Ecological Impact Statement for Large Scale Residential Development at Blessington Demesne, Blessington, Co. Wicklow

Compiled by OPENFIELD Ecological Services

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For Marshall Yards Development Company Ltd



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1 INTRODUCTION

This Ecological Impact Statement has been prepared by Pádraic Fogarty of OPENFIELD Ecological Services. Pádraic Fogarty has worked for 25 years in the environmental field and in 2007 was awarded an MSc from Sligo Institute of Technology for research into Ecological Impact Assessment (EcIA) in Ireland. OPENFIELD is a full member of the Institute of Environmental Management and Assessment (IEMA).

2 STUDY METHODOLOGY

The assessment was carried out in accordance with the following best practice methodology: 'Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland' by the Institute of Ecology and Environmental Management (IEEM, 2018).

Site visits were carried out on the 3rd of April 2019 (in relation to a previous development application) as well as January 9th and April 24th 2024 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).

April lies within the optimal survey period for general habitat surveys (Smith et al., 2010) and so a full classification of habitats was possible. April also lies within the bird breeding season and is optimal for surveying amphibians and larger mammals such as Badger. January is within the optimal season for surveying wintering birds as well as Badger.

3 EXISTING RECEIVING ENVIRONMENT

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 may need to be considered as this assessment progresses. This is shown in figure 1.

There are a number of designations for nature conservation in Ireland including National Park, National Nature Reserve, RAMSAR site, UNESCO Biosphere reserves, 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.



Figure 1 – Development site location (red circle) showing local water courses and Natura 2000 sites. There are no SACs in this vicinity (from <u>www.epa.ie</u>).

There is one area designated for nature conservation in this vicinity: the Poulaphouca Reservoir pNHA and SPA. The development site falls within the catchment of the River Liffey.

The **Poulaphouca Reservoir SPA** (site code: 4063) is located along the River Liffey behind a dam which was created in 1944. Its 'features of interest', i.e. the reasons why the reservoir warrants the SPA designation, include the Greylag Goose *Anser anser* and the Lesser Black-backed Gull *Larus fuscus*. The following descriptions are taken from the *Bird Atlas 2007-2011* (Balmer et al., 2013).

- **Greylag Goose.** Wintering Greylag Geese are very scattered in Ireland and occur on both coastal in inland sites. Their population has expanded greatly in their more northerly ranges (Iceland and Scotland) and this has coincided with losses elsewhere.
- Lesser Black-backed Gull. The wintering range of this distinctive gull has expanded in Ireland by 55% since the early 1980s while breeding colonies have similarly increased.

At an all-Ireland level both the Greylag Goose and Lesser Black-backed Gull are of medium conservation concern (amber listed, Gilbert et al., 2021).

The NPWS web site¹ contains a mapping tool that indicates historic records of legally protected plant species (listed under the Flora Protection Order) within a selected Ordnance Survey (OS) 10km grid square. The development site is located within the square N91 and no protected plant species are highlighted.

Water quality is monitored on an on-going basis by the Environmental Protection Agency (EPA). They assess the pollution status of a stretch of water by analysing the invertebrates living in the substrate as different species show varying sensitivities to pollution. The Blessington site is within the catchment of the River Liffey. Mapping from Environmental Protection Agency (EPA) shows the Deerpark Stream running along the development site boundary to the north-west. This water course (water body code: IE_EA_09L010400) is assessed as 'good status' under the Water Framework Directive (WFD) reporting period 2016-2021. It enters the Poulaphouca reservoir a short distance downstream. The reservoir is also assessed as 'good status'.

The EU's Water Framework Directive (WFD) stipulates that all water bodies were to have attained 'good ecological status' by 2015 or, with some exceptions, by 2027 at the latest. Blessington and the River Liffey were originally located within the Eastern River Basin District. In 2009 the first River Basin Management Plan (RBMP) was published to address pollution issues and included a 'programme of measures' which must be completed. In 2019 a second RBMP was published and this identified 190 priority areas for action. The catchment of the Poulaphouca Reservoir was highlighted as an 'area for restoration'. A third RBMP is due for publication in 2024.

3.2 Site Survey

Recent and historic aerial photography shows that the site itself has been in agricultural use until recently, but new built development has emerged to the south and north. It is located east of a relatively new distributor road while housing developments can be found to the north and south.

3.4.1 Flora

The development site is a large field of **dry meadow – GS2**. This is predominantly composed of rough grasses such as Cock's-foot *Dactylis glomerata*, Timothy *Phleum pratense* and Creeping Bent *Agrostis stolonifera* along with typical grassland plants such as Clovers *Trifolium sp.*, Thistles *Cirsium sp.* and Creeping Buttercup *Ranunculus repens*. Within this area there is a large Oak *Quercus sp.* although it

¹ <u>https://www.npws.ie/news/npws-flora-protection-order-2022-map-viewer-%E2%80%93-vascular-plants-charophytes-and-lichens-has-been</u>

is in poor condition. The non-native Butterfly-bush *Buddleja davidii* and Sycamore *Acer pseudoplatanus* are also growing, albeit in small numbers in this area.

To the north-west there is a patch of **wet grassland – GS4**, which is lower in elevation to the rest of the site and slopes towards the stream to the Deerpark Stream. There are occasional Reed Canary-grass *Phalaris arundinacea*, with abundant Point Spear-moss *Calliergonella cuspidata* and Soft Rush *Juncus effussus* as well as Lesser Tussock-sedge *Carex diandra* and saplings of Grey Willow *Salix cinerea*. However, it was not wet underfoot during any survey and, as it is sloping ground there was no standing water.

The northern boundary is characterised by a **hedgerow** – **WL1** with Hawthorn *Crataegus monogyna*, Elder *Sambucus nigra* and Ivy *Hedera helix*. Further to the west of this hedgerow, this line becomes a tall **treeline** – **WL2** with Ash *Fraxinus excelsior* and Oak *Quercus sp*. The treeline is accompanied by a broad **drainage ditch** – **FW4**. Vegetation in this ditch consists of Water-cress *Nasturtium officinale* and (in April 2024) floating patches of the green alga *Clodophora sp*. This joins the Deerpark Stream, which follows the site boundary to the very north-west and is culverted under the distributor road. There are no plants which are listed as alien invasive under Schedule 3 of SI 477 of 2011.

Habitats on the development site can be broadly described as providing few resources for local wildlife although the treeline and hedgerow are of local biodiversity value. Using methodology from the Heritage Council (Foulkes et al., 2011) the hedgerow can be assessed as 'lower significance' due to relatively low species diversity. The treeline is outside the development site boundary as it lies to the north of the drainage ditch.

No plant species were found which is listed as alien invasive under Schedule 3 of S.I. 477 of 2011. No rare or threatened plant species was recorded. Sycamore and Butterfly-bush are both listed as invasive species by the National Biodiversity Data Centre, although this is not a legal status. They are both listed as of 'medium risk' of invasiveness.

The January 2024 survey was undertaken during the optimal period for surveying wintering birds. No wetland, wading or wintering birds were recorded. The lands are not suitable for regularly occurring populations either bird species which is listed as a qualifying interest of the Poulaphouca Reservoir SPA. These species can be associated with farmland and managed grassland which are used for foraging (Balmer et al., 2013). Grasslands on the development site are not managed or in agricultural use and so do not fall into this category.

There are no habitats which are examples of those listed in Annex I of the Habitats Directive while there is no evidence that species listed in Annex II of that Directive are present.

3.4.2 Fauna

The site survey included incidental sightings or proxy signs (prints, scats etc.) of faunal activity, while the presence of certain species can be concluded where there is suitable habitat within the known range of that species. Table 1 details those mammals that are protected under national or international legislation in Ireland. Cells are greyed out where suitable habitat is not present or species are outside the range of the study area.

Table 1 – Protected mammals in Ireland and their known status within the zone of influence². Those that are greyed out indicate either that suitable habitat is not present or that there are no records of the species from the National Biodiversity Date Centre.

Species	Level of Protection	Habitat ³	
Otter Lutra lutra	Annex II & IV Habitats	Rivers and wetlands	
Lesser horseshoe bat Rhinolophus hipposideros	Directive; Wildlife (Amendment) Act, 2000	Disused, undisturbed old buildings, caves and mines	
Grey seal Halichoerus grypus	Annex II & V Habitats Directive;	Coastal habitats	
Common seal Phocaena phocaena	Wildlife (Amendment) Act, 2000		
Whiskered bat <i>Myotis mystacinus</i>		Gardens, parks and riparian habitats	
Natterer's bat <i>Myotis nattereri</i>		Woodland	
Leisler's bat <i>Nyctalus leisleri</i>		Open areas roosting in attics	
Brown long-eared bat <i>Plecotus auritus</i>	Annex IV Habitats Directive;	Woodland	
Common pipistrelle Pipistrellus pipistrellus	Act, 2000	Farmland, woodland and urban areas	
Soprano pipistrelle Pipistrellus pygmaeus		Rivers, lakes & riparian woodland	
Daubenton's bat <i>Myotis daubentonii</i>		Woodlands and bridges associated with open water	
Nathusius' pipistrelle Pipistrellus nathusii		Parkland, mixed and pine forests, riparian habitats	
Irish hare Lepus timidus hibernicus	Annex V Habitats Directive;	Wide range of habitats	

² From the National Biodiversity Data Centre, excludes marine cetaceans

³ Harris & Yalden, 2008

Pine Marten <i>Martes martes</i>	Wildlife (Amendment) Act, 2000	Broad-leaved and coniferous forest
Hedgehog <i>Erinaceus europaeus</i>		Woodlands and hedgerows
Pygmy shrew Sorex minutus	Wildlife (Amendment) Act, 2000	Woodlands, heathland, and wetlands
Red squirrel <i>Sciurus vulgaris</i>		Woodlands
Irish stoat <i>Mustela erminea hibernica</i>		Wide range of habitats
Badger <i>Meles meles</i>		Farmland, woodland and urban areas
Red deer <i>Cervus elaphus</i>		Woodland and open moorland
Fallow deer Dama dama		Mixed woodland but feeding in open habitat
Sika deer Cervus nippon		Coniferous woodland and adjacent heaths

No setts were found and there is no evidence that Badgers are using the lands. All surveys were carried out during the optimal season for Badger survey and access to field boundaries was not problematic. Features on the site are generally of low value for bats. Tall or old trees may have roosting opportunities for bats while foraging habitat is available along both the treeline and hedgerow (as well across the meadow). A series of dedicated bat surveys was carried out by Wildlife Surveys Ireland in July, August and September 2024, which is during the optimal season for bat activity. It found that:

There are limited opportunities for roosting within the site. There are trees at the northwestern edge of the site and a free-standing oak tree south of the centre point of the site, none of which were used by bats during this assessment. [...] In combination with the Bat Activity Survey, it can be stated that there were no bat roosts within the site on July 9th to 10th 2024 (see below). Furthermore, the visual evaluation and static monitor evaluation of August / September 2024 provided a similar conclusion; there were no bat roosts in this period (August to September).

Three species were noted to be active on the site including Common Pipistrelle, Soprano Pipistrelle and Leisler's Bat.

During the bat survey direct observations were made of Hedgehog, Fox and Greater White-toothed Shrew *Crocidura russula*. The latter is a non-native species that is listed by the National Biodiversity Data Centre as at 'medium risk' of invasiveness, although it is not listed as an alien invasive species in SI No 477 of 2011.

Suitable habitat is not present for Otter, Pine Marten or Red Squirrel. Irish Stoat, Hedgehog, Pygmy Shrew and Irish Hare are considered widespread (Lysaght & Marnell, 2016). There was no evidence that deer are using the site.

Non-protected mammals which are likely to be present include Wood Mouse *Apodemus sylvaticus,* House Mouse *Mus domesticus,* and Brown Rat *Rattus norvegicus.* Rabbits *Oryctolagus cuniculus* and Fox *Vulpes vulpes* are likely to be present also although no direct evidence of their presence was recorded.

April falls within the bird breeding season and the following species were noted in 2019: Wren *Troglodyes troglodyes* and Magpie *Pica pica*. In January 2024 Dunnock *Prunella modularis*, House Sparrow *Passer domesticus*, Blackbird *Turdus merula*, and Stonechat *Saxicola torquata* were recorded. During the breeding survey in April 2024 the following species were noted: House Sparrow, Starling *Sturnus vulgaris*, Blue Tit *Parus caeruleus* and Stonechat. A Moorhen *Gallinula chloropus* was nesting in rushes in the drainage ditch.

These birds are listed by BirdWatch Ireland as being of 'low conservation concern' (Green List, Gilbert et al., 2021) with the exception of Starling which is on the amber list (medium conservation concern).

The drainage ditch may provide suitable habitat for spawning Common Frog *Rana temporaria* although during the surveys tadpoles were not noted. Common Lizard *Lacerta vivipara* is considered common and widespread. No direct evidence of its presence was recorded.

Drainage ditches on the site are of low fisheries value and are not suitable for salmonid (Atlantic Salmon *Salmo salar* or Brown Trout *S. truttta*) or migratory (Lamprey *Lampetra sp.*) or European Eel *Anguilla anguilla*. The culvert along the Deerpark Stream is not fish passable. The River Liffey in a broader sense is of salmonid status however, with a run of Brown Trout and Salmon, as well as European Eel. These species are known from downstream of the Poulaphouca Reservoir.

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 in intensive agricultural grassland. Other protected invertebrates are confined to freshwater and wetland habitats and so are not present on this site.



Figure 2 – Habitat map of the development lands

3.5 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 an area of former agricultural land with traditional field boundaries on one side. There are no examples of habitats listed on Annex I of the Habitats Directive or records of rare or protected plants. There are no plant species listed as alien invasive. Woodland field boundaries provide habitat for a variety of plant and animal species including breeding birds and foraging bats.

Significance criteria are available from guidance published by the National Roads Authority (NRA, 2009). From this an evaluation of the various habitats and ecological features on the site has been made and this is shown in table 2.

Hedgerow – WL1	
Treeline – W2	
Stand-alone Oak	
Dry meadow – GS2	Low local value
Wet grassland – GS4	
Drainage ditch – FW4	
Deerpark Stream	

Table 2 Evaluation of the importance of habitats and species on the subject site

4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development principally comprises the construction of a mixed-use development with a gross floor area of 23,219.1 square metres and ranging in height from 1 No. to 5 No. storeys that includes: 233 No. residential dwellings (24 No. 1-bed, 103 No. 2-bed, 94 No. 3-bed and 12 No. 4-bed), of which 185 No. are houses (103 No. 2-bed, 70 No. 3-bed and 12 No. 4-bed) and 48 No. are apartments/duplexes (24 No. 1-bed and 24 No. 3-bed); 36 No. 'later living' dwellings (12 No. 1-bed and 24 No. 2-bed), of which 12 No. are houses (all 2-bed) and 24 No. are apartments (12 No. 1-bed and 12No. 2-bed); a medical centre (224 sq m); a pharmacy (115 sq m); and a café (60 sq m).

The development also comprises: 2 No. multi-modal entrances/exits with junctions at Blessington Inner Relief Road to the north-west and the local street to the south-west; a new pedestrian/cycle crossing to the south-east at the local street; upgrades to the Blessington Inner Relief Road roundabout to the west, including pedestrian/cycle crossings; new pedestrian/cycle crossing at Blessington Inner Relief Road to the north-west; 341 No. car parking space; cycle parking; hard and soft landscaping including public open space, communal amenity space and private amenity space (as gardens, balconies and terraces facing all directions); boundary treatments; 3 No. sub-stations; bin stores; public lighting; PV arrays atop all dwellings; PV array, lift overrun and plant atop the 5-storey mixed-use building; and all associated works above and below ground.



Figure 3 – Development overview

5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

This section provides a description of the potential impacts that the proposed development may have on biodiversity in the absence of mitigation. Methodology for determining the significance of an impact has been published by the NRA. This is reproduced in table 3 and is based on the valuation of the ecological feature in question (table 2) and the scale of the predicted impact. In this way it is possible to assign an impact significance in a transparent and objective way. Table 4 summaries the nature of the predicted impacts.

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 dry meadow and wet grassland habitat. External hedgerows and treelines are to be retained along with associated sections of ditch. The old Oak is to be removed. With the exception of the installation of a surface water headwall, no works are to be carried out to the drainage ditch, which will remain open and unchanged. The loss of habitat will impact species and habitats which are common and widespread. It will not significantly affect the population structure or functioning of any species.

According to the bat survey report:

There will be a moderate long term negative impact on local bat populations due to lost feeding and commuting opportunities. Without mitigation and under the effects of lighting, the loss of the northern trees and scrub will have the greatest impact, but loss of scrub and pasture will also affect species such as Leisler's bat feeding within the site.

The impact to biodiversity is therefore minor negative.

2. The direct mortality of species during demolition. This impact is most acute during the bird breeding season which can be assumed to last from March to August inclusive. Trees, hedgerows, patches of Bramble and treeline, including the drainage ditch provide suitable nesting habitat and mitigation will be required during the construction phase as all birds' nests and eggs are protected under the Wildlife Act. Potential bat roosts are present in tall and old trees with cracks while all bat species in Ireland are strictly protected under national and EU legislation.

In the absence of mitigation this impact is major negative.



Figure 4 – Showing retention of trees and hedgerow to the north

- 3. Pollution of water courses through the ingress of silt, oils and other toxic substances. The development site is close to drainage pathways which reach the River Liffey and the ingress of silt, in particular, can result in degradation of fish habitat. Although sensitive fish habitat is not present immediately downstream, best practice should be followed for the prevention of pollution. Without mitigation this impact is minor negative.
- 4. Impact to trees and hedgerows to be retained. The compaction of soil within the root zones of trees, through the movement of machinery or the storage of construction materials, can result in permanent damage to trees. Without proper safeguards, this could affect all of the trees and linear woodlands to be retained. This impact is potentially moderate negative.

Operation Phase

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

5. The proposed development will result in additional volumes of foul wastewater. Foul and surface drainage infrastructure will be separated. Foul effluent from the proposed development will be sent to the wastewater treatment plant for Blessington which is licenced by the EPA to discharge treated effluent to the River Liffey (licence no.: D0063-01). Emissions in 2023 from the plant were fully in compliance with emission limit values set under the Urban Wastewater

Treatment Directive. The Annual Environmental Report (AER) for that year – the most recent available - indicates plant has a design capacity 9,000 PE (population equivalent) and both mean and maximum loadings are well within this limit. The plant was recently upgraded to accommodate for population expansion.

Monitoring of the receiving water (the River Liffey) is carried out at points both upstream and downstream of the outfall point. The AER states that "the discharge from the wastewater treatment plant does not have an observable impact on the water quality. The discharge from the wastewater treatment plant does not have an observable negative impact on the Water Framework Directive status." This development will increase demand on the treatment plant however suspected pollution issues are not related to the treatment plant capacity. The impact to biodiversity from this source is neutral.

6. Surface water run-off from roofs and driveways will discharge to a surface water sewer via attenuation storage tanks, flow control devices, permeable paving, tree pits, rain gardens, swales and oil/grit interceptors. In this way surface water quantity and quality will be maintained at a 'greenfield' standard.

The impact to biodiversity from this source is neutral.

7. Artificial lighting. Artificial lighting can affect areas beyond the site boundary. According to the bat survey report:

There will still be increased light pollution from the overspill of domestic lighting, street lighting and security lighting. There will be a mild negative long term to permanent negative impact on individual bats.

8. Protected areas. No impacts are predicted to occur Natura 2000 sites (SACs or SPAs), principally due to the separation distance between the site and these areas, particularly the Poulaphouca Reservoir SPA. A full assessment of potential effects to these areas is contained within a separate Screening Report for Appropriate Assessment.

Table 3: Determination of	f significance matrix	taken from NRA	guidance	Appendix 4	l (2006)
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Impost Loval	Site category				
Impact Level	A	В	С	D	E
Severe negative	Any permanent impact	Permanent impact to a large part of the site			
Major negative	Temporary impact to a large part of the site	Permanent impact to a small part of the site	Permanent impact to a large part of the site		

Moderate negative	Temporary impact to a small part of the site	Temporary impact to a large part of the site	Permanent impact to a small part of the site	Permanent impact to a large part of the site	
Minor negative		Temporary impact to a small part of the site	Temporary impact to a large part of the site	Permanent impact to a small part of the site	Permanent impact to a large part of the site
Neutral (Negligible)	No impact	No impact	No impact	No impact	Permanent impact to a small part of the site
Minor positive				Permanent beneficial impact to a small part of the site	Permanent beneficial impact to a large part of the site
Moderate positive			Permanent beneficial impact to a small part of the site	Permanent beneficial impact to a large part of the site	
Major positive		Permanent beneficial impact to a small part of the site	Permanent beneficial impact to a large part of the site		

Table 4: Significance	level of likely	impacts ir	n the absence	e of mitigation
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Impact		Significance	
Construction	phase		
1	Loss of habitat	Minor negative – permanent loss of a small proportion of the habitat	
2	Mortality to animals during	Major negative - permanent impacts to species of	
2	construction	high local value/or species with legal protection	
3	Pollution of water during construction phase	Minor negative	
4	Damage to trees to be	Moderate negative	
retained		-	
Operation phase			
5	Wastewater pollution	Neutral	
6	Surface water pollution	Neutral	
7	Artificial lighting	Moderate negative	
8 Protected areas		Neutral	

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

5.2 Cumulative impacts

A number of the identified impacts can also act cumulatively with other impacts from similar developments in the Blessington 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, artificial lighting, 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. The subject lands were identified for residential development under the Wicklow County Development Plan 2022-2028. This plan was subject to AA Screening by the planning authority and this concluded that its implementation would not result in negative effects to Natura 2000 site.

6 AVOIDANCE, REMEDIAL AND MITIGATION MEASURES

This report has identified three impacts that were assessed as 'moderate' or 'major' negative and therefore mitigation is needed to reduce the severity of these potential effects.

6.1 Mitigation Measures Proposed

The following mitigation measures are proposed for the development :

Construction Phase

1a: Disturbance of birds' nests

Deliberate disturbance of a bird's nest is prohibited unless under licence from the National Parks and Wildlife Service. The removal of vegetation should be undertaken outside the nesting period (March to July inclusive). Where this is not possible, vegetation must be inspected for the presence of nests. If no nest is found, vegetation can be removed within 48 hours. Where a nest is found, vegetation can only be removed after young birds have fledged, or under licence.

1b: Impacts to bats.

The following mitigation measures are provided in the bat survey report:

Tree Felling

The oak tree shall be assessed by a bat specialist prior to felling. A bat activity survey may allow assessment of the tree in advance of felling to provide further protection to bats. The tree may also be assessed by means of a MEWP (hoist, cherry picker etc.) and given its size, this could be comprehensive. Felling in September or October would ensure that no breeding bats are present, and bats are not in hibernation as well as avoiding nesting birds.

Bat boxes

6 x Schwegler 2F bat boxes shall be erected on remaining mature trees or, where this is not possible, on buildings or walls that will not be illuminated.

2. Pollution during construction

Although not assessed as moderate or major negative impact to biodiversity, every effort should be made to avoid pollution during construction. A Construction and Environmental Management Plan has been prepared, and includes pollution prevention measured in accordance with best practice guidelines from Inland Fisheries Ireland (2016). This includes measures for the storage of potentially polluting substances and specific measures to prevent the loss of silt-laden water to any water course, including the installation of suitably designed silt traps, so that any discharge is only of clean, silt-free water.

Operation Phase

3. 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):

RPA(m2) = π (stem diameter mm 12)/1,000) x2

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.

4. Artificial lighting.

The following mitigation is taken from the bat survey report:

Lighting shall be controlled to avoid light pollution of green areas and shall be targeted to areas of human activity and for priority security areas. Motion-activated sensor lighting is preferable to reduce light pollution.

• None of the remaining mature trees shall be illuminated and any trees that are planted shall not be directly illuminated.

• Dark corridor for movement of bats through the site. Lighting should be directed downwards away from the treetops. The northern area must remain unlit. Areas such as the SUDS area, the Pocket Park and the local plaza must retain light levels of less than 3 lux and ideally approaching 0 lux.

• All lights shall lack UV elements when manufactured and shall be LED.

• A warm white spectrum (ideally <2700 Kelvin but as low as the Council limitations allow) shall be adopted to reduce blue light component.

• Lights shall feature peak wavelengths higher than 550 nm.

• Where lighting is required for pedestrians, bollard lighting shall be used

5. Habitat creation

Although the loss of habitat has been assessed as minor negative, new habitat features will be created post-construction through the implementation of landscape planting. This includes native trees and pollinator-friendly planting that will compensate for the loss of habitat over the medium- to long-term.

The bat report recommends that:

Planting should include species that enhance nocturnal insect diversity including plants such as honeysuckle, night scented stock, Nicotiana. Mixes such as hawthorn, hazel and willow all benefit insects and therefore, bats.

8 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.

No negative effects to biodiversity are predicted to arise from this development which could be considered greater than minor negative.

9 MONITORING

Monitoring is required where the success of mitigation measures is uncertain or where residual impacts may in themselves be significant. After mitigation, no significant effects are likely to arise as a result of this development to flora and fauna and so monitoring is not required.

10 REFERENCES

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