

A Bat, Badger and Otter Assessment of Lands Proposed for Development Enniscorthy, Co. Wexford and An Examination of the Winter Bird Fauna

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Introduction

Most of Ireland's mammals enjoy protection under the Wildlife Act (1976) and the more recent updating of this legislation (Wildlife (Amendment) Act 2000, S.I. No. 94 of 1997, S.I. No. 378 of 2005, European Communities (Natural Habitats) (Amendment) Regulations, 2005) and consolidated by S.I. No. 477 of 2011 European Communities (Birds and Natural Habitats) Regulations 2011. In conjunction with the enactment of the Habitats Directive into Irish legislation, all native mustelid species and bat species are protected with further protection given to otters and lesser horseshoe bats.

Determining the mammal fauna of an area may involve a high level of assessment if the aim of the survey is to catalogue all mammals but this is too detailed for the aim of creating mitigation for a proposed construction project. This assessment is specific to the presence of ground mammals and bats within lands proposed for the construction of a housing project along the and all associated structures and surfaces. The survey undertaken within the site allows a targeting of mitigation measures to the appropriate or most efficient sites to prevent accidental death or injury and to determine if it would be possible to provide safe passage across long-established routes through a new development.

Fieldwork for the current report on badger and bat distribution was carried out by Brian Keeley, an ecologist with over a quarter of a century of fieldwork experience.

This report addresses the main issues that would affect the mammal fauna of the immediate area considered in this assessment and created by construction and the presence of new buildings and increased human activity.

Construction activities and subsequent occupancy of housing and the associated new lanes, tracks or roads close to a riverbank may create a number of significant short-term and long-term risks for resident badger, otter and bat population, in addition to impacts upon other vertebrates and invertebrates. The construction of housing or other properties may involve the removal of key features of the surrounding environment and of the habitats of otters, badgers, bats and other mammal species, such as trees, hedgerow lines and open spaces / pasture in which to feed.

The most damaging operation is the potential for the destruction of otter (holts) or badger dwellings (setts) during the vegetation clearance and early earthworks and of the accidental injury to bats within trees or buildings upon the site, were they to be present.

In relation to badgers, the clearance of hedgerow and treelines poses the risk of the removal of the badgers' home burrow and the associated burrows (all of which are known as setts) that are used seasonally or occasionally throughout the year. In winter, this is especially risky if the sett is not identified before hedgerow removal operations, as this is the time when badger cubs are born. In the classification used in this report, setts are considered to fall into four categories, which are best elaborated by long-term studies but can be interpreted to a relatively good accuracy in terms of status based on basic observations.

Using the most traditional description of badger ecology, the basic sett type within which badgers are typically present throughout the year is the main sett. This is almost always the sett within which cubs are born. Bedding outside the entrance to these setts often identifies their use as such and paw prints and dung pits or latrines nearby also assist in their categorisation. There are typically several entrances to a main sett, some of which may be disused. Paths leading from the main sett are often very easy to trace for some distance.

Annexe setts are similar in construction to main setts and are typically accessed by several entrances. They are often discernibly connected to a main sett by well-worn paths, which is within 150 metres of the annexe sett. Badgers do not necessarily use this type of sett throughout the year and they may be inactive at the time of any short-term study.

Subsidiary setts are again not always active throughout the year. There may be several entrances to the sett and they are not clearly associated with any other sett.

The last type of sett, the outlier sett, may only have one entrance and has no path leading to it. This type of sett is only sporadically used and may even be in areas subject to flooding or seasonally unsuitable to badger use. These setts may be overlooked if they have remained inactive for several weeks and this may be true of such setts in early winter. This survey was undertaken in midwinter to avoid this possibility.

Setts may be under threat from construction if they lie directly in the line of a proposed building. Setts outside of this land take area may also be threatened with damage from the normal activities of the heavy plant equipment required to build the project. For example, if a badger sett entrance were located outside of the land take of a site but led to a system of tunnels that lay under the working area of the heavy plant, there is a clear risk that the tunnels would be crushed under the repeated movement of equipment.

These tunnels may occasionally go as deep as two metres underground but are also liable to surface to shallower depth to avoid rocky substrate or water. Thus, badger setts may be affected by the immediate impact upon them from the excavation and removal of the soil within which they are established or by the indirect destruction of tunnels that lie under the construction corridor of the road.

The population of badgers in Ireland has been revised downwards in recent years for several reasons. Areas where agriculture is of less intensity may provide safer conditions for badgers in terms of state control measures, but urban areas create a risk of interference that may be more persistent than in rural areas. Nonetheless, badgers survive in many areas close to human activities including farmland, gardens, along the rivers even in built-up areas or in the grounds of schools, colleges, convents etc.

For otters, the description of the dwelling places is less prescriptive, and the holts are often identified as either natal (breeding) holts or other. These may be within a riverbank, under tree roots, within old badger setts in drains or ditches close to the water or in some cases, a distance from any water. Otters have a higher level of protection than all other mammals with the exception of lesser horseshoe bats (not found in Wexford, although there is one record

of the greater horseshoe bat from 12 kilometres away from 2013 – this species is not a breeding species in Ireland).

In relation to bats, there is the potential of losses of commuting routes and feeding areas where construction greatly modifies the availability of insect prey, creates a barrier to movement or removes access to roost sites, rendering feeding sites too distant from any alternative roosts used.

In Wexford, the following bat species are commonly recorded: common and soprano pipistrelle, Leisler's bat, brown long-eared bat. The following species are widespread but less common than the above: Daubenton's bat, Natterer's bat. The next species are uncommon; whiskered bat and Nathusius' pipistrelle. There is one record of greater horseshoe bat from approximately 12 kilometres from Enniscorthy from February 2013.

In addition to mammals, the bird fauna of the site in winter was also examined in January 2021.

Methodology

Otters and Badgers

The survey for the presence of otters and badgers within the site was undertaken over two seasons: summer and winter. The summer assessment occurred over two consecutive days in June 2020 (15th and 16th June). The winter assessment was undertaken on 8th January 2021. The riverbank, open ground and hedgerow were all examined for evidence of any suitably large burrows, paw prints, dung pits, spraints or other evidence of these mustelids. All areas of the fields were also checked for badger evidence. In addition to this, the nearest bridges were examined for evidence of otters. In January 2021, the river was walked where water levels were sufficiently shallow wearing chest waders (in some stretches, the water level was high enough to prevent walking through the river).

Bats

A Songmeter Mini (referred to as Mini from this point forward) bat monitor was installed within the site on two sequential nights (15th and 16th June 2020) with a second Mini used on the 16th of June only. The Mini was placed at the small buildings within the site prior to dusk on 15th June 2020 and then re-located to a stand of willow towards the river by 23.00 hours

and finally moved to a mature free-standing oak at 04.00 hours up to sunrise. On the second survey date (16th June 2020), a Mini was positioned at an oak tree within hedgerow within the proposed development area while a second was positioned at a mature beech tree within the site and close to the riverbank.

The active bat survey was undertaken with an Echometer 3 heterodyne and time expansion ultrasonic detector (EM3) which is a handheld detector which has a screen for examining the received signals and a SD card for recording signals.

The survey involved a walked transect through the entire site, a riverside assessment, and a walk through the more exposed lands. Observations of the relative abundance of bats within the site was made visually with the assistance of the bat detector signals.

The site was again visited from 04.00 hours to 05.00 hours on the following mornings to assess for any evidence of bats returning to roosts within the trees or ruined buildings or immediately adjoining sites.

The two bridges close to the site were examined for evidence of roosting bats in June 2020 and January 2021.

Birds

The winter bird fauna of the site was assessed by a walked transect around all hedgerow, a walk along the river and observations within the open fields of the site using a Nikon Aculon 1- x 42 binoculars and an Opticron MM4 Travelscope. Any bird calls or birdsong noted was identified to species.

Survey constraints

The dates were ideal for bat surveys. However, heavy rain fell at sunset on the 16th of June 2020 but given a complete night of survey on 15th June to dawn 16th June and good bat activity prior to dawn on 17th June, sufficient data is available from the site. Bat activity was even noted during continuous rain on 16th June after sunset, but the handheld bat detector (EM3) became increasingly waterlogged and inoperable.

The June survey dates were outside of the optimal period for otters and badgers, but the site was surveyed again in January 2021. This may lead to overlooking of signs that are more

obvious once vegetation abates in winter when surveys are most effective. Access to the entire riverbank was possible on the second survey period when vegetation had died back significantly. There was sufficient clarity and access for otter holt and badger sett detection.

Bird activity was present throughout the winter assessment and the visit is representative of bird activity within the site.

Results of the assessment of the lands for otters, badgers and bats and winter birds.

Otters and Badgers

No otter holts were noted along the riverbank, within open ground or in the hedgerow. One partial spraint was discovered on a rock in the river and while this is considered to be an otter spraint, it is possible that this was a mink spraint as the size of the spraint fragment was very small. The spraint was dried and several days to weeks old and did not have a strong odour associated with it. Mink spraints are typically more pungent than otter spraints.

No otter prints were noted in mud or sand along the riverbank in June 2020 or January 2021. No otters or badgers were seen or heard during night-time survey work in June 2020.

There are no badger setts within the site. No badger signs were evident within the site.

Bats

Species of bat present within the site

Soprano pipistrelle *Pipistrellus pygmaeus*

A single soprano pipistrelle was seen to return to the upper branches of a mature oak that lies to the south of the access road into the housing development proposed within the site. This tree has very high roost potential and may serve as a roost site for other species on other occasions. It is noted that this would be a suitable tree for Leisler's bats amongst others.

Species of bat roosting in close proximity to the site

Common pipistrelle *Pipistrellus pipistrellus*

Soprano pipistrelle *Pipistrellus pygmaeus*

Leisler's bat *Nyctalus leisleri*

Three species of bat were seen to enter and depart the site at times that indicate nearby roost sites. Common pipistrelles were seen to enter the site from housing on the eastern edge of the site and leave at a similar location and are within a house or shed in this area (see Figure 1). The final bat seen on 17th June 2020, a Leisler's bat, flew almost directly north from the site from close to the southern edge at the river having fed around a beech tree within the site and over the pasture itself.

Species of bat feeding within the site with unknown roost location outside of the site.

Daubenton's bat *Myotis daubentonii*

This species was recorded by the static monitors feeding along the river on 16th June 2020. It was also recorded by the static monitor placed on the willow scrub edge on the night of 15th June 2020. Signals of the genus *Myotis* recorded were also most probably all Daubenton's bat signals.

There were no tree roosts within the trees that will be removed on 15th or 16th June 2020. One tree roost was noted in the oak tree that is free-standing close to the perimeter of the site. There are no building roosts within the site based on the activity survey and on an absence of any other bat signs on or around the buildings (e.g., droppings or staining).

Species of bat present within and around the site

Soprano pipistrelle *Pipistrellus pygmaeus*

Common pipistrelle *Pipistrellus pipistrellus*

Leisler's bat *Nyctalus leisleri*

Daubenton's bat *Myotis daubentonii*

The highest bat activity close to the river was soprano and common pipistrelles. Leisler's bat activity was highest over pasture, around the mature free-standing oak as well as around other mature trees including a beech tree close to the river.

Daubenton's bat activity was primarily along the river but some movement into the fields was recorded by the static monitor within the willow scrub.

Winter birds within and around the site January 2021

The following bird species were noted within the site:

Sparrowhawk	<i>Accipiter nisus</i>
Buzzard	<i>Buteo buteo</i>
Rook x 20	<i>Corvus frugilegus</i>
Hooded crow x 2	<i>Corvus cornix</i>
Magpie	<i>Pica pica</i>
Woodpigeon x 3	<i>Columba palumbus</i>
Cormorant	<i>Phalacrocorax carbo</i>
Blue tit	<i>Cyanistes caeruleus</i>
Wren	<i>Troglodytes troglodytes</i>
Chaffinch	<i>Fringilla coelebs</i>
Greenfinch	<i>Carduelis chloris</i>
Bullfinch	<i>Pyrrhula pyrrhula</i>
Goldfinch	<i>Carduelis carduelis</i>
Great tit	<i>Parus major</i>
Coal tit	<i>Periparus ater</i>
Robin	<i>Erithacus rubecula</i>
Blackbird x 10	<i>Turdus merula</i>
Mistle thrush	<i>Turdus viscivorus</i>
Pied wagtail	<i>Motacilla alba yarrellii</i>
House sparrow	<i>Passer domesticus</i>
Pheasant x 5	<i>Phasianus colchicus</i>
Snipe	<i>Gallinago gallinago</i>
Black headed gull	<i>Chroicocephalus ridibundus</i>
Herring gull	<i>Larus argentatus</i>
Goldcrest	<i>Regulus regulus</i>
Lapwing x 6 (flyover)	<i>Vanellus vanellus</i>
Redwing x 67	<i>Turdus iliacus</i>
Starling x 72	<i>Sturnus vulgaris</i>
Grey heron	<i>Ardea cinerea</i>
Duncock	<i>Prunella modularis</i>
Reed bunting (summer 2020)	<i>Emberiza schoeniclus</i>

A possible egret was noted briefly in neighbouring lands but there was insufficient view to confirm identification. The most probable identification was Little Egret (*Egretta garzetta*) with Great White Egret a lesser possibility (*Ardea alba*). Both of these species are Annex 1 under the Birds Directive (Directive 2009/147/EC of the European Parliament and of the Council of 30th November 2009 on the conservation of wild birds). If this were a cattle egret (*Bubulcus ibis*), this is not an Annex 1 species (both cattle egret and Great White Egret were noted in Wexford in January 2021).

<http://www.irishbirding.com/birds/web?task=BasicBirdSightingSearch&offset=50&countyid=31&orderby=latestfirst>).

The presence of one individual in neighbouring lands in the winter period does not indicate breeding of this species and there are limited suitable trees or associated habitat for this purpose.

Proposed Development

The proposed Strategic Housing Development will comprise a residential development of 233 no. units (53 no., 3-4 bed houses and 180 no. 1/2/3 bed duplexes/apartments).

Provision of a creche. Associated car parking, bicycle parking, and open spaces/landscaping.

Vehicular and pedestrian accesses provided via Carley's Bridge Road to the north west, pedestrian/cyclist access via Carley's Bridge Road to the north and Millbrook Residential Estate to the east of the site. All associated site works including boundary treatments, plant, bin stores, site services and connections to facilitate the development.

The Proposed site layout is available in Figure 3.

Potential Impacts from The Proposed Construction

Loss of bat roosts

While there were no bat roosts identified within the site, the presence of so many trees create some potential for roost sites. Overall, the trees are immature and roost sites, if present, are likely to harbour very small numbers of bats. This is currently considered a moderate to low negative impact of long-term duration.

Loss of commuting corridor

There will be a loss of vegetation from the site including the removal of hedgerow and some mature trees including a sizeable beech tree. This may affect commuting bats by removing cover that allows commuting in an unlit area along the field edges away from the river. Badgers and otters are not affected by this based on available signs within the fields in June 2020.

This is a permanent moderate negative impact for the local bat fauna with greater significance for populations roosting close to the site.

Loss of feeding area

As above, there will be an impact upon the feeding activity of bats from the loss of the trees within and around the site. This will reduce feeding for bats by reducing the shelter and substrate for invertebrates.

There is the no potential for interruption to feeding for otters as the scheme does not flank the river directly. This is a long-term to permanent moderate negative impact for bats.

Disturbance from lighting

Lighting can affect different species to varying degrees and within species there is also a range of responses to introduced light ranging from minimal effects to complete avoidance. Otters in urban areas can become very tolerant to light but in rural areas are typically in unlit areas. Bats may actively avoid lights especially if it is shining upon a roost site. In this instance, there would be one oak tree roost that could be illuminated unintentionally by the proposed housing and street lighting.

There is no evidence of sustained activity by otters and it is proposed that otters may avail of the river occasionally to commute and feed. This is a long-term to permanent moderate negative impact for bats and a short-term to medium-term slight negative impact for otters.

There is no evidence of badger activity, but it is probable that badgers enter the site at some point in the year to forage.

Cumulative impacts of the above

There is a loss of green area and of tree cover that will affect bats by reducing feeding and commuting areas. This is unlikely to have a direct impact on the status of any of these species, but it is contributory in a minor way to an overall diminution in habitat availability.

Proposed Mitigation

Lighting control

Lighting around the buildings should be tightly controlled and ornamental lighting should be avoided entirely. Lighting should respond to a motion trigger or be switched off at night after typical active hours (e.g., 11 pm to 6 am). Lighting should not spill on to the river. Spotlights must not be introduced as these are hugely disruptive to most wildlife and cannot be targeted to the required area but create light pollution over a huge radius.

Further recommendations on lighting are given below:

- Dark corridor for movement of bats through the site. Lighting should be directed downwards away from the treetops. All lighting has a zero-degree tilt. See Figure 4 for one proposed route of access for bats with low lighting.
- All luminaires shall lack UV elements when manufactured and shall be LED. Please see the CU Phosco specification sheet.
- It is recommended that a warm white spectrum (ideally <2700 Kelvin) shall be adopted to reduce blue light component (as the Wexford County Council specification colour must be 4000 K to 4400 K, this cannot be reduced to the most suitable temperature).
- Luminaires shall feature peak wavelengths higher than 550 nm (see Figure 4)
- Tree crowns shall remain unilluminated especially the free-standing oak to the south of the access road (southwest corner of the proposal)
- Planting shall provide areas of darkness suitable for bats and badgers to feed and commute through the site.

Planting of Insect Attracting Plants and Trees

Vegetation to provide food and shelter for wildlife should be encouraged. This may include the re-planting of some of the trees removed from hedgerow or trees such as alder, willow, birch which would tolerate wet conditions.

Plants such as *Lonicera periclymenum* (honeysuckle) are beneficial to moths and other nocturnal insects while *Hebe* are beneficial to daytime Lepidoptera and some night insects.

Bees would benefit from lavender, jasmine, rosemary, violets, thyme, blue bells, wisteria, cone flowers and sunflowers. The wider abundance of insects would benefit bats and badgers as well as improve biodiversity generally.

Retention of grassy areas and vegetation in preference to concrete pathways / stone gardens etc.

Consideration should be given to providing greater vegetation relative to paved or concreted areas wherever possible. This could include a system that allows grass paving, grass reinforcement or a grass grid. This allows rainwater to soak away as solid concrete can create greater run-off that could enter the river.

Provision of bat boxes

Bat boxes should be provided to compensate for the potential loss of roost sites from tree removal. 6 x 2F Schwegler bat boxes are proposed for erection along the river or alternatively the provision of access for bats to elements of buildings. All boxes shall be away from illumination.

Checking of buildings prior to demolition

The sheds and buildings shall be checked by a bat specialist prior to removal. If bats are present, a derogation shall be sought from NPWS and additional measures to mitigate the loss of a roost shall be implemented.

Checking of trees for bats

Following a tree assessment of the site, any trees with cavities shall be checked by a bat specialist prior to felling. If bats are present, a derogation shall be sought from NPWS and additional measures to mitigate the loss of a roost shall be implemented.

IMPACTS AFTER MITIGATION


There is the potential for less bat activity within the area where the grassland area and hedgerow cover are reduced by tree removal and lighting has increased. With control of illumination to prevent it spreading over the river, bats and otters will commute to and from the area.

Bats will avail of bat boxes or other modifications within the site to roost over a period of time once the siting, lighting and absence of disturbance is observed.

There is no impact determined for otters or badgers as there is no evidence of the presence of breeding or resting sites for these species. Otters feed along the river but were not noted to pass through the lands.



Figure 1: Enniscorthy bat assessment 15th June to 16th June 2020

The most likely common pipistrelle roost site is shown by a green box () in the north-eastern boundary area.

Legend

Blue paddle	Soprano pipistrelle	Green paddle	Common pipistrelle
Yellow paddle	Leisler's bat	"P" paddle	Pipistrelle (either common or soprano)
White box	Areas for static monitors		



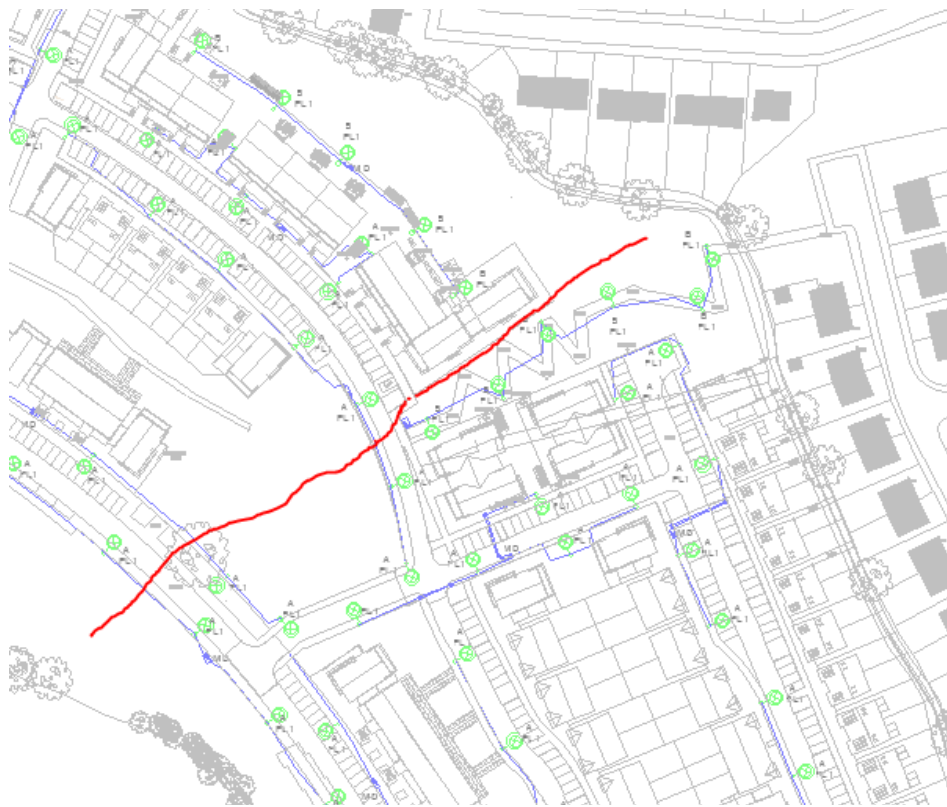
Figure 2: Enniscorthy Bat activity 16th June to 17th June 2020

Most signals relate to the pre-dawn evaluation, but common and soprano pipistrelles were also noted feeding over the river after sunset on 16th June. The arrow indicates the direction of departure of the final bat on site (a Leisler's bat)

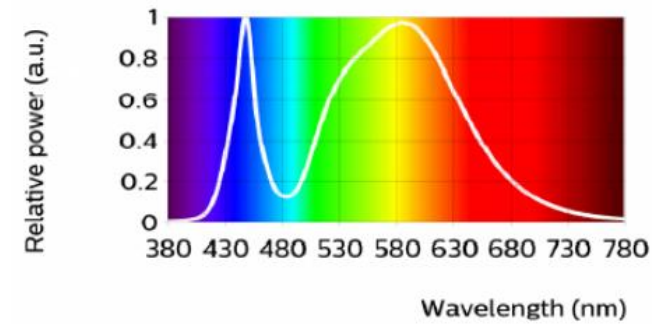


Figure 3: Proposed development within the site

The oak tree roost can be seen directly below the proposed road. A mature oak within the hedgerow will be removed and there will be increased lighting. These impacts are dealt with in the mitigation for this project.



NW neutral white as requested below will have a peak lower than 550nm



They will need the WW Warm white which has a peak higher than 550nm

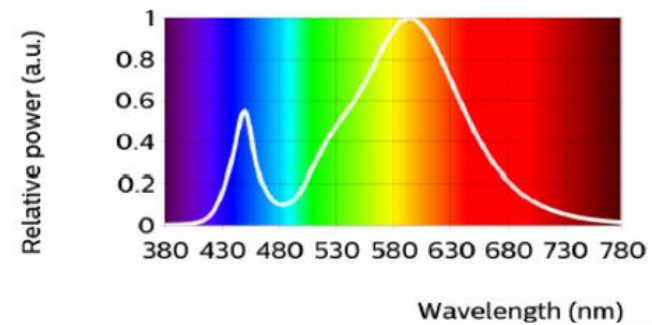


Figure 4: (left) Corridor through development where there is light lower than 3 lux connecting surrounding houses with the River Urrin and riverside vegetation. Right) Wavelengths of light used within the site. The warm white meets the conditions for bats while the neutral white will have wavelengths approaching 440 nm.



Figure 5: Lighting grid for the proposed development (the layout approximates to the final layout and lighting remains the same – please see specific site layout diagrams for details)

Table 1: Date recorded on the Echometer 3 (handheld) 15th to 16th June 2020.

Date	Time	Auto Id*	Pulses	Manual Id
15/06/2020	22:25:22	Noid	5	
15/06/2020	22:25:42	Noid	4	
15/06/2020	22:29:43	Noid	2	
15/06/2020	22:33:45	Noid	123	
15/06/2020	22:34:20	Noid	2	
15/06/2020	22:47:09	Noid	19	Common Pipistrelle Leisler's Bat
15/06/2020	22:49:35	Noid	28	Common Pipistrelle
15/06/2020	22:50:36	Noid	22	Common Pipistrelle
15/06/2020	23:00:42	Noid	5	Soprano Pipistrelle
15/06/2020	23:00:57	Noid	3	Pip
15/06/2020	22:24:21	Leisler's Bat	65	
15/06/2020	22:33:05	Leisler's Bat	85	
15/06/2020	22:33:25	Leisler's Bat	70	
15/06/2020	22:32:45	Leisler's Bat	57	
15/06/2020	22:34:05	Leisler's Bat	48	
15/06/2020	22:34:46	Leisler's Bat	49	
15/06/2020	22:34:25	Leisler's Bat	64	
15/06/2020	22:25:02	Leisler's Bat	41	
15/06/2020	22:32:04	Leisler's Bat	42	
15/06/2020	22:45:33	Leisler's Bat	32	
15/06/2020	22:24:01	Leisler's Bat	26	
15/06/2020	22:35:07	Leisler's Bat	26	
15/06/2020	22:46:14	Leisler's Bat	26	
15/06/2020	22:31:44	Leisler's Bat	28	
15/06/2020	22:45:54	Leisler's Bat	24	
15/06/2020	22:23:56	Leisler's Bat	22	
15/06/2020	22:31:39	Leisler's Bat	22	
15/06/2020	22:23:41	Leisler's Bat	28	
15/06/2020	22:31:19	Leisler's Bat	21	
15/06/2020	22:44:47	Leisler's Bat	22	
15/06/2020	22:45:13	Leisler's Bat	36	
15/06/2020	22:23:21	Leisler's Bat	18	
15/06/2020	22:24:42	Leisler's Bat	19	
15/06/2020	22:33:40	Leisler's Bat	31	
15/06/2020	22:31:04	Leisler's Bat	16	
15/06/2020	22:23:36	Leisler's Bat	15	
15/06/2020	22:24:36	Leisler's Bat	15	
15/06/2020	22:31:24	Leisler's Bat	13	
15/06/2020	22:35:27	Leisler's Bat	13	
15/06/2020	22:21:16	Leisler's Bat	11	
15/06/2020	22:33:20	Leisler's Bat	11	
15/06/2020	22:30:44	Leisler's Bat	10	
15/06/2020	22:24:16	Leisler's Bat	9	
15/06/2020	22:32:19	Leisler's Bat	10	

15/06/2020	22:24:57	Leisler's Bat	8	
15/06/2020	22:35:47	Leisler's Bat	7	
15/06/2020	22:45:28	Leisler's Bat	6	
15/06/2020	22:21:21	Leisler's Bat	5	
15/06/2020	22:34:00	Leisler's Bat	4	
15/06/2020	22:23:01	Leisler's Bat	3	
15/06/2020	22:33:00	Leisler's Bat	3	
15/06/2020	22:35:01	Leisler's Bat	3	
15/06/2020	22:21:56	Leisler's Bat	2	
15/06/2020	23:04:59	Pipnat	24	Common Pipistrelle
15/06/2020	22:38:49	Pipnat	27	Soprano Pipistrelle
15/06/2020	22:38:09	Common Pipistrelle	109	Common Pipistrelle
15/06/2020	22:19:00	Common Pipistrelle	129	Common Pipistrelle
15/06/2020	22:32:24	Common Pipistrelle	96	Common Pipistrelle Leisler's Bat
15/06/2020	22:37:49	Common Pipistrelle	50	Common Pipistrelle
15/06/2020	23:05:39	Common Pipistrelle	73	Common Pipistrelle
15/06/2020	22:19:40	Common Pipistrelle	45	Common Pipistrelle
15/06/2020	22:38:04	Common Pipistrelle	31	Common Pipistrelle
15/06/2020	23:05:44	Common Pipistrelle	41	Common Pipistrelle
15/06/2020	22:53:58	Common Pipistrelle	51	Common Pipistrelle Soprano Pipistrelle
15/06/2020	22:37:28	Common Pipistrelle	24	Common Pipistrelle
15/06/2020	22:38:44	Common Pipistrelle	54	Common Pipistrelle
15/06/2020	22:32:39	Common Pipistrelle	23	Common Pipistrelle
15/06/2020	22:19:35	Common Pipistrelle	27	Common Pipistrelle
15/06/2020	22:34:40	Common Pipistrelle	36	Common Pipistrelle Leisler's Bat
15/06/2020	23:01:02	Common Pipistrelle	30	Common Pipistrelle
15/06/2020	22:18:00	Common Pipistrelle	19	Common Pipistrelle
15/06/2020	22:19:15	Common Pipistrelle	20	Common Pipistrelle
15/06/2020	23:01:42	Common Pipistrelle	21	Common Pipistrelle
15/06/2020	23:00:21	Common Pipistrelle	19	Common Pipistrelle
15/06/2020	22:27:37	Common Pipistrelle	20	Common Pipistrelle
15/06/2020	22:18:55	Common Pipistrelle	18	Common Pipistrelle
15/06/2020	22:18:40	Common Pipistrelle	20	Common Pipistrelle
15/06/2020	22:43:32	Common Pipistrelle	15	Common Pipistrelle
15/06/2020	22:08:58	Common Pipistrelle	13	Common Pipistrelle
15/06/2020	22:38:24	Common Pipistrelle	11	Common Pipistrelle
15/06/2020	23:05:24	Common Pipistrelle	10	Common Pipistrelle
15/06/2020	22:27:42	Common Pipistrelle	8	Common Pipistrelle
15/06/2020	22:19:20	Common Pipistrelle	7	Common Pipistrelle
15/06/2020	22:09:13	Common Pipistrelle	7	Common Pipistrelle
15/06/2020	22:43:27	Common Pipistrelle	5	
15/06/2020	23:01:37	Common Pipistrelle	3	
15/06/2020	22:52:37	Common Pipistrelle	4	
15/06/2020	22:52:52	Common Pipistrelle	4	
15/06/2020	22:51:31	Common Pipistrelle	2	
15/06/2020	22:38:29	Common Pipistrelle	3	

15/06/2020	22:43:52	Soprano Pipistrelle	74	
15/06/2020	22:28:43	Soprano Pipistrelle	67	
15/06/2020	22:44:32	Soprano Pipistrelle	41	
15/06/2020	23:05:04	Soprano Pipistrelle	65	
15/06/2020	22:26:02	Soprano Pipistrelle	40	
15/06/2020	22:28:22	Soprano Pipistrelle	69	
15/06/2020	22:37:08	Soprano Pipistrelle	33	
15/06/2020	22:47:14	Soprano Pipistrelle	46	
15/06/2020	22:56:39	Soprano Pipistrelle	32	
15/06/2020	22:28:37	Soprano Pipistrelle	36	
15/06/2020	22:37:03	Soprano Pipistrelle	31	
15/06/2020	22:44:53	Soprano Pipistrelle	45	
15/06/2020	22:51:56	Soprano Pipistrelle	31	
15/06/2020	22:44:12	Soprano Pipistrelle	37	
15/06/2020	22:17:20	Soprano Pipistrelle	25	
15/06/2020	22:42:52	Soprano Pipistrelle	26	
15/06/2020	22:40:10	Soprano Pipistrelle	20	
15/06/2020	22:26:37	Soprano Pipistrelle	21	
15/06/2020	22:27:02	Soprano Pipistrelle	31	
15/06/2020	22:21:41	Soprano Pipistrelle	21	
15/06/2020	22:26:22	Soprano Pipistrelle	17	
15/06/2020	22:58:20	Soprano Pipistrelle	18	
15/06/2020	22:29:18	Soprano Pipistrelle	20	
15/06/2020	22:26:17	Soprano Pipistrelle	10	
15/06/2020	22:25:57	Soprano Pipistrelle	11	
15/06/2020	22:49:55	Soprano Pipistrelle	9	
15/06/2020	22:26:57	Soprano Pipistrelle	8	
15/06/2020	22:26:42	Soprano Pipistrelle	5	
15/06/2020	23:00:36	Soprano Pipistrelle	8	
16/06/2020	04:06:40	Noid	3	Common Pipistrelle Leisler's Bat
16/06/2020	04:23:49	Noid	23	Common Pipistrelle
16/06/2020	04:26:31	Noid	2	Noise
16/06/2020	04:29:28	Noid	3	Soprano Pipistrelle
16/06/2020	04:30:33	Noid	7	Soprano Pipistrelle
16/06/2020	04:25:25	Pipnat	8	Common Pipistrelle
16/06/2020	04:19:47	Common Pipistrelle	57	Common Pipistrelle
16/06/2020	04:24:29	Common Pipistrelle	41	Common Pipistrelle
16/06/2020	04:24:09	Common Pipistrelle	29	Common Pipistrelle
16/06/2020	04:16:45	Common Pipistrelle	27	Common Pipistrelle
16/06/2020	04:25:10	Common Pipistrelle	31	Common Pipistrelle
16/06/2020	04:20:02	Common Pipistrelle	27	Common Pipistrelle
16/06/2020	04:25:45	Common Pipistrelle	17	Common Pipistrelle
16/06/2020	04:25:30	Common Pipistrelle	18	Common Pipistrelle
16/06/2020	04:11:22	Common Pipistrelle	15	Common Pipistrelle
16/06/2020	04:24:44	Common Pipistrelle	10	Common Pipistrelle
16/06/2020	04:08:40	Common Pipistrelle	5	

16/06/2020	04:05:39	Common Pipistrelle	4	
16/06/2020	04:24:50	Common Pipistrelle	4	
16/06/2020	04:20:07	Common Pipistrelle	2	
16/06/2020	04:19:27	Soprano Pipistrelle	43	
16/06/2020	04:00:51	Soprano Pipistrelle	28	
16/06/2020	04:18:41	Soprano Pipistrelle	31	
16/06/2020	04:27:47	Soprano Pipistrelle	21	
16/06/2020	04:30:28	Soprano Pipistrelle	22	
16/06/2020	04:09:21	Soprano Pipistrelle	15	
16/06/2020	04:27:26	Soprano Pipistrelle	13	
16/06/2020	04:30:13	Soprano Pipistrelle	13	
16/06/2020	04:33:10	Soprano Pipistrelle	11	
16/06/2020	04:22:49	Soprano Pipistrelle	7	
16/06/2020	04:32:55	Soprano Pipistrelle	7	
16/06/2020	04:29:13	Soprano Pipistrelle	6	
16/06/2020	04:31:14	Soprano Pipistrelle	6	
16/06/2020	03:58:37	Soprano Pipistrelle	5	
16/06/2020	04:29:53	Soprano Pipistrelle	5	
16/06/2020	04:30:48	Soprano Pipistrelle	4	
16/06/2020	04:32:35	Soprano Pipistrelle	4	
16/06/2020	04:32:30	Soprano Pipistrelle	4	
16/06/2020	04:29:33	Soprano Pipistrelle	3	

Table 2: Bat activity prior to sunrise 17th June 2020 recorded on EM3.

Date	Time	Auto Id*	Pulses	Manual Id
17/06/2020	04:51:18	Leisler's Bat	59	Leisler's Bat
17/06/2020	05:02:00	Leisler's Bat	53	Leisler's Bat
17/06/2020	05:00:40	Leisler's Bat	45	Leisler's Bat
17/06/2020	05:02:20	Leisler's Bat	44	Leisler's Bat
17/06/2020	05:00:20	Leisler's Bat	33	Leisler's Bat
17/06/2020	05:02:40	Leisler's Bat	33	Leisler's Bat
17/06/2020	04:38:14	Leisler's Bat	38	Common Pipistrelle Leisler's Bat
17/06/2020	04:51:38	Leisler's Bat	43	Common Pipistrelle Leisler's Bat
17/06/2020	04:40:15	Leisler's Bat	31	Leisler's Bat
17/06/2020	04:54:38	Leisler's Bat	29	Leisler's Bat
17/06/2020	04:51:33	Leisler's Bat	25	Leisler's Bat
17/06/2020	05:01:20	Leisler's Bat	25	Leisler's Bat
17/06/2020	04:53:38	Leisler's Bat	24	Leisler's Bat
17/06/2020	05:01:40	Leisler's Bat	27	Leisler's Bat
17/06/2020	05:01:00	Leisler's Bat	23	Leisler's Bat
17/06/2020	04:48:37	Leisler's Bat	28	Common Pipistrelle Leisler's Bat
17/06/2020	04:48:57	Leisler's Bat	35	Common Pipistrelle Leisler's Bat
17/06/2020	04:34:53	Leisler's Bat	19	Leisler's Bat
17/06/2020	05:01:35	Leisler's Bat	19	Leisler's Bat
17/06/2020	05:02:35	Leisler's Bat	19	Leisler's Bat
17/06/2020	04:49:12	Leisler's Bat	30	Common Pipistrelle Leisler's Bat
17/06/2020	04:53:53	Leisler's Bat	18	Leisler's Bat

17/06/2020	04:46:16	Leisler's Bat	19	Leisler's Bat
17/06/2020	04:53:18	Leisler's Bat	31	Common Pipistrelle Leisler's Bat
17/06/2020	04:54:18	Leisler's Bat	16	Leisler's Bat
17/06/2020	04:34:33	Leisler's Bat	15	Leisler's Bat
17/06/2020	04:45:31	Leisler's Bat	15	Leisler's Bat
17/06/2020	04:55:13	Leisler's Bat	15	Leisler's Bat
17/06/2020	05:00:35	Leisler's Bat	15	Leisler's Bat
17/06/2020	04:34:08	Leisler's Bat	28	Leisler's Bat
17/06/2020	04:24:06	Leisler's Bat	14	Leisler's Bat
17/06/2020	04:41:15	Leisler's Bat	15	Leisler's Bat
17/06/2020	04:21:05	Leisler's Bat	13	Leisler's Bat
17/06/2020	04:36:29	Leisler's Bat	13	Leisler's Bat
17/06/2020	04:40:35	Leisler's Bat	13	Leisler's Bat
17/06/2020	05:01:55	Leisler's Bat	13	Leisler's Bat
17/06/2020	04:34:13	Leisler's Bat	22	Soprano Pipistrelle Leisler's Bat
17/06/2020	04:54:58	Leisler's Bat	12	Leisler's Bat
17/06/2020	05:02:15	Leisler's Bat	12	Leisler's Bat
17/06/2020	04:23:51	Leisler's Bat	11	Leisler's Bat
17/06/2020	04:50:37	Leisler's Bat	11	Leisler's Bat
17/06/2020	04:51:12	Leisler's Bat	11	Leisler's Bat
17/06/2020	04:10:28	Leisler's Bat	10	Leisler's Bat
17/06/2020	04:40:55	Leisler's Bat	13	Common Pipistrelle Leisler's Bat
17/06/2020	04:54:13	Leisler's Bat	9	Leisler's Bat
17/06/2020	05:01:15	Leisler's Bat	9	Leisler's Bat
17/06/2020	04:39:55	Leisler's Bat	11	Common Pipistrelle Leisler's Bat
17/06/2020	04:21:10	Leisler's Bat	8	Leisler's Bat
17/06/2020	04:47:17	Leisler's Bat	8	Leisler's Bat
17/06/2020	05:00:00	Leisler's Bat	8	Leisler's Bat
17/06/2020	05:04:01	Leisler's Bat	8	Leisler's Bat
17/06/2020	04:27:52	Leisler's Bat	10	Common Pipistrelle Leisler's Bat
17/06/2020	05:03:56	Leisler's Bat	7	Leisler's Bat
17/06/2020	04:40:10	Leisler's Bat	6	Leisler's Bat
17/06/2020	04:47:32	Leisler's Bat	6	Leisler's Bat
17/06/2020	04:43:31	Leisler's Bat	7	Leisler's Bat
17/06/2020	04:10:48	Leisler's Bat	4	Leisler's Bat
17/06/2020	04:46:31	Leisler's Bat	4	Leisler's Bat
17/06/2020	05:00:15	Leisler's Bat	4	Leisler's Bat
16/06/2020	22:25:20	Leisler's Bat	3	Leisler's Bat
17/06/2020	04:35:08	Leisler's Bat	3	Leisler's Bat
17/06/2020	04:52:18	Leisler's Bat	3	Leisler's Bat
17/06/2020	05:03:41	Leisler's Bat	3	Leisler's Bat
17/06/2020	04:32:48	Leisler's Bat	4	Leisler's Bat
17/06/2020	04:49:17	Leisler's Bat	2	Leisler's Bat
16/06/2020	22:22:00	Noid	31	Common Pipistrelle
16/06/2020	22:26:01	Noid	2	Leisler's Bat
17/06/2020	04:04:21	Noid	2	Soprano Pipistrelle

17/06/2020	04:13:49	Noid	2	Common Pipistrelle
17/06/2020	04:26:11	Noid	5	Common Pipistrelle Soprano Pipistrelle
17/06/2020	04:30:32	Noid	8	Pip
17/06/2020	04:32:13	Noid	2	Soprano Pipistrelle
17/06/2020	04:35:14	Noid	16	Common Pipistrelle
17/06/2020	04:35:54	Noid	83	Common Pipistrelle
17/06/2020	04:35:34	Noid	86	Common Pipistrelle
17/06/2020	04:35:29	Noid	3	Common Pipistrelle
17/06/2020	04:38:54	Noid	82	Common Pipistrelle
17/06/2020	04:44:56	Noid	5	Common Pipistrelle
17/06/2020	04:57:59	Noid	37	Common Pipistrelle
17/06/2020	04:58:34	Noid	44	Soprano Pipistrelle
17/06/2020	04:41:55	Common Pipistrelle	97	
17/06/2020	04:43:16	Common Pipistrelle	103	
17/06/2020	04:38:34	Common Pipistrelle	102	
17/06/2020	04:44:36	Common Pipistrelle	57	
17/06/2020	04:58:19	Common Pipistrelle	82	
17/06/2020	04:33:53	Common Pipistrelle	67	
17/06/2020	04:45:16	Common Pipistrelle	85	
17/06/2020	04:42:10	Common Pipistrelle	52	
17/06/2020	04:46:56	Common Pipistrelle	62	
17/06/2020	04:42:55	Common Pipistrelle	39	
17/06/2020	04:58:59	Common Pipistrelle	59	
17/06/2020	04:36:09	Common Pipistrelle	47	
17/06/2020	04:39:15	Common Pipistrelle	77	
17/06/2020	04:45:36	Common Pipistrelle	46	
17/06/2020	04:38:49	Common Pipistrelle	42	
17/06/2020	04:42:15	Common Pipistrelle	50	
17/06/2020	03:52:01	Common Pipistrelle	34	
17/06/2020	04:47:11	Common Pipistrelle	40	
17/06/2020	04:33:08	Common Pipistrelle	45	
17/06/2020	04:38:29	Common Pipistrelle	28	
17/06/2020	04:40:50	Common Pipistrelle	44	
17/06/2020	04:58:14	Common Pipistrelle	46	
17/06/2020	04:39:35	Common Pipistrelle	62	
17/06/2020	04:01:04	Common Pipistrelle	23	
17/06/2020	04:35:49	Common Pipistrelle	26	
17/06/2020	04:46:36	Common Pipistrelle	49	
17/06/2020	04:45:56	Common Pipistrelle	28	
17/06/2020	04:50:57	Common Pipistrelle	29	
17/06/2020	04:33:28	Common Pipistrelle	36	
17/06/2020	04:33:13	Common Pipistrelle	38	
17/06/2020	04:22:51	Common Pipistrelle	19	
17/06/2020	04:42:30	Common Pipistrelle	22	
17/06/2020	04:33:33	Common Pipistrelle	23	
17/06/2020	04:51:53	Common Pipistrelle	26	

17/06/2020	04:36:14	Common Pipistrelle	39	
17/06/2020	04:01:19	Common Pipistrelle	18	
17/06/2020	04:53:33	Common Pipistrelle	17	
17/06/2020	04:58:39	Common Pipistrelle	17	
17/06/2020	04:39:30	Common Pipistrelle	14	
17/06/2020	04:12:23	Common Pipistrelle	14	
17/06/2020	04:43:10	Common Pipistrelle	14	
17/06/2020	04:52:58	Common Pipistrelle	17	
17/06/2020	04:57:54	Common Pipistrelle	27	
17/06/2020	04:41:10	Common Pipistrelle	12	
17/06/2020	04:41:50	Common Pipistrelle	22	
17/06/2020	04:52:38	Common Pipistrelle	15	
17/06/2020	04:48:17	Common Pipistrelle	18	
17/06/2020	04:26:47	Common Pipistrelle	9	
17/06/2020	04:38:09	Common Pipistrelle	16	
17/06/2020	04:53:13	Common Pipistrelle	8	
17/06/2020	04:39:50	Common Pipistrelle	6	
16/06/2020	22:39:45	Common Pipistrelle	7	
17/06/2020	04:51:58	Common Pipistrelle	8	
17/06/2020	04:28:12	Common Pipistrelle	5	
17/06/2020	04:48:52	Common Pipistrelle	9	
17/06/2020	04:33:48	Common Pipistrelle	4	
17/06/2020	04:45:51	Common Pipistrelle	4	
17/06/2020	04:50:17	Common Pipistrelle	5	
16/06/2020	22:21:55	Common Pipistrelle	6	
17/06/2020	04:39:09	Common Pipistrelle	8	
17/06/2020	04:37:34	Common Pipistrelle	3	
17/06/2020	04:37:29	Common Pipistrelle	3	
17/06/2020	04:00:04	Common Pipistrelle	2	
17/06/2020	04:23:06	Common Pipistrelle	2	
17/06/2020	04:26:26	Common Pipistrelle	2	
17/06/2020	04:36:49	Common Pipistrelle	2	
17/06/2020	04:44:11	Common Pipistrelle	2	
17/06/2020	04:19:10	Common Pipistrelle	3	
17/06/2020	04:25:31	Soprano Pipistrelle	136	
17/06/2020	04:04:06	Soprano Pipistrelle	110	
17/06/2020	04:22:31	Soprano Pipistrelle	99	
17/06/2020	04:22:11	Soprano Pipistrelle	68	
17/06/2020	04:32:53	Soprano Pipistrelle	95	
17/06/2020	04:27:12	Soprano Pipistrelle	64	
17/06/2020	04:27:07	Soprano Pipistrelle	41	
17/06/2020	04:22:26	Soprano Pipistrelle	39	
17/06/2020	04:32:33	Soprano Pipistrelle	61	
17/06/2020	04:03:46	Soprano Pipistrelle	35	
17/06/2020	04:25:11	Soprano Pipistrelle	35	
17/06/2020	04:26:52	Soprano Pipistrelle	36	

17/06/2020	04:29:47	Soprano Pipistrelle	32	
17/06/2020	04:25:26	Soprano Pipistrelle	33	
17/06/2020	04:29:32	Soprano Pipistrelle	29	
17/06/2020	04:41:35	Soprano Pipistrelle	39	
17/06/2020	04:03:25	Soprano Pipistrelle	25	
17/06/2020	04:04:01	Soprano Pipistrelle	19	
17/06/2020	04:25:51	Soprano Pipistrelle	20	
17/06/2020	04:45:11	Soprano Pipistrelle	20	
17/06/2020	04:57:39	Soprano Pipistrelle	50	
17/06/2020	04:40:30	Soprano Pipistrelle	22	
17/06/2020	04:32:28	Soprano Pipistrelle	21	
17/06/2020	04:43:36	Soprano Pipistrelle	35	
17/06/2020	04:42:35	Soprano Pipistrelle	20	
17/06/2020	04:43:56	Soprano Pipistrelle	27	
17/06/2020	04:06:47	Soprano Pipistrelle	13	
17/06/2020	04:23:11	Soprano Pipistrelle	14	
17/06/2020	04:26:06	Soprano Pipistrelle	10	
17/06/2020	04:12:08	Soprano Pipistrelle	14	
17/06/2020	04:30:53	Soprano Pipistrelle	9	
17/06/2020	04:25:46	Soprano Pipistrelle	8	
17/06/2020	04:30:12	Soprano Pipistrelle	5	
17/06/2020	04:02:25	Soprano Pipistrelle	2	
17/06/2020	04:20:45	Soprano Pipistrelle	2	
17/06/2020	04:46:51	Soprano Pipistrelle	12	

Table 3: Static monitor data from 15th June to 17th June 2020

Date	Time	Auto id	Pulses	Manual id
15/06/2020	22:03:01	Leisler's bat	2	
15/06/2020	22:03:15	Leisler's bat	6	
15/06/2020	22:04:57	Leisler's bat	3	
15/06/2020	22:09:21	Leisler's bat	11	
15/06/2020	22:14:59	Common pipistrelle	19	
15/06/2020	22:15:15	Common pipistrelle	24	
15/06/2020	22:16:00	Leisler's bat	3	
15/06/2020	22:16:45	Soprano pipistrelle	79	
15/06/2020	22:17:03	Soprano pipistrelle	23	
15/06/2020	22:17:22	Noid	2	
15/06/2020	22:17:32	Soprano pipistrelle	62	
15/06/2020	22:17:42	Soprano pipistrelle	26	
15/06/2020	22:18:17	Soprano pipistrelle	17	
15/06/2020	22:18:26	Soprano pipistrelle	23	
15/06/2020	22:18:59	Common pipistrelle	21	
15/06/2020	22:19:08	Common pipistrelle	14	
15/06/2020	22:19:30	Common pipistrelle	65	
15/06/2020	22:19:45	Common pipistrelle	31	
15/06/2020	22:19:58	Nathusius' pipistrelle	9	Common pipistrelle

15/06/2020	22:20:10	Nathusius' pipistrelle	43	Common pipistrelle
15/06/2020	22:20:23	Nathusius' pipistrelle	80	Common pipistrelle
15/06/2020	22:20:39	Nathusius' pipistrelle	63	Common pipistrelle
15/06/2020	22:20:52	Nathusius' pipistrelle	34	Common pipistrelle
15/06/2020	22:21:25	Soprano pipistrelle	39	
15/06/2020	22:21:38	Soprano pipistrelle	49	
15/06/2020	22:21:50	Soprano pipistrelle	31	
15/06/2020	22:22:00	Noid	10	
15/06/2020	22:22:42	Soprano pipistrelle	32	
15/06/2020	22:22:52	Leisler's bat	25	
15/06/2020	22:23:20	Leisler's bat	26	
15/06/2020	22:23:51	Soprano pipistrelle	26	
15/06/2020	22:24:12	Soprano pipistrelle	8	
15/06/2020	22:24:27	Soprano pipistrelle	15	
15/06/2020	22:24:53	Leisler's bat	18	
15/06/2020	22:25:35	Noid	51	
15/06/2020	22:26:08	Common pipistrelle	33	
15/06/2020	22:26:25	Soprano pipistrelle	56	
15/06/2020	22:26:49	Leisler's bat	7	
15/06/2020	22:27:05	Common pipistrelle	40	
15/06/2020	22:27:23	Common pipistrelle	35	
15/06/2020	22:27:38	Common pipistrelle	7	
15/06/2020	22:27:50	Common pipistrelle	5	
15/06/2020	22:28:02	Common pipistrelle	12	
15/06/2020	22:28:48	Common pipistrelle	11	
15/06/2020	22:29:16	Myotis bat	8	
15/06/2020	22:31:12	Soprano pipistrelle	44	
15/06/2020	22:31:26	Common pipistrelle	23	
15/06/2020	22:31:51	Soprano pipistrelle	11	
15/06/2020	22:32:08	Soprano pipistrelle	47	
15/06/2020	22:32:55	Leisler's bat	3	
15/06/2020	22:33:05	Soprano pipistrelle	48	
15/06/2020	22:33:20	Common pipistrelle	39	
15/06/2020	22:33:36	Soprano pipistrelle	45	
15/06/2020	22:34:16	Soprano pipistrelle	45	
15/06/2020	22:36:49	Soprano pipistrelle	42	
15/06/2020	22:37:15	Soprano pipistrelle	7	
15/06/2020	22:37:35	Common pipistrelle	26	
15/06/2020	22:40:07	Common pipistrelle	74	
15/06/2020	22:40:22	Common pipistrelle	5	
15/06/2020	22:42:47	Soprano pipistrelle	5	
15/06/2020	22:45:37	Leisler's bat	4	
15/06/2020	22:46:22	Leisler's bat	21	
15/06/2020	22:47:29	Leisler's bat	6	

15/06/2020	22:47:50	Leisler's bat	22	
15/06/2020	22:48:37	Leisler's bat	6	
15/06/2020	22:49:10	Leisler's bat	41	
15/06/2020	22:50:40	Leisler's bat	14	
15/06/2020	22:54:14	Soprano pipistrelle	14	
15/06/2020	22:59:17	Leisler's bat	23	
15/06/2020	23:00:02	Leisler's bat	3	
15/06/2020	23:06:17	Common pipistrelle	47	
15/06/2020	23:08:55	Leisler's bat	8	
15/06/2020	23:09:24	Common pipistrelle	29	
15/06/2020	23:26:54	Soprano pipistrelle	19	
15/06/2020	23:33:21	Leisler's bat	4	
15/06/2020	23:35:22	Myotis bat	21	
15/06/2020	23:36:44	Common pipistrelle	10	
15/06/2020	23:39:40	Common pipistrelle	36	
15/06/2020	23:44:29	Leisler's bat	19	
15/06/2020	23:45:14	Leisler's bat	15	
15/06/2020	23:47:40	Common pipistrelle	29	
15/06/2020	23:48:38	Soprano pipistrelle	27	
15/06/2020	23:49:29	Soprano pipistrelle	22	
15/06/2020	23:50:50	Leisler's bat	2	
15/06/2020	23:54:57	Leisler's bat	19	
15/06/2020	23:56:13	Common pipistrelle	14	
15/06/2020	23:58:22	Soprano pipistrelle	12	
16/06/2020	00:13:06	Leisler's bat	37	
16/06/2020	00:13:22	Leisler's bat	6	
16/06/2020	00:16:12	Common pipistrelle	5	
16/06/2020	00:18:48	Common pipistrelle	13	
16/06/2020	00:19:30	Common pipistrelle	11	
16/06/2020	00:35:12	Soprano pipistrelle	21	
16/06/2020	00:37:04	Myotis bat	14	
16/06/2020	00:38:29	Common pipistrelle	22	
16/06/2020	00:44:22	Common pipistrelle	7	
16/06/2020	00:46:42	Noid	2	
16/06/2020	00:49:45	Leisler's bat	20	
16/06/2020	00:51:13	Myotis bat	21	
16/06/2020	00:51:54	Nathusius' pipistrelle	28	Common pipistrelle
16/06/2020	00:55:01	Common pipistrelle	14	Common pipistrelle
16/06/2020	01:01:52	Nathusius' pipistrelle	24	Common pipistrelle
16/06/2020	01:03:58	Leisler's bat	20	
16/06/2020	01:11:54	Daubenton's bat	7	
16/06/2020	01:14:27	Leisler's bat	18	
16/06/2020	01:34:25	Leisler's bat	19	
16/06/2020	01:37:50	Soprano pipistrelle	18	

16/06/2020	01:41:24	Leisler's bat	5	
16/06/2020	01:41:29	Leisler's bat	4	
16/06/2020	01:43:03	Myotis bat	8	
16/06/2020	02:01:23	Leisler's bat	11	
16/06/2020	02:07:57	Common pipistrelle	11	
16/06/2020	02:09:47	Leisler's bat	17	
16/06/2020	02:21:12	Soprano pipistrelle	12	
16/06/2020	02:25:45	Leisler's bat	5	
16/06/2020	02:28:06	Nathusius' pipistrelle	17	Common pipistrelle
16/06/2020	02:28:57	Nathusius' pipistrelle	25	Common pipistrelle
16/06/2020	02:33:11	Nathusius' pipistrelle	38	Common pipistrelle
16/06/2020	02:35:27	Nathusius' pipistrelle	30	Common pipistrelle
16/06/2020	02:46:35	Soprano pipistrelle	19	
16/06/2020	02:51:16	Common pipistrelle	23	
16/06/2020	03:27:32	Daubenton's bat	13	
16/06/2020	03:36:09	Soprano pipistrelle	9	
16/06/2020	03:54:56	Soprano pipistrelle	14	
16/06/2020	04:06:06	Noid	1	
16/06/2020	04:06:36	Leisler's bat	16	
16/06/2020	04:06:51	Soprano pipistrelle	9	
16/06/2020	04:08:31	Common pipistrelle	6	
16/06/2020	04:11:06	Soprano pipistrelle	22	
16/06/2020	04:13:39	Common pipistrelle	33	
16/06/2020	04:14:22	Common pipistrelle	51	
16/06/2020	04:14:38	Soprano pipistrelle	56	
16/06/2020	04:14:53	Soprano pipistrelle	51	
16/06/2020	04:19:07	Leisler's bat	13	
16/06/2020	04:21:30	Leisler's bat	16	
16/06/2020	04:22:03	Leisler's bat	18	
16/06/2020	04:22:30	Common pipistrelle	8	
16/06/2020	04:22:49	Leisler's bat	21	
16/06/2020	04:23:27	Leisler's bat	3	
16/06/2020	04:23:40	Myotis bat	12	
16/06/2020	04:24:01	Leisler's bat	16	
16/06/2020	04:33:32	Leisler's bat	8	
16/06/2020	04:38:40	Myotis bat	4	

Table 4: Recordings from sunset 16th June 2020 to sunrise 17th June 2020 from the static monitor at the beech tree and river

16/06/2020	21:27:39	Noid	3	
16/06/2020	21:28:12	Noid	1	
16/06/2020	21:32:18	Leisler's bat	3	
16/06/2020	21:32:37	Leisler's bat	5	
16/06/2020	21:32:53	Leisler's bat	8	
16/06/2020	21:33:08	Leisler's bat	6	
16/06/2020	21:34:04	Leisler's bat	5	

16/06/2020	21:34:20	Leisler's bat	4	
16/06/2020	21:34:45	Leisler's bat	4	
16/06/2020	21:58:38	Common pipistrelle	12	
16/06/2020	22:12:35	Common pipistrelle	2	
16/06/2020	22:13:43	Common pipistrelle	5	
16/06/2020	22:15:21	Soprano pipistrelle	3	
16/06/2020	22:16:02	Noid	1	
16/06/2020	22:16:19	Leisler's bat	3	
16/06/2020	22:16:51	Common pipistrelle	9	
16/06/2020	22:17:30	Noid	0	
16/06/2020	22:20:05	Noid	1	
16/06/2020	22:22:50	Soprano pipistrelle	2	
16/06/2020	22:23:05	Soprano pipistrelle	53	
16/06/2020	22:23:20	Common pipistrelle	171	
16/06/2020	22:23:36	Common pipistrelle	129	
16/06/2020	22:23:51	Common pipistrelle	57	
16/06/2020	22:24:07	Soprano pipistrelle	52	
16/06/2020	22:24:23	Soprano pipistrelle	2	
16/06/2020	22:24:39	Leisler's bat	17	
16/06/2020	22:25:10	Leisler's bat	17	
16/06/2020	22:25:25	Soprano pipistrelle	16	
16/06/2020	22:25:41	Soprano pipistrelle	21	
16/06/2020	22:25:57	Leisler's bat	7	
16/06/2020	22:28:27	Myotis bat	6	
16/06/2020	22:38:53	Myotis bat	18	
16/06/2020	22:39:30	Myotis bat	29	
16/06/2020	23:02:49	Noid	2	
16/06/2020	23:09:02	Myotis bat	12	
16/06/2020	23:09:12	Myotis bat	18	
16/06/2020	23:09:33	Myotis bat	15	
16/06/2020	23:09:49	Noid	2	
16/06/2020	23:10:24	Leisler's bat	3	
16/06/2020	23:10:41	Soprano pipistrelle	2	
16/06/2020	23:12:47	Myotis bat	39	
16/06/2020	23:13:02	Myotis bat	11	
16/06/2020	23:13:13	Myotis bat	7	
16/06/2020	23:15:03	Daubenton's bat	15	
16/06/2020	23:20:53	Daubenton's bat	7	
16/06/2020	23:25:35	Myotis bat	8	
16/06/2020	23:26:27	Soprano pipistrelle	42	
16/06/2020	23:26:43	Soprano pipistrelle	35	
16/06/2020	23:27:24	Soprano pipistrelle	57	
16/06/2020	23:28:23	Soprano pipistrelle	48	
16/06/2020	23:28:40	Soprano pipistrelle	70	

16/06/2020	23:33:11	Leisler's bat	10	
16/06/2020	23:34:32	Soprano pipistrelle	109	
16/06/2020	23:35:49	Soprano pipistrelle	71	
16/06/2020	23:36:04	Soprano pipistrelle	136	
16/06/2020	23:36:22	Soprano pipistrelle	58	
16/06/2020	23:36:33	Soprano pipistrelle	57	
16/06/2020	23:36:43	Soprano pipistrelle	100	
16/06/2020	23:37:06	Soprano pipistrelle	137	
16/06/2020	23:37:21	Soprano pipistrelle	25	
16/06/2020	23:37:30	Soprano pipistrelle	140	
16/06/2020	23:37:47	Soprano pipistrelle	41	
16/06/2020	23:37:58	Soprano pipistrelle	2	
16/06/2020	23:40:17	Common pipistrelle	2	
16/06/2020	23:41:30	Soprano pipistrelle	23	
16/06/2020	23:42:54	Soprano pipistrelle	151	
16/06/2020	23:43:09	Myotis bat	46	
16/06/2020	23:43:26	Myotis bat	12	
16/06/2020	23:43:52	Myotis bat	24	
16/06/2020	23:44:09	Myotis bat	16	
16/06/2020	23:44:25	Myotis bat	14	
16/06/2020	23:44:40	Myotis bat	6	
16/06/2020	23:44:49	Myotis bat	13	
16/06/2020	23:45:02	Myotis bat	13	
16/06/2020	23:45:18	Myotis bat	2	
16/06/2020	23:45:41	Myotis bat	13	
16/06/2020	23:49:04	Soprano pipistrelle	49	
16/06/2020	23:50:10	Soprano pipistrelle	33	
16/06/2020	23:53:57	Soprano pipistrelle	15	
16/06/2020	23:54:40	Soprano pipistrelle	30	
16/06/2020	23:55:13	Soprano pipistrelle	95	
16/06/2020	23:58:07	Myotis bat	5	
16/06/2020	23:58:18	Soprano pipistrelle	7	
16/06/2020	23:58:33	Myotis bat	28	
16/06/2020	23:58:49	Soprano pipistrelle	30	
16/06/2020	23:59:06	Noid	2	
16/06/2020	23:59:21	Daubenton's bat	2	
17/06/2020	00:04:11	Soprano pipistrelle	17	
17/06/2020	00:04:39	Common pipistrelle	22	
17/06/2020	00:10:13	Common pipistrelle	34	
17/06/2020	00:25:17	Myotis bat	7	
17/06/2020	00:26:42	Leisler's bat	14	
17/06/2020	00:28:13	Leisler's bat	2	
17/06/2020	00:33:39	Leisler's bat	5	
17/06/2020	00:51:04	Leisler's bat	10	

17/06/2020	00:51:29	Leisler's bat	12	
17/06/2020	00:52:13	Leisler's bat	12	
17/06/2020	00:56:23	Leisler's bat	2	
17/06/2020	00:58:30	Leisler's bat	6	
17/06/2020	01:07:19	Daubenton's bat	20	
17/06/2020	01:37:21	Leisler's bat	8	
17/06/2020	01:59:18	Soprano pipistrelle	55	
17/06/2020	02:11:10	Leisler's bat	10	
17/06/2020	02:18:27	Leisler's bat	6	
17/06/2020	02:24:44	Noid	2	
17/06/2020	02:25:13	Myotis bat	15	
17/06/2020	02:25:30	Myotis bat	5	
17/06/2020	02:31:07	Soprano pipistrelle	96	
17/06/2020	02:31:22	Soprano pipistrelle	95	
17/06/2020	02:31:37	Soprano pipistrelle	101	
17/06/2020	02:31:57	Soprano pipistrelle	69	
17/06/2020	02:32:13	Soprano pipistrelle	121	
17/06/2020	02:32:29	Soprano pipistrelle	10	
17/06/2020	02:40:30	Soprano pipistrelle	98	
17/06/2020	02:40:45	Soprano pipistrelle	92	
17/06/2020	02:41:01	Soprano pipistrelle	75	
17/06/2020	02:43:00	Soprano pipistrelle	103	
17/06/2020	02:43:16	Soprano pipistrelle	71	
17/06/2020	02:43:51	Soprano pipistrelle	38	
17/06/2020	02:44:27	Soprano pipistrelle	49	
17/06/2020	02:44:42	Soprano pipistrelle	41	
17/06/2020	02:47:50	Soprano pipistrelle	55	
17/06/2020	02:48:00	Soprano pipistrelle	49	
17/06/2020	02:48:30	Soprano pipistrelle	115	
17/06/2020	02:49:20	Soprano pipistrelle	41	
17/06/2020	02:49:57	Leisler's bat	3	
17/06/2020	02:52:20	Noid	2	
17/06/2020	02:52:53	Soprano pipistrelle	95	
17/06/2020	02:54:33	Soprano pipistrelle	38	
17/06/2020	02:56:29	Soprano pipistrelle	76	
17/06/2020	02:58:17	Leisler's bat	3	
17/06/2020	02:59:12	Soprano pipistrelle	52	
17/06/2020	02:59:32	Myotis bat	4	
17/06/2020	03:01:05	Common pipistrelle	25	
17/06/2020	03:02:59	Soprano pipistrelle	101	
17/06/2020	03:03:25	Soprano pipistrelle	25	
17/06/2020	03:03:47	Soprano pipistrelle	69	
17/06/2020	03:04:09	Noid	3	
17/06/2020	03:07:06	Leisler's bat	2	

17/06/2020	03:07:12	Soprano pipistrelle	36	
17/06/2020	03:07:31	Soprano pipistrelle	47	
17/06/2020	03:11:33	Leisler's bat	20	
17/06/2020	03:12:22	Leisler's bat	3	
17/06/2020	03:15:03	Soprano pipistrelle	103	
17/06/2020	03:15:18	Soprano pipistrelle	35	
17/06/2020	03:15:45	Soprano pipistrelle	78	
17/06/2020	03:16:40	Soprano pipistrelle	38	
17/06/2020	03:16:51	Soprano pipistrelle	103	
17/06/2020	03:17:06	Soprano pipistrelle	106	
17/06/2020	03:17:22	Soprano pipistrelle	37	
17/06/2020	03:17:32	Soprano pipistrelle	58	
17/06/2020	03:17:44	Soprano pipistrelle	26	
17/06/2020	03:18:52	Soprano pipistrelle	104	
17/06/2020	03:19:18	Soprano pipistrelle	49	
17/06/2020	03:19:29	Soprano pipistrelle	37	
17/06/2020	03:19:40	Soprano pipistrelle	101	
17/06/2020	03:19:56	Soprano pipistrelle	18	
17/06/2020	03:20:01	Soprano pipistrelle	52	
17/06/2020	03:20:13	Soprano pipistrelle	42	
17/06/2020	03:21:44	Soprano pipistrelle	99	
17/06/2020	03:22:05	Soprano pipistrelle	78	
17/06/2020	03:22:21	Soprano pipistrelle	40	
17/06/2020	03:22:34	Soprano pipistrelle	66	
17/06/2020	03:22:53	Soprano pipistrelle	80	
17/06/2020	03:23:08	Soprano pipistrelle	68	
17/06/2020	03:23:47	Soprano pipistrelle	79	
17/06/2020	03:24:03	Soprano pipistrelle	25	
17/06/2020	03:24:11	Soprano pipistrelle	16	
17/06/2020	03:24:22	Soprano pipistrelle	29	
17/06/2020	03:24:30	Soprano pipistrelle	13	
17/06/2020	03:24:39	Soprano pipistrelle	9	
17/06/2020	03:24:54	Soprano pipistrelle	31	
17/06/2020	03:25:04	Soprano pipistrelle	40	
17/06/2020	03:25:16	Soprano pipistrelle	60	
17/06/2020	03:25:31	Soprano pipistrelle	18	
17/06/2020	03:25:52	Soprano pipistrelle	28	
17/06/2020	03:26:12	Soprano pipistrelle	50	
17/06/2020	03:26:28	Soprano pipistrelle	27	
17/06/2020	03:26:41	Soprano pipistrelle	43	
17/06/2020	03:26:48	Myotis bat	31	
17/06/2020	03:27:01	Soprano pipistrelle	21	
17/06/2020	03:27:56	Myotis bat	31	
17/06/2020	03:28:48	Myotis bat	12	

17/06/2020	04:07:27	Leisler's bat	11	
17/06/2020	04:10:33	Leisler's bat	3	
17/06/2020	04:12:36	Leisler's bat	8	
17/06/2020	04:15:13	Leisler's bat	12	
17/06/2020	04:20:53	Leisler's bat	16	
17/06/2020	04:23:57	Leisler's bat	9	
17/06/2020	04:25:57	Soprano pipistrelle	6	
17/06/2020	04:26:13	Leisler's bat	20	
17/06/2020	04:26:33	Leisler's bat	17	
17/06/2020	04:27:26	Leisler's bat	20	
17/06/2020	04:30:56	Common pipistrelle	3	
17/06/2020	04:31:18	Leisler's bat	14	
17/06/2020	04:31:57	Leisler's bat	2	
17/06/2020	04:32:22	Soprano pipistrelle	4	
17/06/2020	04:32:38	Leisler's bat	7	
17/06/2020	04:32:55	Leisler's bat	18	
17/06/2020	04:33:57	Leisler's bat	20	
17/06/2020	04:34:14	Leisler's bat	6	
17/06/2020	04:34:30	Leisler's bat	10	
17/06/2020	04:34:53	Leisler's bat	19	
17/06/2020	04:35:11	Leisler's bat	2	
17/06/2020	04:35:38	Leisler's bat	22	
17/06/2020	04:36:09	Leisler's bat	23	
17/06/2020	04:36:25	Leisler's bat	3	
17/06/2020	04:37:21	Soprano pipistrelle	13	
17/06/2020	04:38:13	Leisler's bat	8	
17/06/2020	04:38:28	Leisler's bat	9	
17/06/2020	04:38:53	Leisler's bat	3	
17/06/2020	04:39:08	Leisler's bat	14	
17/06/2020	04:39:21	Leisler's bat	14	
17/06/2020	04:39:41	Leisler's bat	2	
17/06/2020	04:39:55	Leisler's bat	14	
17/06/2020	04:40:13	Leisler's bat	8	
17/06/2020	04:40:24	Leisler's bat	3	
17/06/2020	04:40:34	Leisler's bat	8	
17/06/2020	04:40:50	Leisler's bat	14	
17/06/2020	04:41:12	Leisler's bat	17	
17/06/2020	04:41:28	Noid	2	
17/06/2020	04:41:45	Leisler's bat	3	
17/06/2020	04:41:57	Leisler's bat	13	
17/06/2020	04:42:21	Noid	2	
17/06/2020	04:42:32	Leisler's bat	3	
17/06/2020	04:43:03	Leisler's bat	19	
17/06/2020	04:43:18	Leisler's bat	3	

17/06/2020	04:43:27	Leisler's bat	17	
17/06/2020	04:43:42	Leisler's bat	10	
17/06/2020	04:43:58	Leisler's bat	12	
17/06/2020	04:44:18	Leisler's bat	10	
17/06/2020	04:44:50	Leisler's bat	13	
17/06/2020	04:45:06	Leisler's bat	33	
17/06/2020	04:45:21	Leisler's bat	20	
17/06/2020	04:45:47	Leisler's bat	36	
17/06/2020	04:46:03	Leisler's bat	24	
17/06/2020	04:46:21	Leisler's bat	9	
17/06/2020	04:46:34	Leisler's bat	21	
17/06/2020	04:46:59	Leisler's bat	21	
17/06/2020	04:47:21	Leisler's bat	7	
17/06/2020	04:48:00	Leisler's bat	21	
17/06/2020	04:48:36	Leisler's bat	19	
17/06/2020	04:48:53	Leisler's bat	3	
17/06/2020	04:48:58	Leisler's bat	29	
17/06/2020	04:49:31	Leisler's bat	4	
17/06/2020	04:49:39	Leisler's bat	25	
17/06/2020	04:49:55	Leisler's bat	2	
17/06/2020	04:50:03	Leisler's bat	4	
17/06/2020	04:50:20	Leisler's bat	10	
17/06/2020	04:50:38	Leisler's bat	12	
17/06/2020	04:50:54	Leisler's bat	36	
17/06/2020	04:51:11	Leisler's bat	48	
17/06/2020	04:51:26	Leisler's bat	26	
17/06/2020	04:51:54	Leisler's bat	22	
17/06/2020	04:52:09	Leisler's bat	6	
17/06/2020	04:52:26	Leisler's bat	6	
17/06/2020	04:52:38	Leisler's bat	2	
17/06/2020	04:52:56	Leisler's bat	7	
17/06/2020	04:53:12	Leisler's bat	20	
17/06/2020	04:53:27	Leisler's bat	11	
17/06/2020	04:53:47	Leisler's bat	15	

Table 5: Static monitor placed at oak tree in treeline 16th June 2020

Date	Time	Auto id	Pulses	Manual id
16/06/2020	22:15:21	Soprano pipistrelle	14	Soprano pipistrelle
16/06/2020	22:16:43	Common pipistrelle	11	Common pipistrelle
16/06/2020	22:17:21	Noid	2	Common pipistrelle
16/06/2020	22:22:06	Common pipistrelle	18	Common pipistrelle
16/06/2020	22:24:40	Leisler's bat	2	Leisler's bat
16/06/2020	22:25:00	Leisler's bat	2	Leisler's bat



Plate 1: Oak tree soprano pipistrelle roost



Plate 2: Old sheds within the site that were checked for bats.

There is no evidence of roosting bats current or historical. These shall be re-examined prior to demolition.



Plate 3: Roost options close to the site

The bridge has no roosting potential as it has been fully re-pointed / skimmed.



Plate 4: Trees with roost potential including an oak tree that will be removed, a beech tree as well as feeding areas such as the willow scrub shown.



Plate 5: The river showing problems of litter disposal within the water.

The first image is a partial spraint on the rocks. This was a fragment and may be either otter or mink but is more probably otter.



Plate 6: Bridge closest to the site and evidence of high-water levels in winter 2020/21