

Appendix 16.A

Appendix 16.A Zones of Influence Informing the Biodiversity Assessment

Table A.1: Zones of Influence informing the EIAR – habitats and flora

Habitats/Plants	Type of potential impact	Zol (m) for potentially significant effects	Rationale
<p>'Terrestrial' habitats and plant species without significant groundwater or surface-water dependency (i.e. relative to examples in the next two rows of this table)</p>	Direct habitat loss.	Footprint of construction including temporary works	<p>No habitat loss / damage predicted beyond this area.</p> <p>Assumes no indirect and / or far-field effects, e.g. from flooding or shading arising as a result of the Proposed development.</p>
<p>Habitats and plant species with relatively high ground-water dependency relative to 'terrestrial' habitats (e.g. turloughs, petrifying springs, petalwort)</p>	Direct habitat loss or indirect impacts to groundwater supply or yield.	Groundwater body in which the development is located.	Assumes no significant impacts predicted on flow or yield of groundwater to groundwater-dependent habitats beyond this area.
<p>Habitats and plant species with relatively high surface-water dependency relative to 'terrestrial' habitats above (e.g. rivers, mudflats, saltmarsh, reefs)</p>	<p>Direct habitat loss.</p> <hr/> <p>Indirect pollution impacts.</p>	<p>Footprint of construction for direct impacts.</p> <hr/> <p>Entire freshwater and/or estuarine catchment (s) downstream of proposed development</p>	<p>No habitat loss / damage predicted beyond this area.</p> <hr/> <p>Highly precautionary approach which assumes pollutants may cross sub-catchment boundaries and estuarine Hydrometric Area boundaries</p>

Table A.2: Zones of Influence (Zol) informing the EIAR – Fauna

Fauna species and their habitat features	Type of potential impact	Zol (m) for potentially significant effects	Rationale
Bats and their roosts (direct effects)	'Direct' disturbance of roost sites including noise, vibration, or light spill.	Typically estimated as a minimum of 50 m from potential or confirmed roost sites, but informed by on a case-by-case basis by relevant data (e.g. isoline drawings of lux levels or other data in the case of light spill).	Professional judgement, having regard for guidance including Collins (2016), BCT and ILP, 2018).
Bats and their roosts (indirect effects)	Fragmentation of foraging / commuting habitats.	Varies by bat species; at least 13 km in the case of long-distance foraging of Irish Leisler's bats.	Leisler bats have been radio-tracked to demonstrate movements of at least 13 km from nursery roost to feeding site (Shiels <i>et al.</i> , 2006).
Breeding or resting sites of otter, badger, hedgehog, stoat	Physical disturbance to breeding or resting sites including 'entombment' in the case of otter and badger (i.e. following collapse of hole / nest due to vibration).	Breeding/resting sites within up to 150 m of disturbance in the case of piling ¹ . Breeding/resting sites within 50 m of other works.	150 m is the potential limit of disturbance from blasting and piling from NRA (2006). Distances are subject to case-by-case assessment of local ground conditions (e.g. holes in unstable clay substrates are more sensitive than those protected from vibration from sheet rock).
Pygmy shrew	Pygmy shrew hibernating or breeding within vegetation to be disturbed.	Habitat within c. 100 m of vegetation removal.	Professional judgement given territory sizes reported by Haydyn and Harrington (2001).
Birds: nesting birds	Nesting birds including any singing males potentially affected by noise.	Territories within 150 m of disturbance.	Professional judgement for distance within which territorial singing may be impacted by noise from construction and operation
Invertebrates	Direct loss of habitat or injury.	Footprint of construction for direct impacts.	Similarly to habitats; no habitat loss / direct injury predicted beyond this area.

Fauna species and their habitat features	Type of potential impact	Zol (m) for potentially significant effects	Rationale
Fish (pollution impacts)	Siltation or other pollution effects on spawning, feeding, or nursery areas.	Entire freshwater and/or estuarine catchment (s) downstream of proposed development of proposed development (and local areas upstream of the discharge point to the Abbey River, given the Abbey River is tidal, and potential pollutants could be carried a distance upstream of the point of discharge).	Highly precautionary approach which assumes pollutants may cross sub-catchment boundaries and estuarine Hydrometric Area boundaries
Fish (noise and vibration from piling)	None – considered non-significant.	None – considered non-significant	Professional judgement, given there will be no instream piling, and piling is indeed c.75 m from the nearest fish habitats.
Non-breeding (wetland) birds	Feeding or roosting birds disturbed by noise or visual presence of humans.	Generally assessed within 500 m of the Proposed development footprint for wintering birds.	Professional judgement applied to data from Madsen (1985); Smit and Visser (1993) and Rees <i>et al.</i> (2005).

Appendix 16.B

Appendix 16.B Flora species lists by habitat type

Table A.3: ED2 Spoil and bare ground/ ED3 Recolonising bare ground mosaic

Common name	Scientific name
Atlantic ivy	Hedera hibernica
Butterfly-bush	Buddleja davidii
Cleavers	Galium aparine
Common nettle	Urtica dioica
Creeping buttercup	Ranunculus repens
Daisy	Bellis perennis
Dandelion	Taraxacum officinale agg.
Common figwort	Scrophularia nodosa
Greater plantain	Plantago major
Ivy-leaved toadflax	Cymbalaria muralis
Ragwort	Senecio jacobaea
Red valerian	Centranthus ruber
Ribwort plantain	Plantago lanceolata
Rose-bay willow herb	Chamerion angustifolium
Spear thistle	Cirsium vulgare
White clover	Trifolium repens
Woody nightshade	Solanum dulcamara
Yorkshire-fog	Holcus lanatus

Table A.4: WL2 Treelines (i.e. Street Trees)

Common name	Scientific name
Norway maple	Acer platanoides,
Small-leaved lime	Tilia cordata
Sycamore	Acer pseudoplatanus
Wych elm	Ulmus glabra

Appendix 16.C Ecological valuation from NRA guidelines

Guidelines for Assessment of Ecological Impacts
of National Road Schemes

Ecological valuation: Examples

International Importance:

- ❑ 'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation.
- ❑ Proposed Special Protection Area (pSPA).
- ❑ Site that fulfills the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended).
- ❑ Features essential to maintaining the coherence of the Natura 2000 Network.⁴
- ❑ Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive.
- ❑ Resident or regularly occurring populations (assessed to be important at the national level)⁵ of the following:
 - ❑ Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or
 - ❑ Species of animal and plants listed in Annex II and/or IV of the Habitats Directive.
- ❑ Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971).
- ❑ World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972).
- ❑ Biosphere Reserve (UNESCO Man & The Biosphere Programme).
- ❑ Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979).
- ❑ Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979).
- ❑ Biogenetic Reserve under the Council of Europe.
- ❑ European Diploma Site under the Council of Europe.
- ❑ Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).⁶

National Importance:

- ❑ Site designated or proposed as a Natural Heritage Area (NHA).
- ❑ Statutory Nature Reserve.
- ❑ Refuge for Fauna and Flora protected under the Wildlife Acts.
- ❑ National Park.
- ❑ Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park.
- ❑ Resident or regularly occurring populations (assessed to be important at the national level)⁷ of the following:
 - ❑ Species protected under the Wildlife Acts; and/or
 - ❑ Species listed on the relevant Red Data list.
- ❑ Site containing 'viable areas'⁸ of the habitat types listed in Annex I of the Habitats Directive.

⁴ See Articles 3 and 10 of the Habitats Directive.

⁵ It is suggested that, in general, 1% of the national population of such species qualifies as an internationally important population. However, a smaller population may qualify as internationally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

⁶ Note that such waters are designated based on these waters' capabilities of supporting salmon (*Salmo salar*), trout (*Salmo trutta*), char (*Salvelinus*) and whitefish (*Coregonus*).

⁷ It is suggested that, in general, 1% of the national population of such species qualifies as a nationally important population. However, a smaller population may qualify as nationally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

⁸ A 'viable area' is defined as an area of a habitat that, given the particular characteristics of that habitat, was of a sufficient size and shape, such that its integrity (in terms of species composition, and ecological processes and function) would be maintained in the face of stochastic change (for example, as a result of climatic variation).

County Importance:

- Area of Special Amenity.⁹
- Area subject to a Tree Preservation Order.
- Area of High Amenity, or equivalent, designated under the County Development Plan.
- Resident or regularly occurring populations (assessed to be important at the County level)¹⁰ of the following:
 - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
 - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
 - Species protected under the Wildlife Acts; and/or
 - Species listed on the relevant Red Data list.
- Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance.
- County important populations of species, or viable areas of semi-natural habitats or natural heritage features identified in the National or Local BAP,¹¹ if this has been prepared.
- Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county.
- Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.

Local Importance (higher value):

- Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared;
- Resident or regularly occurring populations (assessed to be important at the Local level)¹² of the following:
 - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
 - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
 - Species protected under the Wildlife Acts; and/or
 - Species listed on the relevant Red Data list.
- Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality;
- Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.

Local Importance (lower value):

- Sites containing small areas of semi-natural habitat that are of some local importance for wildlife;
- Sites or features containing non-native species that are of some importance in maintaining habitat links.

Table 1: *Examples of valuation at different geographical scales*

⁹ It should be noted that whilst areas such as Areas of Special Amenity, areas subject to a Tree Preservation Order and Areas of High Amenity are often designated on the basis of their ecological value, they may also be designated for other reasons, such as their amenity or recreational value. Therefore, it should not be automatically assumed that such sites are of County importance from an ecological perspective.

¹⁰ It is suggested that, in general, 1% of the County population of such species qualifies as a County important population. However, a smaller population may qualify as County important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

¹¹ BAP: Biodiversity Action Plan

¹² It is suggested that, in general, 1% of the local population of such species qualifies as a locally important population. However, a smaller population may qualify as locally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.