

Chapter 5:

**Biodiversity**

## **5.0 BIODIVERSITY**

### **5.1 INTRODUCTION**

This chapter of the EIAR has been prepared by Padraic Fogarty of OPENFIELD Ecological Services. Pádraic Fogarty has worked for over 20 years in the environmental field and in 2007 was awarded an MSc from Sligo Institute of Technology for research into Ecological Impact Assessment (EclA) in Ireland. OPENFIELD is a full member of the Institute of Environmental Management and Assessment (IEMA).

This section of the Environmental Report provides the for an ecological assessment of the proposed development and its potential impacts to biodiversity, which will be completed in full in the EIAR to be submitted with the application.

Under Article 6(3) of the Habitats Directive a screening for ‘appropriate assessment’ of projects must be carried out to determine if significant effects are likely to arise to Natura 2000 sites. This assessment is carried out by the competent authority, in this case An Bord Pleanála. The AA Screening report is presented separately.

### **5.2 STUDY METHODOLOGY**

The assessment was carried out in accordance with the following best practice methodology: ‘Guidelines on the information to be contained in Environmental Impact Assessment Reports’ by the Environmental Protection Agency (EPA, 2017) and ‘Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland’ by the Chartered Institute of Ecology and Environmental Management (IEEM, 2016).

Site visits were carried out on the 6<sup>th</sup> and 27<sup>th</sup> of July 2017 in fair weather. The site was surveyed in accordance with the Heritage Council’s Best Practice Guidance for Habitat Survey and Mapping (Smith et al., 2010). Habitats were identified in accordance with Fossitt’s Guide to Habitats in Ireland (Fossitt, 2000).

The nomenclature for vascular plants is taken from The New Flora of the British Isles (Stace, 2010) and for mosses and liverworts A Checklist and Census Catalogue of British and Irish Bryophytes (Hill et al., 2009).

July lies within the optimal survey period for general habitat surveys (Smith et al., 2010) and so a full inventory of plant species was possible. It was possible to classify all habitats on the site to Fossitt level 3. July is also within the optimal season for bat surveys and a dedicated bat survey was undertaken by Brian Keeley of Wildlife Surveys Ireland. This survey report is included herewith as Appendix 5.1. It is within the bird nesting season (albeit suboptimal) and is outside the optimal period for surveying large mammals and amphibians.

### **5.3 THE EXISTING RECEIVING ENVIRONMENT (BASELINE SITUATION)**

#### **5.3.1 Zone of Influence**

Best practice guidance suggests that an initial zone of influence be set at a radius of 2km for non-linear projects (IEA, 1995). However, some impacts are not limited to this distance and so sensitive receptors further from the project footprint were considered in the assessment process. This is shown in figure 5.1.



**Figure 5.1 – Site location showing nearby water courses. There are no areas designated for nature conservation in this view (from [www.epa.ie](http://www.epa.ie)).**

There are a number of designations for nature conservation in Ireland including National Park, National Nature Reserve, RAMSAR site, UNESCO Biosphere reserves, Wildfowl Sanctuary, Special Protection Areas (SPA – Birds Directive), Special Areas of Conservation (SAC – Habitats Directive); and Natural Heritage Areas. The mechanism for these designations is through national or international legislation. Proposed NHAs (pNHA) are areas that have yet to gain full legislative protection. They are generally protected through the relevant County Development Plan. There is no system in Ireland for the designation of sites at a local, or county level. Within 2km of the subject site no such areas can be found.

The web site of the National Parks and Wildlife Service ([www.npws.ie](http://www.npws.ie)) contains a mapping tool that indicates records of legally protected species within a selected Ordnance Survey (OS) 10km grid square. The Dunshaughlin site is located within the square N95 and no species of protected flowering plant are highlighted. It must be noted that this list cannot be seen as exhaustive as suitable habitat may be available for other important and protected species.

Water quality in rivers is monitored on an on-going basis by the Environmental Protection Agency (EPA). The Dunshaughlin site is located close to the watershed of three river systems (the Broadmeadow, the Tolka and the Boyne). However, maps from [www.wfdireland.net](http://www.wfdireland.net) show the subject lands to fall within the Broadmeadow river system. The nearest water course shown on EPA maps is the Ratoath Stream, which is shown approximately 600m to the north of the site boundary. The direction of flow is towards the east, where it goes on to enter the Broadmeadow River and, ultimately its estuary at Malahide on the Irish Sea. There is a monitoring point downstream (at Ratoath) and here water quality was most recently (2014) assessed as Q3 – ‘poor status’. The status of the Broadmeadow under the Water Framework Directive downstream of Dunshaughlin as far as its estuary is ‘poor’. The status of the estuary itself is ‘moderate’. These data are taken from the ENVision mapping tool on [www.epa.ie](http://www.epa.ie).

**Table 5.1 – Protected mammals in Ireland and their known status within the zone of influence (Harris & Yalden, 2008)<sup>1</sup> Those cells that are greyed out indicate no records for this species in the N93 square.**

| Species   | Level of Protection   | Habitat <sup>2</sup>  |
|---|---|---|
| Otter <i>Lutra lutra</i>                                | Annex II & IV Habitats Directive;<br>Wildlife (Amendment) Act, 2000 | Rivers and wetlands   |
| Lesser horseshoe bat<br><i>Rhinolophus hipposideros</i> |   | Disused, undisturbed old buildings, caves and mines           |
| Grey seal<br><i>Halichoerus grypus</i>                  | Annex II & V Habitats Directive;<br>Wildlife (Amendment) Act, 2000  | Coastal habitats  |
| Common seal<br><i>Phocaena phocaena</i>                 |   |   |
| Whiskered bat<br><i>Myotis mystacinus</i>               | Annex IV Habitats Directive;<br>Wildlife (Amendment) Act, 2000      | Gardens, parks and riparian habitats                          |
| Natterer's bat<br><i>Myotis nattereri</i>               |   | Woodland  |
| Leisler's bat<br><i>Nyctalus leisleri</i>               |   | Open areas roosting in attics                                 |
| Brown long-eared bat<br><i>Plecotus auritus</i>         |   | Woodland  |
| Common pipistrelle<br><i>Pipistrellus pipistrellus</i>  |   | Farmland, woodland and urban areas                            |
| Soprano pipistrelle<br><i>Pipistrellus pygmaeus</i>     |   | Rivers, lakes & riparian woodland                             |
| Daubenton's bat<br><i>Myotis daubentonii</i>            |   | Woodlands and bridges associated with open water              |
| Nathusius' pipistrelle<br><i>Pipistrellus nathusii</i>  |   | Parkland, mixed and pine forests, riparian habitats           |
| Irish hare<br><i>Lepus timidus hibernicus</i>           |   | Annex V Habitats Directive;<br>Wildlife (Amendment) Act, 2000 |
| Pine Marten<br><i>Martes martes</i>                     | Broad-leaved and coniferous forest                                  |   |
| Hedgehog<br><i>Erinaceus europaeus</i>                  | Wildlife (Amendment) Act, 2000                                      | Woodlands and hedgerows                                       |
| Pygmy shrew<br><i>Sorex minutus</i>                     |   | Woodlands, heathland, and wetlands                            |
| Red squirrel<br><i>Sciurus vulgaris</i>                 |   | Woodlands   |
| Irish stoat<br><i>Mustela erminea hibernica</i>         |   | Wide range of habitats  |

<sup>1</sup> Excludes marine mammals

<sup>2</sup> Harris & Yalden, 2008

|                                   |  |  |
|-----------------------------------|--|--|
| Badger<br><i>Meles meles</i>      |  | Farmland, woodland and urban areas         |
| Red deer<br><i>Cervus elaphus</i> |  | Woodland and open moorland                 |
| Fallow deer<br><i>Dama dama</i>   |  | Mixed woodland but feeding in open habitat |
| Sika deer<br><i>Cervus nippon</i> |  | Coniferous woodland and adjacent heaths    |

### 5.3.2 Stakeholder Consultation

The Development Applications Unit (DAU) of the Department of the Culture, Heritage and the Gaeltacht was contacted for nature conservation observations (reference GPre00028/2018). A response to this was received on March 13<sup>th</sup> 2018. This contained much generic information, but specifically in relation to the subject lands it states:

*“This Department notes that the proposed residential development consists of a number of hedgerows and treelines. Hedgerows and treelines act as ecological corridors as envisaged under Article 10 of the Habitats Directive. In addition there are policies in many local Biodiversity Action Plans and County Development Plans to protect hedgerows and the developer should ensure the proposed development complies with the relevant Plans of the Local Authority.*

*The importance of hedgerows for birds and mammals is outlined below in the general scoping comments. As stated below it should be noted that the National Biodiversity Action Plan sets out Government policy on nature conservation and includes as Objective 1 to “mainstream biodiversity into decision making”, including for all public authorities to move towards no net loss of biodiversity. It also requires Local Authorities to develop policies and objectives for the protection and restoration of biodiversity. Should the hedgerow be a townland or other historical boundary it is likely to be an old hedgerow, and therefore of more importance for biodiversity, as well as having historical significance. Every effort should be made to incorporate existing hedgerows and treelines into the proposed new development and any loss of such habitats will need to be mitigated to ensure no net loss of biodiversity.”*

**Response:** While there will be some hedgerow loss, every effort has been made to retain hedgerows and treelines to the greatest extent possible.

Details were also sent to Ms Gretta Hannigan of Inland Fisheries Ireland.

### 5.3.3 Site Survey

Aerial photography from the OSI and historic mapping shows that this area has been in agricultural use for many decades. Dunshaughlin lies to the east of County Meath, close to the boundary with county Dublin. It is an area that has experienced substantial land use change in recent decades with new residential housing areas and transport links.

### 5.3.4 Flora

The lands in this vicinity can be described as agricultural land with traditional field boundaries. The fields are classified as combination of **arable crops – BC1** and **dry meadow – GS2**. Dry meadows have clearly been in agricultural use but had not been grazed or tilled in 2017. These are dominated by grasses, such as Yorkshire Fog *Holcus lanatus*, Perennial Rye *Lolium perenne*, Cock’s-foot *Dactylis glomerata*, Creeping Bent *Agrostis stolonifera*, Timothy *Phleum pratense* or Common Couch *Elytrigia repens*. These are interspersed with

herbaceous plants, particularly Clovers *Trifolium sp.*, Vetches *Vicia sp.*, Thistles *Cirsium sp.*, Docks *Rumex sp.*, Common Chickweed *Stellaria media* etc. Fields of arable crops meanwhile were planted with potatoes in 2017. These fields are of low local, or negligible biodiversity value.

Field boundaries are a combination of **hedgerows – WL1** and **treeline – WL2**. Species composition in these habitats can be similar, and are differentiated by the fact that treelines consist of tall trees over 5m in height. Nevertheless, both hedgerows and treelines are recognised for their value to wildlife across the countryside. The Heritage Council has produced guidelines to assess the relative value of these linear features and these are based on a scoring system (Foulkes et al., 2013). Features are ranked depending on their age, species diversity (trees and ground flora), structure, habitat connectivity and landscape significance. The age of the hedgerow/treeline is deduced from its presence on 1st edition maps from the Ordnance Survey (dating from the early 1800s). All of the field boundaries in the subject site are shown here and so have been laid down prior to this time. Treelines, with tall trees of Ash *Fraxinus excelsior*, along with abundant Hawthorn *Crataegus monogyna* are typical. Hedgerows include Apple *Malus sylvestris* and Elder *Sambucus nigra*. The ground flora includes Self-heal *Prunella vulgaris*, Pignut *Conopodium majus*, Primrose *Primula vulgaris*, Knapweed *Centaurea nigra* and Yarrow *Achillea millefolium*.. A **drainage ditch – FW4** runs from west to east through the centre of the site and is accompanied for much of this length (but not all) by a double line of hedgerow or a treeline. This ditch is connected to another which runs along the southern boundary. Following the Heritage Council methodology, these hedgerow and treelines features can be assessed as of ‘higher significance’

There are no significant water courses on the site and the drainage ditches are not considered suitable for salmonid fish. There are no plants growing on the site which are protected or threatened. There are no habitats which are listed under Annex II of the Habitats Directive, or habitats which are generally associated with species listed in Annex I. There are no plant species which are listed as alien invasive under Schedule 3 of SI No. 477. The features described above are shown as a habitat map in figure 5.2.

### 5.3.5 Fauna

There is no suitable habitat on the lands for Otter. There was no evidence of Badger activity and no sett is present. Although July is suboptimal for conducting Badger surveys, as tall vegetation can obscure sett entrances, this was not considered a constraint on this site due to the extent of field cultivation and good access to field boundaries. An active sett was identified on adjacent fields and the distance from this feature to the site boundary is approximately 140m. Although there is no defined radius from a sett at which disturbance is likely to occur, this distance is considered to be well beyond the likely zone where negative effects could occur to these protected animals.

The hedgerows and treelines are likely to provide foraging routes for a number of bat species. A dedicated, detector-based bat survey was carried out by Brian Keeley of Wildlife Surveys Ireland in July 2017. This is within the optimal period for bat survey and included much of the surrounding land that has been zoned for housing development. This found that no bat roosts are present within the subject lands. Three species were found to be foraging: Leisler's Bat, Common Pipistrelle and Soprano Pipistrelle. Large trees may provide temporary roosting habitat.

Habitat is not available for Red Deer, Pine Marten or Red Squirrel. Irish Hare are widespread in Ireland and avail to a large extent of agricultural lands. Nevertheless, no record of its presence was found. Small mammals such as the Irish Stoat, Hedgehog and Pygmy Shrew are considered more or less ubiquitous in the Irish countryside, and may be active throughout (Lysaght & Marnell, 2016). Rabbits *Oryctolagus cuniculus* were seen. No other direct evidence of any mammal was recorded although Fox *Vulpes Vulpes* is common along with Brown Rat *Rattus norvegicus*, House Mouse *Mus domesticus* and Field Mouse *Apodemus sylvaticus*. These species are not protected.

July lies marginally outside the optimal season for surveying breeding birds, although is still within the general breeding period. Table 5.2 shows the species which were recorded and these can be assumed to be breeding. As can be seen all birds are common, or 'green listed'.



Figure 5.2 – Habitat map of the Dunshaughlin site

**Table 5.2 – Breeding birds from the Dunshaughlin lands and their national status**

| Species                        |             | BCCI Status <sup>3</sup> |
|--------------------------------|-------------|--------------------------|
| <i>Carduelis carduelis</i>     | Goldfinch   | Green                    |
| <i>Columba palumbus</i>        | Wood pigeon | Green                    |
| <i>Corvus corone</i>           | Hooded crow | Green                    |
| <i>Erithacus rubecula</i>      | Robin       | Green                    |
| <i>Phylloscopus collybita</i>  | Chiffchaff  | Green                    |
| <i>Troglodytes troglodytes</i> | Wren        | Green                    |
| <i>Turdus merula</i>           | Blackbird   | Green                    |
| <i>Turdus philomelos</i>       | Song thrush | Green                    |

Drainage ditches are suitable for breeding Common Frog *Rana temporaria*, while Common Lizard *Zootoca vivipara* is considered widespread. There are no ponds suitable for Smooth Newt *Lissotriton vulgaris*.

Monitoring by Inland Fisheries Ireland, from 2011, indicated that the River Broadmeadow holds populations of Brown Trout *Salmo trutta*, European Eel *Anguilla anguilla*, Minnow *Phoxinus phoxinus*, Nine-spined Stickleback *Pungitius pungitius*, and Three-spined Stickleback *Gasterosteus aculeatus* (this list is an agglomeration from all three sampling points along the Broadmeadow<sup>4</sup>). Drainage ditches running through the site are of low significance in terms of their fisheries habitat but are nevertheless hydrologically linked to the wider catchment. Land use and activities in the headwaters of rivers have knock-on impacts in the main channel of rivers further downstream.

Most habitats, even highly altered ones, are likely to harbour a wide diversity of invertebrates. In Ireland only one insect is protected by law, the Marsh Fritillary butterfly *Euphydryas aurinia*, and this is not to be found on intensive agricultural habitats such as these. Other protected invertebrates are not recorded from the Broadmeadow catchment. A number of butterflies were recorded during the July survey including Ringlet *Aphantopus hyperantus*, Meadow Brown *Maniola jurtina*, Small White *Pieris rapae*, Red Admiral *Vanessa atalanta*, Small Tortoiseshell *Aglais urticae*, Speckled Wood *Pararge aegeria*, Large White *Pieris brassicae*, Green-veined White *Pieris napi* and Peacock *Inachis io*. Each of these species is assessed as of 'least concern' in the Red Data List of Butterflies (Regan et al., 2010).

### 5.3.6 Overall Evaluation of the Context, Character, Significance and Sensitivity of the Proposed Development Site

In summary, it has been seen that the application site is within agricultural land. There are no examples of habitats listed on Annex I of the Habitats Directive or records of rare or protected plants. There are no alien invasive species as listed under Schedule 3 of SI No. 477 of 2011.

High value hedgerows and treelines provide habitat for common breeding birds, foraging areas for bats (although roosting spaces were not recorded), as well as habitat for a range of countryside flora and fauna.

Significance criteria are available from guidance published by the National Roads Authority (NRA, 2009). These are reproduced in table 5.3. From this an evaluation of the various habitats and ecological features on the site has been made and this is shown in table 5.4.

<sup>3</sup> Birds of Conservation Concern in Ireland (Colhoun & Cummins, 2013)

<sup>4</sup> From [www.wfdfish.ie](http://www.wfdfish.ie)



**Table 5.3: Site evaluation scheme taken from NRA guidance 2009**

| <b>Site Rating</b>                 | <b>Qualifying criteria</b>   |
|------------------------------------|--|
| A - International importance       | <p>SAC, SPA or site qualifying as such.<br/>Sites containing 'best examples' of Annex I priority habitats (Habitats Directive).</p> <p>Resident or regularly occurring populations of species listed under Annex II (Habitats Directive); Annex I (Birds Directive); the Bonn or Berne Conventions.</p> <p>RAMSAR site; UNESCO biosphere reserve;</p> <p>Designated Salmonid water</p>   |
| B - National importance            | <p>NHA. Statutory Nature Reserves. Refuge for Flora and Fauna. National Park.</p> <p>Resident or regularly occurring populations of species listed in the Wildlife Act or Red Data List</p> <p>'Viable' examples of habitats listed in Annex I of the Habitats Directive</p>   |
| C - County importance              | <p>Area of Special Amenity, Tree Protection Orders, high amenity (designated under a County Development Plan)</p> <p>Resident or regularly occurring populations (important at a county level, defined as &gt;1% of the county population) of European, Wildlife Act or Red Data Book species</p> <p>Sites containing semi-natural habitat types with high biodiversity in a county context, and a high degree of naturalness, or populations of species that are uncommon in the county</p> |
| D - Local importance, higher value | <p>Sites containing semi-natural habitat types with high biodiversity in a county context, and a high degree of naturalness, or populations of species that are uncommon in the locality</p> <p>Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.</p>  |
| E - Local importance, lower value  | <p>Sites containing small areas of semi-natural habitat that are of some local importance for wildlife;</p> <p>Sites or features containing non-native species that are of some importance in maintaining habitat links.</p>   |

**Table 5.4: Evaluation of the importance of habitats at the Dunshaughlin lands**

|  |                             |
|--|-----------------------------|
| Arable crops – BC1   | Negligible ecological value |
| Dry meadows – GS2  | Low local ecological value  |
| Higher significance Hedgerow – WL1 and Treeline – WL2 (with associated Drainage ditches – FW4) | High local ecological value |

## 5.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development consists of a strategic housing development comprising of 913 no. residential units, a neighbourhood centre, including 2 no. retail units, a café / restaurant unit, a primary healthcare / gym, a community facility and a childcare facility, all associated open space, a section of the Outer Relief Road, internal roads, cycle and pedestrian infrastructure, services and all other associated development.

The 913 no. residential units proposed consist of 505 no. houses (single, two, and three storey), 186 no. duplex units (three storey), and 222 no. apartments (four and five storey).

The development also includes car and cycle parking, ESB substations, boundary treatment, foul and surface water drainage, attenuation tanks, other services and all other associated development.

## 5.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

This section provides a description of the potential impacts that the proposed development may have on flora & fauna in the absence of mitigation. Methodology for determining the significance of an impact has been published by the NRA (NRA, 2009).

### 5.5.1 Construction Phase

The following potential impacts are likely to occur during the construction phase in the absence of mitigation:

1. The removal of habitats including arable crops, hedgerows and treeline. It is calculated that the length of higher significance hedgerow to be removed is 1,150m (out of a total of 1,430m) and higher significance treeline to be removed is 540m (out of a total of 900m). In certain cases individual trees are to be retained within field boundaries to be removed. In accordance with the tree survey report, 23 trees are to be removed due to poor condition.



**Figure 5.3 – Tree impact drawing showing the extent of tree/hedgerow removal (see Tree Survey package included with the application for further details).**

2. The direct disturbance of species during land clearance. This can affect nesting birds as well as small mammals but is dependent upon the timing of works. Under the Wildlife Act the removal of vegetation is prohibited between March and August. The felling of trees may also affect roosting bats.
3. Pollution of water courses through the ingress of silt, oils and other toxic substances. The drainage ditches on the site are not of significant fisheries value, however they do lead to the Broadmeadow River, which is of salmonid status. Silt in particular can clog spawning gravels downstream and, at high concentrations, directly affect the gills of fish. This project will include extensive land clearance works which is likely to result in sediment runoff. This will include the culverting of the drainage ditch.
4. Damage to habitats to be retained. The storage of materials or the movement of machinery can result in soil compaction, which can in turn damage the roots zones of trees, leading to poor growth or disease. Without mitigation, this could affect the lengths of hedgerow to be retained.

### 5.5.2 Operation Phase

The following potential impacts are likely to occur during the operation phase in the absence of mitigation:

5. Impacts to species through the disruption of ecological corridors: bats may be impacted through the loss of foraging routes (hedgerows and treelines). Approximately 45% of native field boundaries are to be retained within the project design. While certain corridors are to be lost in the short-term, there is to be compensatory planting. This will include a new native hedgerow along a portion of the northern and western boundaries. 4 individual trees (away from lines of trees to be retained) are to be

retained within the proposal. There will be a short-term impact from these works as new landscaping will take time to mature.

6. Pollution of water from surface water run-off. The Greater Dublin Strategic Drainage Study (2005) identified issues of urban expansion leading to an increased risk of flooding in the city and a deterioration of water quality. This arises where soil and natural vegetation, which is permeable to rainwater and slows its flow, is replaced with impermeable hard surfaces. Surface water from the project footprint will drain to local drainage ditches. In this way, rain runoff will be separated from foul wastewater within the site. Sustainable drainage systems (SuDS) are to be incorporated into the project design and this will include attenuation tanks and oil/grit interceptors, while a flow control device will limit outfall rates. Runoff will consequently be maintained at a 'greenfield' rate. Two outfall points will discharge to local land drains, ultimately entering the River Broadmeadow.
7. Pollution of water from foul wastewater arising from the development. Wastewater will be sent to the municipal treatment plant at Dunshaughlin. The plant is licenced by the Environmental Protection Agency (EPA) (reference number D0138-01) and discharges treated effluent into the River Boyne. The Annual Environmental Report (AER) for 2017 (the most recent available) stated that discharges were compliant with emission limit values set under the Urban Wastewater Treatment Directive. The treatment capacity of the plant is 12,000 Population Equivalent (P.E.) and the mean hydraulic loading is within this limit. Ambient monitoring at points upstream and downstream of the outfall point is carried out and the AER states that these data indicate that the discharge "does not have an observable impact on the water quality status".
8. Disturbance to species from increased human activity (lighting, pets etc.). The species/habitats present on this site are not considered sensitive to disturbance from noise or general human activity. Bats may be sensitive to the additional artificial lighting that may arise from this development. The lighting plan is to be reviewed by the bat ecologist to ensure that effects to these sensitive species are minimised.  
Lighting is to be controlled on the site spatially and temporally. Lighting in green spaces will be minimised while the use of LED bulbs is to be employed throughout. These are proven to have lower deterrent impacts on bat behaviour, particularly for the most common Pipistrelle species, than traditional metal-halide or high-pressure sodium bulbs. Nevertheless, there will be an increase in ambient lighting levels from windows, cars etc. Details are to be prepared in a lighting plan.
9. Impacts to protected areas. There is a pathway to protected areas in the Malahide Estuary, via the Broadmeadow River. There is also a pathway to the River Blackwater and River Boyne SAC via wastewater discharges to the Boyne. A separate screening report for Appropriate Assessment has been presented and this concludes that negative effects to Natura 2000 areas are not likely to arise.

No other protected areas lie within the zone of influence of this project.

**Table 5.5: Significance level of likely impacts in the absence of mitigation**

| Impact             |  | Significance  |
|--------------------|--|---|
| Construction phase |  |   |
| 1a                 | Habitat loss of features of negligible value | Neutral   |
| 1b                 | Habitat loss of features of low local value  | Minor negative (6.75ha of dry meadow)                                   |
| 1c                 | Habitat loss of features of high local value | Moderate negative (1,2600m of higher significant hedgerow and treeline) |
| 2                  | Disturbance to animals during construction   | Moderate negative   |
| 3                  | Pollution of water during construction phase | Moderate negative   |

|   |  |   |
|---|--|---|
| 4 | Damage to habitats to be retained                        | Moderate negative   |
| 5 | Disruption of ecological corridors                       | Minor negative – effects are unlikely to impact upon the integrity of wildlife populations in the long term |
| 6 | Surface water pollution during operation                 | No impacts  |
| 7 | Wastewater during operation                              | No impacts  |
| 8 | Disturbance to species from human disturbance (lighting) | Minor negative  |
| 9 | Impacts to protected areas                               | No impacts  |

Overall it can be seen that four potential moderate negative impacts are predicted to occur as a result of this project in the absence of mitigation.

## 5.6 POTENTIAL CUMULATIVE IMPACTS

A number of the identified impacts can also act cumulatively with other impacts from similar developments in the Dunshaughlin area. These primarily arise through the urbanisation of the town's hinterland as provided for by land use zoning and include: loss of habitats, particularly hedgerows and treelines, pollution from surface water run-off and pollution from wastewater generation.

A cumulative loss of wildlife value however will be experienced as land use changes in this area from open agricultural to suburban. This is offset somewhat as open green spaces and private gardens mature over time. It is considered that the species which are already present in this area will not suffer long term consequences arising from this land use change.

## 5.7 'DO NOTHING' IMPACT

In the event that this project does not proceed the land can be expected to remain in agriculture use for the foreseeable future. Existing wildlife populations would remain relatively undisturbed.

## 5.8 AVOIDANCE, REMEDIAL & MITIGATION MEASURES

This report has identified four impacts that were assessed as 'moderate negative'. Mitigation is therefore recommended to reduce the severity of these effects.

### 5.8.1 Construction Phase

#### **BIO CONST 1: Habitat Loss – mitigation by reduction and compensation**

The extent of hedgerow and treeline loss has been minimised to the greatest degree possible. In total, 640m of field boundary is to be retained, equating to 27% of the total.

To compensate for the loss of habitat a new, native hedgerow, of approximately 700m in length will be planted along the northern and western boundary. A large number of new trees, of a variety of species, are also to be planted. The amenity open space will include a native meadow area, which will be flower rich, and planted with Irish-grown seed. While these measures will not compensate entirely for the loss of high value field boundaries, they will reduce the severity of the impact from 'moderate negative' to 'minor negative'.

### **BIO CONST 2: Mortality to animals during construction – mitigation by avoidance**

2a. The removal of hedgerow, treeline or scrub vegetation should not take place from March to August inclusive as per the Wildlife Act.

2b. Trees which are to be removed, should be felled during the autumn months of September, October or November (and so avoiding periods when the bats are most active).

### **BIO CONST 3: Pollution during construction – mitigation by reduction**

A Construction Method Statement should be prepared, and which should include pollution prevention measures in accordance with best practice guidelines from Inland Fisheries Ireland (2016). This should identify the location of the site compound, storage areas for potentially polluting substances, and specific measures to prevent the loss of silt-laden water to any water course. Culverting of the drainage ditch should be undertaken 'in the dry' to avoid the excessive loss of sediment during this phase.

## **5.8.2 Operational Phase**

### **BIO OPER 1: Tree damage – mitigation by avoidance**

To avoid damage to trees the developer should follow the guidance from the National Roads Authority in establishing root protection areas (RPA) along hedgerows to be retained.

The NRA gives the following equation for calculating the root protection area (RPA) (NRA, unknown year):

$$\text{RPA(m}^2\text{)} = \pi(\text{stem diameter mm} / 1,000)^2 \times 2$$

The RPA gives the area around which there should be no disturbance or compaction of soil. This will be calculated for the largest tree within each hedgerow. Prior to construction this area will be clearly labelled 'sensitive ecological zone', fenced off with durable materials and instruction given to construction personnel not to disturb this buffer zone. As a rule of thumb this buffer zone should extend at least to the canopy of the trees concerned.

## **5.8.2 'Worst-case' scenario**

In a worst-case scenario temporary negative impacts could be expected to occur to water quality, and the fish spawning habitat of the Broadmeadow River. Permanent damage to trees and hedgerows could occur from compaction of soil within the root zones.

## **5.9 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT**

This section allows for a qualitative description of the resultant specific direct, indirect, secondary, cumulative, short, medium and long-term permanent, temporary, positive and negative effects as well as impact interactions which the proposed development may have, assuming all mitigation measures are fully and successfully applied.

### Construction Phase

There will be some temporary residual impacts to flora and fauna arising from this project.

- The removal of hedgerow and treeline habitats will result in some mortality to species and habitat loss. These are predicted to be **minor negative**.

- Despite mitigation measures, the loss of habitat that will occur, will result in a minor negative impact to the biodiversity value of these lands.

With mitigation, there are expected to be no residual negative effects to flora and fauna which can be considered to be significant.

### **Enhancement Measures**

A bat box scheme is to be implemented which will increase the availability of roosting locations for bats. It is proposed to install 12 Schwegler bat boxes provided in suitably chosen sites for bats on trees or poles away from lighting and traffic.

## **5.10 MONITORING**

Monitoring is required where the success of mitigation measures is uncertain or where residual impacts may in themselves be significant.

### **Construction Phase**

The mitigation measures are considered to be standard measures and come with a high level of confidence with regard to their success. Further monitoring is not required.

### **Operation Phase**

No monitoring is required during the operation phase.

## **5.11 REINSTATEMENT**

No reinstatement measures are required.

## **5.12 INTERACTIONS**

There are interactions between biodiversity and the water, land and soil, and landscaping.

## **5.13 DIFFICULTIES ENCOUNTERED IN COMPILING**

This chapter is based on a number of site visits across the seasons, dedicated surveys for specialist species groups, and thorough consultation with statutory stakeholders. No difficulties were encountered in compiling this study.

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## **APPENDIX 5.1 BAT AND BIRD SURVEY REPORT**

# **A Bat Assessment of Lands at Dunshaughlin, County Meath and Implications for Construction Within the Area**

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**October 2017**

## **Introduction**

Bats are a widespread element of the Irish fauna. They are known to occur from much of the rural landscape, but they are also present within the urban and suburban environment and here they occupy buildings and occasionally trees for short or long periods. Tree usage is very clearly under-reported in bats and especially so in Ireland for a number of reasons.

Firstly, Ireland has a paucity of old and ancient trees and such trees are often the easiest roost types to identify. This may be due to obvious cavities, sizeable crevices and throughout the rest of Europe, numerous woodpecker holes. As woodpeckers have been absent from Ireland for a considerable time and are still limited in their distribution, the availability of woodpecker holes is insignificant on the landscape level.

Buildings are a vital element of the annual cycle of all Irish bat species and at no time more so than the period May to August, but many bats may also avail of buildings as hibernation sites. Changes to a site may reduce the lands available to bats as a feeding site and in some cases, may even destroy their dwelling place through or during the partial or total demolition, restoration and renovation of buildings, clearance activities and the subsequent construction.

Bats are protected by Irish and EU law and to prevent unlawful injury or death, it is essential that a full understanding of the site is available in advance to protect the resident bats from unintentional disturbance and to create a pathway by which a legal derogation and exemption may be designed in consultation with the National Parks and Wildlife Service of the Department of Culture, Heritage and the Gaeltacht.

The site at Dunshaughlin, County Meath has been zoned to allow housing to be constructed. This is currently an agricultural area with a variety of crops and pasture in relatively high-quality farmland. With a changeover of some or all of the lands to housing, the area (lands and adjoining lands) will undergo a clearance of some of the internal structured mature vegetation (hedgerow and individual trees) and the removal of crops and "agricultural weeds" (common tolerant native species).

The lands are surrounded by houses and industrial units to one side, the N3 to another and is flanked by a number of houses and sheds but no domestic buildings lie within the lands being examined. There are no buildings within these lands that would be removed to facilitate housing and in relation to bats, the impacts are most likely to come from tree loss, hedgerow removal and lighting, road construction and other barriers to feeding and commuting.

This assessment will address the potential for bats roosting in trees within the site and within houses, offices, factories and farm buildings surrounding the site and within the surrounding area. Previous evaluations in the south Meath- north Dublin area including house visits, ad hoc observations and survey data recorded by Bat Conservation Ireland have determined the presence of common pipistrelles, soprano pipistrelles, Daubenton's bats, Natterer's bats, brown-long eared bats and Leisler's bats.

Whiskered bats have been identified in Blanchardstown, several kilometres from the site while brown long-eared bats have been recorded in the village.

## **Methodology**

Pettersson D240x heterodyne and time expansion bat detector (D240X)

EchoMeter 3 (EM3) real time expansion bat monitor with Garmin GPS attachment

Head torch and hand torch

The lands at The Willows, Dunshaughlin, County Meath were examined on 28<sup>th</sup> July 2017 in daylight and again from dusk on the 28<sup>th</sup> and prior to dawn on the 29<sup>th</sup> July to identify the species of bat present within the site, to identify roost sites or potential roost sites and to determine the value of the site as a feeding and commuting area. Visual assessment was undertaken in daylight to consider the potential for roost sites. Acoustic surveying commenced prior to dusk on the survey night and continued for over 2.5 hours. Pre-dawn surveying was also undertaken on the subsequent morning. Two bat detectors were hand held (EM3 and D240X) and used to identify bats in the field

Surveying involved a walked transect that covered most of the lands under consideration after dusk (sunset 21.29 hours). Prior to dawn (05.37 hours), a driven transect was carried out to aim to identify roosts in surrounding buildings.

On the survey night, temperatures and all other conditions favoured good bat activity. Bats were seen throughout the survey and this is a reasonable representation of bat activity within this area during the maternity /breeding period.

## **Existing Environment**

### **Bat fauna roosting within the site**

None identified in July 2017

### **Bat fauna feeding and commuting within and through the site -**

|                     |                                  |
|---------------------|----------------------------------|
| Leisler's's bat     | <i>Nyctalus leisleri</i>         |
| Common pipistrelle  | <i>Pipistrellus pipistrellus</i> |
| Soprano pipistrelle | <i>Pipistrellus pygmaeus</i>     |

Bats avail of the hedgerow as feeding and commuting corridors and bats were noted over the two periods of survey over much of the site. The main areas for bat activity the north-western section of the lands (Figure 1 and Figure 2), the mature hedgerows and a small wood to the eastern side of the lands (Figure 1 and Figure 3) and around a laneway leading to houses at the south-eastern corner of the lands (Figure 1 and Figure 4) with good feeding activity in all of these areas.

There was bat activity throughout the survey period and the majority of activity was of common pipistrelles. Towards the N3, Leisler's bat and common pipistrelle activity was present close to the petrol station. Within the fields, pipistrelles were more in evidence than Leisler's bats.

Based on the summer assessment of 2017, there are bat roosts in the lane to the east of the site (soprano pipistrelles and possibly common pipistrelles- see Figure 4), in the housing to the north-western perimeter (common pipistrelle – see Figure 5). There is potentially individual bats or very small numbers of bats within the wood to the eastern edge of the site (see Figure 3) and there is potential for bats within other trees within the site that have not been uncovered by this assessment. Tree roosts may be short-term and are difficult to pinpoint without clear targeting of the tree for assessment.

Bats are feeding throughout the site but to date, there is no evidence of significant roosts or of uncommon bat species.

## **Modifications or Features of development that affect bats**

| <b>Process / Action</b>  | <b>Impacts Upon The Area under consideration</b> |
|--------------------------|--|
| ▪ No Building Demolition | - No houses or Farm building                     |
| ▪ Vegetation Clearance   | - Mature hedgerow, Pasture and tree lines        |
| ▪ New construction       | - Housing and access roads                       |
| ▪ Lighting               | - Security and Access                            |

### **Impacts Of Development Potential Loss of Roost Sites And Risk to Bats**

The removal of mature trees may reduce the roost potential of the site. No bat roosts were noted within the site in July 2017, but this does not rule out occasional use or seasonal use of these sites by bats and a pipistrelle observed early during this assessment may have been within the eastern wood or have come from nearby farm buildings or houses. Roosts may be used for as little as a day at a time and for several months or permanently for some bats.

The mobility and secrecy of bats renders it impossible to rule out a structure without repeat assessment and considerable effort. Where doubt exists, it is safest to consider that a structure has roost potential if the features of benefit to bats exist.

The loss of a roost may create a long-term moderate negative impact. Bats within a roost when it is removed (felled or demolished) may be injured or killed if their presence goes undetected and appropriate measures are not in place.

### **Disturbance from lighting**

Lighting will be increased for two different functions: 1) Access and safety 2) Security and policing. The former is to allow ease of use at night. The latter is to ensure a perceived higher security level.

This affects all bat species, in particular, light-intolerant bat species (such as *Myotis* species and brown long-eared bats) during foraging and if directed at emergence points would affect all bat species, even those that will feed in illuminated areas. However, there are no roosts known within the site to date and therefore illumination is known only to affect commuting and feeding rather than roosting with current knowledge.

At worst, it would be a permanent negligible to slightly negative impact.

## **Reduced Feeding**

The feeding opportunities are provided by mature hedgerow, tree lines and mature vegetation with pasture providing most opportunities and crops such as potato probably contributing less to insect availability. There will be a removal of many of these trees for housing. There will therefore be a permanent moderate negative impact upon the local bat fauna through the removal of the vegetation. Feeding around lighting will potentially increase for Leisler's bats but the insect population will be reduced by loss of habitat and this will lead to an actual decrease in feeding levels albeit that there may appear to be higher bat activity by concentration of Leisler's bat activity into lit areas.

Feeding sites for some species such as *Myotis* species and long-eared bats, albeit that they were not observed in July 2017 may be affected and these species may be hindered in reaching feeding sites by loss of hedgerow and darkness to commute between roost sites and feeding areas.

## **General principles for bat conservation**

The following measures are proposed firstly for the selection of the lands and avoidance or retention of some sites and secondly to indicate measures that would need to be implemented once a site has been selected. The overall bat data is shown in Figure 1 and the sections discussed are listed in the following 5 figures.

### **Retention of hedgerow wherever feasible**

The more mature tree lines and hedgerow must be given consideration for protection in choosing the development areas and for a schedule to reduce the impact of housing on retained trees and hedgerow. Areas of high value for bats include the north-western hedgerow (see Figure 2) and the wooded area (see Figure 3).

### **Examination of mature trees prior to felling and timing of felling**

All mature trees shall be examined by a bat specialist prior to felling. The extent of tree roost potential shall be established by a bat specialist prior to any felling.

A bat specialist must undertake an examination of any mature, hollow / damaged trees prior to removal. Trees with good bat roost shall be inspected to ensure that bats are not present prior to felling. Where this assessment is undertaken at a period when bats are inactive (i.e. either seasonally or due to poor weather conditions), the trees will be inspected with a fibrescope and with height access to rule out the presence of bats.

If bats are present, then the tree is protected under the Wildlife Act as a resting place of a bat and a derogation must be sought from National Parks and Wildlife Service. A licence will be issued once appropriate measures are proposed to protect bats and provide alternative roosting opportunities.

A scientific agent will be required to ensure correct implementation. In most circumstances, this will be the bat specialist undertaking the examination of the trees. Felling should preferably be undertaken after August and prior to late November to ensure that bats are not in hibernation and are not within maternity roosts.

If trees are felled in winter, additional care in examining for bats must be taken to ensure that no bats are placed at risk. This may require access and the use of fibrescopes and lighting.

### **Lighting away from major roads should be motion triggered rather than permanently on**

As lighting is one of the most significant impacts upon bats from the cumulative effects of development it is proposed that no constant security lighting should be employed around the future housing at night. All security lighting should be motion-activated and adjusted to respond to larger movements associated with human entry rather than bird or bat activated.

In relation to security, it is recommended that infra-red lighting and infra-red cameras are employed to record anti-social activity to assist in crime solving and prevention.

This would not raise the visible light levels that would affect mammals and birds to a much greater extent. It is still entirely adequate for monitoring and identification. The source of light should be Light Emitting Diodes (LEDs) as this is a narrow beam highly directional highly energy efficient light source. The lighting should allow for a light level of no greater than 3 lux at ground level. It is easier to control the direction and light level of low lighting because it is so close to the target area (if using bollard lighting).



In summary, the following is proposed:

- (1) No floodlighting should be used – this causes a large amount of light spillage into the sky. The spread of light should be kept below the horizontal.
- (2) Hoods, louvres, shields or cowls should be fitted on the lights to reduce light spillage if high intensity lighting is required or to protect trees or other potential roosts from light overspill.
- (3) Lights should be of low intensity. It is better to use several low intensity lights than one strong light spilling light across the entire area.
- (4) Lights away from essential areas such as major roads should be motion sensitive rather than permanently lit and attached to a timer system to switch off quickly in the absence of sustained movement.
- (5) No overhead lighting of the overbridge. The bridge should avail of reflectivity and strip lighting within the bridge rather than overhead or external illumination to prevent light overspill into the eco-park below.
- (6) Narrow spectrum lighting should be used with a low UV component. Glass also helps reduce the UV component emitted by lights.

## **Enhancement of Feeding sites and Commuting Corridors**

Provision of suitable feeding sites for bats would be easily achieved by planting lines of vegetation including trees or shrubs within gardens and common areas. This cannot replace the value of a mature hedgerow in the short- to medium-term and is a long-term measure.

Wherever feasible, native plant species of local provenance should be employed including typical plants such as hawthorn, blackthorn, elder, gorse, bramble, in addition to other species such as dog rose and *Clematis* attractive to moths. Planting around car park areas and new and modified buildings may avail of window boxes, roof gardens, herbaceous borders etc.

Plants such as *Lonicera periclymenum* (honeysuckle) are beneficial to moths and other nocturnal insects while *Hebe* (*Buddleja* is no longer planted intentionally) are beneficial to daytime Lepidoptera and some night insects. Bees would benefit from lavender, jasmine, rosemary, violets, thyme, blue bells, wisteria, cone flowers and sunflowers.

## Bat boxes and bat access

There will be a need to provide alternative roost sites for bats. This would include the installation of bat boxes on trees and poles and the incorporation of bat access into buildings and other structures.

## IMPACTS OF THE DEVELOPMENT AFTER MITIGATION

It is predicted that there will be effects upon the conservation status of the bat species discussed in this report from development in the long term if no mitigation is provided. The removal of vegetation is the most likely measure to reduce the value of the site for bats. There are no building roosts lost by development and the impacts on bats will be minor but cumulative in association with all other construction within the surrounding area. Lighting control and planting will reduce the impacts greatly but there may be a loss of feeding for less light-tolerant species albeit that these species were not encountered in 2017.

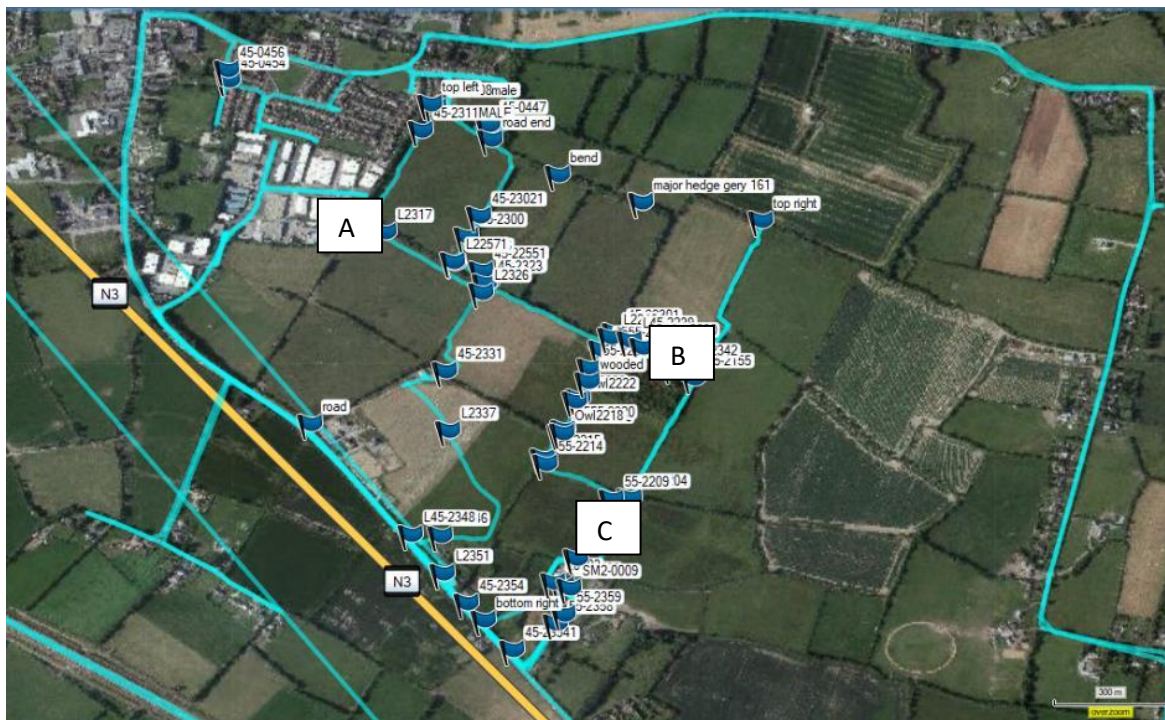
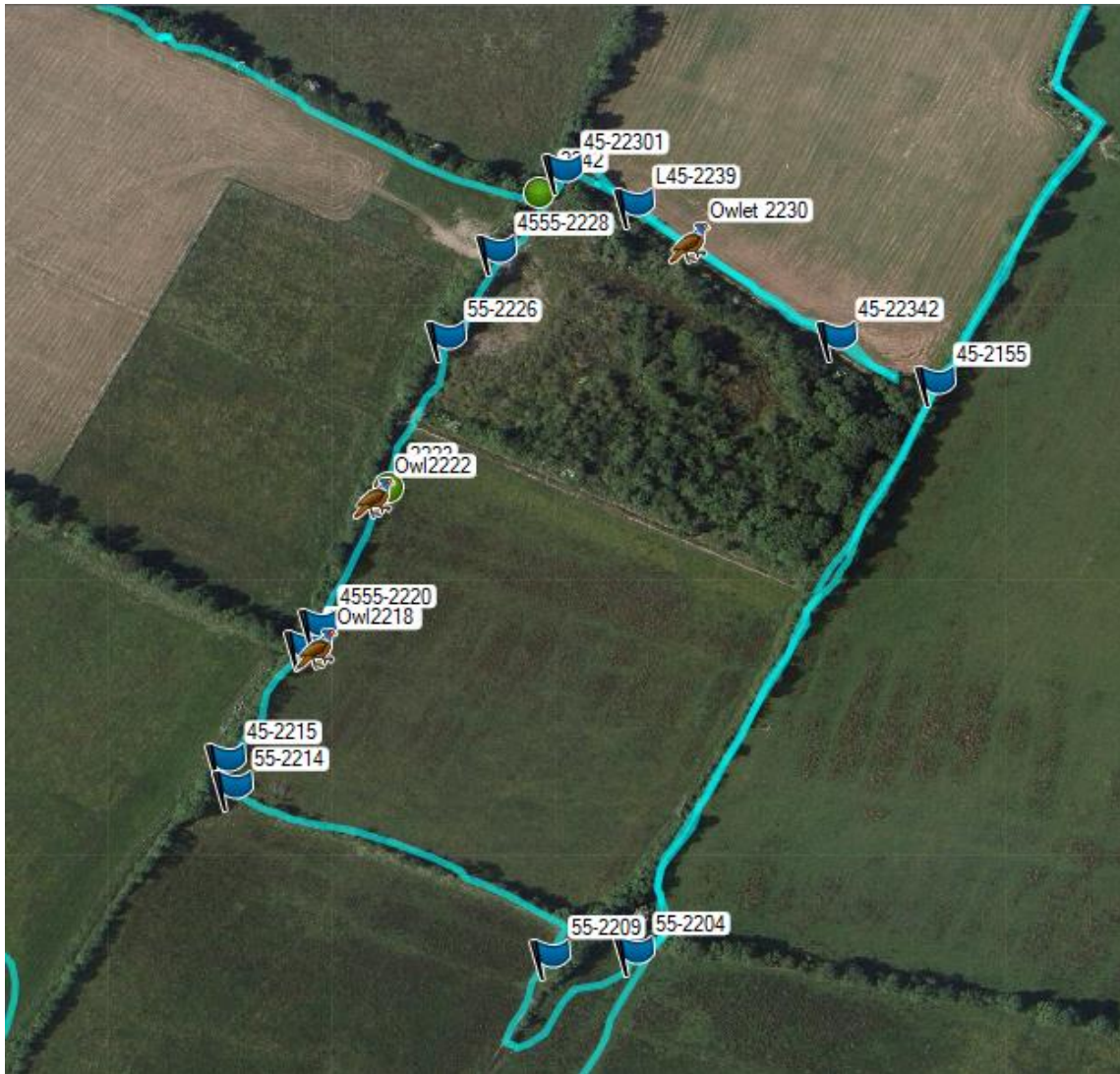


Figure 1: Bat survey transect on and around the lands at The Willows, Dunshaughlin, July 28 and 29



Figure 2: North-western section of the site closest to Dunshaughlin centre (A) in Figure 1.



**Figure 3: Wood to Centre of the study area towards the right.** This is a good area for bats and long-eared owls and should be avoided ((B) In Figure 1)

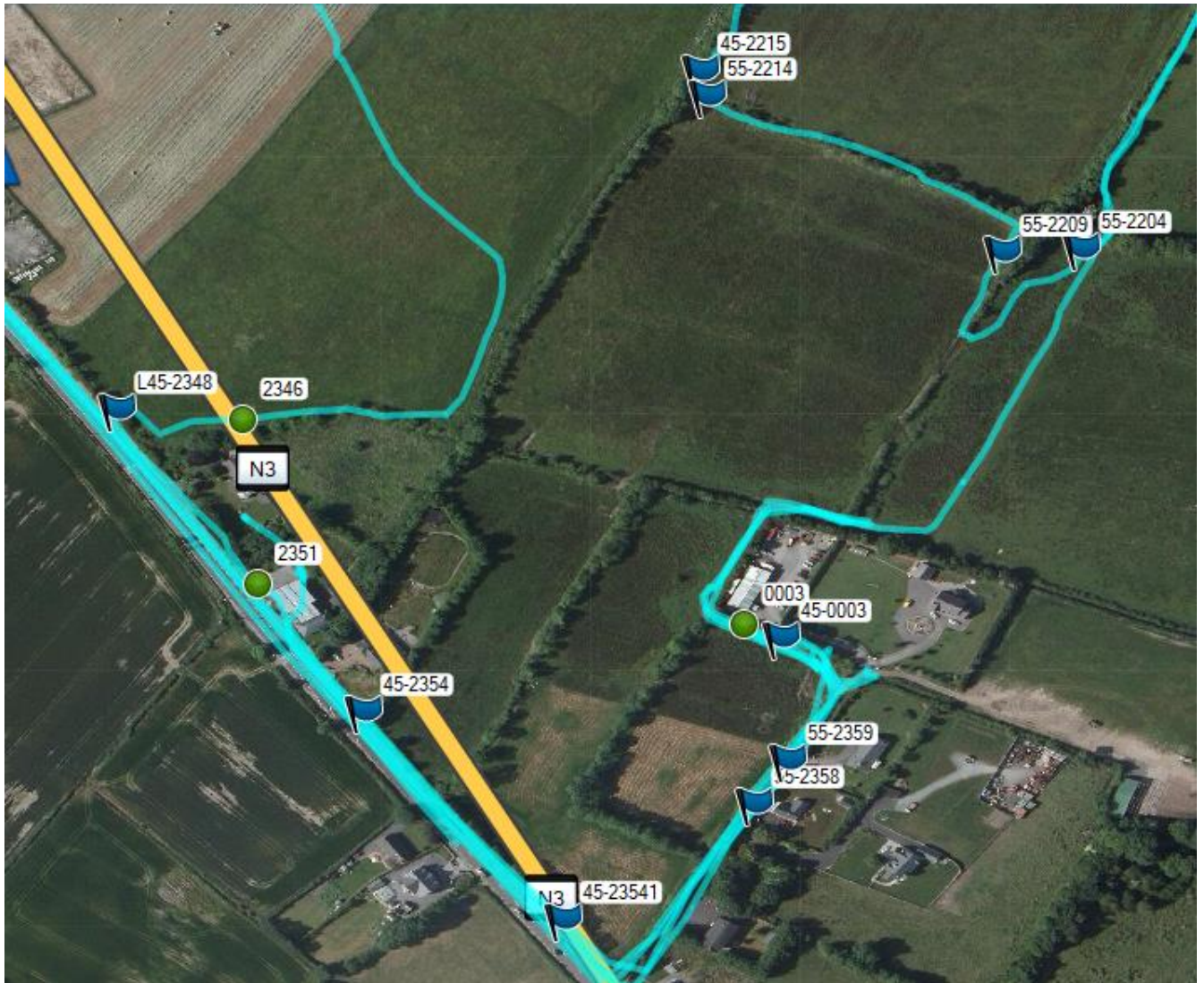


Figure 4: Southern section of the site (C) in Figure 1



**Figure 5: Bat activity at the northern section of the site closest to the village. Roosts are almost certainly present within the housing shown in this photograph**



**Figure 6: High activity towards northern section**