Ecological Impact Statement for a proposed development at Mount St. Mary's, Dundrum Road, Dublin 14

Compiled by OPENFIELD Ecological Services

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For Dún Laoghaire-Rathdown County Council

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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). This included a desk-based study to gather available information on the biodiversity of the development site as well as field studies.

A site visit was carried out on the 31st of July 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).

July lies within the optimal period for general habitat surveys (Smith et al., 2010) and so it was possible to classify all habitats on the site to Fossitt level 3. July lies within the season for surveying breeding birds but is sub-optimal. July is sub-optimal for surveying amphibians and larger mammals, such as Badger. A survey of the site for its suitability for roosting and foraging bats was carried out by Altemar.

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.

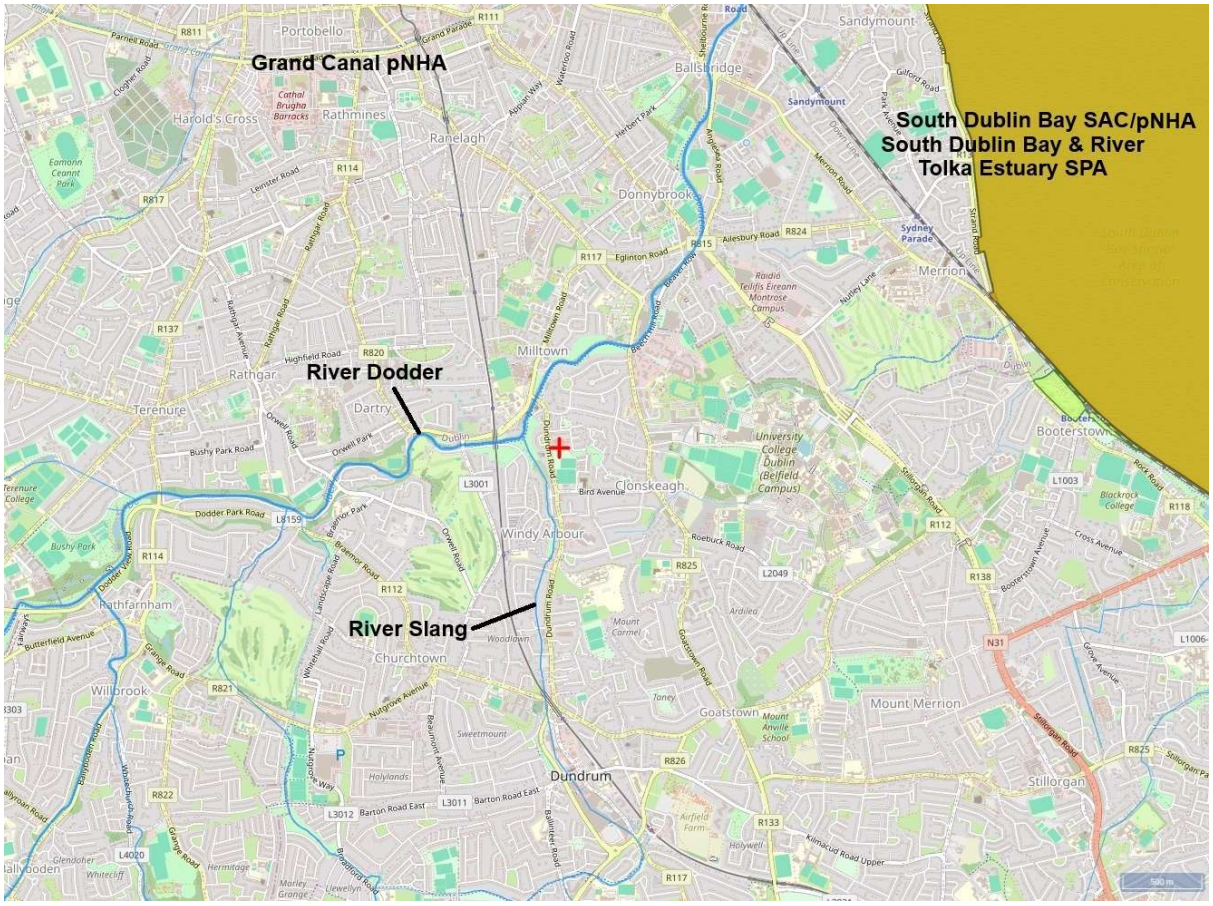

Figure 1 – Site location (red cross) showing local water courses and areas designated for nature conservation (from www.epa.ie).

There is no system in Ireland for the designation of sites at a local, or county level. The following areas were found to be located within the zone of influence of the application site:

Grand Canal pNHA (site code: 2104): The Grand Canal was constructed in the 18th century and links Dublin to the River Shannon. It is a nationally valuable wildlife corridor and is home to a wide range of plants and animals, many of conservation value, including the Otter *Lutra lutra*.

South Dublin Bay SAC/pNHA (side code: 0210; c.850m from the development site) is concentrated on the intertidal area of Sandymount Strand. It has one qualifying interest (i.e. feature which qualifies the area as being of international importance) which is mudflats and sandflats not covered by seawater at low tide.

North Dublin Bay SAC/pNHA (site code: 0206); 6.3km from the development site) is focused on the sand spit on the North Bull island.

South Dublin Bay and Tolka Estuary SPA (side code: 4024; c.850m from the development site) is largely coincident with the SAC boundary with the exception of the Tolka Estuary.

The **North Bull Island SPA** (site code: 0206; c.4.7km from the development site) is largely coincident with the North Dublin Bay SAC with the exception of the terrestrial portion of Bull Island. Table 1 lists the features of interest for these SPAs.

Dublin Bay is recognised as an internationally important site for water birds as it supports over 20,000 individuals.

Table 1 – Qualifying interests for both the South Dublin Bay and Tolka Estuary SPA and the North Bull Island SPA in Dublin Bay (EU code in square parenthesis)

Light-bellied Brent Goose (*Branta bernicla hrota*) [A046]
Oystercatcher (*Haematopus ostralegus*) [A130]
Ringed Plover (*Charadrius hiaticula*) [A137]
Grey Plover (*Pluvialis squatarola*) [A140]
Knot (*Calidris canutus*) [A143]
Sanderling (*Calidris alba*) [A144]
Dunlin (*Calidris alpina*) [A149]
Bar-tailed Godwit (*Limosa lapponica*) [A157]
Redshank (*Tringa totanus*) [A162]
Black-headed Gull (*Croicocephalus ridibundus*) [A179]
Roseate Tern (*Sterna dougallii*) [A192]
Common Tern (*Sterna hirundo*) [A193]
Arctic Tern (*Sterna paradisaea*) [A194]
Wetlands & Waterbirds [A999]

The NPWS web site (www.npws.ie) contains a mapping tool that indicates historic records of legally protected species within a selected Ordnance Survey (OS) 10km grid square. The development site is located within the square O13 and six species of protected flowering plant are highlighted. These species are detailed in Table 2. It must be noted that this list cannot be seen as exhaustive as suitable habitat may be available for other important and protected species.

Table 2 – Known records for protected species within the O13 10km square

Species	Habitat[1]	Current status[2]
Groenlandia densa Opposite-leaved Pondweed	Rivers, canals and estuarine mud	Current
Galeopsis angustifolia Red Hemp-nettle	Calcareous gravels	Record Pre-1970
Hordeum secalinum Meadow Barley	Upper parts of brackish marshes, chiefly near the sea	
Puccinellia fasciculata Borrer's salt-marsh grass	Muddy inlets on the coast	
Hypericum hirsutum Hairy St. John's-wort	Woods and shady places	Current
Viola hirta Hairy Violet	Sand dunes, grasslands, limestone rocks	

In summary it can be seen that of the six species only three records remain current. Opposite-leaved Pondweed was recorded as being 'common in the Grand Canal' in the *Flora of County Dublin* (Doogue et al., 1998). This source elaborates that the plant was "scattered along the Grand Canal at Dolphin's Barn from Portobello to Charlemont Bridge, and between Drimnagh and Kilmainham." Hairy Violet is recorded from "Calcareous grassland at the Magazine Fort in the Phoenix Park" while Hairy St. John's-wort is recorded from "the River Liffey at Knockmaroon."

Water quality in rivers is monitored on an on-going basis by the Environmental Protection Agency (EPA). The proposed development site is located within the Liffey river system. Natural hydrological pathways have been severely disrupted in this area due to sealing of soil and the installation of networks of sewers. Nevertheless, maps from the EPA show no water courses in the immediate vicinity of the site. The River Dodder flows approximately 160m to the north-west while the River Slang, a tributary of the River Dodder, flows approximately 130m to the west. The direction of flow is towards the north and east, where they enter the River Liffey in Dublin City Centre. Both water bodies (River Dodder/Slang and Lower Liffey Estuary) have been assessed as 'moderate' status under the Water Framework Directive reporting period 2016-2021.

The coastal waters of Dublin Bay meanwhile are 'good'. These data are taken from the ENVision mapping tool on www.epa.ie in October 2024.

3.2 Site Survey

Aerial photography and historic mapping from the Ordnance Survey Ireland show that the vicinity of the

[1] Parnell et al., 2012

[2] Preston et al., 2002

development site has long been a part of the built environment of Dublin City. The immediate vicinity of the site is entirely composed of buildings and artificial surfaces as well as grassland used as playing pitches.

3.2.1 Flora

The development lands themselves are centred on a field of **dry meadow – GS1** with abundant grasses such as Cock's-foot *Dactylis glomerata,* Creeping Bent *Agrostis capillaris* and Common Couch *Elytrigia repens* along with Creeping Thistle *Cirsium arvense,* Nettle *Urtica dioica* and Cow Parsley *Anthriscus sylvestris.*

To the east of this there is a small area of **amenity grassland – GA2** with occasional trees including Eucalyptus *Eucalyptus sp,* Sycamore *Acer pseudoplatanus* and Whitebeam *Sorbus sp.* There is a small expanse of **artificial surface – BL3** in this area also.

The southern boundary is marked by a **treeline – WL2** which is composed of widely spaced, mid-aged Lime *Tilia sp.,* Cherry *Prunus sp.* and Aspen *Populus tremula.*

A treeline to the west and north is composed of tall Ash *Fraxinus excelsior,* Birch *Betula sp.,* Scots Pine *Pinus sylvestris,* Cherry, Eucalyptus and Lime and is accompanied by a broad band of Bramble *Rubus fruticosus agg.* **scrub – WS1**.

To the north of this treeline there is a small grove of **scattered trees – WD5** with Sycamore, Horse Chestnut *Aesculus hippocastanum* and Lime.

There are no plant species growing on the site which are listed in SI No. 477 of 2011 as alien invasive.

There are no water courses, wet ditches, bodies of open water or habitats that could be described as wetlands.

The development site is surrounded on all sides by built development and transport arteries which are accompanied by a high level of human disturbance from noise and artificial light sources.

3.2.2 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 3 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 3 – Protected mammals in Ireland and their known status within this 10km grid square[3]. 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[4]
Otter *Lutra lutra*	Annex II & IV Habitats Directive; Wildlife (Amendment) Act, 2000	Rivers and wetlands
Lesser horseshoe bat *Rhinolophus hipposideros*		Disused, undisturbed old buildings, caves and mines
Grey seal *Halichoerus grypus*	Annex II & V Habitats Directive; Wildlife (Amendment) Act, 2000	Coastal habitats
Common seal *Phocaena phocaena*		
Whiskered bat *Myotis mystacinus*	Annex IV Habitats Directive; Wildlife Act (Amendment), 2000	Gardens, parks and riparian habitats
Natterer's bat *Myotis nattereri*		Woodland
Leisler's bat *Nyctalus leisleri*		Open areas roosting in attics
Brown long-eared bat *Plecotus auritus*		Woodland
Common pipistrelle *Pipistrellus pipistrellus*		Farmland, woodland and urban areas
Soprano pipistrelle *Pipistrellus pygmaeus*		Rivers, lakes & riparian woodland
Daubenton's bat *Myotis daubentonii*		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; Wildlife Act (Amendment), 2000	Wide range of habitats
Pine Marten *Martes martes*		Broad-leaved and coniferous forest
Hedgehog *Erinaceus europaeus*	Wildlife (Amendment) Act, 2000	Woodlands and hedgerows
Pygmy shrew *Sorex minutus*		Woodlands, heathland and wetlands
Red squirrel *Sciurus vulgaris*		Woodlands

[3] From the National Biodiversity Data Centre, excludes marine cetaceans
[4] Harris & Yalden, 2008

Irish stoat *Mustela erminea hibernica*		Wide range of habitats
Badger *Meles meles*		Farmland, woodland and urban areas
Red deer *Cervus elaphus*		Woodland and open moorland
Fallow deer *Dama dama*		Mixed woodland but feeding in open habitat
Sika deer *Cervus nippon*		Coniferous woodland and adjacent heaths

Fox *Vulpes vulpes,* was noted during the site survey and it is likely a breeding den is present, perhaps within the scrub area. Fox is not a protected species and is common in Dublin city. This is the only mammals species for which direct evidence was recorded.

The habitats of the site are suitable for Badgers although no signs of their activity were noted during the survey (latrines, prints, setts etc.), notwithstanding the fact that July is sub-optimal for Badger survey.

There are no water courses or wetlands which provide habitat for Otter.

A survey of bat activity was carried out by Altemar during the optimal flight period in 2024. Their report found that “Two relatively common bat species (lesser noctule & soprano pipistrelle) were recorded on site. Several trees of moderate bat roosting potential are proposed to be felled including an Ash Tree (Tree 759) where a soprano pipistrelle roost is located.”

Small mammals such as the Irish Stoat, Hedgehog and Pygmy Shrew are considered more or less widespread in the Irish countryside, including on land in suburban areas, however they are unlikely to be presenst given the lack of semi-natural habitat (Lysaght & Marnell, 2016). Rabbits *Oryctolagus cuniculus* are common in Dublin (although no evidence of their presence was recorded) along with Brown Rat *Rattus norvegicus*, House Mouse *Mus domesticus* and Field Mouse *Apodemus sylvaticus*. These species are not protected.

July is within the suitable season for surveying breeding birds but is sub-optimal as nesting has ceased for some species. Trees and scrub provide opportunity for a variety of common nesting birds. No birds were noted during the site survey.
There are no suitable habitats on the site for amphibians. No amphibians were seen on site. No lizards were seen on the site. The River Dodder, which flows nearby, has high fisheries value however there is no pathway from the development site to this river.

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 built-up sites. Other protected invertebrates are confined to freshwater and wetland habitats and so are not present on this site.

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

In summary it has been seen that the proposed development site is within a built-up area of Dublin. 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 as per SI 477 of 2011.

Significance criteria are available from guidance published by the National Roads Authority (NRA, 2009). These are reproduced in table 4. From this an evaluation of the various habitats and ecological features on the site has been made and this is shown in table 6.

Figure 2 – Habitats of the development site

Table 4 Site evaluation scheme taken from NRA guidance 2009

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

Table 5 Evaluation of the importance of habitats and species on the subject site

Dry meadow – GS2 Scrub – WS2 Treeline – WL2 Scattered trees – WD5	Low local value
Amenity grassland – A2 Artificial surfaces – BL3	Negligible value

4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The development will consist of 129 no. residential units together with associated infrastructure including open space and car/cycle parking and is a mixture of duplexes and apartments in 3 no. buildings ranging in height from two to part six stories.

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 based on the valuation of the ecological feature in question (table 5) 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 6 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 habitats including grassland and trees. 22 out of a total of 71 trees are to be removed either due to their condition or conflict with the scheme design, as shown in figure 4. The loss of these features will result in negative effects to species which are common and widespread in the city and countryside. Loss of habitat will not affect the integrity of any species at a population level. Planting new trees and shrubs as part of a landscaping programme will ensure that in the longer term, habitats for common species will be retained. The landscaping layout is shown in figure 5.

Figure 4 – Layout showing trees to be removed/retained

Figure 5 – Landscaping masterplan

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. Vegetation on the site is suitable for nesting birds, particularly in trees and scrub. Any disturbance to nesting birds is an offence under the Wildlife Act.

While Fox is not a protected species measures can and should be taken to avoid direct mortality.

A bat roost was confirmed from an Ash tree on the site and which is due to be felled. A derogation licence will be required in order to carry out these works.

In the absence of mitigation, the potential negative effect here is **major negative**.

3. Pollution of water courses through the ingress of silt, oils and other toxic substances. There is no direct pathway between the development site and the River Dodder/Slang and so the risk of pollution to water courses is extremely low. During the construction phase, at worst, the impact is **neutral**.

5.2 Operational Phase

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

mitigation:

4. Pollution of water from foul wastewater arising from the development. Wastewater will be sent to the municipal treatment plant at Ringsend. Upgrade works are underway as the plant is not currently meeting its requirements under the Urban Wastewater Treatment Directive. Pollution effects are most acute in freshwater systems where the capacity for dilution is low and the consequent risk of eutrophication is high. The Ringsend WWTP discharges into Dublin Bay which is currently classified as 'good status' by the EPA despite long-running compliance issues at the plant. A separate screening report for Appropriate Assessment specifically examines the impacts of this project on Natura 2000 sites in Dublin Bay and found that no significant effects are likely to arise to these areas. Uisce Éireann is currently undertaking upgrading works on a phased basis and, upon completion, compliance issues will be comprehensively addressed.

5. 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. The proposed development will include SUDS measures in order to maintain run-off at a 'greenfield' rate. This will include Green roof (interception storage), Blue roof (attenuation storage), Permeable surface (reduced run-off), Aco-Drains (surface water drainage), Tree Pits (attenuation storage), Soakaway (absorption & attenuation). Petrol Interceptor (environmental) and French Drain (infiltration & transportation). Because of SUDS measures there will be no effect arising to the quantity and quality of surface run-off. However, these are not measures which are included to reduce or avoid an effect to a Natura 2000 site and so are not mitigation in the context of Appropriate Assessment Screening.

6. Artificial Lighting. Increases in artificial lighting can affect biodiversity although little data is available for most species groups. Research has focused on bats, which are sensitive to artificial lighting to varying degrees. For sensitive species, lighting can result in an effective loss of habitat or severing of foraging or commuting routes. This impact must be considered in the context of the existing surroundings which are already highly urbanized and lit with artificial lighting.

According to the bat report "Lighting during construction and operation could potentially lead to impacts on foraging, however the lighting has been designed to minimise light spill onto treelines. It would be expected that bats would continue to forage on site."

In the absence of mitigation measures the effects from lighting are **moderate negative.**

7. Impacts to protected areas.

Impacts to Natura 2000 sites (SACs or SPAs) in Dublin Bay are not likely to occur, principally due to the separation distance between the site and these areas. There is an indirect pathway to these Natura 2000 sites via the foul and surface sewers. A full assessment of potential effects to these areas is contained within a separate Screening Report for Appropriate Assessment. There are no pathways to the Grand

Canal pNHA or any other areas which are protected for biodiversity and so no effects to any other conservation sites can arise.

Table 7: Significance level of likely impacts in the absence of mitigation

Impact		Significance
Construction phase		
1	Loss of habitat	Minor negative
2	Mortality to animals during construction	Moderate negative – impact to features with legal protection
3	Pollution of water during construction phase	Neutral – no impacts
Operational phase		
4	Wastewater pollution	Neutral – no impacts
5	Surface water pollution	Neutral – no impacts
6	Artificial lighting	Neutral – no impacts
7	Protected areas	Neutral – no impacts

Overall it can be seen that one potential moderate negative impact is predicted to occur as a result of this project in the absence of mitigation.

5.2 Cumulative impacts

Potentially cumulative impacts were identified based on projects which are permitted or planned in the immediate vicinity of the development site as well as through the catchment of the Ringsend wastewater treatment plant. While not considered necessary to list these individually, these include new development on brown-field sites, infrastructure projects such as roads and drainage, as well as new developments on green-field sites. Development throughout Dublin is based upon forward planning by the four local authorities in Co. Dublin and their associated development plans. Each of these plans has been subject to Strategic Environmental Assessment and, where relevant, mitigation has been proposed to ensure significant effects to the environment do not occur.

Additional loading to the Ringsend Wastewater Treatment Plant will not result in negative effects to biodiversity as upgrading works are currently underway to meet licence standards.

Due to the post-construction landscaping, the proposed development is not contributing to a cumulative loss of habitat which may be acting cumulatively in this vicinity and no significant effects will arise from this source.

The development will not significantly add to the level of artificial lighting already being experienced in this vicinity.

There are no effects which could act in a cumulative way to result in negative impacts to biodiversity.

6 AVOIDANCE, REMEDIAL AND MITIGATION MEASURES

This report has identified one impact that was assessed as 'moderate negative' and therefore mitigation is needed to reduce the severity of this potential effect.

6.1 Mitigation Measures Proposed

The following mitigation measures are proposed for the development

Construction Phase

1. Disturbance of birds' nests

Deliberate disturbance of a bird's nest is prohibited unless under licence from the National Parks and Wildlife Service (NPWS). Site clearance works, including removal of vegetation or felling of trees, should proceed outside the nesting season, i.e. from September to February inclusive. This measure will also ensure that Fox cubs, if breeding on the site, will not be entombed.

2. Disturbance of bats

From the bat report:

The following mitigation will be put in place:

- A pre-construction inspection of trees to be felled will be carried out. A derogation licence will be acquired for the Ash tree (Tree 759).
- A pre felling inspection of the trees will be carried out by a bat specialist. If no bats are present during the inspection the tree will be felled in sections and lowered to the ground, where the sections will remain for 24 hours. If a bat is, or bats are, found, a specialist, licenced in manual handling of bats, will oversee the removal of the bat from the tree and the safe relocation of the bat to a suitable site within the site outline. This may include the placing or the bat in a cardboard box for release at night or placing the bat in a safe suitable temporary roosting location, depending on weather conditions.
- 3 Bat boxes will be placed on site in consultation with the project ecologist.

3. Artificial lighting

From the bat report:

- Lighting at all stages will be done sensitively on site with no direct lighting on perimeter treelines and will comply with the sensitive public lighting design. Lighting will follow the Bat Conservation Ireland "Bats & Lighting Guidance Notes for: Planners, engineers, architects and developers (December 2010).
- Lighting will comply with bat lighting guidelines

4. Construction pollution. Moderate negative (or greater) impacts are not predicted to arise to water courses during construction. Nevertheless, every effort should be made to avoid pollution during this phase. This should include storage of fuels and other dangerous substances in bunded areas and ensuring that sediment laden water does not enter surface sewers. Silt traps and/or settlement ponds will be used so that only clean water leaves the development stie.

7 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.

For all impacts which have been identified, after mitigation, no residual effects are likely to arise to biodiversity arising from this project which can be assessed as moderate negative or greater.

The bat report concludes that "The proposed development will result in a long term/low adverse/not significant/negative impacts on bats."

8 MONITORING

Monitoring is required where the success of mitigation measures is uncertain or where residual impacts may in themselves be significant. The bat report recommends that:

A post construction lighting assessment will be carried out by the project ecologist.

9 REFERENCES

Bullock C., Kretch C. & Candon E. 2008. *The Economic and Social Aspects of Biodiversity*. Stationary Office.

Colhoun K. & Cummins S. 2013. *Birds of Conservation Concern in Ireland 2014 – 2019.* Irish Birds. Volume 9 Number 4 pg523-541.

Cooney R. & Dickson B. 2005. *Biodiversity and the Precautionary Principle.* Earthscan.

Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora

Council Directive 97/11/EEC of 3rd March 1997 amending Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment

Council Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy – more commonly known as the Water Framework Directive

Curtis T.G.F.& McGough H.N. 1988. *The Irish Red Data Book 1: Vascular Plants.* Stationary Office.

Department of Arts, Heritage and the Gaeltacht. 2011. *Actions for Biodiversity 2011 – 2016. Ireland's National Biodiversity Plan.*

DG Environment. 2010. *Natura 2000 European Commission Nature and Biodiversity Newsletter.* Number 28. June 2010. ISSN: 1026-6151.

Doogue D., Nash D., Parnell J., Reynolds S., & Wyse Jackson P. 1998. *Flora of County Dublin.* The
Dublin Naturalists' Field Club.

EPA. 2002. *Guidelines on the information to be contained in Environmental Impact Statements.*

EPA, 2003. *Advice Notes on Current Practice (in the preparation of Environmental Impact Statements)*

EPA. 2019. *Water Quality in Ireland 2013-2018.*

Fitter R., Fitter A. & Farrer A. 1984. *Grasses, sedges, rushes and ferns of Britain and Northern Europe.* Collins.

Fossitt J. 2000. *A Guide to Habitats in Ireland*. Heritage Council.

Harris S. & Yalden D.W. 2008. *Mammals of the British Isles: Handbook, 4th Edition.* The Mammal Society.

Heritage Council. 2002. *Draft Habitat Survey Guidelines*. The Heritage Council.

Hill M.O., Blackstock T.H., Long D.G. and Rothero G.P 2008. *A Checklist and Census Catalogue of British and Irish Bryophytes.* British Bryological Society.

Hundt L. 2012. *Bat Surveys: Good Practice Guidelines. 2nd Edition.* Bat Conservation Trust.

IEEM. 2018. *Guidelines for Ecological Impact Assessment in the United Kingdom.* Institute of Ecology and Environmental Management.

Institute of Environmental Assessment, 1995. *Guidelines for Baseline Ecological Assessment*'

Johnson O. & More D., 2004. *Tree Guide*', Collins

Mason C.F. 1996. *Biology of Freshwater Pollution.* Longman.

Morris P. & Therivel R., 2001. *Methods of Environmental Impact Assessment,* Spon Press

NRA. 2009. *Guidelines for Assessment of Ecological Impacts of National Road Schemes.* National Roads Authority.

Parnell J. & Curtis T. 2012. *Webb's An Irish Flora.* Cork University Press.

Preston C.D., Pearman D.A. & Dines T.D. 2002. *New Atlas of the British & Irish Flora*. Oxford University Press.

Rich C. & Longcore T. Editors. 2006. *Ecological Consequences of Artificial Night Lighting.* Island Press.

Sargent G. & Morris P. 2003. *How to Find & Identify Mammals.* The Mammal Society.

Smith G. F., O'Donoghue P., O'Hora K. and Delaney E. 2010. *Best Practice Guidance for Habitat Survey and Mapping.* Heritage Council.

Stace C. 2010. *New Flora of the British Isles.* Cambridge University Press Statutory Instrument No. 94

of 1999. Flora (Protection) Order

Treweek J., 1999. *Ecological Impact Assessment*', Blackwell Science.

United Nations. 1992. *Convention on Biological Diversity*