

# BAT ASSESSMENT IN RELATION TO A PROPOSED RESIDENTIAL DEVELOPMENT SITE AT ARDAROSTIG, BISHOPSTOWN, CORK.



**Prepared for:**

HW Planning 

On behalf of On behalf of Ardstone Homes Ltd.

**Prepared by:**

Kelleher Ecology Services Ltd.



**April 2021**

# **BAT ASSESSMENT IN RELATION TO A PROPOSED RESIDENTIAL DEVELOPMENT SITE AT ARDAROSTIG, BISHOPSTOWN, CORK.**

Our Project Reference: 028-06-2020

<b>Document Rev. No.</b>	<b>Details</b>	<b>Contributor</b>	<b>Date</b>
A	Draft	Katherine M. Kelleher	04.03.21
B	Edits	Katherine M. Kelleher	22.03.21
0	Final	Katherine M. Kelleher	23.04.21

## Contents

<b>1</b>	<b>Introduction</b> .....	<b>1</b>
1.1	Statement of Competence: Dr Katherine Kelleher .....	1
1.2	Bats in Ireland .....	1
1.3	Study Site .....	2
1.4	Proposed Development.....	3
<b>2</b>	<b>Methods</b> .....	<b>6</b>
2.1	Desktop Review .....	6
2.2	Field Assessment .....	6
2.3	Ecological Site Evaluation & Impact Assessment .....	6
<b>3</b>	<b>Results</b> .....	<b>7</b>
3.1	Desktop Review .....	7
3.2	Visual Assessment .....	7
3.2.1	Features & Bat Roosting Potential .....	7
3.2.2	Features & Bat Commuting/Foraging Potential.....	9
3.3	Study Site: Overall Ecological Evaluation .....	10
<b>4</b>	<b>Potential Impacts</b> .....	<b>11</b>
<b>5</b>	<b>Recommendations: Mitigation</b> .....	<b>12</b>
<b>6</b>	<b>References</b> .....	<b>14</b>

## Figures

Figure 1.1	Study Site Location.....	4
Figure 1.2	Study Site .....	5

## Appendices

Appendix A	Potential Suitability of Features for Bats
Appendix B	Biodiversity Evaluation Scheme
Appendix C	Impact Assessment Criteria: Descriptions of Effects
Appendix D	Photos of Trees to be Removed with Bat Roosting Potential

## **Executive Summary**

This report outlines the outcome of a bat assessment undertaken at a proposed residential development site at Ardarostig, Bishopstown, Cork. The field study comprised of a visual assessment to ascertain the potential suitability of features of potential interest for roosting, commuting and foraging bats. In this case, features of potential interest were found to relate to existing trees/linear woody vegetation.

The study site is of lower to higher local importance for bats overall, where some trees due for removal may potentially be of low to moderate suitability for bat roosting and on-site linear woody features are primarily considered to be of high suitability for commuting/foraging bats. This report suggests recommendations in relation to bat conservation and the proposed development.

## 1 Introduction

Kelleher Ecology Services Ltd. (KES) was commissioned by HW Planning, on behalf of Ardstone Homes Ltd., to undertake a bat assessment in relation to a proposed residential development site at Ardarostig, Bishopstown, Cork. This assessment was undertaken as part of a SHD application by the client for planning permission for the proposed residential development.

### 1.1 Statement of Competence: Dr Katherine Kelleher

Katherine Kelleher is a graduate of University College Cork with a BSc in Zoology and PhD in Ecology, and established Kelleher Ecology Services in 2011. She has over ten years of experience in ecological consultancy, acting as project manager on a range of ecological assessments & projects including solar/wind farm, road, gas pipeline, landfill, grid connection, industrial development, retail and housing. Katherine has significant experience of research, evaluative and analytical work in relation to planning applications, EIAR, appropriate assessment, planning compliance, commitments, licensing, baseline assessments, scoping studies *etc.*

### 1.2 Bats in Ireland

There are nine confirmed resident species of bat in Ireland; Common Pipistrelle *Pipistrellus pipistrellus* and Soprano Pipistrelle *Pipistrellus pygmaeus*, Nathusius' Pipistrelle *Pipistrellus nathusii*, Leisler's Bat *Nyctalus leisleri*, Brown Long-eared Bat *Plecotus auritus*, Daubenton's Bat *Myotis daubentonii*, Natterer's Bat *Myotis nattererii*, Whiskered Bat *Myotis mystacinus* and Lesser Horseshoe Bat *Rhinolophus hipposideros*. A further two species were noted on one occasion over the last decade or so, which are not considered resident but possible vagrants (see Roche *et al.* 2014); Brandt's bat *Myotis brandtii* and Greater Horseshoe *Rhinolophus ferrumequinum*.

All bat species occurring in Ireland are legally protected under the Irish Wildlife Acts (1976 - 2018) (see Marnell *et al.* 2009). Under this protection, it is an offence to hunt or interfere with or destroy their breeding or resting places (unless under statutory licence / permission). Furthermore all bat species are listed as Annex IV species under the EU Habitats Directive as an animal species of 'community interest in need of strict protection' (see Marnell *et al.* 2009); Lesser Horseshoe Bat (*Rhinolophus hipposideros*) is also listed on Annex II of the EU Habitats Directive as a species whose core areas of habitat require designation under Special Areas of Conservation (see Marnell *et al.* 2009). Of the nine resident species, only one is currently considered to be of conservation concern in Ireland as 'Near Threatened', Leisler's Bat *Nyctalus leisleri*. However, the Irish population is believed to be stable and the 'Near Threatened' listing is mainly due to the fact that Ireland is considered to be a stronghold for the population worldwide (Marnell *et al.* 2009).

Wildlife corridors are areas of habitat that allow connectivity between adjoining areas so that wildlife can use this connectivity to move about in the wider area. This also applies to bats in Ireland, where commuting is usually associated with linear vegetated features such as treelines, hedges and woodland. Foraging for bats is also often associated with such vegetated features, which tend to support insects that bats prey upon. Some bats species have adapted to specialise in other habitats, although vegetated features are never too far away (*e.g.* Daubenton's Bat *Myotis daubentonii* at rivers). However, bats, like any other wildlife, will also move through less vegetated landscapes when populations are exploring new

roosting/foraging opportunities or migrating between areas or countries. Therefore, potential impacts on bats need to be considered in the situation where vegetation that supports or potentially supports bat foraging/commuting routes may be affected by proposed works/activity.

Roost sites are used by bats all-year-round, although sites will change between spring/summer and winter periods when the bat's requirements are different. From late spring, pregnant female bats of the same species will generally establish maternity roosts where they will give birth and rear their offspring. Maternity roosts are located at warm, dry, undisturbed dark sites that are close to habitats that support the bat's insect prey (*e.g.* house attics, crevices in stone bridges). Breeding females are vulnerable when at their maternity roosts as there is a concentration of heavily pregnant individuals who only give birth to one pup per year. Furthermore, the pups are flightless for several weeks and are wholly dependent on their mothers during this period. Also, the mother has to frequently return to her pup at the roost site when feeding at night, which can increase the chance of predation (*e.g.* by nocturnal birds of prey such as owls). Non-breeding females can also reside at a maternity roost. Males will generally roost elsewhere, in small numbers or singly, at other night/day roosting sites (*e.g.* crevices in trees, between stones of a building or wall), which can change location quite a bit during the summer period. When temperatures and insects decline with the onset of winter, bats will move into hibernation/torpor roosts where bats will reduce their body temperature and slow down their metabolism, heart, breathing and other bodily functions in order to conserve energy. Hibernation roosts are located at cool, humid and undisturbed dark sites (*e.g.* caves, churches); although very few hibernation sites have been confirmed in Ireland (see Roche *et al.* 2014). During the hibernation period, bats will become active for short periods every so often to feed, drink water and sometimes move to another hibernation roost site (Richardson 2000).

The potential impacts on bats need to be considered in the situation where structures (*e.g.* trees, buildings) that support or potentially support bat roost sites may be affected by proposed works/activity. In the case of structures that are suitable as winter roost sites, impacts are generally best avoided during the winter months because of the difficulty in detecting winter hibernation roosts (as acoustic detector methods are less effective when bats are hibernating), and the fact that bats that are in a state of winter torpor are less likely to be able to escape from the affected structure and are therefore more vulnerable to injury/fatality. In the case of structures that are suitable as summer (maternity) roost sites, impacts are usually best avoided during the early/late summer period when females and juveniles are most vulnerable to injury/fatality because females may be heavily pregnant in May or suckling young flightless pups in June/July. Of course, where structures have been confirmed as bat roost sites (including maternity roosts) impacts should be avoided during the period when bats are present.

It is important to note that a derogation licence from the National Parks & Wildlife Service (NPWS) is required in instances where works/activity may impact on a bat roost. Such derogation relates to the destruction of bat roosts and/or potential disturbance/capture of roosting bats with appropriate mitigation measures, where required.

### 1.3 Study Site

The proposed development site is located at Ardarostig townland that is on the south-western edge of Cork City at Bishopstown (see Figure 1.1). The application site encompasses approximately 9.95ha, where the residential part of the study site is currently greenfield in nature comprising of one large open agricultural crop field with largely native hedgerow/treeline habitat along its outer boundary while the

pedestrian connection of the study site is dominated by vegetated habitat (scrub, woodland, spoil and bare ground, amenity grassland, scattered trees & parkland, recolonising bareground) and non-vegetated habitat (buildings and artificial surfaces; see Figure 1.2).

The site is sloping from north to south c. 20-50m above sea level, where it adjoins some private residences at its north-western and north-eastern corners but is otherwise surrounded by farmland with some woodland along the eastern boundary (see Figure 1.2). There are no established watercourses or other water-features at the site, with the nearest known established watercourse being Two Pot (Cork City) River c. 180m to the west of the site. While a small<sup>1</sup> unregistered<sup>2</sup> water-feature was noted flowing into the western end of the proposed new cycle/pedestrian route from an off-site location associated with the adjoining willow-dominated woodland/scrub habitat that best classifies as eroding/upland stream<sup>3</sup>, it is not a typically well-established stream feature as such where it appears to be a water-feature that arises on occasion from peak rain events; it is proposed to manage the flow of this unregistered water-feature by incorporating a filter drain along the southern boundary of the proposed new cycle/pedestrian route (see Drawing Nos. 0420, 0421, 0422& 0423 by DOSA accompanying the planning application). No Tree Preservation Order (TPO) is known for the study site.

## 1.4 Proposed Development

The proposed development will involve the construction of a mixed use residential development with commercial space, crèche, landscaping, road improvement, pedestrian/cycleway and site development works. The proposed development will consist of 137 houses and 139 apartments over 5 apartment blocks, will provide for new vehicular and pedestrian entrances onto Waterfall Road, a two-way cycle track and pedestrian footpath linking to existing shared surface pathway south of the N40, upgrades to this shared surface path to provide two-way cycle track and pedestrian footpath, pedestrian crossings to the east of the site and on waterfall road, infrastructure development works comprising the relocation/undergrounding of ESB powerlines, wastewater treatment proposals, surface water attenuation, water utility services and all ancillary site development.

The proposed public lighting scheme for the development here comprises of LED luminaires on 6m columns internally within the development area and on 8m columns along the adjoining public road (see Kelliher's Lighting 2021). The proposed horizontal illuminance in this case is largely focused on roads/footpaths with no to minimal spillage onto adjoining existing/new vegetated receptors such as hedgerow/trees/woodland (see Kelliher's Lighting 2021).

---

<sup>1</sup> Wetted width c. 30-40 cm & depth c. 5-10 cm

<sup>2</sup> Under EPA rivers database

<sup>3</sup> After Fossitt J.A. 2000. *A Guide to Habitats in Ireland*. Heritage Council, Kilkenny.

Figure 1.1 Study Site Location

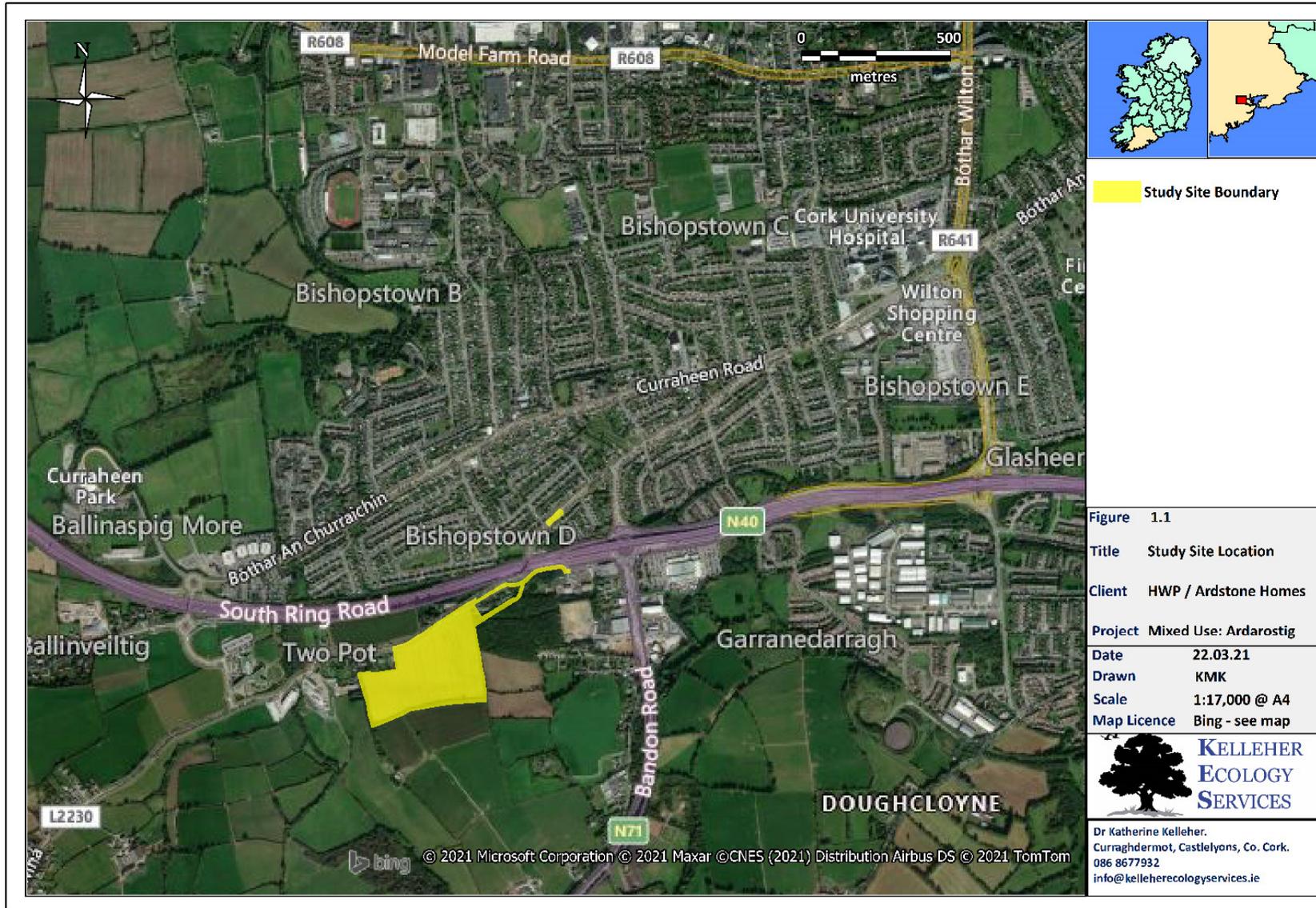
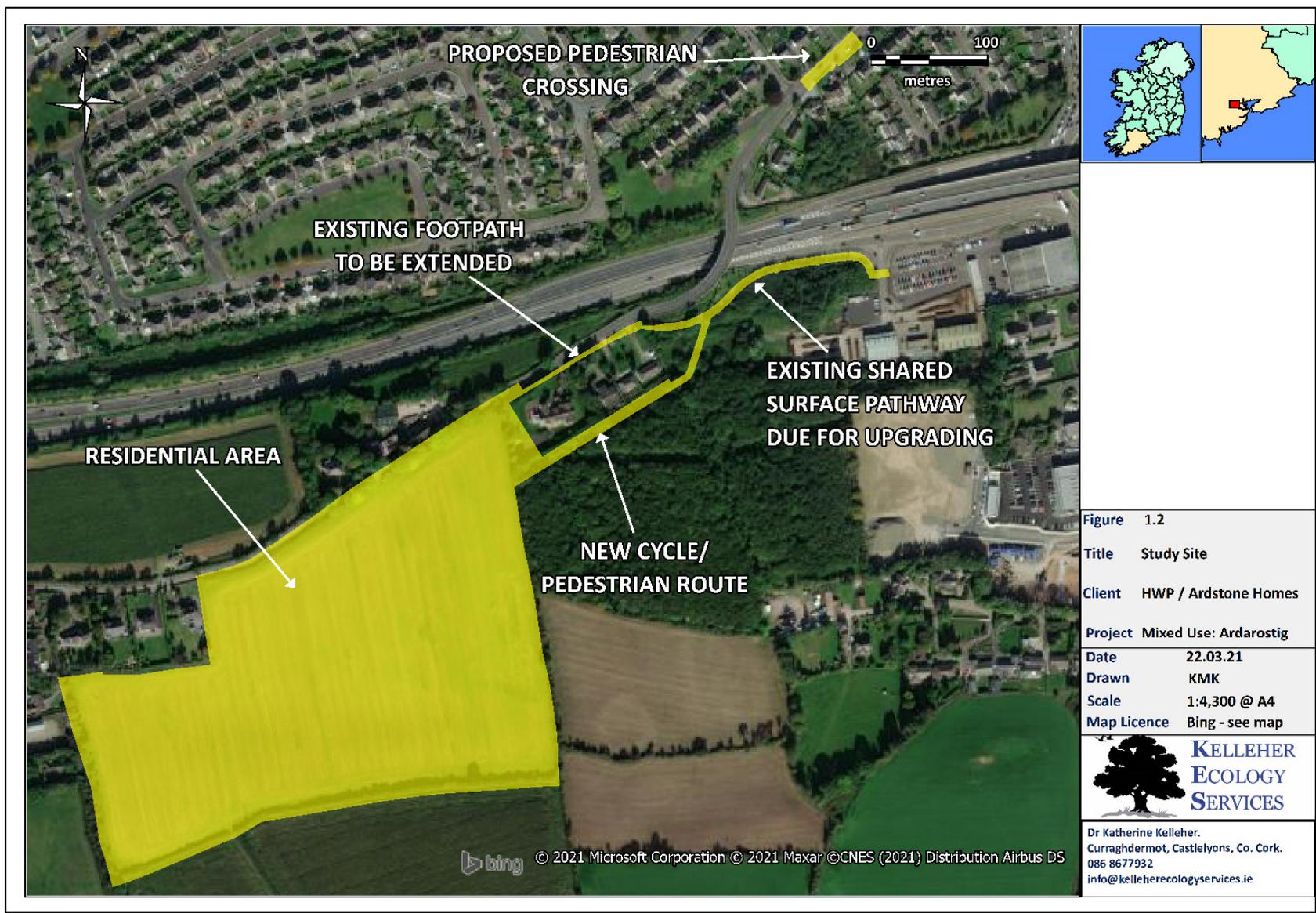


Figure 1.2 Study Site



## 2 Methods

### 2.1 Desktop Review

A desktop review of publicly available data for the study site and locality in relation to bats was undertaken. This included an interrogation of the NBDC online ecology database<sup>4</sup> as follows; (i) review of bat records from the W66J 2km national grid square that overlaps the study site and (ii) review of the Bat Landscape model for Ireland that has assessed the relative importance of landscape and habitat associations for bat species nationally (after Lundy *et al.* 2011) for the relevant W6369 & W6368 1km national grid squares overlapping the study site. A review of conservation sites designated for bats present within 5km of the study site was also undertaken.

### 2.2 Field Assessment

The potential suitability of features of potential interest for roosting, commuting and foraging bats was visually assessed with reference to guidance after Collins (2016; see Appendix A). In this case, features of potential interest relate to existing vegetation/trees; no other buildings/structures are present within the study site here (*e.g.* buildings, caves). The visual assessment in question was carried out from ground level using binoculars as necessary to scan features of potential interest in February 2021 (see Table 2.1); this included a visual assessment of standing trees due for removal regarding their potential suitability for roosting bats. A review of online aerial photography of the study site was also undertaken to assess connectivity to other relevant habitat features in the wider area.

As the timing of the site assessment was at a sub-optimal time of year to record peak bat activity (with bats still in winter torpor), active/passive detector surveys were not undertaken.

**Table 2.1 Bat Survey Schedule.**

Date	Time 24-hrs	Survey	Weather	Ecologist
25.02.21	c. 16.10 – 17.30	Visual Assessment of Features of Potential Interest for Bats.	Dry; Cloud 4/8 Okta; Wind F0-1; Good Visibility	Katherine Kelleher

### 2.3 Ecological Site Evaluation & Impact Assessment

Ecological evaluation of the study site regarding bats followed criteria amended after NRA (2009) and Nairn & Fossitt (2004; see Appendix B). Impact assessment associated with the proposed development on bats followed guidelines published by the EPA 2017 (see Appendix C) with reference to CIEEM (2018).

<sup>4</sup> National Biodiversity Data Centre (NBDC) <http://www.biodiversityireland.ie/>; accessed 4<sup>th</sup> November 2020.

## 3 Results

### 3.1 Desktop Review

The Model of Bat Landscapes (Lundy *et al.* 2011) suggests that the study site is part of a landscape that has a moderate to high resource value for bats in general; the main exceptions being Nathusius' Pipistrelle and Lesser Horseshoe Bat, where the study site is outside of the known national distribution of these species (see Roche *et al.* 2014). While no bat species have been historically recorded in the W66J 2km grid square overlapping the study site (after NBDC database); this is likely to be more indicative of an absence of survey effort locally rather than a real absence of bats, especially as the landscape bat model suggests a moderate to high resource value for bats in general. There is no site designated for bats within 5km of the study site here.

### 3.2 Visual Assessment

#### 3.2.1 Features & Bat Roosting Potential

Potential bat roosting structures present at the study site comprise of trees (*e.g.* mature and/or ivy-covered trees) where no other buildings/structures are present (*e.g.* buildings, caves) such that buildings/structures are not of relevance here.

A total of 31 trees present at the site in association with the field boundary and scrub/woodland edge area will need to be removed to facilitate the proposed development (see Tree Survey & Vegetation Removals Drawing No. 6824-PHL-00-ZZ-DR-L-0001 by Park Hood accompanying the planning application). The bat roosting potential of these trees was visually assessed, where bats can exploit spaces associated with trees for roosting (*i.e.* cracks, splits, holes, ivy *etc.*; see Collins 2016). The outcome of the visual assessment of these trees is summarised in Table 3.1 (potential after Collins 2016 in Appendix A) using the tree tag reference numbers (after South of Ireland Tree Surveys 2020). The potential suitability of trees due for removal to support roosting bats is primarily considered negligible/low overall in this case (17 specimens negligible; 3 specimens negligible to low; 4 specimens low) due to the presence of potentially adequate ivy cover. Only seven trees may potentially be of low to moderate suitability for bat roosting due to the level of extensive heavy ivy cover combined with branching that might be wide/large enough to support roosting opportunities (unable to confirm due to ivy cover). Bat roosting opportunities here are only likely to relate to small numbers of non-breeding bats on a transient basis during the summer/autumn period if they occur at all. Photos of trees with low/moderate roosting potential are available in Appendix D.

**Table 3.1 Trees Due for Removal & Potential for Bat Roosting Opportunities.**

Tree Tag Reference	Tree Details	Bat Roosting Potential
1931	Early mature 8m tall ash, no ivy cover.	Negligible.
1932	Mature 6m tall hawthorn, moderate ivy cover.	Low. (ivy only)
1933	Mature 17m tall ash, no ivy cover.	Negligible.
1934	Mature 17m tall ash, no ivy cover.	Negligible.

Tree Tag Reference	Tree Details	Bat Roosting Potential
1935	Mature 17m tall ash, no ivy cover.	Negligible.
1936	Mature 17m tall ash, no ivy cover.	Negligible.
1937	Mature 15m tall ash, low ivy cover on lower part only.	Negligible.
1938	Mature 16.5m tall ash, extensive ivy cover on central part.	Low. (ivy only)
1939	Mature 16m tall ash, extensive ivy cover.	Low. (ivy only)
1940	Mature 15.5m tall ash, relatively extensive ivy cover.	Low. (ivy only)
1941	Mature 17m tall ash, extensive heavy ivy cover. Branching might be wide/large enough to support roosting opportunities but unable to confirm due to ivy cover.	Low to possibly Moderate.
1942	Mature 17m tall ash, very extensive heavy ivy cover. Branching might be wide/large enough to support roosting opportunities but unable to confirm due to ivy cover.	Low to possibly Moderate.
1943	Mature 17m tall ash, very extensive heavy ivy cover. Branching might be wide/large enough to support roosting opportunities but unable to confirm due to ivy cover.	Low to possibly Moderate.
1944	Mature 17m tall ash, very extensive heavy ivy cover. Branching might be wide/large enough to support roosting opportunities but unable to confirm due to ivy cover.	Low to possibly Moderate.
1945	Mature 15m tall ash, low ivy cover on lower part only.	Negligible.
1946	Mature 6m tall hawthorn, little ivy cover.	Negligible.
1947	Mature 16m tall ash, very extensive heavy ivy cover on part of specimen. Branching might be wide/large enough to support roosting opportunities but unable to confirm due to ivy cover.	Low to possibly Moderate.
1948	Mature 17m tall ash, moderate ivy cover on lower part only.	Negligible to Low. (ivy only)
1949	Mature 15.8m tall ash, little ivy cover at lower end.	Negligible.
1950	Mature 14m tall ash, relatively thick ivy cover on lower half only.	Negligible to Low. (ivy only)
1951	Mature 18m tall ash, very extensive	Low to possibly Moderate.

Tree Tag Reference	Tree Details	Bat Roosting Potential
	heavy ivy cover. Branching might be wide/large enough to support roosting opportunities but unable to confirm due to ivy cover.	
1952	Mature 18m tall ash, very extensive heavy ivy cover. Branching might be wide/large enough to support roosting opportunities but unable to confirm due to ivy cover.	Low to possibly Moderate.
1953	Mature 15m tall ash, low ivy cover.	Negligible.
1954	Mature 15m tall ash, low ivy cover.	Negligible.
1956	Mature 5m tall oak, low ivy cover. Storm damaged branches partly hanging.	Negligible.
1074	Mature 6m tall hawthorn, extensive ivy cover.	Negligible to Low. (ivy only)
1075	Mature 5m tall hawthorn that is leaning, extensive ivy cover.	Negligible.
1078	Young 4m tall hawthorn, no ivy cover.	Negligible.
1079	Early mature 5m tall willow stump, no ivy cover.	Negligible.
1080	Early mature 4m tall willow scrub, no ivy cover.	Negligible.
1082	Early mature 5m tall willow scrub, no ivy cover.	Negligible.

As previously mentioned, active/passive detector surveys were not undertaken due to the timing of the site assessment at a sub-optimal time of year to record peak bat activity (with bats still in winter torpor). In this case, the visual assessment undertaken is considered adequate given the fact that potential bat roosting features here only relate to trees (with no other buildings/structures present) that are only likely to support small numbers of non-breeding bats on a transient basis during the summer/autumn period if they occur at all and will therefore need to be reassessed prior to felling regardless (see Section 5).

### 3.2.2 Features & Bat Commuting/Foraging Potential

Linear woody vegetation features are generally favoured by bats for commuting and foraging. The study site here supports such linear woody features through the presence of field boundary hedgerows/treelines (proposed residential area) and scrub/woodland edge (new proposed cycle/pedestrian route area) that also has connectivity with other similar linear woody features in the surrounding landscape (*i.e.* bat wildlife corridor). In this case, the linear woody features of particular interest for commuting/foraging bats include the western, southern, eastern and (eastern section of the) northern boundaries of the field area, along with scrub/woodland edge at the new proposed cycle/pedestrian route.

In terms of commuting/foraging opportunities for bats, the potential suitability of such on-site linear woody features for commuting/foraging bats is primarily considered high here (after Appendix B) given the presence of hedgerows, treelines and woodland edge features that are connected to other similar linear woody features in the surrounding landscape thereby providing a wildlife corridor that bats are likely to regularly use. The open field area of the study site is of lower value for bats due to the lack of woody/vegetated features.

### **3.3 Study Site: Overall Ecological Evaluation**

The visual assessment found that potential roosting features for bats within the study site are confined to trees, where no other buildings/structures are present. The potential suitability of trees due for removal to support roosting bats is primarily considered negligible/low here with just seven trees that may potentially be of low to moderate suitability for bat roosting due to the level of extensive heavy ivy cover combined with branching that might be wide/large enough to support roosting opportunities (unable to confirm due to ivy cover). In this case, bat roosting opportunities are only likely to relate to small numbers of non-breeding bats on a transient basis during the summer/autumn period if they occur at all.

The potential suitability of on-site linear woody features for commuting/foraging bats is primarily considered high here given the presence of hedgerows, treelines and woodland edge features that are connected to other similar linear woody features in the surrounding landscape, thereby providing a wildlife corridor that bats are likely to regularly use. The open field area of the study site is of lower value for bats due to the lack of woody/vegetated features.

Taking the above into consideration, the study site here is considered to be of lower to higher local importance for bats in general.

## 4 Potential Impacts

The study site is of lower to higher local importance for bats overall, where some trees due for removal may potentially be of low to moderate suitability for bat roosting and on-site linear woody features (*i.e.* hedgerows, treelines and woodland edge) that are also connected to other similar linear woody features in the surrounding landscape are primarily considered to be of high suitability for commuting/foraging bats.

In this case, **bat roosting** opportunities are only likely to relate to small numbers of non-breeding bats on a transient basis during the summer/autumn period if they occur at all. Therefore, there is a possibility that bat roosting activity could be present at the site when tree felling is due, where the removal of bat roosting features during the active bat summer/autumn season has the potential to cause injury or fatality of bats that are protected under the Irish Wildlife Acts (1976 - 2018). Where no roosting activity is present at the time of tree felling, potential effects on bats at the study site/locality arising from the loss of trees is considered neutral imperceptible<sup>5</sup>. In the event that a small number of non-breeding roosting bats are present at the time of felling, potential effects are possibly negative and not significant/slight with the limited loss of likely non-breeding roosting sites, and possibly significant negative in general terms with injury/fatality of a small number of non-breeding roosting bats. However, such possible negative effects on roosting bats can be reduced to neutral by implementing various measures as part of tree felling works to ensure the protection of such non-breeding transient roosting bats.

The permanent loss of existing linear woody vegetation at the study site, arising from construction of the development could negatively affect bats through reduced **commuting/feeding** opportunities. As previously mentioned, the linear woody features of particular interest for commuting/foraging bats here include the western, southern, eastern and (eastern section of the) northern boundaries of the field area, along with scrub/woodland edge at the new proposed cycle/pedestrian route. While in this case the northern field boundary will be permanently removed (see Landscape Masterplan Drawing No. 6824-PHL-00-ZZ-DR-L-1000 by Park Hood accompanying the planning application), the eastern part of this boundary is of interest for commuting/foraging bats due to the presence of a mature treeline whereas the bramble dominated western section is of lower value for commuting/foraging bats due to the absence of woody vegetation along this section. The eastern boundary will be partly realigned with new native hedgerow planting such that a net loss of 15 linear metres will occur, while the western and southern field boundaries will be retained (see Landscape Masterplan Drawing No. 6824-PHL-00-ZZ-DR-L-1000 by Park Hood accompanying the planning application). It is worth noting that landscaping proposals include for the creation of a relatively extensive area of native woodland tree/understorey planting mix with native wildflower meadow that will be partly bordered by a native defensive species mix at the south-western corner of the residential area (see Landscape Masterplan Drawing No. 6824-PHL-00-ZZ-DR-L-1000 by Park Hood accompanying the planning application). Therefore, the permanent loss of trees will be fully compensated through the relatively extensive planting of native tree species associated with the proposed development of native woodland planting, where a net gain of native tree/shrub species should be achieved with the appropriate implementation of the Landscape Masterplan that will also provide new commuting/feeding opportunities for bats as landscaping matures. The planting and retention of

---

<sup>5</sup> Refer to Appendix C for impact criteria

pollinator friendly native species (including proposed new native woodland/meadow area) will also positively support pollinators (see NBDC 2016). While potential effects on foraging/commuting bats at the study site/locality arising from the permanent/temporary loss of linear woody vegetation are considered negative but not significant initially during construction, potential residual effects on foraging/commuting bats are considered to be at least slight positive with the successful implementation and maturation of landscaping proposals especially the native woodland/native wildflower meadow at the south-western corner of the residential area.

Potential **artificial lighting disturbance/displacement** impacts on bats arising from a development such as proposed here include artificial light spillage into the environment from the associated lighting scheme during both the construction and operational stages; where most bat species are negatively affected by artificial light in general (see Bat Conservation Ireland 2010, Stone 2013). Lighting types that emit a narrow spectrum with no UV (*e.g.* low-pressure sodium) attract relatively less insects than broad spectrum types with high or low UV (*e.g.* high-pressure sodium, Metal halide and mercury; see Bat Conservation Ireland 2010, Stone 2013). Therefore, the narrow spectrum types with no UV have a relatively lower impact on bats by not attracting their insect prey base away from the nearby habitats where bats will be searching for prey (see Bat Conservation Ireland 2010, Stone 2013). The use of directional lighting and luminaire accessories (shield, louvre) are also very successful approaches to reducing light spillage nuisance into the surrounding environment (see Bat Conservation Ireland 2010, Stone 2013, BCT & ILP 2018) in relation to bats. The use of artificial lighting during the construction stage is largely irrelevant when works are mainly confined to daylight hours; measures can otherwise be taken to reduce light spillage nuisance on bats using the study site during the construction phase where limited works occur during the hours of darkness during the summer/autumn period. The proposed horizontal illuminance of the operational public lighting scheme is largely focused on roads/footpaths with no to minimal spillage onto adjoining existing/new vegetated receptors such as hedgerow, trees and woodland in this case (see Kelliher's Lighting 2021). Where artificial lighting is managed and/or designed to avoid/minimise light spillage into the wider environment including existing/new vegetated wildlife corridor receptors (hedgerow/treelines and woodland here), potential disturbance/displacement effects on bats associated with artificial lighting are considered neutral imperceptible.

## 5 Recommendations: Mitigation

All bat species occurring in Ireland are legally protected under the Irish Wildlife Acts (1976 - 2018), where it is an offence to hunt or interfere with or destroy their breeding or resting places (unless under statutory licence / permission).

Potential tree roosting opportunities are present such that it is possible that bat roosting activity could be present at the site when tree felling is due. Although, such potential roosting opportunities are only likely to relate to small numbers of non-breeding bats on a transient basis during the summer/autumn period if they occur at all. While existing linear woody vegetation will be lost as a result of the development, landscaping proposals include for the creation of a relatively extensive area of native woodland tree/understorey planting mix with native wildflower meadow that will be partly bordered by a native defensive species mix at the south-western corner of the residential area (see Landscape Masterplan Drawing No. 6824-PHL-00-ZZ-DR-L-1000 by Park Hood accompanying the planning application).

Developments that require artificial lighting need to consider potential disturbance/displacement impacts on bats due to artificial light spillage arising from an associated lighting scheme.

Taking the above into consideration, the following measures are recommended in relation to bat conservation and the proposed development:

1. Trees due for felling that have been identified with low/moderate potential to support bat roosts (as outlined in Section 3.2.1) will be reassessed in advance of felling by a suitably qualified/experienced Ecologist in accordance with best practice guidelines (*e.g.* BTHK 2018, Collins 2016). All such trees will be marked in the field to allow easy identification for all site staff and thereby ensure protection from inappropriate felling (*e.g.* erect a notice as per NRA 2005). The subsequent felling of all such trees will be undertaken under the advice/supervision of a suitably qualified/experienced Ecologist in accordance with best practice guidelines (*e.g.* NRA 2005) and in consultation with NPWS where relevant (*e.g.* derogation licence to remove bat roost; see NRA 2005).
2. The construction/operational phase lighting scheme will be designed to minimise/avoid light spillage nuisance on existing/new vegetated receptors by using shielded, downward directed lighting wherever possible; switching off all non-essential lighting during the hours of darkness; using narrow spectrum lighting types with no UV and luminaire accessories (*e.g.* shielding plates). The existing/new vegetated receptors relevant in this case include hedgerow/treelines and woodland (both adjoining existing woodland and proposed new woodland area). This will benefit bats as well as other fauna active/resting at night. The proposed operational lighting scheme achieves this (see Kelliher's Lighting 2021 accompanying the planning application) – in the event the proposed operational artificial lighting scheme will be changed, the revised scheme will also be reviewed by an Ecologist/Bat Specialist and altered accordingly under their advice.
3. As per the landscaping proposals (see Landscape Masterplan Drawing No. 6824-PHL-00-ZZ-DR-L-1000 by Park Hood accompanying the planning application), the final landscape plan will take native tree/shrub/understory species as well as non-native pollinator friendly species into account (see NBDC 2016), and also ensure that new planting connects to other woody habitat/other vegetation in order to maintain and provide connectivity via wildlife corridors.
4. In the (unlikely) event that a bat is found actively using a feature at the development site for roosting during the construction phase, works will cease immediately and the area cordoned off until advice is sought from a suitably qualified /experienced Ecologist so that appropriate steps can be taken under their advice/supervision in accordance with best practice (*e.g.* NRA 2005). Where feasible, bats will be allowed to disperse naturally; in the event that this is not feasible, bats will be collected by an Ecologist/Bat Specialist and held in suitable cloth bags/storage boxes for release in the area at dusk.

## 6 References

- Bat Conservation Ireland 2010. Bats and Lighting: Guidance Notes for Planners, Engineers, Architects and Developers. Bat Conservation Ireland ([www.batconservationireland.org](http://www.batconservationireland.org)).
- BCT (Bat Conservation Trust) and ILP (Institution of Lighting Professionals). 2018. Bats and Artificial Lighting in the UK. Bats and the Built Environment Series. Guidance Note 08/18. England, UK.
- BTHK. 2018. Bat Roosts in Trees – A Guide to Identification and Assessment for Tree-Care and Ecology Professionals. Pelagic Publishing, Exeter UK.
- CIEEM. 2018. Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester.
- Collins J. (Ed.). 2016. Bat Surveys for Professional Ecologists: Good Practice Guidelines (3<sup>rd</sup> Edition). The Bat Conservation Trust, London.
- EPA. 2017. Guidelines on the Information to be Contained in Environmental Impact Assessment Reports. Draft, August 2017. Environmental Protection Agency.
- Kellihers Lighting. 2021. Outdoor Lighting Report. Project Name: Ardarostig Bishoptown Cork. Report compiled as part of SHD planning application.
- Lundy, M.G., Aughney, T., Montgomery, W.I. & Roche, N. 2011. Landscape Conservation for Irish Bats & Species Specific Roosting Characteristics. Bat Conservation Ireland.
- Marnell, F., Kingston, N. and Looney, D., 2009. Ireland Red List No. 3, Terrestrial Mammals. National parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.
- Nairn, R. & Fossitt, J. 2004. The Ecological Impacts of Roads, and an Approach to their Assessment for National Roads Schemes. In: J. Davenport & J.L. Davenport (eds) The Effects of Human Transport on Ecosystems: Cars and Planes, Boats and Trains, 98-114. Royal Irish Academy, Dublin.
- NBDC (National Biodiversity Data Centre). 2016. Councils: Actions to Help Pollinators. All-Ireland Pollinator Plan, Guidelines 4. National Biodiversity Data Centre Series No.12, Waterford. November, 2016.
- NRA (National Roads Authority, now Transport Infrastructure Ireland). 2009. Guidelines for Assessment of Ecological Impacts of National Roads Schemes. Revision 2, 1st June, 2009. NRA, Dublin.
- NRA (National Roads Authority, now Transport Infrastructure Ireland). 2005. Guidelines for the Treatments of Bats During the Construction of National Road Schemes.
- Richardson, P. 2000 (reprinted 2003). Bats. British Natural History Series. Whittet Books, UK.
- Roche, N., Aughney, T., Marnell, F. and Lundy M. 2014. Irish Bats in the 21st Century. Bat Conservation Ireland, Cavan.
- South of Ireland Tree Surveys. 2020. Tree Survey. Report compiled as part of SHD planning application.
- Stone, E.L. 2013. Bats and lighting: Overview of Current Evidence and Mitigation. University of Bristol.

## **APPENDIX A:**

# **Potential Suitability of Features for Bats<sup>6</sup>**

---

<sup>6</sup> after Collins 2016

**Guidelines for assessing the potential suitability of proposed development sites for bats, based on the presence of habitat features within the landscape, to be applied using professional judgement.**

Suitability	Description Roosting habitats	Commuting and foraging habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	<p>A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions<sup>a</sup> and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation<sup>b</sup>).</p> <p>A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.<sup>c</sup></p>	<p>Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat.</p> <p>Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.</p>
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions <sup>a</sup> and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	<p>Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens.</p> <p>Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.</p>
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions <sup>a</sup> and surrounding habitat.	<p>Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge.</p> <p>High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland.</p> <p>Site is close to and connected to known roosts.</p>

<sup>a</sup> For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.

<sup>b</sup> Evidence from the Netherlands shows mass swarming events of common pipistrelle bats in the autumn followed by mass hibernation in a diverse range of building types in urban environments (Korsten *et al.*, 2015). This phenomenon requires some research in the UK but ecologists should be aware of the potential for larger numbers of this species to be present during the autumn and winter in large buildings in highly urbanised environments.

<sup>c</sup> This system of categorisation aligns with BS 8596:2015 Surveying for bats in trees and woodland (BSI, 2015).

## **APPENDIX B:**

# **Biodiversity Evaluation Scheme<sup>7</sup>**

---

<sup>7</sup> amended after NRA 2009 and Nairn & Fossitt 2004

## Biodiversity Evaluation Criteria

### 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 fulfils 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.
- 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\*) 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).
- Major salmon river fisheries.

### 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\*) of the following:
  - Species protected under the Wildlife Acts; and/or
  - Species listed on the relevant Red Data list.
- Site containing 'viable areas'\*\*\* of the habitat types listed in Annex I of the Habitats Directive.
- Major trout river fisheries.
- Commercially important coarse fisheries.
- Waterbodies with major amenity fishery value.

### County Importance:

- Area of Special Amenity^.
- 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\*) of the following:

### Biodiversity Evaluation Criteria

- 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 Biodiversity Action Plan (BAP) 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.
  - Small waterbodies with known salmonid populations or with good potential salmonid habitat.
  - Large waterbodies with some coarse fisheries value.

#### **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\*) 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.
- Small waterbodies with some coarse fisheries value or some potential salmonid habitat.
- Waterbodies with unpolluted 'High' water quality status (Q4-5, Q5).

#### **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.
- Waterbodies with no current fisheries value, no significant potential fisheries value, poor fisheries habitat.

\* A general suggestion is that 1% of the national population of such species qualifies as an internationally or nationally or county or locally 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.

\*\* 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).

^ 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.

**APPENDIX C:**  
**Impact Assessment Criteria:**  
**Descriptions of Effects <sup>8</sup>**

---

<sup>8</sup> After EPA 2017.

<p><b>Quality of Effects</b></p> <p>It is important to inform the non-specialist reader whether an effect is positive, negative or neutral</p>	<p><b>Positive Effects</b></p> <p>A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).</p> <p><b>Neutral Effects</b></p> <p>No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.</p> <p><b>Negative/adverse Effects</b></p> <p>A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).</p>
<p><b>Describing the Significance of Effects</b></p> <p>‘Significance’ is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful (also see <i>Determining Significance</i> below.).</p>	<p><b>Imperceptible</b></p> <p>An effect capable of measurement but without significant consequences.</p> <p><b>Not significant</b></p> <p>An effect which causes noticeable<sup>2</sup> changes in the character of the environment but without significant consequences.</p> <p><b>Slight Effects</b></p> <p>An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.</p> <p><b>Moderate Effects</b></p> <p>An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.</p> <p><b>Significant Effects</b></p> <p>An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.</p> <p><b>Very Significant</b></p> <p>An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.</p> <p><b>Profound Effects</b></p> <p>An effect which obliterates sensitive characteristics</p>
<p><b>Describing the Extent and Context of Effects</b></p> <p>Context can affect the perception of significance. It is important to establish if the effect is unique or, perhaps, commonly or increasingly experienced.</p>	<p><b>Extent</b></p> <p>Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.</p> <p><b>Context</b></p> <p>Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)</p>

<p><b>Describing the Probability of Effects</b></p> <p>Descriptions of effects should establish how likely it is that the predicted effects will occur – so that the CA can take a view of the balance of risk over advantage when making a decision.</p>	<p><b>Likely Effects</b></p> <p>The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.</p> <p><b>Unlikely Effects</b></p> <p>The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.</p>
<p><b>Describing the Duration and Frequency of Effects</b></p> <p>'Duration' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful.</p>	<p><b>Momentary Effects</b></p> <p>Effects lasting from seconds to minutes</p> <p><b>Brief Effects</b></p> <p>Effects lasting less than a day</p> <p><b>Temporary Effects</b></p> <p>Effects lasting less than a year</p> <p><b>Short-term Effects</b></p> <p>Effects lasting one to seven years.</p> <p><b>Medium-term Effects</b></p> <p>Effects lasting seven to fifteen years.</p> <p><b>Long-term Effects</b></p> <p>Effects lasting fifteen to sixty years.</p> <p><b>Permanent Effects</b></p> <p>Effects lasting over sixty years</p> <p><b>Reversible Effects</b></p> <p>Effects that can be undone, for example through remediation or restoration</p> <p><b>Frequency of Effects</b></p> <p>Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)</p>

**APPENDIX D:**  
**Photos of Trees to be Removed with Bat Roosting  
Potential**

