of sediment onto roadways. Use a 150mm (minimum) layer of 40mm recycled aggregate or crushed rock. A raised hump across the entry/exit pad can be used to direct storm water run-off into a sediment trap to the side of the pad. Protect materials that may erode, particularly sand and soil stockpiles, with waterproof coverings. Contain waste in covered bins or traps made from geotextile fabric. Locate stockpiles of building materials away from drainage paths and uphill of sediment barriers. Divert run-off around stockpiles unavoidably located in drainage paths using a perimeter bank uphill. Use biodegradable erosion control mats to protect exposed earth.

Prevent sediment-contaminated water leaving the site

Use barriers to trap coarse sediment at all points where storm water leaves the site, before it can wash into drains or the watercourse on site. Relocate sediment on site or dispose of it suitably. Remove accidental spills of soil or other material immediately. Maintain vegetation elsewhere on the site in a healthy state as it can function as an additional filter for sediment. Cut brick, tile or masonry on a pervious surface such as grass or loosened soil within the property boundary. The same applies when cleaning equipment. Waste concrete, paint and other solutions used on site should be properly disposed of so they do not contaminate storm water.

7.3 Contractor Briefing

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

7.4 Protection Measures for Birds

Section 40 of the Wildlife Act 1976, as amended by Section 46 of the Wildlife (Amendment) Act 2000, restricts the cutting, grubbing, burning or destruction by other means of vegetation growing on uncultivated land or in hedges or ditches during the nesting and breeding season for birds and wildlife, from 1 March to 31 August. **No clearance of vegetation suitable for nesting birds within the site (shrubs, bramble tangles, etc.) will take place during this period. Should such clearance be required then the area proposed for clearance should be inspected by an ecologist to ascertain if any nesting birds are present.**

7.5 Provision of Nesting Measures for Birds

A variety of artificial nesting opportunities for birds such as starter cups for swallows and house martins, and swift boxes will be included on the new buildings with sparrow terraces and other bird boxes erected on the retained trees, treelines and hedgerows within the development.

7.6 Protection Measures for Bats

Bat Foraging Habitat

The majority of trees, hedgerows and boundary vegetation within the site have been retained in full as these provide foraging habitat for bats supporting a diversity of invertebrates. These trees also help to maintain and create a corridor which allows bats (and other fauna) to forage and commute through these lands.

These retained trees and hedgerows will be fenced and protected during the construction phase to ensure that they are not damaged during the works. Protective fencing will be erected in advance of any construction works commencing in order to prevent damage to these retained habitats during construction in accordance with BS 5837:2012. This will be signed off on by a qualified ecologist to ensure it has been erected properly and the vegetation has been protected before any machinery/works are allowed on site. No ground clearance, earth moving, stock-piling or machinery movement will occur within these protected areas.

Potential Bat Roosts

A number of mature trees on the site boundaries have been identified as having the potential to support roosting bats. The majority of these trees are to be retained in full and will be afforded protection during construction as detailed in the arboricultural impact assessment. 17 trees are proposed for removal as detailed in the tree survey drawings and the landscape rationale document prepared for the project. These trees will be further assessed by a licensed bat specialist prior to removal to check for the presence of bats. If any bats are encountered during the assessment a bat derogation licence for the works will be

sought from NPWS. The results of the survey will determine how they should be felled. Tree felling of potential bat roosts will be conducted during the winter months of October and November to avoid both the bird breeding season and the maternity/hibernation periods for bats.

Reduction of light disturbance

Design recommendations from the BCT (2010) for wildlife-friendly lighting include:

1. Do not "over" light. This is a major cause of obtrusive light and is a waste of energy. Use only the minimum amount of light needed for safety. There are published standards for most lighting tasks, adherence to which will help minimise upward reflected light.
2. Eliminate any bare bulbs and any light pointing upwards. The spread of light should be kept near to or below the horizontal.
3. Use narrow spectrum bulbs to lower the range of species affected by lighting.
4. Use light sources that emit minimal ultra-violet light. Insects are attracted to light sources that emit ultra-violet radiation.
5. Reduce light-spill so that light reaches only areas needing illumination. Shielding or cutting light can be achieved through the design of the luminaire or with accessories, such as hoods, cowls, louvers and shields to direct the light.
6. Reduce the height of lighting columns. Light at a low level reduces ecological impact. However, higher mounting heights allow lower main beam angles, which can assist in reducing glare.
7. For pedestrian lighting, use low level lighting that is directional as possible and below 3 lux at ground level.
8. Limit the times that lights are on to provide some dark periods for wildlife.
9. Use lighting design computer programs and professional lighting designers to predict where light spill will occur.
10. In general any lighting used in the development should not overspill onto the adjoining trees and woodland thereby ensuring that a dark corridor for foraging and commuting bats and movement for other wildlife is maintained.

In addition:

11. Luminaires will be dimmable LED (light emitting diode) fittings with High performance optics to provide high visual comfort.
12. Luminaires will be selected to ensure that when installed there shall be zero direct upward light emitted to the sky (all output shall be at or below 90° to the horizontal to help prevent sky glow from light pollution of the night sky).
13. Luminaires will be selected to ensure that there is no light spill from the proposed development onto the retained areas of linear vegetation and boundary features.
14. The light emitted from these fittings shall have no photo biological risk and shall be categorised as "Exempt Group" in relation to emissions of Blue light, Infrared and Ultra Violet Radiation in accordance with EN 62741:2008.

15. All luminaires shall have a Luminous intensity Classification of between G4 and G6 to IS EN 13201-2:2003(E) / BS 5489-1:2013.
16. The recommendations of the Institution of Lighting Professionals and Bat Conservation Trust "Bats and Lighting in the UK" documentation and Bat Conservation Ireland Guidance Notes for planners, engineers, architects and developers December 2010 will be met.

These guidelines have been implemented in the project lighting design prepared by Lighting Reality Pro as shown below on **Figures 13 and 14** extracted from the lighting design report.

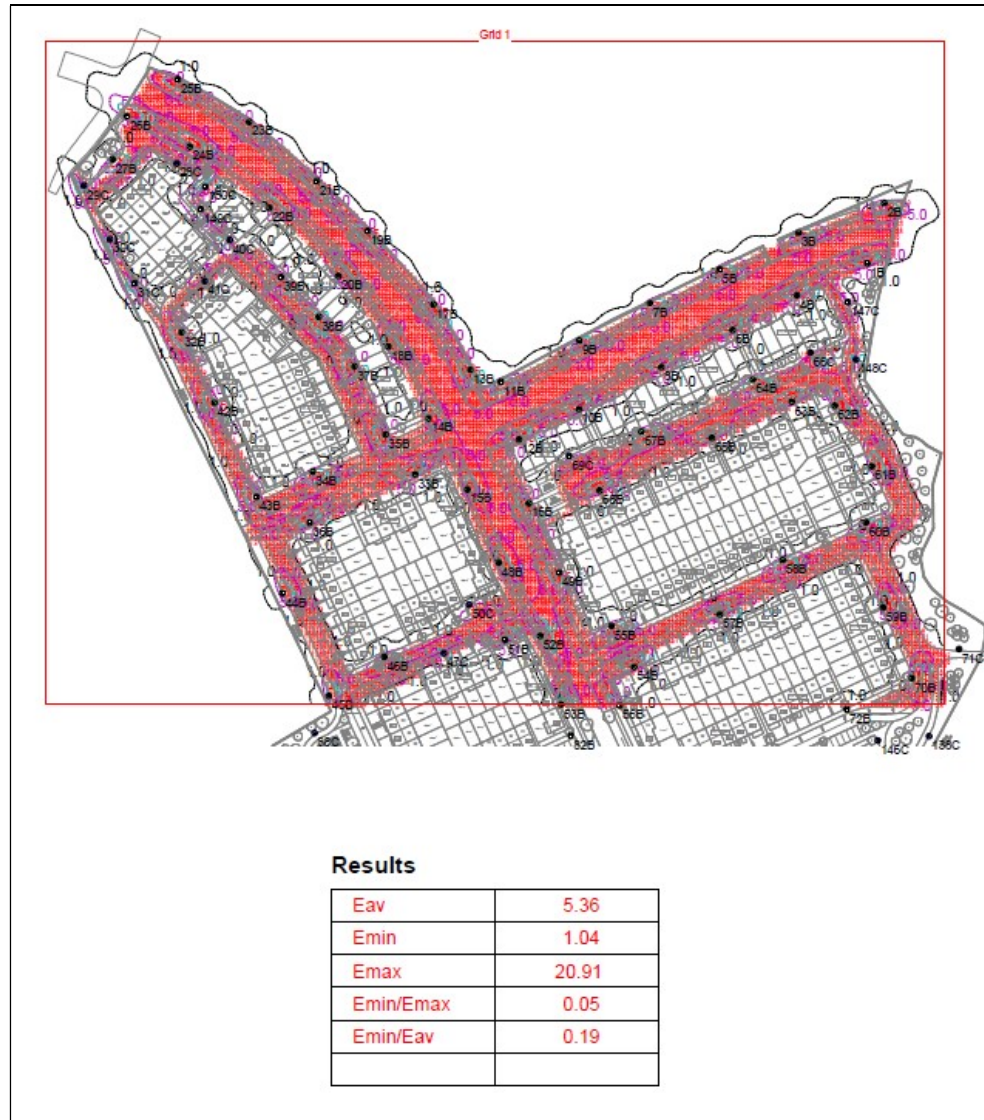


Figure 13. Lighting design for the northern portion of the lands showing field boundaries in darkness.

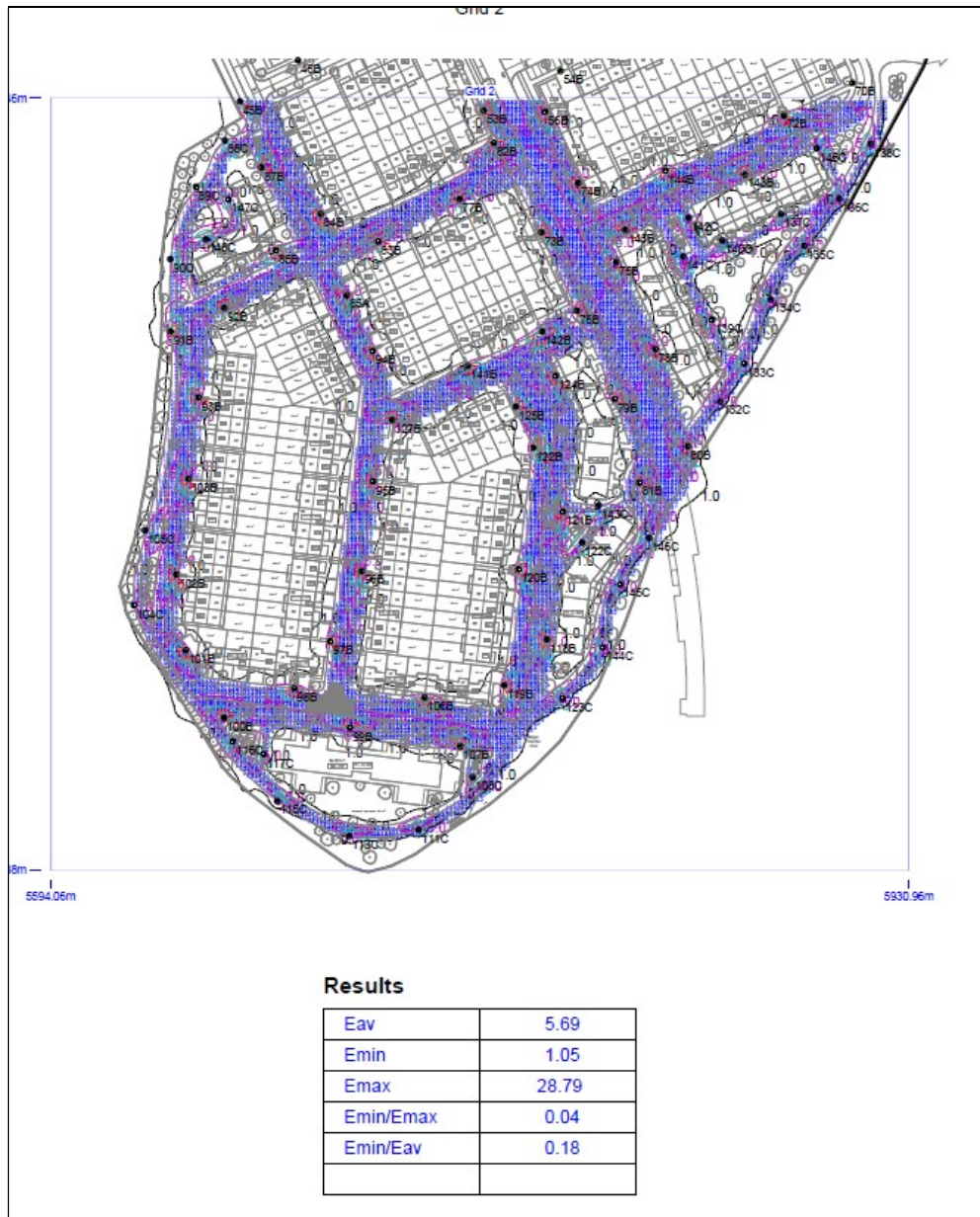


Figure 14. Lighting design for the southern portion of the lands showing field boundaries in darkness.

7.7 Measures for Bats - Erection of Bat Boxes

It is recommended that fifteen no. Schwegler 2F bat boxes are erected on trees on site to provide roosting potential for bats. These will be sited by the contractor under the supervision of a suitably qualified ecologist.

7.8 Protection Measures for Badger

Boundary areas of hedgerows, native vegetation, immature and mature trees have been retained surrounding the site and will be afforded protection during the works as shown on the landscaping and tree protection drawings. The badger sett is located on the shared boundary with the lands to the east and a buffer zone of 25m from the sett is required for the protection of badgers. This

has been achieved through detailed design and adjustments to the site layout by providing an exclusion zone around the sett in this area. Lighting impacts on these nocturnal animals has also been duly considered and the lighting has also been designed accordingly as shown on **Figure 15** below.

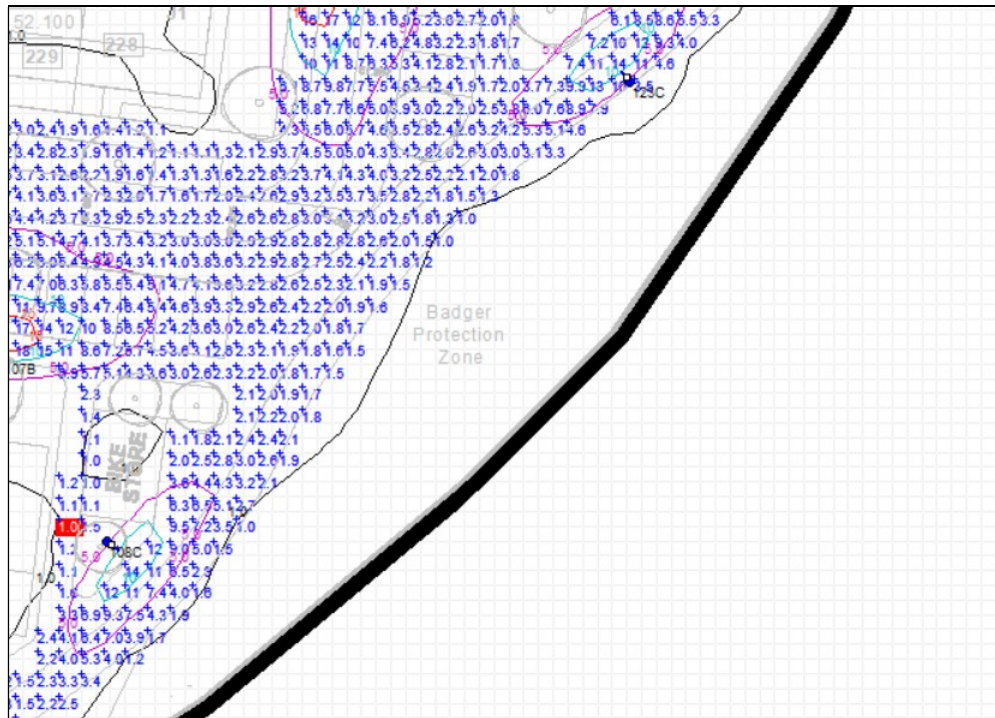


Figure 15. Lighting design for the southern portion of the lands in the vicinity of the badger sett showing the exclusion zone and field boundaries in darkness.

A large linear network of scrub planting is proposed along the site boundaries to provide an ecological corridor for badgers and other fauna to move through as shown in the landscape rationale document prepared by RMDA Landscape Architects (see pages 14 and 15) and **Figure 16** below.

These areas of scrub planting will (subject to SDCC approval) be secured with badger proof fencing (following the NRA guidelines for badger protection) as shown on page 22 of the landscape rationale document prepared by RMDA Landscape Architects.

This will minimise badger casualties on local roads within the development, allow the planting within the wildlife corridor to develop and mature without trampling impacts and also reduce human disturbance to legally protected fauna in these areas.

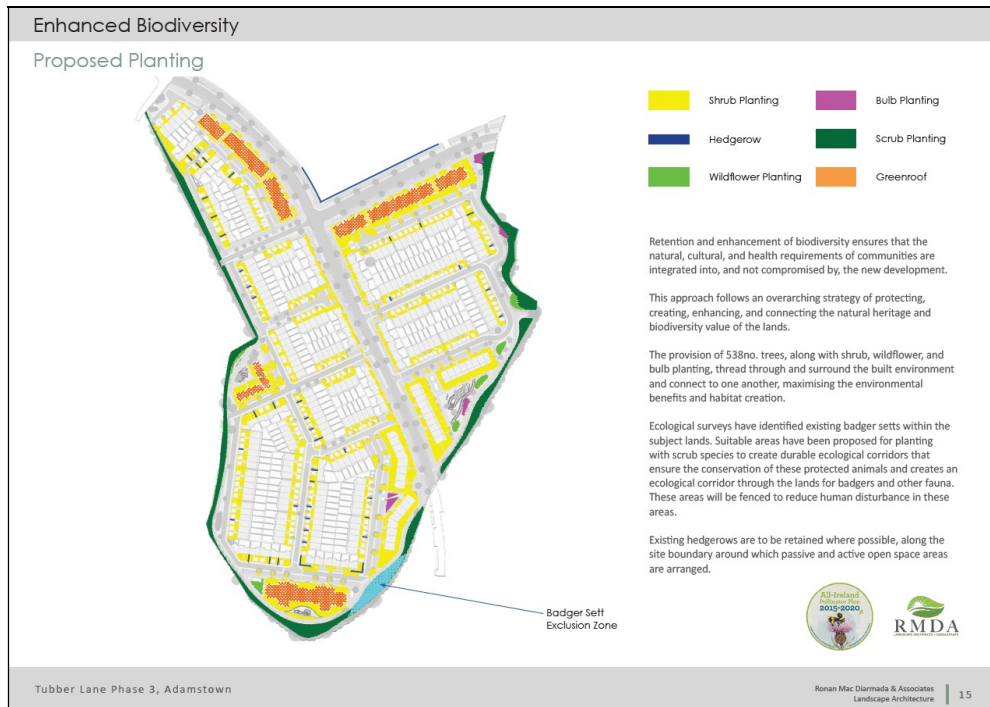


Figure 16. Biodiversity measures for badgers and other fauna (RMDA 2021).

7.9 Soil Handling

Soil should be handled with care as it is a living entity. The topsoil and subsoil layers will be stripped, stored and maintained separately. Topsoil will be temporarily stored upon geotextile such as Terram 1000 (www.terram.com). The contractor should submit proposals for supplier and product, which should be a nonwoven geotextile manufactured from UV stabilised, high tenacity, virgin polypropylene fibres that have been both mechanically and thermally bonded with a minimum of 5 years lifespan in all soil conditions. Note that soil levels within the root spread of those trees that are to be retained should not be raised. From this temporary storage heap the topsoil should be distributed as required for landscaping purposes. In general the topsoil should not be firmed, consolidated or compacted when laying. Tipping and grading to approximate levels should be done in one operation with minimum of trafficking by plant.

The topsoil, which is to be retained and reused should not be mixed with: subsoil, stone, hardcore, rubbish or material from demolition work, or the other grades of topsoil, including those contaminated with non-native invasive species. The topsoil should be handled in the driest condition possible. Topsoil should not be handled during or after heavy rainfall or when it is wetter than the plastic limit less 3%, to BS 1377-2.

Depending on how long the construction period is expected to last it might be necessary to seed the stored topsoil to prevent weed establishment. A recommended mixture is: 35% Chewings fescue, 35% Slender red fescue, 20% Smooth stalked meadow grass and 10% Brown top bent. This should be applied to the manufacturer's recommendations (min. 15g/m²) and the following wildflower mix @ 5g/m² added:

- Native Origin Irish Wildflower Seed Mixture - Product Code/Name: MM12 Wild Flora for Raw Impoverished Sub Soil
- Supplier: Design by Nature www.wildflowers.ie
- Species List: Bird's-foot Trefoil, Black Medick, Corn Marigold, Corn Pansy, Corn Poppy, Corncockle, Cornflower, Cowslip, Devil's Bit Scabious, Eyebright, Meadow Buttercup, Fleabane, Greater Trefoil, Lesser Knapweed, Scented Mayweed, Meadowsweet, Ox-eye Daisy, Purple Loosestrife, Ragged Robin, Red Rattle, Red Bartsia, Red Clover, Ribwort Plantain, Rough Hawksbit, Sorrel, St. John's-wort, White Champion, Wild Angelica, Wild Carrot, Yarrow, Yellow Rattle, Lady's Smock, Yellow Clover.

7.10 Invasive Species

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

7.11 Rare Plant Monitoring

Monitoring of the site during the construction phase will be completed by a suitably qualified botanist with experience of rare plants. This is to ensure that, should any seed germinate following disturbance or alterations in site condition or light and plants develop, they will be protected during the works.

7.12 Planting proposals

The landscaping proposals for the development (including the planting of trees and shrubs) were developed in conjunction with the project ecologist. The planting proposals set out to strengthen areas within the site for wildlife and biodiversity and to reinstate green infrastructure across the site post construction where feasible. Further details are provided in the accompanying landscaping drawings. They include the use of native and local plant species such as hawthorn, blackthorn, holly, hazel, guelder rose and dog rose. The species used will be native and of local origin, certified stock is available from nurseries who supply stock for the Native Woodland Scheme.

The site boundaries will be secured with permanent hoarding during the construction phase to both protect the trees and foraging habitat for the badgers and to ensure that this area actively functions as an ecological corridor within the landscape in line with SDCC Green Infrastructure objectives such as:

GI1 Objective 3:

To facilitate the development and enhancement of sensitive access to and connectivity between areas of interest for residents, wildlife and biodiversity, and other distinctive landscapes as focal features for linkages between natural, semi natural and formalised green spaces where feasible and ensuring that there is no adverse impact (directly,

indirectly or cumulatively) on the conservation objectives of Natura 2000 sites and protected habitats outside of Natura 2000 sites.

Further detail is provided in the landscape rationale document prepared by RMDA Landscape Architects (see pages 14 and 15).

Green roofs will be provided in the development as shown on **Figure 17** below, and on page 33 of the landscape rationale document prepared by RMDA Landscape Architects. These will be planted with native wildflower seed mixes on a crushed concrete/limestone chipping base. This approach is significantly more biodiverse than the standard sedum mat. It is proposed they are planted with a native seed mix such as the Esker Ridge Wild Flora EC08 from 'Design by Nature', which reflects the semi-natural grassland habitats lost from the wider landscape of the Lucan area.

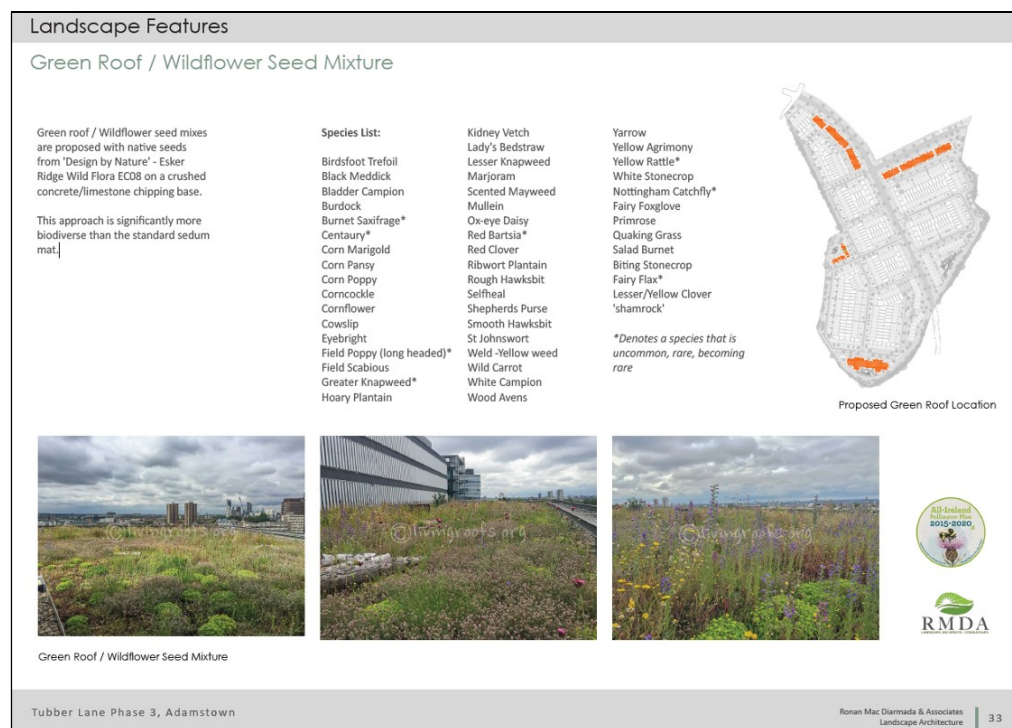


Figure 17. Green roof specifications.

Remnants of calcareous grassland flora (**Dry calcareous and neutral grassland (GS1)**) have been recorded on adjacent lands and in the Tobermaclugg Park where the soils are thin and leached. These include species such as lady's bedstraw (*Galium verum*), common knapweed (*Centaurea nigra*), agrimony (*Agrimonia eupatoria*), red clover (*Trifolium pratense*), white clover (*Trifolium repens*), bush vetch (*Vicia sepium*), Yorkshire fog (*Holcus lanatus*), creeping cinquefoil (*Potentilla reptans*), yarrow (*Achillea millefolium*), crested dog's tail grass (*Cynosurus cristatus*), ragwort (*Senecio jacobaea*), yellow clover (*Trifolium dubium*), rough hawkbit (*Leontodon hispidus*), rosebay willowherb (*Epilobium angustifolium*), dandelion (*Taraxacum agg*), ribwort plantain (*Plantago lanceolata*), tufted vetch (*Vicia cracca*), meadow buttercup (*Ranunculus acris*), meadow vetchling (*Lathyrus pratensis*), selfheal (*Prunella vulgaris*), bird's foot trefoil (*Lotus corniculatus*), red

fescue (*Festuca rubra*), Restharrow (*Ononis repens*), common centaury (*Centaureum erythraea*), cowslip (*Primula veris*), field scabious (*Knautia arvensis*), and more rarely pyramidal orchid (*Anacamptis pyramidalis*), sedge (*Carex flacca*) and yellow-wort (*Blackstonia perfoliata*).

It is recommended that a similar calcareous grassland mix is utilised in areas, which can be left uncut and where long grass can be maintained as a meadow for pollinators and other invertebrates during the summer months. Such sowings are best established on poor soils/gravels which are naturally low in nutrients and will require annual cutting and removal of the meadow cuttings to ensure diversity within the sward.

7.13 Ecological Clerk of Works

An ecological clerk of works will be appointed for the duration of the project to oversee and sign off on the ecological mitigation measures set out in this report.

8. PREDICTED IMPACT OF THE PROPOSED DEVELOPMENT

When assessing the ecological impacts and effects, reference was made to the following characteristics as required:

- positive or negative
- extent
- magnitude
- duration
- frequency and timing
- reversibility.

The proposed development of the Phase 3 lands at Tubber Lane have been assessed from the perspective of ecology and detailed mitigation measures have been presented to reduce impacts on species of European and national conservation interest present in the vicinity of the proposed development and surrounding lands.

If the entire site was cleared for development including all the boundary features and no mitigation measures implemented to protect flora and fauna this destroy all aspects of biodiversity within the site and at a local scale in the locality including impacts on five legally protected faunal species. This would have had very serious negative ecological impacts, which would have had long term effects across the entire site.

Ultimately these lands have been zoned in the Adamstown SDZ for significant development as a new area for residential housing. The development of these lands is therefore an element of the planned urbanisation of a previously relatively rural environment with subsequent losses for biodiversity within the site.

Given the SDZ zoning of the site for residential development the proposed development design takes into account the existing biodiversity within the site with a view to minimising the ecological effects of developing these lands. The

project team of architects, engineers and landscape architects have worked together to mitigate these effects within the constraints of the site.

Mitigation measures have been implemented to avoid and reduce direct impacts (for example on the boundary hedgerows and treelines), to ameliorate impacts (through the timing of works such as clearance of vegetation and works to confirmed and potential bat roosts) and to design mitigation measures such as the creation of new areas of scrub/hedgerow planting to create a functioning ecological corridor through the lands, areas of native wildflower planting, and bird and bat nesting and roosting opportunities.

No habitat designated for nature conservation purposes, will be impacted by the proposed development of these lands, which would be deemed of local importance for biodiversity. The potential for the emergence of plant species protected under the Floral Protection Order 2015 has been considered and mitigated for.

Ultimately the development, which will be constructed in accordance with the County Development Plan and SDZ, will result in the urbanisation of a previously rural environment with subsequent losses for biodiversity within the site. Species which adapt readily to urban environments may remain in the general area.

Given the implementation of the above mitigation measures the overall impacts on flora and fauna have been reduced as much as possible.

9. CONCLUSION

The proposed development of the lands at Tubber Lane for housing has been assessed from the perspective of ecology and several mitigation measures are presented to reduce impacts on same in the vicinity of the proposed development.

The above mitigation measures should be reflected in the Construction Environmental Management Plan/Method Statements prepared for the site and an ecologist should be engaged to review same with the project contractor prior to the commencement of the development.

10. BIBLIOGRAPHY

- Altringham, J. D. (1996). *Bats: Biology and Behaviour*. Oxford University Press.
- Altringham, J. D. (2003). *British Bats*. HarperCollins Publishers.
- Bat Conservation Trust (2007). *Bat Surveys – Good Practice Guidelines*. Bat Conservation Trust London.
- Bat Conservation Ireland (2010). *Bats & Lighting - Guidance Notes for: Planners, engineers, architects and developers*. Bat Conservation Ireland.
- Bat Conservation Ireland (2021). Database containing records of Bat Roosts, Transects (Car Transect Monitoring Records) and Ad Hoc Observations.
- Barratt, E. M., Deauville, R., Burland, T. M., Bruford, M. W., Jones, G., Racey, P. A., and R. K. Wayne (1997). DNA answers the call of pipistrelle bat species. *Nature* 387: 138 - 139.
- Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) 1982.
- Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) 1979.
- Corbett, G. B. and S. Harris (1991). *Handbook of British Mammals*. 3rd Edition, Blackwell Scientific, Publications.
- Council of the European Communities (1992). *Council Directive of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (92/43/EEC)*. O.J. L 206/35, 22 July 1992.
- Council of the European Communities (1979). *Council Directive of 02 April 1979 on the conservation of wild birds (79/409/EEC)*. O.J.L. 103, 25 April 1979.
- Fairley, J. (2001). *A Basket of Weasels*. Published Privately, Belfast.
- Flora Protection Order (2015). Government of Ireland.
- Fossitt, J. (2000). *A Guide to Habitats in Ireland*. Heritage Council, Kilkenny.
- Gilbert G, Stanbury A and Lewis L.J. 2021. *Birds of Conservation Concern in Ireland 2020 –2026*. *Irish Birds* 43, 1-22.
- Hayden, T. and R. Harrington (2000). *Exploring Irish Mammals*. Town House, Dublin.
- Kelleher, C. and F. Marnell (2006). *Bat Mitigation Guidelines for Ireland*. Irish Wildlife Manuals, No. 25. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

- Kelly, F.L., Matson, R., Connor, L., Feeney, R., Morrissey, E., Wogerbauer, C. and Rocks, K. (2012). *Water Framework Directive Fish Stock Survey of Rivers in the Eastern River Basin District*. Inland Fisheries Ireland, Swords Business Campus, Swords, Co. Dublin, Ireland.
- King, J.L., Marnell, F., Kingston, N., Rosell, R., Boylan, P., Caffrey, J.M., FitzPatrick, Ú., Gargan, P.G., Kelly, F.L., O'Grady, M.F., Poole, R., Roche, W.K. & Cassidy, D. (2011). *Ireland Red List No. 5: Amphibians, Reptiles & Freshwater Fish*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.
- McAney, K. (2006). *A Conservation Plan for Irish Vesper Bats*. Irish Wildlife Manuals, No. 20. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.
- Marnell, F., Looney, D. & Lawton, C. (2019). *Ireland Red List No. 12: Terrestrial Mammals*. National Parks and Wildlife Service, Department of the Culture, Heritage and the Gaeltacht, Dublin, Ireland.
- Mitchell-Jones, A. J. and A. P. McLeish (1999). *The Bat Workers' Manual*. 2nd Edition, JNCC.
- National Parks and Wildlife Service Online Database. Available online at www.npws.ie
- Naper, A. (20). *Designing for Nature*. Available online at http://eleceng.dit.ie/sdar/IrishLighter/il_2011/AlexNaper.pdf
- NRA (2006). *Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes*. National Roads Authority. www.nra.ie
- NRA (2006). *Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes*. National Roads Authority. www.nra.ie
- NRA (2009). *Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*. Available online at www.nra.ie
- NRA, (2010). *Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads*. Available online at www.nra.ie
- O'Sullivan, P. (1994). *Bats in Ireland*. Special supplement to the Irish Naturalists' Journal.
- Parnell, J., Curtis, T. and E. Cullen (2012). *Webb's An Irish Flora*. Eighth Edition. Cork University Press.
- Regan, E.C., Nelson, B., Aldwell, B., Bertrand, C., Bond, K., Harding, J., Nash, D., Nixon, D., & Wilson, C.J. (2010). *Ireland Red List No. 4 Butterflies*. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Ireland.

- Stone, E.L., Jones, G. and S. Harris (2009). *Street Lighting Disturbs Commuting Bats*. *Current Biology* 19, 1-5 j.cub.2009.05.058
- Svensson, L., Mullarney, K., Zetterström, D. and P. J. Grant (2010). *Collins Bird Guide*. Collins Press.
- S.I. No. 477 of 2011. *The European Communities (Birds and Natural Habitats) Regulations 2011*. Irish Government, Government Publications Office, Molesworth Street, Dublin 2.
- Wildlife Act, 1976 including all other amendments 1976–2010 Number 39 of 1976 and Number 38 of 2000. Dublin: Office of the Attorney General. Wildlife (Amendment) Act (2000). Government of Ireland.
- Wyse Jackson, M., FitzPatrick, Ú., Cole, E., Jebb, M., McFerran, D., Sheehy Skeffington, M. & Wright, M. (2016) *Ireland Red List No. 10: Vascular Plants*. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs, Dublin, Ireland.

11. PHOTOGRAPHIC RECORD



Plate 1. Looking north along the hedgerow, which forms the western boundary of the northern section of the lands.



Plate 2. Remnant treeline along the western boundary of the southern portion of the lands. This will be augmented with additional native planting.



Plate 3. Looking south west across the southern lands showing both intact and remnant treelines along the boundary.



Plate 4. Treeline along the south eastern boundary of the site.



Plate 5. Badger sett along the south eastern boundary.



Plate 6. Stored topsoil from Phase 2.



Plate 7. Looking east across the lands to the newly developed Celbridge Link Road.



Plate 8. Badger trails in March 2021.



Plate 9. Badger sett in March 2021.



Plate 10. Celbridge link road – fenced wayleave in June 2021.