



BAT SURVEY REPORT
ENNISCORTHY FLOOD DEFENCE SCHEME
CO. WEXFORD

Prepared For Mott MacDonald

On behalf of

Wexford County Council

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1. INTRODUCTION

1.1 AIMS OF THE REPORT

Scott Cawley Ecological Consultancy was commissioned by Mott MacDonald on behalf of Wexford County Council (WCC) to undertake a survey for bats within a Survey Area affected by the proposed Enniscorthy Flood Defence Scheme hereafter referred to as the proposed Scheme. The Survey Area for mobile bat activity surveys can be seen in Figure 1 below.

The overarching aims of the bat surveys were to determine the following:

- The areas and habitats within the Survey Area that are being used by bats (including flight paths/commuting routes and foraging areas);
- The species of bats using the Survey Area; and,
- To identify, where possible, any bat roosts within the Survey Area and the environs of the scheme.

These surveys were also informed by the previous surveys undertaken for the *River Slaney (Enniscorthy) Drainage Scheme Environmental Impact Statement* (Royal Haskoning, 2009). This is discussed further in Section 5.1.

The Scott Cawley bat surveys were completed during April to September 2016. This also informed the assessment of potential hibernation sites for bats. The Survey Area for this baseline assessment focussed within a 250m – 400m wide corridor of suitable habitat which encompasses the location of the proposed Scheme. Bat surveys focussed on suitable roosting and foraging habitat within the Zone of Influence such as watercourses, treelines, woodlands, hedgerows, grasslands and swamps along the section of the River Slaney which shall be directly impacted by these works. The Zone of Influence for the proposed Scheme is described in Section 4.1 below.

1.2 SITE OVERVIEW

The River Slaney flows from the Wicklow Mountains to Wexford Harbour, traversing several towns along its route. The proposed Flood Defence Scheme works start at approximate National Grid Reference (NGR) S 97877 40784 and end at approximate NGR S 97270 38415 (c. 3km long). The area supports a variety of habitats including woodland (scrub, hedgerows and treelines), grasslands and wetlands, as well as more urban habitats and amenity areas. Land-uses include agricultural, recreational (including water-based activities), angling, forest, wildlife habitat, commercial, and residential use. The surrounding area includes similar habitat types of improved agricultural fields, hedgerows, scrub, marsh and wet grassland. Many of these habitats provide suitable foraging areas for bats, as well as opportunities for roosting sites.

2. LEGISLATION, POLICY AND GUIDELINES

2.1 RELEVANT LEGISLATION, POLICY AND GUIDELINES

Currently there are nine species of bat known to breed in Ireland, while two other species have been recorded on a single occasion. Further details on Irish bat species can be found on the Bat Conservation Ireland (BCI) website¹. All species and their roosting sites are strictly protected under both European and Irish legislation including:

- *Wildlife Act 1976 and Wildlife (Amendment) Act, 2000 (S.I. No. 38 of 2000);*
- *Council Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna 1992 (Council Directive 92/43/EEC); and,*
- *European Communities (Birds and Natural Habitats) Regulations, 2011.*

It is an offence under Section 23 of the *Wildlife Acts 1976-2012* and under Section 51 of the *European Communities (Birds and Natural Habitats) Regulations, 2011* to kill a bat or to damage or destroy the breeding or resting place of any bat species. Under the *European Communities (Birds and Natural Habitats) Regulations 2011* actions that intentionally or unintentionally harm, damage or destroy a bat or its roosting site are committing an offence. In addition, if it is possible to establish a clear cause-effect relationship between one or more human-induced activities and the deterioration of a breeding site or resting place of a European protected species, then an offence is likely under the regulations. This places an onus of due diligence on anyone proposing to carry out works that might result in such damage, deterioration or destruction of such a site. Furthermore, as a signatory to the *European Bats Agreement (Agreement on the Conservation of Bats in Europe) 1993*, Ireland is required to protect their habitats, requiring the identification and protection from damage or disturbance, of important feeding areas. All Irish bat species are listed in Appendix II of the Bern Convention (1979), as species requiring protection.

In the Red data list, Common Pipistrelle (*Pipistrellus pipistrellus*), Soprano Pipistrelle (*P. pygmaeus*) and Nathusius' Pipistrelle (*P. nathusii*), Brown Long-eared (*Plecotus auritus*), Lesser Horseshoe (*Rhinolophus hipposideros*), Daubenton's (*M. daubentoni*), Natterer's and Whiskered bats are listed as "Least Concern", while Leisler's bat (*Nyctalus leisleri*) is listed as "Near Threatened" and Brandt's bat (*M. brandtii*) is listed as "data deficient" (Marnell *et al.*, 2009). The Greater Horseshoe Bat (*R. ferrumequinum*) status is not yet determined in Ireland as only one record has been confirmed. The various desk study and field surveys which were carried out for this project are outlined below. Bat surveys were conducted having regard to the following guidelines:

- *Bat Surveys for Professional Ecologists – Good Practice Guidelines 3rd Edition* (Collins, J. (Ed.) 2016).

¹ <http://www.batconservationireland.org/irish-bats/species>

3. CONSULTATION

Consultation was carried out with Ciara Flynn District Conservation Officer (DCO) for Co. Wexford, of the National Parks and Wildlife Service (NPWS). Meetings were coordinated by Mott MacDonald, with the attendance of Scott Cawley (Project Ecologists) and the Project Engineer from Wexford County Council (Larry McHale). A number of meetings took place in 2016 (Dates attended by Scott Cawley: 17th February 2016 and 6th July 2016).

4. METHODOLOGY

4.1 ZONE OF INFLUENCE

According to the 2016 CIEEM Guidelines, the Zone of Influence (Zoi) for a project is *'the area over which ecological features may be subject to significant effects as a result of the proposed project and associated activities. This is likely to extend beyond the project site, for example, where there are ecological or hydrological links beyond the site boundaries.'* The likely Zoi for the proposed development was discussed with the project engineer prior to ecology surveys. As detailed design aspects were still under review, following discussion with the Project Engineer for this scheme, Mott MacDonald, it was anticipated that the Survey Area for the scheme should include the areas identified in Figure 1. These habitats may undergo direct impacts as part of the proposed scheme or indirect impacts from scheme related activities (e.g. dredging or construction of flood defences which are likely to cause the release of silt). At this stage according to the Project Engineers, it is anticipated that the proposed EFDS scheme will not have a direct impact upon habitats or water levels upstream of the works extent in the north or further downstream than the southern floodplain.

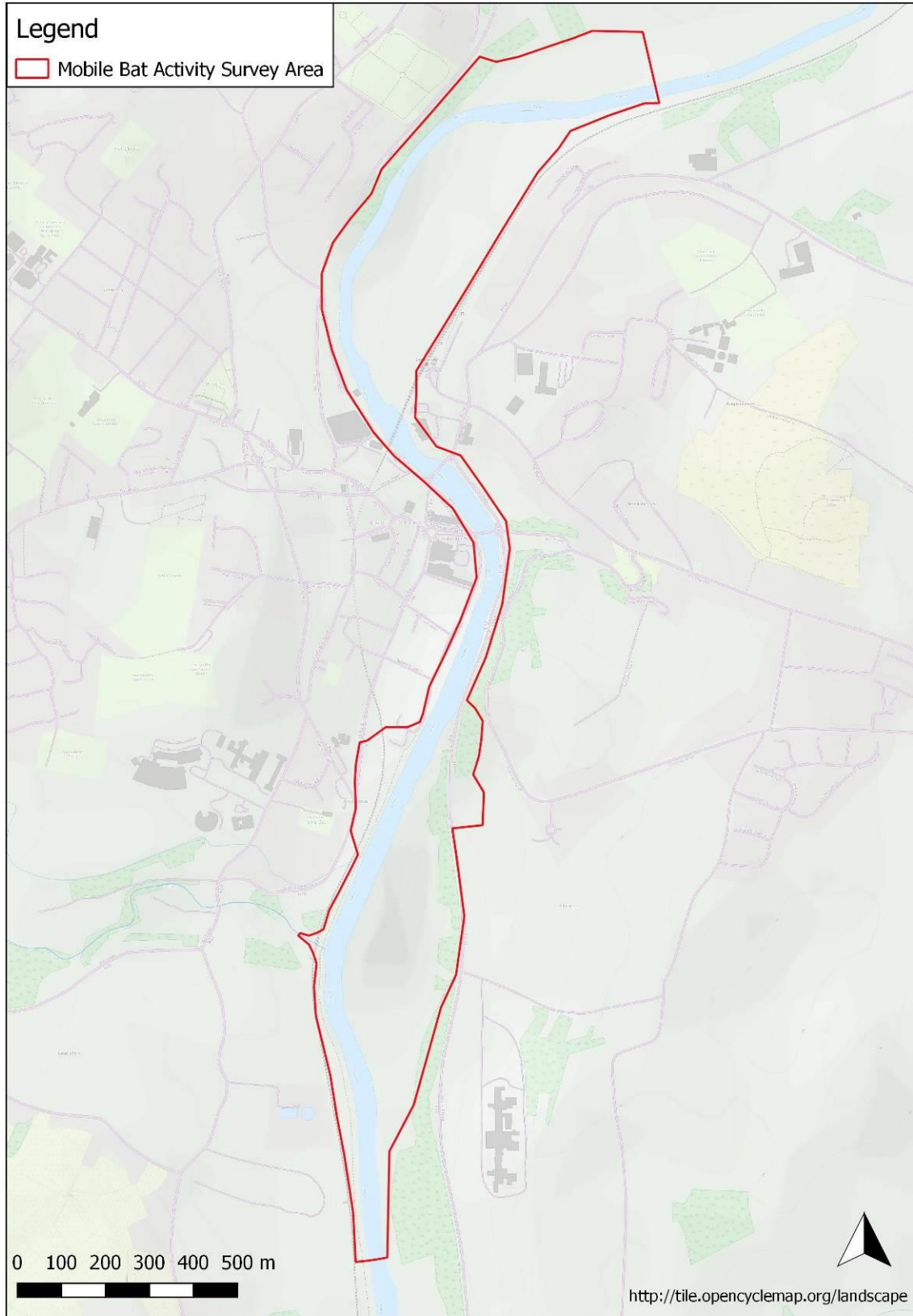


Figure 1: Survey Area for mobile bat activity surveys undertaken by Scott Cawley in Enniscorthy

(Please note: desk study records data and static detector data extends outside of this area)

The Survey Area for the proposed Scheme Bat surveys that were carried out by Scott Cawley in 2016 was considered to be a corridor of approximately 250 – 400m wide where access was possible. This Survey Area runs from approximately NGR: S 98043 40828 in the north to NGR: S 97490 37409 in the south (see Figure 1 above). This corridor was constrained in the south west by the Dublin to Rosslare train line, and in the east by the N11 road. The area around the proposed location for bridge roundabouts and approach roads (at approximate NGR: S 97263 39252 in the west and S 97476 39183 in the east) was included in the survey area when this information was made available.

The water levels in the river are not anticipated to be affected further downstream than the southern floodplain as there will be no works that might affect tidal levels beyond this point (Pers. Comm. Barry O'Connor, Project Manager, Mott MacDonald).

4.2 DESK STUDY

Information from a number of different sources was collected in April 2016 and analysed. This information informed the locations for bat surveys which were subsequently undertaken. Data sources employed include the following:

- Records of bat roost and activity within 10km of the proposed Scheme Survey Area , held by Bat Conservation Ireland (April 2016);
- Records of bat activity held by the online National Biodiversity Data Centre database, available online at <http://maps.biodiversityireland.ie/#/Map>;
- Bat landscape suitability mapping, National Biodiversity Data Centre database, available online at <http://maps.biodiversityireland.ie/#/Map>;
- An Assessment of the River Slaney for the Presence of Bats, Badgers and Otters in Advance of a Flood Relief Scheme at Enniscorthy, County Wexford and Proposed Mitigation (Keeley, 2005);
- Records from the All-Ireland Daubenton's Bat Surveys 2006-2011;
- Information from the Irish Bat Monitoring Schemes BATLAS Republic of Ireland Report for 2008 – 2009;
- Site Synopsis for Slaney River SAC (000781) (NPWS, 2015);
- National Biodiversity Data Centre On-line Database. Available online at <http://maps.biodiversityireland.ie>;
- County Wexford Biodiversity Action Plan 2013 - 2018 (Wexford County Council, 2013); and,
- Environmental Impact Statement M11 Gorey to Enniscorthy Scheme (Ryan Hanley WSP 2009).

4.3 FIELD SURVEYS

The bat surveys were undertaken by Paul Scott CEnv MCIEEM, Róisín NigFhloinn MCIEEM, Kate Bismilla and Caroline Kelly.

Potential Tree Roosts

Preliminary ground-level roost assessments were carried out by Scott Cawley ecologists on 20th and 21st April 2016 and the 4th and 5th May 2016 during daylight hours. Trees were not in full leaf and were inspected from the ground to look for Potential Roost Features (PRFs). It was not possible to accurately inspect features located above head height.

Collins (2016) states that PRFs that bats might use include:

- “woodpecker holes;
- rot holes;
- hazard beams;
- other vertical or horizontal cracks and splits (such as frost-cracks) in stems or branches;
- partially detached platey bark;
- knot holes arising from naturally shed branches, or branches previously pruned back to the branch collar; man-made holes (e.g. cavities that have developed from flush cuts) or cavities created by branches tearing out from parent stems;
- cankers (caused by localised bark death) in which cavities have developed; other hollows or cavities, including butt-rots;
- double-leaders forming compression forks with included bark and potential cavities;
- gaps between overlapping stems or branches;
- partially detached ivy with stem diameters in excess of 50mm;
- bat, bird or dormouse boxes.”

Trees were classified using the roost descriptions provided in Collins 2016 which can be seen in Table 1 below.

Table 1 Guidelines for assessing the potential suitability of structures, trees and habitats for bats.

| Suitability | Description | Commuting and foraging habitats |
|---|---|--|
| | Roosting 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.</p> <p>However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions^a 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).</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.</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 ^b 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 ^a 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, treelined watercourses and grazed parkland.</p> <p>Site is close to and connected to known roosts.</p> |
| <p>^a Source: Collins 2016; This table is adapted from Table 4.1 on page 35 of the guidelines. Non-relevant references have been removed.</p> <p>^b For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.</p> | | |

The results of the survey for potential tree roosts can be seen in Section 5.2 below, and within Appendix A. That table provides further information on the PRFs recorded within these trees and the suitability of these as potential roosting sites for bats.

Assessment of Structures for Potential Bat Roosts

Roosting sites for bats can be found within structures such as buildings, cellars, churches, stone masonry, bridges, tunnels, mines, caves. In addition, a number of bat species can be found roosting in suitable features within trees.

During the surveys, all structures within the Survey Area and particularly, the potential Zone of Influence of this scheme, were surveyed to assess their ability to support roosting bats using a torch to inspect any suitable features. The Table A2 in Appendix A lists the structures and bridges assessed. As there are no buildings which might be demolished within the Survey Area it was not necessary to undertake building inspections. However, a number of structures were inspected which may be directly impacted by these works. The Old Bridge and Seamus Rafter Bridge (including Quay walls) in Enniscorthy town were a focus of the activity surveys. In addition, the railway and foot bridges, a small wall from a ruin and on the northern floodplain and a large disused underground water tank on the northern floodplain were all included in the surveys in order to assess their potential to support roosting bats. Suitable buildings also lie outside of the Survey Area, e.g. the Old Mill along the Urrin inflow lies c. 380m from the Zone of Influence and will not be affected by this scheme.

The classification of bridges adopted the ratings suggested by Billington and Norman (1997) where:

- 0 = No potential (no suitable crevices);
- 1 = Crevices present may be of use to bats;
- 2 = Crevices ideal for bats, but no evidence of usage; and,
- 3 = Evidence of bats (e.g. bat present, droppings, etc.)

Non-bridge structures were assessed according to Table 1 above (Collins, 2016).

The results of this survey are discussed in Section 5.2 below and a full table of results can be seen in Table A2 in Appendix A.

Mobile Bat Activity Surveys

Dusk and dawn bat activity surveys were carried out in Enniscorthy during suitable weather conditions (sunset temperatures above 10°C, no rain and no strong wind).

Dusk and dawn bat activity surveys were conducted on 4th and 5th May and 9th and 10th June 2016. Two surveyors walked transects along the east and west sides of the Survey Area concentrating on areas which might support bats, and structures/habitats which might be affected by the proposed works (See Figure 1 above). The surveys focused on the existing bridges and quay walls 15 minutes before sunset and

approximately an hour before dawn in order to ascertain their use as bat roosts. Petterson D 240x bat detectors and Zoom H1 Handy Recorders were used by each surveyor.

An extended dusk survey² was undertaken on 28th September 2016 on both banks at the proposed bridge location (Roughan and O'Donovan, 2016). Weather conditions were not optimal during this survey (some strong winds and occasional light rain during parts of this survey). An Elekon Batlogger M, was used by each surveyor on the East and the West side of the River Slaney for the survey at the proposed bridge location.

The full results of these surveys are presented in Section 5.3 below and Appendix B

Static Bat Surveys

Static bat detector surveys were conducted within the Survey Area using Frequency Division bat detectors (Song Meter ZC and Anabat SD1). The aim of the static bat detector surveys was to record bat activity at specific locations (shown in Figure 2 below) over a longer time period to account for fluctuations generally associated with weather. Longer recording periods also have an increased probability of recording a higher diversity of species. Statics were located across the Survey Area within suitable habitat where they were anticipated to pick up bat activity.

Ultrasound recordings were analysed using sound analysis software (Bat Sound Version 3.31, AnalookW Version 0.4.2.7 and Bat Explorer Version 1.11.2.0) and interpreted using Russ (2012).

Recordings on the statics were quantified as bat “passes”³ as a standardised way of describing bat activity for different species in different locations.

² This survey began 15 minutes before sunset at 19:00 and was completed at 22:00 – this is approximately 1hr 15 minutes of additional survey effort to a standard dusk bat activity survey (which is generally conducted 15 minutes prior to sunset and 90 minutes after sunset.) As such, this survey is referred to as an extended dusk bat activity survey.

³ One bat pass is equal to one bat recording (this does not infer exact numbers of bats as individual bats of the same species cannot be identified when using a single Static bat detector at one precise location).

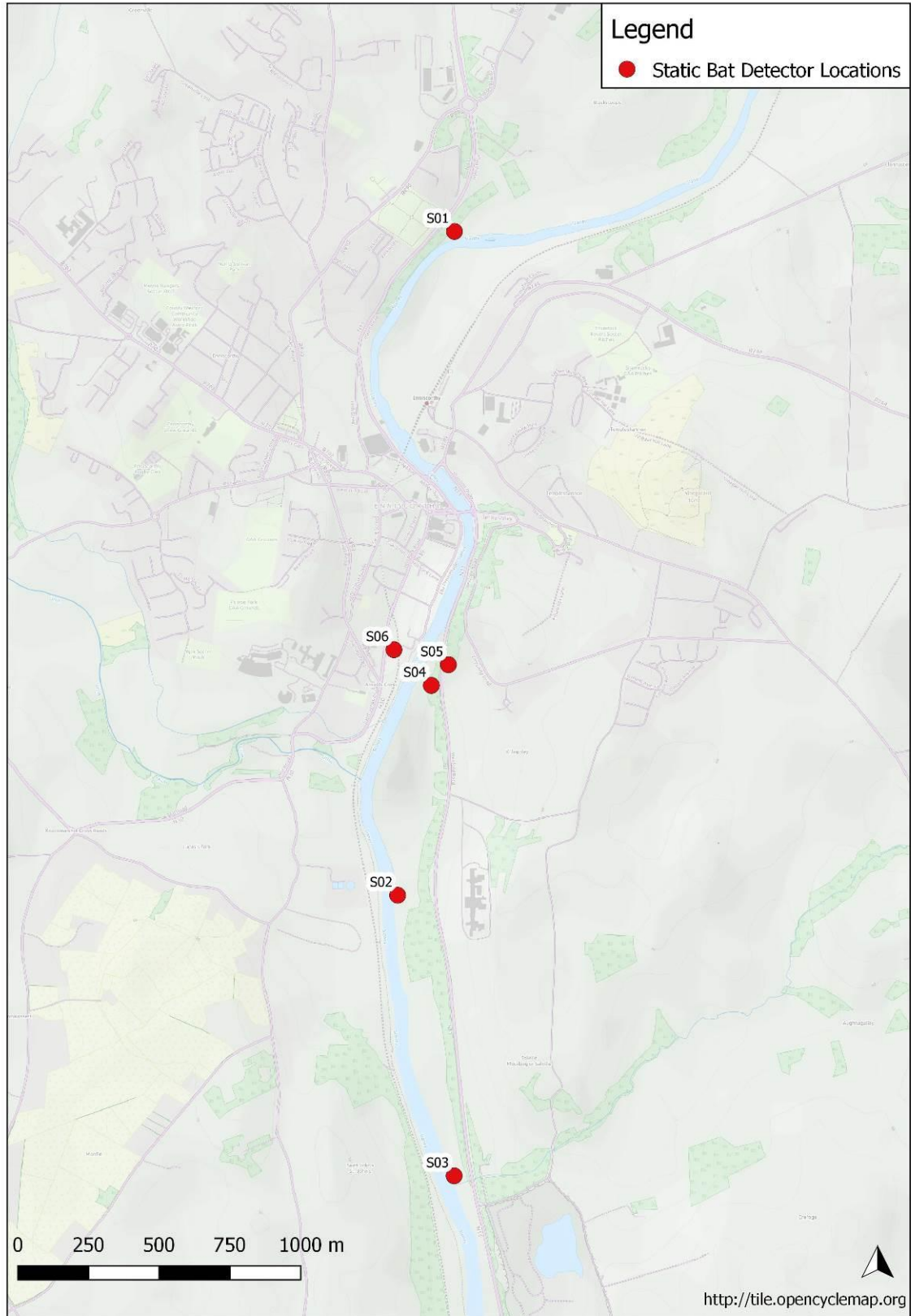


Figure 2: Locations of Static Bat Detectors.

Table 2- Static Bat Activity Survey Details

| Reference No. | Type of Static Detector | Location | Dates | Location Description |
|---------------|-------------------------|---------------|---|--|
| S01 | SMZC | S 97452 40751 | 04.05.2016 – 09.05.2016 (5 nights data) | Within mature treeline on edge of woodland in north-west of Survey Area. |
| S02 | SMZC | S 97304 38419 | | Within mature treeline and scrub alongside the northern end of the southern floodplain beside the River Slaney (near alluvial woodland). |
| S03 | Anabat Logger | S 97525 37435 | | Within area of woodland and scrub in south-east of Survey Area (c. 1km south of Survey Area). |
| S04 | SMZC | S 97427 39219 | 9 th and 10 th of June 2016 (1 nights data) | Within alluvial woodland at proposed bridge location. |
| S05 | SMZC | S 97472 39240 | 03.08.2016 – 12.08.2016 (9 nights data) | Old Sessile Oak woodland on eastern side of N11. |
| S06 | SMZC | S 97276 39284 | | Within mixed deciduous woodland on western side of playground and railway line (east of St Johns Road). |

4.4 LIMITATIONS OF SURVEYS

The dusk and pre-dawn activity surveys in May and June were conducted during good weather conditions (warm, dry and no strong winds). However, there were some strong winds and occasional light showers during the extended dusk survey that was conducted on 28th September 2016. This may have forced bats to stay within more sheltered areas during this poorer spell of weather.

The surveys undertaken for this study represent a snapshot in time. Repeated surveys and during multiple seasons may reveal a different pattern of usage of the area by bats. Therefore, while conclusions can be drawn from areas that appear to be important to bats from the present study, caution has been applied in evaluating locations where bats may seem to be absent.

Surveys were not undertaken in winter and therefore confirming use of certain roost features by bats in winter was not possible. Inferences have been made regarding suitability for bats at this time of year.

The static bat detectors provide an indication of the levels of bat activity and the species at a given location, during a particular period of time. This cannot be translated into estimating numbers of bats and therefore, it is still necessary to carry out mobile bat activity surveys in order to make direct observations of bat abundance and behaviour.

Roost characterisation surveys for trees often include tree inspections undertaken at height. Detailed tree inspection surveys at height were not conducted at this stage. Ground level observations of trees are only effective at making estimations of suitability of individual trees for bats. Therefore the work that has been undertaken for identifying trees suitable for bats is regarded as preliminary in nature.

5. RESULTS

5.1 DESK STUDY

National Biodiversity Data Centre⁴ (NBDC) and Bat Conservation Ireland (BCI)

The habitats within the proposed Scheme obtained a Bat Landscape Suitability index⁵ (Lundy *et. al.* 2011) score of c.30 on the index (from 0 – c.59). This indicates that the habitats within the Survey Area are suitable for bats and provide habitat that is of importance to bats.

Bat species within the Survey Area included Daubenton's Bat (2014); Whiskered Bat (2008); Leisler's Bat (2010); Common Pipistrelle Bat (2010); and, Brown Long-eared Bat (2008) (Source: NBDC – Title of Dataset: National Bat Database of Ireland).

A search for Bat Conservation Ireland (BCI) records of bat species within 10km of the Survey Area was conducted on 25th April 2016. Bat roost record results are provided in Appendix D (in order to protect these species, the precise locations have been withheld). Bat roosts recorded within a 10km buffer zone of the proposed Scheme included the following species: Whiskered Bat, Brown Long-eared bat, Common Pipistrelle, Soprano Pipistrelle. In addition, there were roosts recorded for 'Myotis species' and 'Unidentified bat'.

Other bat species records on the BCI database included Daubenton's bat *Myotis daubentonii*, Leisler's bat *Nyctalus leisleri* and Nathusius Pipistrelle bat *Pipistrellus nathusii*. These species were recorded foraging or commuting during transect surveys, or as *ad hoc* observations, within 10km of the Survey Area (records were analysed using the same grid references as referred to above).

BATLAS 2010 and BATLAS 2020 Pilot

BATLAS is a largely volunteer-based survey funded by the National Parks and Wildlife Service in the Republic of Ireland, and is administered by BCI. BATLAS helps to meet the aspirations of EUROBATS by effectively mapping the distribution of four target species – the Common and Soprano Pipistrelle, Leisler's bat, and Daubenton's bat (Carden et al, 2010).

Bats recorded in County Wexford during BATLAS surveys include; Common Pipistrelle bat, Soprano Pipistrelle bat, Leisler's bat and Daubenton's bat. In addition, Nathusius Pipistrelle bat, other *Myotis sp.* (including Natter's bat and Whiskered bat) and Brown-long-eared bat were also recorded in Co. Wexford during BATLAS but were not a focus species for that particular study (Carden et al, 2010).

⁴ Data from the XXXXX held by the National Biodiversity Data Centre www.biodiversityireland.ie [16.12.2016]

⁵ [http://maps.biodiversityireland.ie/metadata/Landscape_Conservation_for_Irish_Bats_metadata\(v.3\).pdf](http://maps.biodiversityireland.ie/metadata/Landscape_Conservation_for_Irish_Bats_metadata(v.3).pdf)

It is noted in the BATLAS 2020 Pilot (Abbott, I. *et al.* 2015) that a single Greater Horseshoe bat *Rhinolophus ferrumequinum* was recorded in County Wexford in the winter of 2012-2013, however, no additional specimen of this species has been confirmed since.

Environmental Impact Statement M11 Gorey to Enniscorthy Scheme (Enniscorthy Bypass) – Bat Roosts (Royal Haskoning 2009)

The EIS for the above scheme confirmed a number of roosting locations for bats (*Pipistrelle* bat species and Brown Long-eared bat) in 2007-8, the closest⁶ of those to the proposed Scheme Survey Areas are:

- At c.1.8km east of the centre of the town, two bat roosts exist to the north and south of the N30 road near Carley's Bridge;
- At c.2km south-west of the Survey Area (northern floodplain) a bat roost exists east off the N11 near Ballyorrill; and,
- At c.2.2km north-east of The Moyne, a bat roost exists on the alignment of the M11 road.

A potential Leisler's bat roost was noted during the M11 surveys (Kelleher, 2001) within a linear strip of woodland which lies c.2.27km north-west of the Survey Area. c. 20 Leisler's bats were recorded leaving woodland at dawn but the tree roost location was not found (Royal Haskoning 2009).

None of these historic records of bat roosts are within the Zone of Influence of the proposed Scheme. As such they are unlikely to be directly impacted by these works. However, due to their proximity, bats supported by these roosts could make use of suitable habitats within the Survey Area for foraging or commuting, particularly as most bat species can travel several kilometres from their roosting sites to favourable foraging grounds (Lundy *et al.* 2011).

Bat Surveys for Enniscorthy Flood Relief Scheme (2007)

As part of the EIA for the Enniscorthy Flood Relief Scheme proposed in 2007, an assessment for the presence of bats along the River Slaney was conducted by Brian Keeley in 2005. The results of this survey identified four species using the Survey Area: Daubenton's bat; Soprano pipistrelle bat; Common pipistrelle bat and Leisler's bat. Separate to the 2005/2006 Flood Relief study, Brown Long-eared bats and Whiskered Bats were recorded by Brian Keeley along the River Slaney at Edermine House south of Enniscorthy (Keeley, 2005).

Several suitable roosting sites were identified as part of these survey which also occur in the proposed Scheme Survey Area, including mature trees, a disused water tank, a derelict stone ruin (all within the northern floodplain); small stone drains along the river; bats were noted feeding at the town bridges, but there were no bat roosts identified here (Keeley, 2005).

⁶ Source EIS Volume 4 map 9.1.6 Ecology Fauna Map

5.2 Results of Surveys of Potential Bat Roosts

Bats in Ireland are insectivorous and rely mainly on habitat types which can provide a large biomass of insects such as woodland or wetland for feeding. Using echolocation as a means of navigation, they can commute between roosting sites and foraging grounds which may be some distance apart. The majority of bat species tend to follow linear routes in the landscape e.g. watercourses, hedgerows or tree-lines. As such these features can be important in supporting a population of bats in a given area (Highways Agency, 2011). Section 5.2 considers the potential for roosting sites to exist within the Survey Area. General bat activity within the Survey Area is discussed further in Section 5.3.

5.2.2 TREE SURVEYS

Table A1 and the Potential Roost Maps in Appendix A provide the full details regarding trees within the Survey Area which were deemed suitable for bats due to the presence of PRFs. 108 trees and 6 tree groups were identified as having PRFs within the Survey Area.

Tree species included Ash *Fraxinus excelsior*, Crack Willow *Salix fragilis*, Oak *Quercus sp.*, Beech *Fagus sylvatica*, Willow *Salix sp.*, Lime *Tilia sp.*, Horse Chestnut *Aesculus hippocastanum*, Hawthorn *Crataegus monogyna*, Sycamore *Acer pseudoplatanus*, Alder *Alnus glutinosa*, Scots Pine *Pinus sylvestris*, Copper beach *Fagus sylvatica 'Purpurea'* and also standing dead wood.

Suitable features recorded within trees included dense Ivy *Hedera hibernica*, lifting bark, tear-outs (where the limb has torn off from the main stem), desiccation fissures (deep but narrow radial-cracks that occur in dead wood, hazard beams (splits in stems or limbs of trees), knot holes (naturally occurring holes in trees where a limb has died but rots back rather than tearing out), butt rot (fungal decay of the tree butt, just above the root), double-leaders (where two stems split off from each other, a cavity can form at the base of this), stem unions (where trees stems, limbs, branches grow to touch one another creating a gap), flush cuts (where a limb has been cut and if this gets fungal infection a cavity can form) and standing dead wood with cracks. Further details on PRFs can be found in the *Bat Tree Habitat Key – Third Edition* (Andrews, 2016).

The results of the survey for PRFs indicates that of these trees/tree groups, approximately 43 are considered to be of low suitability for roosting bats and 65 are considered to be of moderate suitability according to the Collins (2016) criteria in Table 1 Section 4.3. There were no trees that were considered as being of high suitability. Maps identifying locations of potential Tree roosts and the locations of structures that were surveyed are shown in Appendix B.

PRF trees were scattered throughout the Survey Area, with the majority of moderate suitability trees being recorded within the woodland to the northwest, along the back ditch of the northern floodplain, alongside The Promenade just north of the Riverside Hotel and within woodlands to the south and south east of the Survey Area.

5.2.2 STRUCTURE SURVEYS

The Bridge structures within Enniscorthy were assessed according to Billington and Norman (1997), an evaluation which considers that any crevice greater than 100mm deep and sheltered from the elements should be regarded as a potential bat roost. Other structures (such as the quay walls and other stonework) within the Survey Area were assessed according to Table 1 in Section 4.3.

A total of eight structures were surveyed as part of the bat surveys. These are described below and listed in Table A2 within Appendix A.

Structure 1 (STR01) – Railway Bridge

The railway bridge crossing the River Slaney in the north of the Survey Area was assessed for its suitability to provide roost features. The piers on this bridge are well sealed and the bridge deck is comprised of metal and wood. The structure is open to the elements and no suitable crevices etc. were noted. This bridge was categorised as '0' (no potential for bats (no suitable crevices)) on the Billington and Norman scale.

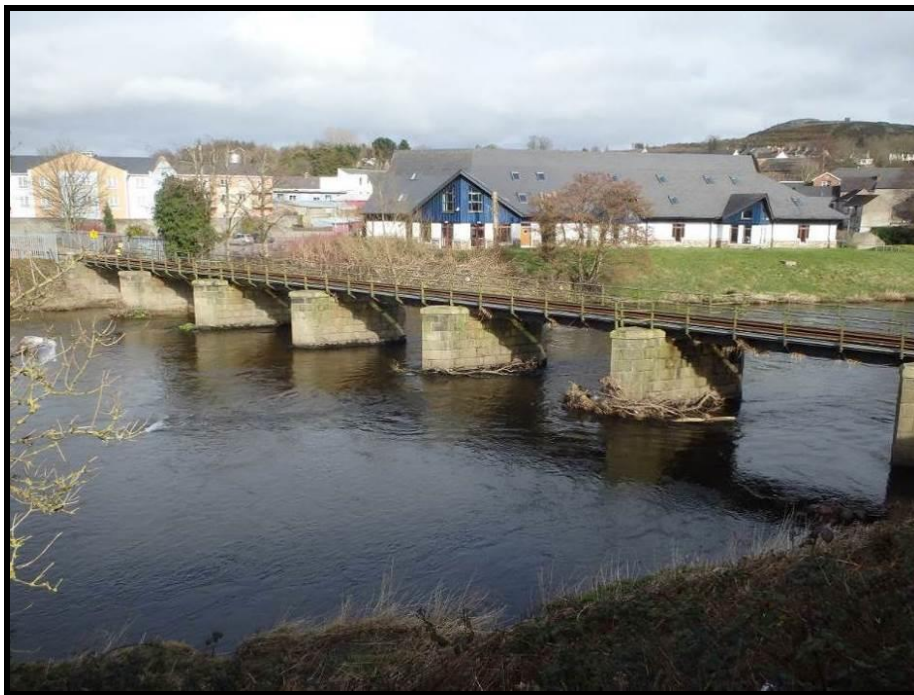


Plate 1 – Railway Bridge in the north of the Survey Area in Enniscorthy (Facing south east towards the Leisure Centre)

Structure 2 (STR02) – Quay walls

The most suitable parts of the Quay walls for roosting bats are within the section to the north east of the Old Enniscorthy Bridge. In this location, there are several substantial crevices within the old stone walls in which bats might roost. The strands of Ivy growing on the walls were noted to be thin and leafy, however

they covered crevices and voids in places within the Quay walls. The wall was classed as having 'Moderate' potential to support bats according to Table 1 in Section 4.3. Equating this evaluation to the Billington and Norman (1997) Scale for Bridge Structures, this feature would achieve a score of '2' and was considered to have crevices that were ideal for bats, but no evidence found during 2016.



Plate 2 – Quay Walls in central and south west of the Survey Area. Note: substantial holes/crevices in walls

Structure 3 (STR03) – Old Enniscorthy Bridge

This structure dates back from 1630. In 1837 the Bridge was lowered and widened⁷. It appears to have undergone maintenance over the years and does not provide suitable cracks or crevices in which bats might roost. It was classed as having a score of '0' (no potential for bats (no suitable crevices)), (Billington *et. al.*, 1997). There was no Ivy cover on this bridge.

⁷<https://www.wexford.ie/wex/Departments/CommunityDevelopment/SportsActiveWexford/Walks/HeritageWalks/Thefile,15198,en.pdf>



Plate 3 – The Old Enniscorthy Bridge over the River Slaney



Plate 4 – A view of the typical underside of the Old Enniscorthy Bridge showing no cracks or crevices

Structure 4 (STR04) –Seamus Rafter Bridge

This more modern bridge in Enniscorthy was opened in 1991. The cement work was well-sealed and on further inspection, it did not offer suitable cracks or crevices for bats. In addition, there was no Ivy cover. The water levels often exceed the bridge deck in high water/heavy rain. This bridge category was classed as ‘0’ (no potential for bats (no suitable crevices)), (Billington *et. al.*, 1997).



Plate 5 – The Seamus Rafter Bridge in Enniscorthy town



Plate 6 – Underside of the Seamus Rafter Bridge in Enniscorthy town



Plate 7 – Abutment joints under the Seamus Rafter Bridge in Enniscorthy

Structure 5 (STR05) - Derelict building / Old stone wall

The remnants of an old building (shown on the historic 25" maps⁸) exist on the north eastern end of the northern floodplain. This structure is in disrepair with cracks in parts of the walls where there are crevices and gaps that had the potential for use by bats. Plants growing on the wall included Ivy (thick strands), Butterfly bush *Buddleja davidii* and Navelwort *Umbilicus rupestris*. Some of the plants such as the former Ivy and Butterfly bush can offer cover for roosting bat species and the strands of Ivy on these walls were thick enough to do so. No evidence of a bat roost was recorded during the survey. This structure was considered to have 'Moderate' potential to support roosting bats (according to Table 1 in Section 4.3). Equating this evaluation to the Billington and Norman (1997) Scale for Bridge Structures, this feature would achieve a score of '1' and was considered to have crevices present that may be of use by bats, but no evidence to suggest they were currently in use.

⁸ <http://maps.osi.ie/publicviewer>



Plate 8 – The derelict building / wall on the northern floodplain

Structure 6 (STR06) Underground Water tank

This structure is present in the central eastern area of the northern floodplain, at approximate grid reference point S 97508 40487. It consisted of a disused underground water tank with open access holes. Visible space within the tank provided opportunities for bats to gain access and roost. However, no evidence of roosting bats were noted here during the activity surveys. The tank was considered to have 'Moderate' potential to support roosting bats (according to Table 1 in Section 4.3). Equating this evaluation to the Billington and Norman (1997) Scale for Bridge Structures, this feature would achieve a score of '2' as it provides a large enclosed space with suitable access hatches that may be of use by bats, but no evidence was recorded to suggest that bats were using this water tank during 2016.



Plate 9 – Underground water tank on the northern floodplain

Structure 7 (STR07) – Railway Bridge at Urrin River

The bridge abutment joints within this bridge offered gaps that are suitable for bats to roost within. However, no evidence of bat activity was noted here. This bridge was categorised as ‘1’ (crevices present may be of use to bats) according to Billington *et. al.* (1997).



Plate 10 – Railway Bridge over the Urrin River.

Structure 8 (STR08) – Railway Bridge in South West of Study Area

This bridge did not offer any suitable crevices or gaps in which bats could roost. The strands of Ivy here were noted to be too thin to offer roosting opportunities. This bridge was categorised as '0' (Crevices present (may be of use to bats)) according to Billington *et. al.* (1997).



Plate 11 – Railway Bridge in south west of the Survey Area

5.3 ACTIVITY SURVEYS

The presence of the following bat species was confirmed within the survey area during the bat activity surveys:

- Soprano pipistrelle bat;
- Common pipistrelle bat;
- Leisler's bat; and,
- *Myotis* species (including Daubenton's bat).

The main areas of bat activity within the Survey Area comprised:

- Over the River Slaney alongside the northern and southern floodplains (most of the *Myotis sp.* activity was noted directly over the river (believed to be Daubenton's bats). Daubenton's bats

were recorded alongside the floodplains to the north and south just outside of the town centre – this is likely to be influenced by the locations of street lighting within the town⁹);

- Along mature treelines with ditches (particularly used by Leisler’s bats and Pipistrelle bat species);
- Adjacent to, and within woodland habitat (particularly where they included mature trees);
- Above open scrub areas that were sheltered by trees (e.g. Pipistrelle species recorded along the N30, St John’s Road on the western side of the River Slaney); and,
- Beside the old Enniscorthy Bridge and the Seamus Rafter Bridge. Pipistrelle bat species forage on either side of these bridges. The old Enniscorthy Bridge is illuminated at night time and public street lighting is found in all urban areas. The Seamus Rafter Bridge also has lighting mounted on the northern side of the structure.

During the survey on the 28th September at the proposed bridge location, it was noted that the majority of bats were recorded in more sheltered locations e.g. within woodland or openings between mature trees. This was attributed to the windier weather conditions and light rain.

Over the three mobile bat activity surveys surveyors noted a minimum of 33 Unidentified Pipistrelle bats¹⁰, 20 Common Pipistrelle bats, 52 Soprano pipistrelle bats, 15 *Myotis* species (including Daubenton’s bat) and 13 Leisler’s bat records.

The results of all bat activity recorded during the mobile bat activity surveys can be seen in Figures 3 – 5 below. Full details of these bat activity surveys can be seen in and Table B1 in Appendix B. The mobile bat activity surveys were conducted within the area indicated on Figure 1 above in Section 4.1.

Four species were definitively identified following sound analysis of the mobile activity survey recordings – Soprano pipistrelle bat (this was the commonest species recorded during those surveys); Common pipistrelle bat; Leisler’s bat; and, Daubenton’s bat. In addition, unidentified *Myotis* bat species, Pipistrelle bat species and other unidentified bat records were noted. Species also likely to be using the Survey Area that were not recorded during these surveys include Brown Long-eared bat; Natterer’s bat and Whiskered bat. All of these species have been recorded in the environs of the proposed Scheme Survey Area and the former have bat roosts <5km of the proposed Scheme.

⁹ All bat species have a low tolerance for light levels. Species which are particularly sensitive include: Brown long-eared bat, Whiskered bat, Natter’s bat, Daubenton’s bat and Lesser Horseshoe bat. Daubenton’s bat prefers a light level of less than 1 lux – in order to compare, 0.2 lux level is equivalent to moonlight (Bat Conservation Ireland, 2010).

¹⁰ Either Soprano or Common pipistrelle bats with a peak frequency of between 48 - 52kHz and due to a certain degree of overlap in the calls of these species it is not possible to state precisely which species was recorded.

Figure 3. Areas of bat activity recorded during the mobile transects and extended dusk surveys (location of statics also included)

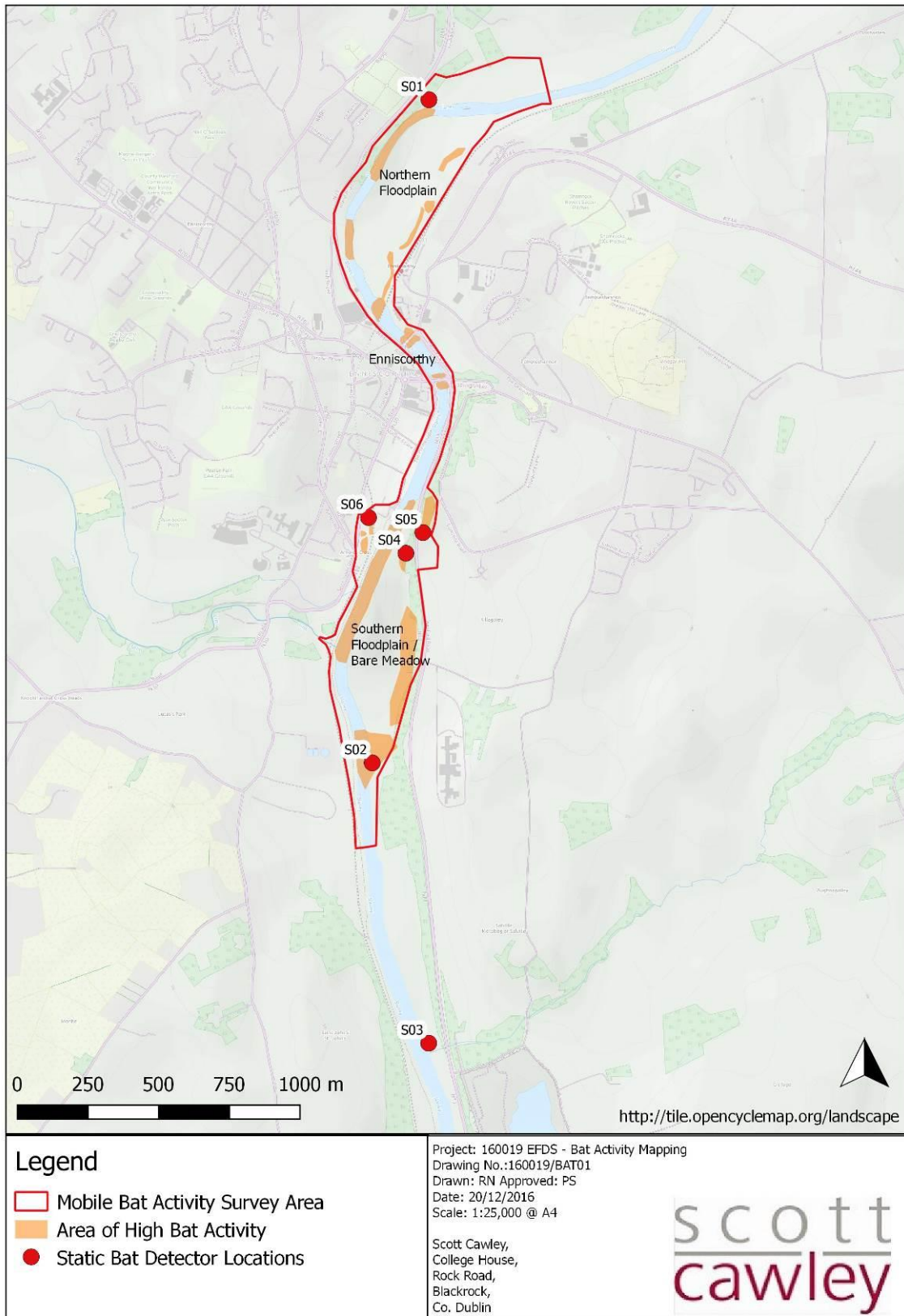


Figure 4. Areas of bat activity recorded within the north and centre of the Survey Area

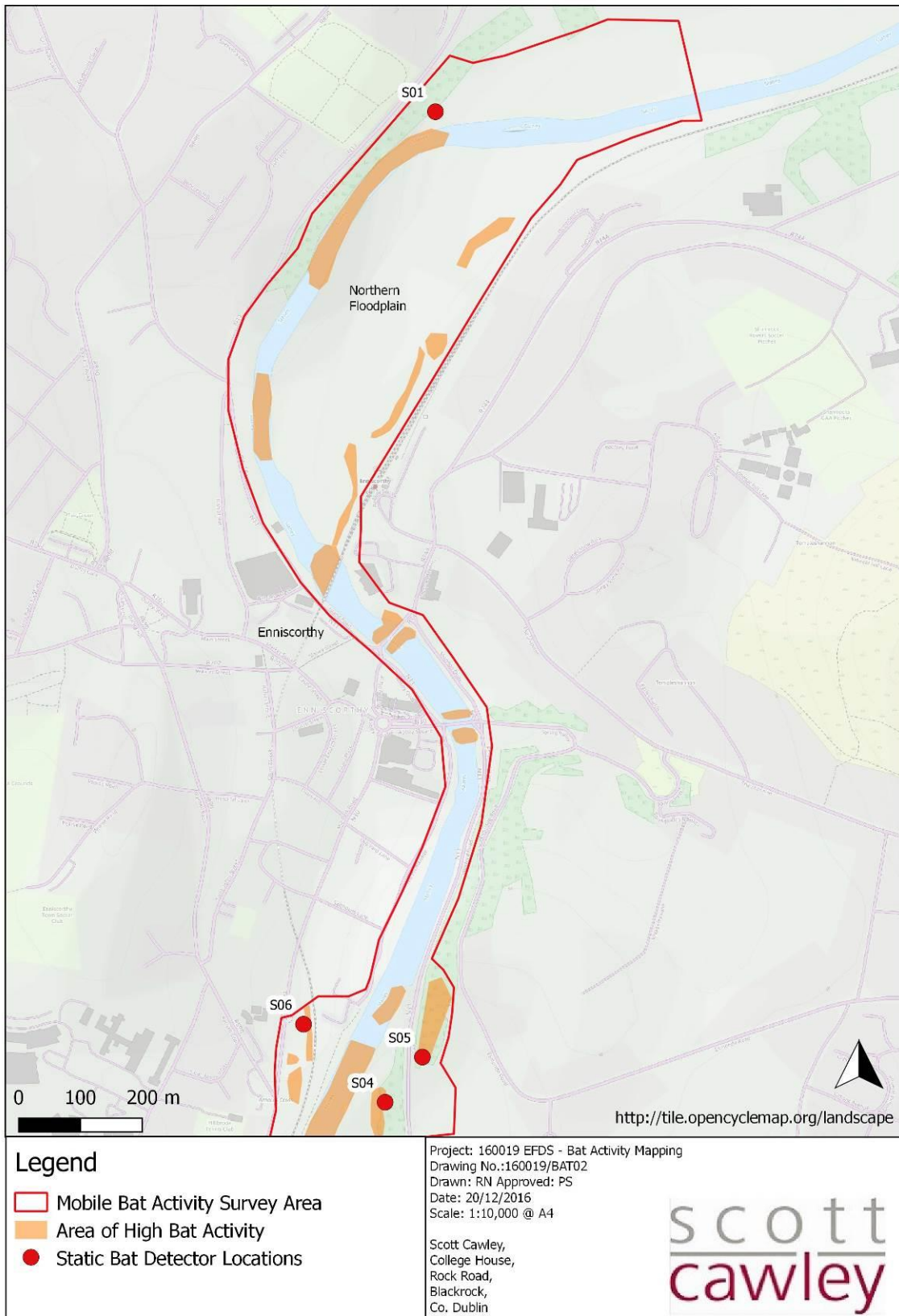
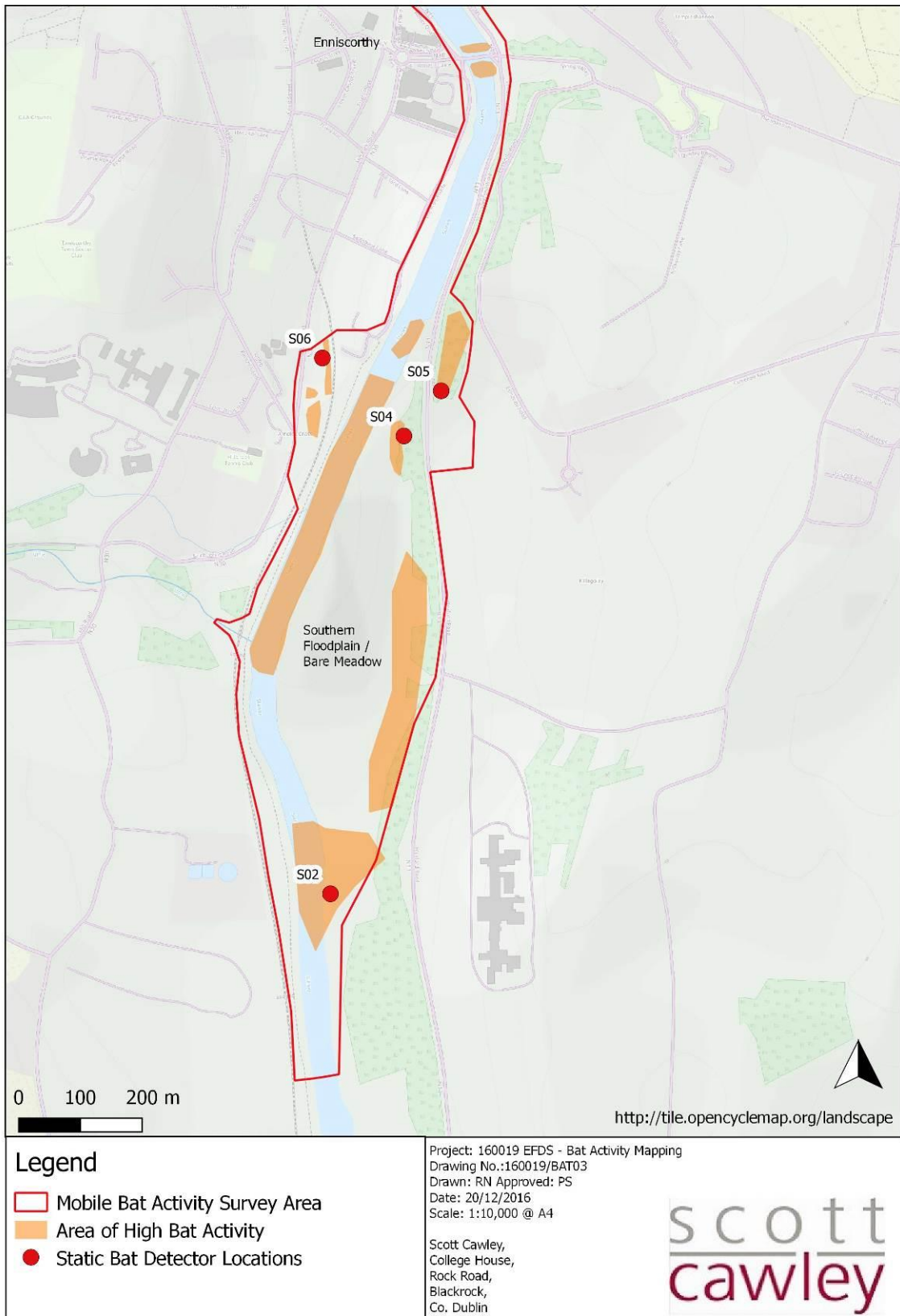


Figure 5. Areas of bat activity recorded within the centre and south of the Survey Area



5.4 STATIC DETECTOR SURVEYS

The survey details and locations of static detectors deployed over the course of the study are presented Figure 2 and Table 2 in Section 4.3 above. Table C1 in Appendix C lists the species recorded during the static bat detector surveys and the number of “passes” at each detector (as described in the methodology in Section 4). The following charts illustrate these results. The numbers indicated are the number of recordings made of each species (bat passes). Bat passes offer an index of bat activity, rather than a measure of number of individuals in a population (Collins, 2016).

There is little evidence to prove that higher levels of bat echolocation activity reflects higher bat abundance in reality (Hayes, 2000), however, the detector records are somewhat corroborated by the observational results obtained during the mobile bat activity surveys in the same areas as the static detectors.

Static bat detector records in May 2016

Three detectors were each deployed over 5 nights during the 4th – 9th May 2016. Bat activity was recorded from c.30 minutes pre-sunset to c.30 minutes post-sunrise.

The results can be seen in Figures 6, 7 and 8 below.

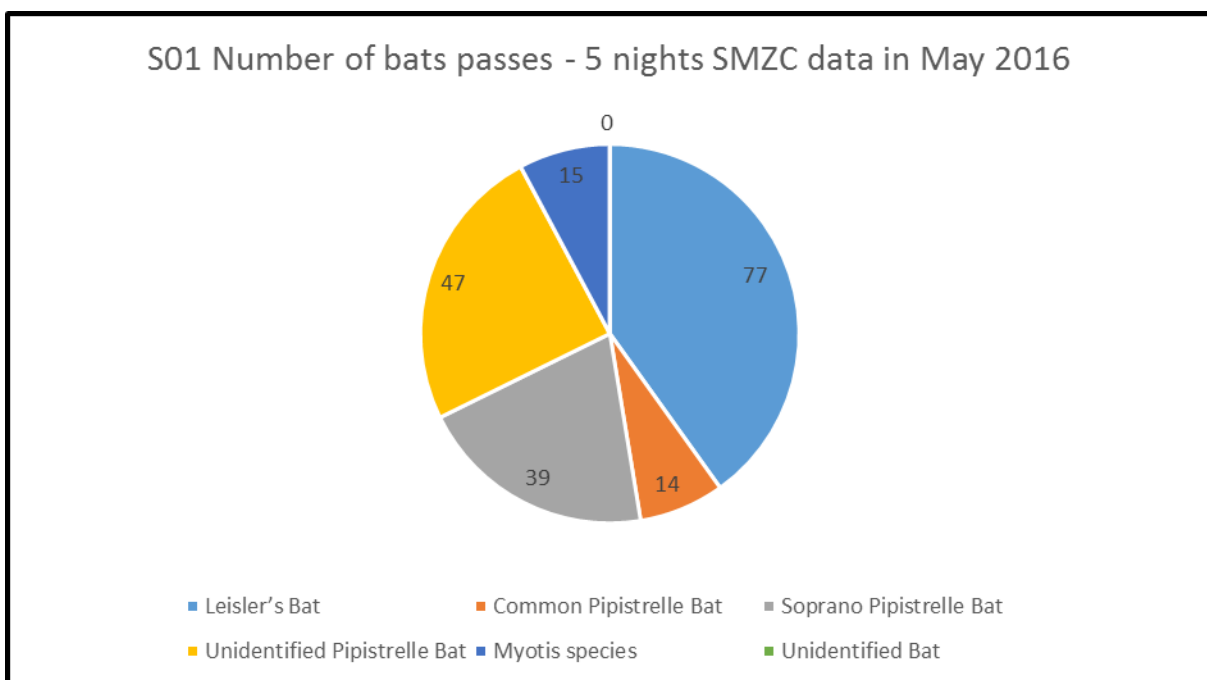


Figure 6. Bat passes at S01 – SMZC

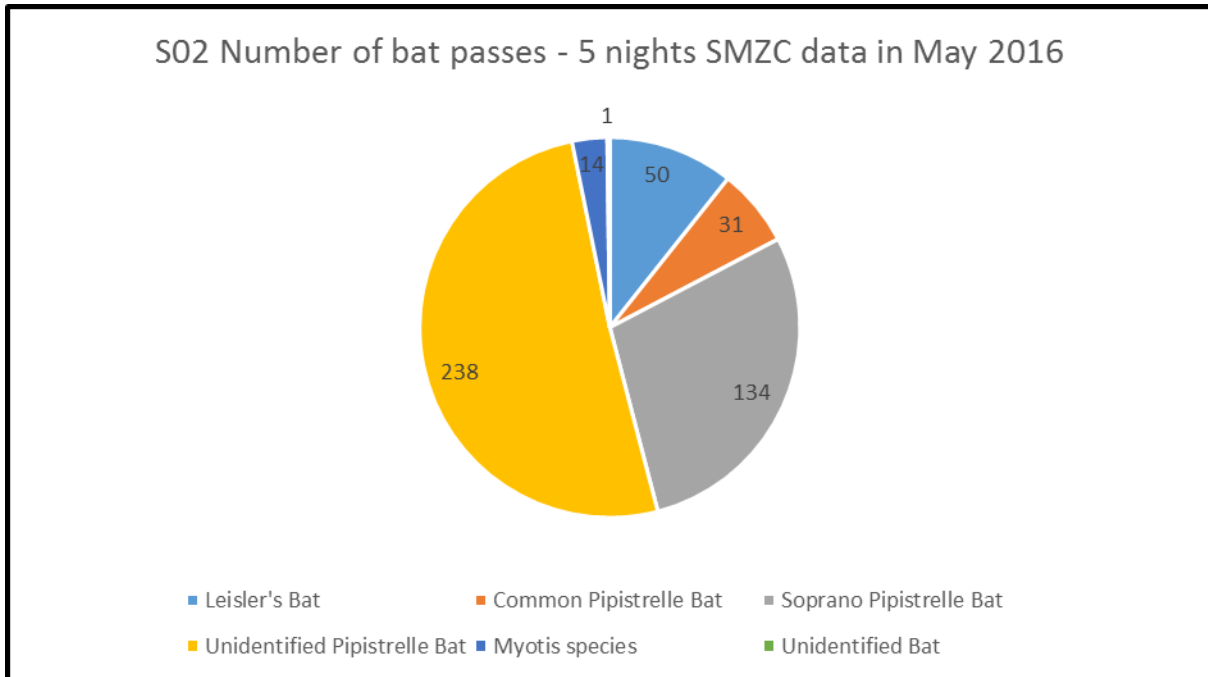


Figure 7. Bat passes at S02 – SMZC

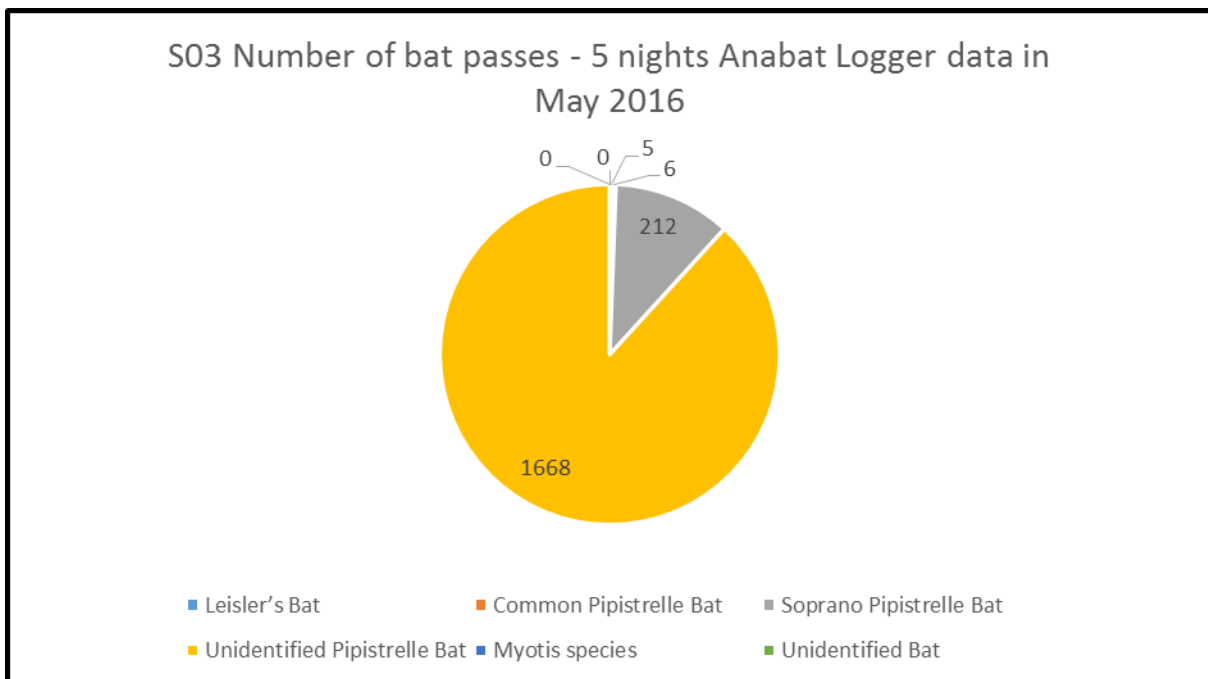


Figure 8. Bat passes at S03 – Anabat Logger

S01 was located at woodland in north west of Survey Area. *Pipistrelle* bats were the most commonly recorded bat passes at S01 (100 passes), with good numbers of Leisler's bat also recorded (77). The woodland and surrounding habitats also supported *Myotis* species. This mature Oak-Ash-Hazel woodland provided excellent foraging (and roosting) habitat immediately adjacent to the River Slaney.

S02 was deployed at woodland just south of the southern floodplain. Over 5 nights, this detector recorded a substantial number of 403 Pipistrelle bat passes, 50 Leisler's bat and 14 passes by *Myotis* sp. Wet ditches adjacent to the woodland in this location provide sheltered areas in which invertebrates may be found and may attract bats to feed in this area.

The static detector (Anabat SD1) at S03 (deployed at woodland and scrub to the south east of Survey Area (outside of the mobile bat activity Survey Area) recorded a large number of unidentified *Pipistrelle* bat species passes (1668; 88% of all passes at S03) and 212 Soprano pipistrelle bat passes (11% of passes at S03). A small number of Leisler's bat and Common pipistrelle bat passes were also recorded here (0.2% and 0.3% respectively). The results indicate a high level of bat activity south of the Zone of Influence of the proposed scheme.

A total of c.192 passes were recorded at S01 and c.468 at S02 during the same survey period. 52% of all passes at S01 were Pipistrelle bat species. During the same period, 86% of all passes at S02 were Pipistrelle species, inferring that more Pipistrelle bat activity occurred in this southern location during that survey period. The more mature woodland at S01 had more Leisler's bat passes (40% of passes at S01) than S02 (11% of bat passes at S02). Both locations recorded a similar number of passes for *Myotis* bat species (*Myotis* passes were attributed to 8% at S01 and 3% at S02).

Static bat detector records in June 2016

In June 2016, an SMZC recorder (S04) was deployed for one night at the proposed bridge location within the alluvial woodland near the southern floodplain. The results can be seen in Figure 9 below.

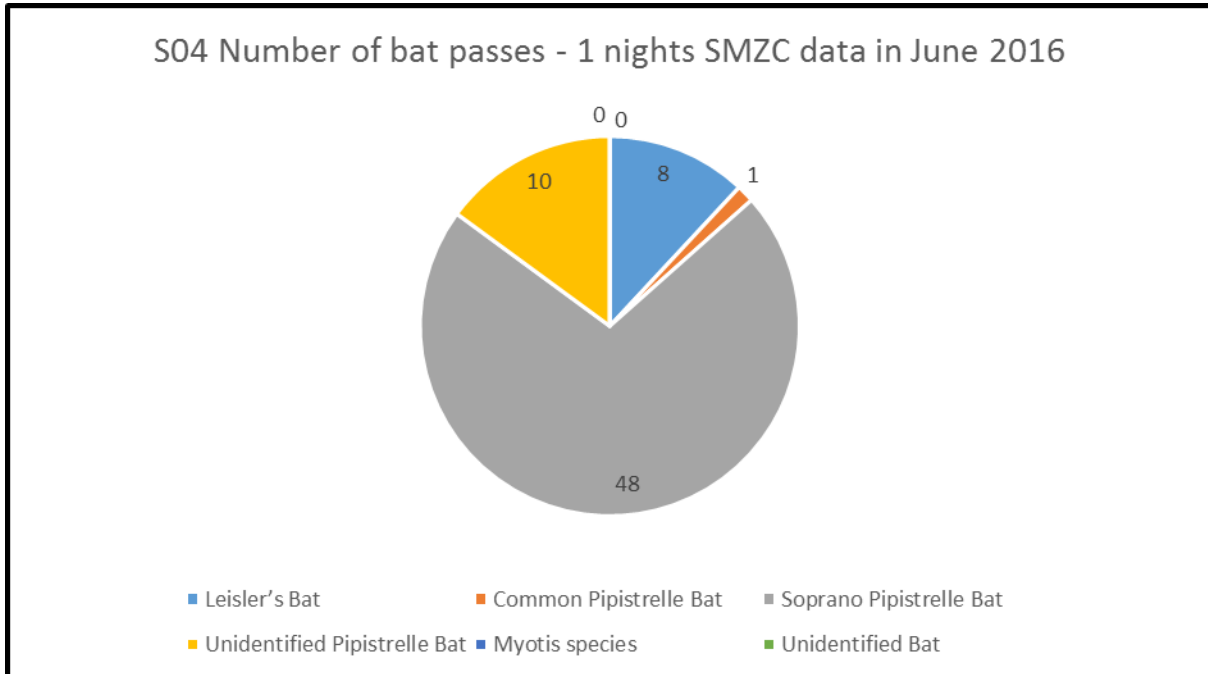


Figure 9. Bat passes at S04 - SMZC

S04 recorded a total of 67 bat passes. Of these 67 passes, 48 (72%) passes were Soprano pipistrelle bat, 10 (15%) unidentified Pipistrelle bat passes, 8 (12%) Leisler’s bat passes and 1 (1%) Common pipistrelle bat pass.

Static bat detector records in August 2016

During August 2016, two bat detectors were deployed adjacent to the proposed new bridge locations for abutments, roundabouts and approach roads. These were S05 at “Old Sessile Oak Woodland” habitat on the eastern bank, and S06 at planted Mixed Deciduous Woodland on the western bank. These detectors were intended to gather data regarding the bat species using habitats at the proposed locations for new bridge abutments and approach roads. The results of this survey can be seen in Figures 10 and 11 below.

Species recorded at both woodlands included Common and Soprano Pipistrelle bats and Leisler’s bats.

Between these two locations, *Myotis* species, were only recorded on the static detector at the “Old Sessile Oak Woodland” habitat on the eastern side of the proposed bridge with 5 passes (0.5% of all passes at S05)¹¹.

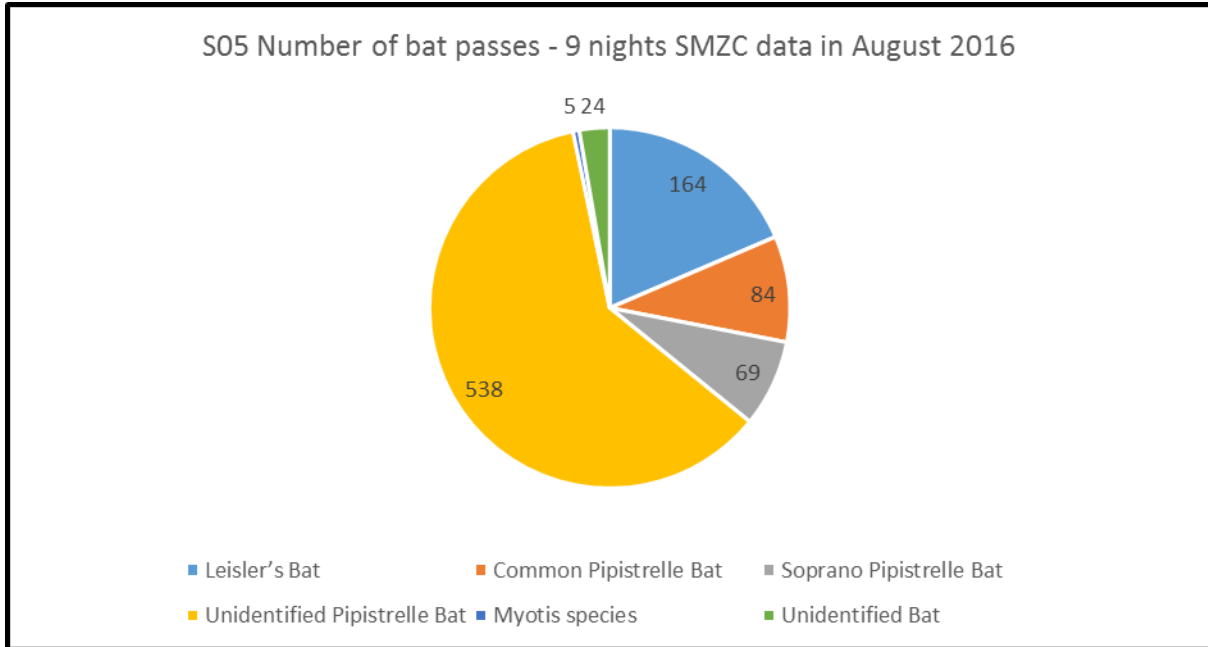


Figure 10. Bat passes at S05 - SMZC

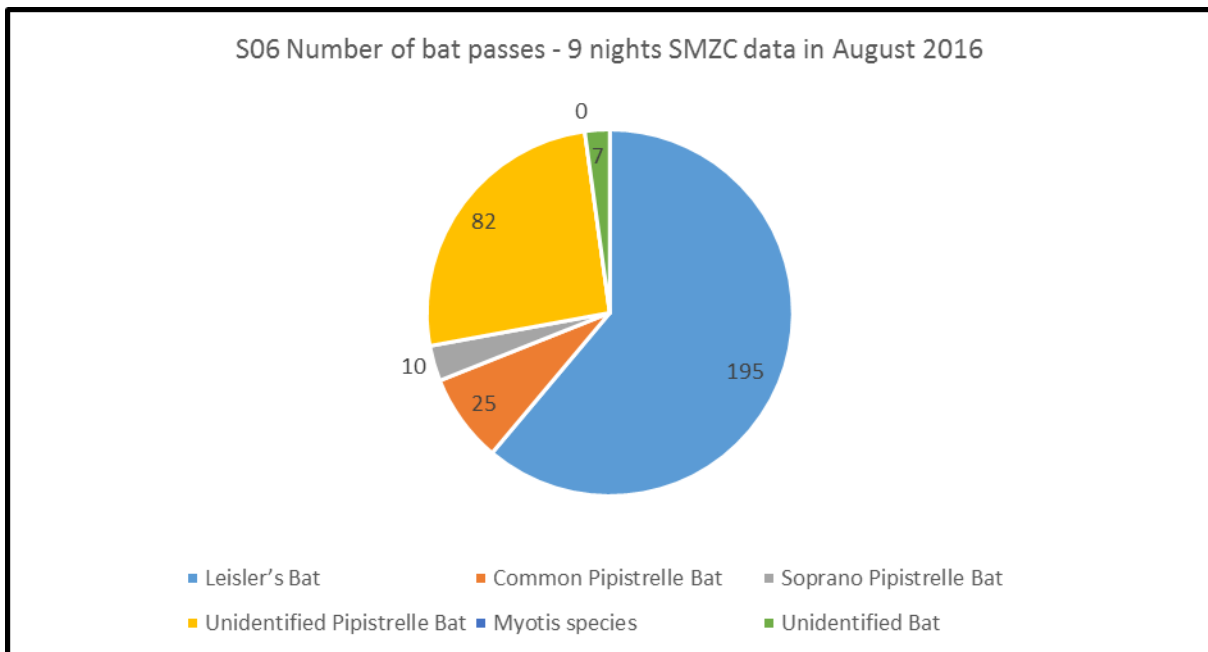


Figure 11. Bat passes at S06 - SMZC

¹¹ Please Note: Daubenton's bat (a *Myotis* species) were recorded over the River at the proposed bridge location during the mobile activity surveys.

There were 884 bat passes at S05 and a lower number of passes (319) were recorded at S06. A large number of unidentified Pipistrelle bat species were recorded at S05 (538; 61% of passes at this location), compared to a smaller number recorded at S06 (82; 26% of passes at this location).

The most frequently-recorded bat species detected at the “Old Sessile Oak Woodland” (S05) were Pipistrelle bats, with approximately 79% of all recordings being attributed to that species in this location. This contrasts with 37% of bat passes being attributed to Pipistrelle bat species at S06. Leisler’s bats were attributed to 19% of the passes at S05 and 61% of the passes at S06, however the actual number of passes were similar for this species (164 and 195 respectively).

6. SUMMARY OF RESULTS

Several bat species have been recorded foraging across the site on a regular basis. The proposed Scheme and its environs offer foraging and commuting habitat for bats. The habitats of highest value to bats within the Survey Area were considered to be the mature woodlands, the Slaney River and tributaries, tree-lined ditches, wet grasslands and scrub.

The surveys within the Survey Area did not confirm any bat roosts. However, the surveys determined the levels of suitability for potential roosting. PRF (Potential Roost Feature) trees were scattered throughout the Survey Area, with the majority of moderate suitability trees being recorded within the woodland to the northwest, along the back ditch of the northern floodplain, alongside The Promenade just north of the Riverside Hotel and within woodlands to the south and south east of the Survey Area.

A total of eight structures were surveyed as part of the bat surveys. Four structures (STR01, STR03, STR04 and STR08) were considered to have 'No' potential to support roosting bats. The remaining four structures surveyed (STR02, STR05, STR06 and STR07) were assessed as having 'Moderate' potential to support roosting bats due to features such as cracks, crevices and ivy cover. No evidence of roosting bats were identified at any of the structures during surveys.

During activity surveys the presence of four bat species was confirmed within the Survey Area. Soprano pipistrelle bat (was the commonest species recorded during mobile activity surveys); Common pipistrelle bat; Leisler's bat; and, Daubenton's bat. In addition, unidentified *Myotis* bat species, Pipistrelle bat species and other unidentified bat records were noted. Species also likely to be using the Survey Area that were not recorded during these surveys include Brown Long-eared bat; Natterer's bat and Whiskered bat. All of these species have been recorded in the environs of the proposed Scheme Survey Area and the former have bat roosts <5km of the proposed Scheme.

The main areas of bat activity within the Survey Area comprised over the River Slaney alongside the northern and southern floodplains (most of the *Myotis sp.* activity was noted directly over the river (believed to be Daubenton's bats). Daubenton's bats were recorded alongside the floodplains to the north and south just outside of the town centre, along mature treelines with ditches (particularly used by Leisler's bats and Pipistrelle bat species), adjacent to, and within woodland habitat (particularly where they included mature trees), above open scrub areas that were sheltered by trees, and, beside the old Enniscorthy Bridge and the Seamus Rafter Bridge. Pipistrelle bat species forage on either side of these bridges. Static detector survey results somewhat verified the observational results obtained during the mobile bat activity surveys in the same areas as the static detectors.

Overall the survey results demonstrate the value of the Survey Area as a foraging and commuting habitat for bats, with no bats roosts confirmed within the Survey Area.

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APPENDIX A: Potential Bat Roosts (Trees, Structures & Bridges) – Table of Results and Maps

| TABLE A1- Potential Tree Roosts within the Survey Area | | | | | | | | |
|--|-----|---------|---------------|-------------------------------|---------------|-------------------|---|-------------|
| Tree species | Id | Age | Photo Code(s) | PRF type | PRF height | PRF aspect | Additional Comments | Suitability |
| Ash (<i>Fraxinus excelsior</i>) | T1 | 30-50 | 183 | Ivy | 7-8m + | All around | Tree located beside proposed main access route | Low |
| Crack Willow (<i>Salix fragilis</i>) | T2 | 30-50 | 184, 185 | Lifting bark, tear out | 5m + | West | Low potential bark no proper gap | Low |
| | | | 190 | Tear out/ Desiccation fissure | 5m + | West | Small hole + inclusion in bark | |
| | | | 191 | Hazard beam | 7m | West + all around | Hazard beam? Snapped branch | |
| Oak (<i>Quercus sp.</i>) | T3 | 30-50 + | 193, 194 | Tear out | 3.5m | North | Could be shallow | Moderate |
| | | | 195 | Hazard beam | 4m | North | Good crack into narrow branch (7cm wide branch) | |
| | | | 196 | Hazard beam | 4.3m | North | Hazard beam branch with flaking bark and hole | |
| | | | 197 | Ivy | 4.3m + | West + all around | Thick ivy pulled back from trunk in places | |
| Oak (<i>Quercus sp.</i>) | T4 | 30-50 + | 198 | Hazard beams | 4m + & 1.5m | All around | A few hazard beams + fractures on thin, damaged Oak | Moderate |
| Oak (<i>Quercus sp.</i>) | T5 | 50-100 | 201, 202 | Hazard beam | 1.5m | Northwest | Some features outstretched over river | Low |
| | | | 203 | Hazard beam | 1m | North | Low potential. Narrow, not deep | |
| Oak (<i>Quercus sp.</i>) | T6 | 30-50 | 204, 205 | Ivy | 3m | All around | Thick strands of ivy | Low |
| Ash (<i>Fraxinus excelsior</i>) | T7 | 30-50 | 206, 207 | Knot hole | 3.5m | Northwest | Low potential. Upwards facing but might travel up through trunk | Low |
| Ash (<i>Fraxinus excelsior</i>) | T8 | 30-50 | 208, 209 | Ivy | 4m | All around | Dense, thick ivy | Low |
| Ash (<i>Fraxinus excelsior</i>) | T9 | 30-50 | 210-212 | Knot hole | 5m | North + East | Looks shallow from ground but needs closer inspection | Low |
| Ash (<i>Fraxinus excelsior</i>) | T10 | 30-50 | 213-216 | 2 x Hazard beams | 5.5m + | East + North | Good hazard beams, cracks in branches | Moderate |
| Ash (<i>Fraxinus excelsior</i>) | T11 | 30-50 | 217, 218 | Knot hole | 3m | North | Appears deep (from ground level) | Moderate |
| | | | | Ivy | All over 3m + | All around + West | Tree growing on an old stone wall. Canker growing on it | |
| Ash (<i>Fraxinus</i>) | T12 | 10-30 | 219 | Knot hole | 3m | North | Very good potential | Moderate |

| TABLE A1- Potential Tree Roosts within the Survey Area | | | | | | | | |
|--|-----------|--------|-----------------|----------------|-----------------|------------------------|--|-------------|
| Tree species | Id | Age | Photo Code(s) | PRF type | PRF height | PRF aspect | Additional Comments | Suitability |
| <i>excelsior</i> | | | 221 | Lifting bark | 4m | All over | Inclusions (tree healing) + cracks | |
| | | | 220 | Knot hole | 3.5m | South | - | |
| Ash (<i>Fraxinus excelsior</i>) | T13 | 10-30 | 225 | Tear out | 7m | South | Canker, flaking bark, tear out | Moderate |
| | | | 226 | Lifting bark | 7m | All around | Shallow, not suitable | |
| Ash (<i>Fraxinus excelsior</i>) | T14 | 10-30 | 227, 228 | Ivy | 7m | East | Cluster of thin ivy | Low |
| Ash (<i>Fraxinus excelsior</i>) | T15 | 30-50 | 229, 230 | Ivy | 2.5m | All around | Very thick ivy. Lots of branches, could have more features in canopy. (Tree beside plank over ditch) | Moderate |
| Oak (<i>Quercus sp.</i>) | T16 | 50-100 | 01 (RNF camera) | Hazard beam | 2m | South | - | Moderate |
| | | | 02, 03 | Hazard beam | 4.5m | South | | |
| | | | | Ivy | 1m | All around | | |
| | | | | Hazard beam | 7m | East | | |
| Ash (<i>Fraxinus excelsior</i>) | T17 | 30-50 | 04, 05 | Ivy | 1m | South | Ivy is thicker at base of trunk and leafier at top | Low |
| Beech (<i>Fagus sylvatica</i>) | T18 | 30-50 | 06 | Double leader | 20m | North | Twin stem with cracks in bark | Moderate |
| | | | 07 | Union | 18m | East | Crossing branches | |
| Oak (<i>Quercus sp.</i>) | T19 | 50-100 | 08, 09 | Knot holes x 3 | 5m, 6.5m & 8.5m | East, Southeast & East | Good bat roost feature | Moderate |
| | | | 10 | Hazard beams | 7.5m | South | Good bat roost feature | |
| Oak (<i>Quercus sp.</i>) | T20 & T21 | 50-100 | 11, 12 | Knot hole | 7.5m | South | Not possible to see entire tree canopy due to dense ivy cover. Note similar tree behind, T21 | Moderate |
| | | | | Hazard beam | 8m | south | | |
| | | | | Union | 6m | All around | | |
| Oak (<i>Quercus sp.</i>) | T22 | 50-100 | 13, 14 | Knot hole | 4m | South | Tree overhangs river path | Moderate |
| | | | 15 | Knot hole | 6.5m | South | | |
| | | | 16 | Hazard beam | 5m | South | | |
| Beech (<i>Fagus sylvatica</i>) | T23 | 50-200 | 18 | Knot hole | 5m | North | Tree overhangs river path | Moderate |
| | | | 19 | Knot hole | 4.8m | East | | |
| | | | 20 | Hazard beam | 5.4m | East | | |
| Oak (<i>Quercus sp.</i>) | T22a | 50-100 | 21 | Knot hole | 4m | East | Tree overhangs river path | Moderate |
| | | | 22 | Hazard beam | 5m | East | | |
| | | | 23, 24 | Hazard beam | 6m | North | | |
| Oak (<i>Quercus sp.</i>) | T24 | 50-100 | 25 | Knot hole | 4.5m | East | Not possible to see entire tree canopy | Moderate |
| | | | 26 | Hazard beam | 4.8m | East | | |
| | | | 27 | Hazard beam | 6m | East | | |

| TABLE A1- Potential Tree Roosts within the Survey Area | | | | | | | | |
|--|-----|--------|---------------|------------------------|---------------------|-----------------------------|--|-------------|
| Tree species | Id | Age | Photo Code(s) | PRF type | PRF height | PRF aspect | Additional Comments | Suitability |
| | | | 28 | Hazard beam | 6m | Southeast | | |
| | | | 29 | Hazard beam | 7m | East | | |
| | | | | Tear out | 6.5m | Southeast | | |
| Beech (<i>Fagus sylvatica</i>) | T25 | 50-100 | 30 | Hazard beam | 10m | Southwest | Not possible to see entire tree canopy | Moderate |
| | | | 31 | Knot hole | 8.5m | East (trunk) | | |
| | | | 32 | Knot hole | 8.5m | East (branch) | | |
| | | | 33 | Hazard beam | 9.5m | North | | |
| Oak (<i>Quercus sp.</i>) | T26 | 50-100 | 34, 35 | Flush cut | 4.5m | East | - | Moderate |
| | | | 36 | Flush cut | 7m | East | | |
| | | | 37 | Hazard beam | 9.5m | East | | |
| Oak (<i>Quercus sp.</i>) | T27 | 50-100 | 38-42 | Knot hole x 3 | 1.5m, 7m & 9m | Southeast & West | - | Moderate |
| | | | | Hazard beam x 4 | 4m, 4m, 7m & 9m | Southeast, West & Southwest | | |
| Willow (<i>Salix sp.</i>) | T28 | 10-30 | 43, 44 | Transverse snaps | 6m | South | Split right into centre of trunk at top of the tree | Low |
| Willow (<i>Salix sp.</i>) | T29 | 10-30 | 45, 46 | Lifting bark | 3m | South | - | Low |
| Willow (<i>Salix sp.</i>) | T30 | 10-30 | 47 | Lifting bark | 5m | West | - | Low |
| | | | 48 | Lifting bark | 5.5m | West | | |
| | | | 49, 50 | Ivy | 1-2.5m | All around | | |
| Beech (<i>Fagus sylvatica</i>) | T31 | 50-100 | 51, 52, 53 | Hazard beam | 7m | South | Dense ivy, but thick strands. | Moderate |
| Standing dead wood | T32 | >50 | 54, 55 | Dead trunk with cracks | 3m | All around | Bracket fungus | Moderate |
| Ash (<i>Fraxinus excelsior</i>) | T33 | 50-100 | 56, 57 | Knot hole | 2.5m | West | Tree in carpark. Crown and branches removed. But highly disturbed area | Moderate |
| | | | 57 | Lifting bark | >1m + | All around | | |
| Beech (<i>Fagus sylvatica</i>) | T34 | 10-30 | 58 | Double leader with ivy | 5m | All around | Dense ivy on trees. Tree in area of high disturbance | Low |
| Beech (<i>Fagus sylvatica</i>) | T35 | 10-30 | 58 | Double leader with ivy | 5m | All around | Dense ivy on trees. Tree in area of high disturbance | Low |
| Beech (<i>Fagus sylvatica</i>) | T36 | 10-30 | 59 | Knot hole x 4 | 2m, 2.3m, 2.5m & 3m | All East | Some loose bark at holes. Tree in area of high disturbance | Low |
| Beech (<i>Fagus</i>) | T37 | 10-30 | 60, 61 | Hazard beam | 2m | North | Tree in area of high disturbance levels | Low |

| TABLE A1- Potential Tree Roosts within the Survey Area | | | | | | | | |
|--|-----|-------|---------------------|---------------------|-----------------|-------------------|---|-------------|
| Tree species | Id | Age | Photo Code(s) | PRF type | PRF height | PRF aspect | Additional Comments | Suitability |
| <i>sylvatica</i>) | | | 62 | Knot hole | 2.3m | East | | |
| Beech (<i>Fagus sylvatica</i>) | T38 | 10-30 | 63 | Knot hole | 1m | North | Tree in area of high disturbance levels | Low |
| | | | 64 | Union/double leader | 7m | North & South | | |
| Beech (<i>Fagus sylvatica</i>) | T39 | 10-30 | 65 | Knot hole | 1.5m | East | Tree in area of high disturbance levels | Low |
| Lime (<i>Tilia sp.</i>) | T40 | 10-30 | 80, 81, 82, 83 | Knot hole x 2 | 3m & 4m | West & South | Tree in area of high disturbance levels | Moderate |
| Horse Chestnut (<i>Aesculus hippocastanum</i>) | T41 | 30-50 | 1 (KB phone) | Butt rot | Base | West | Tree in area of high disturbance levels | Moderate |
| | | | 2, 3 | Knot hole x 2 | 1m & 5m | West & Northeast | | |
| | | | 3 | Lifting bark | 4m | All around | | |
| Lime (<i>Tilia sp.</i>) | T42 | 30-50 | 96, 97 (RNF Camera) | Knot hole x 3 | 4.5m, 4.5m & 6m | All North | Tree in area of high disturbance levels | Moderate |
| | | | 98, 100 | Double leader | 4.2m | North & South | | |
| | | | 99 | Hazard beam | 7m | All around | | |
| Lime (<i>Tilia sp.</i>) | T43 | 30-50 | 101, 102 | Knot hole x 2 | 3.5m & 2.5m | West & East | Tree in area of high disturbance levels | Moderate |
| Lime (<i>Tilia sp.</i>) | T44 | 30-50 | 103 | Knot hole x 2 | >6m | East | Tree in area of high disturbance levels | Moderate |
| | | | 104 | Double leader x 2 | >5m | North & South | | |
| Lime (<i>Tilia sp.</i>) | T45 | 30-50 | 105, 106 | Knot hole x 2 | >6m | East | Tree in area of high disturbance levels | Moderate |
| | | | 107 | Knot hole | 7m | West | | |
| | | | 108 | Hazard beam | 7m | West | | |
| Lime (<i>Tilia sp.</i>) | T46 | 30-50 | 109 | Knot hole x 2 | Both 3m | Both North | Tree in area of high disturbance levels | Moderate |
| Lime (<i>Tilia sp.</i>) | T47 | 30-50 | 110, 111 | Knot hole | 3.5m | North | Tree in area of high disturbance levels | Moderate |
| | | | 112 | Lifting bark | 5m | North | | |
| | | | 113 | Hazard beam | 8m | All around | | |
| Lime (<i>Tilia sp.</i>) | T48 | 30-50 | 114 | Knot hole x 3 | 4m, 6m & 4m | South & Southeast | Tree in area of high disturbance levels | Moderate |
| | | | 115 | Knot hole | 6m | North | | |
| Lime (<i>Tilia sp.</i>) | T49 | 30-50 | 116 | Knot hole x 3 | 5.5m, 5.5m & 8m | West & South | Tree in area of high disturbance levels | Moderate |
| | | | 117 | Union | 4.5m | East & West | | |
| Lime (<i>Tilia sp.</i>) | T50 | 30-50 | 118 | Knot hole x 2 | Both 4m | Both West | Tree in area of high disturbance levels | Moderate |
| Horse Chestnut (<i>Aesculus hippocastanum</i>) | T51 | 30-50 | 119, 120 | Lifting bark x 2 | 5m & 7m | South & Southwest | Tree in area of high disturbance levels | Low |
| Lime (<i>Tilia sp.</i>) | T52 | 30-50 | 121 | Knot hole | 6m | West | Tree in area of high disturbance levels | Moderate |

| TABLE A1- Potential Tree Roosts within the Survey Area | | | | | | | | |
|--|-----|--------|----------------|----------------------|-------------------------------|--------------------------------------|--|-------------|
| Tree species | Id | Age | Photo Code(s) | PRF type | PRF height | PRF aspect | Additional Comments | Suitability |
| Horse Chestnut (<i>Aesculus hippocastanum</i>) | T53 | 30-50 | 122, 123 | Knot hole x 2 | Both 5m | Both North | Tree in area of high disturbance levels | Moderate |
| Beech (<i>Fagus sylvatica</i>) | T54 | 50-100 | 1-5 (21.04.16) | Multiple unions | >25m | North & South | - | Moderate |
| Hawthorn (<i>Crataegus monogyna</i>) | T55 | 10-30 | 9 | Ivy | 1m & 1.5m | All around | - | Low |
| Hawthorn (<i>Crataegus monogyna</i>) | T56 | 10-30 | 9 | Ivy | 1m & 1.5m | All around | - | Low |
| Hawthorn (<i>Crataegus monogyna</i>) | T57 | 10-30 | 10 | Ivy | 1.5m | West | - | Low |
| | | | | Hazard beam | 2m | West | | |
| | | | | Lifting bark | 2m | West | | |
| Alder (<i>Alnus glutinosa</i>) | T58 | 10-30 | 12-14 | Knot hole x 3 | 1m, 2m & 3m | All west | Canopy is obscured by Ivy | Moderate |
| | | | 15 | Ivy | 2.5m | All around | | |
| Sycamore (<i>Acer pseudoplatanus</i>) | T59 | 10-30 | 17, 18 | Union | 7.5m | North | Some ivy but very thin | Low |
| Sycamore (<i>Acer pseudoplatanus</i>) | T60 | 30-50 | 19 | Ivy | 2m | All around | Cannot see all of tree. Dense, thick ivy covers | Moderate |
| | | | - | Hazard beam | 7m | Southeast | | |
| | | | 21 | Knot hole | 6m | East | | |
| Sycamore (<i>Acer pseudoplatanus</i>) | T61 | 30-50 | 22-24 | Knot hole x 6 | 3m, 3.5m, 4m, 6m, 6.5m & 6.5m | North, east, east, east, east & east | Some flaking bark but not wide enough. Very good bat roost potential tree. | Moderate |
| Ash (<i>Fraxinus excelsior</i>) | T62 | 30-50 | 31, 32, 33 | Hazard beam | 6m | South | Good features (particularly knot hole) | Moderate |
| | | | | Knot hole | 4m | South | | |
| Ash (<i>Fraxinus excelsior</i>) | T63 | 50-100 | 34 | Lifting bark | 3m | All around | Good bat roost potential. Trunk is rotten and hollow in parts | Moderate |
| | | | 35 | Butt rot | All tree | All around | | |
| | | | 36 | Lightning strike (?) | Through trunk | South | | |
| Alder (<i>Alnus glutinosa</i>) | T64 | 10-30 | 37, 38 | Knot hole x 2 | 1.5m & 2.2m (over water) | Both east | Some black staining on lower hole | Moderate |
| Alder (<i>Alnus glutinosa</i>) | T65 | 10-30 | 39, 40 | Hazard beam | 2m (over water) | East | Low potential feature | Low |

| TABLE A1- Potential Tree Roosts within the Survey Area | | | | | | | | |
|--|------------|--------|---------------|-----------------|---------------|-------------------|---|-------------|
| Tree species | Id | Age | Photo Code(s) | PRF type | PRF height | PRF aspect | Additional Comments | Suitability |
| Alder (<i>Alnus glutinosa</i>) | T66 | 10-30 | 41, 42 | Knot hole | 7m | East | Small. | Low |
| Ash (<i>Fraxinus excelsior</i>) | T67 | 30-50 | 43-44 | Hazard beam | 4m | North | - | Moderate |
| | | | | Ivy | 5m + | All around | | |
| | | | | Hazard beam | 5m | South | | |
| Ash (<i>Fraxinus excelsior</i>) | T68 | 30-50 | 45-47 | Knot hole x 2 | 5m & 1m | Both south | Small but good potential for bats Canker | Moderate |
| | | | | Hazard beam | 1m | South | | |
| Alder (<i>Alnus glutinosa</i>) | T69 | 10-30 | 48 | Ivy | 2m + | East | - | Low |
| Hawthorn (<i>Crataegus monogyna</i>) | T69a | 10-30 | 48 | Ivy | 2m + | East | - | Low |
| Crack Willow (<i>Salix fragilis</i>) | T70 | 10-30 | 49, 50 | Butt rot | 2m | North | - | Moderate |
| Alder (<i>Alnus glutinosa</i>) | T71 | 10-30 | 51 | Ivy | All over | All over | Dense ivy but thin strands | Low |
| Ash (<i>Fraxinus excelsior</i>) & Alder (<i>Alnus glutinosa</i>) | T72 / T72a | 10-30 | 52 | Ivy | All over | All over | Dense ivy but thin strands | Low |
| Horse Chestnut (<i>Aesculus hippocastanum</i>) | T73 | 50-100 | 54 | Knot hole | 2m | North | Suitable | Moderate |
| | | | 55 | Lifting bark | 5m | All around | | |
| Horse Chestnut (<i>Aesculus hippocastanum</i>) | T74 | 30-50 | 56-58 | Knot hole x 3 | 2m, 2.5m & 3m | East, east, south | Very suitable | Moderate |
| | | | | Lifting bark | 5m | East | | |
| Alder (<i>Alnus glutinosa</i>) | T75 | 10-30 | 59 | Ivy | All over | All over | low suitability | Low |
| Horse Chestnut (<i>Aesculus hippocastanum</i>) | T76 | 30-50 | 60-62 | Lifting bark | 1m + | All over | Quite suitable, lots of cracked bark | Moderate |
| | | | 64 | Hazard beam | 7m | East | | |
| Oak (<i>Quercus sp.</i>) | T77 | 50-100 | 65 | Ivy | 3m | All over | - | Moderate |
| | | | | Hazard beam x 2 | Both 7m | Both east | | |
| | | | | Butt rot | At base | West | | |
| Willow (crack?) (<i>Salix sp.</i>) | T78 | 10-30 | 69 | Ivy | 2m | All around | - | Low |
| Alder (<i>Alnus</i>) | T79 | 10-30 | 70 | Ivy | 3m | All around | - | Low |

| TABLE A1- Potential Tree Roosts within the Survey Area | | | | | | | | |
|---|-------------|--------|---------------|-------------------------|------------|-----------------------|---|-------------|
| Tree species | Id | Age | Photo Code(s) | PRF type | PRF height | PRF aspect | Additional Comments | Suitability |
| <i>glutinosa</i> | | | | | | | | |
| Crack Willow (<i>Salix fragilis</i>) | T80 | 30-50 | 309, 310 | Tear out | 1m | West | Could be affected by proposed channel in southern floodplain | Moderate |
| Fallen Ash tree (<i>Fraxinus excelsior</i>) | T81 | 10-30 | 311 | Butt rot | 1m | West | Could be affected by proposed channel in the southern floodplain & proposed new bridge (*group of Alder & Willow trees – some flaking bark & Ivy cover. Low potential. Photo 312) | Low |
| Willow (<i>Salix sp.</i>) | T82 | 10-30 | 313, 314 | Helical split | 2.5m | East & west | Should not be directly impacted | Moderate |
| Oak (<i>Quercus sp.</i>) | T83 | 30-50 | 315 | Hazard beam | 5m | Northwest | - | Moderate |
| Alder (<i>Alnus glutinosa</i>) x 3 | T84 | 30-50 | 316 | Butt rot & lifting bark | | | Half tree stump still growing. Very rotten with flaking bark. (another beside) | Moderate |
| Alder (<i>Alnus glutinosa</i>) | T85 | 10-30 | 318 | Hazard beam x 2 | 2.5m & 3m | Both east | - | Moderate |
| Ash (<i>Fraxinus excelsior</i>) | T86 | 30-50 | 319 | Ivy | All over | All around | - | Low |
| Willow (<i>Salix sp.</i>) | T86a | 30-50 | 320 | Ivy | All over | All around | - | Low |
| Oak (<i>Quercus sp.</i>) & Scots Pine (<i>Pinus sylvestris</i>) | T87 (Group) | 50-100 | 321 | Ivy & hazard beams | Various | All around | Should not be affected. Very old trees | Moderate |
| Alder (<i>Alnus glutinosa</i>) | T88 | 10-30 | 322 | Ivy | 1m + | All around | Along ditch. May be impacted by channel | Moderate |
| Alder (<i>Alnus glutinosa</i>) x 2 | T89 & T90 | 10-30 | 323 | Ivy | 1m + | All around | Along ditch. May be impacted by channel | Moderate |
| Sycamore (<i>Acer pseudoplatanus</i>) | T91 | 30-50 | 324 - 326 | Ivy | 4m + | All around | Along ditch. May be impacted by channel | Moderate |
| Beech (<i>Fagus sylvatica</i>) | T92 | 10-30 | 327 | Double leader/union | 3m | Southeast & northwest | Union twin stem | Moderate |
| Willow (<i>Salix sp.</i>) & Hawthorn (<i>Crateagus monogyna</i>) | T93 (Group) | 10-30 | 328 | Ivy | All over | All over | To the west of channel outside of works | Moderate |
| Treeline of Willow (<i>Salix sp.</i>) & Sycamore (<i>Acer pseudoplatanus</i>) | T94 (Group) | 10-30 | 329 | Ivy | All over | All over | To the west of proposed channel | Moderate |
| Willow (<i>Salix sp.</i>) Gallery woodland | T95 (Group) | 30-50 | 330-334 | Hazard beams | 2-3m | South or various | Tree group in wet willow “gallery” woodland. Lots of hazard beams (small | Low |

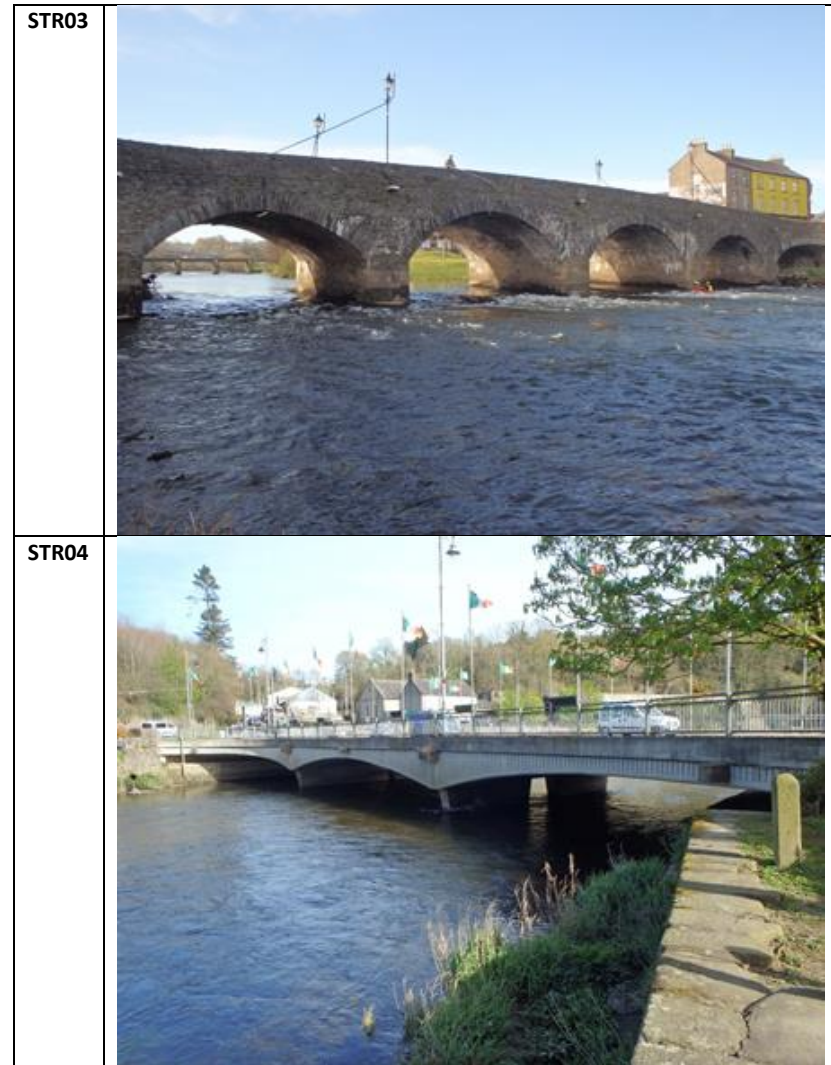
| TABLE A1- Potential Tree Roosts within the Survey Area | | | | | | | | |
|---|--------------|--------|----------------|---|------------|---------------|---------------------|-------------|
| Tree species | Id | Age | Photo Code(s) | PRF type | PRF height | PRF aspect | Additional Comments | Suitability |
| Alder (<i>Alnus glutinosa</i>) | T96 | 10-30 | 336 | Hazard beam | 6m | All around | Crown topped | Low |
| Alder (<i>Alnus glutinosa</i>) | T97 | 10-30 | 335 | Hazard beam | 7m | All around | - | Low |
| Alder (<i>Alnus glutinosa</i>) (beside Sycamore) | T98 | 10-30 | 337 | Hazard beam & Union | 1m & 2.5m | West | - | Low |
| Ash (<i>Fraxinus excelsior</i>) | T99 | 10-30 | 17, 18 | Union | 6m | North & south | - | Low |
| Ash (<i>Fraxinus excelsior</i>) | T100 | 10-30 | 19, 20 | Ivy | 2m + | All around | - | Low |
| Sessile Oak (<i>Quercus robur</i>) | T101 | 50-100 | 181, 184 & 186 | Knot holes, hollow trunk & Hazard beams | multiple | All around | - | Moderate |
| Oak Woodland (includes Ash) | T102 (Group) | 50-100 | 195 - 197 | Multiple trees with suitable PRFs | Multiple | All around | - | Moderate |
| Mixed broadleaved trees (including Ash and Sycamore) | T103 (Group) | 30-50 | 85, 226 - 228 | Some low potential PRF features | Multiple | All around | - | Low |
| Copper beach (<i>Fagus sylvatica 'Purpurea'</i>) | T104 | 30-50 | 230 | Tree is clean, but canopy should be inspected from height | Canopy | All around | - | Low |
| <p>Please Note: As PTR surveys were carried out in winter/early spring, trees were often not in full leaf or fruiting and it may have only been possible to identify them to family rather than species level e.g. in the case of Oak, <i>Quercus</i> sp. In addition, the trees listed above are not considered to have features that are obviously suitable for use by larger numbers of bats (high level), however, the suitability level could change following closer inspection during a tree climbing survey or survey using a cherry picker.</p> <p>PTR Photos available on request.</p> | | | | | | | | |

TABLE A2 – Structures and bridges within the proposed Scheme Survey Area.

| Structure Number | Structure Name & NGR | Surrounding Habitat | Category* | Crevices | Ivy Suitable for Bats | Bat Activity Survey Results |
|------------------|---|---|-----------|---|-----------------------|---|
| STR01 | Railway Bridge crossing in north of Survey Area NGR: S 97308 40002 | Crossing over River Slaney | 0 | None suitable | No | No bats recorded using this bridge but bats recording commuting and foraging in the area. |
| STR02 | Quay Wall on NE (north of Old Bridge) NGR: S 97326 39941 | Amenity grassland, river and road | Moderate | Holes, cracks and gaps | Very thin strands | No bats recorded using this wall. |
| STR03 | Old Bridge Enniscorthy NGR: S 97402 39917 | Over River Slaney, roads and amenity grassland adjacent | 0 | No, well-sealed with cement | No | Bats recorded foraging either side of this bridge – no roosts recorded. Bridge is illuminated at night. |
| STR04 | Seamus Rafter Bridge NGR: S 97517 39777 | Over River Slaney, roads and amenity grassland adjacent | 0 | No, well-sealed with cement | No | Bats recorded foraging either side of this bridge – no roosts recorded. Bridge is lit up at night. |
| STR05 | Derelict Building/walls on northern end of northern floodplain | Neutral grassland adjacent to River Slaney (not grazed in 2016) | Moderate | Cracks through walls, dense roots of Ivy / plants | No | No bats recorded roosting here in 2016, but bats recorded foraging and commuting in the area. |

| | | | | | | |
|---|---|--|----------|--|---|--|
| | NGR: S 97501 40689 | | | | | |
| STR06 | Underground Open Water tank NGR: S 97508 40484 | Surrounded by trees, scrub and neutral grassland | Moderate | Open access points into large disused underground water tank | No | Bats recorded in vicinity on floodplain, but not immediately adjacent to tank – however, this is very suitable for use as a roost. |
| STR07 | Railway Bridge at Urrin inflow on SW Bank NGR: S 97150 38837 | Adjacent to public walkway, river, amenity grassland, neutral grassland, floodplain and treeline | 1 | Bridge abutment joints have gaps | Very thin cover (not suitable for bats) | Low to negligible suitability. No roosts recorded. |
| STR08 | Railway Bridge in SW NGR: S 97238 38250 | Adjacent to public walkway and amenity grassland | 0 | No suitable crevices | Very thin cover (not suitable for bats) | Negligible. No roosts recorded. |
| <p>*Bridge structure suitability levels were based on the grading system established by Billington and Norman (1997) for Bridges where:</p> <p>0 = No potential (no suitable crevices)</p> <p>1 = Crevices present may be of use to bats</p> <p>2= Crevices ideal for bats, but no evidence of usage</p> <p>3 = Evidence of bats (e.g. bat present, droppings, etc.)</p> <p>Other structures were categorised according to Table 1 in Section 4.3 as having Negligible; Low; Moderate; and High suitability to support roosting bats.</p> | | | | | | |

STRUCTURE PHOTO LOG:



STR05



STR07



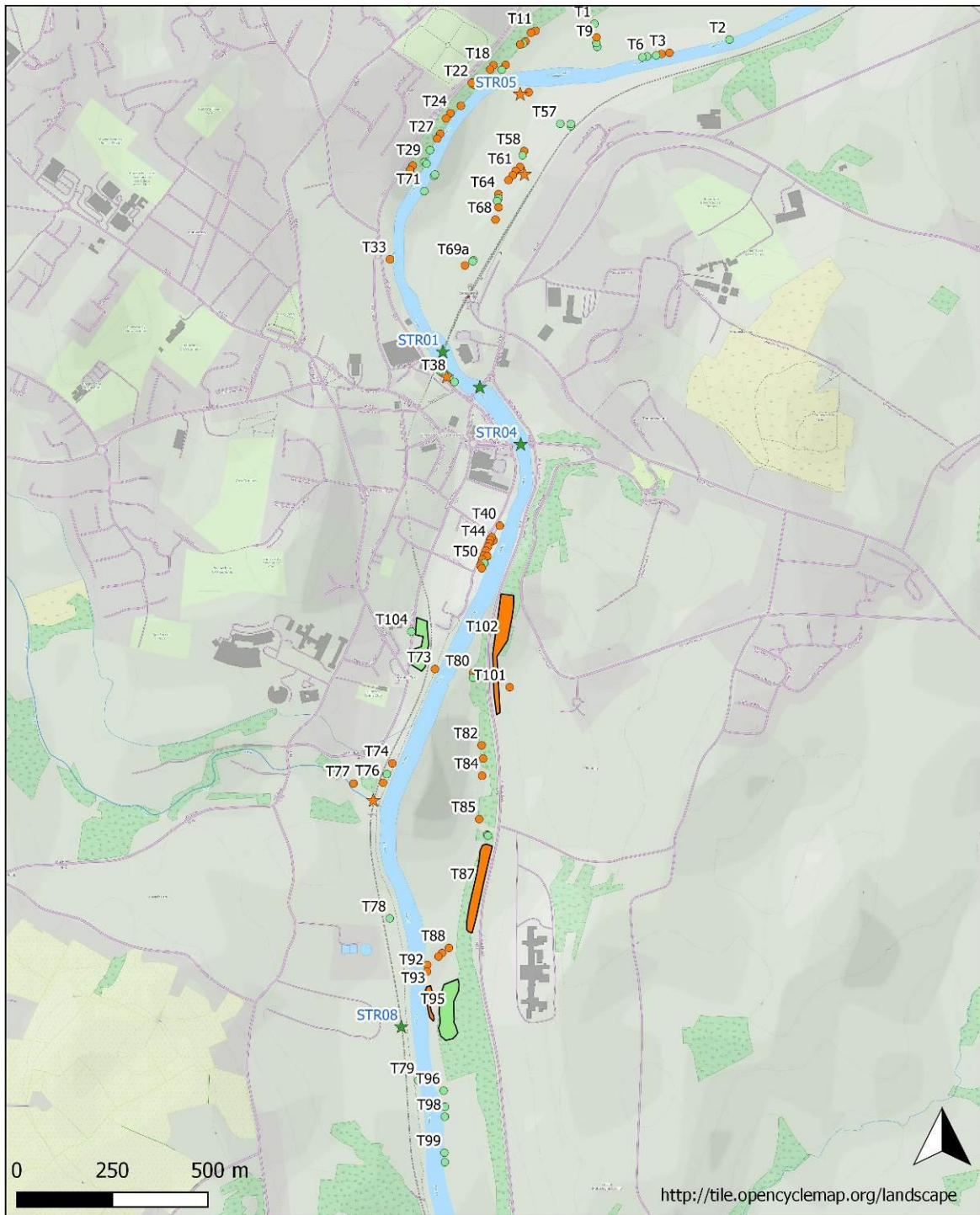
STR06



STR08




Potential Roost Location Maps



| Legend | | |
|----------------|------------|------------|
| Structure | Tree | Tree Group |
| ★ 0 - Low | ● Low | ■ Low |
| ★ 1 - Moderate | ● Moderate | ■ Moderate |

Project: 160019 EFDS - Potential Bat Roost Mapping
 Drawing No.:160019/BAT01
 Drawn: RN Approved: PS
 Date: 21/12/2016
 Scale: 1:20,000 @ A4



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| Legend | | |
|----------------|------------|------------|
| Structure | Tree | Tree Group |
| ★ 0 - Low | ● Low | ■ Low |
| ★ 1 - Moderate | ● Moderate | ■ Moderate |

Project: 160019 EFDS - Potential Bat Roost Mapping
 Drawing No.:160019/BAT03
 Drawn: RN Approved: PS
 Date: 21/12/2016
 Scale: 1:5,000 @ A4

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cawley

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 Rock Road,
 Blackrock,
 Co. Dublin



| Legend | | |
|----------------|------------|------------|
| Structure | Tree | Tree Group |
| ★ 0 - Low | ● Low | ■ Low |
| ★ 1 - Moderate | ● Moderate | ■ Moderate |

Project: 160019 EFDS - Potential Bat Roost Mapping
 Drawing No.:160019/BAT04
 Drawn: RN Approved: PS
 Date: 21/12/2016
 Scale: 1:5,000 @ A4

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Legend

| Structure | Tree | Tree Group |
|----------------|------------|------------|
| ★ 0 - Low | ● Low | ■ Low |
| ★ 1 - Moderate | ● Moderate | ■ Moderate |

Project: 160019 EFDS - Potential Bat Roost Mapping
 Drawing No.:160019/BAT05
 Drawn: RN Approved: PS
 Date: 21/12/2016
 Scale: 1:5,000 @ A4

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| Legend | | |
|----------------|------------|------------|
| Structure | Tree | Tree Group |
| ★ 0 - Low | ● Low | ■ Low |
| ★ 1 - Moderate | ● Moderate | ■ Moderate |

Project: 160019 EFDS - Potential Bat Roost Mapping
 Drawing No.:160019/BAT06
 Drawn: RN Approved: PS
 Date: 21/12/2016
 Scale: 1:5,000 @ A4

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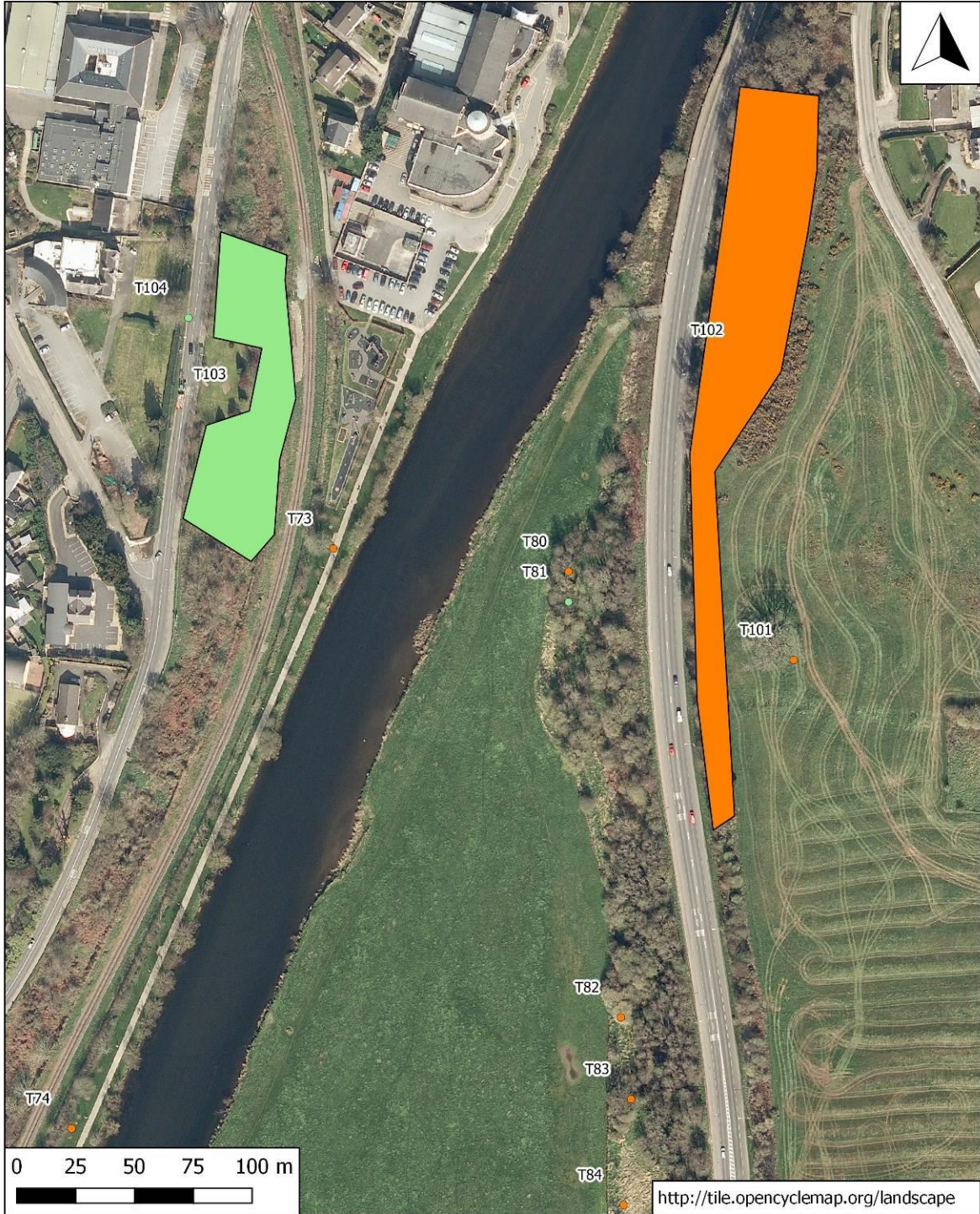
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| Legend | | |
|----------------|------------|------------|
| Structure | Tree | Tree Group |
| ★ 0 - Low | ● Low | ■ Low |
| ★ 1 - Moderate | ● Moderate | ■ Moderate |

Project: 160019 EFDS - Potential Bat Roost Mapping
 Drawing No.:160019/BAT07
 Drawn: RN Approved: PS
 Date: 21/12/2016
 Scale: 1:5,000 @ A4


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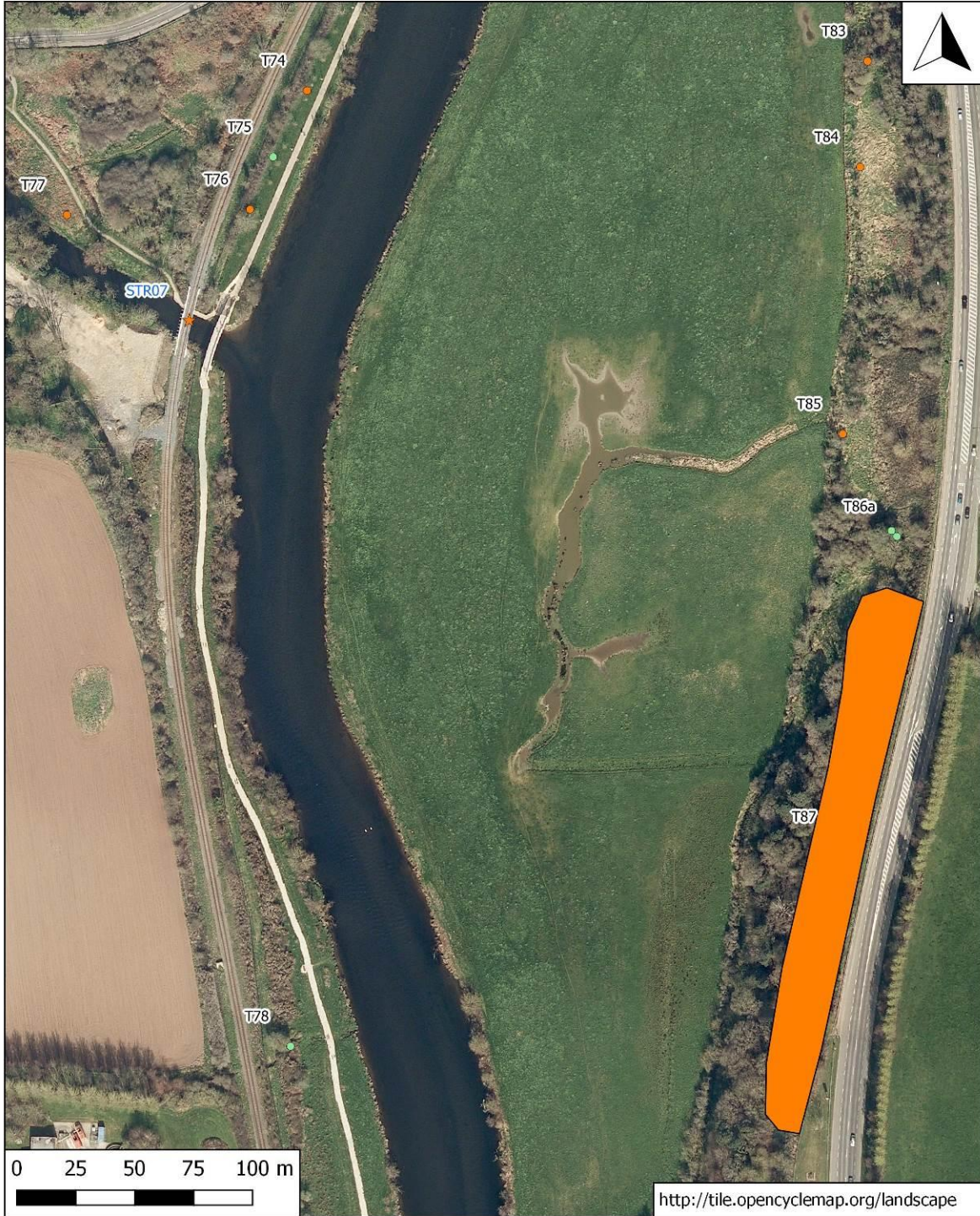


| Legend | | |
|----------------|------------|------------|
| Structure | Tree | Tree Group |
| ★ 0 - Low | ● Low | ■ Low |
| ★ 1 - Moderate | ● Moderate | ■ Moderate |

Project: 160019 EFDS - Potential Bat Roost Mapping
 Drawing No.:160019/BAT08
 Drawn: RN Approved: PS
 Date: 21/12/2016
 Scale: 1:5,000 @ A4

Scott Cawley,
 College House,
 Rock Road,
 Blackrock,
 Co. Dublin





| Legend | | |
|----------------|------------|------------|
| Structure | Tree | Tree Group |
| ★ 0 - Low | ● Low | ■ Low |
| ★ 1 - Moderate | ● Moderate | ■ Moderate |

Project: 160019 EFDS - Potential Bat Roost Mapping
 Drawing No.:160019/BAT09
 Drawn: RN Approved: PS
 Date: 21/12/2016
 Scale: 1:5,000 @ A4

scott
cawley

Scott Cawley,
 College House,
 Rock Road,
 Blackrock,
 Co. Dublin



| Legend | | |
|----------------|------------|------------|
| Structure | Tree | Tree Group |
| ★ 0 - Low | ● Low | ■ Low |
| ★ 1 - Moderate | ● Moderate | ■ Moderate |

Project: 160019 EFDS - Potential Bat Roost Mapping
 Drawing No.:160019/BAT10
 Drawn: RN Approved: PS
 Date: 21/12/2016
 Scale: 1:5,000 @ A4

scott
cawley

Scott Cawley,
 College House,
 Rock Road,
 Blackrock,
 Co. Dublin



<http://tile.opencyclemap.org/landscape>

Legend

| Structure | Tree | Tree Group |
|----------------|------------|------------|
| ★ 0 - Low | ● Low | ■ Low |
| ★ 1 - Moderate | ● Moderate | ■ Moderate |

Project: 160019 EFDS - Potential Bat Roost Mapping
 Drawing No.:160019/BAT11
 Drawn: RN Approved: PS
 Date: 21/12/2016
 Scale: 1:5,000 @ A4

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 Rock Road,
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 Co. Dublin



APPENDIX B: Bat Activity – Results Table

| TABLE B1 – Mobile Bat Activity Survey Results within the Survey Area in 2016 | | | |
|---|--|---|---|
| Survey 1 | | | |
| Date: 4th & 5th of May | | Survey Times: | |
| | | Dusk 20:45 – 22:45 | |
| | | Dawn 04:15 – 06:00 | |
| Time | Species | Activity | General Location |
| Surveyor: RN – on Eastern Side of River | | | |
| 21:40 | Soprano Pipistrelle Bat | Foraging ¹² along river and over grassland. | Northern floodplain on East side of River Slaney. |
| 21:41 | <i>Myotis</i> species | Foraging along tree-lined drainage ditch. | Northern floodplain on East side of River Slaney. |
| 21:45 | Soprano Pipistrelle Bat | Foraging along tree-lined drainage ditch. | Northern floodplain on East side of River Slaney. |
| 21:55 | Soprano Pipistrelle Bat and Leisler's Bat | Foraging within grassland and along hedgerows. | Northern floodplain on East side of River Slaney. |
| 22:10 | Soprano Pipistrelle Bat | Foraging over grassland and alongside woodland. | Southern floodplain on East site of River Slaney. |
| 22:12 | Daubenton's Bat | Foraging c. 30cm over River Slaney alongside Southern Floodplain. | Southern floodplain on East site of River Slaney. |
| 04:30 | <i>Myotis</i> species | Foraging above River Slaney | Adjacent to northern floodplain. |
| 04:45 | Unidentified Pipistrelle Bat | Foraging along tree-lined drainage ditch | Northern floodplain on East side of River Slaney. |
| 04:48 | Two unidentified Pipistrelle Bats | Foraging along tree-lined drainage ditch | Northern floodplain on East side of River Slaney. |
| 05:15 | Soprano Pipistrelle Bat | Foraging in front of North side of Old Bridge | Old bridge Enniscorthy. |
| 05:30 | Unidentified Pipistrelle Bat | Commuting along river in a Southerly direction and then flew West. | South of railway bridge crossing over the River Slaney. |
| 05:35 | Unidentified Pipistrelle Bat | Commuting along river in a Southerly direction | Between railway bridge and Seamus Rafter bridge. |
| Date: 4th & 5th of May | | Survey Times: | |
| | | Dusk 20:45 – 22:45 | |
| | | Dawn 04:15 – 06:00 | |
| Time | Species | Activity | General Location |
| Surveyor: KB – On Western side of River | | | |
| 21:19 – 21:27 | Soprano Pipistrelle Bat Common Pipistrelle Bat And Unidentified Pipistrelle Bat | A number of bats foraging within woodland (c. 5 No.) and along hedgerow (1 - 2 No.) | North-western woodland and hedgerow adjacent |
| 21:34 | <i>Myotis</i> species | Foraging on river | Near small island in North of Survey Area |
| 21:56 | Unidentified Pipistrelle Bat | Foraging along riverbank and treeline (1 – 2 No.) | At mature planted trees to north of Riverside Hotel |

¹² Foraging was distinguished from commuting behaviour by noting feeding buzzes and/or the flight behaviour/pattern of the bat being recorded.

| | | | |
|--|--|--|--|
| 22:00 | Soprano Pipistrelle Bat | Foraging along riverbank | Adjacent to Riverside Hotel |
| 22:05 – 22:06 | Soprano Pipistrelle Bat | Foraging along riverbank and treeline (3 No.) | Adjacent to playground |
| 22:14 – 22:15 | Unidentified Pipistrelle Bat And <i>Myotis</i> Species | Pipistrelle foraging along treeline And <i>Myotis</i> foraging over river | South of Playground on Western side of River Slaney |
| 22:16 – 22:18 | <i>Myotis</i> Species | <i>Myotis</i> foraging over river | Alongside western pedestrian footpath walk |
| 22:24 | Unidentified Pipistrelle Bat And <i>Myotis</i> Species | Pipistrelle foraging along treeline/hedgerow And <i>Myotis</i> foraging over river | North of pedestrian footbridge |
| 22:29 | Unidentified Pipistrelle Bat | Foraging within trees and scrub | Urrin inflow |
| 04:13 | Unidentified Pipistrelle Bat | Foraging over river | Along River Slaney c.100m South of Pedestrian Footbridge |
| 04:18 | <i>Myotis</i> species | Foraging beside riverbank | On River Slaney in South-west of Survey Area (opposite hospital on eastern side) |
| 04:25 | <i>Myotis</i> species | Foraging beside riverbank | On River Slaney in South-west of Survey Area (beside wet grassland) |
| 04:30 | <i>Myotis</i> species | Foraging beside riverbank | On River Slaney in South-west of Survey Area (beside wet grassland) |
| 04:31 – 04:32 | Soprano Pipistrelle Bat | Foraging along treeline and scrub | Wet grassland in South-west of Survey Area adjacent to railway line |
| 04:35 | <i>Myotis</i> species | Foraging along river beside scrub area | South-west of Survey Area adjacent to railway line |
| 04:42 – 04:56 | Soprano Pipistrelle Bat and Common Pipistrelle Bat | Foraging along wet grassland area | South-west of Survey Area adjacent to railway line (opposite Quarry on eastern side) |
| 05:20 | <i>Myotis</i> species (likely Daubenton's bat) | Foraging close to surface of river | South of pedestrian footbridge in South-west of Survey Area |
| Survey 2 | | | |
| Date: 09.06.2016 | | Survey Times: | |
| | | Dusk 21:30 – 23:55 | |
| | | Dawn 03:30 – 05:03 | |
| Time | Species | Activity | General Location |
| Surveyor: CK – On Western side of River | | | |
| 22:21 | Soprano Pipistrelle Bat | Commuting north of old bridge near river | Old bridge Enniscorthy |
| 22:22 – 22:23 | Common Pipistrelle Bat | Commuting north of old bridge near river | Old bridge Enniscorthy |

| | | | |
|------------------|-----------------------------------|--|---|
| 22:25 – 22:40 | Common Pipistrelle Bat | Commuting north of old bridge near river | Old bridge Enniscorthy |
| 22:45 | Unidentified Pipistrelle Bat | Commuting | South of Seamus Rafter Bridge |
| 22:49 | Soprano Pipistrelle Bat | Commuting | North of Riverside Hotel |
| 22:57 | Soprano Pipistrelle Bat | Commuting | Amenity area on western side of River Slaney in the vicinity of future bridge location. |
| 23:01 | Soprano Pipistrelle Bat | Commuting | Beside railway overbridge in South West of Survey Area. |
| 23:05 | Leisler's Bat | Foraging | Along south and east sides of Riverside hotel car park. |
| 23:08 – 23:09 | Common Pipistrelle Bat | Foraging | Along Riverside footpath beside Railway line |
| 23:11 | Common Pipistrelle Bat | Foraging | North of Pedestrian Footbridge |
| 23:12 | Leisler's Bat | Commuting | Over river in South of Survey Area |
| 23:13 | Common Pipistrelle Bat | Commuting | Over river in South of Survey Area |
| 23:15 | Leisler's Bat | Commuting | Over river in South of Survey Area |
| 23:15 – 23:17 | <i>Myotis</i> species | Foraging | On River Slaney in South of Survey Area |
| 23:17 | Common Pipistrelle Bat | Foraging | In vicinity of pedestrian footbridge |
| 23:17 - 23:28 | Pipistrelle Bats and Leisler Bats | Foraging | Along pedestrian footpath on western side of river |
| 23:28 | Leisler's Bat | Commuting | Adjacent to hotel |
| 23:43 | Common Pipistrelle Bat | Foraging | Adjacent to Seamus Rafter Bridge |
| 23:43 | Soprano Pipistrelle Bat | Foraging | Adjacent to Seamus Rafter Bridge |
| 03:34 | Soprano Pipistrelle Bat | Foraging | South of Riverside Hotel |
| 03:36 | Leisler's bat | Commuting | South of Riverside Hotel |
| 03:38 | Common Pipistrelle Bat | Commuting | South of Riverside Hotel |
| 03:40 | Unidentified Pipistrelle Bat | Commuting | South of Riverside Hotel |
| 03:40 | Soprano Pipistrelle Bat | Commuting | South of Riverside Hotel |
| 03:47 | Soprano Pipistrelle Bat | Commuting | South of pedestrian footbridge |
| 03:48 | Leisler's Bat | Commuting | South of pedestrian footbridge |
| 03:54 | Unidentified Pipistrelle Bat | Commuting | South of pedestrian footbridge |
| 03:58 | Unidentified Pipistrelle Bat | Commuting | South of pedestrian footbridge |
| 03:59 | Common Pipistrelle Bat | Commuting | At pedestrian footbridge |
| 04:00 | Soprano Pipistrelle Bat | Commuting | North of pedestrian footbridge |
| 04:03 | Unidentified Pipistrelle Bat | Commuting | South of Riverside Hotel |
| 04:07 | Unidentified Pipistrelle Bat | Commuting | Within playground towards hedgerow. |
| 04:09 | Soprano Pipistrelle Bat | Foraging | Hotel Car Park |
| 04:11 | Soprano Pipistrelle Bat | Foraging | Adjacent to front of Riverside Hotel |
| 04:13 | Soprano Pipistrelle Bat | Foraging | North of Riverside Hotel |
| 04:14 | Unidentified Pipistrelle Bat | Commuting | In front of Sheehan's DIY shop |
| 04:19 – 04:26 | Soprano Pipistrelle Bat | Foraging beside bridge. | South side of Seamus Rafter Bridge |
| 04:26 | Soprano Pipistrelle Bat | Noted flying in from east to forage along river. | South side of Seamus Rafter Bridge |
| 04:29 | Leisler's Bat | Foraging | South side of Seamus Rafter Bridge |
| 04:36 | Leisler's Bat | Foraging | North side of Seamus Rafter Bridge |

| Time | Species | Activity | General Location |
|---|---|---|--|
| Surveyor: RN – On southern Side of River | | | |
| 22:55 – 23:00 | Myotis sp. | Foraging over river Slaney | Above River Slaney adjacent to northern floodplain |
| 23:02 – 23:06 | Leisler's Bat | Foraging | Northern end of northern floodplain (on the East Side of River Slaney) |
| 23:08 – 23:09 | Common Pipistrelle Bat | Foraging over grassland | Northern end of northern floodplain (on the East Side of River Slaney) |
| 23:10 | Soprano Pipistrelle Bat | Foraging over grassland and along tree-lined ditch | At northern end of ditch on northern floodplain (on the East Side of River Slaney) |
| 23:11 | Unidentified Pipistrelle Bat | Foraging over grassland and along tree-lined ditch | Along ditch on northern floodplain (on the East Side of River Slaney) |
| 23:17 | Soprano Pipistrelle Bat | Foraging over grassland and along tree-lined ditch | Along ditch on northern floodplain (on the East Side of River Slaney) |
| 23:23 | Unidentified Pipistrelle Bat | Foraging over grassland and along tree-lined ditch | Along ditch on northern floodplain (on the East Side of River Slaney) |
| 23:35 | Unidentified Pipistrelle Bat | Foraging over grassland | On northern end of southern Floodplain (on the East Side of River Slaney) |
| 23:45 | Leisler's Bat | Commuting overhead | Centre of southern floodplain beside River Slaney (on the East Side of River Slaney) |
| 23:45 – 23:52 | Unidentified Bat (Likely <i>Myotis</i> sp.) | Foraging over River Slaney | Adjacent to southern floodplain (on the East Side of River Slaney) |
| 00:03 | Common Pipistrelle Bat | Foraging along main road | Adjacent to southern foodplain (on the East Side of River Slaney) |
| 00:06 | Unidentified Pipistrelle Bat | Foraging along main road | Adjacent to southern floodplain (on the East Side of River Slaney) |
| 03:44 – 03:46 | Common pipistrelle Bat | Foraging over grassland and along tree-lined ditch | Along ditch on northern floodplain (on the East Side of River Slaney) |
| 03:50 | Soprano Pipistrelle Bat | Foraging over grassland and along tree-lined ditch | Along ditch on northern floodplain (on the East Side of River Slaney) |
| 03:53 | Unidentified Pipistrelle Bat | Foraging over grassland and along tree-lined ditch | Along ditch on northern floodplain (on the East Side of River Slaney) |
| 03:53 | Soprano Pipistrelle Bat | Foraging over grassland and along tree-lined ditch | Along ditch on northern floodplain (on the East Side of River Slaney) |
| 03:54 – 03:57 | Unidentified Bat (Likely <i>Myotis</i> sp.) | Foraging over river Slaney | Above River Slaney adjacent to northern floodplain |
| 03:57 – 03:58 | Soprano Pipistrelle Bat | Foraging over grassland and along tree-lined ditch | Along ditch on northern floodplain (on the East Side of River Slaney) |
| 04:00 | Soprano Pipistrelle Bat | Foraging over grassland and along tree-lined ditch | Along ditch on northern floodplain (on the East Side of River Slaney) |
| 04:00 – 04:02 | Unidentified Pipistrelle Bat | Foraging over grassland and along tree-lined ditch | Along ditch on northern floodplain (on the East Side of River Slaney) |
| 04:13 – 04:15 | Soprano Pipistrelle Bat | Foraging at Old Bridge | At old bridge in Enniscorthy |
| 04:17 | Common pipistrelle Bat | Foraging at Old Bridge | At old bridge in Enniscorthy |
| 04:31 | Leisler's Bat | Commuting – Not Seen | At old bridge in Enniscorthy |
| Date: 28.09.2016 | | Survey Times: Extended Dusk Survey from 19:00 – 22:00 | |
| Surveyor: Paul Scott | | Location: Eastern side of N11 and North of Southern Floodplain (Eastern Bridge Location) | |
| Time | Species | Activity | General Location |
| 19:19 | Unidentified Pipistrelle Bat | Foraging | Old Sessile Oak Woodland |
| 20:20 | Unidentified <i>Myotis</i> species | Foraging/Commuting | Within south of Old Sessile Oak Woodland on eastern side of proposed bridge |
| 20:28 | Soprano Pipistrelle Bat | - | As above |
| 20:39 | Soprano Pipistrelle Bat | - | As above |
| 20:41 | Soprano Pipistrelle Bat | - | As above |
| 20:45 | Soprano Pipistrelle Bat | - | As above |
| 20:58 – | Soprano Pipistrelle Bat | Foraging (and social calls) | As above |

| | | | |
|--|---|--|---|
| 21:01 | | | |
| 21:23 | Soprano Pipistrelle Bat | Foraging | Treeline and Mature lone standing Oak tree at proposed roundabout location. |
| 21:32 | Soprano Pipistrelle Bat | Foraging | Within Old Sessile Oak Woodland on Eastern side of N11 road. |
| 21:47 - 21:52 | Soprano Pipistrelle Bat | Foraging | Immediately adjacent to Alluvial Woodland on northern end of southern floodplain |
| 21:53 | Soprano Pipistrelle Bat | Foraging | Immediately adjacent to Alluvial Woodland on northern end of southern floodplain |
| 21:53 - 21:54 | Soprano Pipistrelle Bat | Foraging | Immediately adjacent to Alluvial Woodland on northern end of southern floodplain |
| 21:55 | Common pipistrelle Bat | Foraging/Commuting | At northern end of Southern floodplain and immediately adjacent to Alluvial Woodland |
| 21:58 | Soprano Pipistrelle Bat | Commuting | Over River Slaney in vicinity of Proposed Bridge location |
| 22:00 | <i>Myotis species (Likely Myotis Daubentonii)</i> | Foraging | On River Slaney in vicinity of Proposed Bridge location |
| Date: 28.09.2016 | | | |
| Surveyor: Roisin NigFhloinn | | Survey Times: Extended Dusk Survey from 19:00 – 22:00 | |
| Location: Western side of River Slaney and Railway Line (Western Bridge Location) | | | |
| Time | Species | Activity | General Location |
| 19:23 - 19:24 | Soprano Pipistrelle Bat | Foraging | Within mixed planted woodland to South of amenity area (seating area where proposed western bridge round about shall be located) |
| 19:44 | Common pipistrelle Bat | Commuting | Over proposed western bridge round location |
| 19:50 | Common pipistrelle Bat | Foraging | Within mixed planted woodland to South of amenity area (seating area where proposed western bridge round about shall be located) |
| 19:50 | Soprano Pipistrelle Bat | Foraging (and social calls) | Within mixed planted woodland to South of amenity area (seating area where proposed western bridge round about shall be located) |
| 19:50 | Common pipistrelle Bat And Soprano Pipistrelle Bat | Foraging at the same time | Within mixed planted woodland to South of amenity area (seating area where proposed western bridge round about shall be located) |
| 19:51 - 19:52 | Soprano Pipistrelle Bat | Foraging | Within mixed planted woodland to South of amenity area (seating area where proposed western bridge round about shall be located) |
| 19:52 | Soprano Pipistrelle Bat | Foraging | Within an open area of scrub beside the mixed woodland South of amenity area (seating area where proposed western bridge round about shall be located) |
| 19:53 | Unidentified Pipistrelle Bat | Foraging | Within an open area of scrub beside the mixed woodland South of amenity area (seating area where proposed western bridge round about shall be located) |
| 19:55 | Two Unidentified Pipistrelle bats (Possibly one Common and one Soprano) | Foraging (and social calls) | Within an open area of scrub beside the mixed woodland South of amenity area (seating area where proposed western bridge round about shall be located) |
| 19:55 - 19:56 | Soprano Pipistrelle Bat | Foraging | Adjacent to mixed planted woodland to South of amenity area (seating area where proposed western bridge round about shall be located) |
| 20:16 | Common pipistrelle Bat | Foraging | Within National 1798 Rebellion Centre grounds and mixed planted woodland to North of amenity area (seating area where proposed western bridge round about shall be located) |
| 21:11 | Soprano Pipistrelle Bat | Foraging | Within National 1798 Rebellion Centre grounds and mixed planted woodland to North of amenity area (seating area where proposed western bridge round about shall be located) |
| 21:24 | Soprano Pipistrelle Bat | Foraging | Over railway line near proposed western bridge location |

APPENDIX C: Table of Static Bat Detector Survey Results

Static Bat Detector Surveys

In order to supplement the data collected from the mobile transects, Scott Cawley deployed static bat detectors within the Survey Area on a three occasions (full details can be seen in the table below). The results of this are as follows:

| TABLE C1 – STATIC BAT DETECTOR SURVEY RESULTS | | | | |
|---|--|---|---|--|
| Type of Recorder | Location | Dates of recording | Species (passes recorded during period) | Additional Notes |
| S01 SMZC | S 97452 40751 Within mature treeline on edge of woodland in North-west of Survey Area. | 04.05.2016 – 09.05.2016 (five nights data) | Leisler's Bat (77) | Earliest Leisler's Bat recorded at 21:04 on 04.05.2016 Latest Leisler's Bat recorded at 05:19 on 08.05.2016 |
| | | | Common Pipistrelle Bat (14) | Earliest Common Pipistrelle Bat recorded at 21:34 on 05.05.2016 Latest Common Pipistrelle Bat recorded at 04:31 on 06.05.2016 |
| | | | Soprano Pipistrelle Bat (39) | Earliest Soprano Pipistrelle Bat recorded at 21:19 on 04.05.2016 Latest Soprano Pipistrelle Bat recorded at 04:01 on 07.05.2016 |
| | | | Unidentified Pipistrelle Bat (47) | Earliest Unidentified Pipistrelle Bat recorded at 21:31 on 04.05.2016 Latest Unidentified Pipistrelle Bat recorded at 04:45 on 06.05.2016 |
| | | | <i>Myotis</i> species (15) | Earliest <i>Myotis</i> sp. recorded at 21:55 on 05.05.2016 Latest <i>Myotis</i> sp. recorded at 02:30 on 06.05.2016 |
| Type of Recorder | Location | Dates of recording | Species (passes recorded during period) | Additional Notes |
| S02 SMZC | S 97304 38419 Within mature treeline and scrub alongside the northern end of the Southern Floodplain beside the River Slaney (near alluvial woodland) | 04.05.2016 – 09.05.2016 (five nights data) | Leisler's Bat (50) | Earliest Leisler's Bat recorded at 21:54 on 05.05.2016 Latest Leisler's Bat recorded at 05:15 on 08.05.2016 |
| | | | Common Pipistrelle Bat (31) | Earliest Common Pipistrelle Bat recorded at 21:28 on 06.05.2016 Latest Common Pipistrelle Bat recorded at 05:12 on 08.05.2016 |
| | | | Soprano Pipistrelle Bat (134) | Earliest Soprano Pipistrelle Bat recorded at 21:27 on 06.05.2016 Latest Soprano Pipistrelle Bat recorded at 05:16 on 08.05.2016 |
| | | | Unidentified Pipistrelle Bat (238) | Earliest Unidentified Pipistrelle Bat recorded at 21:17 on 05.05.2016 Latest Unidentified Pipistrelle Bat recorded at 05:17 on 08.05.2016 |
| | | | <i>Myotis</i> species (14) | Earliest <i>Myotis</i> sp. recorded at 21:32 on 05.05.2016 Latest <i>Myotis</i> sp. recorded at 03:06 on 05.05.2016 |
| | | | Unidentified Bat | 07.05.2016 recorded at 23:24 |

| Type of Recorder | Location | Dates of recording | Species (passes recorded during period) | Additional Notes |
|-------------------|---|---|---|---|
| S03 Anabat Logger | S 97525 37435 Within area of woodland and scrub in south east (c. 1km south of Scheme area). | 04.05.2016 – 09.05.2016 (five nights data) | Leisler's Bat (5) | Earliest Leisler's Bat recorded at 21:12 on 06.05.2016 Latest Leisler's Bat recorded at 22:34 on 06.05.2016 |
| | | | Common Pipistrelle Bat (6) | Earliest Common Pipistrelle Bat recorded at 21:51 on 06.05.2016 Latest Common Pipistrelle Bat recorded at 23:30 on 07.05.2016 |
| | | | Soprano Pipistrelle Bat (212) | Earliest Soprano Pipistrelle Bat recorded at 21:23 on 07.05.2016 Latest Soprano Pipistrelle Bat recorded at 05:28 on 05.05.2016 |
| | | | Unidentified Pipistrelle Bat (1668) | Earliest Unidentified Pipistrelle Bat recorded at 21:18 on 04.05.2016 Latest Unidentified Pipistrelle Bat recorded at 05:35 on 05.05.2016 |
| Type of Recorder | Location | Dates of recording | Species (passes recorded during period) | Additional Notes |
| S04 SMZC | S 97427 39219 Within Alluvial Woodland at proposed bridge location. | 9 & 10 th of June 2016 (one nights data) | Leisler's Bat (8) | Earliest Leisler's Bat recorded at 23:28 on 09.06.2016 Latest Leisler's Bat recorded at 2:59 on 10.06.2016 |
| | | | Common Pipistrelle Bat (1) | One Common Pipistrelle Bat recorded at 22:20 |
| | | | Soprano Pipistrelle Bat (48) | Earliest Soprano Pipistrelle Bat recorded at 22:06 on 09.06.2016 Latest Soprano Pipistrelle Bat recorded at 04:19 on 10.06.2016 |
| | | | Unidentified Pipistrelle Bat (10) | Unidentified Pipistrelle Bat recorded at 22:19 on 09.06.2016 Latest Unidentified Pipistrelle Bat recorded at 04:18 on 10.06.2016 |
| Type of Recorder | Location | Dates of recording | Species (passes recorded during period) | Additional Notes |
| S05 SMZC | S 97472 39240 Old Sessile Oak Woodland on Eastern side of N11 (near proposed bridge abutment). | 03.08.2016 – 12.08.2016 (Nine nights data) | Leisler's Bat (164) | Earliest Leisler's Bat recorded at 21:26 on 10.08.2016 Latest Leisler's Bat recorded at 05:13 on 12.08.2016 |
| | | | Common Pipistrelle Bat (84) | Earliest Common Pipistrelle Bat recorded at 22:12 on 11.08.2016 Latest Common Pipistrelle Bat recorded at 05:03 on 12.08.2016 |
| | | | Soprano Pipistrelle Bat (69) | Earliest Soprano Pipistrelle Bat recorded at 21:49 on 05.08.2016 Latest Soprano Pipistrelle Bat recorded at 05:18 on 09.08.2016 |
| | | | Unidentified <i>Pipistrelle</i> Bat (538) | Unidentified <i>Pipistrelle</i> Bat recorded at 21:13 on 08.08.2016 Latest Unidentified <i>Pipistrelle</i> Bat recorded at 05:26 on 11.08.2016 |
| | | | <i>Myotis</i> species (5) | Earliest <i>Myotis</i> sp. recorded at 22:00 on 06.08.2016 Latest <i>Myotis</i> sp. recorded at 04:38 on 07.08.2016 |
| | | | Unidentified Bat (24) | Earliest Unidentified bat recorded at 22:25 on 05.08.2016 |

| Type of Recorder | Location | Dates of recording | Species (passes recorded during period) | Additional Notes |
|------------------|--|---|--|--|
| S06 SMZC | S 97276 39284 Within mixed deciduous planted woodland on western side of playground and railway line (East of St Johns Road) near proposed bridge abutment. | 03.08.2016 – 12.08.2016 (Nine nights data) | Leisler's Bat (195) | Latest Unidentified bat recorded at 04:17 on 12.08.2016 Earliest Leisler's Bat recorded at 21:38 on 5.08.2016 Latest Leisler's Bat recorded at 05:07 on 10.08.2016 |
| | | | Common Pipistrelle Bat (25) | Earliest Common Pipistrelle Bat recorded at 22:10 on 7.08.2016 Latest Common Pipistrelle Bat recorded at 03:38 on 8.08.2016 |
| | | | Soprano Pipistrelle Bat (10) | Earliest Soprano Pipistrelle Bat recorded at 23:18 on 04.08.2016 Latest Soprano Pipistrelle Bat recorded at 05:20 on 10.08.2016 |
| | | | Unidentified <i>Pipistrelle</i> Bat (82) | Unidentified <i>Pipistrelle</i> Bat recorded at 21:20 on 09.08.2016 Latest Unidentified <i>Pipistrelle</i> Bat recorded at 05:15 on 5.08.2016 |
| | | | Unidentified Bat (7) | Earliest Unidentified bat recorded at 22:09 on 06.08.2016 Latest Unidentified bat recorded at 04:02 on 7.08.2016 |

APPENDIX D: Bat Conservation Ireland (BCI) Bat Roost Records

BCI Bat Roosts recorded within 10km Buffer of proposed Scheme Survey Area (source: BCI Database)

10km searches were carried out using the following National Grid References:

- S 97311 40598 the north of the Survey Area;
- S 97313 39610 the centre of the Survey Area;
- S 97221 38666 the south of the Survey Area; and,
- S 97221 38666 the south of the Survey Area.

| Address | Species observed |
|---|--|
| Enniscorthy; County Wexford | <i>Myotis mystacinus</i> (Whiskered bat) |
| Ballyeden; Davidstown, Co Wexford | <i>Myotis mystacinus</i> |
| Enniscorthy; County Wexford | <i>Myotis spp.</i> |
| Milehouse; Enniscorthy; County Wexford | <i>Pipistrellus pipistrellus</i> (45kHz) (Common Pipistrelle Bat) |
| Solsborough; Enniscorthy; County Wexford | <i>Myotis spp.</i> ; <i>Pipistrellus spp.</i> (45kHz/55kHz) |
| Enniscorthy; County Wexford | <i>Myotis spp.</i> ; Unidentified bat |
| Aherlow; County Tipperary | <i>Pipistrellus pipistrellus</i> (45kHz) |
| Parnell Road; Enniscorthy; County Wexford | <i>Pipistrellus pipistrellus</i> (45kHz) |
| Ferns; County Wexford | <i>Pipistrellus pygmaeus</i> (Soprano Pipistrelle bat) |
| Enniscorthy; County Wexford | <i>Pipistrellus pygmaeus</i> |
| Ferns; County Wexford | <i>Pipistrellus pygmaeus</i> |
| The Old Deanery; Ferns; Co. Wexford | <i>Pipistrellus pygmaeus</i> |
| Enniscorthy; County Wexford | <i>Pipistrellus spp.</i> (45kHz/55kHz) (<i>Pipistrelle bat sp.</i>); <i>Plecotus auritus</i> |
| Solsborough; Enniscorthy; County Wexford | <i>Plecotus auritus</i> (Brown Long-eared bat) |
| Enniscorthy; County Wexford | <i>Pipistrellus spp.</i> (45kHz/55kHz); <i>Plecotus auritus</i> |
| Solsborough; Enniscorthy; Co. Wexford | <i>Pipistrellus spp.</i> (45kHz/55kHz); <i>Plecotus auritus</i> ; Unidentified bat |
| County Wexford | <i>Plecotus auritus</i> |
| County Wexford | Unidentified bat |
| Parnell Road; Enniscorthy; County Wexford | Unidentified bat |

Please Note: Three Brown Long-eared bat roosts were surveyed in Wexford in 2012 as part of the Brown Long-eared Bat Roost Monitoring Scheme by BCI (<http://www.batconservationireland.org/what-we-do/monitoring-distribution-projects/brown-long-eared-bat-roost-monitoring>).