Ecological Impact Assessment

Proposed residential development at
'Capri', Whitechurch Road,
Rathfarnham, Dublin 16

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Executive Summary

This Ecological Impact Assessment has been prepared by NM Ecology Ltd on behalf of Gerard O'Connor as part of a planning application for a residential development at the 'Capri' property on Whitechurch Road, Rathfarnham, Dublin 16. The proposed development will involve the demolition of a derelict residence, and the construction of 4 no. replacement residences, with associated paved areas, landscaping and services. The aim of this report is to identify, quantify and evaluate the impacts of the proposed development on ecosystems and their components, including designated sites, habitats, flora and fauna.

There are no designated sites within 2 km of the proposed development site, and no viable pathways for indirect impacts on distant designated sites. A stand-alone *Screening for Appropriate Assessment* report accompanies this application.

Habitats within the proposed development site include: buildings and artificial surfaces, dry meadows, treelines / hedgerows, and a stream. No rare or protected plant species were observed. The stream is considered to be of local importance, but it will not be directly affected during construction works, and will be incorporated into the development. All other habitats are considered to be of negligible value, and their clearance will have no ecological impact. An invasive plant species – Japanese knotweed – was recorded in the north-east of the site. It is listed on the third schedule of the *EC Birds and Natural Habitats Regulations* 2011 (as amended), and it is an offence to cause it to spread.

A series of pollution-control measures will be implemented during construction works in order to avoid or minimise the risk of any potential indirect impacts on the stream and downstream watercourses. Impacts on nesting birds will be avoided by scheduling site clearance works for the non-breeding season (October – February, inclusive), or by commissioning a pre-construction survey by a suitably-qualified ecologist. All Japanese knotweed will be excavated and disposed of by a specialist contractor in advance of construction works, under the terms of a derogation licence issued by the National Parks and Wildlife Service.

Subject to the successful implementation of these measures, it can be concluded that the proposed development will not cause any significant negative impacts on designated sites, habitats, legally protected species, or any other features of ecological importance.

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1 Introduction

The aim of this Ecological Impact Assessment (EcIA) is to identify, quantify and evaluate the impacts of the proposed development on ecosystems and their components, including designated sites, habitats, flora and fauna. It has been prepared in accordance with the *Guidelines for Ecological Impact Assessment in the UK and Ireland* (2018), which are the primary resources used by members of the Chartered Institute of Ecology and Environmental Management (CIEEM).

The purpose of this document is to:

- Provide an objective and transparent assessment of the potential ecological impacts of the proposed development for all interested parties, including planning authorities and the general public
- Facilitate objective and transparent determination of the consequences of the development in terms of national, regional and local policies relevant to ecology
- Propose the steps will be taken to adhere to legal requirements relating to designated sites and legally protected species (CIEEM 2018).

Although the above guidelines provide a scientifically-rigorous framework for EcIA, some processes also rely on the professional judgement of an ecologist, including survey design, the valuation of ecological features, and the characterisation of impacts. An outline of the author's experience, training and accreditation is provided in the following section, which support his competency to make such judgements.

1.1 Statement of authority

All surveying and reporting was carried out by Nick Marchant, the principal ecologist of NM Ecology Ltd. He has twelve years of professional experience, including nine years as an ecological consultant, one year as a local authority biodiversity officer, and two years managing an NGO in Indonesia. He provides ecological assessments for developments throughout Ireland and Northern Ireland, including wind farms, infrastructural projects (water pipelines, greenways, etc.), and a range of residential and commercial developments.

He has an MSc in Ecosystem Conservation and Landscape Management from NUI Galway and a BSc in Environmental Science from Queens University Belfast. He is a member of the Chartered Institute of Ecology and Environmental Management, and operates in accordance with their code of professional conduct.

2 Methods

2.1 Scoping

The objective of this assessment was to identify any ecological features that would pose a constraint to the proposed development. It involved the following steps:

- Identification of designated sites within an appropriate zone of influence
- A walkover survey incorporating the following elements:
  - Classification and mapping of habitats
  - A search for rare or protected flora, and for any problematic non-native plant species (e.g. Japanese Knotweed)
  - A search for field signs of rare or protected fauna (e.g. badgers), and habitat suitability assessments for species that are shy, nocturnal or seasonal
- Valuation of ecological features, review of legal considerations, and selection of important ecological features
- Assessment of impacts on important ecological features and development of appropriate mitigation strategies

It is also noted that a prior planning application (planning reference SD18A/0433) at the site was refused by South Dublin County Council, due, in part, to: "*Failure to submit ... an ecology report, a bat survey ... and appropriately address the presence of invasive species onsite. These are considered significant as the application fails to address environmental and ecological considerations, and the protection of the stream*". All of the points raised by SDCC in the prior refusal have been addressed in this EcIA.

2.2 Data collection and walkover survey

A desk-based scoping study was carried out using data from the following sources:

- Plans and specifications for the proposed development
- Bedrock, soil, subsoil, ground water and surface water maps from the Geological Survey of Ireland webmapping service (www.gsi.ie/mapping.htm), and the Environmental Protection Agency web viewer (http://gis.epa.ie/EPAmaps/)
- Maps and details of designated sites from www.npws.ie
- A tree survey prepared by Arborists Associates Ltd (2019)

The following resources were used for the walkover surveys:

- Habitat surveys were carried out in accordance with the *Best Practice Guidance for Habitat Survey and Mapping* (Smith et al 2011), and using the classification system of *A Guide to the Habitats of Ireland* (Fossitt 2000)

- Flora were identified using *Webb's An Irish Flora* (8th edition, Parnell & Curtis 2012), *Grasses, Sedges Rushes and Ferns of the British Isles and northwestern Europe* (Rose 1989) and *The Vegetation Key to the British Flora* (Poland & Clement 2009). Nomenclature follows the plant crib of the Botanical Society of the British Isles (BSBI 2007). The abundance and extent of species is described using the DAFOR scale (Dominant, Abundant, Frequent, Occasional, Rare)
- Fauna surveys followed the methods outlined in the *Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes* (NRA 2006), with reference to other species-specific methods as appropriate.

Desktop data from internet resources was accessed in May and June 2019. Site inspections were carried out on the 9th, 15th and 31st of May 2019. A walkover survey was carried out within the boundaries of the proposed development site, and adjacent lands were inspected visually within a 10 m buffer. A bat survey was undertaken at sunset on the 15th of May, and at sunrise on the 16th of May.

2.3 Valuation of ecological features

Based on the information collected during the desktop and walkover surveys, the ecologist assigns an ecological value to each feature based on its conservation status at different geographical scales (Table 1). For example, a site may be of national ecological value for a given species if it supports a significant proportion (e.g. 5%) of the total national population of that species.

Table 1: The six-level ecological valuation scheme used in the CIEEM guidelines (2016)

Ecological value	Geographical scale of importance
International	International or European scale
National	The Republic of Ireland or the island of Ireland
Regional	Leinster, and/or the east coast of Ireland
County	County Dublin
Local	Rathfarnham and associated suburban areas
Negligible	None, the feature is common and widespread

It is accepted that any development will have an impact on the receiving environment, but the significance of the impact will depend on the value of the ecological features that would be affected. The following is outlined in the CIEEM guidelines: "*one of the key challenges in an EcIA is to decide which ecological features (habitats, species, ecosystems and their functions/processes) are important and should be subject to detailed assessment. Such ecological features will be those that are considered to be important and potentially affected by the project. It is not necessary to carry out detailed assessment of features that are*

sufficiently widespread, unthreatened and resilient to impacts from the development, and that will remain viable and sustainable."

For the purposes of this report we have only assessed impacts on ecological features that are of local value or higher (refer to Table 1), or those that receive legal protection. These features are termed 'important ecological features' and are listed in Section 4.6. Impacts on features of negligible ecological value (e.g. amenity grasslands) are not considered to be significant, so they are not included in the impact assessment.

2.4 Ecological Impact Assessment

Potential direct, indirect or cumulative impacts on ecological features can be described in relation to their magnitude, extent, duration, reversibility and timing/frequency, as outlined in the CIEEM (2018) guidelines. Depending on the type of impact and the sensitivities of the important ecological feature, the ecologist may determine that the impact would have a 'significant effect'. The following definitions are provided in the CIEEM guidelines: *"A significant effect is simply an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project". "For the purpose of EcIA, a 'significant negative effect' is an effect that undermines biodiversity conservation objectives for 'important ecological features', or for biodiversity in general."*. Where significant impacts are identified, measures will be taken to avoid, minimise or compensate for impacts (where possible). Based on these measures, the impact assessment will be repeated, and any residual impacts of the proposed development will be discussed.

3 Development proposals

3.1 Characteristics of the proposed development

The site currently contains a derelict bungalow, which has suffered extensive fire damage and vandalism. There is an overgrown garden to the south of the house.

The proposed development will involve the demolition of the existing residence, and its replacement with 4 no. semi-detached residences. Access will be from Whitechurch Road on the eastern boundary of the site, which will lead to a communal parking area. An entrance bridge will be constructed over the Whitechurch Stream at the road access point, and a new flood defence wall will be constructed along the eastern boundary. The houses will have private gardens, which will incorporate some retained trees. Foul water and surface water will be discharged to local authority sewers on Whitechurch Road.

3.2 Other developments in the area (potential in-combination effects)

The proposed development site is located in a suburban setting in Rathfarnham. It is included in zone RES: *Existing Residential* of the South Dublin County Development Plan 2016 – 2022, for which the planning objective is "*to protect and/or improve residential amenity*". The surrounding area is characterised by long-established housing estates, and it is not subject to significant development pressure.

Live and recently-approved planning applications in the vicinity of the site were reviewed on the online planning records of South Dublin County Council. Planning permission has been granted for two developments to the south of the site: one for the alteration of an existing car show-room (planning reference SD16A/0007), and the second for the demolition of a former filling station and construction of a small residential development (planning reference SD16A/0247). All other nearby planning applications were for small-scale developments such as residential extensions.

In summary, two developments were identified that could potentially act in-combination with the proposed development to increase the scale of potential ecological impacts, if developments were constructed concurrently. The potential for cumulative impacts is addressed in the impact assessment.

4 The Receiving Environment

4.1 Environmental setting

The site is located in the southern suburbs of Dublin city. It consists of a small derelict bungalow, some outbuildings / sheds, and an overgrown garden. The eastern boundary is formed by the Whitechurch Stream and Whitechurch Road, the southern boundary by a car dealership, and the northern and western boundaries by housing estates.

The underlying bedrock is 'dark limestone & shale', which is a locally-important aquifer. Subsoils are limestone gravels, and soils are deep and well-drained, potentially with some alluvium along the river channel.

The Whitechurch / Kilmashogue Stream runs along the eastern boundary of the site, flowing from south to north. The channel width is approx. 3 – 4 m, and it was approx. 0.2 m deep at the time of survey. The river channel is open, but it is quite overgrown with herbaceous vegetation. Several sections of the watercourse to the north and south of the development have been culverted. The stream is currently of moderate status (Water Framework Directive Status Assessments 2010-2015), due to poor biological and invertebrate status.

The stream flows north and meets the River Dodder at Rathfarnham, approx. 1.4 km north of the proposed development site. The River Dodder then flows north-east and meets the River Liffey at Grand Canal Dock a further 8.5 km downstream. The River Dodder is also of moderate status downstream of its confluence with the Whitechurch / Kilmashogue Stream.

4.2 Designated sites

There are no designated sites within 2km[1] of the proposed development site (Figure 1), nor any sites within 10km along downstream watercourses. Therefore, there is not considered to be any risk of direct or indirect impacts on designated sites.

Potential impacts on Natura 2000 sites were considered within a larger zone of influence as part of the *Screening for Appropriate Assessment* report that accompanies this application, but it was concluded that all potential impacts could be screened out, and thus that Appropriate Assessment is not required.

4.3 Phase 1 Habitat Survey

Habitats within the proposed development site were classified using *A Guide to Habitats in Ireland* (Fossitt 2000). It was not considered necessary to provide a habitat map for the proposed development site, because all habitats can be seen clearly from an aerial photograph (Figure 2).

Buildings and artificial surfaces (BL3)

The existing residence and buildings are almost entirely unvegetated. The driveway of the property is surfaced in gravel, which has partially been colonised by ruderal vegetation, including dandelion *Taraxacum officinale* ag., rough meadow-grass *Poa trivialis*, creeping bent *Agrostis stolonifera*, herb-Robert *Geranium robertianum*, lesser trefoil *Trifolium dubium*, spurge *Euphorbia* sp., nipplewort *Lapsana communis*, hairy bitter-cress *Cardamine hirsuta* and groundsel *Senecio vulgaris*. This habitat is considered to be of negligible ecological value.

[1] For the purposes of this assessment we considered indirect impacts on designated sites within a potential zone of influence of 2km. This distance is considered to be proportionate to the relatively small scale of the proposed development and its suburban setting.

Figure 1	Designated sites
Location	Capri, Whitechurch Road
Applicant	Gerard O'Connor
Date	04-06-2019

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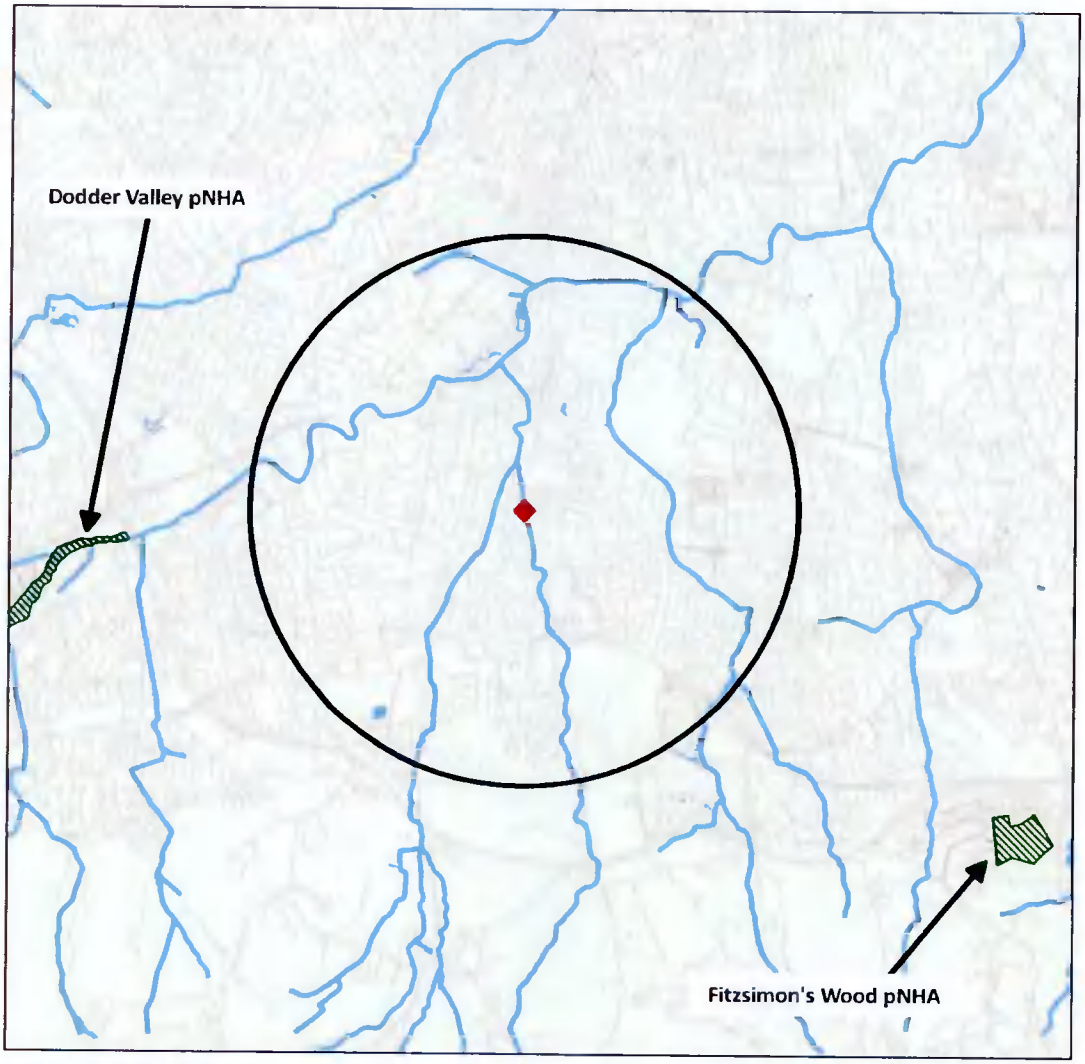
Site location
- Proposed development site
- Buffer zone (2km)
- Roads
- Watercourses

Designated sites
- Special Areas of Conservation
- Special Protection Areas
- Natural Heritage Areas



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0 0.5 1 1.5 2 km

Figure 2. 'Bird's Eye' Imagery from Bing Maps, taken from an eastern perspective. The site boundary is marked in red, and the existing residence, garden and trees are visible within this area. The Whitechurch Stream is located alongside the Whitechurch Road (the eastern boundary of the site)

Lowland watercourse (FW2)

The Whitechurch / Kilmashogue Stream runs along the eastern boundary of the site, flowing from south to north. The channel width is approx. 3 – 4 m, and it was approx. 0.2 m deep at the time of survey. There is some water-cress *Rorippa nasturtium-aquaticum* along the sides of the stream, but it covers only a small proportion of the channel. The river banks have abundant bramble *Rubus fruticosus* ag., nettle *Urtica dioica*, cleavers *Galium aparine* and bindweed *Calystegia sepium*, and frequent pendulous sedge *Carex pendula*. Occasional species include common hogweed *Heracleum sphondylium*, river water-dropwort *Oenanthe fluviatilis*, smooth brome *Bromus racemosus* and alexanders *Smyrnium olusatrum*. The stream and its banks are considered to be of local value, due to their semi-natural state, and their importance as an ecological corridor.

Dry meadow (GS2)

A former garden to the south of the residence has become quite overgrown, and is now dominated by ruderal vegetation. Broad-leaved dock *Rumex obtusifolius*, Yorkshire-fog *Holcus lanatus*, creeping bent, and cleavers are abundant, with frequent false oat-grass *Arrhenatherum elatius*, nettle, dandelion, creeping buttercup *Ranunculus repens*, common mouse-ear *Cerastium fontanum*, common field-speedwell *Veronica persica*, bush vetch *Vicia sepium* and white clover *Trifolium repens*. Occasional species include bluebell *Hyacinthoides*

non-scripta, field forget-me-not *Myosotis arvensis*, greater plantain *Plantago major*, sow-thistles (*Sonchus asper* and *Sonchus oleraceus*), spear thistle *Cirsium vulgare*, hogweed, colt's-foot *Tussilago farfara*, red dead-nettle *Lamium purpureum*, meadow foxtail *Alopecurus pratensis*, oil-seed rape *Brassica napus subsp. oleifera* and borage *Borago officinale*.

The species richness of this habitat is relatively high for a suburban site, but all plant species are common and widespread throughout Dublin city, so it is considered to be of negligible ecological value.

Treelines / hedgerows (WL2 / WL1)

The eastern, southern and western boundaries of the proposed development site have occasional trees and some discontinuous sections of hedgerow. There is a short line of immature sycamores *Acer pseudoplatanus* on the south-western boundary of the site, and two stumps of white willow *Salix alba* that have extensive basal regrowth. There is also a semi-mature elder *Sambucus nigra* on the southern boundary.

The southern and eastern boundaries (and parts of the western boundary) superficially resemble hedgerows, but on closer inspection were found to be chainlink fences that support dense growths of traveller's-joy *Clematis vitalba*, cleavers and bindweed.

The treeline / hedgerow habitats are dominated by non-native species, and are rather disjointed in structure, so they are considered to be of negligible ecological value. However, these features may provide habitat for some fauna, as discussed in Section 4.4.

Rare or protected flora

No rare or protected plants were encountered during field surveys.

Invasive plant species

A patch of Japanese knotweed *Fallopia japonica* is located near the north-eastern corner of the site. There are approx. 40 – 50 stems, but the growth is not particularly dense, suggesting that it was introduced to the site relatively recently (e.g. within the last five years). Japanese knotweed is listed on the third schedule of the *European Communities (Birds and Natural Habitats) Regulations 2011*, under which it is an offence to spread the plant, or any soil / spoil that contains its rhizomes / roots.

No other restricted invasive species (as listed on the third schedule of the *European Communities (Birds and Natural Habitats) Regulations 2011*) were recorded at the proposed development site.

4.4 Surveys for protected / priority fauna

Bats

Potential roost features

The existing structure is a derelict bungalow with a roof of pre-formed tiles, wooden fascia panels, and block walls. It is estimated to be approx. 30 – 40 years old. There is a hole measuring approx. 1 – 2 m in diameter on the northern side of the roof, and there are missing tiles throughout. The doors and windows on the eastern side of the structure have been boarded up, but there are unobscured broken windows on the western side. The interior of the structure has been extensively vandalised, with fire damage in places. Overall, the bungalow is considered to have moderate to high suitability for roosting bats, based on the classification system in the *Bat Survey: Good Practice Guidelines* document (Collins, 2016).

None of the trees have any crevices or cavities that would be suitable for roosting bats. The existing bridge over the Whitechurch Stream is constructed of steel girders and concrete, and also has negligible suitability for bats.

Results of bat surveys

Emergence and re-entry surveys were carried out in May 2019. Weather conditions were ideal, with mild temperatures and no wind or rain. There was abundant insect life during the sunset period.

One Leisler's bat was detected soon after sunset, and was observed feeding in open air for approx. ten minutes, before leaving the area. It is likely to have emerged from a roost to the south-east of the proposed development site, but it clearly did not emerge within the site. There was no bat activity for the next 30 – 40 minutes, until a single common pipistrelle was recorded approx. one hour after sunset. It flew past the house (travelling from north to south) and fed within the site for a few minutes, and before leaving the area. Soon afterwards, two common pipistrelles approached from the north and circled in the area, apparently in pursuit of one another.

In summary, bat activity was considered to be relatively low, comprising only two species: Leisler's bats and common pipistrelles. There was no indication that any bats emerged from the derelict structure. It was noted that most of the site was illuminated by streetlights on Whitechurch Road, including the eastern side of the structure and most of the garden and river channel. No Daubenton's bats were observed foraging along the Whitechurch Stream, and it is unlikely that this species would use the watercourse at this location, due to the level of artificial light in the area, and the narrow channel of the stream.

A re-entry survey was carried out at dawn, but no bats were recorded.

Evaluation

The existing structure is superficially considered to have some suitability for roosting bats, but no bats were recorded emerging from or re-entering the structure in May 2019. Two common bat species were recorded foraging within the site during the post-sunset period, but neither used the site for extended periods of time. The lack of bat activity on the site may be due, in part, to light spill from streetlights on the Whitechurch Road. Therefore, the site is considered to have negligible value for roosting or foraging bats.

Birds

A number of common garden birds were recorded during the surveys, including blackbird, great tit and wren, but no birds of conservation concern were recorded. The trees and shrubs have low suitability for nesting birds. No riparian birds (e.g. grey wagtail, dipper) were observed on the Whitechurch Stream.

Suburban areas rarely support significant populations of endangered birds, so the site is considered to be of negligible ecological value for birds. However, all birds (including nests, eggs and chicks) receive protection under the Wildlife Act 1976 (as amended).

Terrestrial mammals

Foxes were observed within the landholding during two of the surveys. There were scats and a strong odour of fox in some of the outbuildings, suggesting use as a den or resting place, and signs of digging in the grassland area (several shallow pits measuring approx. 30 cm in depth). However, foxes are common and widespread in Dublin, and they are not legally protected, so they are not considered an 'important ecological feature'.

No other mammals were observed during field surveys, nor any characteristic field signs of protected fauna (e.g. badger setts, pine marten scats). There are records on the online databases of the National Biodiversity Data Centre for a number of terrestrial mammals in the surrounding area, including badger, hedgehog and grey squirrel. Some of these species could pass through the site on an occasional basis, but it is unlikely that any could use the site on a regular basis, due to its small size, the lack of tree cover, and the barrier to movement caused by the stream. Overall, the proposed development site is considered to be of negligible importance for all of these species.

Reptiles and amphibians

No reptiles or amphibians were observed during the site survey. Considering the lack of suitable breeding sites for amphibians, and that all habitats within the site boundary are well-represented in the surrounding landscape, the proposed development site is considered to be of negligible value for these taxa.

Terrestrial invertebrates

The habitats within the proposed development site are common in urban landscapes in Ireland, so the site is considered to be of negligible value for invertebrates.

4.5 Potential limitations and information gaps

The walkover surveys were carried out in May 2019, which is an ideal time for surveys of most flora and fauna, including bats. Therefore, the assessment does not have any limitations or information gaps.

4.6 Identification of important ecological features

Table 3 provides a summary of all ecological features identified on the site, including their valuation and legal / conservation status. For the purposes of this impact assessment, any features that are of local ecological value, or that receive legal protection, are considered to be 'important ecological features', and will be addressed in the impact assessment.

Table 3: Identification of 'important ecological features' within the proposed development site

Ecological feature	Valuation	Legal status	Important feature?
Designated sites	National	WA	No
Lowland depositing river (FW2)	Local	-	Yes
Treelines (WL2) / Hedgerows (WL1)	Negligible	-	Yes, secondary value for fauna
Dry meadow (GS2)	Negligible	-	No
Buildings and artificial surfaces (BL3)	Negligible	-	No
Japanese knotweed	-	HR	Yes
Birds	Negligible	WA	Yes
Bats	Negligible	HR, WA	No
Other terrestrial mammals	Negligible	-	No
Reptiles and amphibians	Negligible	-	No
Invertebrates	Negligible	-	No

** HR – European Communities (Birds and Natural Habitats) Regulations 2011 (as amended); WA - protected under Section 19 or 20 of the Wildlife Act 1976 (as amended)*

In summary, the important ecological features identified on the proposed development site are the watercourse, Japanese knotweed, and birds. The trees and hedgerows are of negligible intrinsic value but would provide habitat for birds, so they are also considered to be important ecological features.

5 Predicted Impacts of the Proposed Development

5.1 Pollution of the watercourse (construction phase)

The proposed development will involve the demolition of an existing structure, clearance of the site, construction of new structures, and landscaping works (see Section 3). These activities have potential to generate pollutants, including:

- Suspended silt or other sediments, which can reduce water quality, harm aquatic fauna, and/or alter the flow of the river
- Concrete and cement, which are composed of highly alkaline, corrosive fine sediments that are very harmful for aquatic life
- Hydrocarbons (oil, petrol, diesel, etc), solvents and other chemicals, which can be toxic to aquatic fauna

As the site is directly adjacent to the Whitechurch Stream, it is possible that waterborne pollutants could be washed into the stream via surface water runoff. Pollutants could have localised effects on fish and other aquatic fauna in the stream, and/or could contribute to diffuse pollution.

A hypothetical impact assessment of potential pollution incidents is difficult, as any potential impacts would vary depending on: the type of pollutant, the quantity of material entering the stream, the rate at which it would occur, the time of year, and/or any potential 'in-combination' effects in the surrounding area (e.g. as discussed in Section 3.2). Minor pollution incidents would be diluted by the stream waters, reducing the concentration of pollutants to negligible levels. Alternatively, a pollution incident could have a localised impact within the stream, but may not be severe enough to have a significant impact on the local status of aquatic fauna. However, if a precautionary approach is adopted, it is possible that a large-scale pollution event could cause significant impacts on the stream and its associated fauna. Therefore, in accordance with best practice, it is recommended that appropriate mitigation measures are employed during construction in order to reduce the risk and magnitude of potential pollution incidents.

For the avoidance of doubt, surface water pollution would not pose a risk of indirect impacts on downstream designated sites. There is more than 10 km of intervening watercourse to the closest hydrologically-connected sites (some SACs and SPAs in Dublin Bay), so any pollutants would be reduced to negligible concentrations before they could reach the designated sites. This is discussed in greater detail in the *Screening for Appropriate Assessment* report that accompanies this application.

5.2 Impacts on birds during site clearance works (construction phase)

If any trees or shrubs are cleared during the bird nesting season (usually between March and August, inclusive), it is possible that active nests could be destroyed. The killing of any birds or the disturbance of their breeding / resting places would constitute an offence under the *Wildlife Act* 1976 (as amended).

5.3 Spread of invasive species (construction phase)

Japanese knotweed is present within the footprint of the proposed development. If construction work took place without control measures, it is likely that fragments of knotweed stem and rhizome would be spread within the site boundary. Knotweed can readily regrow from plant fragments, so it is likely that there would be extensive new growth after the completion of construction works. It is also possible that knotweed could be spread outside the site boundary if any contaminated soils were removed from the site, or if plant fragments were snagged on construction vehicles. As Japanese knotweed is a restricted invasive species, any spread of the plant would constitute an offence under the *EC (Birds and Natural Habitats) Regulations 2011 (as amended)*.

5.4 Potential for pollution of waterbodies (operational phase)

All foul water from the proposed development will be discharged to a local authority sewer and treated in the Ringsend waste water treatment plant, which is currently operating within its population equivalent limits and providing a satisfactory level of treatment prior to discharge into Dublin Bay. It is the responsibility of the local authority to provide appropriate treatment to foul water within their sewers, and to assess any potential impacts on water quality at the discharge point. Therefore, foul water treatment during the operation of the development would not cause any significant impacts upon receiving waters. There is no risk of any other ecological impacts during the operation of the proposed development.

5.5 Potential cumulative impacts

Two planning applications were identified that could potentially act in combination with the proposed development to increase the scale of potential ecological impacts (refer to Section 3.2). They will be relatively similar in character to the proposed development, and could potentially cause some localised pollution of the watercourse. However, the developments are not considered likely to increase the magnitude of any of the impacts outlined above, because a precautionary approach has been adopted for this impact assessment.

6 Proposed mitigation measures

6.1 Pollution-prevention measures for the construction phase

In order to avoid or minimise pollution of the Whitechurch Stream, the following pollution-prevention measures will be implemented during construction works.

Concrete and cement

These products are highly toxic to fauna, particularly fish and other aquatic / marine species. It is expected that some pouring and/or mixing of concrete or cement will be required during construction works, so the following measures will be implemented in order to prevent any cement-based materials from reaching the stream:

- Concrete pouring / mixing will only take place in dry weather conditions. It will be suspended if high intensity local rainfall events are forecast (e.g. >10 mm/hr, >25 mm in a 24 hour period or high winds)
- If any pouring is required within 2 m of the stream, barriers will be placed between the pouring site and the watercourse in order to prevent any liquid concrete / cement from flowing or falling into the stream
- If any on-site mixing of concrete is required, it will only be carried out in the west of the site, i.e. as far as possible from the stream. If any cement-based products will be stored on site, they will be kept in the west of the site and protected from rainfall using a tarpaulin or other shelter
- Ready-mix lorries and larger plant will not be cleaned on-site, and will be taken to an appropriate off-site facility with capacity to capture and treat contaminated wash waters
- If any on-site cleaning of tools or concrete-batching plant is required, it will take place in the west of the site.

Suspended sediments

The term 'suspended sediments' refers to any silt, mud or other fine sediment that becomes dissolved in water. Water can be contaminated by suspended sediments from open earthworks and excavations (either from rainfall or groundwater seepage), from rainfall on soil/sediment stock-piles, or from the wheels or tracks of construction vehicles. In order to avoid or reduce potential impacts on nearby waterbodies, the following measures will be implemented:

- Excavation works will be suspended if high intensity local rainfall events are forecast (e.g. >10 mm/hr, >25 mm in a 24 hour period, or high winds)
- If any excavations need to be dewatered, the sediment-contaminated waters will not be pumped or allowed to flow directly into the stream or any local surface water

sewer. It will be collected and pumped into a settlement tank (or similar feature), left undisturbed until sediments have settled, and then discharged via a buffered outflow to a soakaway in the west of the site

- Stockpiles of mud, sand or other fine sediments will be stored in the west of the proposed development site, i.e. as far as possible from the river. Stockpiles will be levelled and compacted, and will be covered with plastic sheeting in order to limit wind/rainwater erosion.

Hydrocarbons and chemicals

Hydrocarbons (oil, petrol, diesel, etc) and solvents are toxic to fauna. These chemicals can enter surface water or groundwater if they are accidentally spilled (e.g. during re-fuelling of machinery), or from leaking containers. In order to avoid or reduce potential impacts upon the river and downstream designated sites, the following measures should be applied throughout the construction works:

- Any fuel, oil or chemical containers will be kept in the west of the proposed development site, i.e. as far as possible from the stream. These pollutants are hazardous and must be stored in a designated bunded area that has sufficient capacity to retain any spills. If possible these areas should be covered by a tarpaulin or other form of shelter
- All machinery should be protected from vandalism and unauthorised interference, and should be turned off and securely locked overnight
- If any on-site re-fuelling is required, it will take place in the west of the site in a bunded / impermeable area. Immobile plant will be refuelled over drip-trays
- While in operation, diesel pumps, generators or other similar equipment will be placed on drip trays to catch any leaks
- A spill kit will be kept on site. If any spills occur, appropriate measures will be taken to intercept hydrocarbons or chemicals on-site before they can reach the stream.

6.2 Protection of trees and birds during site clearance works

Under Sections 22 and 23 of the *Wildlife Act* 1976 (as amended), it is an offence to kill or injure a protected bird, or to disturb their breeding / resting places. Most birds nest between March and August (inclusive), so it is strongly recommended that all tree felling and site clearance works are carried out between September and February (inclusive), i.e. outside the nesting season. If this is not possible, an ecologist will survey the affected areas in advance in order to determine whether any active nests are present. If any are encountered, the vegetation clearance will be delayed until the chicks have fledged and the nest has been abandoned.

All retained trees and hedgerows will be protected during construction works, as outlined in the Tree Protection Plan and Arboricultural Implications Assessment (Arborist Associates Ltd, 2019).

6.3 Management of invasive species

In August 2018, the applicant engaged a third-party contractor (Knotweed Control Ireland) to advise on the treatment of Japanese knotweed at the proposed development site. A survey was carried out, and an indicative management plan was produced, which would involve the excavation and off-site disposal of Japanese knotweed. The applicant will engage the services of Knotweed Control Ireland to implement the excavation / disposal works prior to the commencement of construction works.

A derogation licence will be required from the National Parks and Wildlife Service to permit the excavation and transfer of soil or spoil that is contaminated with knotweed.

7 Residual Impacts

The proposed pollution-prevent measures will prevent fine sediments, concrete/cement, hydrocarbons and other pollutants from reaching the Whitechurch Stream. Subject to the successful implementation of these measures, the construction of the proposed development will not have any effect on the stream or aquatic fauna. There will be no impacts on water quality during the operation of the development.

Trees will be felled and cleared outside the season of peak nesting activity in birds, or the area would be surveyed by an ecologist to confirm that no protected fauna were present. As a result, there would be no significant impact on nesting birds in these trees, and no legal offence under the *Wildlife Act* 1976. Retained trees and shrubs will be protected during construction work using tree-protection zones.

The contractor will engage a specialist contractor to excavate and dispose of all knotweed-contaminated soils in advance of construction works, subject to a derogation licence from the National Parks and Wildlife Service. This will ensure that no Japanese knotweed is spread during construction works, and that there is no offence under the *EC (Birds and Natural Habitats) Regulations 2011.*

Subject to the successful implementation of these measures, we conclude that the proposed development will not cause any significant negative impacts on designated sites, habitats, legally protected species, or any other features of ecological importance.

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