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Moore Land, Collin Lane, Willersey.
Bat Activity Surveys

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Notice to readers:

The results of the survey and assessment work undertaken by All Ecology are representative at the time of surveying.

Every endeavour has been made to identify the presence of protected species on site, where this falls within the agreed scope of works.

The flora and fauna detailed within this report are those noted during the field survey and from anecdotal evidence. It should not be viewed as a complete list of flora and fauna species that may frequent or exist on site at other times of the year.

Up to date standard methodologies have been used, which are accepted by Natural England and other statutory conservation bodies. No responsibility will be accepted where these methodologies fail to identify all species on-site.

All Ecology cannot take responsibility where Government, national bodies or industry subsequently modify standards.

All Ecology cannot accept responsibility for data collected from third parties.

Reference to sections or particular paragraphs of this document taken out of context may lead to misrepresentation.

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1.0 Introduction

Background

- 1.1 All Ecology was commissioned to undertake bat activity surveys of part of a site known as Moore Land, Collin Lane, Willersey, Broadway, Gloucestershire, WR12 7PE (Grid Ref: SP 1015 3978). The site is comprised of a grassland field which, at the time of the survey, was being grazed by a small number of cattle and sheep. Apart from the main gated entrance in the south-west corner and another gateway to the adjoining field in the south-east corner, it is primarily surrounded by species-poor hedge and species-poor hedge and trees, plus several small areas of scrub and a small number of mature trees. Two small dilapidated wooden buildings flank the main entrance. One is overgrown with ivy and the other fronted by tall ruderal species. A small ditch with trickling water runs the length of the east boundary between the grassland and hedgerow. The site is surrounded primarily by other agricultural land, with the exception of a small number of dwellings to the northeast.
- 1.2 The site is the subject of a planning application for a new housing development, which will result in the loss of the poor semi-improved grassland that covers the majority of the site. The boundary vegetation would be retained with the exception of a section of the eastern perimeter hedge, which is to be permanently removed to allow for a new access road to the new development to be created.
- 1.3 Although the site as a whole is considered to be poor for bats, the hedgerows and trees and scrub edges are likely to be used by various species of foraging and commuting bats. As a new access point is proposed that will create a permanent gap in the eastern perimeter hedge, a bat activity survey was deemed necessary in order to establish the importance of this stretch of hedgerow for bats and enable a suitable mitigation strategy to be devised. Given the nature and location of this hedge, the potential for it to be important for bats was regarded as low and any significant value for bats would be associated with use by any significant roosts in the vicinity rather than for bats moving through the landscape in general. In accordance with the Bat Conservation Trust 'Bat Surveys for Professional Ecologists: Good Practice Guidelines' (Collins, 2016), for sites where habitat is classed as low, one survey visit in each of spring, summer and autumn is usually required. In this instance, the spring survey window was missed so an additional survey was carried out in summer (see Methodology section for the justification of deviation from the guidelines).
- 1.4 The aims of the surveys were to establish the following:
 - Which bat species are utilising areas of the site in question.
 - Level of bat activity and determine the presence of important feeding areas and flight corridors.
 - Which type of mitigation measures would need to be employed.

Site Location



Surveyed Hedge Location



2.0 Legislation and Status

2.1 All species of bat are listed on Schedule 5 of The Wildlife and Countryside Act (1981) and as such receive protection under Section 9 of this Act. This has been amended several times, most recently by the Countryside and Rights of Way Act 2000, which added 'or recklessly' to Section 9(4) (a) and (b). In summary, it is a criminal offence to.

- intentionally kill, injure or take a wild bat
- be in possession of, or control, any live or dead wild bat or part of, or anything derived from a wild bat
- intentionally or recklessly damage, destroy or obstruct access to any place that a wild bat uses for shelter or protection
- intentionally or recklessly disturb any wild bat whilst it is occupying a structure or place that it uses for shelter or protection
- transport for sale or exchange, or offer for sale or exchange a live or dead bat or any part of a bat.

2.2 The Conservation of Habitats and Species Regulations 2010, consolidate all the various amendments made to the Conservation (Natural Habitats, &c.) Regulations 1994, in respect of England and Wales. It is an offence to possess, sell or offer or transport for sale any European species of bat or any part derived from such a species. These Regulations also remove the 'incidental result defence'. In other words, it is no longer a defence to show that the killing, capture or disturbance of a species covered by the Regulations or the destruction or damage of their breeding sites or resting places was the incidental and unavoidable result of a lawful activity. Natural England can grant European Protected Species (EPS) licenses in respect of development to permit activities that would otherwise be unlawful.

2.3 Under Section 40 of the Natural Environment and Rural Communities Act (2006) public bodies, including Local and Regional Planning Authorities have a duty to 'have regard' to the conservation of biodiversity in England when carrying out their normal functions, which includes consideration of planning applications. In compliance with Section 41 of the Act, the Secretary of State has published a list of species considered to be of principal importance for conserving biodiversity in England. This is known as The England Biodiversity List, all of which make up the NERC Priority Species. Regional Planning Bodies and Local Planning Authorities will use it to identify the species that should be afforded priority when applying the requirements of the National Planning Policy Framework (NPPF) to maintain, restore and enhance species and habitats.

2.4 Seven bat species are NERC Priority Species (JNCC, 2017). These are:

- Barbastelle *Barbastella barbastellus*
- Bechstein's *Myotis bechsteinii*
- Noctule *Nyctalus noctula*
- Soprano Pipistrelle *Pipistrellus pygmaeus*
- Brown Long-eared *Plecotus auritus*

- Greater Horseshoe *Rhinolophus ferrumequinum*
- Lesser Horseshoe *Rhinolophus hipposideros*

2.5 Greater Horseshoe, Lesser Horseshoe, Barbastelle and Bechstein's, are afforded greater protection under European legislation, being listed under Annex II of the EC Habitats Directive which lists species whose conservation requires the designation of Special Areas of Conservation (SACs).

3.0 Methodology

Field Survey

- 3.1 The surveys were carried out in general accordance with the Bat Conservation Trust Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016).
- 3.2 For the purposes of the survey, the hedge in question were classed as being of low quality due to the relatively low cut nature of the hedge and its poor connectivity into the wider landscape. In accordance with the Bat Conservation Trust 'Bat Surveys for Professional Ecologists: Good Practice Guidelines' (Collins, 2016), for sites where habitat is classed as low, one survey visit in each of spring, summer and autumn is usually required. However, spring had already passed by the time the need for the surveys had been determined and instead an additional survey was carried out in summer. This enabled a satisfactory assessment of the site to be carried out as the nature and location of the site is such that any importance of foraging and commuting habitats would be associated with the potential for nearby maternity roosts rather than seasonal changes or movements of bats through the wider area.
- 3.3 The size and nature of the survey area meant that it could be sufficiently covered by two surveyors walking a single transect. The hedge was subject to a dusk and dawn survey on the 6th/7th July 2017, and dusk surveys on the 14th August and the 20th September 2017
- 3.4 The manual dusk surveys began just before sunset and continued for at least three hours after sunset. A minimum of 10 completed circuit of the transect were carried out on each visit with the surveyors beginning at different points for each visit to reduce the likelihood of any survey bias.
- 3.5 Two automated detectors were placed along the transect in two locations and data collected for the minimum five days recommended by the guidelines, although this was exceeded on every occasion.
- 3.6 Automated surveys began/ended to coincide with visits to carry out manual surveys. Automated surveys therefore took place from the:
 - 6th July to the 12th July 2017
 - 14th August to the 21st August 2017
 - 20th September to the 28th September 2017
- 3.7 The surveyors were initially equipped with Echo Meter Touch 2 Pro bat detectors. Registrations were recorded on the devices and notes were made on species recorded, behaviour, time of registration, location and direction of flight where possible, including incidental observations from surrounding habitats. Where it was not possible to identify a bat species on site, audio recordings were later analysed using Wildlife Acoustics' Kaleidoscope software. Automated surveys were carried out with one Wildlife Acoustics Song Meters SM2BAT+ and one SM4BAT FS detectors; all microphones were calibrated prior to each use. Data was analysed using Kaleidoscope using the automated analysis feature as well as manual checks to confirm accuracy.

Assessment

- 3.8 The activity surveys are intended to give an indication of:
- Which bat species use the site.
 - The intensity and distribution of bat activity.
 - The type of activity such as foraging indicated by characteristic 'feeding buzzes' (attempts at prey capture), commuting, etc.

Personnel

- 3.9 The surveys were carried out by James Godbeer BSc Hons MCIEEM, an ecologist with over 10 years experience working as a consultant and an experienced bat surveyor. James has extensive experience of managing environmental contracts, and particular experience in surveying, assessment and mitigation for rare and protected species. He has considerable knowledge of the development and planning process including Ecological Impact Assessments, sustainable ecological design and he has completed ecology chapters of Environmental Statements. James holds a number of protected species licences including bats (all species, all counties, Class Licence Registration No. 2015-12313-CLS-CLS), and Great Crested Newts (Class Licence Registration No. 2016-20363-CLS-CLS). He has successfully obtained European Protected Species mitigation licences for a number of bat species including Lesser Horseshoe, Greater Horseshoe, Serotine, Brown Long-eared, Common Pipistrelle and Natterer's bats, for a number of roost types including maternity and hibernation sites.

Limitations

- 3.10 The surveys began in summer instead of spring for the reasons given above and given the low levels of activity over the course of the survey, which took place over the majority of the optimal period, any effect on the overall quality of the data is expected to be minimal and the conclusions drawn valid.
- 3.11 Each survey visit only provides a 'snapshot' of the overall use by bats over the course of part of a year. Multiple visits and automated surveys are carried out in order to increase the confidence in the overall assessment of the site but it is possible that larger numbers of bats are utilising it than those recorded.

4.0 Results

Activity Survey Results

Automated activity surveys

- 4.1 During the automated surveys the following species were recorded on each of the detectors. The percentages are illustrative and do not provide a reliable comparison of activity between species due to relative population sizes, call strength and other factors such as attenuation etc.

Detector 1

- Common Pipistrelle – 243 recordings – 63.78%
- Noctule – 102 recordings – 26.77%
- *Myotis* sp. – 17 recordings – 4.46%
- Not identifiable – 19 recordings – 4.99%

Detector 2

- Common Pipistrelle – 347 recordings – 69.26%
- Noctule – 96 recordings – 19.16%
- *Myotis* sp. – 37 recordings – 7.39%
- Not identifiable – 21 recordings – 4.19%

Manual activity surveys

- 4.2 The following species were recorded over the course of the manual activity surveys:

- Common Pipistrelle – 28 recordings – 66.67%
- Noctule – 5 recordings – 11.90%
- *Myotis* sp. – 4 recordings – 9.52%
- Not identifiable – 5 recordings – 11.90%

- 4.3 The July dusk survey recorded activity of occasional foraging passes by Common Pipistrelle bats and Noctules over the adjacent field to the east. Activity was minimal with only 14 recordings of one, possibly two Common Pipistrelles, making sporadic passes and seen foraging along the hedges extending to the west from each end of the surveyed hedge. The earliest Noctule was recorded between seven minutes after sunset. The pipistrelle activity began between 42 minutes after sunset, continuing sporadically throughout the remainder of the surveys. No other species were recorded during this survey.

- 4.4 The July dawn survey recorded three brief foraging passes by Common Pipistrelle, the last of which was heard at 48 minutes before sunset.

- 4.5 The August survey recorded seven foraging passes by Common Pipistrelles at each end of the hedge where it meets other hedges and trees, the earliest being at 39 minutes after sunset. No

activity was recorded along the hedge itself. Four recordings of the same foraging Myotis bat were made at the north edge of the hedge between 48 and 49 minutes after sunset.

- 4.6 The September survey recorded three foraging passes by a Common Pipistrelle towards the north end of the hedge between 34 and 42 minutes after sunset, and a single recording along over the area of tall ruderal vegetation adjacent to the hedge extending along the south boundary of the site at 48 minutes after sunset.
- 4.7 Refer to Plan 1 for a graphical representation of the results.
- 4.8 The following table presents the sunset and sunrise times, and weather conditions encountered during the manual surveys.

Table 1: Sunset and sunrise times, and weather conditions.

Date	Temperature (°C)	Sunset/Sunrise Times	Wind	Cloud Cover (%)
06/07/17 (dusk)	17-15	21:28	light	30
07/07/17 (dawn)	14	04:57	light	60
14/08/17 (dusk)	16-15	20:33	light	70
20/09/17 (dusk)	14	19:10	light	80

5.0 Evaluation

Activity Surveys

- 5.1 The manual surveys recorded sporadic foraging of low numbers of Common Pipistrelle with only occasional recordings of Noctule and a *Myotis* species. During the automated and manual activity surveys, two confirmed species of bat were recorded on or close to the site: Common Pipistrelle and Noctule. A small number of registrations of *Myotis* species were recorded during the surveys although the species could not be conclusively identified.
- 5.2 A total of 618 recordings of Common Pipistrelle were made over the course of the surveys. Pipistrelle bats are the most common species of bat in the UK with widespread distributions, most commonly found in England and Wales; Pipistrelle bats exploit a wide range of habitats (BCT, 2010). The levels of activity along the hedge were below what would be expected for an important foraging area and there was no indication of the hedge being important for commuting bats.
- 5.3 A total of 203 recordings of Noctule were made over the course of the surveys although the majority of these are likely to have been the same bat or bats picked up by multiple detectors. Noctules tend to feed over habitats rich in invertebrate fauna such as permanent pasture, woodland edge and hedgerows. It is still a relatively widespread species in much of England, Wales and to southwest Scotland, but has become scarce in some areas of intensive agriculture (BCT, 2010a). The number of registrations of this species is not considered to be significant and the majority will have been of bats foraging overhead, well above the site, and in the surrounding areas.
- 5.4 A total of 58 recordings of *Myotis* species were made over the course of the surveys. Distribution of *Myotis* species is variable and species dependant. Daubenton's are found throughout the UK; Natterer's are also found across the UK, except northern Scotland, wherever there is suitable woodland; Whiskered/Brandt's bats are found throughout England, Wales, southern Scotland and parts of Northern Ireland although little is known about their individual distributions; ; Alcahoie bats have only been identified relatively recently due to their similarity to Whiskered/Brandts and little is known about their distribution. Bechstein's have a limited distribution, only found in southern England, Shropshire and occasionally in Wales. These species typically forage and commute throughout the following habitats during the summer months (BCT, 2010b, 2010c, 2010d, 2010e, 2010f);
- Daubenton's – Hunts close to the surface of slow-moving or calm water. Will also forage in trees or along woodland rides, especially if these are associated with water.
 - Natterer's – Hunts in tree canopies or close to foliage and by edges of water although at a higher level than Daubenton's bat.
 - Whiskered/Brandt's – Whiskered bats forage in a wide range of habitats including parkland, woodlands, flowing water and suburban gardens. Brandt's bat forage more in woodlands and close to water bodies.
 - Bechstein's – Forages in areas of closed-canopy woodland close to water. It will also forage along overgrown hedgerows and tree lines.

- 5.5 Taking into account the distributions and above preferred foraging and commuting habitats, in the absence of water bodies the activity could be attributed to mainly Whiskered bats although this cannot be predicted with certainty. There are variations in the calls of *Myotis* bats but they are often very similar and dependent on the types of habitats being used. Calls within or close to cluttered environments are particularly difficult to differentiate; sound analysis of the calls was inconclusive. However, the minimal level of activity suggests that this part of the site is of low conservation significance for these species.

Site Status Assessment

- 5.6 The results of the surveys would appear to indicate that the hedge and adjacent parts of the connecting hedges are visited by a small number of species for mainly foraging activity. No important commuting routes have been identified with the majority of the activity attributed to bats foraging along these habitats. There are no roosting opportunities for bats and the levels of activity were not indicative of a nearby maternity roost of bats using the site for commuting and significant foraging.
- 5.7 The species recorded are common species that would be expected to be present. No notable species or areas of significant activity were noted and overall the hedge does not appear to be important for bats.

6.0 Impacts and Recommendations

Impacts

- 6.1 The site is the subject of a planning application for a new housing development, which will result in the loss of the poor semi-improved grassland that covers the majority of the site. The boundary vegetation would be retained with the exception of a section of the eastern perimeter hedge, which is to be permanently removed to allow for a new access road to the new development to be created.
- 6.2 In the absence of any consideration or mitigation for bats, the following potential impacts with respect to the bats currently using the hedge for foraging and commuting have been identified:
- Permanent loss of a section of hedge resulting in the severance of a linear feature deemed to be of low potential for bats. Based on the activity recorded, this is regarded as being a minor adverse impact.
 - Temporary and permanent disruption of areas of bat foraging habitat on the retained site boundaries through unsympathetic use of lighting. Unknown impact but impacts can be mitigated without the need for surveys of these areas.
 - Construction of new buildings and gardens creating sheltered areas for foraging. Moderate beneficial impact provided lighting is appropriate.
 - Provision of roosting features in buildings. Major beneficial impact.

Further Surveys

- 6.3 No further surveys are required at this time. Sufficient surveys have been carried out to satisfy the survey effort and repeat surveys would not be required unless the proposals are delayed by two years or more.

Provision for Bats

- 6.4 The proposals for the site will inevitably result in the short term loss of foraging habitat for the species recorded on site during the surveys. However, based on the results of the present surveys and the nature of the habitats on site, no significant negative impact on the conservation status of these species is predicted provided the following recommendations are implemented to maximise the potential for biodiversity gains within the development.
- 6.5 Overall, there is an availability of similar foraging habitats in the surrounding area and the most important habitats on site (the boundary hedges) will be retained; the new development is not expected to cause any significant fragmentation of these habitats as sufficient surrounding vegetation will be retained around the development.
- 6.6 No significant commuting routes were identified but it will be essential to ensure that an appropriate lighting scheme is put in place to ensure that adjacent off site and boundary vegetation remains suitable for bats, particularly the more light sensitive species such as long-eared bats, horseshoe bats and *Myotis* species which may be present around the remainder of the site, particularly the northwest boundary hedges and tree lines, which connect into the

wider area. External lighting should be kept to minimum in line with current best practice and should not exceed minimum requirements. It should include the use of column lighting, with full cut-off directional shielding to ensure that lighting is directed only where required and light spill into adjacent areas and skyglow is minimized. Low-UV lights with a wavelength of 590 nm (warm LED) should be used to minimise direct and indirect impacts to bats. The retained part of the hedge, and the remaining boundary hedges, should be left unlit as far as it is possible.

- 6.7 Where the section of hedge is to be removed along the east boundary, it is recommended that trees within the hedge either side of the gap be allowed to increase in height or ideally allow standard trees to mature to minimise the impact of the hedge removal; however, given the relatively limited activity associated with the hedge, this recommendation is precautionary only. The retained boundary vegetation around the site is to be maintained to provide suitable foraging and commuting habitats around the site. The new residential gardens and landscaping works, are expected to provide new foraging opportunities for bats in addition to the retained boundary hedges.
- 6.8 In order to generally enhance the development for roosting bats, it is recommended that a number of bat tubes be installed in the new buildings throughout the development. Bats are very particular about the internal conditions of bat boxes, so by providing several bat boxes with different aspects creates differences in temperature, humidity etc. thereby increasing the chance of colonisation.

Timing of Works

- 6.9 There are no timing constraints for the proposed development as no significance is attached to the results of the present survey and there is no potential for roosting bats on site. However, it is recommended that any vegetation removal and ongoing tree and hedge maintenance works be carried out outside the bird-nesting season of March to August. Works during this time should not commence until a suitably qualified ecologist has carried out a nesting bird survey. If any active nests are discovered then the nest and surrounding habitat must be left undisturbed until the young have fledged.

Care and Vigilance during Works

- 6.10 When carrying out ongoing tree maintenance works, the following procedures should be employed in the unlikely event a bat or bats are discovered:
- If the roost is still on the tree and bats are not injured, seek advice from a licensed ecologist. If help is not available, allow bats to fly out of harm's way.
 - If the timber is felled, the roost is not exposed and the bats are not injured, temporarily seal and isolate the roost and seek advice from a licensed ecologist. If advice is not readily available, position the roost off the ground, re-open it and allow bats to relocate of their own accord.
 - If the roost has been exposed, and especially if bats have been injured, collect bats in a secure box or bag (using a glove) and contact a licensed ecologist.
 - Note the date, locality, type of tree, situation in tree and bat species if known.

7.0 References

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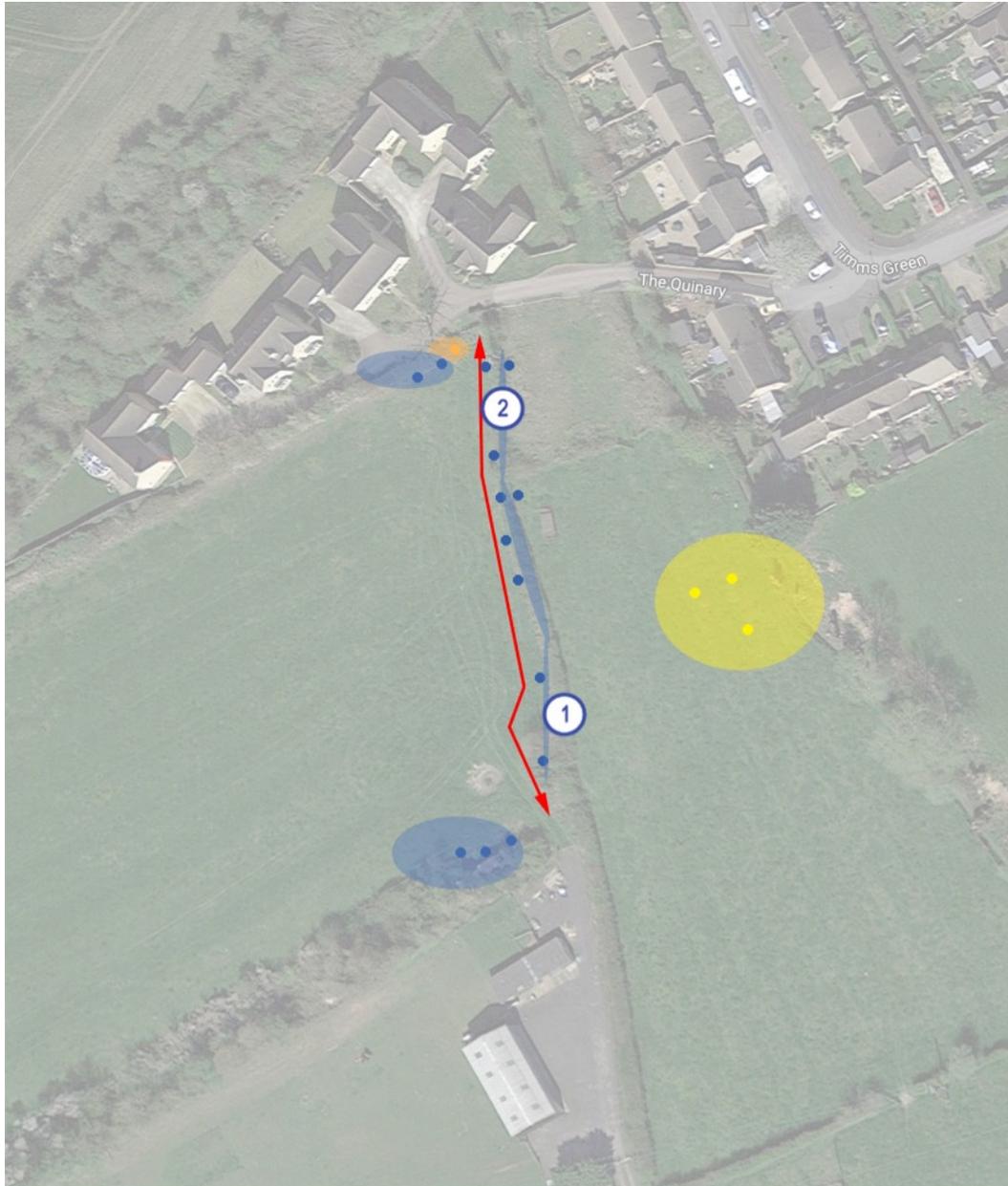
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8.0 Plans

Plan 1 - Bat Activity Survey Results (Indicative)



Key

- Pipistrelle sp recording location and observed activity ●
- Noctule recording location and observed activity ●
- Myotis recording location and observed activity ●
- Automated detector ○
- Transect →