Appendix 6-1 Relevant Supporting Information

SDCC Rathcoole Housing Development

Volume 2 of the Environmental Impact Assessment Report

South Dublin County Council

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Delivering a better world

Quality Information

Prepared by	Checked by	Verified by	Approved by
Jenny Hunter MCIEEM MRSB Principal Ecologist	Seánin Munglani née Maxwell ACIEEM Senior Ecologist	Eleanor Ballard CEnv MCIEEM Technical Excellence Director	Richard O'Callaghan Project Manager

Revision History

Revision	Revision Date	Details	Authorised	Name	Position

Prepared for:

South Dublin County Council

Prepared by:

AECOM Ireland Limited
4th Floor
One Burlington Plaza
Burlington Road
Dublin 4
D04 RH96
T +353-1-696-6220

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1. Introduction

This Appendix accompanies Chapter 06 Biodiversity of the Environmental Impact Assessment Report (EIAR). This Appendix contains additional, relevant information that is required to support and inform the assessment and Chapter, but which for reasons of brevity are not detailed in full in the Chapter. This information comprises the following, which are discussed in the subsequent sections of this Appendix:

- Determinations and descriptions of the various zones of influence (ZoI) for ecological features.
- Additional details of relevant wildlife legislation and policy.
- Full method for Ecological Impact Assessment (EcIA).
- Relevant qualifications and experience of ecology personnel.

2. Zones of Influence

The Chartered Institute of Ecology and Environmental Management guidance defines the potential ZoI for a project is "*the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities*" (CIEEM, 2018[1]). The ZoI is likely to extend beyond the boundary of a project, for example, where there are ecological or hydrological links extending beyond a site's boundary.

Activities associated with the construction and operation phases have been separately identified, as the ZoI for an ecological feature may vary depending on the stage due to differing types of activities or impacts. The ZoI will also vary for different ecological features depending on their sensitivity to an environmental change or impact. It is therefore appropriate to identify different ZoI for different ecological features. The broad ecological features that can be affected include designated sites, habitats, species, and ecosystems (i.e. the processes on which they depend). Therefore, ZoI are specified for different ecological features and types of potential impact.

As recommended by CIEEM (2018) guidance, professionally accredited or published studies have been used to determine the ZoI, in addition to CIEEM and/or other industry-standard survey guidance and advice. Having considered the Proposed Development, ZoI have been estimated for ecological features, and these are presented in Table 1. In the context of determining the ZoI for potential pollution effects from the Proposed Development, a conservative approach has been adopted, assuming that the ZoI includes all areas downstream of the Proposed Development within the same catchment (which in this case is Liffey and Dublin Bay).

Table 1: Potential Minimum ZoI for Ecological Features Informing the Assessment

Ecological Feature	Potential ZoI	Rationale
Internationally designated sites	• Precautionary approach of 10km from the Site. • Precautionary approach of 20km from the Site where geese are a qualifying feature of a Special Protection Area (SPA). • Hydrologically connected within the same catchment.	Precautionary approach used due to potential for hydrological/other ecological links. For several bird species, NatureScot has published guidance on the distances up to which qualifying species may use functionally linked habitat outside of European sites (NatureScot, 2020; Scottish Natural Heritage (SNH), 2016). The distances given in this guidance were used when searching for SPAs which may be within the ZoI of the Proposed Development. This included searching up to 20km, as this is given as the largest core

[1] N.B. this guidance was updated in 2024, but it still cited as 2018.

Ecological Feature	Potential ZoI	Rationale
		foraging range for any species (non-breeding geese species).
Nationally designated sites	• Precautionary approach of 2km from the Site. • Hydrologically connected within the same catchment.	Precautionary approach used due to potential for hydrological/other ecological links.
Locally designated sites	• Precautionary approach of 1km from the Site. • Hydrologically connected within the same catchment.	Precautionary approach used due to potential for hydrological/other ecological links.
Habitats	• Footprint of construction (for habitat loss). • Downstream catchment of Proposed Development during construction and operation (for indirect impacts). • Up to 50m from the Site during construction (for habitat damage relating to air pollution and quality impacts). • Up to 250m from the Site entrance during construction (for habitat damage relating to air pollution and quality impacts).	Hydrological links to downstream catchment. Professional judgement, having regard for Institute of Air Quality Management (IAQM) guidance (IAQM, 2024).
Invasive plant species	• Up to 10m from terrestrial species during construction (and potentially operation). N.B. This can increase if impacted or disturbed by movement of plant and could extend to potentially the downstream catchment of Proposed Development in worst-case scenario (possible during construction).	Guidance from the Property Care Association (PCA) (2018).
Bats	• Footprint of construction (for loss of roosts in buildings/trees). • Up to 50m from known or potential roosts during construction and operation (for disturbance to roosts, for example, lighting). • Footprint of construction (for loss and/or fragmentation of habitat, disturbance and displacement).	Guidance from Bat Conservation Trust (BCT) (Collins, 2023), UK Bat Mitigation guidelines (Reason and Wray, 2025).
Otter *Lutra lutra*	• 30m from an otter resting place during construction (for potential loss, damage, disturbance). • 100m from an otter resting place during construction (for potential loss, damage, disturbance). • 150m from an otter natal holt during construction (for potential loss, damage, disturbance where piling is required). • Footprint of construction (for loss and/or fragmentation of habitat, disturbance and displacement, injury or mortality).	NIEA survey requirements (NIEA, 2017a), DAERA Standing Advice (DAERA, 2025a). NIEA guidance (NIEA, 2011a), National Roads Authority (NRA)[2] guidance (NRA, 2008, 2009).
Badger *Meles meles*	• 30m from an active badger sett during construction (for potential loss of or damage/disturbance to sett), extending up to 50m during breeding season. • 100m from a badger sett during construction (for potential loss of or damage/disturbance to sett where piling is required). • Footprint of construction during construction (for loss and/or fragmentation of habitat, disturbance and displacement, injury or mortality).	NIEA survey requirements (NIEA, 2017b), DAERA Standing Advice (DAERA, 2025b). NIEA guidance (NIEA, 2011b) and guidance from Harris *et al.* (1989). NRA guidance (NRA, 2006, 2006).

[2] The NRA was subsumed by Transport Infrastructure Ireland (TII), though guidelines were published by the NRA and remain valid as a source of guidance.

Ecological Feature	Potential ZoI	Rationale
Red squirrel *Sciurus vulgaris*	• 50m from a squirrel drey during construction (for potential loss of or damage to drey). • Footprint of construction during construction (for loss and/or fragmentation of habitat, disturbance and displacement, injury or mortality).	NIEA survey requirements (NIEA, 2017c), NatureScot guidance for red squirrel (NatureScot, 2024a), NRA guidance (NRA, 2009).
Pine marten *Martes martes*	• 30m from a pine marten den during construction (for potential loss of or damage to den). • Up to 100m from a breeding pine marten den during construction. • Footprint of construction during construction (for loss and/or fragmentation of habitat, disturbance and displacement, injury or mortality).	NIEA survey requirements (NIEA, 2024), Birks (2012), NatureScot guidance for pine marten (NatureScot, 2024b).
Other small mammals	• Footprint of construction during construction for loss and/or fragmentation of habitat, disturbance and displacement, injury or mortality.	NRA guidance (NRA, 2009).
Amphibians	• Footprint of construction for habitat loss and injury/mortality of smooth newt *Lissotriton vulgaris* and common frog *Rana temporaria*. • Up to 200m of breeding habitat for potential loss of or damage to habitats of smooth newt. • Downstream catchment of Proposed Development during construction and operation (for pollution sedimentation impacts).	DAERA standing advice for smooth newt (DAERA, 2025c), NRA guidance (NRA, 2009).
Reptiles	• Footprint of construction (for habitat loss and/fragmentation, disturbance and displacement, injury or mortality).	DAERA Standing Advice for viviparous lizard *Zootoca vivipara* (DAERA, 2025d), NRA guidance (NRA, 2009).
Birds	• Footprint of construction during construction and Proposed Development during operation (for loss and/or fragmentation of nesting habitat, disturbance and displacement, injury or mortality). • Up to 500m during construction (disturbance/disruption to territories of some species).	Guidance from Cutts *et al*. (2013) and NatureScot (Goodship and Furness, 2022) for bird disturbance from construction works.
Fish and aquatic species	• Aquatic habitats in footprint of construction (for habitat loss and damage, injury and mortality). • Downstream catchment of Proposed Development during construction and operation (for pollution sedimentation impacts).	Hydrological links to downstream catchment.
Terrestrial invertebrates	• Footprint of construction (for habitat loss and/fragmentation, disturbance and displacement, injury or mortality). • Potentially up to 1.5km from the Proposed Development in areas with potential to be used by important terrestrial invertebrates.	Most likely ZoI is within the Site. Research by Wahlberg et al (2002) found that the average dispersal distance of male marsh fritillary *Euphydryas aurinia* was 1.3km, and up to 0.5km for females. On a precautionary basis, therefore, a distance of 1.5km was adopted.

3. Relevant Legislation and Planning Policy

3.1 Designated Sites

3.1.1 European Sites

Under Article 6(3) of the Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive), any project which is not directly connected with or necessary to the management of a European site, but would be likely to have a significant effect on such a European site, either individually or in-combination with other plans or projects, must be subject to an Appropriate Assessment (AA) of its implications for the Special Area of Conservation (SAC)/SPA and its nature conservation objectives.

Following the repeal of the Planning and Development Act 2000, the requirements of Article 6(3) are transposed into national law through Part 6, Chapter 3 of the Planning and Development Act in relation to local authority development, and by the European Communities (Birds and Natural Habitats) Regulations 2011 (the Habitats Regulations) in relation to other relevant approvals, consents and matters.

The legislative provisions for Appropriate Assessment Screening for planning applications are set out in Sections 212 and 213 of the Planning and Development Act 2024, under which states that the Appropriate Assessment process must be carried out by a Competent Authority. The process is stepwise and must be followed in sequence. The first step in the sequence of tests is to establish whether an Appropriate Assessment is required. This is often referred to as an Appropriate Assessment Screening. Should likely significant effects on a European site be identified, in the absence of mitigation, then the next stage in the process (Appropriate Assessment) must be initiated, and a Natura Impact Statement prepared. It is only at the stage of Appropriate Assessment that avoidance and mitigation measures can be considered.

3.1.2 Ramsar Sites

Ramsar sites are international wetland sites designated under the Convention on Wetlands of International Importance especially as Waterfowl Habitat 1971 (the Ramsar Convention). Most Ramsar sites are encompassed by SACs or SPAs and would normally be protected indirectly by the strict protection afforded to European sites. Where not encompassed by SACs or SPAs, habitat within Ramsar sites is often likely to constitute functionally linked habitat for qualifying SAC/SPA species which would require consideration during the AA process. In the unlikely case that a Ramsar site was not encompassed by an SAC or SPA and did not constitute functionally linked habitat for qualifying SAC/SPA species, the international status of Ramsar sites dictates that impacts upon them should be considered.

3.1.3 National Sites

Natural Heritage Areas (NHA) are designated under the Wildlife (Amendment) Act, 2000 and are nature conservation sites of national importance. NHAs are legally protected from damage from the date they are formally proposed for designation. There are also numerous proposed Natural Heritage Areas (pNHA) that have not been statutorily designated. However, these sites are of significance for wildlife and habitats. For example, some provide roosting places for rare bats or comprise important habitats such as woodlands and lakes, and therefore receive limited protection, including recognition of their ecological value by Planning and Licensing Authorities. Despite this difference in legal designation, NHAs and pNHAs are considered and assessed equally.

3.1.4 Nature Reserves

Nature reserves in Ireland are areas of importance to wildlife that are protected under Ministerial order and most of these are owned by the State. However, some are owned by organisations of private landowners. Nature reserves in Ireland may also be underpinned by NHAs and are therefore protected by the measures for NHA detailed above.

3.2 Species

3.2.1 Bats, Otter, Natterjack Toad, Marsh Fritillary and Kerry Slug

Bats, otter, natterjack toad *Epidalea calamita*, marsh fritillary, and Kerry slug *Geomalacus maculosus*, known as European Protected Species (EPS), are protected through the Habitats Regulations. For EPS, it is an offence to deliberately or recklessly:

- Capture or kill any specimen of these species in the wild.
- Disturb these species particularly during the period of breeding, rearing, hibernation and migration.
- Take or destroy eggs of these species in the wild.
- Damage or destroy a breeding or resting place of such an animal (whether occupied or not).
- Keep, transport, sell, exchange, offer for sale or offer for exchange any specimen of these species taken in the wild, other than those taken legally as referred to in Article 12(2) of the Habitats Directive.

It is also an offence for EPS, whether or not carried out deliberately or recklessly, to damage or destroy a breeding site or resting place used by an animal, whether occupied or not.

Where development works are at risk of causing one or more of the offences listed above, a derogation licence from National Parks and Wildlife Service (NPWS) can be obtained to facilitate the works that would otherwise be illegal. However, for a licence to be obtained, evidence must be provided that there is no satisfactory alternative. Applicants must include detailed information about the proposal and describe any likely impacts on local population of the species. Satisfactory survey information and a species protection plan incorporating proportionate mitigation and/or compensation are also required.

3.2.2 Badger, Hedgehog, Irish Hare, Irish Stoat, Pine Marten, Pygmy Shrew, and Red Squirrel

Badger, hedgehog *Erinaceus europaeus*, Irish hare *Lepus timidus hibernicus*, Irish stoat *Mustela erminea hibernica*, pine marten, pygmy shrew *Sorex minutus*, red squirrel and their resting places are listed on Schedule 5 of the Wildlife Acts and are species to which Section 23 of the Wildlife Acts applies. Irish stoat and pygmy shrew were added to Schedule 5 of the Wildlife Acts through the Wildlife Act 1976 (Protection of Wild Animals) Regulations, 1980. For these species it is an offence to:

- Hunt, take or kill a protected wild animal which is not an exempted wild mammal otherwise than under and in accordance with a permission or licence granted by the Minister under this Act.
- Injure a protected wild animal otherwise than while hunting it under permission or licence.
- Wilfully interfere with or destroy the breeding place or resting place of any protected wild animal.

It is possible to obtain a licence and/or agreement from NPWS to permit works that would otherwise be offences where there is no satisfactory alternative. Satisfactory survey information and a species protection plan incorporating proportionate mitigation and/or compensation are also required.

3.2.3 Common Frog, Viviparous Lizard, and Smooth Newt

Common frog *Rana temporaria*, viviparous lizard, and smooth newt are listed on Schedule 5 of the Wildlife Acts and are species to which Section 23 of the Wildlife Acts applies. These species were added to Schedule 5 of the Wildlife Acts through the Wildlife Act 1976 (Protection of Wild Animals) Regulations, 1980. For these species it is an offence to:

- Hunt, take or kill a protected wild animal.
- Injure a protected wild animal.
- Wilfully interfere with or destroy the breeding place or resting place of any protected wild animal.

3.2.4 Freshwater Pearl Mussel and White-clawed Crayfish

Freshwater pearl mussel *Margaritifera margaritifera* and white-clawed crayfish *Austropotamobius pallipes* are listed on Schedule 5 of the Wildlife Acts and are species to which Section 23 of the Wildlife Acts applies. These species were added to Schedule 5 of the Wildlife Acts through the Wildlife Act 1976 (Protection of Wild Animals) Regulations, 1990. For these species it is an offence to:

- Hunt, take or kill a protected wild animal.
- Injure a protected wild animal.
- Wilfully interfere with or destroy the breeding place or resting place of any protected wild animal.

3.2.5 Nesting Birds

All wild birds are protected under the Wildlife Acts. It is an offence to intentionally or recklessly:

- Kill, injure or take a protected wild bird.
- Take, destroy, injure, or remove the eggs or nest of a protected wild bird.
- Disturb a protected wild bird on or near a nest containing eggs or unflown young.

3.2.6 Invasive Non-native Species

In Irish legislation, the Wildlife Acts address invasive non-native species by stating that "*anyone who plants or otherwise causes to grow in a wild state in any place in the State any species of (exotic) flora or the flowers, roots, seeds or spore of (exotic) flora shall be guilty of an offence*" in Sections 52(7) and (8).

Scheduled invasive species listed on the Third Schedule of the Habitats Regulations are considered to be of EU concern under the Invasive Alien Species Regulation requiring action on pathways of unintentional introduction, measures for early detection and rapid eradication, and management of species that are already widespread. It is considered an offence to release or allow to disperse or escape, to breed, propagate, import, transport, sell or advertise species listed on the Third Schedule.

If charged with committing an offence under the above legislation, it is a defence against prosecution to prove that all reasonable steps were taken, and all due diligence exercised in attempting to avoid committing the offence. To reduce the potential for prosecution, a management plan should be put in place for invasive non-native species, and land managers should be able to show that they are following it.

It is not illegal to have invasive non-native native species on a property. However, even when growing on managed land, the spread of the species should be kept under control such that the species is not having an appreciable adverse impact on habitats and their native biodiversity.

3.3 Project Ireland 2040 National Planning Framework

The Project Ireland 2040 National Planning Framework (NPF) (Department of Housing, Planning and Local Government, 2018) sets out the Government's planning policies for Ireland and how these should be applied. NPF sets out that to achieve sustainable development, the planning system must incorporate an environmental objective, which should include:

- Integrating planning for green infrastructure and ecosystem services.
- Enhancing of the conservation status and improving management of protected areas and protected species.
- Using natural resources prudently.
- Minimising waste and pollution.
- Mitigating and adapting to climate change, including moving to a low carbon economy.

There is a presumption in favour of sustainable development in NPF.

3.4 Ireland's 4th National Biodiversity Action Plan 2023-2030

The National Biodiversity Action Plan 2023-2030 for Ireland (NBAP) outlines five main objectives to meet commitments under the Convention on Biological Diversity (CBD) and EU Biodiversity Strategy. These objectives are to:

- Adopt a whole of Government, whole of society approach to biodiversity.
- Meet urgent conservation and restoration needs.
- Secure nature's contribution to people.
- Enhance the evidence base for action on biodiversity.
- Strengthen Ireland's contribution to international biodiversity initiatives.

3.5 South Dublin County Development Plan 2022-2028

The South Dublin County Council Development Plan 2022-2028 sets out the framework to guide future development in South Dublin and includes policies and objectives for topics such as natural heritage and green infrastructure for South Dublin County. Several policies are relevant to biodiversity and the Proposed Development, including the following:

- Policy NCBH1: Overarching – protect, conserve and enhance the County's natural, cultural and built heritage, supporting its sensitive integration into the development of the County for the benefit of present and future generations.
- Policy NCBH2: Biodiversity – protect, conserve, and enhance the County's biodiversity and ecological connectivity having regard to national and EU legislation and Strategies.
- Policy NCBH3: Natura 2000 Sites – conserve and protect Natura 2000 sites and achieve and maintain favourable conservation status for habitats and species that are considered to be at risk through the protection of the Natura 2000 network from any plans or projects that are likely to have a significant effect on their coherence or integrity.
- Policy NCBH4: Proposed Natural Heritage Areas – protect the ecological, visual, recreational, environmental and amenity value of the County's proposed Natural Heritage Areas and associated habitats and species.
- Policy NCBH5: Protection of Habitats and Species Outside of Designated Areas – protect and promote the conservation of biodiversity outside of designated areas and ensure that species and habitats that are protected under the Wildlife Acts 1976 to 2018, the Birds Directive 1979 and the Habitats Directive 1992, the Flora (Protection) Order 2015, and wildlife corridors are adequately protected.
- Policy NCBH10: Invasive Species – protect against and prevent the introduction and spread of invasive species within the County and require landowners and developers to adhere to best practice guidance in relation to the control of invasive species.
- Policy NCBH11: Tree Preservation Orders and Other Tree/Hedgerow Protections – review Tree Preservation Orders (TPO) within the County and maintain the conservation value of trees and groups of trees that are the subject of a Tree Preservation Order while also recognising the value of and protecting trees and hedgerows which are not subject to a TPO.
- Policy GI1: Overarching – protect, enhance and further develop a multifunctional Green Infrastructure (GI) network, using an ecosystem services approach, protecting, enhancing and further developing the identified interconnected network of parks, open spaces, natural features, protected areas, and rivers and streams that provide a shared space for amenity and recreation, biodiversity protection, water quality, flood management and adaptation to climate change.
- Policy GI2: Biodiversity – strengthen the existing GI network and ensure all new developments contribute towards GI, to protect and enhance biodiversity across the County as part of South Dublin County Council's commitment to the National Biodiversity Action Plan 2021-2025 [sic] and the South Dublin County Council Biodiversity Action Plan 2020-2026, the NPF, and the Eastern and Midlands Region Spatial and Economic Strategy.

- Policy GI7: Landscape, Natural, Cultural and Built Heritage – protect, conserve and enhance landscape, natural, cultural and built heritage features, and support the objectives and actions of the County Heritage Plan. Of particular note is:
  - GI7 Objective 4: To develop Rathcoole Woodlands as part of a wider nature/walking trail from Saggart to Lugg Woods subject to the protection of its biodiversity, wildlife and ecological value which is of primary importance.
    - GI7 SLO 1: The current green wildlife corridor between Saggart and Rathcoole be maintained, and the need to preserve this wildlife corridor be incorporated into the design and development plans for Rathcoole Park.
    - GI7 SLO 2: To ensure the adequate protection and augmentation of the identified Alluvial Rathcoole Woodlands within the zoning RU, and in recognising their value as green infrastructure and the potential linkages to Lugg Woods and Slade Valley and other amenity areas, provide for sensitive passive amenity uses which have regard to their Annex I status.

3.6 South Dublin County Biodiversity Action Plan 2020-2026

The draft South Dublin County Biodiversity Action Plan is a six-year plan for the protection, enhancement, and future adaptation of biodiversity in the County. The actions of the South Dublin County Biodiversity Action Plan were formulated with the aim of addressing local biodiversity needs and addressing key actions of the National Biodiversity Action Plan 2017-2021.

The actions arising from the consultation process are listed under three agreed themes or targets as follows:

- "*Getting to know what we have*": surveying and mapping habitats and species in the county, identifying high nature value areas and local biodiversity spots, mapping the County's Green Infrastructure, locating and managing non-native invasive species.
- "*Telling the story*": connecting with nature, encouraging awareness and community involvement in biodiversity projects, celebrating and promoting the County's biodiversity, communicating the objectives and achievements, undertaking biodiversity research studies.
- "*Leading the way*": good governance, addressing the threats to biodiversity in the County by striving for better implementation of local, national, and international biodiversity policy and action for climate change.

4. Methods for Ecological Impact Assessment

4.1 Overview of Ecological Impact Assessment

This section describes the method used for the assessment of potential impacts from the Proposed Development, both in isolation and cumulatively with other plans or projects, on ecological features. As discussed in the Methods section of Chapter 06, the term ecological feature refers to all sites designated for nature conservation, habitats and plant and animal species, though only ecological features that are important and that could be significantly affected by the Proposed Development require detailed assessment.

The method adopted follows the CIEEM (2018) guidelines for EcIA. These guidelines set out a process of identifying the baseline ecology and value of ecological receptors, identifying, and characterising the impacts/effects that are predicted, describing the mitigation measures required, and assessing the significance of the effects of the residual impacts effects once mitigation is considered. Throughout the assessment, the professional judgement of experienced ecologists is applied as necessary.

The principal steps in EcIA are summarised as follows:

- Determine baseline conditions through targeted desk study and field survey, to identify important ecological features that are present and that might be affected.

- Evaluate the importance of identified ecological features on a geographic scale, determining which features will be subject to detailed impact assessment.
- Describe potential impacts on relevant ecological features, considering best practice, legislation and embedded design measures.
- Assess and quantify (as far as possible) likely effects (adverse or beneficial) on relevant ecological features and determine if effects are likely to be significant.
- Develop measures to avoid or reduce predicted significant effects, in conjunction with other elements of the design (including mitigation for other environmental disciplines).
- Report residual effects, considering developed mitigation and/or compensation.
- Assess the potential for cumulative effects.
- Identify opportunities for biodiversity enhancement.

4.2 Baseline Conditions

The assessment first establishes the ecological baseline conditions which are determined by obtaining data on potentially affected ecological features through targeted desk study and field surveys. Ecological baseline conditions are those existing in the absence of proposed activities, in a "do nothing" scenario.

The impact assessment determines how the conditions will change in relation to this baseline to facilitate a clear understanding of the impacts of a development. Assessing the impacts of the Proposed Development, and associated activities, requires an understanding of the baseline conditions before and at the time of the project proceeding, or specific activities taking place.

4.3 Valuing the Importance of Ecological Features

Only those ecological features that are important and that could be significantly affected by the Proposed Development require detailed assessment – *"it is not necessary to carry out detailed assessment of ecological features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable*" (CIEEM, 2018).

However, this does not mean that efforts should not be made to safeguard wider biodiversity, and national policy documents emphasise the need to minimise impacts on and provide benefits for biodiversity from development.

To support focused EcIA there is a need to determine the importance of the ecological features identified through the desk studies and field surveys carried out for the Proposed Development. The approach taken when establishing the importance of ecological features needs to be robust as it provides much of the rationale for the identification and further assessment of relevant ecological features. Factors which can determine the relative importance of an ecological feature can include:

- Naturalness.
- Animal or plant species, sub-species or varieties that are rare or uncommon, either internationally, nationally or more locally, including those that may be seasonally transient.
- Ecosystems and their component parts, which provide the habitats required by important species, populations and/or assemblages.
- Endemic species or locally distinct sub-populations of a species.
- Habitats that are rare or uncommon.
- Habitats that are effectively irreplaceable.
- Habitat diversity.
- Size of habitat or species population.
- Habitat connectivity and / or synergistic associations.
- Habitats and species in decline.

- Rich assemblages of plants and animals.
- Large populations of species or concentrations of species considered uncommon or threatened in a wider context.
- Plant communities (and their associated animals) that are considered to be typical of valued natural/semi-natural vegetation types, including examples of naturally species-poor communities.
- Species on the edge of their range, particularly where their distribution is changing as a result of global trends and climate change.

Where available, relevant guidance is used to inform the importance of ecological features. Professional judgement is also used as appropriate when assigning importance, particularly where habitats or species are poorly known, or where guidance is lacking. Ecological features may be identified that are not included in lists of important habitats or species, but that can be considered important on the basis of expert judgement (for example, because of their local rarity, or because they enable effective conservation of other important features) (CIEEM, 2018).

Requirements to comply with legislation are stated during the assessment, but legislative protection or priority listing does not necessarily translate to importance. For example, a transitory roost of a single bat would not be afforded the same importance as a regularly occurring maternity roost (although legal obligations must still be met), and areas of European Annex I habitat could be unfavourably small or in poor condition and not practically restorable.

The importance of ecological features is described within a geographic scale. Examples of the types of ecological features which might fall into various importance categories are given in Table 2, which is adapted from CIEEM (2018) guidance. In some cases, professional judgement is used to increase or decrease the value of ecological features, based on contemporary studies or first-hand knowledge.

Table 2: Importance of Ecological Features

Importance	Example of Ecological Feature
International	• European sites, e.g. SAC and SPA, including proposed and candidate sites, and Ramsar sites. • Areas which meet the published selection criteria for the sites listed above but which are not themselves designated as such. • Resident, or regularly occurring, populations of species which may be considered at an International or European level where: – the loss of these populations would adversely affect the conservation status or distribution of the species at this geographic scale. – the population forms a critical part of a wider population at this scale. – the species is at a critical phase of its life cycle at this scale.
National	• Nationally designated nature conservation site (or proposed such site), or site satisfying criteria for such designation. • Sustainable area of good quality Annex I habitat not deemed to be of international importance. • Regularly occurring nationally significant population (e.g. 1% of the national population, or potentially less for critical parts of wider populations or those at a critical life-cycle stage) of species listed or protected under the Wildlife Acts or Red Data Lists, or site supporting one.
County	• County designated nature conservation site (or proposed such site). • Sustainable area of Annex I habitat not deemed to be of higher importance (e.g., lower quality, highly fragmented, small and/or low restoration potential), or priority habitat under a Local Biodiversity Action Plan if this exists and applies at county level. • Regularly occurring County significant population (e.g. 1% of county resource, or potentially less for critical parts of wider populations or those at a critical life-cycle stage) of species listed or protected under the Habitats/Birds Directives, Wildlife Acts, Red Data Lists or Local Biodiversity Action Plan (if this exists and applies at county level), or site supporting one.
Local	• Habitat of insufficient size or quality for higher importance or degraded with low restoration potential. • Habitat providing significant biodiversity or important ecological corridors in a local context.

Importance	Example of Ecological Feature
	• Small sustainable population of notable species not qualifying for higher importance or uncommon locally. • Common, heavily managed or modified habitat. • Common and widespread species.

4.4 Describing and Characterising Potential Impacts

Impacts may occur during the construction, operation, and decommissioning phases of a development. They may be direct or indirect (also termed 'secondary'). Direct impacts are attributable to an action associated with a development. Indirect impacts are often produced away from a development or as a result of other initial impacts.

In line with the CIEEM guidelines (2018), the terminology used within the EcIA draws a clear distinction between the terms 'impact' and 'effect'. For the EcIA, these terms are defined as follows:

- Impact: actions result in changes to an ecological feature. For example, tree felling activities leading to the loss of a bat roost.
- Effect: the outcome resulting from an impact acting upon the conservation status or structure and/or function of an ecological feature. For example, killing/injury of bats and reducing the availability of breeding habitat as a result of the loss of a bat roost may lead to an adverse effect on the conservation status of the population concerned.

In general accordance with CIEEM (2018) guidelines, potential impacts and effects are characterised by considering parameters described in Table 3.

Table 3: Descriptions of Potential Impact Parameters

Potential Impact/ Effect Parameter	Description
'Quality' or direction of effect	Positive (or beneficial) – a change that improves the quality of the environment or slows an existing decline in the quality of the environment.
	Negative (or adverse) – a change which reduces the quality of the environment, e.g. destruction of habitat, removal of species foraging habitat.
Magnitude	Refers to size, amount, intensity, and volume of impact. Proportion of a population, or other measurable unit significantly impacted by an effect, e.g. amount of habitat loss, percentage change to habitat area. Should be described in quantitative terms as far as possible.
Extent	The spatial or geographical area over which the impact/effect may occur under a range of conditions, e.g. noise transmission under water. Can be synonymous with magnitude in the case of habitats.
Duration	Duration should be defined in relation to ecological characteristics (such as a species' lifecycle) as well as human timeframes. The duration of an activity may differ from the duration of the resulting effect caused by the activity, e.g. if short-term construction activities cause disturbance to the breeding bird period, there may be long-term implications from failure to reproduce that season. Impacts/effects may be described as short-, medium-, or long-term, and permanent or temporary. Short-, medium-, long-term, and temporary are defined in months/years.
Frequency and timing	Frequency refers to how often the effect will occur (e.g. once, rarely, occasionally, frequently, hourly, daily, or constantly). Timing differs from frequency and is of particular relevance to biodiversity effects; the timing of an activity may result in a significant potential impact if it coincides with critical life-stages or seasons, e.g. bird nesting season. Outside this period, similar actions may not cause significant impacts.
Reversibility	An irreversible effect is one from which recovery is not possible within a reasonable timescale or there is no reasonable chance of action being taken to reverse it. A reversible effect is one from which spontaneous recovery is possible or which may be counteracted by mitigation.

4.5 Determining Significance of Effects

Potential impacts on relevant ecological features are assessed and a judgement reached on whether or not the resultant effect on the 'conservation status' or structure and function is likely to be significant. This process takes into consideration the characteristics of the impact, the sensitivity of the ecological feature concerned, and the geographic scale at which the feature is considered important.

CIEEM (2018) states that, for habitats "*conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area*".

CIEEM defines the conservation status of a species as "*the sum of the influences acting on it which may affect its long-term distribution and abundance, within the geographical area of interest*". A species' conservation status is considered to be favourable when:

- Population dynamics indicate that the species is maintaining itself on a long-term basis as a viable component of its habitats.
- The natural range of the species is not being reduced, nor is it likely to be reduced for the foreseeable future.
- There is (and probably will continue to be) a sufficiently large habitat to maintain its population on a long-term basis.

CIEEM (2018) states that:

> *"for the purpose of EcIA a 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' (i.e., relevant ecological features) or for biodiversity in general … In broad terms, significant effects encompass impacts on the structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution)".*

The scale of the significance of an effect is assessed by determining whether the ecological integrity of a site or ecosystem, or the conservation status of a species, will be affected at the geographic levels described in Table 2. An effect could occur at a lower geographic level than the importance assigned to that particular ecological feature (for example, an effect on a habitat or population assigned National importance may be slight and not consequential at the National level). These assessments are based on quantitative evidence where possible, and as necessary through the professional judgement of experienced ecologists.

Initially, the assessment of effects does not consider mitigation (avoidance or reduction) or compensation measures, except where these are explicitly embedded into the design of the Proposed Development or where they are industry-standard good practice measures required to comply with other non-ecological legislation. The assessment of residual effects takes such measures into account, with the aim that, wherever possible, residual effects are not significant or are significant at a lower geographic level than the unmitigated effects (unless beneficial).

Consideration is given to cumulative effects, since effects acting in-combination may have a cumulative effect exceeding that of the separate effects. Cumulative effects may also arise from a combination of effects from the Proposed Development itself.

In the broader context of the EIAR for the Proposed Development, effects on ecological features predicted to be significant at the County or greater geographic level are considered to be 'Significant', whereas those predicted to be significant only at the Local level, or to have Negligible effect, are considered to be 'Not Significant'.

5. Mitigation, Compensation, and Enhancement

The identification and specification of mitigation proposals in this assessment have been conducted with regard to the following hierarchical principles (based on CIEEM (2018)):

- Avoid: Seek options that avoid negative effects to ecological features (e.g. locating to an alternative site, removing an element of a development, or timing of works to avoid sensitive periods).
- Minimise: Where negative effects cannot be avoided, they should be minimised through mitigation measures (e.g. use of directional or low-level lighting to avoid sensitive habitats). Minimisation can be implemented either through the design of the Proposed Development (e.g. iterative design) or subsequent measures that can be guaranteed (e.g. through a condition or planning obligation), such as advanced commitment to sensitive methods or timing of working (i.e. embedded mitigation) or the application of additional proven measures, such that the residual effect realised is reduced in magnitude (non-embedded mitigation).
- Compensate: Where there are significant residual negative ecological effects despite the mitigation proposed, these should be offset by appropriate compensatory measures (e.g. by providing suitable habitats elsewhere on the client-owned parts of the wider site). Proposals should achieve appropriate compensation in a reasonable timeframe and be legally enforceable.
- Enhance: Seek to provide net benefits for biodiversity over and above requirements for avoidance, mitigation, or compensation.

This hierarchy requires the highest level to be applied where possible (i.e. avoidance in the first instance). Only where this cannot reasonably be adopted should lower levels be considered.

Where it is reasonably practicable to do so, attempts have been made to avoid potential impacts. Where impacts cannot be avoided then efforts have been made to limit the magnitude of the potential impact and to mitigate the resultant effects through the provision of appropriate measures. Where effects cannot be mitigated to a level where they are not significant then compensatory measures have been employed to (as far as is reasonably possible) offset any remaining adverse effects.

6. AECOM Ecology Personnel Experience

Dr Eleanor Ballard BSc (Hons) PGDip CEnv MCIEEM (Technical Excellence Director) is Technical Excellence Director for AECOM's Environment Business Unit with over 25 years' post-doctoral experience in ecological project design, delivery and management. Her work spans major infrastructure schemes including roads, electrical networks, power stations and wind farms, underpinned by a comprehensive knowledge of ecological best practice and legislation. Eleanor has conducted protected species and habitat surveys across aquatic, marine and terrestrial environments in Northern Ireland, the Republic of Ireland, and Great Britain, producing the full range of ecological reports, assessments and chapters. Eleanor combines her wealth of skills and experience to deliver complex projects with scientific rigour and client-focused clarity.

Dr Emma Boston BSc (Hons) CEcol MCIEEM MRSB (Associate Director) has over 20 years' experience in research, conservation, and consultancy. She has published 16 peer-reviewed publications from her research conducted across a number of international research institutions. Emma has experience in a variety of ecological survey methods and has worked independently and as part of a multidisciplinary environmental team as consultant. Emma's primary expertise is bats, using a range of survey methods, techniques, and equipment. She has held protected species survey licences to catch and radio-track bats in Northern Ireland and the Republic of Ireland.

Dr Paul Lynas BSc (Hons) MRes CEnv MCIEEM (Associate Director) has over 22 years' professional experience, including over 18 years at AECOM. Specialising in bird survey, he has also carried out numerous flora and fauna assessments for both public and private sector clients and regularly works as part of a multidisciplinary team on many large-scale infrastructure projects, including power, road, rail, and other large developments, acting as an Expert Witness where required. Paul has wide-ranging experience with the application of the European Habitats Directive and has prepared many Appropriate Assessments.

Jenny Hunter BSc (Hons) MSc MCIEEM MRSB (Principal Ecologist) has over eleven years' professional experience of ecological consultancy. She has worked as part of multidisciplinary and dedicated ecological teams contributing to projects in power and energy, infrastructure, industrial and commercial, and property development across the UK and Ireland. Jenny has extensive field experience of a variety of species and habitat survey techniques. She is proficient in Phase 1 and

Fossitt habitat survey across a variety of habitats and has experience of National Vegetation Classification (NVC) and Irish Vegetation Classification (IVC) methods. She has experience of habitat condition assessment and monitoring, previously having carried out quadrat monitoring and habitat assessment for a variety of projects.

Dr Ruth Kelly BSc (Hons) MSc (Principal Ecologist) is an experienced ecologist with over thirteen years of professional experience in ecological research, university-level teaching, and environmental advice and policy. Ruth has extensive experience in botanical and invasive species surveys, with particular expertise in upland habitats. Ruth is experienced with habitat and vegetation survey methods, including Phase 1, Fossitt, NVC, and IVC.

Seánin Munglani BSc (Hons) MSc ACIEEM (Senior Ecologist) has over six years' professional experience of ecological consultancy. Seánin has been involved in a range of projects including infrastructure, residential, educational, and commercial across the UK and Ireland. Seánin has experience carrying out a range of ecological surveys, including bats, badger, smooth newt, reptiles, otter, and Fossitt habitat surveys. Seánin has extensive experience in the survey of bats using a range of survey methods.

Laura Cappelli BSc (Hons) MSc MCIEEM (Senior Ecologist) has six years of professional ecological consultancy experience throughout Ireland. Laura has extensive experience of field survey and reporting, and has prepared numerous EcIA, Preliminary Ecological Appraisals, and AA Screenings for a range of planning applications, including solar farms, national road schemes, underground cable connections, residential developments, transport developments, waste-to-energy projects and waste remediation projects. Laura is also experienced in surveying for a range of habitats and species, including bats, mammals and amphibians.

Alison Donnelly BSc (Hons) MSc (Senior Ecologist) has eight years of experience specialising in ornithology. Alison has extensive experience authoring and managing technical reports in support of EIA and AA in Ireland, the UK, and internationally. She has designed and led year-round survey programmes, including breeding and non-breeding bird surveys, vantage point surveys and collision risk modelling, for numerous projects throughout Ireland, including major energy and infrastructure projects.

Fred Mosley BSC (Hons) MSc (Graduate Ecologist) is a qualifying member of CIEEM and has two years of experience in professional consultancy. Fred has experience of reporting and field work, including bat, mammal, and habitat survey for a variety of projects across Ireland.

Aoife Keenan BSc (Hons) MSc (Graduate Ecologist) is a qualifying member of CIEEM with one year of ecological consultancy experience. She also has two years' experience in environmental consultancy. Aoife has assisted in a wide variety of ecological surveys including habitats (including upland habitats), bats, badger, otter, breeding and non-breeding birds, and butterflies. Aoife has contributed to projects in power and energy, infrastructure, waste management, water compliance and industrial activities across the UK and Ireland.

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