

A30 Chiverton to Carland Cross Improvement Scheme Environmental Statement

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A30 CHIVERTON CROSS TO CARLAND CROSS

BAT ACTIVITY SURVEY REPORT

CONFIDENTIAL

February 2018

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Highways England

**Final
Confidential**

Project no:
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1 INTRODUCTION

1.1 OVERVIEW

- 1.1.1 WSP was commissioned by Highways England to undertake ecological surveys in respect of the proposed A30 Chiverton to Carland Cross Improvement Scheme (hereafter referred to as 'the proposed Scheme'). Surveys were required in order to inform an Ecological Impact Assessment (EclA) forming part of an Environmental Statement (ES) supporting a Development Consent Order (DCO) Application for the proposed Scheme.

1.2 SITE CONTEXT AND ECOLOGICAL BACKGROUND

- 1.2.1 The A30 is a major trunk road running through the centre of Cornwall from West to East. The A30 forms an important route through the county of Cornwall and is under pressure during the summer months due to the high volume of tourism-related traffic. The section of road between Chiverton and Carland Cross is a traffic pinch point, where the dual carriageway narrows to single carriageway in both directions between two roundabouts. The single carriageway sits between grid references SW 74759 46978 at the western end and SW 84665 53957 at the eastern end.
- 1.2.2 The presence of habitat considered suitable to support roosting, foraging and commuting bats was identified during a Phase 1 Habitat Verification Survey conducted on 6th August 2015¹. In addition, the desk study undertaken as part of the report confirmed the presence of roosting bats within 10 km of the current A30 (the search area). As such, a suite of bat surveys was recommended to understand how bats were using the surrounding habitat and to inform suitable mitigation associated with the proposed Scheme.

1.3 BRIEF AND OBJECTIVES

- 1.3.1 The objective of this report is to identify the bat species composition, relative abundance, key areas of bat activity, including important bat habitats and flight paths. The survey results will be used to inform measures to mitigate any potentially adverse effects on local bat populations. The mitigation measures will be detailed within the subsequent ES that accompanies the DCO Application.
- 1.3.2 Bat activity surveys undertaken in 2016 and 2017 consisted of the following surveys:-
- à **Bat activity transect surveys (2016)** were undertaken to assess the bat species assemblage and distribution of bat activity within the survey area, identify important habitat types and features for commuting and foraging bats. The results informed the requirement for crossing point surveys;
 - à **Bat static automated surveys (2016)** were undertaken to supplement the transect surveys and provide long-term quantitative monitoring data. The results informed the requirement for crossing point surveys;
 - à **Crossing point surveys (2016 and 2017)** were undertaken to identify any important bat commuting and foraging linear features that will be directly severed by the proposed Scheme¹⁰. The surveys were designed to be repeatable following construction in order to provide comparable results to facilitate the monitoring of the effectiveness of any mitigation

¹ WSP | Parsons Brinckerhoff (2015), A30 Carland Cross to Chiverton Cross Phase 1 Habitat verification Survey. Prepared on behalf of Highways England.

strategies.

- à **Landscape scale transect surveys (2017)** were undertaken in order to comply with current best practice¹⁰ and as agreed with Natural England¹¹ to provide a pre-construction baseline of bat activity and diversity on a landscape scale¹⁰. The surveys were designed so that they could be replicated during- and post-construction to facilitate the on-going collection of comparable data during the phases of development in order to determine the impact of the proposed Scheme at a landscape scale.

1.3.3 It should be noted that bat roosting surveys are reported within a separate document. The results of these surveys and initial analysis have been included within this report where applicable.

1.4 BAT ECOLOGY

1.4.1 As a result of the differences in flight behaviour and ability or willingness to cross gaps, the level of risk posed by a new road will differ significantly for a number of species. However, many bat species have similar hunting behaviour and flight characteristics due to the fact that they occupy similar ecological niches. These similarities mean that the risks and mitigation required for species with similar ecological niches are broadly the same.

1.4.2 For the purposes of this report the bats recorded have been classified as cluttered habitat; edge habitat or open habitat species with the flight characteristic assumptions as shown in Table 1.4.1.

Table 1.4.1: Ecological niche and general characteristics of bat species

ECOLOGICAL NICHE	SPECIES	ABBREVIATION	FLIGHT SPEED	WILLINGNESS TO CROSS GAPS AND OPEN HABITAT ²	FLIGHT HEIGHT ³	LIGHT TOLERANCE ⁴⁵
Cluttered habitat adapted species	<i>Myotis</i> species -Daubenton's bat (<i>Myotis daubentonii</i>) -Whiskered bat (<i>Myotis mystacinus</i>) -Brandt's bat (<i>Myotis brandtii</i>) -Alcathoe bat** (<i>Myotis alcathoe</i>) -Natterer's bat (<i>Myotis nattereri</i>) -Bechstein's bat** and * (<i>Myotis bechsteini</i>)	<i>Myotis</i> species	Slow	Least willing to cross gaps and open ground	Generally fly close to linear features, when crossing open habitat will usually fly close to the ground	Least tolerant of light. Artificial lighting may present a barrier to these species ⁴
	<i>Plecotus</i> species Brown long-eared bat (<i>Plecotus auritus</i>)	<i>Plecotus</i> species				

² Frey-Ehrenbold A., Bontadina F., Arlettaz R., Orbist M. K. (2013) Landscape connectivity, habitat structure and activity on bat guilds in farmland-dominated matrices. *Journal of applied Ecology*, **50**, 252,-261.

³ Russ J (2012) British Bat Calls: A Guide to Species Identification. Pelagic Publishing, UK

⁴ Stone, E. L., Jones, G. & Harris, S. (2012) Conserving energy at a cost to biodiversity? Impacts of LED lighting on bats. *Global Change Biology*, **18**, 2458-2465.

⁵ Stone, E.L. (2013) Bats and lighting: Overview of current evidence and mitigation guidance

ECOLOGICAL NICHE	SPECIES	ABBREVIATION	FLIGHT SPEED	WILLINGNESS TO CROSS GAPS AND OPEN HABITAT ²	FLIGHT HEIGHT ³	LIGHT TOLERANCE ⁴⁵
	and grey long-eared bat** (<i>Plecotus austriacus</i>)					
	Lesser horseshoe bat* (<i>Rhinolophus hipposideros</i>)	Rhip				
	Greater horseshoe bat* (<i>Rhinolophus ferrumequinum</i>)	Rfer				
Edge habitat adapted species	Common pipistrelle bat (<i>Pipistrellus pipistrellus</i>)	Ppip	Medium	Will regularly cross small and medium sized gaps	Typically tend to fly 10 m off the ground / linear features	Light tolerant, will often predate insects drawn to light.
	Soprano pipistrelle (<i>Pipistrellus pygmaus</i>)	Ppyg				
	Nathusius' pipistrelle bat (<i>Pipistrellus nathusii</i>)	Pnat				
	Serotine bat (<i>Eptesicus serotinus</i>)	Eser				Least tolerant of light. Artificial lighting may present a barrier to this species
	Barbastelle bat* (<i>Barbastella barbastellus</i>)	Bbar				
Open habitat adapted species	Noctule bat (<i>Nyctalus noctula</i>)	Nnoc	Fast	Open habitat does not present a problem for these species	Usually fly high > 10 m above open habitat	Light tolerant, will often predate insects drawn to light.
	Leisler bat (<i>Nyctalus leisleri</i>)	Nlei				

*Bat species listed within Annex II under the EC Habitats Directive, for which Special Areas of Conservation are designated as a mechanism for protection of these species 6.

**These bats have not been recorded with Cornwall, and are considered to be absent from the survey area.

⁶ http://jncc.defra.gov.uk/ProtectedSites/SACselection/SAC_species.asp:- Accessed:- 09/10/2017

1.5 LEGISLATION

- 1.5.1 All UK bat species are included in Annex IV of the EC Habitats Directive which is transposed into UK law under Schedule 2 of the Conservation of Habitats and Species Regulations 2010 (as amended) which defines 'European protected species of animals'. This legislation is commonly referred to as the 'Habitats Regulations'. Barbastelle, Bechstein's bat, greater horseshoe bat and lesser horseshoe bat are also listed on Annex II of the Habitats Directive, which means that Special Areas of Conservation (SAC) may be attributed to internationally important roosts and foraging areas of these species.
- 1.5.2 All 18 native UK bat species also receive partial protection under Schedule 5 of the Wildlife and Countryside Act 1981 (WCA) (as amended). The Countryside and Rights of Way Act 2000 (CRoW) has amended the WCA in England and Wales and this act adds additional enforcement.
- 1.5.3 Together this legislation makes it illegal to:
- à Deliberately kill, injure or capture bats;
 - à Deliberately disturb bats whether in a roost or not, disturbance includes anything that is likely to impair their ability to survive, breed, reproduce or rear their young, or impair their ability to hibernate or migrate;
 - à Intentionally or recklessly disturb roosting bats or obstruct access to their roosts;
 - à Damage or destroy a bat roosting place (even if bats are not occupying the roost at the time);
 - à Possess or transport a bat or any part of a bat unless acquired legally; and
 - à Sell or exchange bats, or parts of bats.
- 1.5.4 Certain bat species are also 'Species of Principal Importance (SPIs) for the purpose of conserving biodiversity under Section 41 (England) of the NERC Act (2006). These species need to be taken into consideration by a public body when performing any of its functions. The bat SPIs are: greater horseshoe bat; lesser horseshoe bat; Bechstein's bat; noctule; soprano pipistrelle; brown long-eared bat; and barbastelle.

2 METHODS

2.1 OVERVIEW

2.1.1 The survey methodology follows current best practice guidance⁷, and relevant sections of the Design Manual for Roads and Bridges (DMRB)^{8,9}. The survey methodologies were broadly in line with the new best practice methodology for surveying linear infrastructure¹⁰, except where deviations were necessary. These are detailed where applicable. Consultation was undertaken with Natural England whereby the proposed survey methodology was agreed¹¹.

2.2 DESK STUDY

2.2.1 As part of the Phase 1 Verification Report a desk study was undertaken to collate all records of bats within 10 km of the existing A30 over the past ten years, in accordance with current best practice^{9,7}. Data was also collected from previous survey work for Carland Cross Wind Farm located immediately adjacent to the proposed Scheme¹².

2.2.2 Data was collected to identify any non-statutory designated sites within 2 km of the existing A30 between Chiverton Cross and Carland Cross that has been designated for bats / contains bats within the citation. This was extended to 10 km for national statutory designated sites. The search area was extended to a 30 km search radius for SACs where bats are the qualifying interest in accordance with the DMRB¹³ and based on the proposed Scheme's potential zone of influence on bats¹⁴.

2.2.3 The following sources were consulted to obtain desk data:

- à Multi-Agency Geographic Information for the Countryside (MAGIC)¹⁵;
- à Environmental Records Centre for Cornwall and the Isles of Scilly (ERCCIS);
- à Cornwall Bat Group;
- à Arcus Renewable Energy (2008) Carland Cross Windfarm Repowering, Environmental Statement. Prepared on behalf of Scottish Power Renewables; and
- à BSG Ecology (2015) Carland Cross Wind Farm Bat Monitoring Report 2014. Prepared on behalf of Scottish Renewables.

2.2.4 The bat records received from ERCCIS and Cornwall Bat Group were limited to a resolution of 1 km square. As such; it was not possible to determine accurate distances of bat records from the

⁷ Collins, J. (ed) (2016) Bat Surveys for professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London.

⁸ Interim Advice Note 116/08 Nature conservation in relation to bats

⁹ Anon (1999) *Design Manual for Roads and Bridges, Volume 10: Environmental Design and Management, Section 4: Nature Conservation, Part 3 HA 80/99 Nature Conservation Advice in Relation to Bats*. Highways Agency.

¹⁰ Berthinussen & Altringham (2015) WC1060 'Development of a cost-effective method for monitoring the effectiveness of mitigation for bats crossing linear transport infrastructure'

¹¹ Email from Katherine Walsh (NE) to Hannah Broughton (WSP) dated 2nd February 2017

¹² BSG Ecology (2015) Carland Cross Wind Farm Bat Monitoring Report 2014. Prepared on behalf of Scottish Renewables.

¹³ DMRB volume 11 section 4 (2009) assessment of implications (of highways and/or roads projects) on European sites (including appropriate assessment) HD 44/09

¹⁴ As defined by CIEEM (2016) 'the area over which ecological features may be subject to significant effects as a result of the proposed project and associated activities'. This takes into account that the ZoI may vary within a species group, the lifecycle/activity of the bat, and for given development activities. It also recognises that the ZoI is reviewed and refined as the project progresses

¹⁵ <http://www.natureonthemap.naturalengland.org.uk/>:- Accessed 2016

proposed Scheme.

2.3 FIELD SURVEY

2.3.1 The habitat suitability for bats varied throughout the survey area from low bat suitability (e.g. large intensively managed arable fields with grass-topped Cornish hedgerows as field boundaries) to high bat suitability (e.g. woodland edges, pasture fields with hedgerows and marshy grassland). In order to standardise the surveys, provide comparable results, the survey area of the proposed Scheme as a whole was assessed as being of moderate habitat suitability to support commuting and foraging bats. The survey effort reflects this, whereby each walked bat activity transect was repeated a minimum of once a month between May and September, with a minimum of two automated static detector sampling points being set up per transect as per best practice⁷.

BAT ACTIVITY TRANSECT SURVEYS

2.3.2 The survey area was split into five transects that were walked on consecutive nights, each transect was between 5.5-6 km and incorporated up to ten, five minute Point Count locations (Figure 2, Appendix A) apart from Transect 4, where a single Point Count location had to be amended and Point Count location omitted due to access (please refer to limitations).

2.3.3 Following a scoping walkover survey, the 2016 bat activity transect surveys were designed to follow the best practice guidance⁷ to sample a range of habitat types present throughout the survey area, although focusing on the habitats most likely to be impacted by the proposed Scheme¹⁶. The areas away from the proposed Scheme were surveyed to a limited degree to sample species in the local area which may be displaced by a road¹⁷ (Figure 2, Appendix A). Further landscape-scale surveys were undertaken within 2017 which provided the landscape scale baseline, these are described in detail below.

2.3.4 Each transect was surveyed monthly (in accordance with a moderate habitat suitability for bats, as detailed within 2.3.1⁷) between May and September 2016 inclusive. Each transect was walked once during each survey visit. All surveys were dusk transect surveys with a pre-dawn survey also completed in July and August 2016 within the same 24-hour period as the dusk survey. For each transect, the direction walked was varied throughout the year to reduce any sampling bias associated with the time of emergence and change in activity patterns throughout the night for each species.

2.3.5 Each dusk walked transect began approximately at sunset and continued for up to 200 minutes afterwards as detailed within current best practice⁷. The pre-dawn survey commenced approximately 200 minutes before sunrise and terminated at sunrise. Weather conditions were recorded at the beginning of each transect survey along with any significant changes as the survey progressed. Surveys were undertaken in dry conditions with temperatures at the start of the survey of 10°C or warmer (Appendix B).

2.3.6 During each transect, the surveyors noted the bat species recorded by sound or sight, including the time, location, and, where possible, behaviour type and direction of flight. At each Point Count the number of bat passes (and where possible the species and number of bats) were recorded, a summary of between Point Count activity was detailed on a map, including each species (where identifiable) recorded in each between-point-count location. Data was analysed from the Point Count locations only to ensure the provision of comparable quantitative data. Data obtained from between Point Counts was considered to be qualitative as per current best

¹⁶ In 2016 and early 2017, a number of Scheme options were under consideration; these included the proposed Scheme. It should be noted that although a wider survey area was included in the bat surveys, for the purpose of relevance within this report, reference is made to the proposed Scheme only.

¹⁷ Berthinussen A. & Altringham J. (2012) *The effect of a major road on bat activity and diversity*. Journal of Applied Ecology. Vol 49 pages 82-89.

practice⁷. It was mapped and used to identify important foraging and commuting routes, although omitted from the analysis and inclusion within the activity counts.

2.3.7 Surveyors were equipped with Echo-Meter 3 and Echo-Meter Touch full spectrum detectors¹⁸ to identify and record bat activity. Bat activity registered by the bat detectors were recorded for later analysis using specialist computer software AnalookW v0.4.1.2¹⁹ details are provided in below within the Analysis section.

2.3.8 In the field, a 'bat pass' was defined as two or more bat calls in a continuous sequence, lasting for no more than 10 seconds. Each sequence or pass is separated by one second or more in which no calls are recorded. Where constant activity was recorded (i.e. the number of passes was too high to record), the number of bat passes was given a value of 30 (which assumed one pass every 10s per five minute Point Count).

2.3.9 Bat activity was standardised as the number of bat passes per minute, detailed below:

$$\text{Bat ppm} = \frac{\text{Total bat passes recorded at each Point Count}}{\text{number of minutes Point Count was surveyed}}$$

2.3.10 This enabled comparison between the different bat species recorded and the relative level of activity across the survey area. It should be noted that this survey type represents an index of bat activity at the Point Count locations. It is not a measure of bat abundance.

2.3.11 The starting locations, dates, times and full weather data for each transect is included in the summary table in Appendix B.

AUTOMATED DETECTOR SURVEY

2.3.12 Automated static bat detectors were used to supplement the bat activity transect data. A total of 15 static detectors (Song Meter 2 (SM2))²⁰ were deployed throughout the survey area, this equates to three SM2s per transect (Table 2.3.1). The automated static detector locations were selected using a stratified technique as per current best practice⁷ to sample the representative habitats throughout the survey area, focusing on linear features likely to be bisected by the proposed Scheme options (where access allowed)²¹. The sample points were located where the 2016 proposed Scheme options bisected the habitats, this information supplemented the transect survey data and informed the Crossing Point surveys. The automated static detectors were sited within the following locations (Figure 3, Appendix A).

¹⁸ Echo Meter 3 full spectrum detectors (Wildlife Acoustics Ltd., Massachusetts, USA)

¹⁹<http://www.titley-scientific.com/uk/downloads-support/firmware-software:-> Downloaded 15/12/2016

²⁰ Song Meter 2 (Wildlife Acoustics, Concord, Massachusetts, USA)

²¹ Including all other Scheme options considered during 2016.

Table 2.3.1: Static Detector Location and description of surrounding habitat

SM2	LOCATION (NGR)	HABITAT DESCRIPTION
A30_SM2_01	SW 74896 47305	Adjacent to a mature hedgerow and large arable field.
A30_SM2_02	SW 77429 48924	Adjacent to a blackthorn hedgerow that links to Callestick Vean.
A30_SM2_03	SW 79121 49497	Adjacent to a hedgerow and pasture field. The hedgerow is in a shallow depression at Nanteague Farm.
A30_SM2_04	SW 79921 50253	Adjacent to mature tree line within Marazan Farm Campsite.
A30_SM2_05	SW 80026 50379	Adjacent to mature tree line and access road located at Nancarrow Farm.
A30_SM2_06	SW 79911 50519	Along mature oak tree lined road leading towards Higher Ventongimps Farm.
A30_SM2_07	SW 80231 50687	Adjacent to Chyverton Farm woodland edge.
A30_SM2_08	SW 80653 50828	Adjacent to the underpass at Zelah.
A30_SM2_09	SW 81152 51509	Within a cow pasture field, near an area of marshy grassland.
A30_SM2_10	SW 81311 51801	Adjacent to a woodland edge.
A30_SM2_11	SW 81532 52225	Adjacent to Trevalso access road.
A30_SM2_12	SW 82575 52962	Adjacent to shallow gorge near Ventonteague.
A30_SM2_13	SW 83459 53298	Adjacent to hedgerow linking Deer Park Wood to the current A30.
A30_SM2_14	SW 84800 54178	Adjacent to hedgerow on the edge of the Carland Cross Wind farm.
A30_SM2_15	SW 77065 48651	Beech and sycamore woodland edge at Garvinack Break.

2.3.13 The Static detectors were programmed to collect data for a minimum of five consecutive nights per month between May and October 2016 as per current best practice⁷, where this was not achievable, it is stated within the limitations section. The automated detectors were set to commence recording 30 minutes before sunset and cease recording 30 minutes after sunrise.

2.3.14 Bat passes registered by the static bat detectors were recorded for later analysis using specialist computer software AnalookW v0.4.1.2¹⁹. Details are provided below within the Analysis section.

2.3.15 To allow standardisation and comparison of static detector survey results the number of bat passes recorded per hour (pph) was used as per current best practice⁷, as detailed below:

$$\text{Bat pph} = \frac{\text{Total bat passes recorded at a SM2 location}}{\text{number of hours SM2 surveyed}}$$

2.3.16 This standardisation of pph compensated for the changes in seasonal night length and as such available bat foraging time and varying survey length due to battery life, occasional equipment malfunction and external factors (such as vandalism and theft). The pph measurement allowed an un-biased comparison of static detector data.

2.3.17 Static detector surveys were standardised to the number of bat passes per hour unlike the bat activity transect surveys (standardised to bat passes per minute). This was to ensure useful figures (to an appropriate number of decimal places) were obtained within the results. This also ensured that the results for the transect surveys and automated static detector surveys were not confused, as these results were not considered, or, intended to be directly comparable due to the differences in detector sensitivity, survey period and objectives.

- 2.3.18 This standardisation enabled comparison between the different bat species recorded, the level of activity at each SM2 location and the level of activity recorded across the year. It should be noted that this survey type represents an index of bat activity at the SM2 locations. It is not a measure of bat abundance.
- 2.3.19 Microphones were tested at the start of the survey season, and calibrated following the third survey visit.
- 2.3.20 Further details regarding the analysis are detailed below within the Analysis sub-section.

CROSSING POINT SURVEYS

- 2.3.21 In addition to the activity transect and automated static detector surveys, and following confirmation of the proposed Scheme in 2017, Crossing Point surveys were undertaken at 14 locations along linear features to be directly affected and most likely to be used by bats. In addition to these 14 locations, three of the Crossing Point surveys that had commenced within 2016 were no longer necessary following the confirmation of the proposed Scheme in 2017 (these were Crossing Points 2, 5 and 8), as such, no further surveys were undertaken.
- 2.3.22 All surveys were undertaken in consideration of current best practice methodologies¹⁰ with all surveys being undertaken under suitable conditions, during acceptable times of the season between June-September, with the optimal time for surveys being June-August (please refer to Table 2.3.2 and Appendix B). The data was used to identify the likely important linear habitat features that may provide connective habitat for bats to use to forage and commute to areas within the wider landscape

Table 2.3.2: Dates of Crossing Point Surveys between 2016 and 2017

CROSSING POINT	VISIT 1	VISIT 2	VISIT 3	VISIT 4	VISIT 5	VISIT 6
1	22/07/2016	28/09/2016	12/06/2017	26/06/2017	11/07/2017	09/08/2017
2	23/08/2016	28/09/2016	Scoped Out Change in Scheme	Scoped Out Change in Scheme	Scoped Out Change in Scheme	Scoped Out Change in Scheme
3A	22/08/2016	28/09/2016	15/06/2017	10/07/2017	15/08/2017	23/08/2017
3B	22/08/2016	28/09/2016	15/06/2017	10/07/2017	15/08/2017	23/08/2017
3C	15/06/2017	10/07/2017	08/08/2017	Scoped Out <10 bats recorded to be using feature	Scoped Out <10 bats recorded to be using feature	Scoped Out <10 bats recorded to be using feature
4A	22/08/2016	27/09/2016	12/06/2017	26/06/2017	11/07/2017	14/08/2017
4B	22/08/2016	27/09/2016	12/06/2017	26/06/2017	11/07/2017	14/08/2017
5	23/08/2016	Scoped Out Change in Scheme	Scoped Out Change in Scheme	Scoped Out Change in Scheme	Scoped Out Change in Scheme	Scoped Out Change in Scheme
6	23/08/2016	27/09/2016	22/08/2016	24/08/2017	29/08/2017	30/08/2017
7	24/08/2016	28/09/2016	13/06/2017	12/07/2017	16/08/2017	06/09/2017
8	24/08/2016	29/09/2016	Scoped Out Change in Scheme	Scoped Out Change in Scheme	Scoped Out Change in Scheme	Scoped Out Change in Scheme
9	24/08/2016	28/09/2016	13/06/2017	12/07/2017	16/08/2017	17/08/2017

CROSSING POINT	VISIT 1	VISIT 2	VISIT 3	VISIT 4	VISIT 5	VISIT 6
10	13/06/2017	12/07/2017	16/08/2017	17/08/2017	22/08/2017	07/09/2017
11	25/08/2016	29/09/2016	14/06/2017	27/06/2017	13/07/2017	15/08/2017
12	25/08/2016	28/09/2016	14/06/2017	27/06/2017	13/07/2017	14/08/2017
13	25/08/2016	29/09/2016	14/06/2017	27/06/2017	13/07/2017	17/08/2017
14	09/08/2017	10/08/2017	Scoped Out <10 bats recorded to be using feature	Scoped Out <10 bats recorded to be using feature	Scoped Out <10 bats recorded to be using feature	Scoped Out <10 bats recorded to be using feature

2.3.23 In order to scope the potential Crossing Point survey locations, data was gathered from the bat activity transect surveys, automated static detector surveys, desk study information and using aerial photography. This approach was agreed with Natural England following consultation¹¹. Current guidance¹⁰ recommends undertaking an initial dusk and dawn survey of every potential bat commuting and foraging feature to scope it in or out of the full suite of surveys (consisting of six survey repeats). On the basis of the data gathered during 2016 and the large number of features within the proposed Scheme, it was not proportionate or necessary to undertake a dusk and dawn survey on all of the potential linear features to be directly bisected by the proposed Scheme. The rationale for scoping out features from the Crossing Point surveys is presented in Figure 3.A, Appendix A. The locations where Crossing Point surveys were undertaken is shown on Figure 3, Appendix A.

2.3.24 Following the scoping exercise, a total of 15 locations were identified as requiring further survey. This is proportionate and suitable for the type and scope of the proposed Scheme in accordance with current best practice¹⁰ and through consultation with Natural England¹¹. The surveys were focused on the important bat areas along the proposed Scheme, at linear features that provide connectivity between habitats within the wider landscape that are considered to be high suitability bat habitat¹⁰, and where bat activity levels and species diversity was generally highest. A summary of the Crossing Point locations and the justification for inclusion is provided in Table 2.3.3. Figure 3A (Appendix A) provides a commentary of the areas that have been scoped out.

Table 2.3.2-2: Criteria for scoping in the Crossing Point surveys

FEATURE (CROSSING POINT LOCATION)	GRID REFERENCE	CONNECTIVE FEATURE	CONNECTING HABITATS/ FEATURES IN THE WIDER LANDSCAPE	IS THE FEATURE BISECTED BY THE SCHEME?	BAT SPECIES RECORDED DURING STATIC / TRANSECT SURVEYS	CONSIDERED SUITABLE TO SCOPE IN FOR SURVEY
1	SW 75099 47544	Cornish hedgerow	Known common pipistrelle maternity roost to the north of feature. And Habitat to the south.	Yes	The static surveys undertaken within proximity recorded an activity level of 11.81 bat pph. Common pipistrelles were recorded along feature during the activity transects. Species recorded were, Common pipistrelle, soprano pipistrelle, Nathusius pipistrelle, <i>Myotis</i> , <i>Plecotus</i> , lesser horseshoe, greater horseshoe, barbastelle, noctule, Leisler's bat, and Serotine.	Yes
2	SW 77418 48908	Hedgerow with trees within a slight depression	Callestick Vean and Polvenna Wood County Wildlife Site (CWS) (known to support both lesser and greater horseshoes) to the north of the existing A30 And Woodland to the south of the existing A30.	No (scoped out in 2017). The 2016 results are included within the Appendix B.	The static surveys undertaken within proximity recorded an activity level of 16.37 bat pph. The transect surveys recorded an activity level of 0.51 ppm. Species recorded were, common pipistrelle, soprano pipistrelle, <i>Myotis</i> species, lesser horseshoe, greater horseshoe, barbastelle, noctule, Leisler's bat, and Serotine.	NA:- Scoped out following confirmation of proposed Scheme route
3A and 3B	SW 79052 49478 and SW 79094 49516	Hedgerows with trees within a slight depression surrounded by pasture land	Callestick Vean and Polvenna Wood CWS (known to support both lesser and greater horseshoes) to the north of the existing A30. And Allet Bog CWS (known to support both lesser and greater horseshoes) to the south of the existing A30.	Yes	The static surveys undertaken within proximity recorded an activity level of 2.47 bat pph. The transect surveys recorded an activity level of 1.71 ppm. Species recorded were, common pipistrelle, soprano pipistrelle, <i>Myotis</i> species, lesser horseshoe, noctule, Leisler's bat, and Serotine.	Yes

FEATURE (CROSSING POINT LOCATION)	GRID REFERENCE	CONNECTIVE FEATURE	CONNECTING HABITATS/ FEATURES IN THE WIDER LANDSCAPE	IS THE FEATURE BIASECTED BY THE SCHEME?	BAT SPECIES RECORDED DURING STATIC / TRANSECT SURVEYS	CONSIDERED SUITABLE TO SCOPE IN FOR SURVEY
3C	SW 78952 49390	Minor road with sparse Cornish hedge	Callestick Vean and Polvenna Wood CWS (known to support both lesser and greater horseshoes) to the north of the existing A30. And Allet Bog CWS (known to support both lesser and greater horseshoes) to the south of the existing A30.	Yes	The transect surveys recorded an activity level of 0.57 ppm. Species recorded along the feature were common pipistrelle, <i>Myotis</i> species, and Serotine.	Yes
4A and 4B	SW 79887 50245 and SW 79905 50264	Sheltered road with trees lining both sides And Line of mature trees	Woodland at Chyverton Woodland Cornwall Wildlife Trust (CWT) Reserve to the north of the existing A30. And Suitable foraging areas to the south in the form of marshy grassland.	Yes	The static surveys undertaken within proximity recorded an activity level of 2.47 bat pph. The transect surveys recorded an activity level of 1.71 ppm. Species recorded were common pipistrelle, soprano pipistrelle, <i>Nathusius pipistrelle</i> , <i>Myotis</i> species, lesser horseshoe, greater horseshoe, Barbastelle bat, noctule, Leisler's bat, and Serotine.	Yes
5	SW 79938 50468	Road to the north of the existing A30 with mature treeline on both sides of the road.	Woodland at Chyverton Woodland CWT Reserve to the north of the existing A30. And A known roost at Nancarrow Farm (species included lesser and greater horseshoe bats, common pipistrelle, Daubenton's bats, brown long-eared bats, and Natterer's bat) ¹⁵	No (Scoped out in 2017). The 2016 results are included within Appendix B.	The static surveys undertaken within proximity recorded an activity level of 21.52 bat pph. The transect surveys recorded an activity level of 0.4 ppm. Species recorded were common pipistrelle, soprano pipistrelle, <i>Myotis</i> species, lesser horseshoe, greater horseshoe, Barbastelle bat, noctule, Leisler's bat, and Serotine.	NA:- Scoped out following confirmation of preferred route

FEATURE (CROSSING POINT LOCATION)	GRID REFERENCE	CONNECTIVE FEATURE	CONNECTING HABITATS/ FEATURES IN THE WIDER LANDSCAPE	IS THE FEATURE BISECTED BY THE SCHEME?	BAT SPECIES RECORDED DURING STATIC / TRANSECT SURVEYS	CONSIDERED SUITABLE TO SCOPE IN FOR SURVEY
6	SW 80019 50386	Tree lined access road to known roost at Nancarrow Farm	Woodland at Chyverton Woodland CWT Reserve to the north of the existing A30. And A known roost at Nancarrow Farm (species included lesser and greater horseshoe bats, common pipistrelle, Daubenton's bats, brown long-eared bats, and Natterer's bat) ¹⁵ .	Yes	The static surveys undertaken within proximity recorded an activity level of 29.68 bat pph. The transect surveys recorded an activity level of 1.74 ppm. Species recorded were, common pipistrelle, soprano pipistrelle, <i>Myotis</i> species, lesser horseshoe, greater horseshoe, Barbastelle bat, noctule, Leisler's bat, and Serotine.	Yes
7	SW 80652 50861	Tree lined road that runs underneath the existing A30	Woodland at Chyverton Woodland CWT Reserve to the north of the existing A30. And Pasture fields located to the south of the existing A30.	Yes	The static surveys undertaken within proximity recorded an activity level of 2.34 bat pph. Species recorded were common pipistrelle, soprano pipistrelle, <i>Myotis</i> species, lesser horseshoe, greater horseshoe, noctule, Leisler's bat, and Serotine.	Yes
8	SW 80757 50869	Tree lined access road to Hill House	Known roost at Hill House with pasture fields to the south.	No 2017 preferred route will result in a small section of habitat loss at the north of the feature. The 2016 results are included within Appendix B.	The transect surveys recorded an activity level of 1.11 ppm. Species recorded along the feature were, common pipistrelle and <i>Myotis</i> species.	NA:- Scoped out following confirmation of preferred route

FEATURE (CROSSING POINT LOCATION)	GRID REFERENCE	CONNECTIVE FEATURE	CONNECTING HABITATS/ FEATURES IN THE WIDER LANDSCAPE	IS THE FEATURE BISECTED BY THE SCHEME?	BAT SPECIES RECORDED DURING STATIC / TRANSECT SURVEYS	CONSIDERED SUITABLE TO SCOPE IN FOR SURVEY
9	SW 80964 51229	Double hedgerow lined access track to Tolgroggan Farm	Potential roosting features to the north in Zelah. And Potential roosting features to the south at Tolgroggan Farm.	Yes	The transect surveys recorded an activity level of 0.43 ppm. Species recorded were, common pipistrelle, <i>Myotis</i> species, greater horseshoe. During the transect surveys a greater horseshoe was recorded flying along the access route over the existing A30.	Yes
10	SW 81151 51498	Hedgerow with trees along a shallow depression with a stream running alongside	Potential roosting features to the north in Zelah. And A large area of wet woodland / scrub area to the south.	Yes	The static surveys undertaken within proximity recorded an activity level of 45.22 pph. The transect surveys recorded an activity level of 1.34 ppm. Species recorded were, common pipistrelle, soprano pipistrelle, <i>Myotis</i> species, <i>Plecotus</i> species, lesser horseshoe, greater horseshoe, Barbastelle bat, noctule, Leisler's bat, and Serotine.	Yes
11	SW 81523 52240	Double hedgerow lined access road to the Trevalso farm complex	Known and potential roosts to the north of the existing A30. And Known roosts located within the Trevalso Farm complex south of the A30 and suitable habitat in Treworgan Quarry & lower Tolcarne CWS.	Yes	The static surveys undertaken within proximity recorded an activity level of 69.69 pph. The transect surveys recorded an activity level of 0.94 ppm. Species recorded were common pipistrelle, soprano pipistrelle, Nathusius pipistrelle, <i>Myotis</i> , <i>Plecotus</i> , lesser horseshoe, greater horseshoe, and noctule.	Yes

FEATURE (CROSSING POINT LOCATION)	GRID REFERENCE	CONNECTIVE FEATURE	CONNECTING HABITATS/ FEATURES IN THE WIDER LANDSCAPE	IS THE FEATURE BISECTED BY THE SCHEME?	BAT SPECIES RECORDED DURING STATIC / TRANSECT SURVEYS	CONSIDERED SUITABLE TO SCOPE IN FOR SURVEY
12	SW 83452 53363	Hedgerow	Newlyn Downs SSSI & SAC (lesser horseshoe are known to be present). And Suitable habitat in Treworgan Quarry & lower Tolcarne CWS	Yes	The static surveys undertaken within proximity recorded an activity level of 32.94pph. The transect surveys recorded an activity level of 1.3 ppm. Species recorded were, common pipistrelle, soprano pipistrelle, Nathusius pipistrelle, <i>Myotis</i> species, <i>Plecotus</i> species, lesser horseshoe, greater horseshoe, Barbastelle bat, noctule, Leisler's bat, and Serotine.	Yes
13	SW 82552 52874	Double hedgerow lined road	Treworgan Quarry & lower Tolcarne CWS with Newlyn Downs SSSI & SAC	Yes	The static surveys undertaken within proximity recorded an activity level of 3.98 pph. The transect surveys recorded an activity level of 0.66 ppm. Species recorded were, common pipistrelle, soprano pipistrelle, <i>Myotis</i> species, noctule, Leisler's bat, and Serotine.	Yes
14	SW 81313 51863	Double hedge lined farm road	Zelah town to the north And Woodland / scrub area to the south	No the scheme would involve the removal of the end section of the feature.	Species recorded during the 2017 landscape scale surveys were common pipistrelle, soprano pipistrelle, <i>Myotis</i> species, lesser horseshoe, <i>Plecotus</i> species, noctule, and Serotine.	Yes

2.3.25 The surveys commenced at sunset and extended until 120 minutes after sunset. This is later than the recommended 60 minutes due to the presence¹⁰ of greater and lesser horseshoe bats identified within the desk study and the first three months' worth of transect and static detector surveys (both of which are considered to be late emerging species).

2.3.26 The surveyors were equipped with Echo-Meter 3 full spectrum¹⁸, Batloggers²² and Echo-Meter

²² Batlogger M (<http://www.batlogger.com/en/detectors.html>)

Touch²³ bat detectors to listen to and record echolocation calls of bats observed. During the survey, surveyors mapped the flight-lines used by any bats observed and noted the distance from the potential commuting feature, and direction of flight.

2.3.27 The Batlogger settings were as follows:-

à Trigger Mode:	Continuous
à Trigger Mode:	Crest Adv
à Trig_Autorec:	Auto
à Trig_PAR6:	min.Crest = 6
à Trig_PAR7:	minimum: 7 kHz
à Trig_PAR8:	maximum: 130 kHz

2.3.28 Two surveyors monitored each Crossing Point (one surveyor located at either side of the proposed route where possible on opposite sides of the feature). In certain cases the number of surveyors required was reduced to one. This only occurred where access was possible on one side of the feature and the surveyor was equipped with thermal imagers so that the feature was visible along the full width of the Scheme (3A, 3B, 4A, 4B, 9 and 10) and a second surveyor was located within proximity for health and safety reasons although surveying a different feature. This was considered acceptable as the data recorded by a second surveyor is unlikely to have added to the final data set.

2.3.29 At Crossing Point 14, due to the topography (the existing A30 being on a large ~10 m embankment), it was unlikely that bats would be commuting and foraging along the linear feature and crossing into the wider landscape at this point. However, the landscape scale surveys identified a number of bats using the perpendicular lane for foraging. As such, the feature was included within the Crossing Point surveys. Due to the topographical setting of the A30 and the proximity of the proposed Scheme at this location, it was considered suitable to undertake a Crossing Point survey over the existing A30 itself (Figure 3, Appendix A), with the addition of static detectors located along the perpendicular linear feature to the north and south, to compare crossing activity. During the two (dusk and dawn) scoping surveys no bats were recorded crossing the existing A30 and the number of bat passes recorded on the static detectors (within the two hour survey duration) was lower than other surveys (individual noctule passes recorded). Therefore, the feature was scoped out from the full suite of six survey repeats.

2.3.30 Thermal imagers (Flir T460 and E60) were only used at Crossing Point locations where ambient light levels were so low (due to being heavily vegetated) that it was deemed to be necessary to use a visual aid, this allowed a single surveyor to undertake the surveys in certain instances (as detailed above). These were Crossing Points 3A, 3B, 4A, 4B, 6, 7, 9, 11, and 13. It was not considered necessary to use thermal imagers for Crossing Points 1, 3C, 10, 12 and 14 as ambient light levels were high enough to accurately record bats throughout the survey. The thermal cameras were used as a visual aid only. As such, they were turned on when the ambient light levels were too low to accurately record bat flight paths. The outputs of the thermal cameras have been retained, although not used for the analysis, as the cameras were used as a visual aid when necessary.

2.3.31 In the field, a 'bat pass' was defined in accordance with the bat activity transect survey (as previously described) or as a single Batlogger file where the bat was only heard and not seen. If the bat was seen, a bat pass constitutes a bat recorded to be crossing the proposed Scheme (no matter whether it was the same bat travelling back and forth). On completion of each survey the bat detector recordings were analysed using the software and filters detailed within the Analysis

²³ Echo Meter Touch (Wildlife Acoustics, Concord, Massachusetts, USA)

sub-section below.

2.3.32 Every bat pass was recorded, along with the behaviour, distance from feature (at its closest point) flight path and height of flight (where observed). For those bats that altered their flight height during crossing, the lowest flight height was recorded. Incidental records of bat activity in the vicinity of the surveyor locations were also collected. The results are presented as individual bat passes rather than passes per minute, as the surveys do not require standardisation for comparison.

2.3.33 Bats were considered to be using the feature if individuals crossed the proposed Scheme in a horizontal direction (roughly parallel) to the linear feature within 5 m of the linear feature. Bats were considered to be crossing the proposed Scheme but not using the linear feature when bats were recorded parallel to the features although further than 5 m. Bats were not considered to be crossing the proposed Scheme if they were recorded to be flying perpendicular to the linear feature (and not crossing the proposed Scheme in between surveyors).

2.3.34 The definition of 'safe and unsafe heights' were defined as above and below 5 m from the road and current ground level respectively¹⁰. Bats crossing the road below a height of 5 m are considered to be at risk of direct mortality by passing traffic.

2.3.35 Post survey data handling involved the removal of duplicate survey results (this was only possible for bats that were both heard and seen), whereby both surveyors recorded bats traversing the feature at the same time, height, distance and directions. Where there was uncertainty of duplicates, records were retained.

2.3.36 Results presented the following information:

- à Total number of bats heard but not seen;
- à Total number of bats not using the feature (where surveyors have heard and seen the bat and the bat is either flying perpendicular to the linear feature, or does not fly within 5 m of the linear feature);
- à Total number of bats using the feature (definition is flying in a parallel direction to the feature and within 5 m of the feature at its closest point);
- à Total number of bats crossing the proposed Scheme at an unsafe height.

2.3.37 The data are presented within Tables detailing the total number of bats recorded, the species recorded, whether bats were considered to be using the feature and whether bats were considered to be flying at 'safe heights'¹⁰.

2.3.38 The flight heights of all of the bats recorded crossing the proposed Scheme are displayed as box and whisker plots. These illustrate the median, upper and lower quartiles of the heights at which each species was recorded flying (at its lowest point), to identify the likely main species of risk.

2.3.39 Box and whisker plots have been produced to detail the number of bats per survey that were recorded crossing the proposed Scheme, using the feature, and using the feature and flying at unsafe heights. This is to allow the pre-construction data to be compared with the construction and post-construction monitoring surveys.

2.4 LANDSCAPE SCALE TRANSECTS

2.4.1 All surveys were undertaken in consideration of current best practice methodologies¹⁰ with all surveys being undertaken under suitable conditions, during acceptable times of the season. A total of nine individual transects were surveyed during July 2017, with one of the landscape transects walked twice (Transect 4) in order to sample 11 transects¹⁰, as it was not possible to survey Transect 3 for health and safety reasons. This is not considered to be a limitation as it is

aligned with the best practice methodology¹⁰.

- 2.4.2 The transects were 1 km in length and were perpendicular to the proposed Scheme, with 10 minute stationary spot checks being located at 100 m perpendicular intervals from the outer edge of the Scheme. Seven transects were walked away from the road with three transects being walked towards the road (Transect 4 was walked twice). The transects were designed so as to avoid known maternity roosts or habitat considered to be optimal or very low value to bats, so as to avoid any habitat extremes that might hide or over emphasise any potential impacts of the proposed Scheme¹⁰. To avoid pseudo-replication, transects were located over 500 m apart (Figure 4, Appendix A).
- 2.4.3 All surveys were undertaken under suitable weather conditions (>7°C, wind <20km/h, ~12 mph). The weather conditions were recorded at each 10 minute spot checks, along with the number of bat passes, start time, stop time, habitat grade, path type and any additional notes regarding activity. The bat detectors were held at approximately waist height pointing upwards and away from the surveyor at all times.
- 2.4.4 The habitat grades that were recorded at each spot check are categorised below, these were then included within the GEE analysis to determine whether habitat type is a significant variable¹⁰.

Table 2-3.1: Habitat grade descriptions

HABITAT GRADE	DESCRIPTION
1	Fence or wall lining road/path & open fields beyond
2	Hedges/shrubby verges lining road/path & open fields beyond
3	Intermittent medium trees/bushes lining road/path & open fields beyond
4	Intermittent tall trees lining road/path & open fields beyond
5	Continuous tall tree cover lining road/path with woodland &/ open fields beyond

- 2.4.5 Full spectrum Batloggers were used for all of the surveys with an SM4 recording as a back-up. The Batlogger settings were set up as per the Crossing Point surveys (detailed above).
- 2.4.6 The surveys commenced approximately 30 minutes after sunset and were completed within two hours of commencing the survey as per current best practice¹⁰.
- 2.4.7 The acoustic data was analysed using BatClassify²⁷ with a threshold value of 0.8 used to confirm that the auto analysis had correctly identified the bat pass. All passes that did not meet the threshold of 0.8 were analysed individually. All bat passes were checked visually using bat explorer as a general quality assurance process (all files were checked against the corresponding sonogram, although not labelled if they had met the 0.8 threshold).
- 2.4.8 Following the surveys, the landscape scale transect data was analysed using Generalised Estimating Equations (GEE) in the R program to determine whether there is already an effect on bats with distance from the proposed Scheme. This will allow comparisons to be made on the effect of the proposed Scheme on bats during and post construction¹⁰.

- 2.4.9 The results of the analysis detail the standard error and significance of the distance from the proposed Scheme variable, and any other variables that have been found significant in the final model. The results are displayed as a table along with the scale and correlation parameters. The Wald statistic and significance level are reported individually for the distance variable within the text.
- 2.4.10 The scale and correlations figure details the predicted difference of bat activity over the range of variables (time, distance, habitat grade) with distance from the proposed Scheme for total bat activity. This shows the predicted percentage change in bat activity between 0 and 1000 m from the proposed Scheme using the following formula (included within the R package²⁴).

$$\frac{(\text{predicted number of bat passes at 100 m} - \text{predicted number of bat passes at 0 m}) \times 100}{\text{predicted number of bat passes at 0 m}}$$

2.5 DATA ANALYSIS

- 2.5.1 WAC recordings from the SM2s, SM4s and Echo Meter 3 used for the bat activity transect, automated static detector, and certain crossing point surveys were converted into ZCA and WAV format using Kaleidoscope 3.1.8 Software. During the conversion a filter was applied to filter out noise files. The settings used during the filter process are detailed in Table 2.5.1.

Table 2-4.1: Conversion and filter parameters

SIGNAL OF INTEREST	
Kilohertz	5 – 150
Milliseconds	2 – 500
Minimum number of calls	2

- 2.5.2 All files that the software does not consider to be bat passes are saved as 'noise' files, which are filtered into a separate folder. All noise files filtered out during the conversion process were saved but not included within the subsequent data counts. The noise files were only interrogated in instances where no/low levels of bats were recorded during the automated static detector survey and bat activity transect to ensure the SM2s were still successfully recording.
- 2.5.3 The converted files were analysed using AnalookW v0.4.1.2 Anabat data analysis software. Where the recordings were unclear the corresponding WAV file was analysed using Batsound v 4.2.1²⁵.
- 2.5.4 WAV recordings from the batloggers were auto-analysed using the BatClassify software, with a pass threshold of 0.8. The auto analysis identifies the bat passes to species level, apart from *Nathusius pipistrelle* and noctule, Leisler's bat, and Serotine (NSL).
- 2.5.5 Where possible, bat calls were identified to species level. However, species of the genus *Myotis* were grouped together in most cases as their calls are similar in structure and have overlapping call parameters, making species identification problematic²⁶. For *Pipistrellus* species the following

²⁴ R Version 3.3.2 (2016-10-31)

²⁵ Pettersson Eletronik AB, Uppsala, Sweden, 2002.

²⁶ Russ, J. (2013). British Bat Calls: A Guide to Species Identification. Pelagic Publishing

criteria based on measurements of peak frequency are used to classify calls (alongside other call parameters typical of this genus):

- à Common pipistrelle ≥ 42 and <49KHz;
- à P50 (common / soprano) ≥ 49 and <51KHz;
- à Soprano pipistrelle ≥ 51KHz;
- à P40 (Nathusius / common) ≥ 39 and <42KHz;
- à Nathusius pipistrelle <39KHz;

2.5.6 In addition, the following categories were used for calls which cannot be identified with confidence due to the overlap in call characteristics between species or species groups:

- à *Nnoc/Nlei* (either Leisler's bat or noctule);
- à NSL (noctule, Leisler's bat, or Serotine);
- à *Esero/Nlei* (Serotine or Leisler's bat); and
- à *Plecotus* sp.

2.5.7 Following the initial analysis, all recordings of Annex II species (of the Habitats Directive) and unknown calls were checked by a second experienced ecologist. Approximately 10% of all bat calls (excluding common pipistrelle and soprano pipistrelle species) underwent a further check as part of the quality assurance process.

2.5.8 Where the Batloggers were used during the Crossing Point surveys and the Landscape Scale surveys, BatClassify²⁷ auto identification was used to analyse the calls. A threshold of 0.8 was used to confirm likely correct analysis, where a call did not reach the threshold of 0.8 the call was manually analysed. All calls that were not classified as common or soprano pipistrelle were also checked to confirm species. This is further detailed within the methodology sections above.

2.6 NOTES AND LIMITATIONS

DESK STUDY

2.6.1 It should be noted that an absence of desk study records for particular species does not necessarily convey an absence of such species in that area, but is often a facet of under-recording. Because the desk study is designed to give an overview of the species already recorded in the local area, and used as indicative data prior to more detailed surveys such as bat activity and commuting route surveys, it is not considered to be a significant constraint.

2.6.2 Due to confidentiality reasons the resolution of the ecological records relating to bats were limited to a resolution of 1 km. As such, an accurate location of roosting sites within proximity of the Scheme from the desk study is not possible.

2.6.3 The desk study data was obtained within 2015. However, it is considered suitable for the purposes of this report, as it identifies the species present within the surrounding area that may be affected by the proposed Scheme.

FIELD SURVEYS

2.6.4 Observations of bat activity can be restricted by low light levels. Therefore some bats were recorded on bat detectors but details regarding their flight direction etc. could not be ascertained.

²⁷ <https://bitbucket.org/chrisscott/batclassify/> - Accessed June 2017

This is a limitation to all bat transect and crossing point surveys and has been addressed within the results sections as appropriate and in certain cases the inclusion of specialist imagery equipment within the methodology.

- 2.6.5 All types of bat detector have technical limitations in certain aspects of their design, for example microphone range, mode of recording, ease of use. These limitations are common to all bat surveys and have been addressed within the results section of this report as appropriate.
- 2.6.6 During the bat activity transect surveys there were incidents when deviations to the routes were made in order to avoid livestock. When this occurred the Point Count was undertaken as close as possible to the original location, or further along within the same habitat type or landscape features, such as hedgerows, fields and tree lines. If this was not possible the Point Count result for that survey was omitted from the final results so the data would not show a false negative recording and skew the survey findings (averages). This was mainly associated with Transect 4 (Point Counts 32-40), (Table 2.6.1).

Table 2-5.1: Details of transect stopping points that have been excluded from the analysis

POINT COUNTS	MONTH	REASON
32-34	May	Agressive Livestock
32	August Dusk	Agressive Livestock
26	September	Agressive Livestock

- 2.6.7 Access to Crossing Point 6 was retracted in 2017 until August; as such, all of the 2017 surveys were undertaken in August. This could have resulted in a bias of the results, as the surveys did not encompass the peak maternity period or coincide with the Crossing Point surveys peak bat activity levels (generally found to be June and July for the proposed Scheme). However, in this case, this is not considered to limit the validity of the results as the surveys were undertaken within the prescribed optimal survey period¹⁰. The correct number of survey repeats were undertaken and the supporting information provided by the automated static detector surveys and bat activity transect surveys highlights any species that were likely to have been present within the area outside of the months the surveys were undertaken.
- 2.6.8 Due to bad weather conditions experienced during the planned 26th September 2016 surveys, the Crossing Point 1 survey was postponed and undertaken at dawn on 28th September 2016. Although the dawn survey had lower relative bat activity data, it is unlikely that the results would have skewed the validity of the data output, as consistently lower levels of bat activity was recorded at this location.
- 2.6.9 During the 2016 Crossing Point surveys, thermal imagers (details of which are provided in the methodology section) were not used, this may have reduced the number of bats seen during the initial two surveys. As the limitation was common across all of the Crossing Points, it was not considered likely to have biased the results (please refer to the methods for the dates). As such, it is not considered to limit the validity of the results, although it should be noted during the repeat surveys so that the surveys can be comparable throughout the construction process.
- 2.6.10 During the Crossing Point survey undertaken at Crossing Point 4B on 28th September 2016, a bat detector malfunction resulted in the survey being cut short by approximately 45 minutes. This is not considered to limit the results as five further visits were undertaken.

AUTOMATED STATIC DETECTOR SURVEYS

- 2.6.11 During the automated static detector surveys there were four SM2 malfunctions, an SM2 was stolen and access was retracted, as detailed in Table 2.6.2. As the data would introduce a bias into the results any recordings for these detectors (e.g. noise) have been excluded from the data-set. This was not considered to constitute a limitation as over 4,000 hours of sampling has been undertaken in total and this is considered suitable to provide robust and comparable data for the purposes of this report.
- 2.6.12 SM2_A30_04 recordings were omitted from May to July, where only noise files were recorded. It is likely that this was a recorder malfunction. In order to ensure full coverage of survey and reduce the limitation, further surveys were undertaken within the areas (Crossing Points 4A and 4B), to ensure all features were fully surveyed.

Table 2.6.22-6:Details of static monitoring data that has been excluded from the analysis

DETECTOR	MONTH	REASON
SM2_A30_04	May	Noise files only
SM2_A30_04	June	Noise files only
SM2_A30_04	July	Noise files only
SM2_A30_05	October	Access denied
SM2_A30_07	September	Noise files only
SM2_A30_10	June	SM2 stolen
SM2_A30_13	October	Noise files only

DATA ANALYSIS

- 2.6.13 Species identification by sonogram is limited (to a certain extent) by similarities in call structure. In addition, all bats can modulate their calls according to the habitats they are navigating, their behaviour and the information they require at the time. This imposes limitations on reliable analysis particularly between species of the same genus in the genera's *Plecotus*, *Myotis* and *Nyctalus*. *Nyctalus* species and *Serotine* were separated where possible but grouped to NSL where call parameter overlap prevented reliable identification.
- 2.6.14 Due to the geographical location and habitat structure within the survey area every *Plecotus* bat recorded was assumed to be a brown long-eared bat. Unidentified *Myotis* species were assumed to be either Daubenton's bat, whiskered bat, Brandt's bat or Natterer's bat.
- 2.6.15 It should be noted that bat surveys undertaken using bat detectors are inherently biased as bats with louder calls (such as the *Nyctalus* and pipistrelle species) can be recorded at a greater distance and with greater confidence than species which use quiet calls such as *Plecotus* species. This affects the results of all surveys undertaken as it under represents certain species such as quiet calling *Myotis* species and long-eared species.
- 2.6.16 Due to similarities in ecology and flight behaviour (within the species likely to be present within the site) the mitigation to reduce any impact is likely to be similar for all species present within *Myotis* or *Nyctalus* genera's. Therefore as long as any potential impacts recognise that the numbers of each individual species within the genera may be much lower than the total *Myotis* and *Nyctalus* recordings, identification to species level is not considered a significant limitation.

3 RESULTS

3.1 SUMMARY

- 3.1.1 A minimum of 11 species and species groups were recorded within the survey area following analysis of the desk study and survey results. Species recorded were Leisler's bat, Serotine, common pipistrelle, soprano pipistrelle, Nathusius pipistrelle, Barbastelle bat, lesser horseshoe bat, greater horseshoe bat, brown long-eared bat and *Myotis* species (considered to constitute a combination of Daubenton's bat, Natterer's bat, whiskered bat, and Brandt's bat).
- 3.1.2 Bat activity was recorded throughout the survey areas at varying levels. Peak levels of bat activity recorded during the transect, static and crossing point surveys were generally associated with vegetated habitats within four main areas associated with Nanteague Farm, Nancarrow Farm, Tolgroggan Farm and Trevalso Farm, where bats were recorded to be using the linear features within these areas for foraging and commuting purposes. A peak level of bat activity was also recorded during the crossing point surveys at the underpass (crossing point 7) near Chyverton Park, although the static detectors and activity surveys recorded fairly low levels of activity. Lower levels of bat activity were generally recorded within the more open, exposed arable and heath habitats to the north and south of the survey area; open habitat adapted species (noctule and Leisler's bat) were more prominent within these areas.
- 3.1.3 Common pipistrelle and *Myotis* species were the most commonly recorded species throughout the survey areas. Lesser and greater horseshoe bats were recorded throughout the survey area with peak levels being recorded within habitats associated with Nanteague Farm, Nancarrow Farm, and Trevalso Farm. Barbastelle bats were recorded as individual passes throughout the survey areas.
- 3.1.4 The Crossing Point surveys identified that bats were using all of the linear features surveyed as commuting and foraging routes. Crossing Points 3A located at Nanteague Farm complex, 6 located at Nancarrow Farm complex, 7 located at the underpass near Zelah, and 11 located at Trevalso Farm complex recorded higher activity levels of bats, with bats recorded to be crossing the A30 at all of these locations (the majority of bats at Crossing Point 7 were crossing under the underpass, with only a single bat being recorded commuting over it).
- 3.1.5 Barbastelle bats were recorded sporadically throughout the survey area in individual or low numbers on a sporadic basis.
- 3.1.6 Lesser and greater horseshoe bats were recorded throughout the survey area at generally lower activity levels than the other species and species groups. Peak activity levels of these species were recorded within the Nanteague Farm complex, and the Trevalso Farm complex. Although lesser horseshoe bats were not recorded during the crossing point surveys at Crossing Point 6, they are considered to be using the feature, as lesser horseshoe bats were recorded during the transect and static detector surveys.

3.2 DESK STUDY

Designated Sites

- 3.2.1 No SACs within 30 km were identified with bats as a qualifying species. A total of one National Nature Reserve and 22 Sites of Special Scientific Interest (SSSI) are within the 10 km search area, of which only Trehane Barton SSSI, located approximately 6 km South-east of the current A30, is designated in part for the bats it supports (Table 3.2.1).

Table 3.2.1: Details of statutory designated sites located within 10 km of the current A30 between Chiverton and Carland Cross designated due to the bat species supported

SITE NAME	STATUS	NATIONAL GRID REFERENCE	REASONS FOR DESIGNATION	DISTANCE FROM THE CURRENT A30
Trehane Barton	SSSI	SW 866482	The barns at Trehane Barton support the largest known breeding colony of greater horseshoe bats in Cornwall. It is one of only eleven such main breeding roosts of this rare and endangered species in Britain.	~6 Km

3.2.2

There are a total of 15 non-statutory County Wildlife Sites (CWS) within 2 km of the current A30 between Chiverton and Carland Cross and four Cornwall Roadside Verge Inventory (CRVI) sites located along the A30. Bats have been cited in the reason for designation within four of the CWS's (Table 3.2.2).

Table 3.2.2 Details of non-statutory designated sites located within 2 km of the current A30 between Chiverton and Carland Cross where bats are included within the citation

SITE NAME	STATUS	REASONS FOR DESIGNATION	DISTANCE FROM THE CURRENT A30
Carland Moor	CWS	The site runs along two valleys and the majority of this moor is within the Carrick Heaths SSSI. It is comprised largely of willow/gorse scrub and marshy grassland with small areas of purple moor grass (<i>Molinia caerulea</i>). Mixed broadleaf woodland is also present. The site supports priority habitat wet woodland and priority species lesser horseshoe bat, brown long eared bat, and otter (<i>lutra lutra</i>).	180 m South-east
Allet Bog	CWS	The site lies adjacent to parts of the Carrick Heath SSSI at the head of a valley near to the River Allen. Wet willow woodland dominates in the valley bottom, two areas of rough rush-dominated pasture are present which remain waterlogged for much of the year. Some remnant heath is present supporting Dorset heath. Priority habitats are wet woodland, purple moor grass and rush pastures, and hedgerows. Priority species include a number of birds, common toad (<i>Bufo bufo</i>) and common lizard (<i>Zootoca vivipara</i>), a number of bats including lesser horseshoes and noctule, and otter.	~600 m South
Polvenna Wood	CWS	The site sits on either side of part of the Carrick Heath SSSI. The larger section is dominated by wet willow woodland supporting rich epiphytic growth and particularly rich ground flora. The smaller section includes wet woodland and open marshy areas with a man-made pond. Priority habitat is wet woodland and priority species include greater horseshoe bat and lesser horseshoe bat.	~350 m North
Benny Mill Valley	CWS	The site contains a range of undisturbed habitats along a 4 km stretch of stream. The site is made up of grey willow dominated wet woodland and herb rich meadow. Drier broadleaved woodland occurs in the northern part of the site containing species such as Cornish elm (<i>Ulmus stricta</i>) and oak. The priority habitat is wet woodland and the site supports a number of notable species such as willow warbler (<i>Phylloscopus trochilus</i>) whiskered bat (<i>Myotis mystacinus</i>) and badger.	~300 m North-east

Bat records

3.2.3

As part of the Phase 1 Verification Report¹, a desk study was undertaken to collate all records of bats within 10 km of the current A30 over the past ten years in accordance with current best practice

(Appendix B)²⁸. The desk study identified a total of 711 records of bats, recorded between 2007 and 2015, of which 124 were roosts. Species recorded roosting were, greater horseshoe bat, lesser horseshoe bat, Natterer's bat, brown long-eared bat, and common pipistrelle. Species identified during the desk study were¹:

- à Barbastelle
- à Brown long-eared bat
- à Common pipistrelle
- à Daubenton's bat
- à Greater horseshoe bat
- à Lesser horseshoe bat
- à Nathusius pipistrelle
- à Noctule
- à Serotine
- à Soprano pipistrelle
- à Whiskered bat

- 3.2.4 The Phase 1 Verification Report identified that previous bat surveys undertaken to inform previous iterations of the proposed Scheme had identified the presence of common pipistrelle bat roosts at two locations near Trevalso and Nancarrow Farm. Additionally a known hibernation roost was surveyed at Little Tresawsen. Species and numbers identified during the hibernation survey were unknown at the time this report was written. Little Tresawsen was located >100 m from proposed Scheme¹.
- 3.2.5 The bat records received from ERCCIS and Cornwall Bat Group were limited to a resolution of 1 km square, as such; it is not possible to determine accurate distance from the current A30. The full list of bat records is presented within Appendix B.
- 3.2.6 A review of MAGIC²⁹ identified a total of 36 Granted Natural England European Protected Species Licences relating to bats. Of which, three are located within 2 km of the current A30. The closest was located at Nancarrow Farm complex (EPSM2012-5115), located at Marazanvose (NGR SW 80163 50232). The licence covers the destruction of a known breeding site and resting place. Species covered by the licence were: lesser and greater horseshoe bats; common pipistrelle; soprano pipistrelle; Daubenton's bats; brown long-eared bats; and Natterer's bat (Appendix B).
- 3.2.7 The ES and post construction bat monitoring surveys undertaken for the Carland Cross Wind farm in order to discharge Planning Conditions¹² recorded a total of 11,010 bat passes from a minimum of ten bat species and species groups using the habitat associated with the Wind Farm. Species recorded were: noctule; Leisler's bat; serotine; common pipistrelle; soprano pipistrelle; Nathusius pipistrelle; lesser horseshoe bat; greater horseshoe bat; long-eared bat species; and *Myotis* species. The species with the highest level of bat activity was common pipistrelle, with the relative activity of 3.0 bat passes per hour. No roosts were recorded during the surveys.

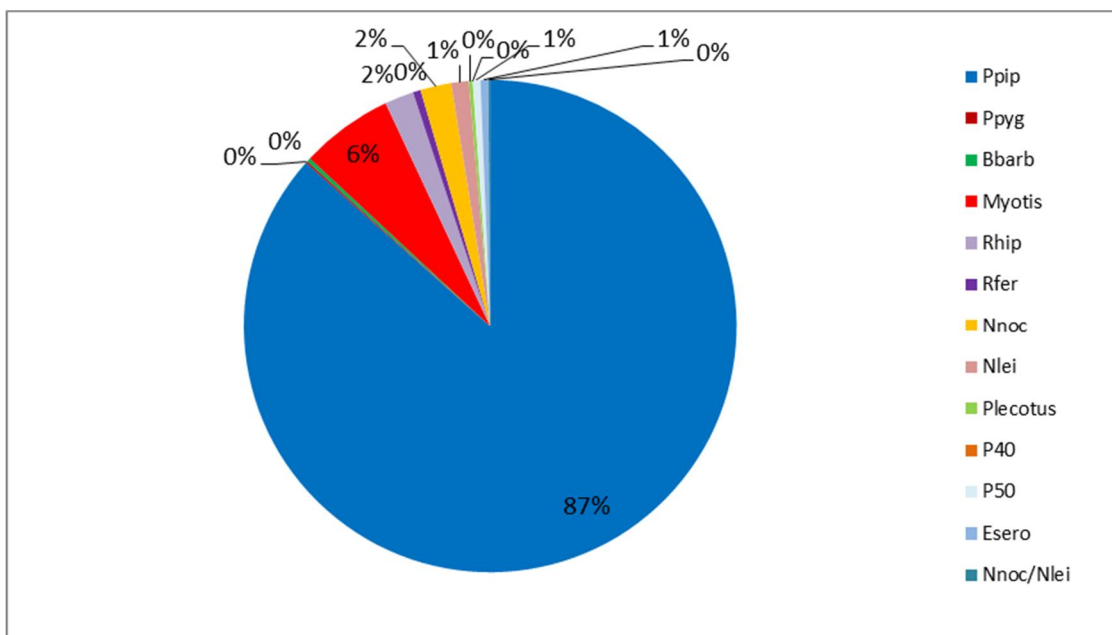
²⁸ Anon (1999) *Design Manual for Roads and Bridges, Volume 10: Environmental Design and Management, Section 4: Nature Conservation, Part 3 HA 80/99 Nature Conservation Advice in Relation to Bats*. Highways Agency.

²⁹ <http://www.magic.gov.uk/MagicMap.aspx>: Accessed 14/02/2017

3.3 BAT ACTIVITY TRANSECT SURVEYS

- 3.3.1 A total of 788 bat calls were recorded from a minimum of ten bat species. Common and soprano pipistrelle, serotine, noctule, Leisler's bat, *Myotis* species, *Plecotus* species, lesser horseshoe bat, greater horseshoe bat, and barbastelle bat were recorded at the Point Count locations. Species recorded between Point Count locations have been mapped in order to identify any potential important foraging or commuting habitat (Figure 2, Appendix A), although were omitted from the graphs and analysis. No further species were recorded during the walked sections of the five transects.
- 3.3.2 The details of each transect are illustrated below and within the raw data (Appendix B). The Transect routes and Point Count locations are illustrated within Figure 2, Appendix A.
- 3.3.3 During the 2016 bat activity transect surveys, the most commonly recorded species was common pipistrelle, which constituted 87% of all bat passes recorded at the Point Count locations. *Myotis* species were the second most commonly recorded species, with 6% of all bat passes recorded being identified as *Myotis* (Figure 3.3.1 below). Both *Myotis* species and common pipistrelle were recorded during each transect. Bat activity levels were highest within the months of June and August, with the lowest level of bat activity being recorded within September (Figure 3.3.1a).

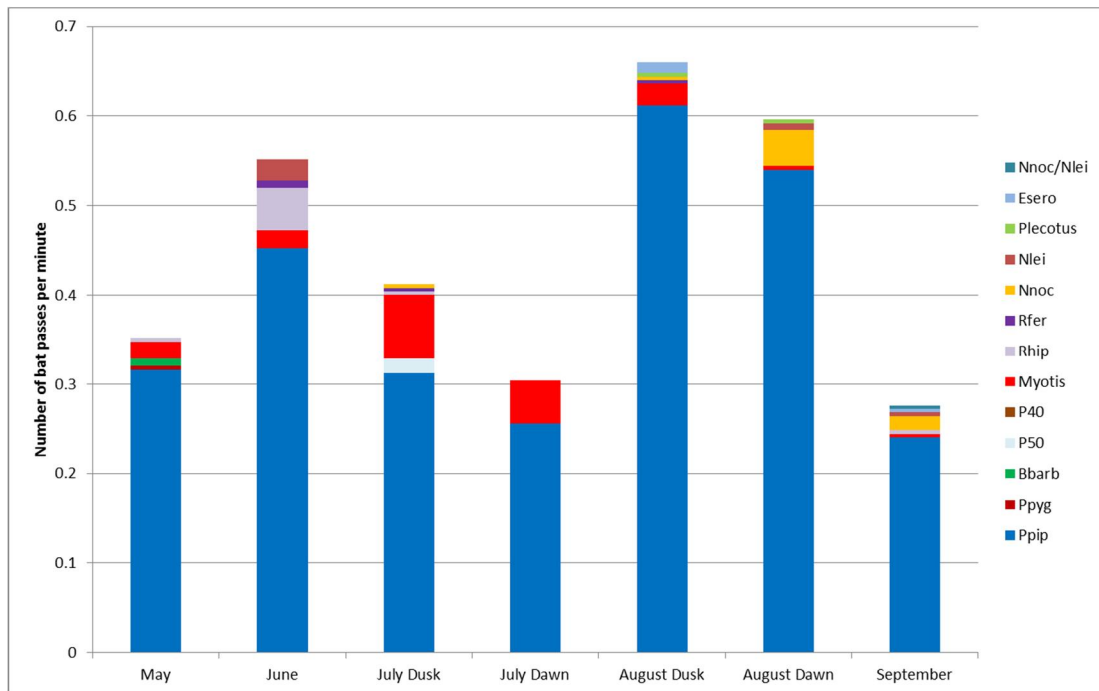
Figure 3.3.1: Percentage breakdown of bat passes recorded from each species during the 2016 bat activity transect surveys combined*, **.



*Please note that species that account for less than 1% are labelled as 0% but are present.

**Please refer to Table 1.4.1 and the Methodology Section for abbreviations.

Figure 3.3.1a: Seasonal variations of bat activity levels of each species during the 2016 bat activity transect surveys combined.



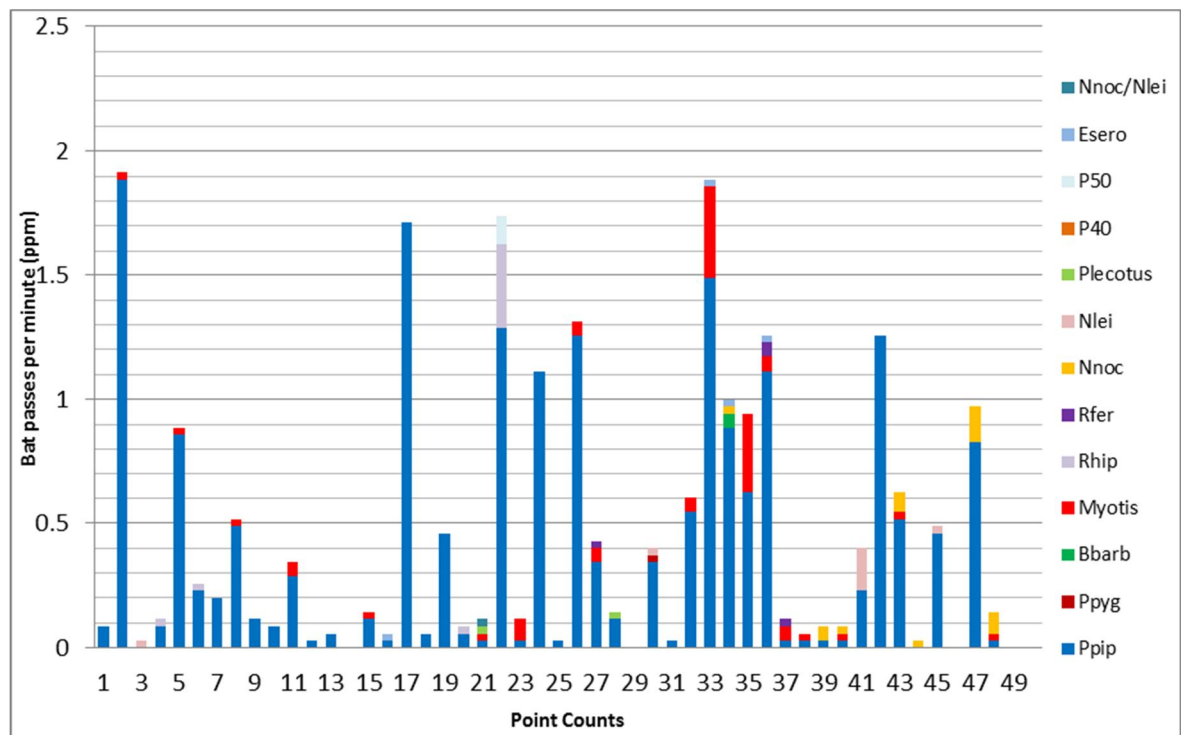
3.3.4

Bat activity levels were highest at Point Counts 2, 17, 22, and 33 (Figure 3 and Figure 3.3.2 below). Point Count 2 was located along a Cornish hedgerow adjacent to a large arable field between Trevisome Farm and Silversprings Farm. Point Count 17 was located within the Nanteague Farm complex, at the edge of a woodland with an adjoining hedgerow with trees. Point Count 22 was located along the tree lined footpath within Nancarrow Farm complex. Point Count 33 was located along the tree-lined road within the Trevalso Farm complex. It was noted that at these locations, generally higher numbers of bats were recorded foraging and commuting along the hedgerows in between Point Count locations (Figure 2, Appendix A).

3.3.5

Bats were not recorded at Point Counts 14, 28, 46, 49, and 50. These were located within a mixture of habitats including large arable fields, grassland fields, and areas of heathland (Figure 2, Appendix A).

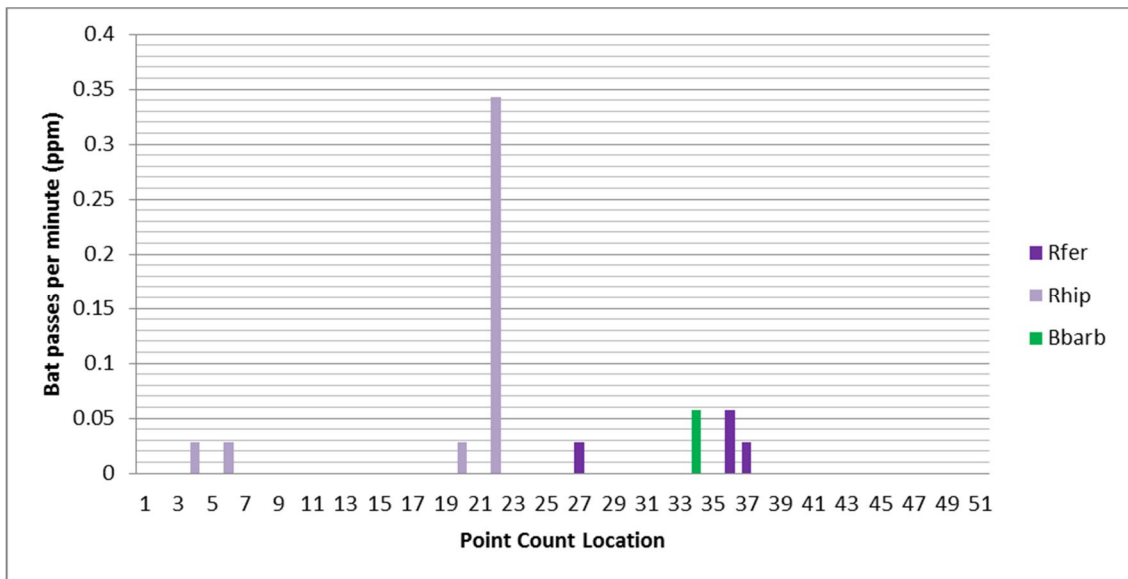
Figure 3.3.2: Bat passes per minute at each Point Count location during the 2016 bat activity transect surveys



Annex II Species

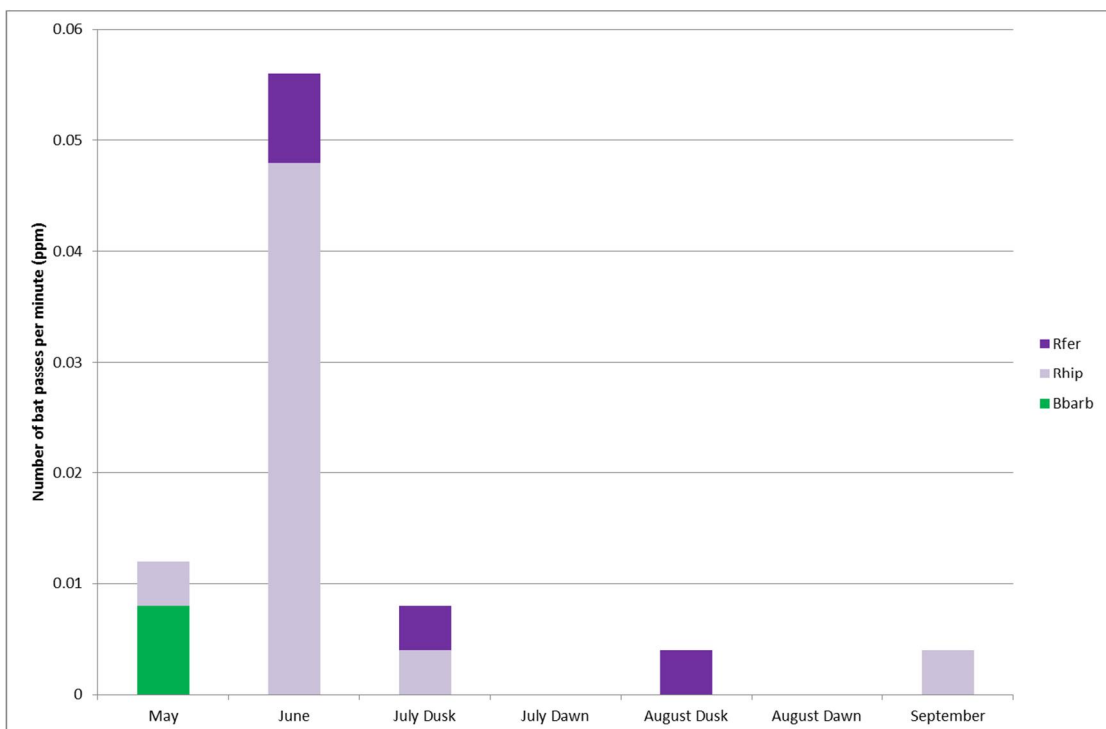
- 3.3.6** A total of four UK bat species are listed within Annex II under the EC Habitats Directive, for which SAC are designated as a mechanism for protection of these species⁶. Three have been recorded during the transect surveys. These were lesser horseshoe bat, greater horseshoe bat, and Barbastelle bat. As detailed within the methods Section, the survey area is considered to be outside of the current known range for Bechstein's bat. As such, they are considered to be absent from the survey area and are not considered further.
- 3.3.7** A total of two Barbastelle bat passes were recorded during the May 2016 surveys at Point Count 34 which is located in pasture fields on the eastern side of the A30 (Figure 2, Appendix A).
- 3.3.8** Peak lesser horseshoe bat activity levels (0.34 ppm) were recorded from bats foraging along the lane within the Nancarrow Farm complex during the June transect (Point Count locations 20 and 22). Lesser horseshoe bat activity was also recorded within large arable fields at the south of the survey area (Point Count locations 4 and 6). No lesser horseshoe bats were recorded further east during the transect surveys. During the June transect survey, a lesser horseshoe bat was recorded using one of the outhouses within the Nancarrow Farm complex as a night roost (this has been reported separately within the roosting report).
- 3.3.9** Greater horseshoe bat activity was recorded within the Trevalso Farm area (Point count locations 36 and 37) adjacent to some wet woodland and pasture fields during June and July. Greater horseshoe bats were also recorded along the bridle path linking Zelah to Tolgroggan Farm complex, with a greater horseshoe being recorded to be using the footbridge to cross the current A30 (Point count location 27) during the August survey.
- 3.3.10** Peak levels of lesser and greater horseshoe bat activity was recorded across the survey area during the June survey (Figure 3.3.3a).

Figure 3.3.3:- Bat activity levels of Annex II bat species recorded during the 2016 bat activity transect surveys



3.3.11

Figure 3.3.3a:- Seasonal variations of activity levels of Annex II bat species recorded during the 2016 bat activity transect surveys combined



Cluttered Habitat Adapted Species

3.3.12

Cluttered habitat adapted bats were recorded throughout the survey area and accounted for approximately 9% of all of the bat activity recorded during the 2016 transect surveys. *Myotis* species accounted for 69% of the cluttered habitat adapted bat activity, with lesser horseshoe bats accounting for 22%. The remaining 9% is associated with greater horseshoe and brown long-eared bats (Figure 3.3.4).

- 3.3.13 Peak levels of cluttered habitat adapted bats were recorded within proximity of Nancarrow Farm at Marazanvose (associated with Point Counts 20-23) and Trevalso (associated with Point Counts 32-33, and 35-37) (Figure 3.3.4 below and Figure 2, Appendix A). The peak activity level of lesser horseshoe bat was recorded at Nancarrow Farm during the June transect (Point Counts 20 and 22), during which a lesser horseshoe bat was observed using an outbuilding within the farm complex as a night roost (Figure 3.3.4a). The lesser horseshoe bat activity recorded during the June transect was not attributed to the individual using the building, as the closest Point Count was not adjacent to this feature, as such the roosting lesser horseshoe bat has not skewed the data (the roosting data is reported separately). Point Counts 26-28 (located between Zelah and Tolgroggan Farm) also had higher levels of cluttered bat habitat adapted species including *Myotis* species, greater horseshoe bat and brown long-eared bat (Figure 3.3.4).
- 3.3.14 The lowest levels of cluttered habitat adapted bats were recorded at the southern and most northerly sections of the survey area. The southern section of the survey area (associated with Point Counts 1-10 and 13-16) was dominated by large, exposed arable fields with limited connective habitat. The northern section of the survey area (associated with Point Counts 43-50) was dominated by exposed arable and grassland fields and areas of exposed heathland. This area also supports Carland Cross Wind farm (Figure 2, Appendix A).

Figure 3.3.4:- Bat activity levels of cluttered habitat adapted bats recorded during the 2016 bat activity transect surveys

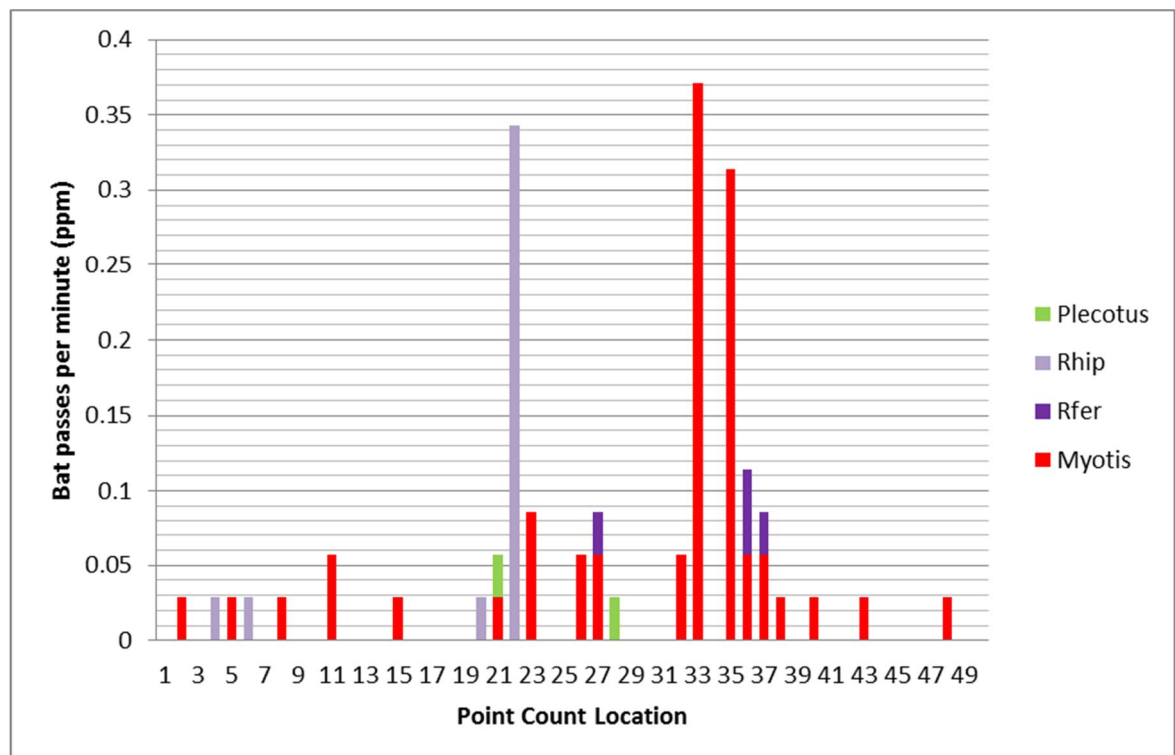
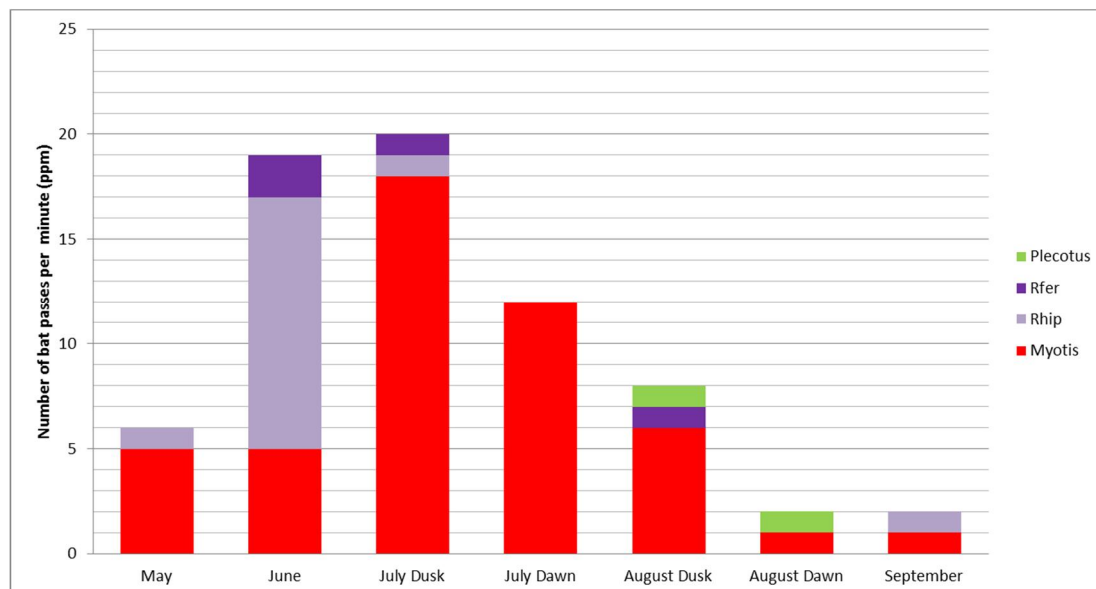


Figure 3.3.4:- Seasonal variations of activity levels of cluttered habitat adapted bats recorded during the 2016 bat activity transect surveys combined



Edge Habitat Adapted Species

- 3.3.15** Edge habitat adapted bats were recorded throughout the survey area and accounted for approximately 88% of all of the bat activity recorded during the 2016 transect surveys. Edge habitat adapted bats were recorded at higher levels than both open and cluttered habitat adapted bats species and within more habitats throughout the survey area. Common pipistrelles were the most recorded bat species, with 98% of all edge habitat adapted bats. Serotine, Barbastelle, and soprano pipistrelles accounted for the remaining 2% (Figure 3.3.5).
- 3.3.16** The activity levels of the edge habitat adapted bats was fairly even throughout the 2016 survey season, with slightly higher levels being recorded during the August surveys (Figure 3.3.5a)
- 3.3.17** Peak levels of edge habitat adapted bats were recorded at Point Counts 2, 17, 22, and 33, where activity levels exceeded 1.3 ppm. Point Count 2 was located adjacent to a large arable field, along a hedgerow. Point Count 17 was located within the Nanteague Farm complex along a treeline. Point Counts 22 and 33 are located within the Nancarrow and Trevalso Farm complexes (as described above).
- 3.3.18** The lowest levels of edge habitat adapted bats were generally recorded at the northern section of the survey area, generally within exposed open habitats (Figure 2, Appendix A). Serotine were recorded near Nanteague Farm (Point Count location 16) within August and within the Trevalso farm complex (Point Count locations 33, 34, and 36) within September. Barbastelle bats were recorded within the Trevalso farm complex (Point Count 34) within May.

Figure 3.3.5: Bat activity levels of edge habitat adapted bats recorded during the 2016 bat activity transect surveys

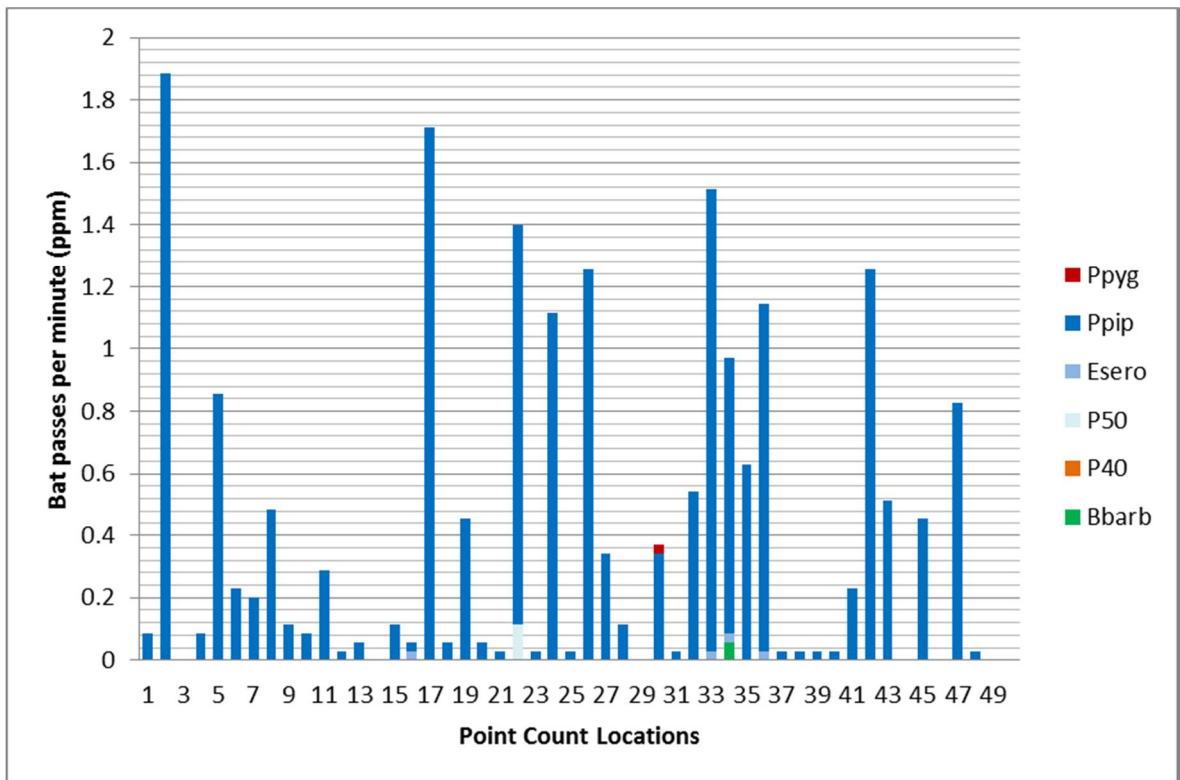
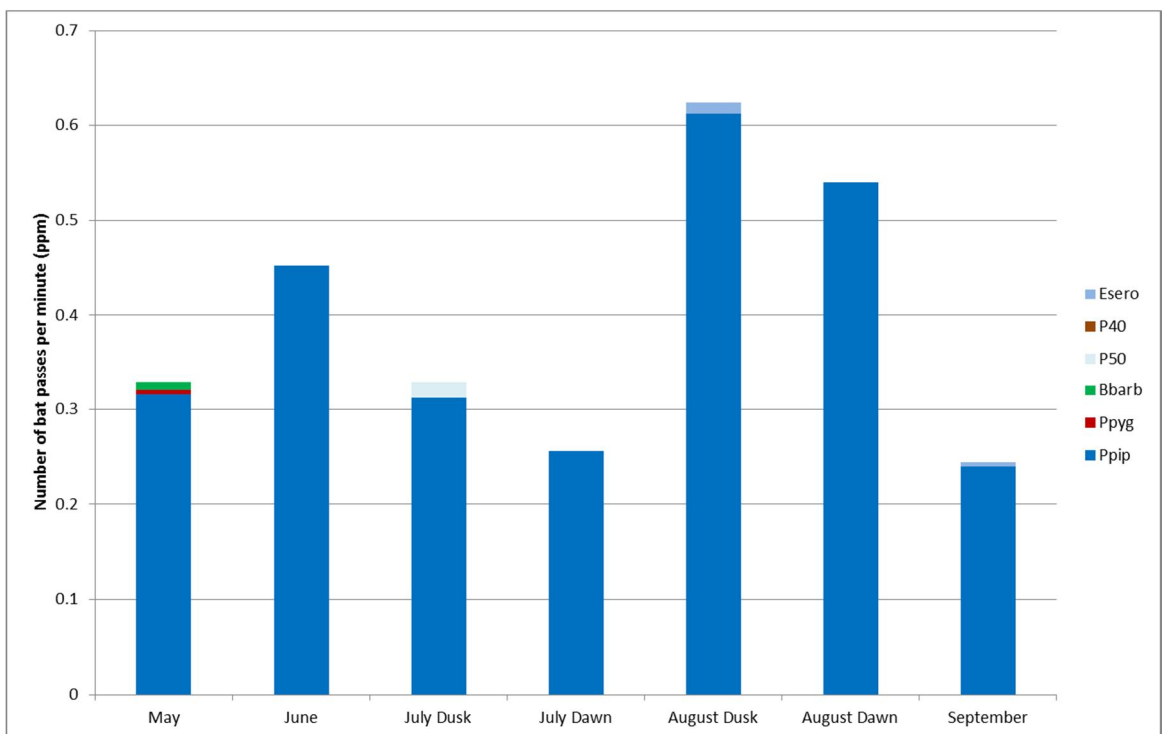


Figure 3.3.5a:- Seasonal variations of activity levels of edge habitat adapted bats recorded during the 2016 bat activity transect surveys combined



Open Habitat Adapted Species

- 3.3.19 Open habitat adapted bats were generally recorded at lower levels and less frequently than edge or cluttered habitat adapted bats. Both noctules and Leisler's bats were recorded during the 2016 transect surveys; they were generally recorded within the northern section of the survey area (Figure 3.3.6 below and Figure 2, Appendix A).
- 3.3.20 Peak levels of open habitat adapted bats were recorded during the August dawn survey, where both Leisler's bat and noctules were recorded (Figure 3.3.6a).
- 3.3.21 Peak levels of bat activity were recorded at Point Counts 41 and 47 within June, and August. Point Count 41 is located south of the A30 in an area of land that is considered to be fairly exposed. Point Count 47 is located north of the current A30 adjacent to Carland Cross Wind Farm. The northern section of the survey area is dominated by large arable fields, grazing fields and heathland with limited linear features bisecting the area (Point Counts 43-50) (Figure 2, Appendix A).

Figure 3.3.6: Bat activity levels of open habitat adapted bats recorded during the 2016 bat activity transect surveys

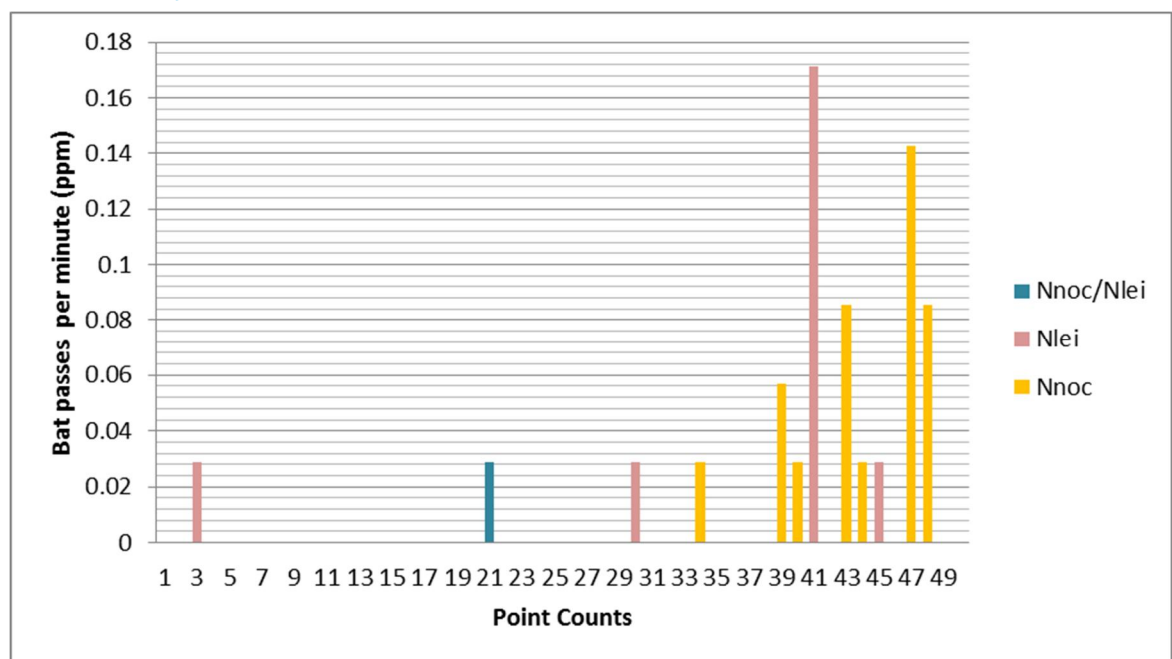
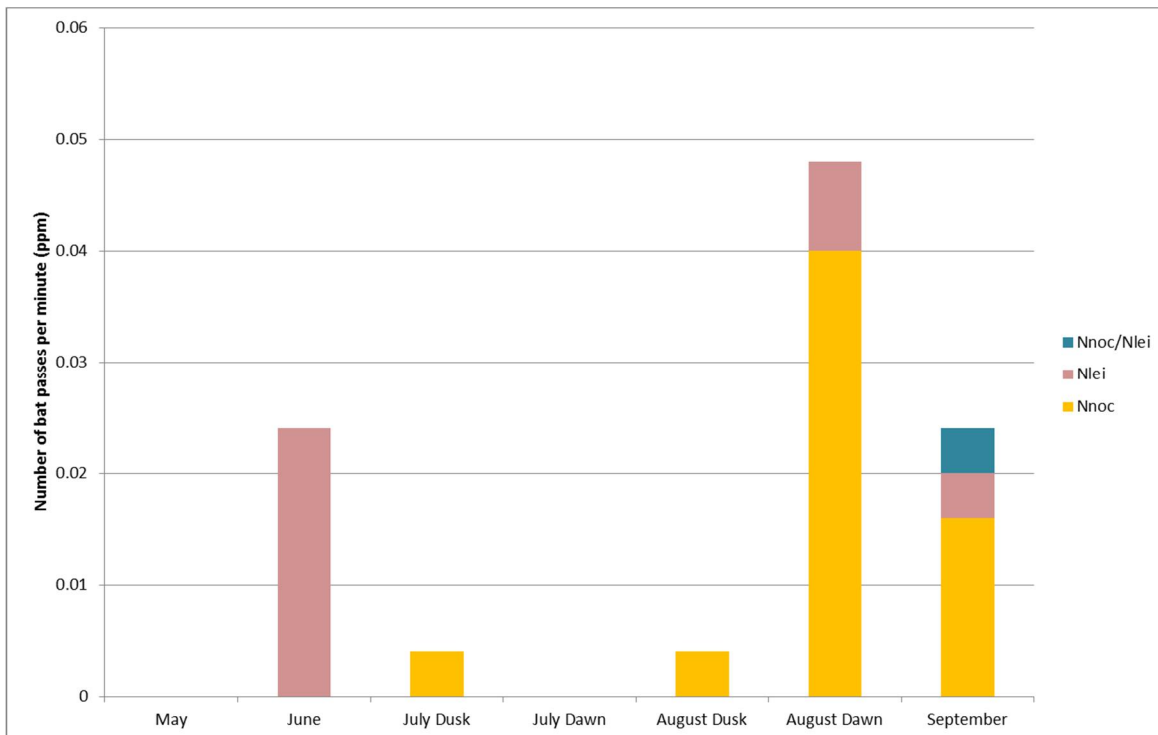


Figure 3.3.6a:- Seasonal variations of activity levels of open habitat adapted bats recorded during the 2016 bat activity transect surveys combined



3.4 AUTOMATED DETECTOR SURVEYS

- 3.4.1 A total of 15 ground-level automated Song Metre 2 (SM2) static detectors were deployed within the survey area for a minimum of five nights per month between May and October 2016. As detailed within the methodology section, the automated detectors were located within typical habitat and at locations most suitable for bat activity, such as linear habitat features within the survey area in order to supplement the transect data (Figure 3, Appendix A).
- 3.4.2 During the 2016 survey period over 4,173 hours of automated static monitoring surveys have been undertaken, with a total of 103,452 files being analysed of which, 88,246 were considered to be bat passes, from a minimum of 11 bat species and species groups: noctule; Leisler's; Serotine; common pipistrelle; soprano pipistrelle; Nathusius pipistrelle; Barbastelle; lesser horseshoe; greater horseshoe; brown long-eared bats; and *Myotis* species (Figure 3.4.1).
- 3.4.3 The peak levels of bat activity were recorded across the whole survey area during the May survey, with the lowest levels of bat activity being recorded within the month of October (Figure 3.4.1a).
- 3.4.4 The highest level of bat activity related to common pipistrelles, which accounted for approximately 89 % of all bat activity. *Myotis* species had the second highest level of bat activity, which accounted for 5 % of all bat activity.
- 3.4.5 The level of bat activity varied among the static detector locations, with SM2_A30_11 (located within the Trevalso farm complex) having the peak level of bat activity of with an average of 69.69 bat passes per hour (pph). At SM2_A30_11 activity levels were highest during May (188.60 pph), September (83.22 pph) and October (81.01 pph), although activity levels were consistently moderate - high in comparison to the other detectors (Appendix B). Eight of the 11 species recorded within the survey area being recorded at this location (Figure 3.4.1 and Figure 3, Appendix A). Higher levels of bat activity were also recorded at detectors SM2_A30_04, 05, 09, and 13. These were located within the Marazanvose area (SM2_A30_04 and 05), near Tolgroggan Farm (SM2_A30_09), and along the road near Honeycombe Farm (Figure 3, Appendix A). No significant peaks of activity were recorded during the 2016 survey season at detectors SM2_A30_04, 05, and 09 (Figure 3.4.1b).
- 3.4.6 The lowest bat activity levels were recorded within the Nanteague Farm complex (SM2_A30_03), at the underpass that crosses under the A30 at the south of Zelah (SM2_A30_08), a tree line near Ventonteague (SM2_A30_12), and along the woodland edge of Garvinack Brake (SM2_A30_15) (Figure 3.4.1).

Figure 3.4.1: Bat activity levels recorded from the automated static detectors during the 2016 survey period

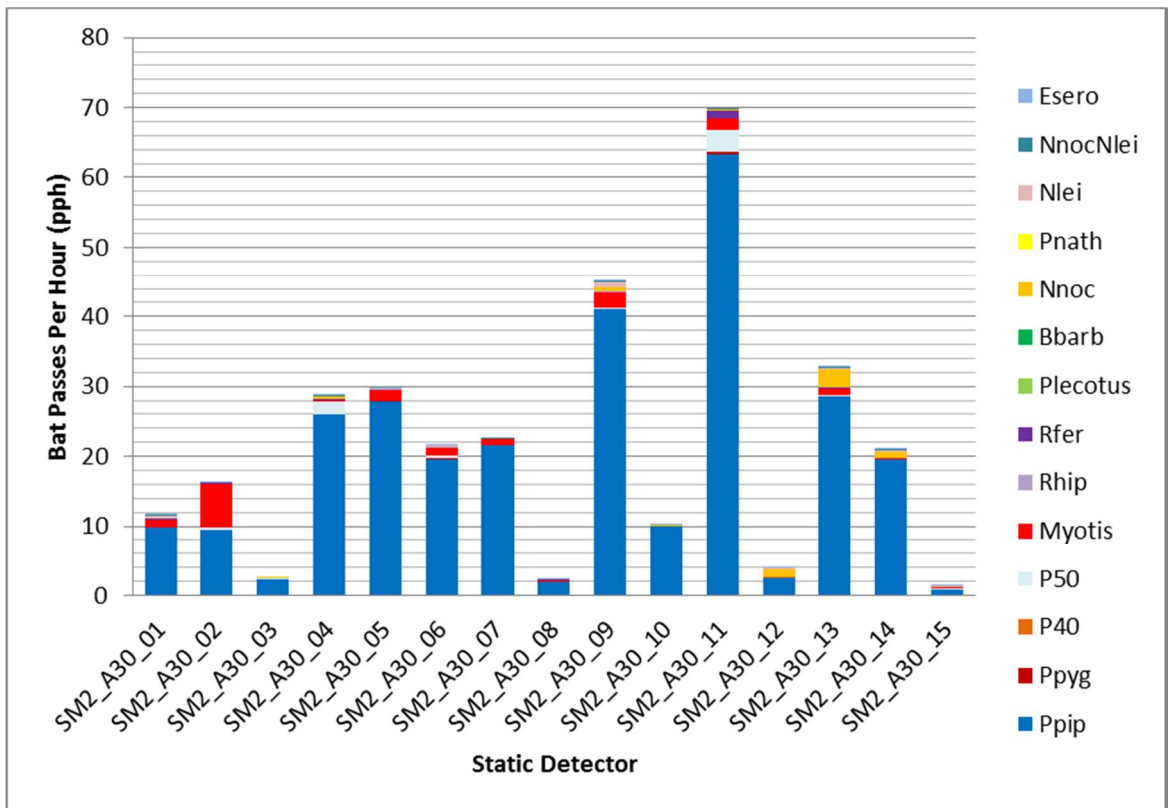


Figure 3.4.1a: Bat activity levels recorded across all detectors during the 2016 survey period

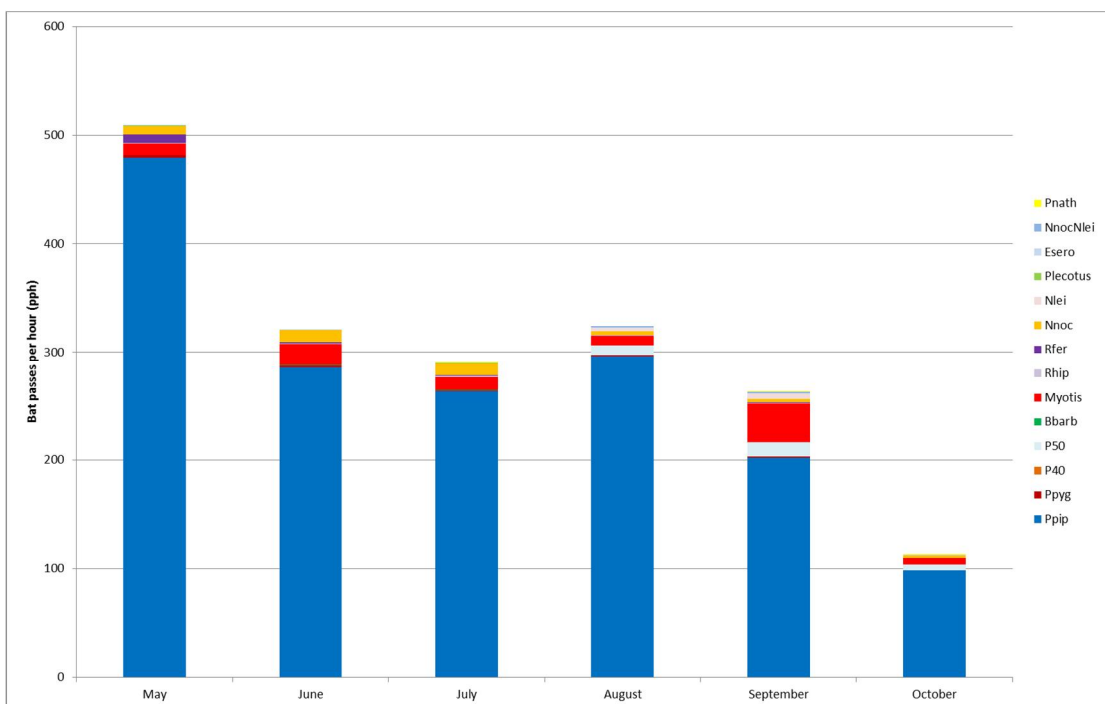
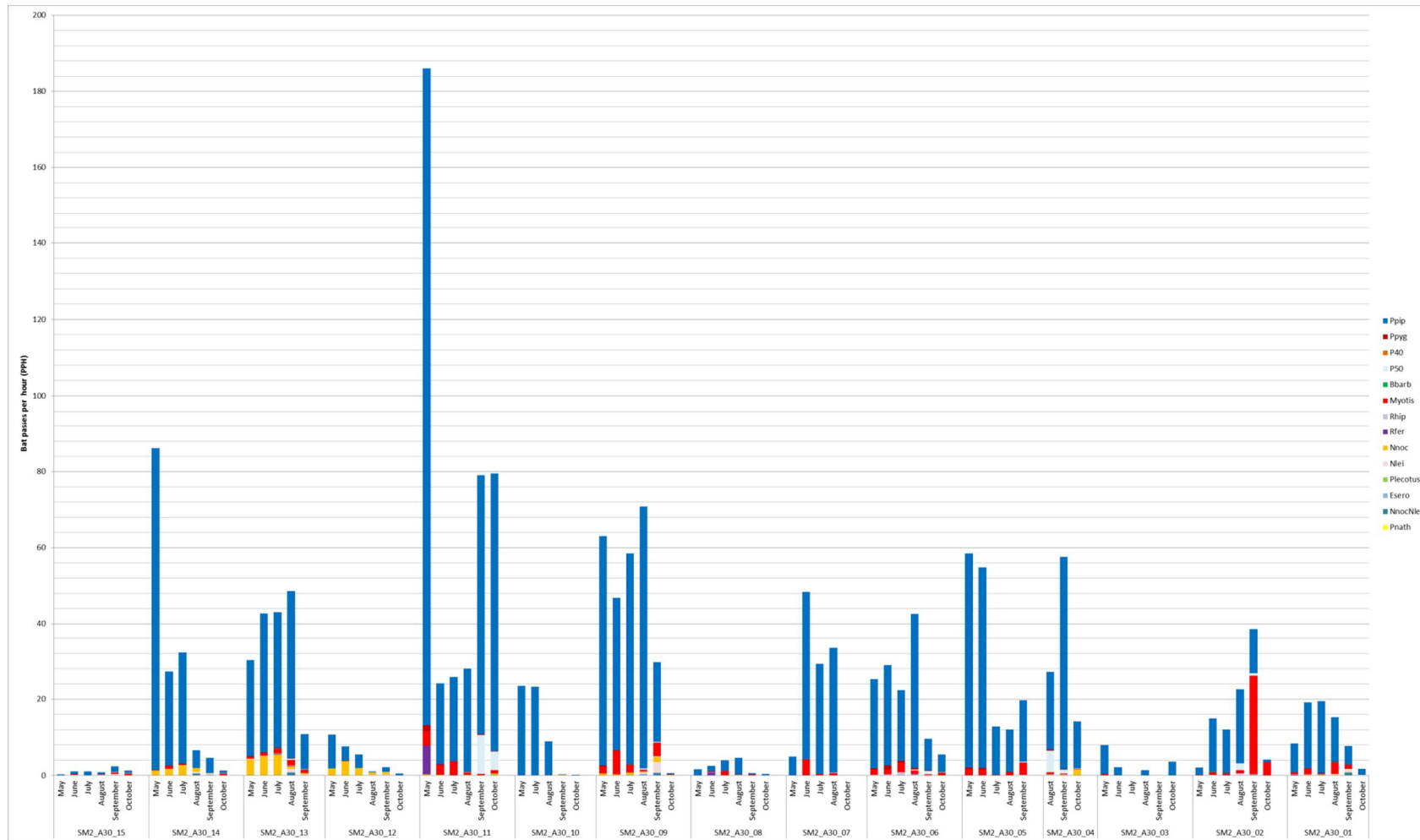


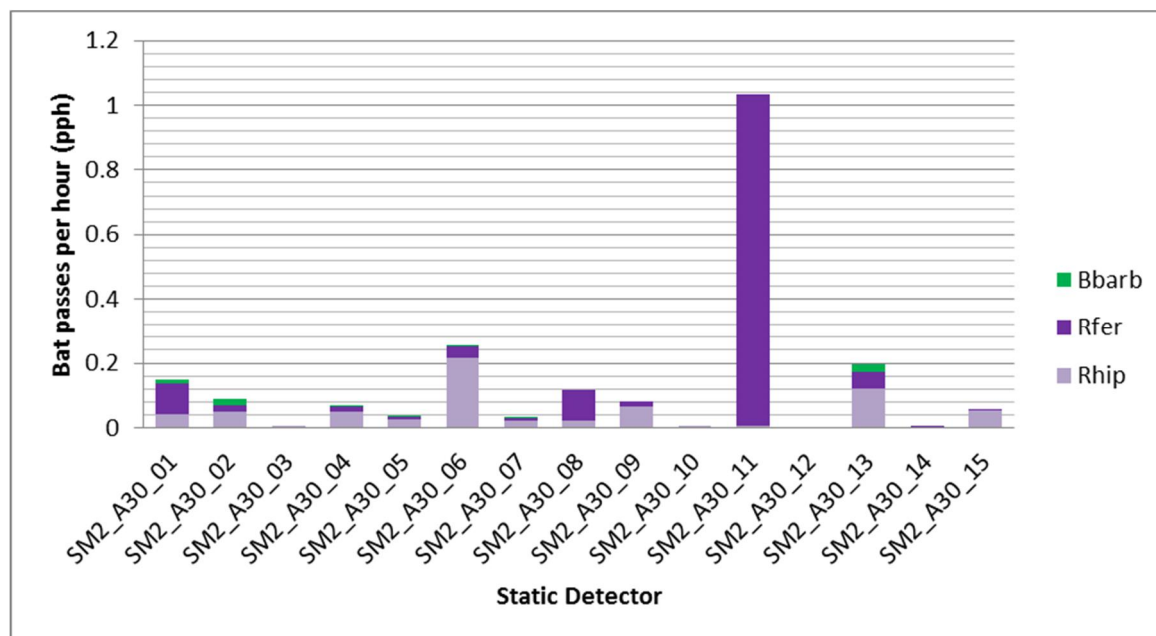
Figure 3.4.1a: Monthly bat activity levels recorded from the automated static detectors during the 2016 survey period



Annex II Species

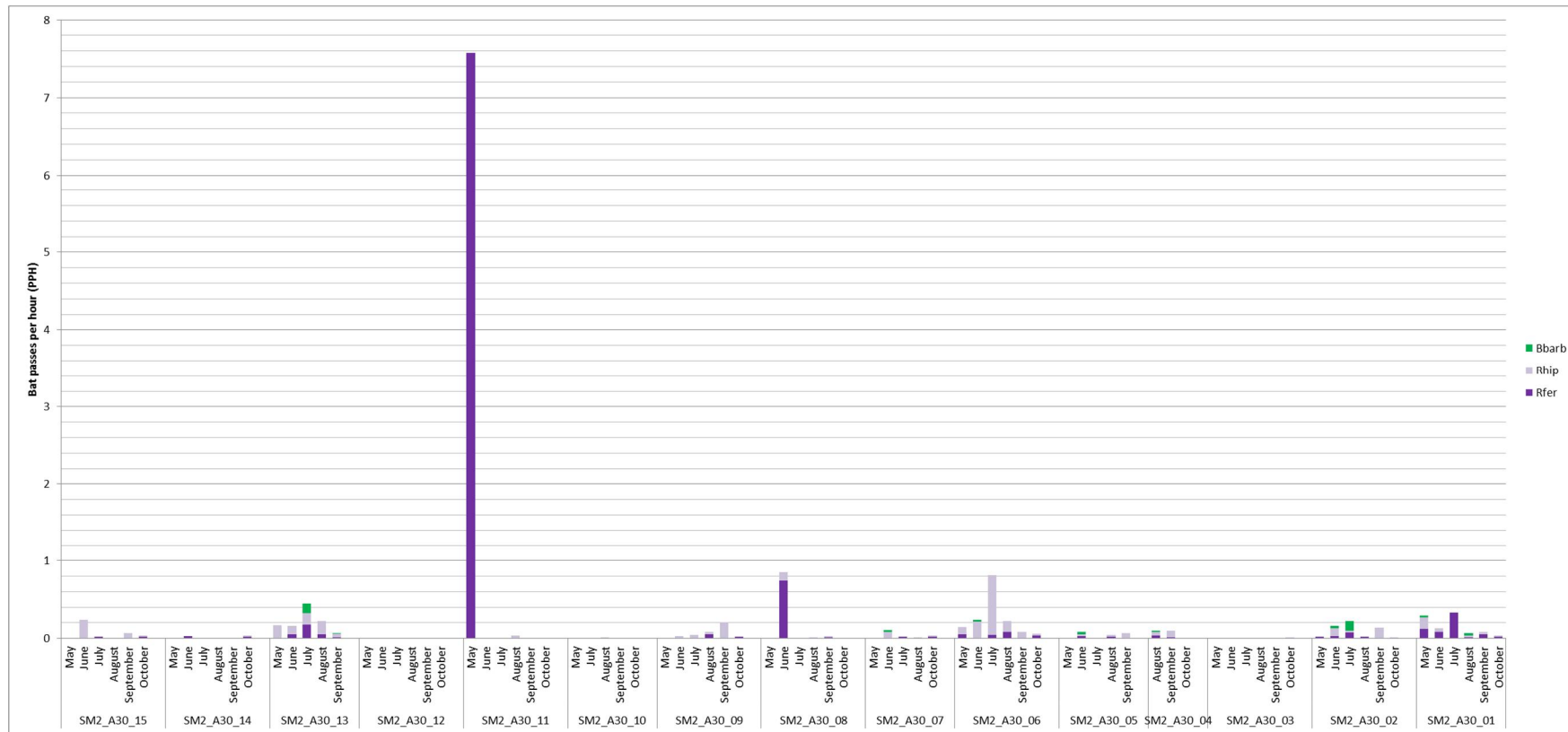
- 3.4.7 A total of 19 Barbastelle bat passes were recorded sporadically throughout the survey area at individual levels, with a peak activity (0.02 pph) being recorded at SM2_A30_02 (Figure 3.4.2) located to the north of the existing A30 and SM2_A30_13 located at the south of the existing A30 near the eastern end. Barbastelle were recorded individually, as such, no temporal peak levels of activity were noted (Figure 3.4.2a).
- 3.4.8 A total of 183 lesser horseshoe bat passes were recorded throughout the survey area (all SM2's with the exception of 12 and 14), with a peak activity (0.22 pph) being recorded at SM2_A30_06 located to the north side of the A30 at Marazanvoze along a double tree-lined road which links to Chyverton House (Figure 3.4.2 and Figure 3, Appendix A). Lesser horseshoe bats were recorded throughout the season with a peak in activity being recorded during July at SM2_A30_06 located within the Nancarrow Farm complex (Figure 3.4.2a). A single building within the Nancarrow Farm complex is confirmed to be a lesser horseshoe night roost. Lesser horseshoe bats were also recorded at SM2_A30_09 along a hedgerow in a valley and at SM2_A30_13 at the north of the survey area at slightly lower levels (Figure 3, Appendix A).
- 3.4.9 A total of 414 greater horseshoe bat passes were recorded throughout the survey area. The highest level of greater horseshoe bat activity (1.03 pph) was recorded at static detector SM2_A30_11 located along the access road to the Trevalso Farm complex with a peak being recorded within May (Figure 3.4.2a and Figure 3, Appendix A). None of the buildings within the Trevalso complex were identified as greater horseshoe bat roosts³⁰. SM2_A30_01 located at the south of the survey area and SM2_A30_08 located at the Zelah underpass also recorded greater horseshoe bats, the peak levels were recorded within June and July 2016.

Figure 3.4.2: Bat activity levels of Annex II species recorded during the 2016 automated static detector surveys



³⁰WSP (2017) A30 Chiverton to Carland Cross, Bat Roost Report. HA551502-WSP-EBD-0000-RE-EN-00017

Figure 3.4.2a: Monthly bat activity levels of Annex II species recorded during the 2016 automated static detector surveys



Cluttered habitat adapted species

- 3.4.10 The majority of the cluttered habitat adapted bat activity was associated with *Myotis* species which accounted for approximately 88% of all cluttered habitat adapted species activity (Figure 3.4.3). The peak activity level of cluttered habitat adapted bats (6.33 pph) was recorded at SM2_A30_02 located to the north of the A30 along a hedgerow surrounded by arable and pasture fields within the southern section of the survey area (Figure 3, Appendix A). The majority of cluttered habitat species activity, however, was recorded within the central sections of the survey area between SM2_A30_05-11. Peaks in activity levels were recorded at static detector SM2_A30_11 during the month of May (11.5 pph) and at SM2_A30_02 during the month of September (26 pph) (Figure 3.4.3a), the rest of the activity was spread fairly evenly across the months.
- 3.4.11 It should be noted that maternity brown long-eared roosts were recorded within the vicinity of SM2_A30_03 and 06. It is possible that the actual activity level of cluttered habitat species has been under represented particularly within these areas, as the species generally associated within this ecological niche tend to have quieter calls, which often don't trigger the detectors. This is an unavoidable outcome using bat detectors. All four cluttered habitat adapted species were recorded at static detectors SM2_A30_01, 07, 09, 11, 13, and 15, peak levels of brown long-eared bats were recorded at SM2_A30_09 and 11.
- 3.4.12 The lowest levels of cluttered habitat adapted bats was recorded at SM2_A30_03, 10, and 12, where bat activity levels of all of the ecological niches were also low (Figure 3, Appendix A).

Figure 3.4.3: Bat activity levels of cluttered habitat adapted species recorded during the 2016 automated static detector surveys

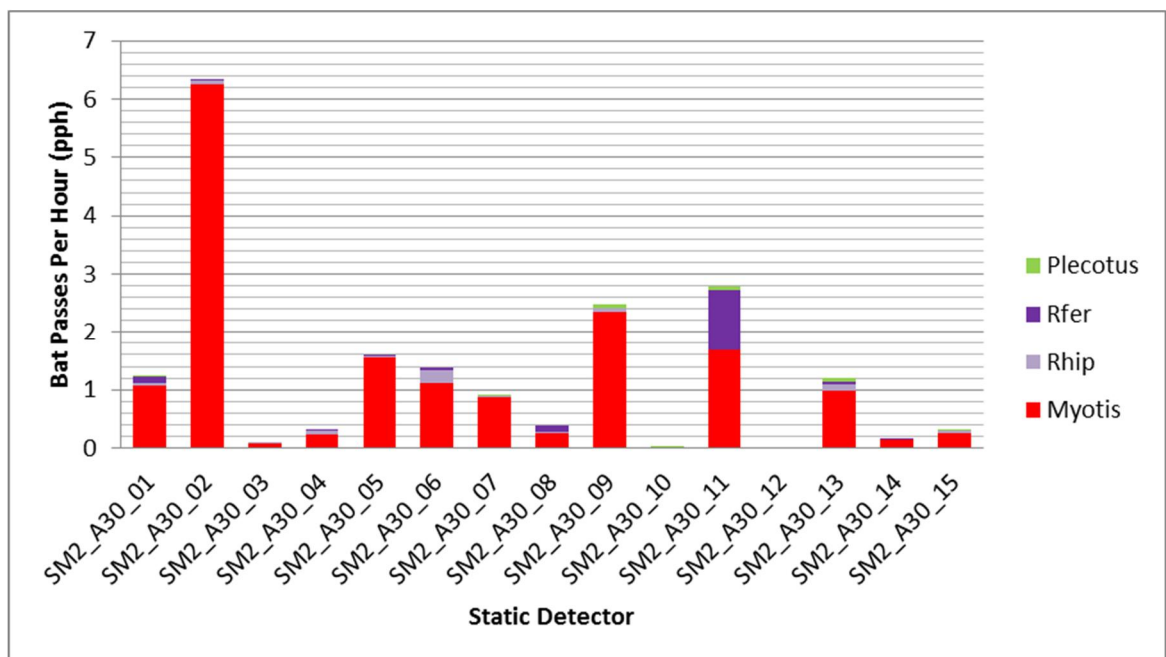
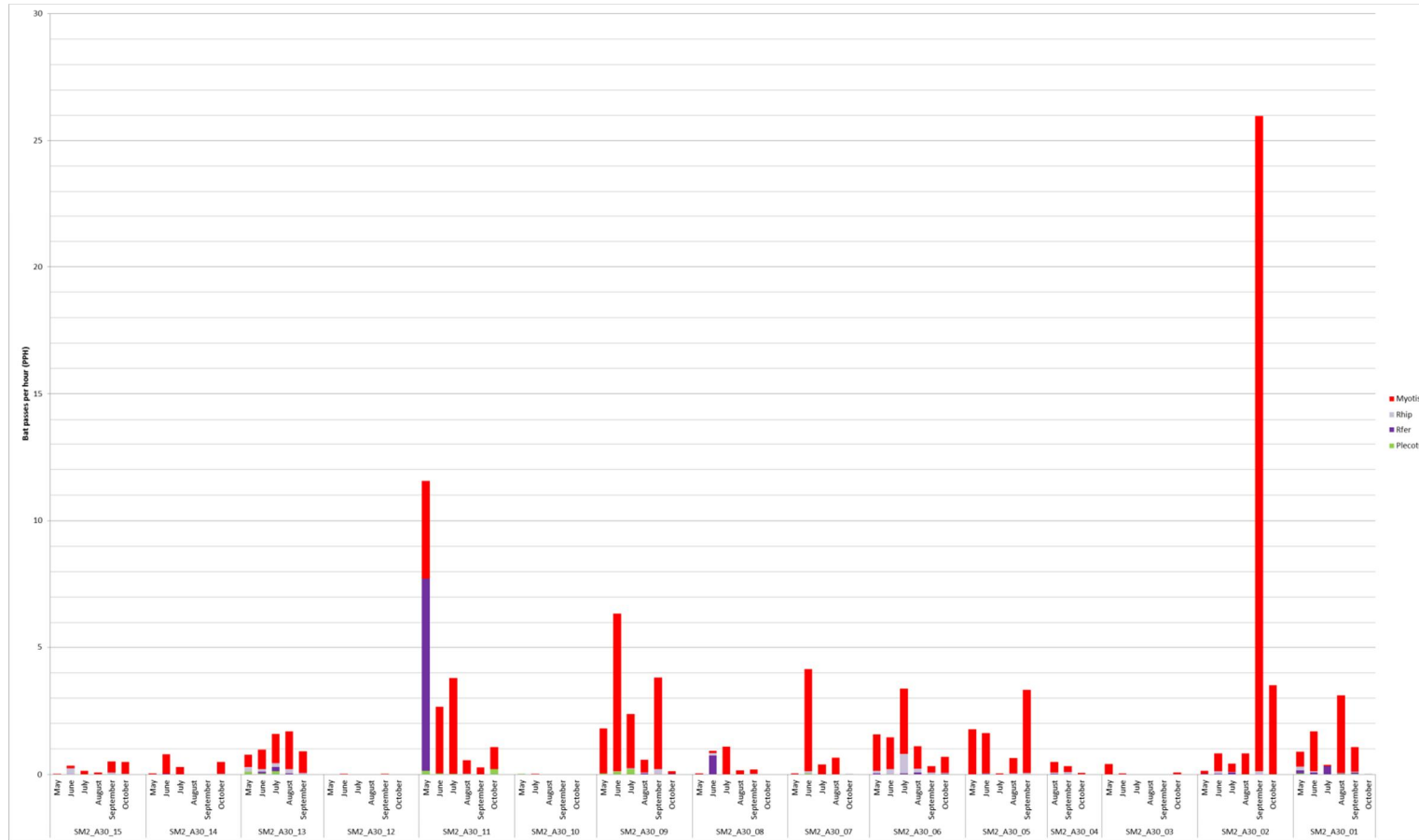


Figure 3.4.3a: Monthly bat activity levels of cluttered habitat adapted species recorded during the 2016 automated static detector surveys



Edge habitat adapted species

- 3.4.13 Common pipistrelles were the most commonly recorded edge habitat species present, with peak levels of activity being recorded at 66.75 bat pph on SM2_A30_11 located within the Trevalso Farm complex (Figure 3.4.4). A common pipistrelle maternity colony has been identified within the main farm building within the Trevalso Farm complex (reported separately).
- 3.4.14 Peak levels of edge habitat species were also recorded within the Marazanvose area (SM2_A30_04, 05, 06), near Tolgroggan Farm (SM2_A30_09) and along a small hedgerow lined road to the south of the A30 (SM2_A30_11) (Figure 3, Appendix A).
- 3.4.15 Barbastelle bat, Serotine, and Nathusius pipistrelle were recorded sporadically at individual levels throughout the survey area. The peak activity level for these species and species groups not rising above 0.07 pph.
- 3.4.16 Peak levels of bat activity were recorded during the May surveys at detectors SM2_A30_11 and 14 (Figure 3.4.4a). As detailed within the Annex II section, Barbastelle was recorded within the months of June and July at individual levels at static detectors SM2_A30_01, 02, 05, 06, 07, and 13 (Figure 3.4.4a).

Figure 3.4.4: Bat activity levels of edge habitat adapted species recorded during the 2016 automated static detector surveys

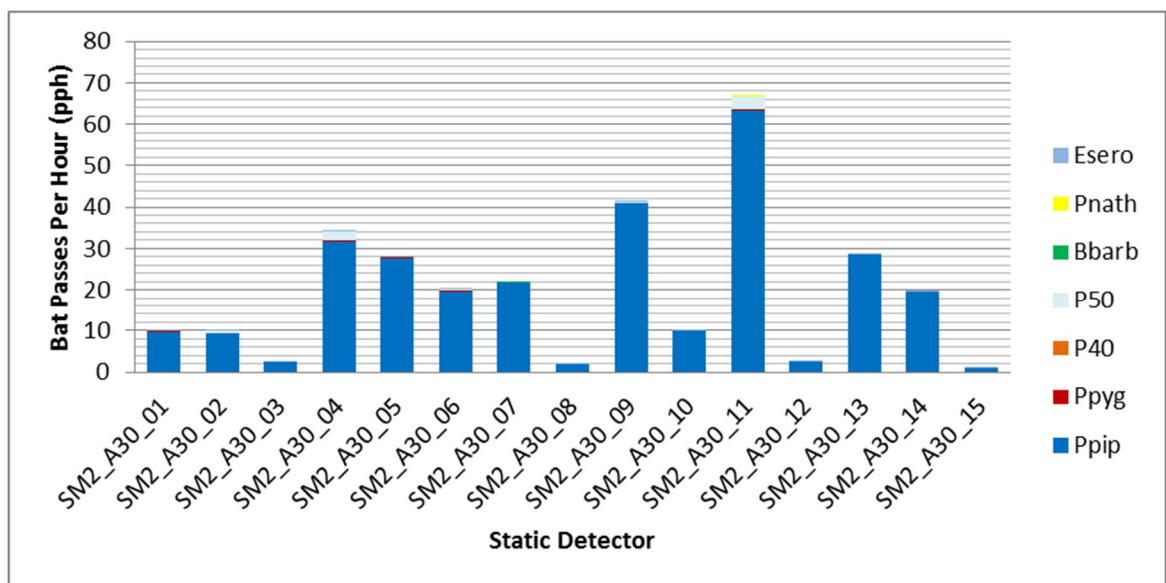
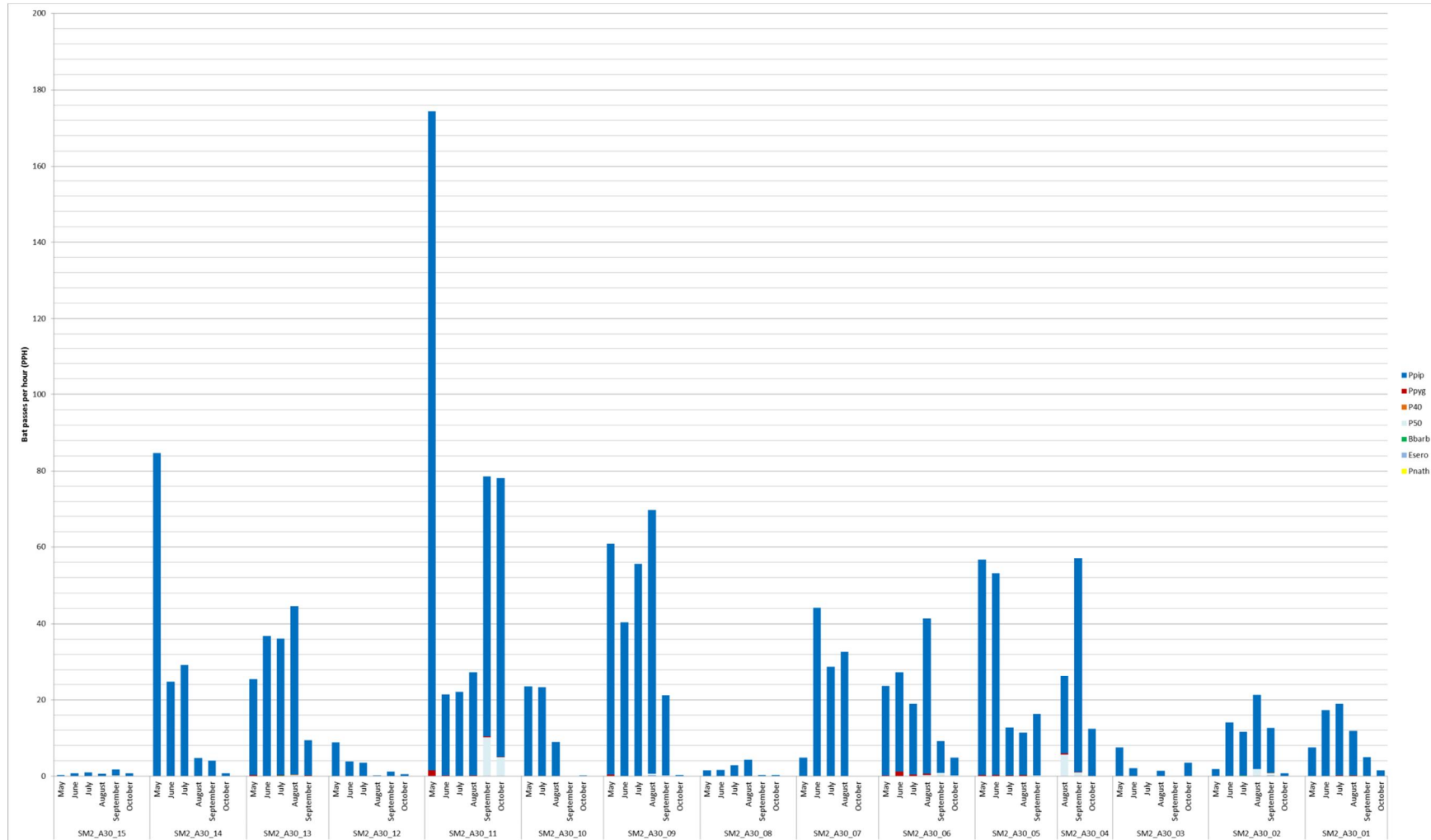


Figure 3.4.4a: Monthly bat activity levels of edge habitat adapted species recorded during the 2016 automated static detector surveys



Open habitat adapted species

- 3.4.17 Both of the open habitat adapted species, noctule and Leisler's bat were recorded within the survey area. Both species were recorded throughout the survey area with noctules being recorded more frequently (Figure 3.4.5).
- 3.4.18 Peak levels of activity were recorded at detectors SM2_A30_09, 12, 13, 14 located to the north of the survey area (Figure 3, Appendix A). The habitats in these areas were generally considered to be fairly open and exposed, with the exception of A30_SM2_09 and 12 which was located along a hedgerow and woodland edge located within a valley.
- 3.4.19 Lower levels of open adapted species were recorded within the central sections of the survey area that were associated with a more cluttered environment (Figure 3.4.5 and Figure 3, Appendix A).
- 3.4.20 Peak levels of open habitat adapted bats were recorded within the month of July, with the lowest levels of activity being recorded within October (Figure 3.4.5a).

Figure 3.4.5: Bat activity levels of open habitat adapted species recorded during the 2016 automated static detector surveys

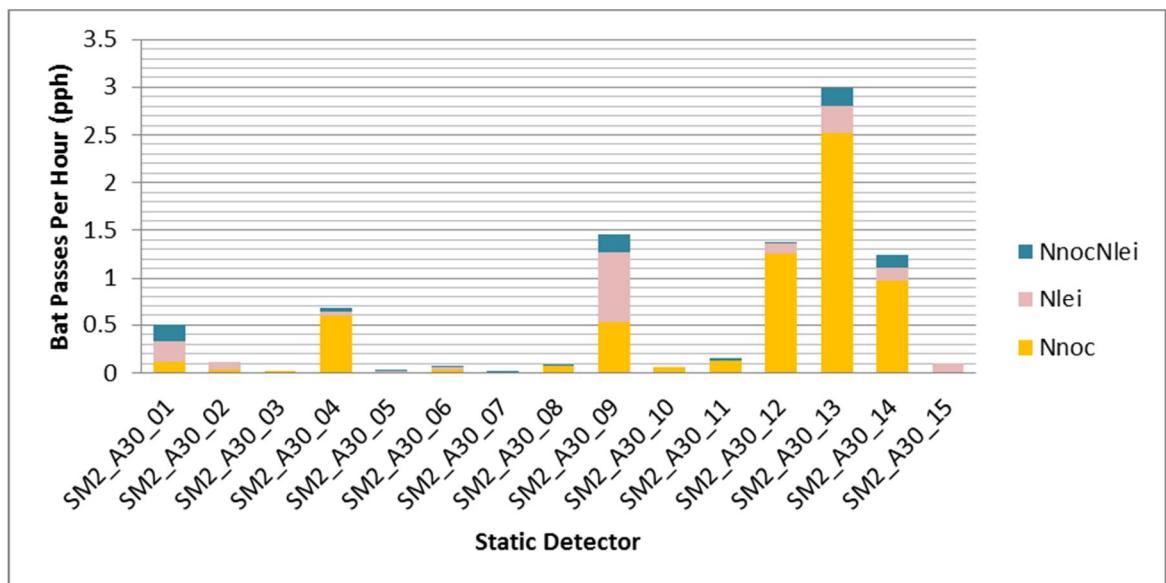
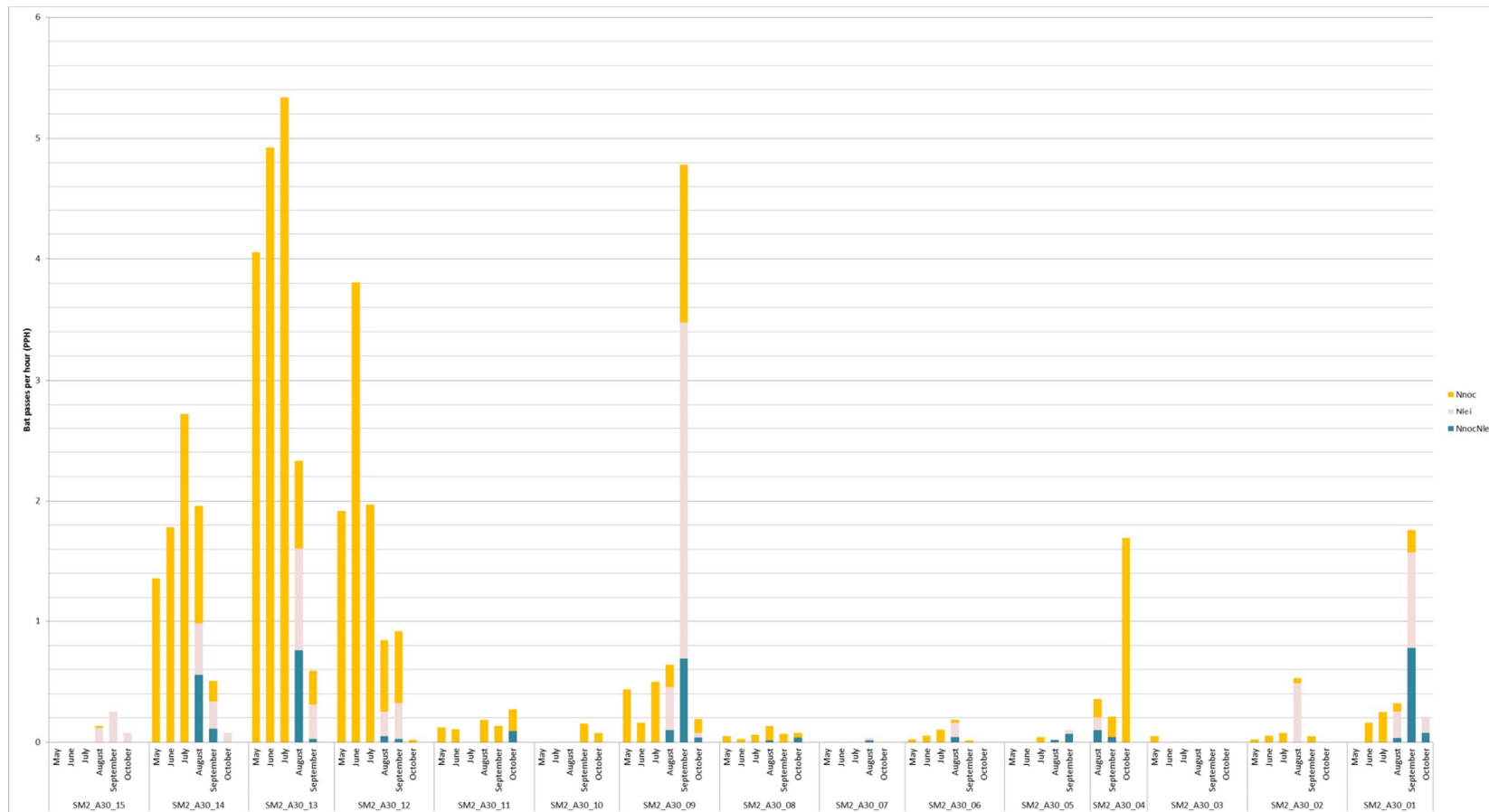


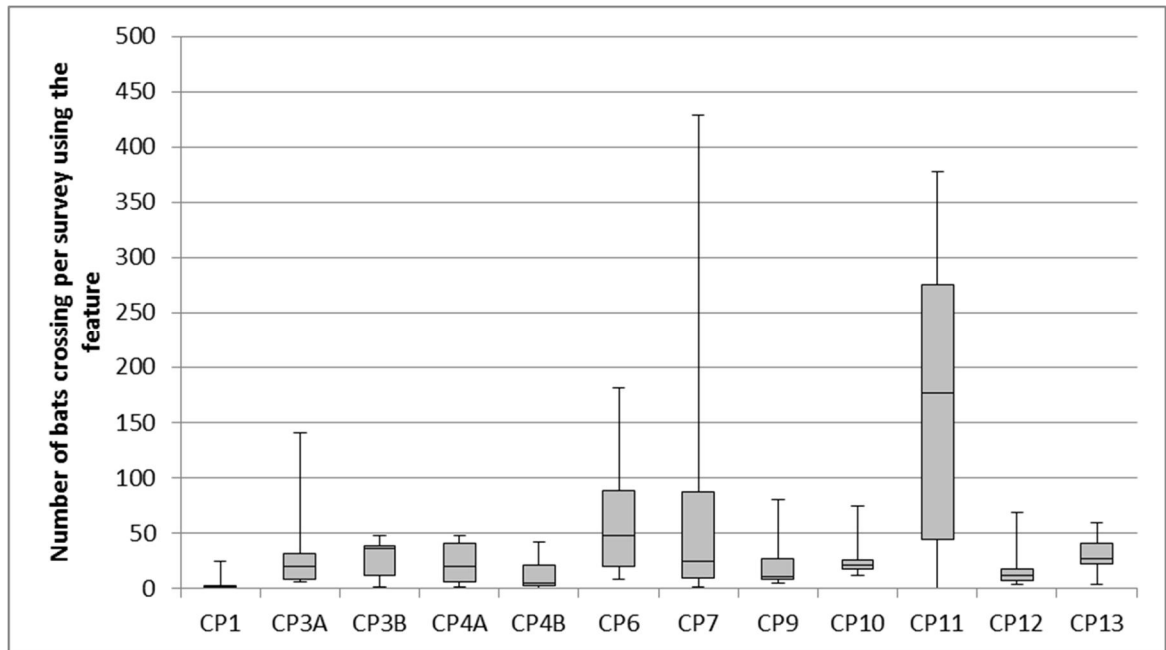
Figure 3.4.5a: Monthly bat activity levels of open habitat adapted species recorded during the 2016 automated static detector surveys



3.5 CROSSING POINT SURVEYS

- 3.5.1 A full suite of Crossing Point surveys (consisting of six repeat visits between June-September as per current best practice¹⁰) were undertaken at 12 locations during the 2016 and 2017 survey period (Figure 3 Appendix A). The data from both of the years has been included (please refer to the methods section).
- 3.5.2 The results of the scoped out Crossing Point surveys where initial scoping surveys were undertaken, but the number of bat passes recorded using the feature did not reach the threshold level¹⁰ are presented within Appendix B. These were Crossing Points 3C and 14.
- 3.5.3 Following confirmation of the proposed Scheme in 2017, it was not necessary to continue surveying three of the crossing points, as the Scheme no longer bisects the linear features, these were Crossing Points 2, 5, and 8. The results of which have been included within the Appendix, but not within the report.
- 3.5.4 Bats were recorded crossing the proposed Scheme at all of the 12 Crossing Points. Peak numbers of bats confirmed to be crossing the proposed Scheme were recorded at Crossing Points 3A at Nanteague Farm, 6 at Nancarrow Farm, 7 where bats are using the current underpass and 11 at Trevalso Farm (Figure 3.5.1). The lowest number of bats seen to be crossing the proposed Scheme was at Crossing Point 1 (Figure 3.5.1). Figure 3.5.1 illustrates that consistently high numbers of bats were recorded to be crossing the proposed Scheme at Crossing Points 6, 7, and 11. A peak level of bats recorded to be crossing the proposed Scheme at Crossing Point 7 was recorded during one survey whereby a peak number of 429 bats were recorded (as identified by the top whisker of the box and whisker plot: Figure 3.5.1).
- 3.5.5 Bats were recorded crossing the existing A30 at Crossing Points 3A, 4A, 4B (bats were recorded flying towards / away from the A30), 6, 7, and 9-12 (in the case of Crossing Point 7, the majority of bats were recorded crossing underneath the existing A30 at the underpass). Further details of the results of each Crossing point are presented below, the raw Data is presented within Appendix B.
- 3.5.6 Within the Box and Whisker Plots the upper and lower quartiles were set at 75 and 25 percent of the range of data. Where no median or upper quartile is present, it is due to the limited range of the results (for example the median can also be the upper quartile). Where there is no median presented, it will be due to either single bats being recorded, or all bats being recorded at the same height. This is applicable to all box and whisker graphs.

Figure 3.5.1: Summary of the number of bats recorded per survey considered to be using the linear feature



Crossing Point 1

- 3.5.7 A total of 31 bats were seen crossing the proposed Scheme at Crossing Point 1 (Figure 3, Appendix A) during the six survey visits (please refer to methods for dates), of which 29 were considered to be using the linear feature. 27 of these were considered to be flying at an unsafe height (Table 3.5.1). Common pipistrelle bats were the only species recorded to be using the linear feature as a commuting and foraging route to cross the proposed Scheme at Crossing Point 1, although *Myotis*, Leisler's, serotine and NSL species group was also recorded during the survey (Table 3.5.1).
- 3.5.8 No known tree or building roosts were located within immediate proximity, although known maternity roosts of common pipistrelle and brown long-eared bats were identified within the buildings to the north of the Crossing point (reported separately).
- 3.5.9 No bats were recorded to be crossing the adjacent A3075 during the surveys.

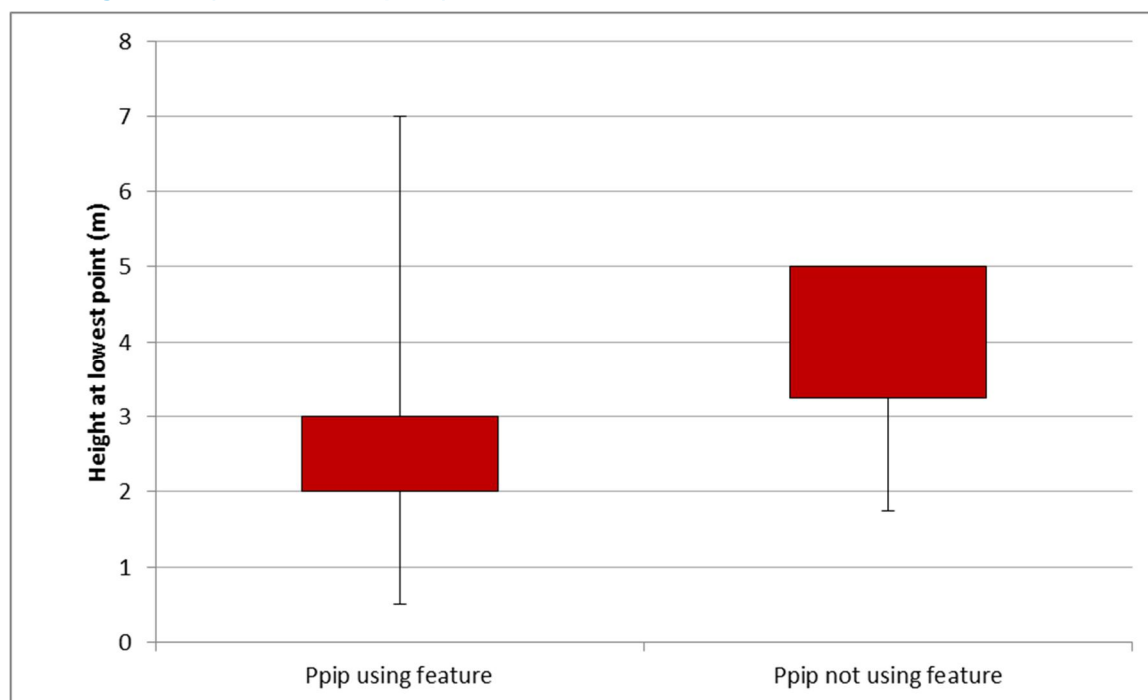
Table 3.5.1 Numbers and crossing behaviour for each bat species and species group using the linear feature that bisects the proposed Scheme at Crossing Point

SPECIES	TOTAL *	TOTAL SEEN CROSSING	USING FEATURE	HEARD AND NOT SEEN	USING FEATURE AT AN UNSAFE HEIGHT <5 M	NOT USING FEATURE AT AN UNSAFE HEIGHT <5 M
ALL SPECIES	234	31	29	202	27	2
COMMON PIPISTRELLE	218	31	29	186	27	2
LEISLER'S BAT	1	0	0	1	0	0
SEROTINE	1	0	0	1	0	0
MYOTIS	2	0	0	2	0	0
NSL	10	0	0	10	0	0
UNIDENTIFIED BAT	2	0	0	2	0	0

**Please note that bats seen crossing at safe heights > 5 m have not been reported within these tables.*

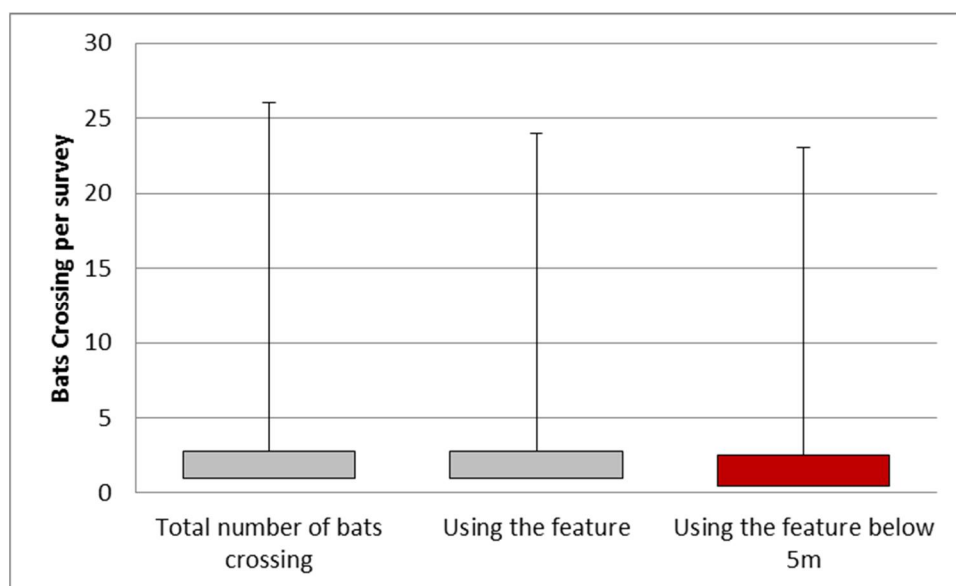
- 3.5.10 All of the bats seen crossing the proposed Scheme were between 0.5 m and 7 m, the majority of which were recorded crossing at unsafe heights (<5 m) (Figure 3.5.2). A total of 27 bats were recorded using the feature to cross the proposed Scheme at an unsafe height (<5m). Two bats not considered to be using the feature crossed the proposed Scheme at an unsafe height.

Figure 3.5.2: Heights at which the recorded bat species were crossing the proposed Scheme at Crossing Point 1 (at their lowest point)



- 3.5.11 In general during each survey visit only individual bats (<5 bats) were recorded crossing the proposed Scheme (irrespective of using the feature or not). A peak of 26 common pipistrelles were seen to be crossing the proposed Scheme on the fourth visit in June 2017 (see Figure 3.5.3 and Appendix B (A30 Crossing Point Surveys:- Raw Data Bats Crossing Per Survey)). This higher level of activity is likely to be attributed to a single or individual numbers of bats foraging along the feature (although not crossing the adjacent A3075).

Figure 3.5.3 Total number of bats per survey crossing the proposed Scheme at Crossing Point 1 and the number considered to be using the feature



Crossing Point 3A

3.5.12

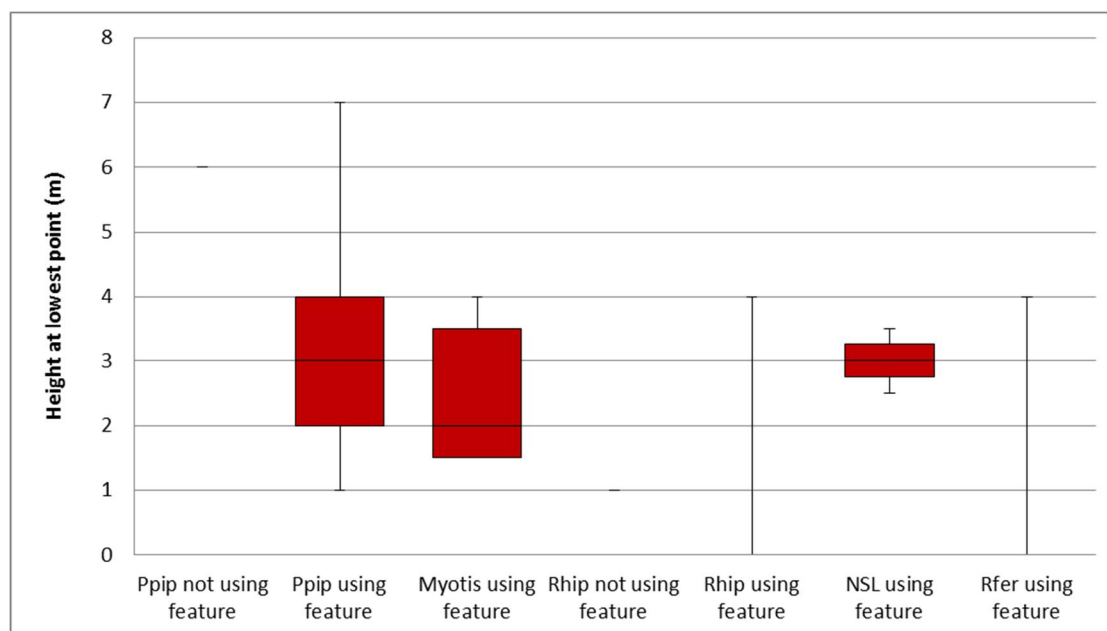
A total of 226 bats were seen crossing the proposed Scheme during the six survey visits (please refer to methodology for dates), of which 218 were considered to be using the linear feature (Table 3.5.2). During the surveys a similar number of common pipistrelle and greater horseshoe bats were recorded to be using the linear feature as a commuting and foraging route to cross the proposed Scheme at Crossing Point 3A (Table 3.5.2). The third most commonly recorded species seen crossing the feature was lesser horseshoe bat. *Myotis* species, NSL and unidentified bats were also recorded using the linear feature (Table 3.5.2).

Table 3.5.2: Numbers and crossing behaviour for each bat species and species group using the linear feature that bisects the proposed Scheme at Crossing Point 3A

SPECIES	TOTAL	TOTAL SEEN CROSSING	USING FEATURE	HEARD AND NOT SEEN	USING FEATURE AT AN UNSAFE HEIGHT <5 M	NOT USING FEATURE AT AN UNSAFE HEIGHT <5 M
ALL SPECIES	503	226	218	237	211	13
Common pipistrelle	295	94	90	164	85	0
Myotis	14	5	5	8	5	0
Lesser horseshoe	86	40	36	45	34	13
Greater horseshoe	94	84	84	9	84	0
Noctule	4	0	0	4	0	0
Soprano pipistrelle	5	0	0	5	0	0
Serotine	1	0	0	1	0	0
NSL	2	2	2	0	2	0
Unidentified bat	2	0	1	1	1	0

- 3.5.13** All of the bats seen crossing the proposed Scheme were between 0.5 m - 7 m, the majority of which (224 bats) were recorded crossing at unsafe heights (<5 m) (Figure 3.5.4). A total of 211 bats were recorded using the feature to cross the proposed Scheme at an unsafe height (<5m), of which common pipstrelle and greater horseshoe were the majority of the bats in equal numbers (85 and 84 bats), followed by lesser horseshoe 34 bats as detailed within Table 3.5.2. A total of 13 bats not considered to be using the feature crossed the proposed Scheme at an unsafe height, these were all lesser horseshoe (Figure 3.5.4).
- 3.5.14** The earliest lesser horseshoe bat pass was recorded approximately 40 minutes after sunset in July 2017, the earliest greater horseshoe bat pass was recorded approximately 40 minutes after sunset in September 2016. Known maternity roosts of common pipistrelle and brown long-eared bat were identified within the buildings of the Nanteague Farm complex to the south of the Crossing Point and to the north of the existing A30 (reported separately). No known tree roosts were located within proximity.

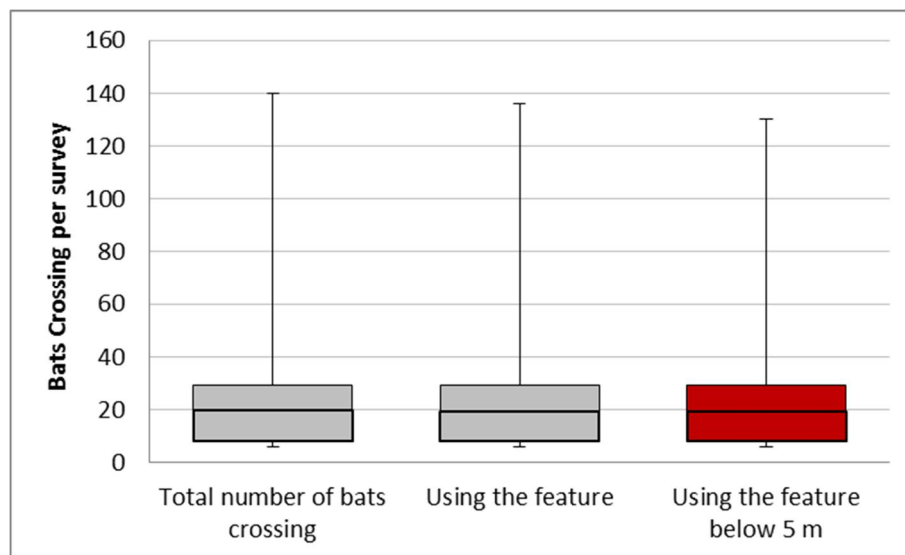
Figure 3.5.4 Heights at which the recorded bat species were crossing the proposed Scheme at Crossing Point 3A (at their lowest point)



- 3.5.15** The majority of bats seen crossing the proposed Scheme was during the fourth visit in July 2017 (peak of 140) where common pipistrelle, *Myotis* species, soprano pipistrelle, lesser horseshoe bat, greater horseshoe bat were recorded. It is likely that the higher number of bats recorded are attributed to a number of individuals foraging along the hedgerow and within the surrounding pasture fields. The highest numbers of lesser and greater horseshoe bats was recorded during the July survey (32 and 88 respectively). Although lesser horseshoe bats were recorded during every survey, greater horseshoe bats were recorded only during the September and two July surveys. In general the number of bats recorded to be using the linear feature to forage and commute along was 10-30 per survey (Figure 3.5.5, Appendix B). The majority of these were flying at unsafe heights (Figure 3.5.5).
- 3.5.16** During the surveys, a total of six bats were observed crossing the current A30, species included greater and lesser horseshoe bats, an unidentified bat and a common pipistrelle. It should be noted that the purpose of the Crossing point surveys were to identify the species and number of bats crossing the proposed Scheme at varying heights, the number of bats crossing the existing A30 is deemed to be an incidental sighting only. A number of other possible individuals were recorded either commuting or foraging towards or away from the A30. These were not confirmed

to be crossing. As such, the number of bats crossing the current A30 is likely to be higher than recorded.

Figure 3.5.5 Total number of bats per survey crossing the proposed Scheme at Crossing Point 3A, the total number of bats using the feature and how many per survey were considered to be at unsafe heights



Crossing Point 3B

- 3.5.17** A total of 165 bats were seen crossing the proposed Scheme during the six survey visits, of which 124 were considered to be using the linear feature (Table 3.5.3). Common pipistrelle bats were the most common species recorded using the feature for commuting and foraging purposes (127 bats seen), although individual bats of *Myotis* species, lesser horseshoe bat, Barbastelle bat, brown long-eared bat, and greater horseshoe bats were also recorded. Noctule bats were recorded during the survey, although not considered to be using the linear feature.
- 3.5.18** No known tree roosts were located within proximity, although known maternity roosts of common pipistrelle and brown long-eared bats were identified within the buildings of the Nanteague Farm complex to the south of the Crossing Point and to the north of the existing A30 (reported separately).

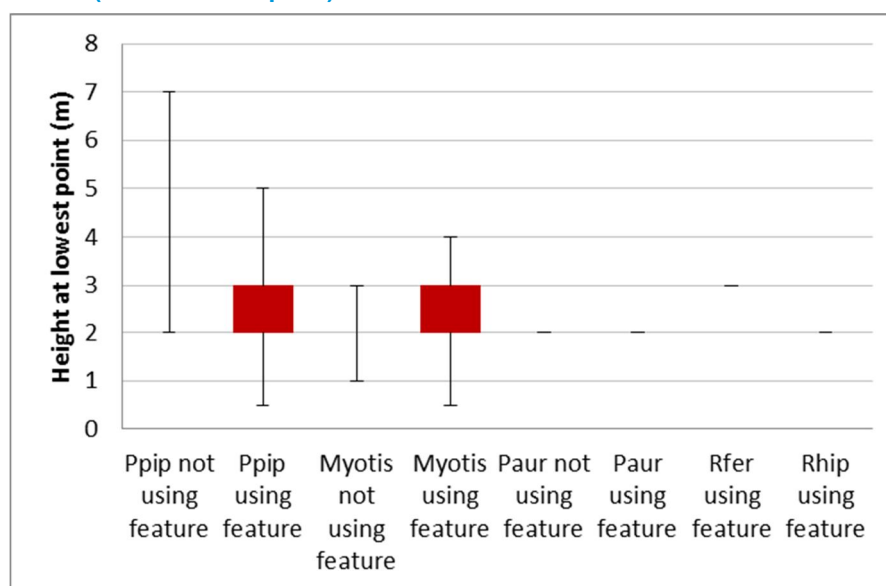
Table 3.5.3: Numbers and crossing behaviour for each bat species / species group using the linear feature that bisects the proposed Scheme at Crossing Point 3B

SPECIES	TOTAL	TOTAL SEEN CROSSING	USING FEATURE	HEARD AND NOT SEEN	USING FEATURE AT AN UNSAFE HEIGHT <5 M	NOT USING FEATURE AT AN UNSAFE HEIGHT <5 M
All Species	411	165	124	184	123	40
Common pipistrelle	353	127	112	165	111	14
Myotis	32	24	9	8	9	15
Lesser horseshoe	8	2	1	5	1	1
Greater horseshoe	2	1	1	1	1	0
Noctule	1	0	0	1	0	0
Barbastelle	1	0	0	1	0	0
Brown long-eared bat	12	11	1	1	1	10

3.5.19

All of the bats seen were crossing the proposed Scheme between 0.5 m - 7 m, with all of the bats considered to be using the feature recorded flying at unsafe heights (<5m) (Figure 3.5.6). The majority of the bats that were considered to be crossing the proposed Scheme at unsafe heights (<5 m) were likely to have been foraging within the surrounding pasture fields.

Figure 3.5.6: Heights at which the recorded bat species were crossing the proposed Scheme at Crossing Point 3B (at their lowest point)



3.5.20

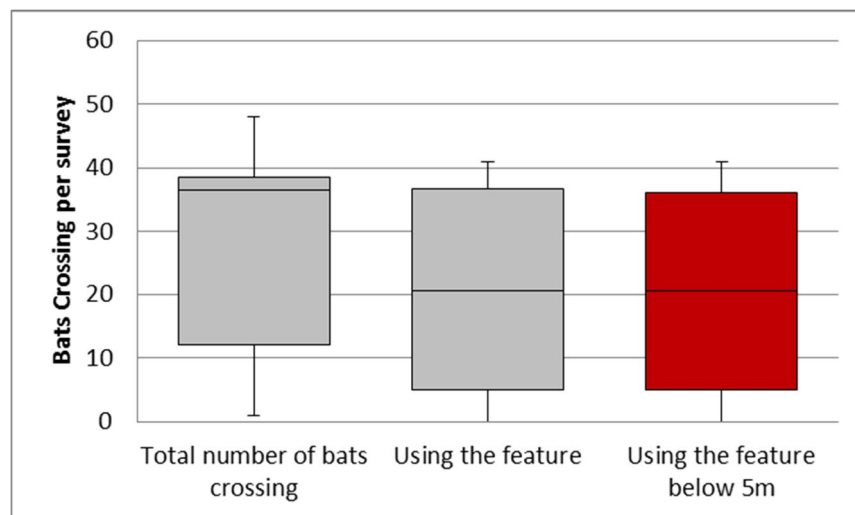
There were no peaks in activity levels during the six surveys, with data being evenly spread throughout the survey period. The number of bats recorded to be using the feature was generally 10-40 per survey, the majority of which were flying at unsafe heights (Figure 3.5.7). The earliest lesser horseshoe bat pass was recorded approximately 50 minutes after sunset during the August 2017 surveys.

3.5.21

No bats were observed crossing the current A30. It was not possible to survey along the A30 itself at this point due to health and safety issues, as such it is not possible to rule out that bats

are crossing the current A30 at this location.

Figure 3.5.7: Total number of bats per survey crossing the proposed Scheme at Crossing Point 3B, the total number of bats using the feature and how many per survey were considered to be at unsafe heights



Crossing Point 4A

- 3.5.22 A total of 136 bats were seen crossing the proposed Scheme during the six survey visits, of which 134 were considered to be using the linear feature (Table 3.5.4). Common pipistrelle bats were the most common species recorded using the feature for commuting and foraging purposes, although individual bats of *Myotis* species, Leisler's bat, soprano pipistrelle, unidentified bat, and lesser horseshoe bats were also recorded. Serotine and noctule bats were also recorded although none were considered to be using the linear feature.
- 3.5.23 No known tree or building roosts were located within proximity, although know maternity roosts of common pipistrelle and brown long-eared bats were identified within the buildings within the Nancarrow Farm complex to the north of the Crossing Point (Figure 4, Appendix A, and reported separately).

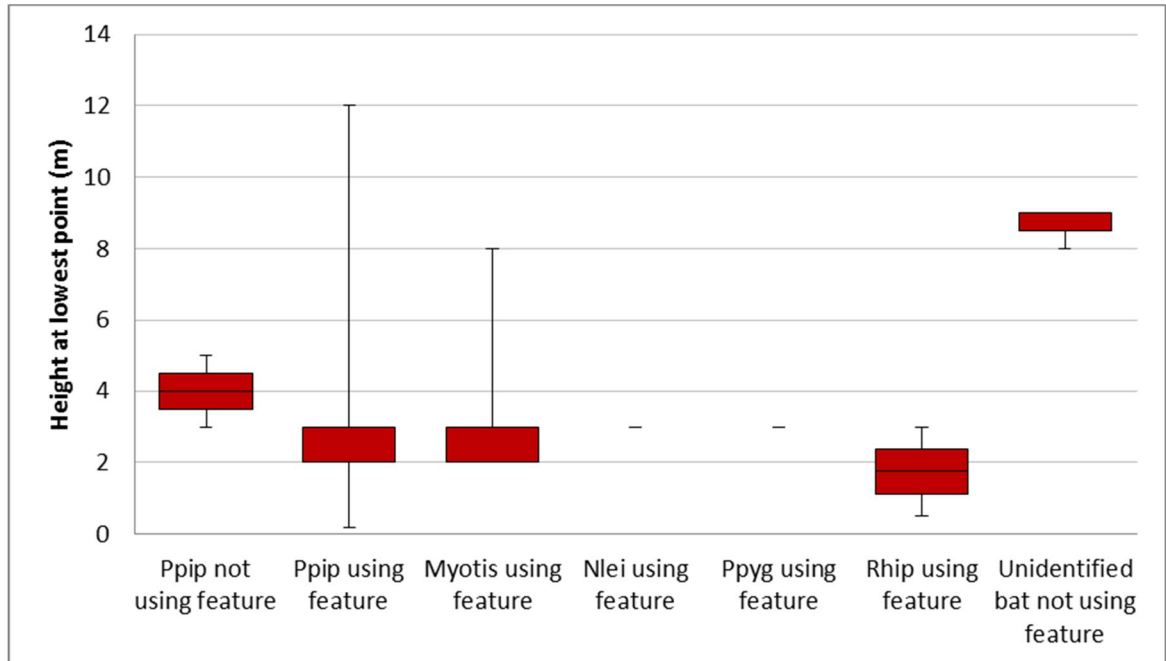
Table 3.5.4: Numbers and crossing behaviour for each bat species / species group using the linear feature that bisects the proposed Scheme at Crossing Point 4A

SPECIES	TOTAL	TOTAL SEEN CROSSING	USING FEATURE	HEARD AND NOT SEEN	USING FEATURE AT AN UNSAFE HEIGHT <5 M
ALL SPECIES	345	136	134	199	126
Common pipistrelle	311	118	116	184	112
Myotis	18	10	10	8	9
Noctule	3	0	0	3	0
Serotine	1	0	0	1	0
Leisler's bat	1	1	1	0	1
Soprano pipistrelle	5	2	2	3	2
Lesser horseshoe	2	2	2	0	2
Unidentified bat	4	3	3	0	0

- 3.5.24 The majority of bats using the linear feature were considered to be flying at unsafe heights (<5 m)

(Figure 3.5.8). All of the unidentified bats were recorded to be flying at safe heights (>5 m). These were following the tops of the mature trees along the linear feature.

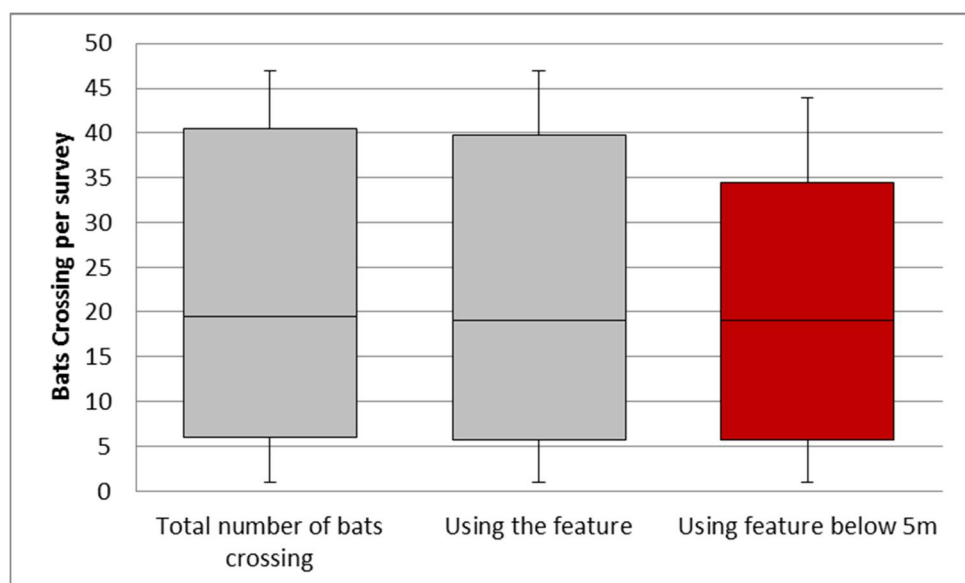
Figure 3.5.8 Heights at which the recorded bat species were crossing the proposed Scheme at Crossing Point 4A (at their lowest point)



3.5.25 There was no obvious peak in number of bats recorded to be using the feature for commuting or foraging purposes (Figure 3.5.9). Bats were generally foraging up and down the double tree-lined minor road (Figure 4, Appendix A and Appendix B).

3.5.26 A total of six common pipistrelle bats were recorded crossing the existing A30 during the June and July 2017 surveys.

Figure 3.5.9: The number of bats per survey crossing the proposed Scheme at Crossing Point 4A, whether they are using the feature and if so what height



Crossing Point 4B

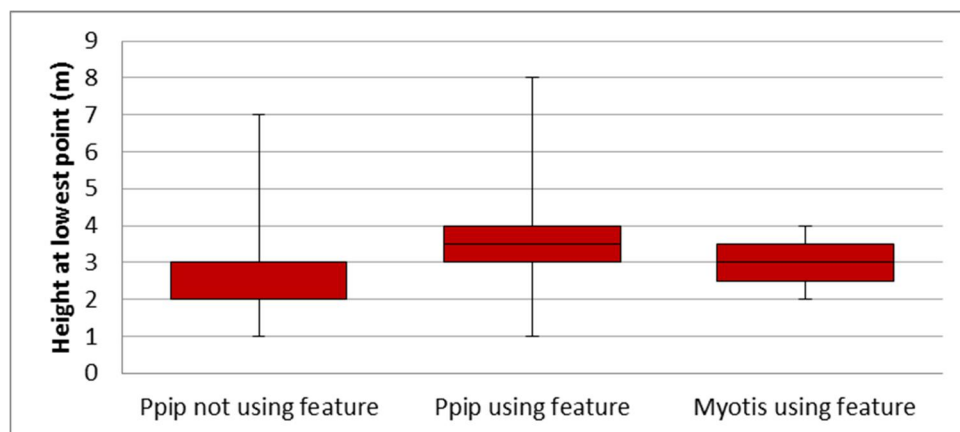
- 3.5.27 A total of 79 bats were seen crossing the proposed Scheme during the six survey visits, of which 33 were considered to be using the linear feature (Table 3.5.5). Common pipistrelle bats were the most common species recorded using the feature for commuting and foraging purposes, although individual bats of *Myotis* species, lesser horseshoe, unidentified bat, noctule and Serotine were also recorded.
- 3.5.28 No known tree or building roosts were located within proximity, although known maternity roosts of common pipistrelle and brown long-eared bats were identified within the buildings within the Nancarrow Farm complex (reported separately) to the north of the Crossing Point (Figure 4, Appendix A).

Table 3.5.5: Numbers and crossing behaviour for each bat species / species group using the linear feature that bisects the proposed Scheme at Crossing Point 4B

SPECIES	TOTAL	TOTAL SEEN CROSSING	USING FEATURE	HEARD AND NOT SEEN	USING FEATURE AT AN UNSAFE HEIGHT <5 M	NOT USING FEATURE AT AN UNSAFE HEIGHT <5 M
ALL SPECIES	410	79	33	304	31	44
Common pipistrelle	397	77	31	294	29	44
Myotis	6	2	2	4	2	0
Noctule	4	0	0	4	0	0
Serotine	1	0	0	1	0	0
Lesser horseshoe	1	0	0	1	0	0
Unidentified bat	1	0	0	0	0	0

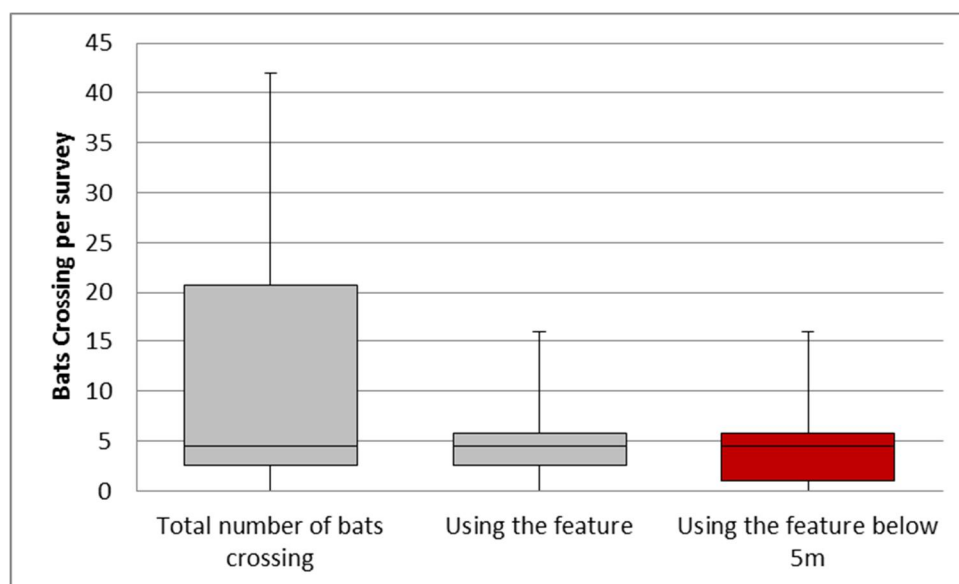
- 3.5.29 The majority of bats using the linear feature were considered to be flying at unsafe heights (<5 m) (Figure 3.5.10).

Figure 3.5.10: Heights at which the recorded bat species were crossing the proposed Scheme at Crossing Point 4B (at their lowest point)



- 3.5.30 The highest number of bats recorded to be crossing the proposed Scheme was recorded in June with a peak of 42 bat passes (Figure 3.5.11). Bats were generally foraging within the grassland of the caravan park during the surveys (Figure 4, Appendix A and Appendix B).
- 3.5.31 A minimum of eight common pipistrelle bats were recorded flying towards or away from the existing A30 during the surveys (it was not confirmed whether the bats were crossing the existing A30 at this point).

Figure 3.5.11: The number of bats per survey crossing the proposed Scheme at Crossing Point 4B, the whether they are using the feature



Crossing Point 6

- 3.5.32 A total of 396 bats were seen crossing the proposed Scheme during the six survey visits, of which 384 were considered to be using the linear feature (Table 3.5.6). Common pipistrelle bats were the most common species recorded using the feature for commuting and foraging purposes. *Myotis* species, soprano pipistrelle, lesser horseshoe, greater horseshoe, Leisler's bat noctule and Serotine bats were also recorded. Unidentified bats were likely to be brown long-eared bats.
- 3.5.33 Crossing Point 6 was located within proximity of a minimum of two known common pipistrelle maternity roosts, a brown long-eared maternity roost, and a number of common pipistrelle and *Myotis* species day roosts, and a lesser horseshoe night roost located throughout the Nancarrow Farm complex (this is reported separately). A Natural England EPS licence (EPSM2012-5115), is currently active for this complex, the licence covers the destruction of a known breeding site and resting place. Species covered by the licence were: lesser and greater horseshoe bats; common pipistrelle; soprano pipistrelle; Daubenton's bats; brown long-eared bats; and Natterer's bat (Appendix B).
- 3.5.34 The earliest lesser horseshoe bat was recorded approximately 40 minutes after sunset during the August 2017 surveys.

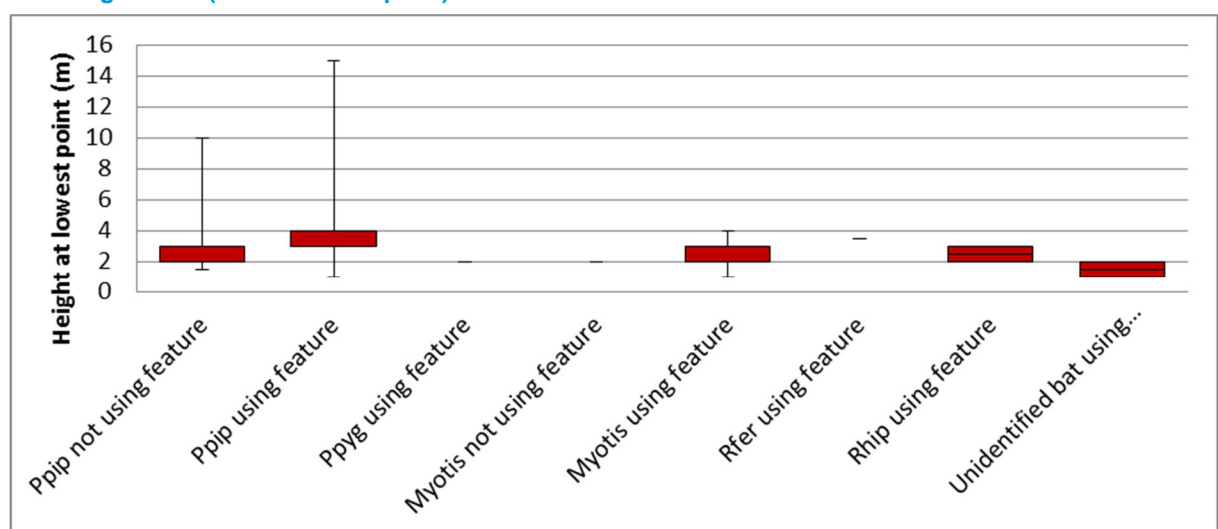
Table 3.5.6: Numbers and crossing behaviour for each bat species / species group using the linear feature that bisects the proposed Scheme at Crossing Point 6

SPECIES	TOTAL	TOTAL SEEN CROSSING	USING FEATURE	HEARD AND NOT SEEN	USING FEATURE AT AN UNSAFE HEIGHT <5 M	NOT USING FEATURE AT AN UNSAFE HEIGHT <5 M
ALL SPECIES	1045	396	384	634	303	12
Common pipistrelle	940	351	342	575	263	8
Myotis	62	21	20	41	20	1
NSL	1	0	0	1	0	1
Leisler's	1	0	0	1	0	0
Noctule	7	1	0	6	0	1
Soprano pipistrelle	17	12	12	4	10	1
Lesser horseshoe	8	4	4	4	4	0
Greater horseshoe	2	1	0	1	0	1
Serotine	1	0	0	1	0	0
Unidentified bat	6	6	6	0	6	0

3.5.35

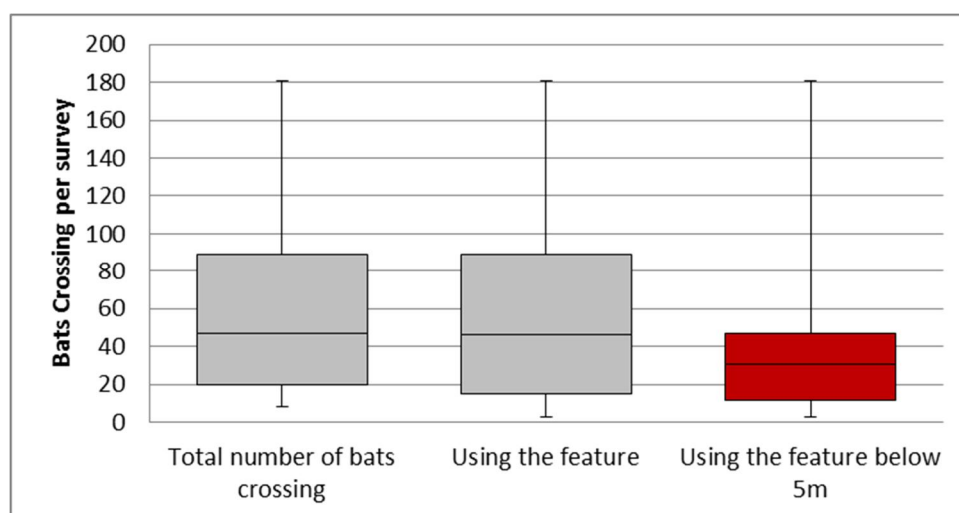
The majority of bats using the linear feature were considered to be flying at unsafe heights (<5 m) (Figure 3.5.12). All of the *Myotis*, soprano pipistrelle, lesser horseshoe, greater horseshoe, and unidentified bats were recorded to be flying at unsafe heights (<5 m). These were generally flying under the crown of the trees.

Figure 3.5.12 Heights at which the recorded bat species were crossing the proposed Scheme at Crossing Point 6 (at their lowest point)



- 3.5.36 The majority of bats recorded crossing the proposed Scheme was recorded during the third visit at the start of August (peak of 181). It is likely that the peak levels of activity is due to individual common pipistrelles and *Myotis* using the access road to forage along. In general, the number of bats recorded using the feature was under 90 per survey (Figure 3.5.13).
- 3.5.37 The majority of bats recorded crossing the proposed Scheme at this location were considered to be using the feature, with flight heights ranging from 0.5-15 m (Figure 3.5.13). A total of 77 bats were recorded as possibly crossing the existing A30 at the northern section of the feature during the six survey visits (approximately 13 per survey). It was not possible to record whether the bats changed direction at the A30 and continued to forage along the A30 or crossed directly from or to the northern side of the road in all cases. It should be noted that the thermal imagers were focused on the areas where the proposed Scheme is to bisect the linear feature (as per best practice), as such, it was not possible to confirm every possible bat crossing the existing A30. It should be noted that a greater horseshoe bat was recorded potentially crossing over the A30 during the transect surveys and Crossing Point surveys undertaken at Crossing Point 5 during the 2016 surveys (scoped out following confirmation of the preferred route).

Figure 3.5.13 Numbers of bats per survey crossing the proposed Scheme at Crossing Point 6, and whether they are using the feature



Crossing Point 7

- 3.5.38 A total of 591 bats were seen crossing the proposed Scheme during the six survey visits, of which 589 were considered to be using the underpass (Table 3.5.7 and Figure 3.5.14). Common pipistrelle were the most common species recorded using the feature for commuting and foraging purposes. *Myotis* species, lesser horseshoe, greater horseshoe, Leisler's bat, Barbastelle bat, soprano pipistrelle, noctule and Serotine bats were also recorded.
- 3.5.39 The earliest lesser horseshoe bat was recorded approximately one hour after sunset during the September 2017 survey.
- 3.5.40 A total of three bats (NSL and Serotine bat) were recorded to be crossing the existing A30 over the underpass (above 5 m). All of the remaining bats were recorded using the underpass to forage and commute underneath the A30.

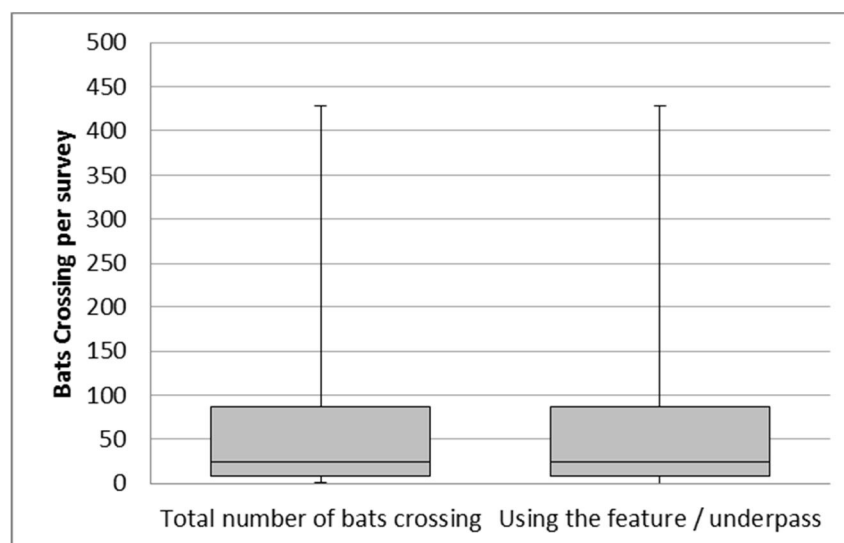
Table 3.5.7: Numbers and crossing behaviour for each bat species / species group using the linear feature that bisects the proposed Scheme at Crossing Point 7

SPECIES	TOTAL	TOTAL SEEN CROSSING	USING FEATURE / UNDERPASS	HEARD AND NOT SEEN
ALL SPECIES	1256	591	589	645
Common pipistrelle	844	482	480	348
Myotis	330	89	89	239
NSL	6	4	4	2
Leisler's	1	0	0	1
Noctule	1	0	0	1
Soprano pipistrelle	47	7	7	40
Lesser horseshoe	14	1	1	10
Greater horseshoe	3	2	2	1
Serotine	3	1	1	1
Barbastelle	2	1	1	1
Unidentified bat	5	4	4	1

3.5.41

The majority of the bats were recorded during the fourth visit in June 2017 (peak of 429 passes). It is likely that the peak levels of activity is due to individual common pipistrelles and *Myotis* using the feature to forage underneath. In general, the number of bats recorded using the underpass was between 1-25 per survey (Figure 3.5.14).

Figure 3.5.14 Numbers of bats per survey crossing the proposed Scheme at Crossing Point 7, and whether they are using the underpass



Crossing Point 9

3.5.42

A total of 143 bats were seen crossing the proposed Scheme during the six survey visits, of which 118 were considered to be using the linear feature (Table 3.5.8). Common pipistrelle bats were the most common species recorded using the feature for commuting and foraging purposes. *Myotis* species, lesser horseshoe, greater horseshoe, Barbastelle bat, brown long-eared bat, noctule and Serotine were also recorded. Unidentified bats were likely to be brown long-eared bat.

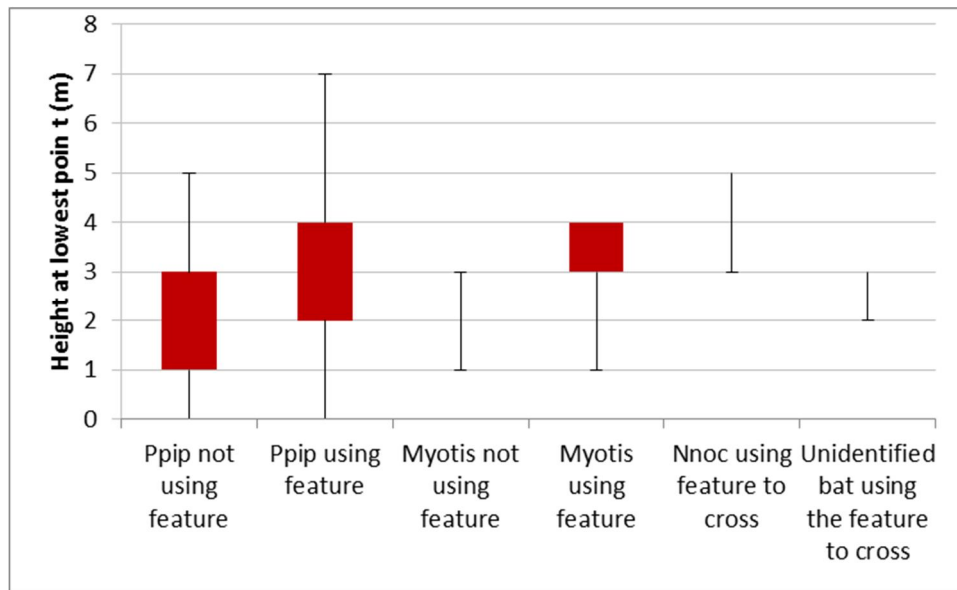
Table 3.5.8: Numbers and crossing behaviour for each bat species and species group using the linear feature that bisects the proposed Scheme at Crossing Point 9

SPECIES	TOTAL	TOTAL SEEN CROSSING	USING FEATURE	HEARD AND NOT SEEN	USING FEATURE AT AN UNSAFE HEIGHT <5 M	NOT USING FEATURE AT AN UNSAFE HEIGHT <5 M
ALL SPECIES	348	143	118	191	114	25
Common pipistrelle	229	119	95	100	92	24
Myotis	80	22	21	56	20	1
Noctule	4	1	1	3	1	0
Lesser horseshoe	30	0	0	28	0	0
Greater horseshoe	1	0	0	1	0	0
Barbastelle	1	0	0	1	0	0
Brown long-eared	1	0	0	1	0	0
Serotine	1	0	0	1	0	0
Unidentified bat	1	1	1	0	1	0

3.5.43

The majority of bats using the linear feature were considered to be flying at unsafe heights (<5 m) (Figure 3.5.15). Only common pipistrelles were recorded to be flying at a safe height (>5 m).

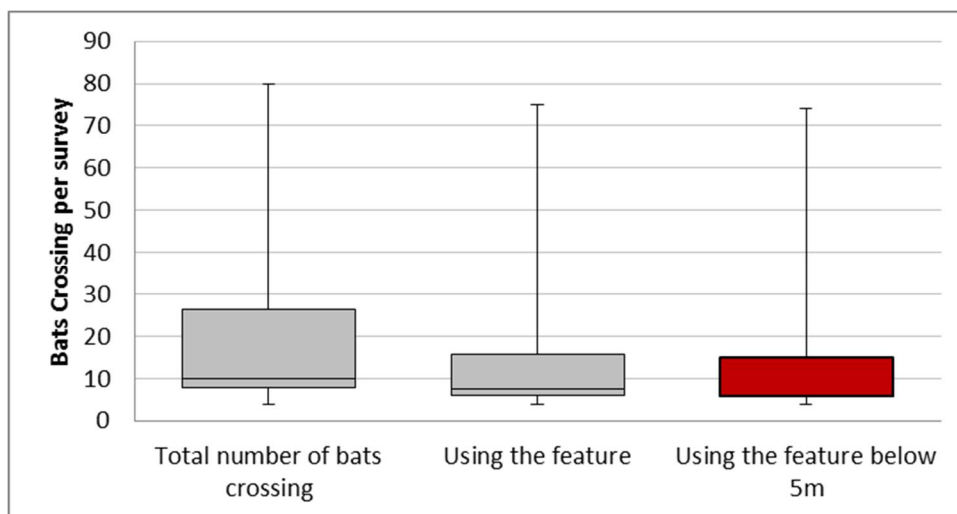
Figure 3.5.15 Heights at which the recorded bat species were crossing the proposed Scheme at Crossing Point 9 (at their lowest point)



3.5.44 The peak number of bats recorded to be crossing the proposed Scheme was recorded in June with a total of 80 bats recorded crossing the proposed Scheme (Figure 3.5.16). During the remaining surveys the data was more evenly distributed, ranging from 5 to 30 bats being recorded crossing the Scheme per survey. The lesser and greater horseshoe bats were recorded during August in 2016 and June and July in 2017. The earliest lesser horseshoe bat and Barbastelle bat was recorded approximately 45 minutes after sunset during the August and September 2016 surveys.

3.5.45 A total of 26 bats consisting of *Myotis* species and common pipistrelle were recorded to be crossing the existing A30 using the farm access bridge as a feature, the majority were recorded during August 2017. An incidental sighting of a lesser horseshoe recorded crossing the existing A30 using the farm access bridge was recorded during the activity transect surveys. It should be noted that at this point the A30 is in cutting, the existing footbridge follows the topography of the landscape (Figure 4, Appendix A).

Figure 3.5.16: Numbers of bats per survey crossing the proposed Scheme at Crossing Point 9, and whether they are using the linear feature



Crossing Point 10

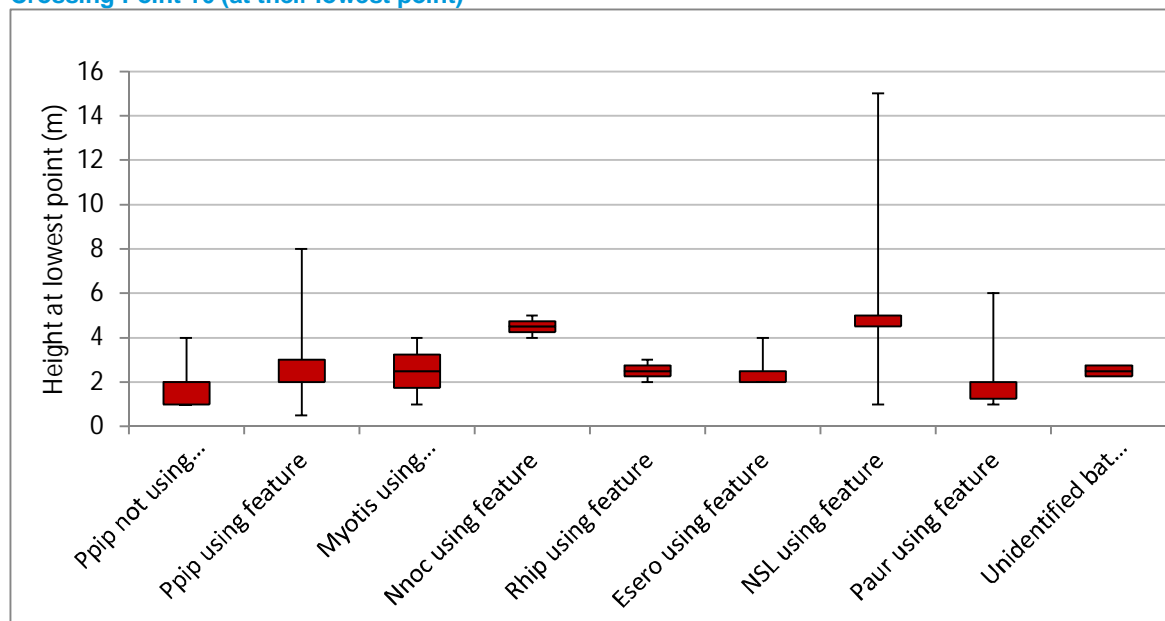
3.5.46 A total of 171 bats were seen crossing the proposed Scheme during the six survey visits, of which 162 were considered to be using the linear feature (Table 3.5.9). Common pipistrelle bats were the most common species recorded using the feature for commuting and foraging purposes. *Myotis* species, lesser horseshoe, brown long-eared bat, noctule, and Serotine were also recorded. Other species recorded during the surveys that were not considered to be using the linear feature were soprano pipistrelle, greater horseshoe bat, Barbastelle bat and unidentified bats.

Table 3.5.9: Numbers and crossing behaviour for each bat species and species group using the linear feature that bisects the proposed Scheme at Crossing Point 10

SPECIES	TOTAL	TOTAL SEEN CROSSING	USING FEATURE	HEARD AND NOT SEEN	USING FEATURE AT AN UNSAFE HEIGHT <5 M	NOT USING FEATURE AT AN UNSAFE HEIGHT <5 M
ALL SPECIES	431	171	162	233	153	0
Common pipistrelle	266	124	115	136	107	0
Myotis	25	7	7	17	7	0
Noctule	4	1	1	2	1	0
Soprano pipistrelle	1	0	0	1	0	0
Greater horseshoe	4	0	0	4	0	0
Lesser horseshoe	3	2	2	0	2	0
Brown long-eared	17	10	10	7	9	0
Serotine	28	18	18	8	18	0
Leisler's	1	0	0	1	0	0
NSL	76	9	9	53	9	0
Barbastelle	1	0	0	1	0	0
Unidentified	5	0	0	3	0	0

3.5.47 The majority of bats using the linear feature were considered to be flying at unsafe heights (<5 m) (Figure 3.5.16). Only common pipistrelles and NSL group bats were recorded to be flying at a safe height (>5 m).

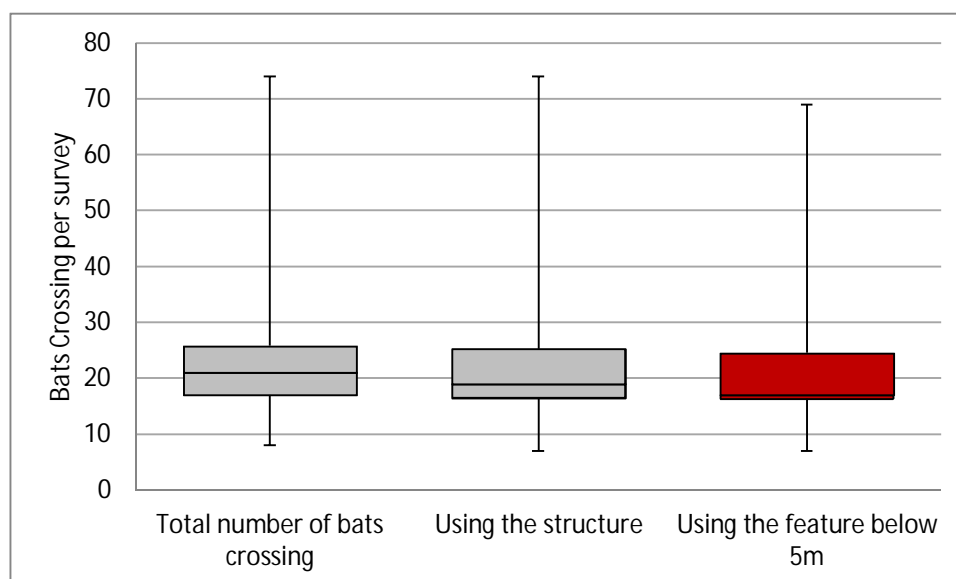
Figure 3.5.16 Heights at which the recorded bat species were crossing the proposed Scheme at Crossing Point 10 (at their lowest point)



3.5.48 The highest number of bats recorded to be crossing the proposed Scheme was recorded in August with a peak of 74 bats (Figure 3.5.17). During the remaining surveys the number of bats recorded crossing the proposed Scheme was <30 per survey.

3.5.49 A total of 10 bats consisting of common pipistrelle, serotine, and *Myotis* species were recorded to be flying over the hedgerow towards or away from the existing A30 during the August and September 2017 surveys. It was not possible to determine if the bats crossed the existing A30 or changed direction as they reached the carriageway due to the soft estate hedgerow obscuring the view, it is considered likely that some of these bats did cross the existing A30.

Figure 3.5.17 Numbers of bats per survey crossing the proposed Scheme at Crossing Point 10, the whether they are using the linear feature



Crossing Point 11

3.5.50 A total of 1,037 bats were seen crossing the proposed Scheme during the six survey visits, of which 1033 were considered to be using the linear feature (Table 3.5.10). As detailed within Figure 3.5.1 and 3.5.19 the number of bats recorded was fairly similar apart from the first two surveys within 2016, where lower number of bats were seen (this could be because a thermal camera was not used in 2016). Crossing Point 11 recorded the highest number of bat passes of all of the Crossing Points within the survey area (Appendix B).

3.5.51 Common pipistrelle and *Myotis* bats were the most commonly recorded species. Other species recorded were noctule, Leisler's bat, brown long-eared bat soprano pipistrelle and unidentified bats. During the surveys no Barbastelle bats, lesser or greater horseshoe bats were recorded (Table 3.5.10). Lesser and greater horseshoe were, however, recorded during the 2016 automated static detector surveys, and during emergence and re-entry surveys within close proximity of the linear feature, with peak levels of greater horseshoe activity (312 passes) being recorded during the May automated static detector surveys at this location. As such, they are considered to be present and using the linear feature, although on a more seasonal basis.

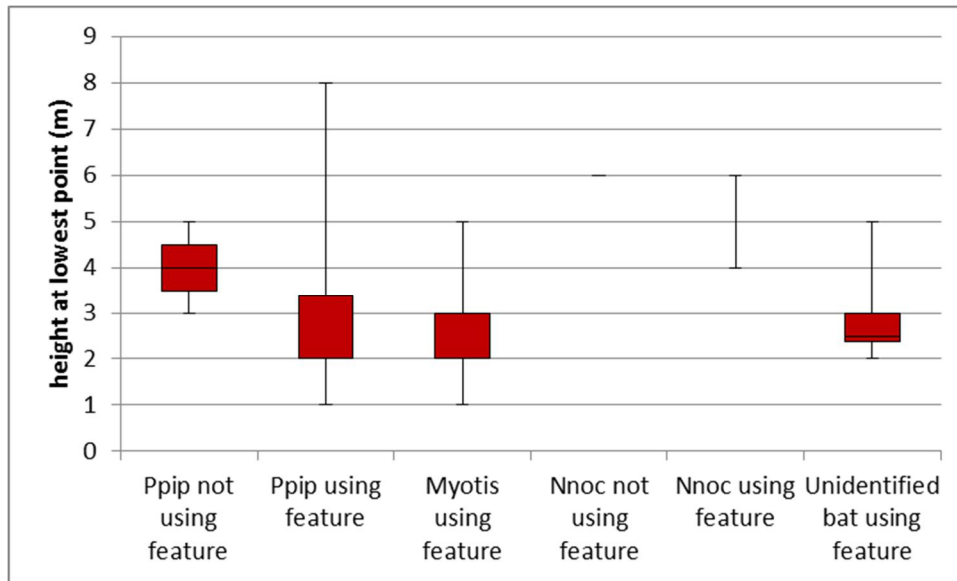
Table 3.5.10: Numbers and crossing behaviour for each bat species / species group using the linear feature that bisects the proposed Scheme at Crossing Point 11

SPECIES	TOTAL	TOTAL SEEN CROSSING	USING FEATURE	HEARD AND NOT SEEN	USING FEATURE AT AN UNSAFE HEIGHT <5 M	NOT USING FEATURE AT AN UNSAFE HEIGHT <5 M
ALL SPECIES	1427	1037	1033	369	1028	3
Common pipistrelle	1166	892	889	268	884	3
Myotis	230	135	135	89	135	0
NSL	2	0	0	2	0	0
Leisler's	1	0	0	1	0	0
Noctule	6	2	1	0	1	0
Soprano pipistrelle	8	0	0	8	0	0
Brown long-eared	1	0	0	1	0	0
Unidentified bat	13	8	8	0	8	0

3.5.52 A total of five common pipistrelles were recorded to be crossing the proposed Scheme using the feature at safe heights (>5 m). These bats were recorded foraging and commuting along the top of the tree line. The actual number is likely to be higher, but due to the canopy restricting the view these may not have been seen.

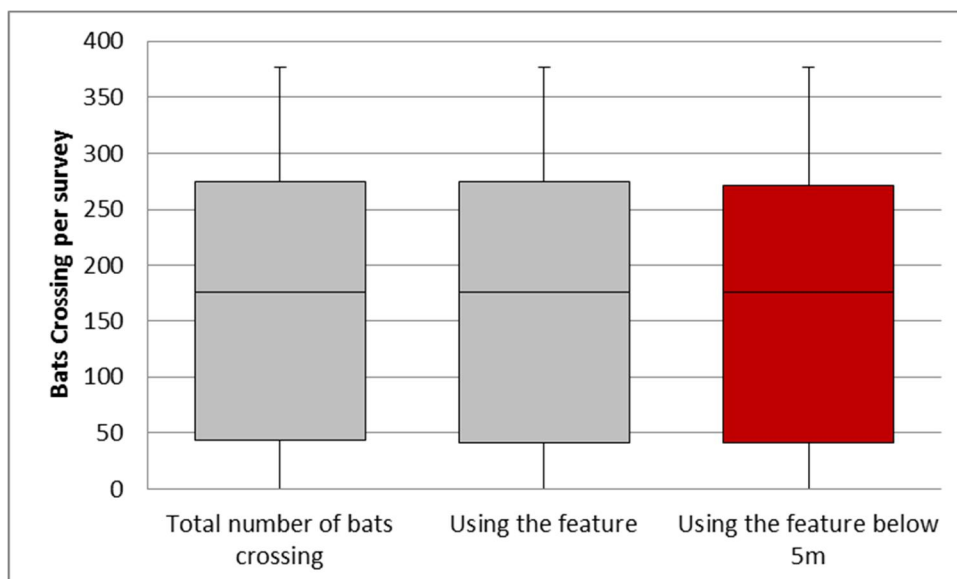
3.5.53 A total of 1,031 bats were recorded to be crossing the proposed Scheme, with the majority recorded flying at unsafe heights (<5 m) (Figure 3.5.18). It should be noted that due to the number of bat passes recorded, it was not possible to accurately record the heights of every single bat. As such, the general height of the bats was recorded with any individuals flying at different heights being recorded individually.

Figure 3.5.18 Heights at which the recorded bat species were crossing the proposed Scheme at Crossing Point 11 (at their lowest point)



- 3.5.54** The highest number of bats seen to be crossing the proposed Scheme was recorded in July with a peak of 377 bats (Figure 3.5.19). During the first two surveys in 2016, lower numbers of bats were recorded to be crossing the feature hence the low whisker bar (Figure 3.5.19). This was prior to the use of the thermal camera. During the remaining surveys the number of bats seen crossing the proposed Scheme was 145-377 per survey, which is consistently higher than the other crossing points.
- 3.5.55** The majority of bats were observed foraging along the lane and turning back upon reaching the A30. A total of 28 bats consisting of common pipistrelle and Myotis bats were confirmed to be crossing the A30 at this location during the June, July, and August 2017 surveys.

Figure 3.5.19 Numbers of bats per survey crossing the proposed Scheme at Crossing Point 11, and whether they are using the linear feature



Crossing Point 12

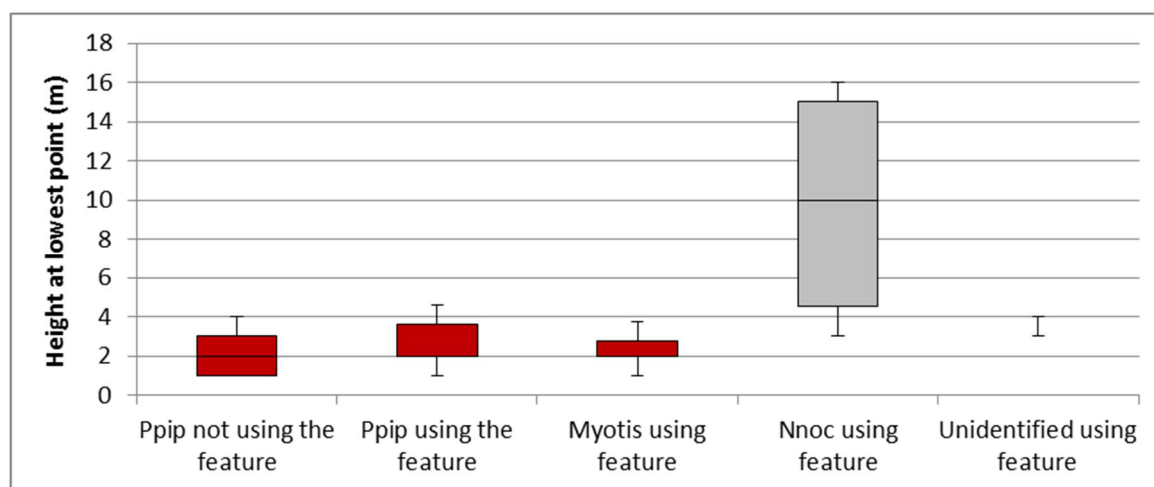
3.5.56 A total of 118 bats were seen crossing the proposed Scheme during the six survey visits, of which 112 were considered to be using the linear feature (Table 3.5.11). Common pipistrelle bats were the most common species recorded using the feature for commuting and foraging purposes. *Myotis* species and noctule bat were also recorded. Leisler's bat, lesser and greater horseshoe bats were also recorded during the surveys.

Table 3.5.11: Numbers and crossing behaviour for each bat species / species group using the linear feature that bisects the proposed Scheme at Crossing Point 12

SPECIES	TOTAL	TOTAL SEEN CROSSING	USING FEATURE	HEARD AND NOT SEEN	USING FEATURE AT AN UNSAFE HEIGHT <5 M	NOT USING FEATURE AT AN UNSAFE HEIGHT <5 M
ALL SPECIES	371	118	112	238	101	6
Common pipistrelle	302	110	104	181	95	6
Myotis	39	5	5	32	4	0
Leisler's	1	0	0	1	0	0
Noctule	14	2	2	10	1	0
Greater horseshoe	9	0	0	9	0	0
Lesser horseshoe	4	0	0	4	0	0
Unidentified	2	1	1	1	1	0

3.5.57 The majority of noctule bats recorded crossing the proposed Scheme were considered to be crossing at safe heights (>5 m). All of the remaining species were recorded crossing the road at unsafe heights (<5 m) (Figure 3.5.20).

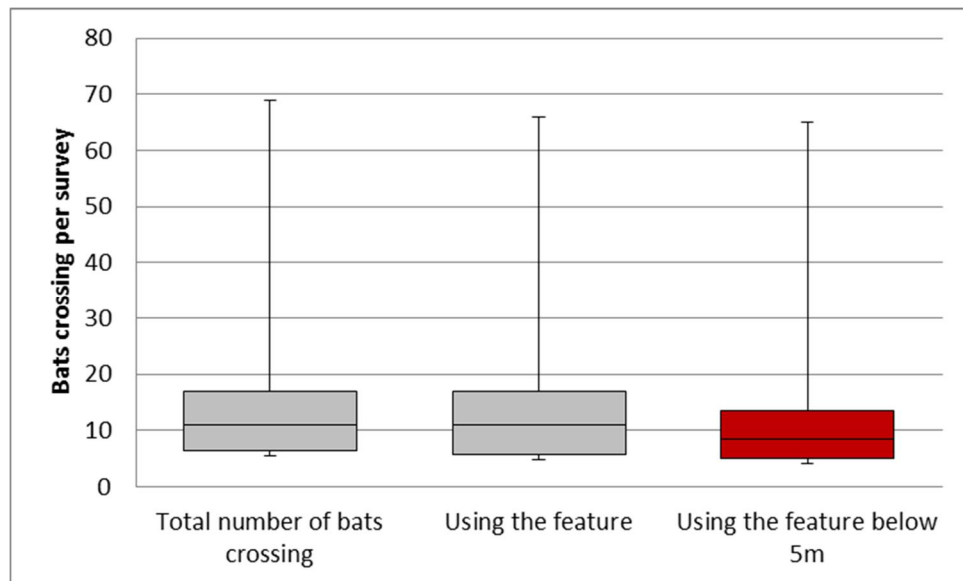
Figure 3.5.20: Heights at which the recorded bat species were crossing the proposed Scheme at Crossing Point 12 (at their lowest point)



3.5.58 The highest number of bats recorded to be crossing the proposed Scheme was recorded in August with a peak of 69 bats (Figure 3.5.21). During the remaining surveys the number of bats recorded crossing the proposed Scheme was <20 per survey. The majority of bats recorded crossing the proposed Schemed were considered to be using the features and flying at unsafe heights (<5 m).

3.5.59 A total of four common pipistrelles were confirmed to be crossing the A30 at this location.

Figure 3.5.21 Numbers of bats per survey crossing the proposed Scheme at Crossing Point 12, the whether they are using the linear feature



Crossing Point 13

3.5.60 A total of 182 bats were seen crossing the proposed Scheme during the six survey visits, of which 180 were considered to be using the linear feature (Table 3.5.12). Common pipistrelle bats were the most common species recorded using the feature for commuting and foraging purposes. Other species recorded were *Myotis* species, soprano pipistrelle, lesser horseshoe, greater horseshoe, Leisler's bat, noctule, Serotine and brown long-eared bat.

3.5.61 The majority of the lesser and greater horseshoe bat passes was recorded within the two June 2017 surveys, only two lesser horseshoe bats were recorded within the August 2016 surveys. The earliest lesser or greater horsehose bat pass was recorded approximately 50 minutes after sunset during the June 2017 surveys.

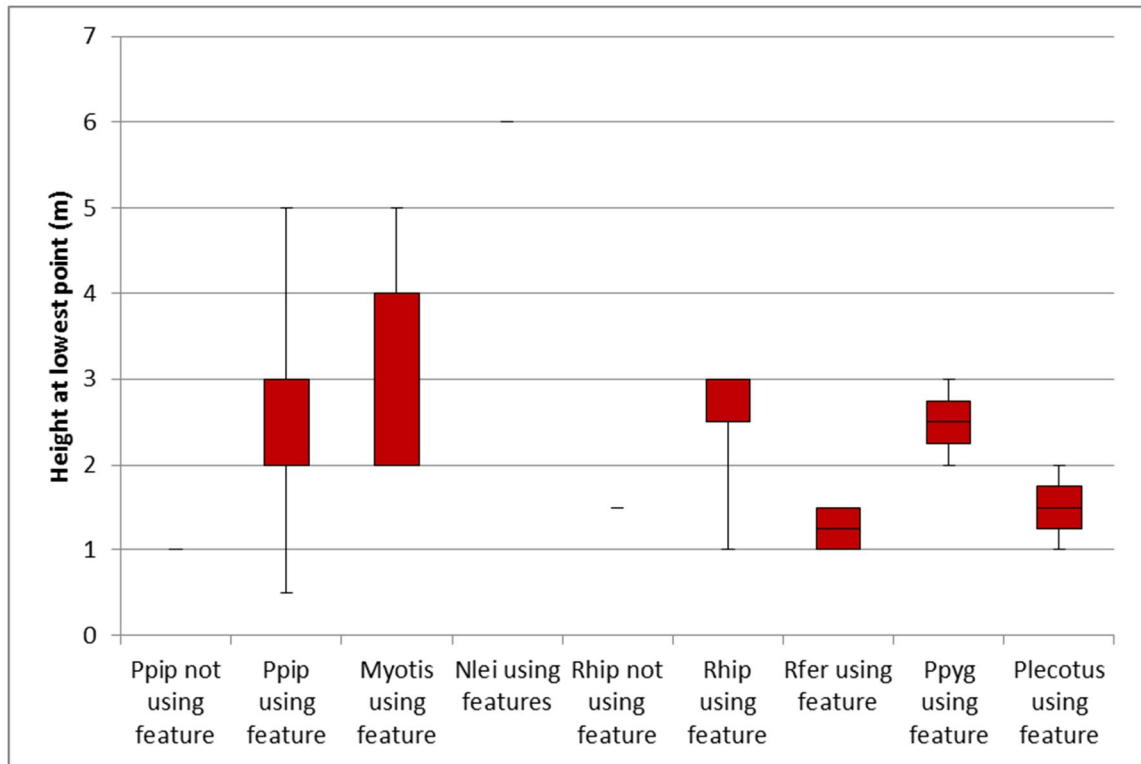
Table 3.5.12: Numbers and crossing behaviour for each bat species and species group using the linear feature that bisects the proposed Scheme at Crossing Point 13

SPECIES	TOTAL	TOTAL SEEN CROSSING	USING FEATURE	HEARD AND NOT SEEN	USING FEATURE AT AN UNSAFE HEIGHT <5 M	NOT USING FEATURE AT AN UNSAFE HEIGHT <5 M
ALL SPECIES	404	182	180	216	179	2
Common pipistrelle	321	146	145	169	145	1
Myotis	24	7	7	17	7	0
Noctule/Leisler	2	0	0	2	0	0
Leisler's	3	1	1	2	0	0
Noctule	8	0	0	8	0	0
Soprano pipistrelle	4	2	2	2	2	0
Serotine	1	0	0	1	0	0
NSL	8	0	0	8	0	0
Lesser horseshoe	25	20	19	5	19	1
Greater horseshoe	6	4	4	2	4	0
Brown long-eared bat	2	2	2	0	2	0

3.5.62

All bats recorded crossing the proposed Scheme (excluding a single Leisler's bat) were recorded to be crossing at unsafe heights (<5 m) (Figure 3.5.22).

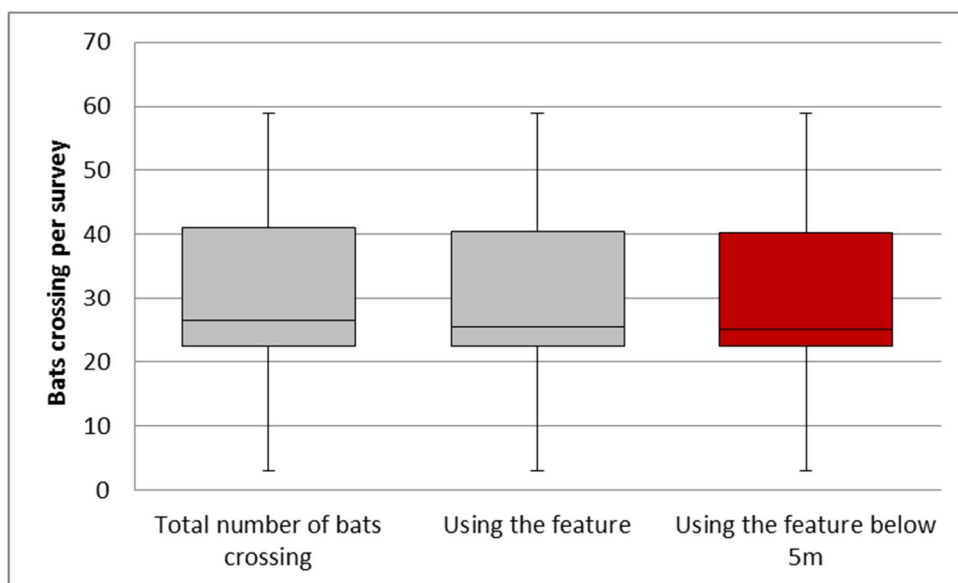
Figure 3.5.22: Heights at which the recorded bat species were crossing the proposed Scheme at Crossing Point 13 (at their lowest point)



3.5.63

The peak activity levels were recorded during the June and July surveys, where the numbers of bats crossing the proposed Scheme was 45 and 59. During the remaining surveys the numbers of bats recorded crossing the proposed Scheme was <30 per survey (Figure 3.5.23).

Figure 3.5.23 Numbers of bats per survey crossing the proposed Scheme at Crossing Point 13, and whether they are using the linear feature



3.6 LANDSCAPE SCALE SURVEYS

- 3.6.1 A total of 1,413 bat passes of a minimum of eight species were recorded during the Landscape Scale Surveys. Common pipistrelle was the most abundant species, accounting for 93% of the total bat passes. The other species and species groups recorded were *Myotis* species, brown long-eared bat, Barbastelle, soprano pipistrelle, lesser horseshoe, greater horseshoe and NSL species group.
- 3.6.2 The landscape scale transect with the peak bat activity levels was transect nine, where a total of 251 bat passes were recorded. Figure 3.6.1 details the results of the transect surveys.
- 3.6.3 Lesser horseshoe bats were recorded on transects 4 (at 800-1000 m), 6 (at 300 m), and 8 (at 600 m). Greater horseshoe bats were recorded on transects 2 (at 300 m) and 10 (at 700 m). A single Barbastelle bat was recorded along transect 6 (at 100 m). Full details are reported within Table 3.6.1.

Table 3.6.1: Results of the 2017 bat landscape scale surveys

ROUTE	DIRECTION	DATE	DISTANCE (M)	SUNSET	SPOT START TIME	TIME AFTER SUNSET (MIN)	BARBASTELLE	MYOTIS	NSL	BROWN LONG-EARED	COMMON PIPISTRELLE	SOPRANO PIPISTRELLE	GREATER HORSESHOE	LESSER HORSESHOE	HABITAT
1	Away	24/07/2017	0	21:14	21:44	30.00	0	0	0	0	0	0	0	0	1
1	Away	24/07/2017	100	21:14	21:55	41.00	0	0	0	0	0	0	0	0	1
1	Away	24/07/2017	200	21:14	22:06	52.00	0	0	0	0	3	0	0	0	2
1	Away	24/07/2017	300	21:14	22:19	65.00	0	0	0	0	10	0	0	0	2
1	Away	24/07/2017	400	21:14	22:30	76.00	0	0	0	0	38	0	0	0	2
1	Away	24/07/2017	500	21:14	22:42	88.00	0	0	0	0	8	0	0	0	2
1	Away	24/07/2017	600	21:14	22:53	99.00	0	0	0	0	20	0	0	0	2
1	Away	24/07/2017	700	21:14	23:04	110.00	0	0	0	0	15	0	0	0	2
1	Away	24/07/2017	800	21:14	23:15	121.00	0	0	0	0	4	0	0	0	2
1	Away	24/07/2017	900	21:14	23:27	133.00	0	0	0	0	17	0	0	0	2
1	Away	24/07/2017	1000	21:14	23:38	144.00	0	0	0	0	15	0	0	0	2
2	Towards	24/07/2017	0	21:14	23:30	136.08	0	0	0	0	7	0	0	0	2
2	Towards	24/07/2017	100	21:14	23:25	131.00	0	0	0	0	0	0	0	0	3
2	Towards	24/07/2017	200	21:14	23:14	120.00	0	0	0	0	2	0	0	0	3
2	Towards	24/07/2017	300	21:14	23:03	109.10	0	0	0	0	3	0	1	0	2
2	Towards	24/07/2017	400	21:14	22:51	97.67	0	0	0	0	6	0	0	0	2
2	Towards	24/07/2017	500	21:14	22:40	86.32	0	0	0	0	10	0	0	0	3
2	Towards	24/07/2017	600	21:14	22:29	75.32	0	0	0	0	14	0	0	0	3
2	Towards	24/07/2017	700	21:14	22:18:10	64.17	0	0	0	0	18	0	0	0	3
2	Towards	24/07/2017	800	21:14	22:07:00	53.00	0	0	0	0	4	0	0	0	2
2	Towards	24/07/2017	900	21:14	21:55:30	41.50	0	0	0	0	1	0	0	0	3
2	Towards	24/07/2017	1000	21:14	21:44	30.00	0	0	0	0	0	0	0	0	3

ROUTE	DIRECTION	DATE	DISTANCE (M)	SUNSET	SPOT START TIME	TIME AFTER SUNSET (MIN)	BARBASTELLE	MYOTIS	NSL	BROWN LONG-EARED	COMMON PIPISTRELLE	SOPRANO PIPISTRELLE	GREATER HORSESHOE	LESSER HORSESHOE	HABITAT
4	Towards	25/07/2017	0	21:13	23:39:00	146.00	0	0	0	0	1	0	0	0	2
4	Towards	25/07/2017	100	21:13	22:26:32	73.53	0	1	0	0	0	0	0	0	4
4	Towards	25/07/2017	200	21:13	22:15:04	62.07	0	0	0	0	4	1	0	0	4
4	Towards	25/07/2017	300	21:13	22:03:40	50.67	0	0	0	0	2	0	0	0	2
4	Towards	25/07/2017	400	21:13	22:52:24	99.40	0	0	0	0	0	0	0	0	5
4	Towards	25/07/2017	500	21:13	22:40:20	87.33	0	0	0	0	6	0	0	0	5
4	Towards	25/07/2017	600	21:13	22:27:26	74.43	0	0	0	0	5	0	0	0	2
4	Towards	25/07/2017	700	21:13	22:16:25	63.42	0	1	0	0	38	0	0	0	3
4	Towards	25/07/2017	800	21:13	22:05:18	52.30	0	0	0	0	3	0	0	1	3
4	Towards	25/07/2017	900	21:13	21:54:14	41.23	0	0	0	0	5	0	0	1	3
4	Towards	25/07/2017	1000	21:13	21:43:00	30.00	0	0	0	0	39	2	0	3	2
4	Away	27/07/2017	0	21:12	21:45:54	33.90	0	0	0	0	0	0	0	0	2
4	Away	27/07/2017	100	21:12	21:58:01	46.02	0	0	0	0	16	1	0	0	4
4	Away	27/07/2017	200	21:12	22:09:26	57.43	0	1	0	0	17	0	0	0	4
4	Away	27/07/2017	300	21:12	22:20:31	68.52	0	0	0	0	26	0	0	0	2
4	Away	27/07/2017	400	21:12	22:31:26	79.43	0	0	1	0	28	0	0	0	5
4	Away	27/07/2017	500	21:12	22:43:06	91.10	0	0	1	0	10	1	0	0	5
4	Away	27/07/2017	600	21:12	22:55:55	103.92	0	0	0	0	11	0	0	0	2
4	Away	27/07/2017	700	21:12	23:06:50	114.83	0	0	0	0	31	0	0	0	3
4	Away	27/07/2017	800	21:12	23:17:42	125.70	0	0	0	0	7	0	0	0	3
4	Away	27/07/2017	900	21:12	23:28:34	136.57	0	0	0	0	2	0	0	0	3
4	Away	27/07/2017	1000	21:12	23:39:36	147.60	0	0	0	0	19	0	0	0	2
5	Away	25/07/2017	0	21:13	21:43:00	30.00	0	0	0	0	1	0	0	0	1

ROUTE	DIRECTION	DATE	DISTANCE (M)	SUNSET	SPOT START TIME	TIME AFTER SUNSET (MIN)	BARBASTELLE	MYOTIS	NSL	BROWN LONG-EARED	COMMON PIPISTRELLE	SOPRANO PIPISTRELLE	GREATER HORSESHOE	LESSER HORSESHOE	HABITAT
5	Away	25/07/2017	100	21:13	21:54:18	41.30	0	0	0	0	1	0	0	0	1
5	Away	25/07/2017	200	21:13	22:05:36	52.60	0	0	0	0	0	0	0	0	1
5	Away	25/07/2017	300	21:13	22:16:58	63.97	0	0	0	0	4	0	0	0	3
5	Away	25/07/2017	400	21:13	22:28:21	75.35	0	0	0	0	3	0	0	0	2
5	Away	25/07/2017	500	21:13	22:40:34	87.57	0	0	0	0	8	0	0	0	5
5	Away	25/07/2017	600	21:13	22:52:01	99.02	0	0	0	0	0	0	0	0	5
5	Away	25/07/2017	700	21:13	23:03:21	110.35	0	0	0	0	0	0	0	0	5
5	Away	25/07/2017	800	21:13	23:14:59	121.98	0	0	0	0	2	0	0	0	5
5	Away	25/07/2017	900	21:13	23:26:13	133.22	0	0	0	0	2	0	0	0	4
5	Away	25/07/2017	1000	21:13	23:38:05	145.08	0	0	0	0	5	0	0	0	4
6	Away	27/07/2017	0	21:12	21:43:10	31.17	0	0	0	0	5	0	0	0	3
6	Away	27/07/2017	100	21:12	21:54:11	42.18	1	1	0	0	11	0	0	0	3
6	Away	27/07/2017	200	21:12	22:06:40	54.67	0	0	0	0	0	0	0	0	4
6	Away	27/07/2017	300	21:12	22:14:55	62.92	0	0	0	0	19	0	0	1	4
6	Away	27/07/2017	400	21:12	22:26:53	74.88	0	3	0	0	49	0	0	0	4
6	Away	27/07/2017	500	21:12	22:39:38	87.63	0	0	0	0	46	0	0	0	4
6	Away	27/07/2017	600	21:12	22:52:24	100.40	0	4	0	0	34	1	0	0	4
6	Away	27/07/2017	700	21:12	23:05:15	113.25	0	0	0	0	0	0	0	0	4
6	Away	27/07/2017	800	21:12	23:18:13	126.22	0	0	0	0	0	0	0	0	3
6	Away	27/07/2017	900	21:12	23:30:10	138.17	0	0	0	0	0	0	0	0	4
6	Away	27/07/2017	1000	21:12	23:42:17	150.28	0	0	0	0	0	0	0	0	3
7	Away	26/07/2017	0	21:13	21:43:00	30.00	0	0	0	0	0	0	0	0	5
7	Away	26/07/2017	100	21:13	21:54:40	41.67	0	2	0	0	17	0	0	0	5

ROUTE	DIRECTION	DATE	DISTANCE (M)	SUNSET	SPOT START TIME	TIME AFTER SUNSET (MIN)	BARBASTELLE	MYOTIS	NSL	BROWN LONG-EARED	COMMON PIPISTRELLE	SOPRANO PIPISTRELLE	GREATER HORSESHOE	LESSER HORSESHOE	HABITAT
7	Away	26/07/2017	200	21:13	22:07:25	54.42	0	0	0	0	2	0	0	0	5
7	Away	26/07/2017	300	21:13	22:18:41	65.68	0	0	0	0	4	0	0	0	5
7	Away	26/07/2017	400	21:13	22:29:45	76.75	0	0	0	0	1	0	0	0	5
7	Away	26/07/2017	500	21:13	22:40:55	87.92	0	0	0	0	1	0	0	0	4
7	Away	26/07/2017	600	21:13	22:55:20	102.33	0	0	0	0	3	0	0	0	5
7	Away	26/07/2017	700	21:13	23:09:05	116.08	0	32	0	0	52	1	0	0	5
7	Away	26/07/2017	800	21:13	23:20:50	127.83	0	0	0	0	45	3	0	0	5
7	Away	26/07/2017	900	21:13	23:32:00	139.00	0	0	0	0	61	0	0	0	5
7	Away	26/07/2017	1000	21:13	23:43:40	150.67	0	0	0	0	20	0	0	0	5
8	Away	26/07/2017	0	21:12	21:51:38	39.63	0	0	1	0	0	0	0	0	3
8	Away	26/07/2017	100	21:12	22:02:35	50.58	0	1	1	0	0	0	0	0	3
8	Away	26/07/2017	200	21:12	22:13:45	61.75	0	0	0	0	0	0	0	0	3
8	Away	26/07/2017	300	21:12	22:25:07	73.12	0	1	0	0	2	0	0	0	3
8	Away	26/07/2017	400	21:12	22:36:33	84.55	0	0	0	0	53	3	0	0	5
8	Away	26/07/2017	500	21:12	22:47:42	95.70	0	0	0	0	43	0	0	0	5
8	Away	26/07/2017	600	21:12	22:58:43	106.72	0	0	0	0	45	0	0	3	5
8	Away	26/07/2017	700	21:12	23:09:43	117.72	0	0	0	0	9	0	0	0	5
8	Away	26/07/2017	800	21:12	23:20:41	128.68	0	0	0	0	4	0	0	0	4
8	Away	26/07/2017	900	21:12	23:32:01	140.02	0	0	0	0	8	0	0	0	5
8	Away	26/07/2017	1000	21:12	23:43:48	151.80	0	0	0	0	52	2	0	0	5
9	Toward	26/07/2017	0	21:12	23:51:01	159.02	0	0	0	0	1	0	0	0	2
9	Toward	26/07/2017	100	21:12	23:41:20	149.33	0	1	0	0	2	0	0	0	2
9	Toward	26/07/2017	200	21:12	23:30:15	138.25	0	0	0	0	13	0	0	0	2

ROUTE	DIRECTION	DATE	DISTANCE (M)	SUNSET	SPOT START TIME	TIME AFTER SUNSET (MIN)	BARBASTELLE	MYOTIS	NSL	BROWN LONG-EARED	COMMON PIPISTRELLE	SOPRANO PIPISTRELLE	GREATER HORSESHOE	LESSER HORSESHOE	HABITAT
9	Toward	26/07/2017	300	21:12	23:19:01	127.02	0	0	0	0	22	0	0	0	3
9	Toward	26/07/2017	400	21:12	23:07:45	115.75	0	0	0	0	16	1	0	0	3
9	Toward	26/07/2017	500	21:12	22:56:37	104.62	0	0	0	0	50	2	0	0	3
9	Toward	26/07/2017	600	21:12	22:44:43	92.72	0	0	2	0	63	0	0	0	3
9	Toward	26/07/2017	700	21:12	22:33:06	81.10	0	0	0	0	25	1	0	0	3
9	Toward	26/07/2017	800	21:12	22:22:16	70.27	0	9	2	0	3	0	0	0	5
9	Toward	26/07/2017	900	21:12	22:11:08	59.13	0	0	1	0	37	0	0	0	3
9	Toward	26/07/2017	1000	21:12	21:59:09	47.15	0	0	0	0	0	0	0	0	3
10	Away	27/07/2017	0	21:12	21:42:00	30.00	0	0	0	0	0	0	0	0	2
10	Away	27/07/2017	100	21:12	21:53:30	41.50	0	0	0	0	0	0	0	0	2
10	Away	27/07/2017	200	21:12	22:04:40	52.67	0	0	0	0	0	0	0	0	2
10	Away	27/07/2017	300	21:12	22:15:55	63.92	0	0	2	0	0	0	0	0	2
10	Away	27/07/2017	400	21:12	22:27:05	75.08	0	0	0	0	0	0	0	0	2
10	Away	27/07/2017	500	21:12	22:38:10	86.17	0	0	0	0	0	0	0	0	2
10	Away	27/07/2017	600	21:12	22:49:35	97.58	0	0	0	0	0	0	0	0	2
10	Away	27/07/2017	700	21:12	23:00:35	108.58	0	0	0	0	0	0	1	0	2
10	Away	27/07/2017	800	21:12	23:11:50	119.83	0	0	0	0	3	0	0	0	2
10	Away	27/07/2017	900	21:12	23:23:00	131.00	0	0	0	0	2	0	0	0	2
10	Away	27/07/2017	1000	21:12	23:34:10	142.17	0	0	0	0	0	0	0	0	2

- 3.6.4 Distance from the proposed Scheme has a significant positive effect on the number of bat passes (GEE, Wald $\chi^2=13.91$, $P<0.001$; Table 3.6.1), with a predicted increase in bat activity of 83 % from 0 and 1000 m from the proposed Scheme (Figure 3.6.1). This is likely due to the presence of the existing A30.
- 3.6.5 Bat activity was significantly higher in habitat 2-5 than habitat 1 (GEE, Wald $\chi^2=$, $P<0.001$ Table 3.6.2). Please refer to Appendix B for the raw data and output.

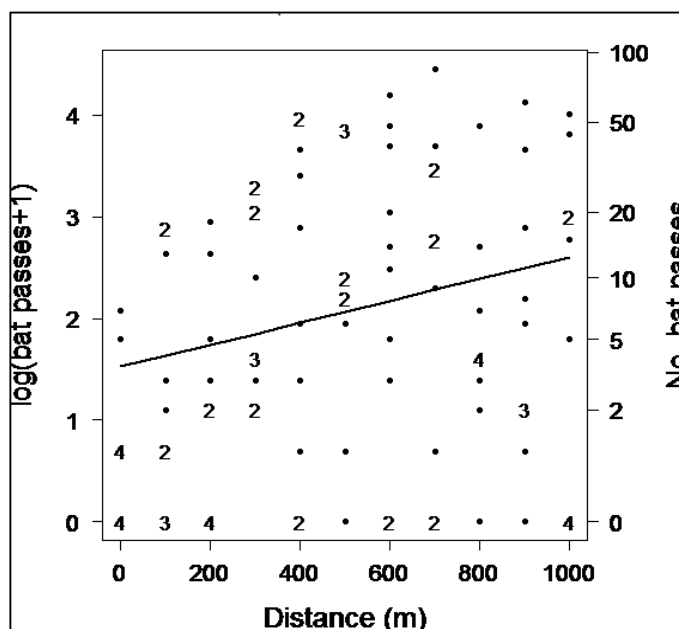
Table 3.6.2 GEE Results for total bat activity (log (1 + number of bat passes)) species present per spot check)

Coefficients	Estimate	Wald	Standard Error
Intercept	0.038342	0.15	0.3965
Distance (m)	0.001078	13.91***	0.0004
Habitat 2	1.077039	65.64***	0.4927
Habitat 3	1.094199	76.22***	0.4460
Habitat 4	1.170349	182.48***	0.5790
Habitat 5	1.486805	69.87***	0.4178
Correlation parameter****	0.53		0.0527
Scale parameter		1.63	0.807

. $P<0.1$, * $P<0.05$, ** $P<0.01$, *** $P<0.001$ (Wald test)

**** Correlation (on a scale of 0 and 1) between two sequential spot checks along the same transect route on the same night.

Figure 3.6.1: Effect of distance from 0 - 1000 m on total bat activity with the final GEE model



4 CONCLUSIONS

- 4.1.1 The baseline within the report describes the species present within the survey area, and highlights the local areas where bat activity and species richness is highest in order to inform the EclA and mitigation design.
- 4.1.2 A minimum of 11 species and species groups were recorded within the survey area following analysis of the desk study and survey results. Species recorded were Leisler's bat, Serotine, common pipistrelle, soprano pipistrelle, Nathusius pipistrelle, Barbastelle bat, lesser horseshoe bat, greater horseshoe bat, brown long-eared bat and *Myotis* species (considered to constitute a combination of Daubenton's bat, Natterer's bat, whiskered bat, and Brandt's bat). The status of each species both locally and nationally are detailed within Table 4.1.1.
- 4.1.3 Peak levels of bat activity was recorded on the static detectors during May 2016. The month with the lowest bat activity levels was October 2016, it is likely that this is due to the lower temperatures. Peak levels of greater horseshoe bats were recorded on the static detectors during May 2016. Bat activity levels of lesser horseshoe bats were fairly similar throughout the year. The transect surveys recorded a peak in activity levels during the August 2016 transect surveys. Peak activity levels of lesser and greater horseshoe bats during the transect surveys were recorded within June 2016.
- 4.1.4 Of the bat species and groups recorded during the surveys greater and lesser horseshoe bats, *Myotis* species and brown long-eared bats are considered to be the species most often associated with cluttered environments (species predisposed to flying in woodland or very close to trees, hedges, water or the ground). These species and groups are less likely to cross large gaps to commute or forage. Additionally these species are likely to fly closer to linear features and should they cross a large gap are more likely to be crossing at unsafe heights (<5 m). As such; they are more susceptible to fragmentation impacts associated with vegetation severance. The impacts of fragmentation are likely to be particularly damaging to the rarer species such as lesser and greater horseshoe bats that have already fragmented populations³¹, and tend to be faithful to their commuting routes.
- 4.1.5 Barbastelle, Serotine, Nathusius pipistrelle, common pipistrelle and soprano pipistrelle are considered to be species which tend to forage in semi-cluttered (edge habitats) environments, such as road verges. They usually follow linear features such as hedges and tree lines, but will readily cross small gaps meaning that the widening of a road would be unlikely to cause additional habitat fragmentation. However, the construction of a new road next to an existing road may result in gaps that are too large for these species to cross and result in fragmentation, although the effect of this may be less than the cluttered habitat adapted bats. The results show that these species tend to be flying within 1 to 7 m from the ground (with the majority < 5 m). As such, direct mortality may have a more damaging impact on these species (particularly *Pipistrellus* species) that may already be present within the soft estate, foraging on insects attracted by the lights¹⁰.
- 4.1.6 The two remaining species, noctule and Leisler's bat (*Nyctalus* species), are considered to be open habitat species with a predisposition to fly high and forage in open spaces¹⁰. These species would not be likely to suffer from habitat fragmentation and would usually cross gaps in foraging habitat at above traffic height. The results of the Crossing Point surveys have recorded *Nyctalus* species foraging >5 m throughout the survey area.

³¹ Altringham J.D (2008) Proof of Evidence of Professor John Altringham On behalf of the White Horse Alliance. Public Inquiry into The A350 Westbury Bypass

Table 4.1.1: Status of the bat species recorded or assumed to be present within the survey area.

FLIGHT STRATEGY	SPECIES	RELATIVE UK DISTRIBUTION AND STATUS ^{32, 33*}	LOCAL DISTRIBUTION AND STATUS ^{34*}
CLUTTERED HABITAT ADAPTED SPECIES	Brown long-eared bat	Widespread, common	Widespread, common
	Whiskered bat	Common (in the north and west) Rare (in the south and west)	Widespread, locally common
	Brandt's bat	Common (in the north and west) Rare (in the south and west)	Locally distributed, likely to be under recorded
	Natterer's bat	Locally common	Widespread (more common to the west)
	Daubenton's bat	Common	Widespread (not common, it is likely to be under recorded)
	Lesser horseshoe bat	Rare (restricted to Wales and western England)	Widespread (generally restricted to the central and east)
	Greater horseshoe bat	Rare (restricted to the south west)	Scattered, rare
	Barbastelle	Rare, widespread	Rare, widespread
EDGE HABITAT ADAPTED SPECIES	Serotine	Uncommon, (largely restricted to the south)	Less common, widespread
	Common pipistrelle	Common	Widespread
	Nathusius' pipistrelle	Rare, but widespread, may be under recorded	Only recorded in a few areas around Penzance (likely to be under recorded)
	Soprano pipistrelle	Widespread, common (England)	Widespread (less common than common pipistrelle)
OPEN HABITAT ADAPTED SPECIES	Leisler's bat	Widespread, uncommon (England, although it may be under recorded)	No Information
	Noctule	Widespread, common	Widespread

**It should be noted that the distribution and status data was obtained from a national source and a local source, as such terminology may vary.*

4.1.7

Bat activity was recorded throughout the survey areas at varying levels. Peak levels of bat activity recorded during the transect, static and crossing point surveys were generally associated with vegetated habitats within four main areas associated with Nanteague Farm, Nancarrow Farm, Tolgroggan Farm and Trevalso Farm, where bats were recorded to be using the linear features within these areas for foraging and commuting purposes. A peak level of bat activity was recorded during the crossing point surveys at the underpass (crossing point 7) near Chyverton Park, although the static detectors recorded fairly low levels of bat activity. Lower levels of bat activity were generally recorded within the more open, exposed arable and heath habitats to the north and south of the survey area; open habitat adapted species (noctule and Leisler's bat) were

³² Natural England (2014). Technical Information Note TIN051: Bats and onshore wind turbines *Interim guidance*

³³ The Bat Conservation Trust (2014), The State of the UK's bats. *National Bat Monitoring Programme Population Trends*. The Bat Conservation Trust

³⁴ <https://www.cornwallmammalgroup.org/bats-in-cornwall/> - Accessed 2nd October 2017

more prominent within these areas.

- 4.1.8 Common pipistrelle and *Myotis* species were the most commonly recorded species throughout the survey areas. Lesser and greater horseshoe bats were recorded throughout the survey area with peak levels being recorded within habitats associated with Nanteague Farm, Nancarrow Farm, and Trevalso Farm. Barbastelle bats were recorded at individual passes throughout the survey areas.
- 4.1.9 The Crossing Point surveys identified that bats were using all of the 12 linear features surveyed as commuting and foraging routes. Based on the surveys undertaken, the key areas for bats are located at Crossing Points 3A located at Nanteague Farm complex, 6 located at Nancarrow Farm complex, 7 located at the underpass near Zelah, and 11 located at Trevalso Farm complex, as higher activity levels of bats were recorded at these locations (Figure 3.5.1). Incidental sightings of bats crossing the existing A30 was recorded at several locations (the majority of bats were crossing through the underpass at 7, with only a single bat being recorded commuting over it).
- 4.1.10 Lesser and greater horseshoe bats were recorded throughout the survey area at generally lower activity levels than the other species and species groups. Peak activity levels for these species were recorded within the Nanteague Farm complex, and the Trevalso Farm complex. Although lesser horseshoe bats were not recorded during the crossing point surveys at Crossing Point 6, they are using the feature, as lesser horseshoe bats were recorded during the transect and static detector surveys.

The landscape scale surveys identified that bat activity levels increased with distance from the current A30. Transects 7-9 had the highest levels of bat activity. The surveys provide a suitable baseline from which construction and post-construction surveys can be compared.

Appendix A

FIGURES

APPENDIX A-1

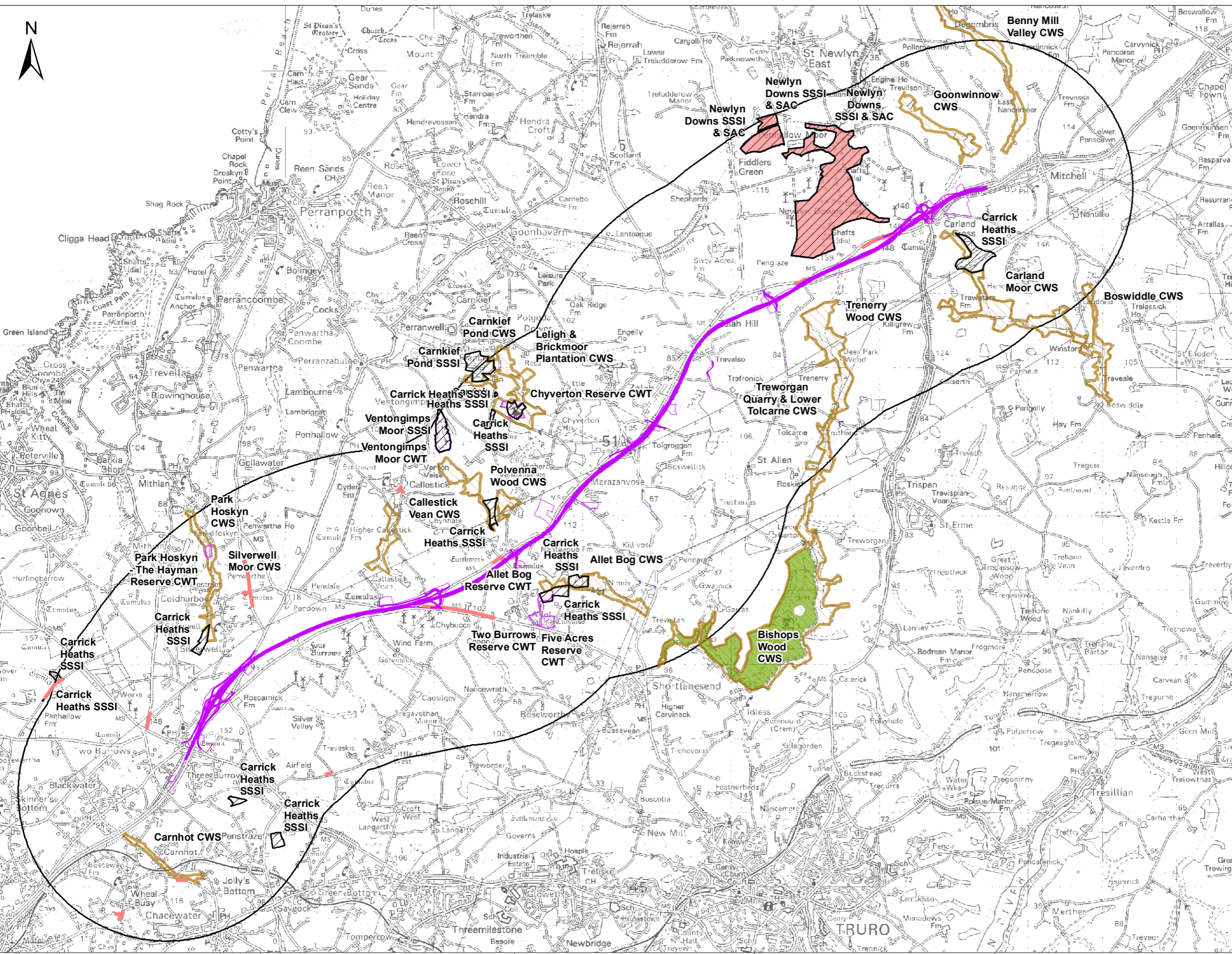
FIGURES

Appendix B

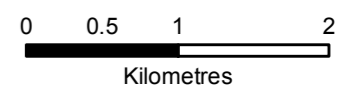
RAW DATA

APPENDIX B-1

RAW DATA



- Proposed Route
- 2km Study Area
- Cornwall Roadside Inventory Sites
- Site of Special Scientific Interest
- Special Area of Conservation
- County Wildlife Site
- Cornwall Wildlife Trust Reserve
- Ancient Woodland



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Rev	Date	Description	By	Chk	App	Notes

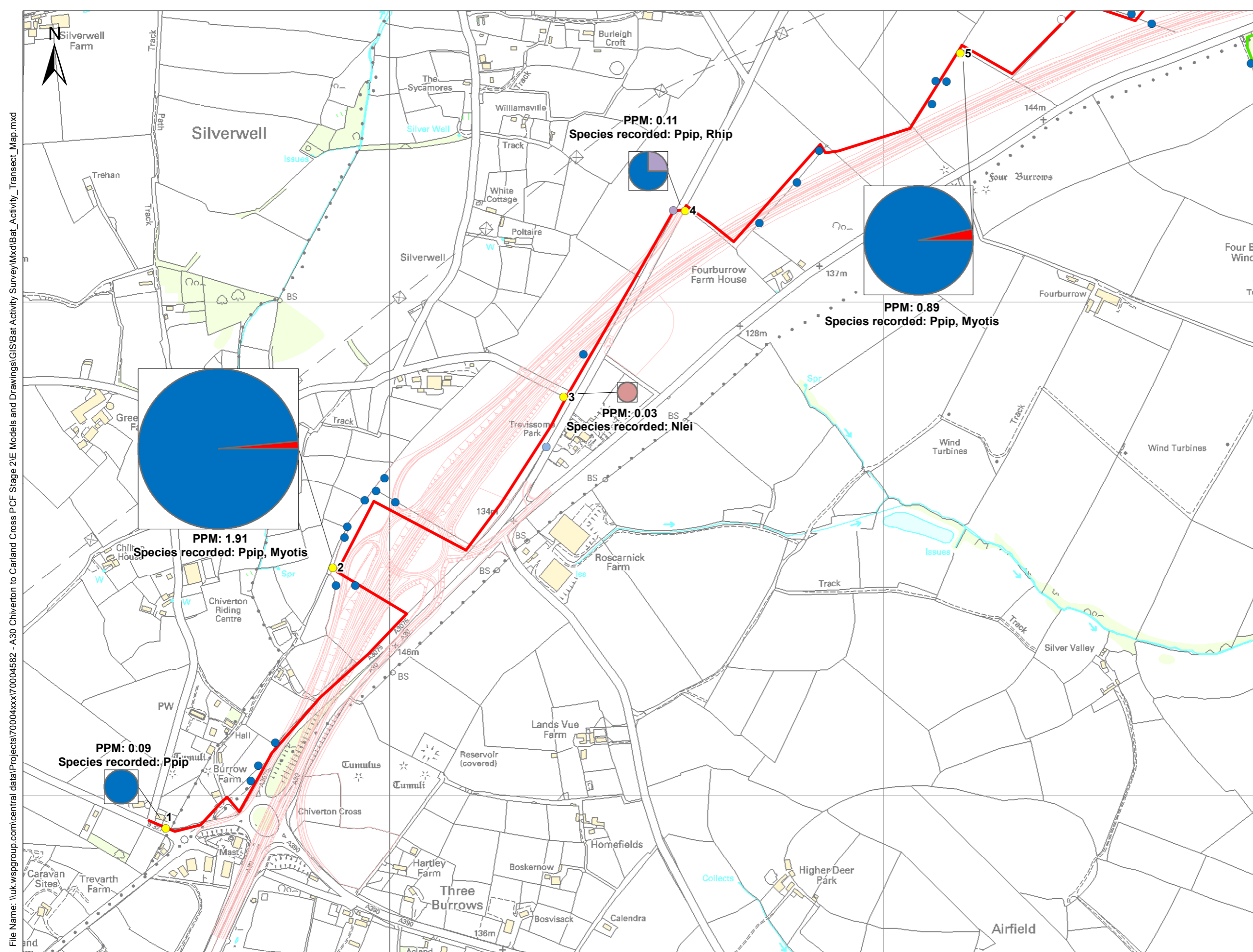
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 1 Queen Street, Bristol
 BS2 0HQ
 Tel: 44-(0)117-930-6200

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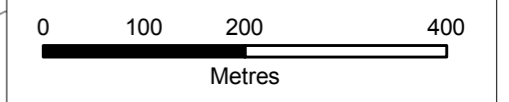
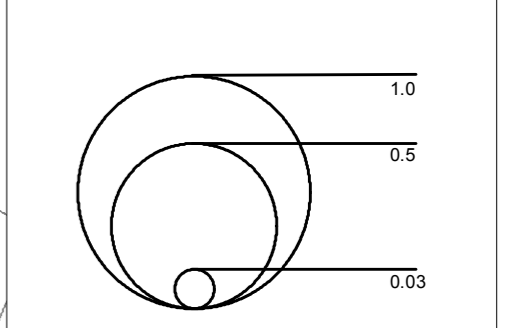
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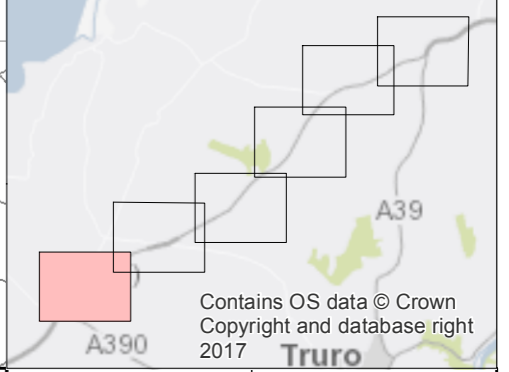
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- Point Count
- Bat Passes**
- Esero
 - Plecotus
 - Nlei
 - Nnoc
 - Rfer
 - Rhip
 - Myotis
 - Ppyg
 - Ppip
 - Unidentified

- Bat Species Observed**
- Nnoc/Nlei
 - Esero
 - Plecotus
 - Nlei
 - Nnoc
 - Rfer
 - Rhip
 - Myotis
 - Bbarb
 - P50
 - P40
 - Ppyg
 - Ppip
- Transect Routes**
- 1
 - 2
 - 3
 - 4
 - 5
 - Diversion
 - Diversion
 - Diversion

Chart Totals (Representative PPM)
PPM=Bat passes per minute



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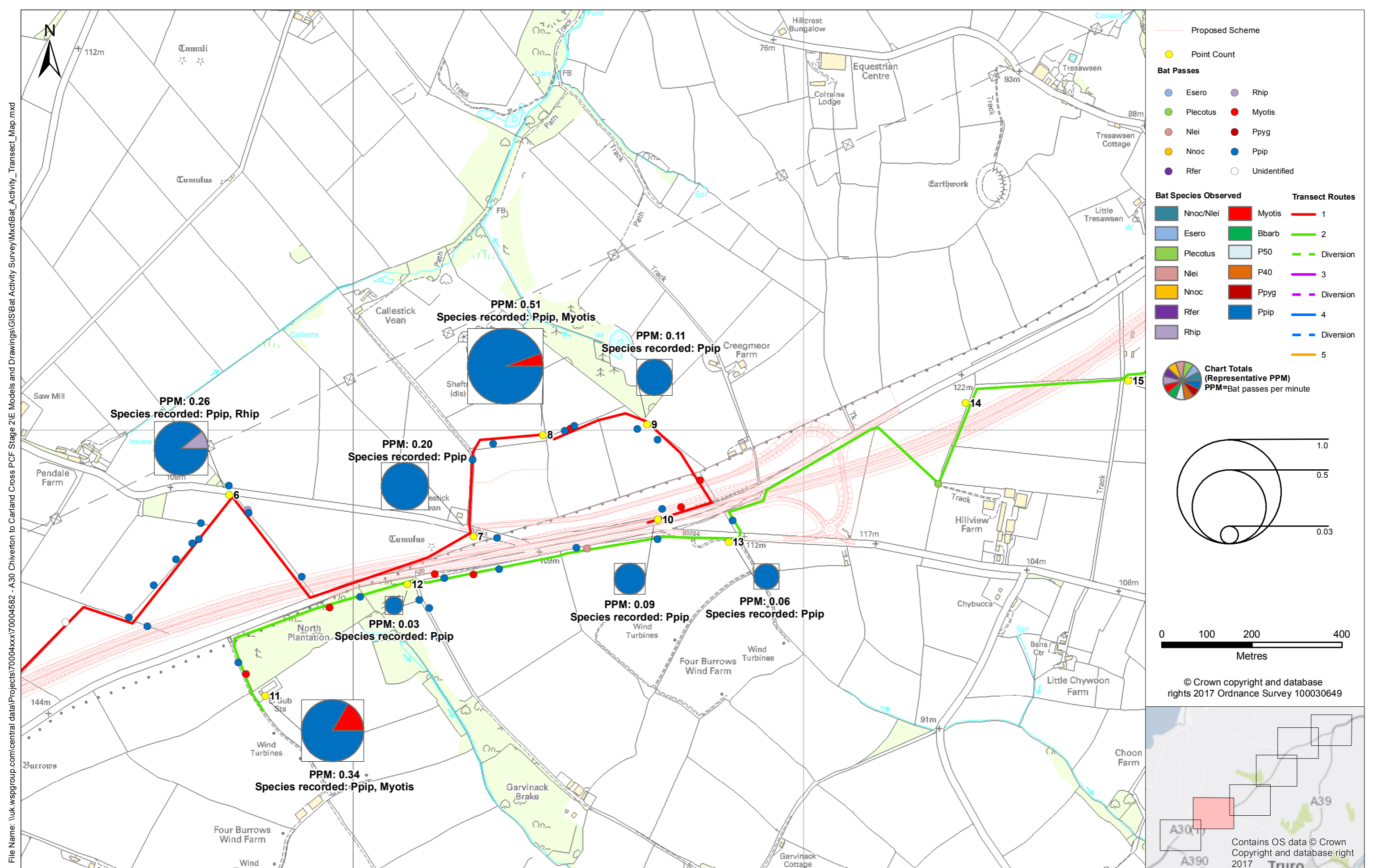
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Project: **A30 CHIVERTON TO CARLAND CROSS**

Title: **BAT ACTIVITY TRANSECT MAP**
PAGE 1 OF 6

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Project Number: 70004582	Drawing Number: FIGURE 2
	Revision:

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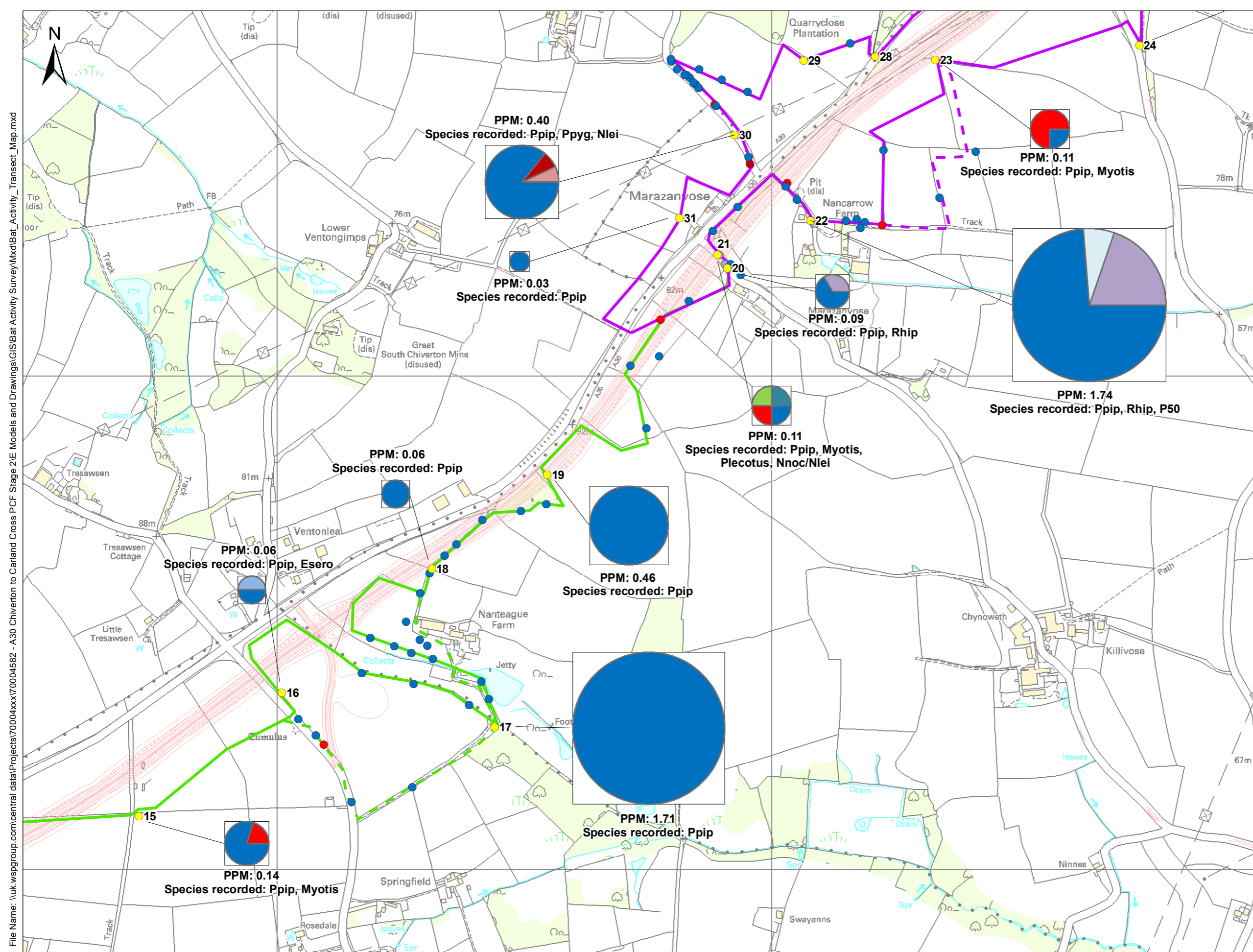
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Title: **BAT ACTIVITY TRANSECT MAP**
 PAGE 2 OF 6

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Date: 06/11/2017	Scale: 1:7,500 A3 Sheet:
Project Number: 70004582	Drawing Number: FIGURE 2
	Revision:

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Proposed Scheme

Point Count

Bat Passes

- Esero
- Plecotus
- Nlei
- Nnoc
- Rfer
- Rhip
- Myotis
- Ppyg
- Unidentified

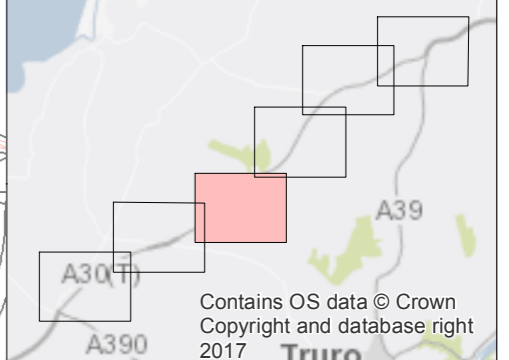
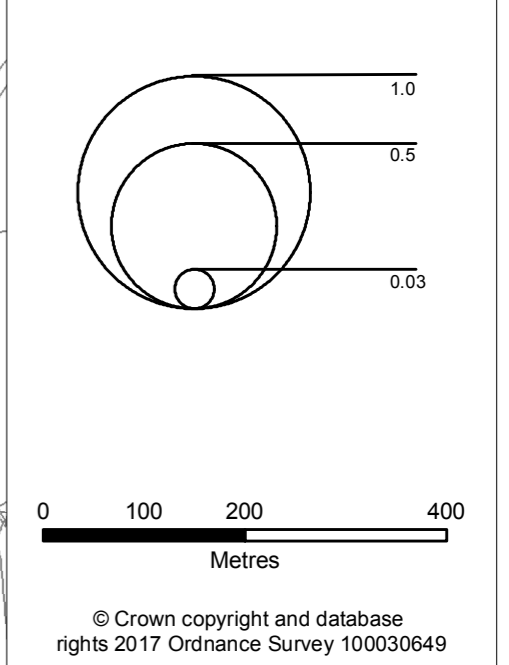
Bat Species Observed

- Nnoc/Nlei
- Esero
- Plecotus
- Nlei
- Nnoc
- Rfer
- Rhip
- Myotis
- Bbarb
- P50
- P40
- Ppyg
- Ppip

Transect Routes

- 1
- 2
- 3
- 4
- 5
- Diversion
- Diversion
- Diversion

Chart Totals (Representative PPM)
PPM=Bat passes per minute



Rev	Date	Description	By	Chk	App	Notes

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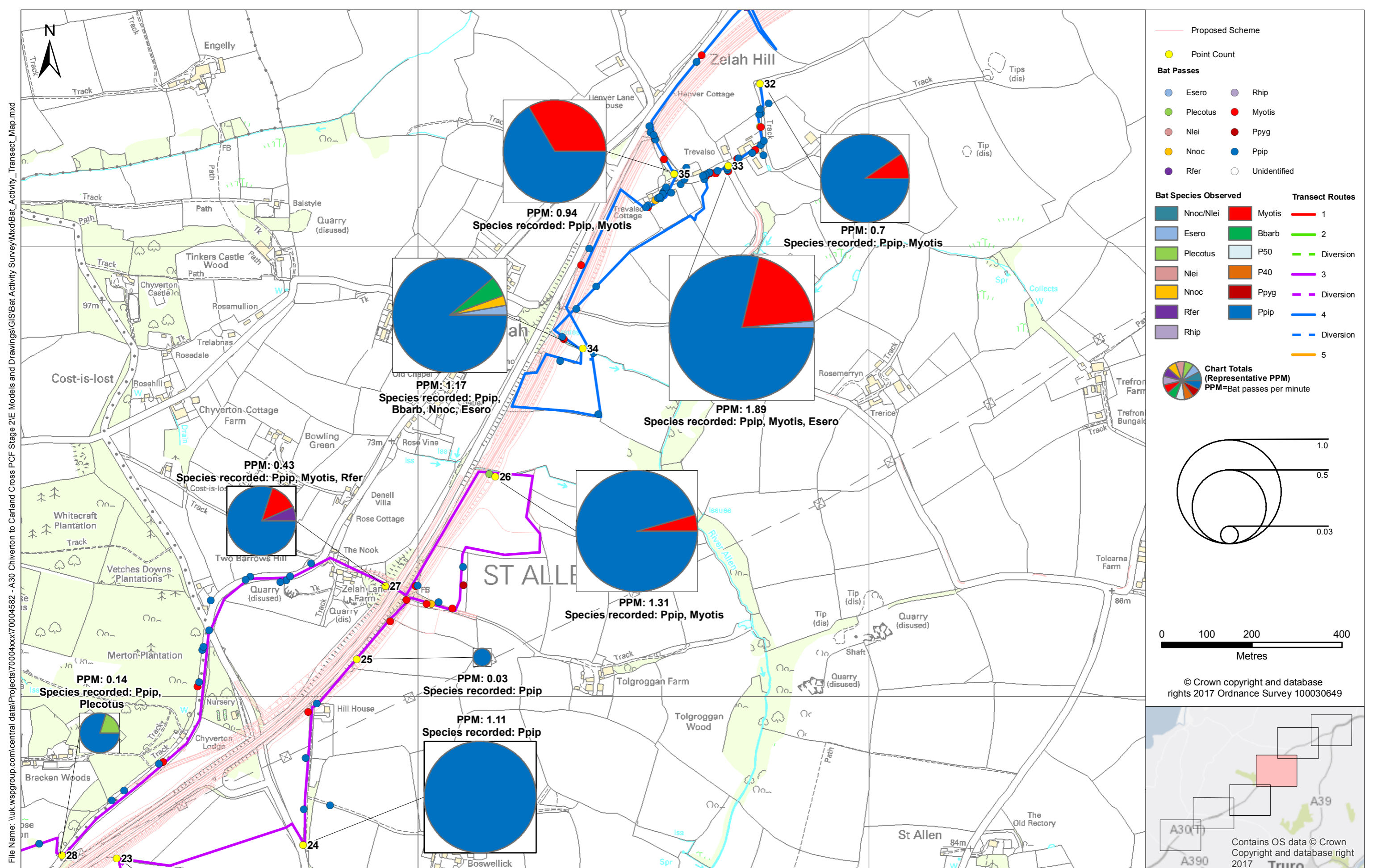
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PAGE 3 OF 6

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Date: 06/11/2017	Scale: 1:7,500 A3 Sheet:
Project Number: 70004582	Drawing Number: FIGURE 2
	Revision:

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Proposed Scheme

Point Count

Bat Passes

- Esero
- Plecotus
- Nlei
- Nnoc
- Rfer
- Rhip
- Myotis
- Ppyg
- Ppip
- Unidentified

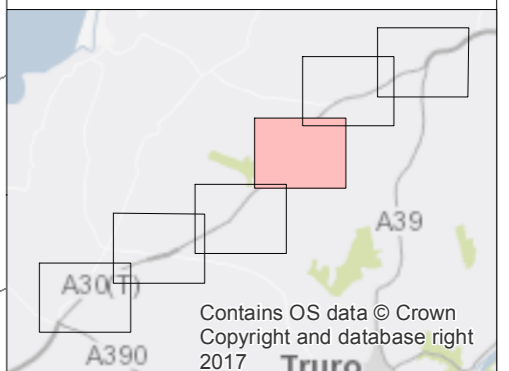
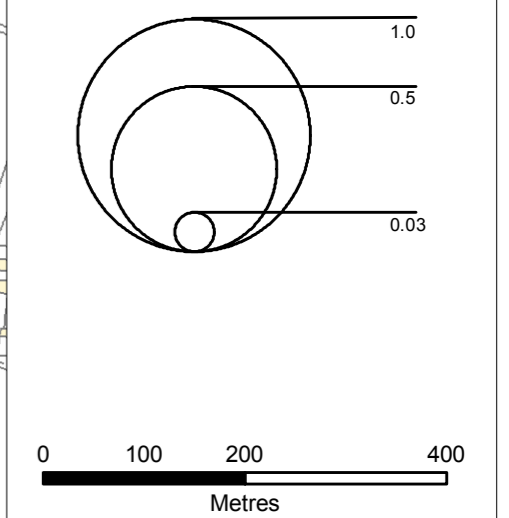
Bat Species Observed

- Nnoc/Nlei
- Esero
- Plecotus
- Nlei
- Nnoc
- Rfer
- Rhip
- Myotis
- Bbarb
- P50
- P40
- Ppyg
- Ppip

Transect Routes

- 1
- 2
- 3
- 4
- 5
- Diversion
- Diversion
- Diversion

Chart Totals (Representative PPM)
PPM=Bat passes per minute



Rev	Date	Description	By	Chk	App	Notes

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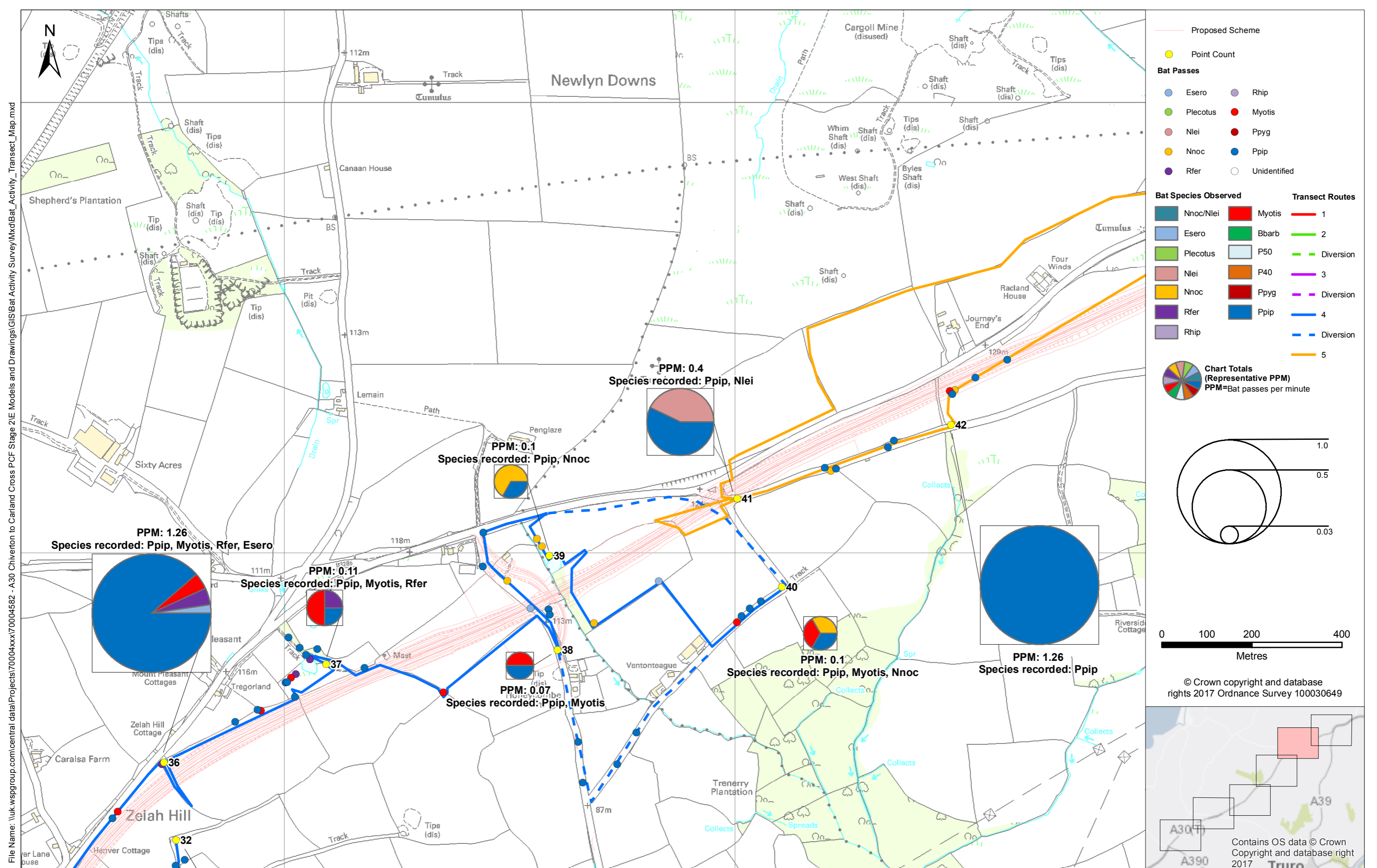
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Project: **A30 CHIVERTON TO CARLAND CROSS**

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PAGE 4 OF 6

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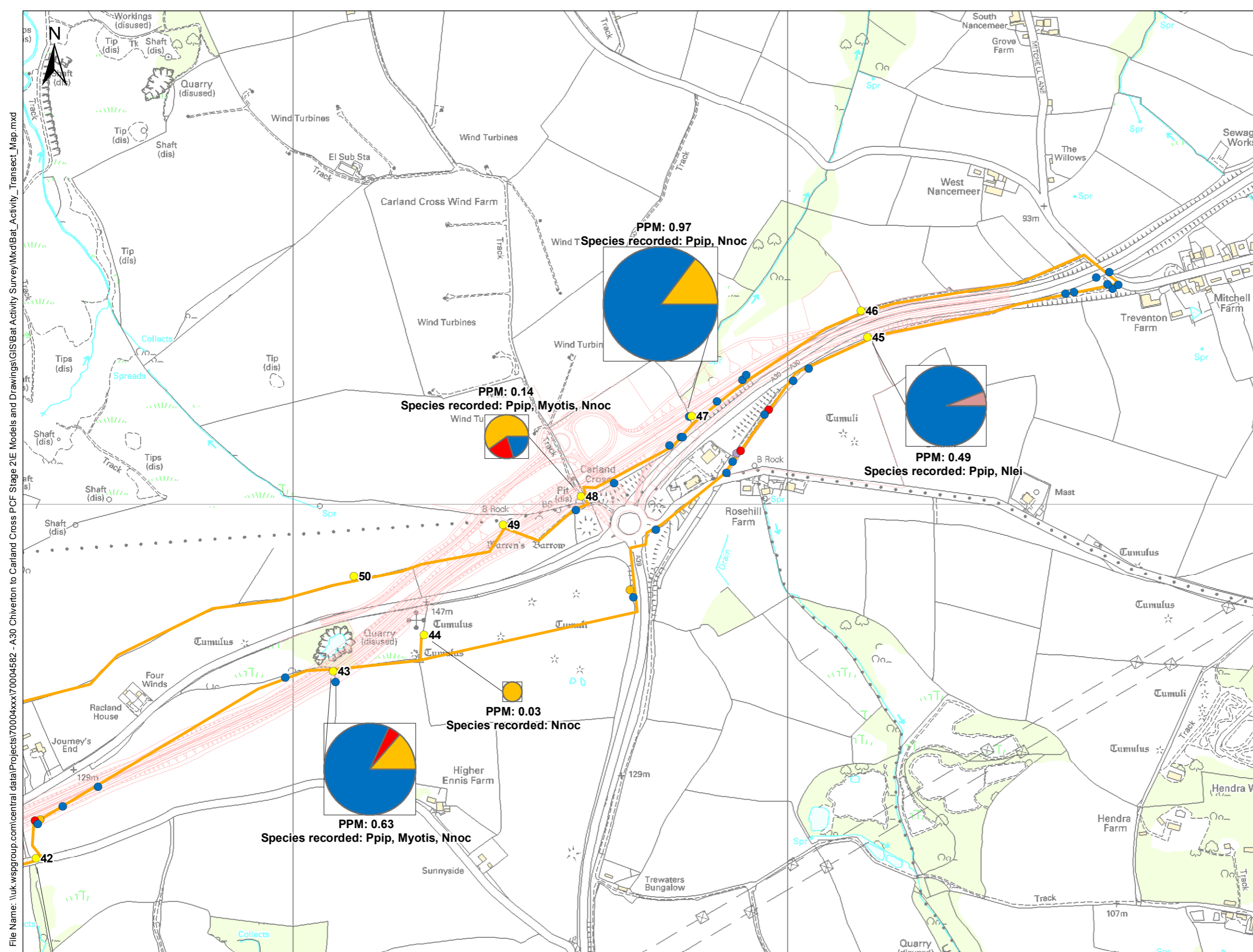
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PAGE 5 OF 6

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Designed: MC	Approved: UD
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Project Number: 70004582	Drawing Number: FIGURE 2
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Proposed Scheme

Point Count

Bat Passes

- Esero
- Plecotus
- Nlei
- Nnoc
- Rfer
- Rhip
- Myotis
- Ppyg
- Ppip
- Unidentified

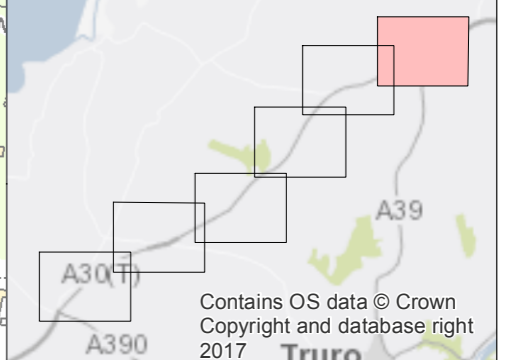
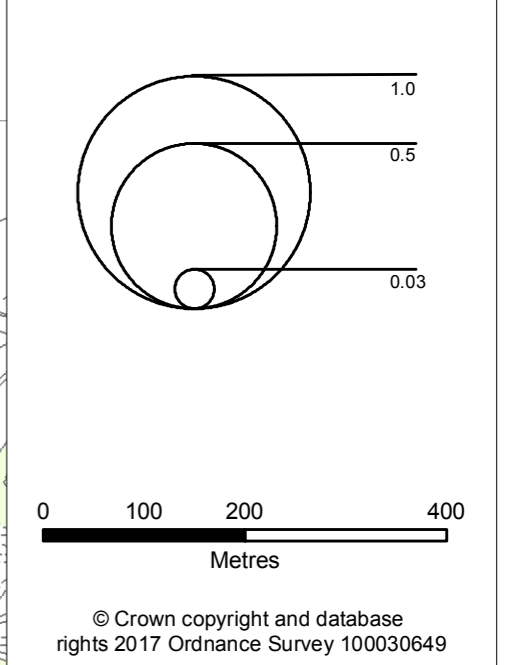
Bat Species Observed

- Nnoc/Nlei
- Esero
- Plecotus
- Nlei
- Nnoc
- Rfer
- Rhip
- Myotis
- Bbarb
- P50
- P40
- Ppyg
- Ppip

Transect Routes

- 1
- 2
- 3
- 4
- 5
- Diversion
- Diversion
- Diversion

Chart Totals (Representative PPM)
PPM=Bat passes per minute



Rev	Date	Description	By	Chk	App	Notes

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Project: **A30 CHIVERTON TO CARLAND CROSS**

Title: **BAT ACTIVITY TRANSECT MAP**
PAGE 6 OF 6

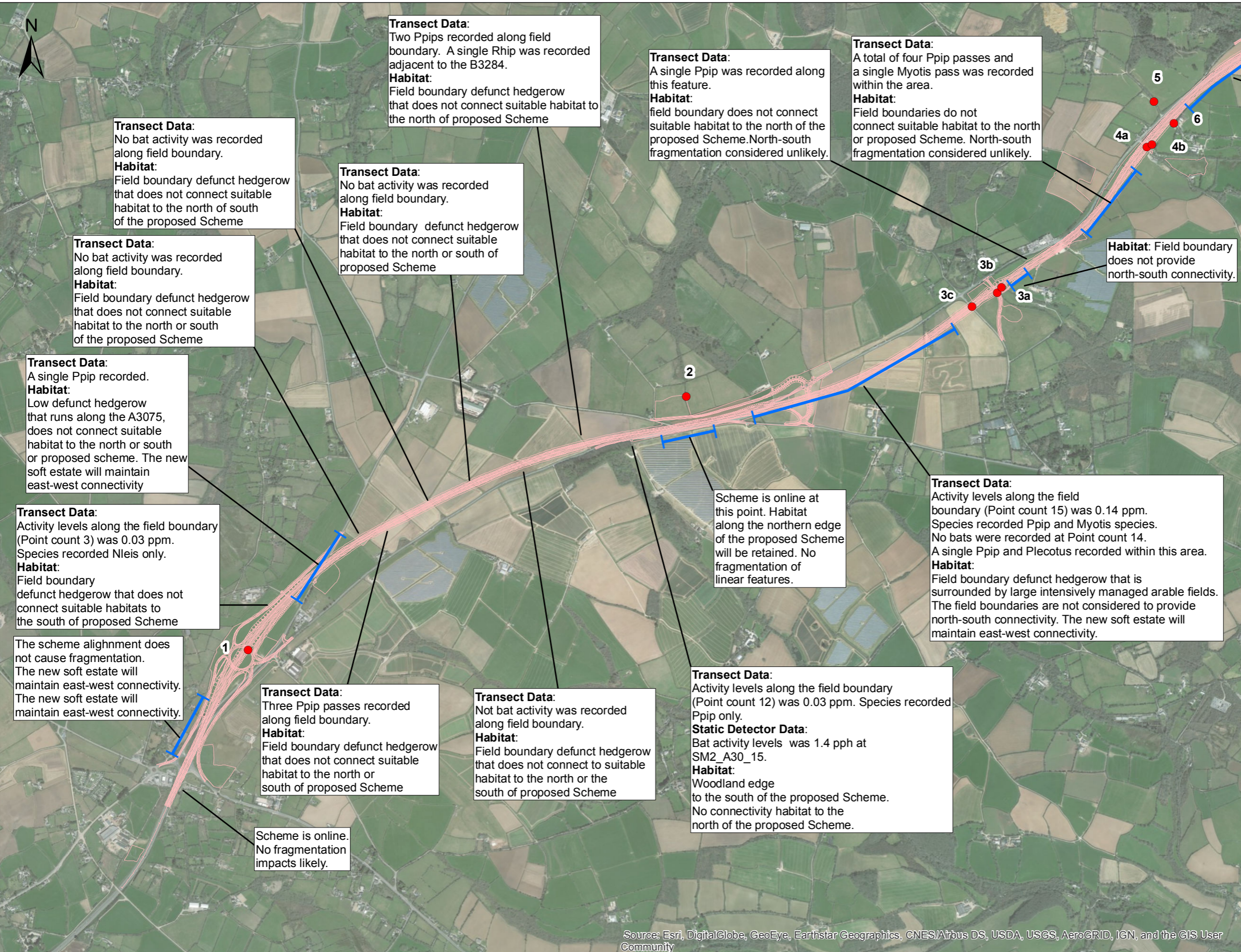
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Date: 06/11/2017	Scale: 1:7,500 A3 Sheet:
Project Number: 70004582	Drawing Number: FIGURE 2
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Plot Date: 06/11/2017

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 Login: DeSouzaJ
 Plot Date: 07/11/2017



— Proposed Scheme
 ● Crossing Point

Transect Data:
 No bat activity was recorded along field boundary.
Habitat:
 Field boundary defunct hedgerow that does not connect suitable habitat to the north or south of the proposed Scheme

Transect Data:
 Two Ppips recorded along field boundary. A single Rhip was recorded adjacent to the B3284.
Habitat:
 Field boundary defunct hedgerow that does not connect suitable habitat to the north of proposed Scheme

Transect Data:
 A single Ppip was recorded along this feature.
Habitat:
 field boundary does not connect suitable habitat to the north of the proposed Scheme. North-south fragmentation considered unlikely.

Transect Data:
 A total of four Ppip passes and a single Myotis pass was recorded within the area.
Habitat:
 Field boundaries do not connect suitable habitat to the north or proposed Scheme. North-south fragmentation considered unlikely.

Habitat: Field boundary does not provide north-south connectivity.

Transect Data:
 No bat activity was recorded along field boundary.
Habitat:
 Field boundary defunct hedgerow that does not connect suitable habitat to the north or south of the proposed Scheme

Transect Data:
 No bat activity was recorded along field boundary.
Habitat:
 Field boundary defunct hedgerow that does not connect suitable habitat to the north or south of proposed Scheme

Transect Data:
 A single Ppip recorded.
Habitat:
 Low defunct hedgerow that runs along the A3075, does not connect suitable habitat to the north or south or proposed scheme. The new soft estate will maintain east-west connectivity

Scheme is online at this point. Habitat along the northern edge of the proposed Scheme will be retained. No fragmentation of linear features.

Transect Data:
 Activity levels along the field boundary (Point count 15) was 0.14 ppm. Species recorded Ppip and Myotis species. No bats were recorded at Point count 14. A single Ppip and Plecotus recorded within this area.
Habitat:
 Field boundary defunct hedgerow that is surrounded by large intensively managed arable fields. The field boundaries are not considered to provide north-south connectivity. The new soft estate will maintain east-west connectivity.

Transect Data:
 Activity levels along the field boundary (Point count 3) was 0.03 ppm. Species recorded Nleis only.
Habitat:
 Field boundary defunct hedgerow that does not connect suitable habitats to the south of proposed Scheme

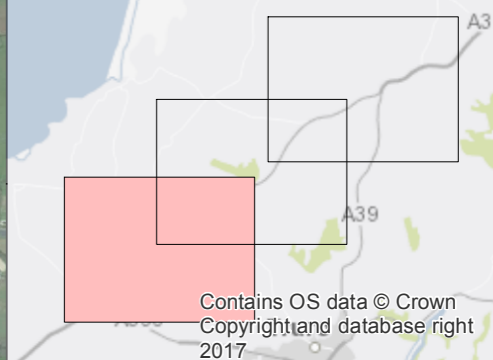
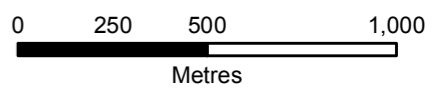
The scheme alignment does not cause fragmentation. The new soft estate will maintain east-west connectivity. The new soft estate will maintain east-west connectivity.

Transect Data:
 Three Ppip passes recorded along field boundary.
Habitat:
 Field boundary defunct hedgerow that does not connect suitable habitat to the north or south of proposed Scheme

Transect Data:
 Not bat activity was recorded along field boundary.
Habitat:
 Field boundary defunct hedgerow that does not connect to suitable habitat to the north or the south of proposed Scheme

Transect Data:
 Activity levels along the field boundary (Point count 12) was 0.03 ppm. Species recorded Ppip only.
Static Detector Data:
 Bat activity levels was 1.4 pph at SM2_A30_15.
Habitat:
 Woodland edge to the south of the proposed Scheme. No connectivity habitat to the north of the proposed Scheme.

Scheme is online. No fragmentation impacts likely.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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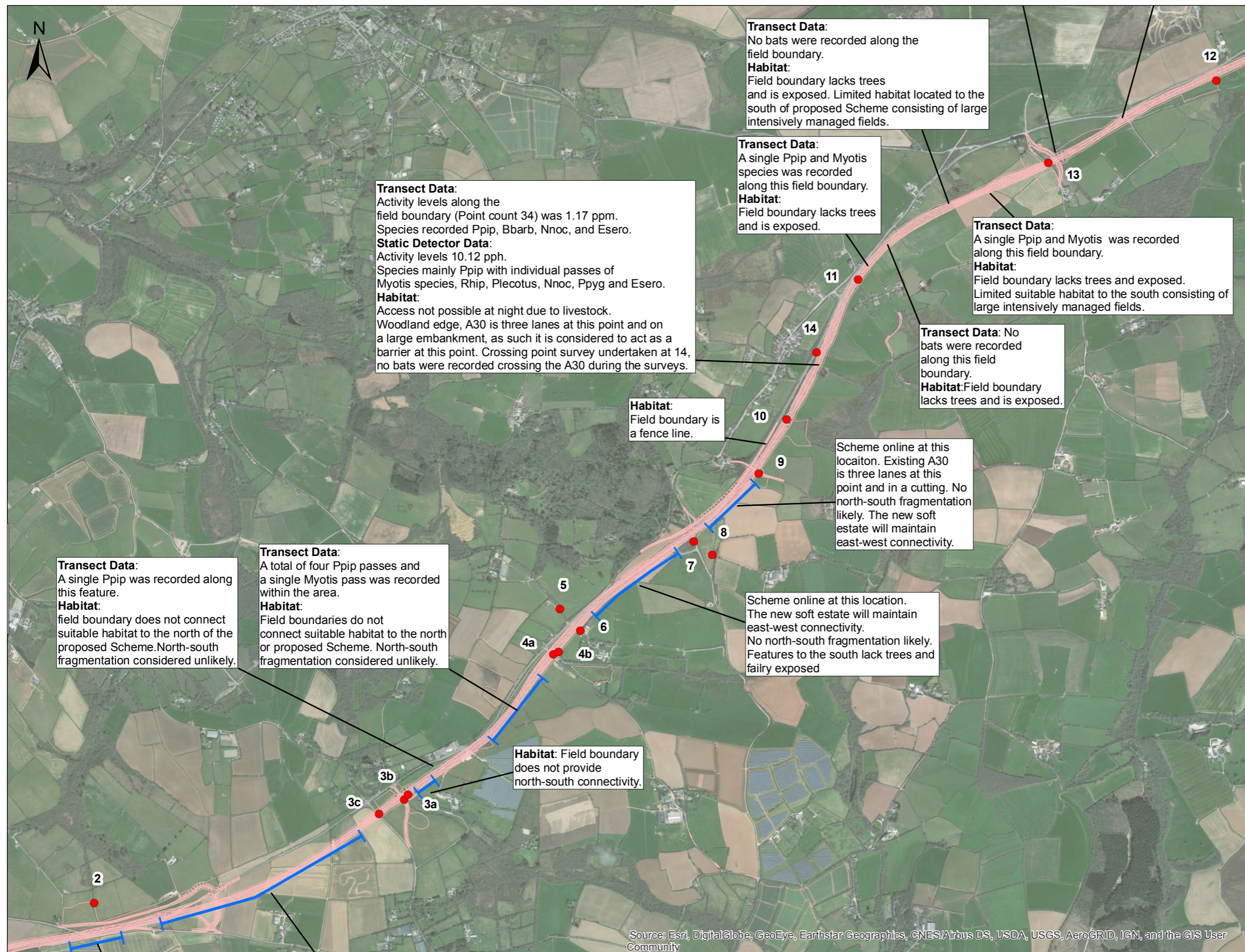
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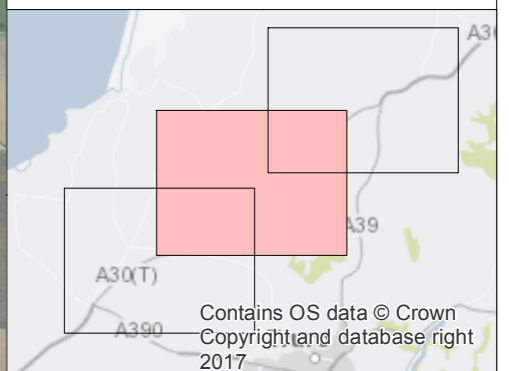
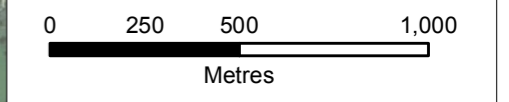
Title:
 COMMENTARY ON AREAS OF
 HABITAT SCOPED OUT OF THE
 CROSSING POINT SURVEYS
 PAGE 1 OF 3

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Project Number: 70004582	Drawing Number: FIGURE 3A

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 Login: DeSouzaJ
 Plot Date: 07/11/2017



— Proposed Scheme
● Crossing Point



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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 PAGE 2 OF 3

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Project Number: 70004582	Drawing Number: FIGURE 3A

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Transect Data:
Activity levels along the field boundary (Point count 47 and 48) was 0.97 ppm and 0.14 ppm (respectively). Species recorded Ppip, Myotis species and Nnoc.

Static Data:
Bat activity levels of 21.04 pph was recorded on SM2_A30_14. Species recorded were mainly Ppip and Nnoc with individual passes of Rfer, Myotis species, Nnoc, Ppyg, Nlei, P50, Esero.

Habitat:
All of the connective features are located to the north of the proposed Scheme, no north-south fragmentation considered likely. The new soft estate will maintain east-west connectivity.

Transect Data:
Three Nnoc passers recorded along tree-line.

Static Detector Data:
Activity levels 3.96 pph. Species recorded were Ppip Myotis species, Nnoc/Nlei, Ppyg, P40, P50 and Esero.

Habitat:
Steep ravine, so safe access at night. Current plans (June 2017) include a combined underpass and culvert that will not have lighting. Fragmentation is considered unlikely.

Transect Data:
Activity levels along the field boundary (Point count 41) was 0.4 ppm. Species recorded Ppip and Nlei.

Habitat:
Hedgerow terminates at A30, limited connective habitat to the north of the proposed Scheme. The new soft estate will maintain east-west connectivity.

Scheme online, no fragmentation considered likely.

Transect Data:
No bats were recorded along the field boundary.

Habitat:
Field boundary lacks trees and is exposed. Limited habitat located to the south of proposed Scheme consisting of large intensively managed fields.

Transect Data
Activity levels along the field boundary (Point count 43) was 0.63 ppm. Species recorded Ppip, Myotis species and Nnoc.

Habitat:
Coniferous woodland block considered to be fairly isolated as limited connective habitat to the north and defunct hedgerow to the south. The new soft estate will maintain east-west connectivity.

Transect Data:
A single Ppip and Myotis species was recorded along this field boundary.

Habitat:
Field boundary lacks trees and is exposed.

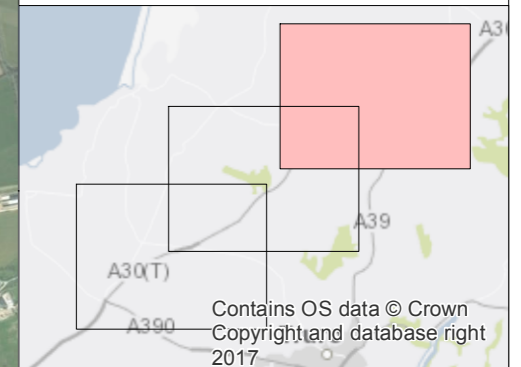
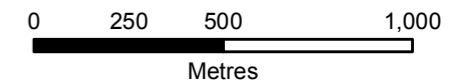
Transect Data:
A single Ppip and Myotis was recorded along this field boundary.

Habitat:
Field boundary lacks trees and exposed. Limited suitable habitat to the south consisting of large intensively managed fields.

Transect Data: No bats were recorded along this field boundary.

Habitat: Field boundary lacks trees and is exposed.

- Proposed Scheme
- Crossing Point



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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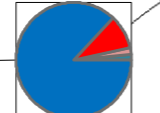
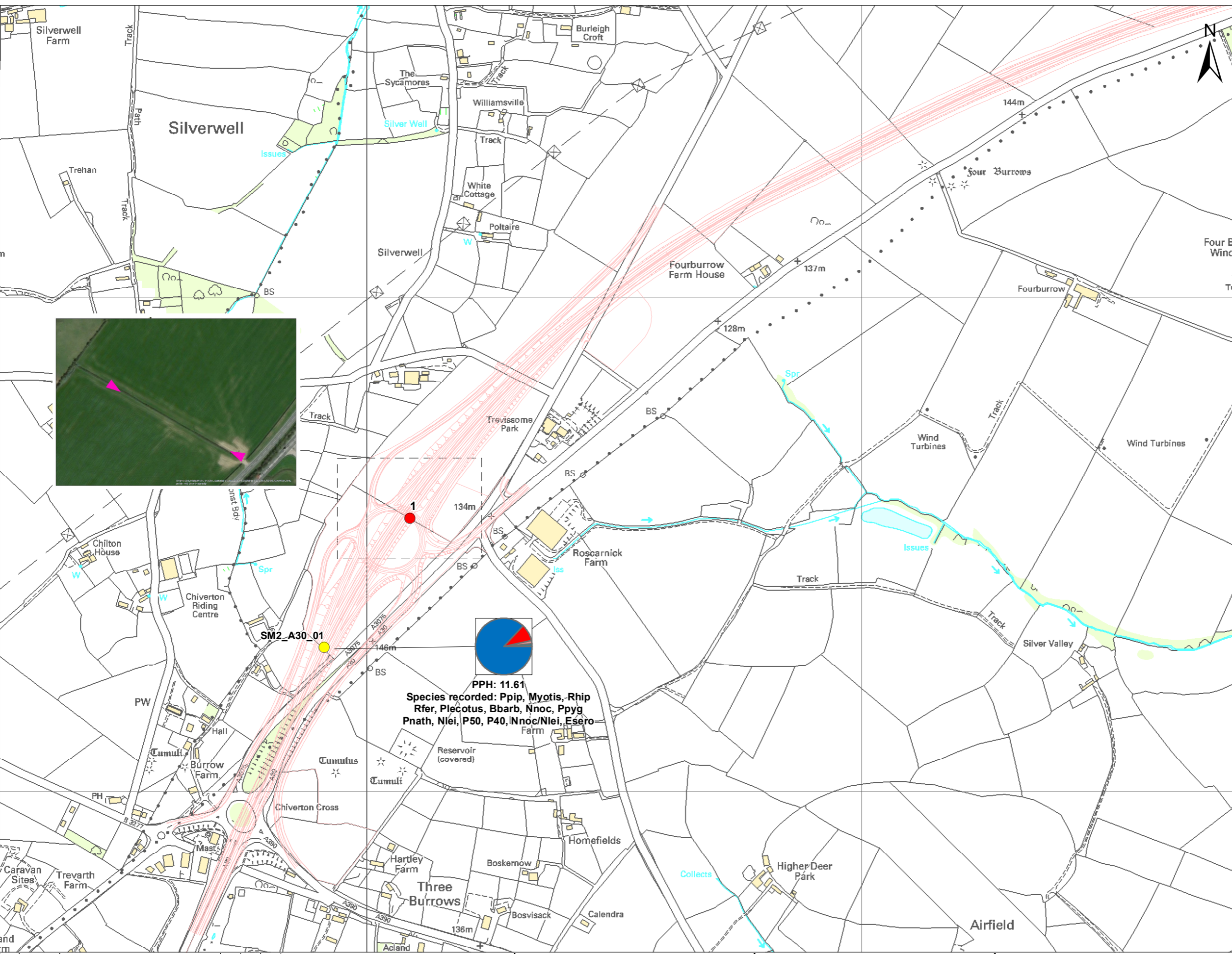
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Sheet: A3	Revision:

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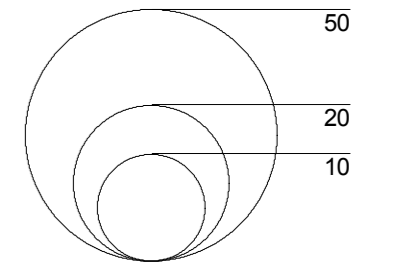


PPH: 11.61
Species recorded: Ppip, Myotis, Rhip, Rfer, Plecotus, Bbarb, Nnoc, Ppyg, Pnath, Nlei, P50, P40, Nnoc/Nlei, Esero

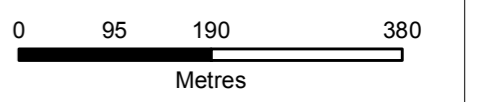
- Proposed Route
- Static Detector Location
- Crossing Points
- Extent of Aerial Image
- ▶ Surveyor Location and direction

- Bat Species Observed**
- | | |
|---|---|
| NnocNlei | Myotis |
| Esero | Bbarb |
| Plecotus | Pnath |
| Nlei | P50 |
| Nnoc | P40 |
| Rfer | Ppyg |
| Rhip | Ppip |

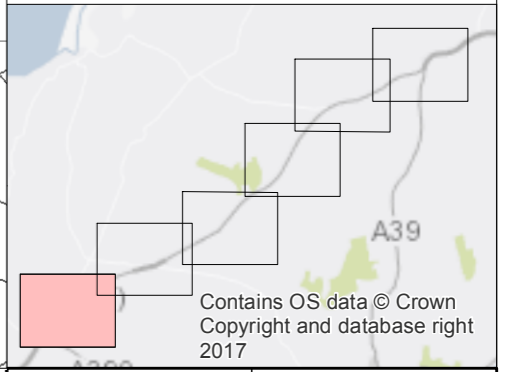
Chart Totals (Representative PPH)
 PPH = passes per hour



N.B. These figures are intended as a visual representation of the bat activity levels within the survey area



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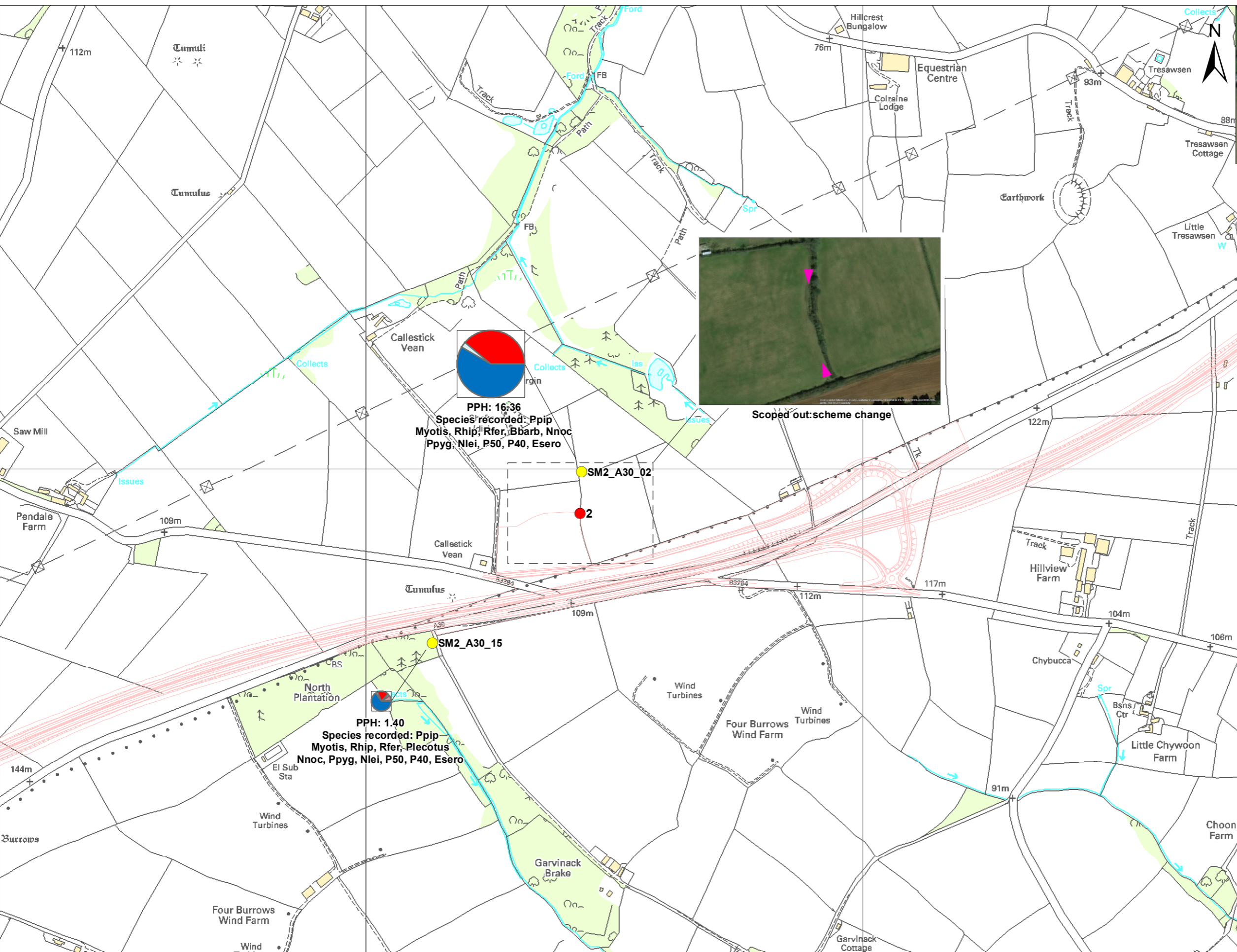
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Title: **STATIC DETECTOR AND CROSSING POINT BAT SURVEY PAGE 1 OF 6**

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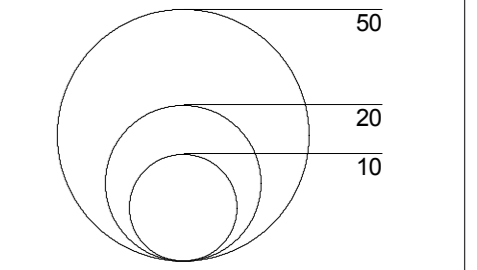


- Proposed Route
- Static Detector Location
- Crossing Points
- Extent of Aerial Image
- Surveyor Location and direction

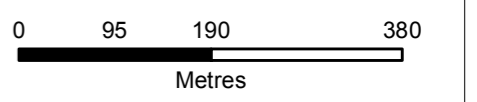
Bat Species Observed

NnocNlei	Myotis
Esero	Bbarb
Plecotus	Pnath
Nlei	P50
Nnoc	P40
Rfer	Ppyg
Rhip	Ppip

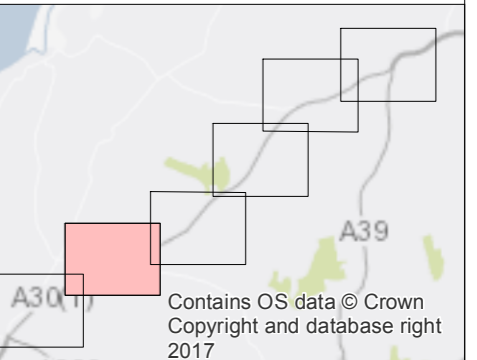
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Title:
STATIC DETECTOR AND CROSSING POINT BAT SURVEY
 PAGE 3 OF 6

Proposed Route
 Static Detector Location
 Crossing Points
 Extent of Aerial Image
 Surveyor Location and direction

Bat Species Observed

NnocNlei	Myotis
Esero	Bbarb
Plecotus	Pnath
Nlei	P50
Nnoc	P40
Rfer	Ppyg
Rhip	Ppip

Chart Totals (Representative PPH)
 PPH = passes per hour

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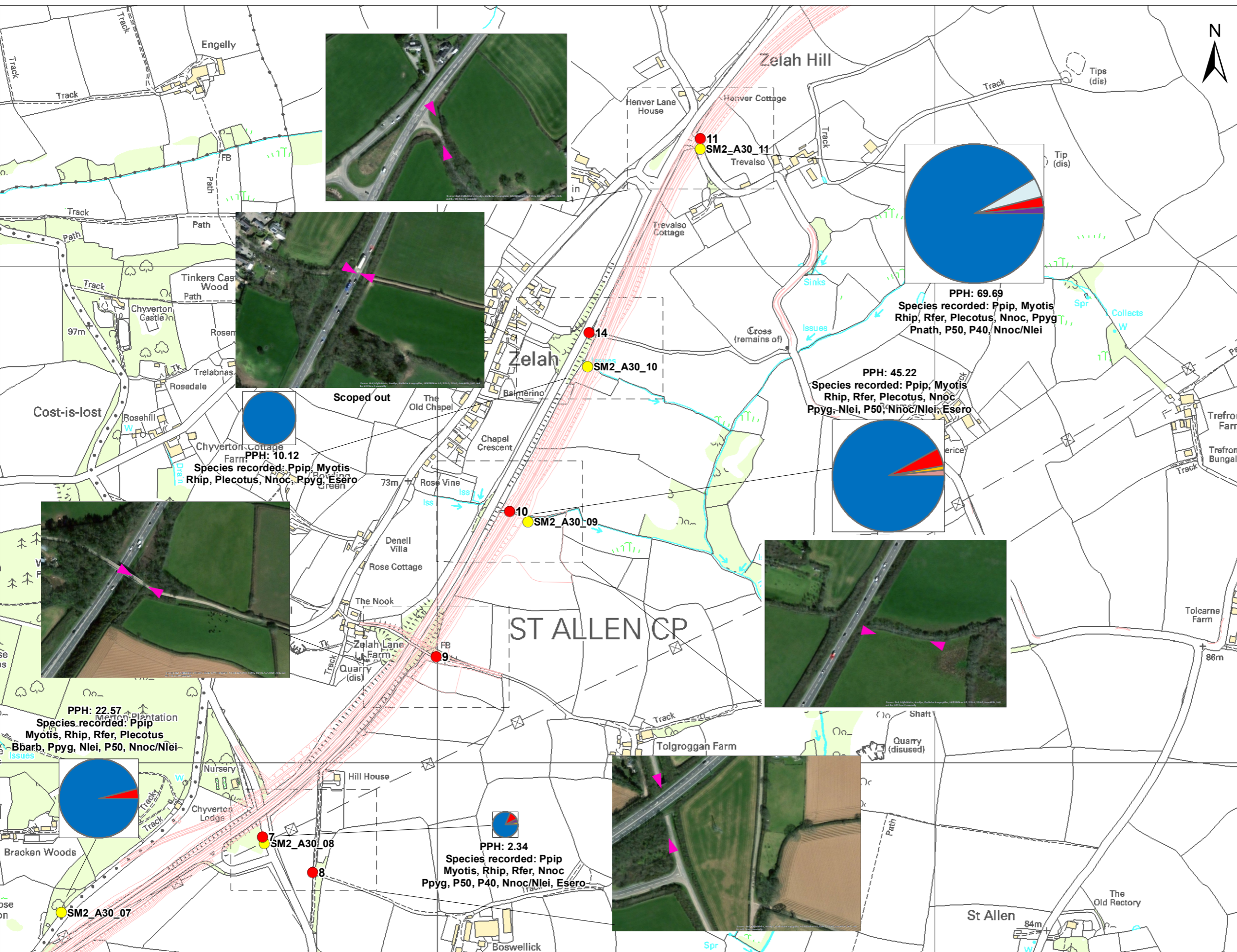
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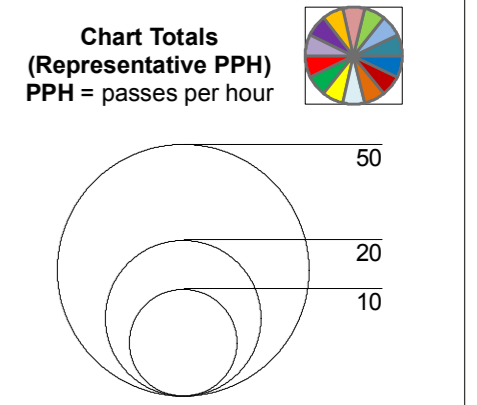
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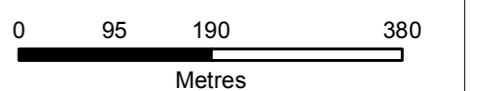


- Proposed Route
- Static Detector Location
- Crossing Points
- Extent of Aerial Image
- Surveyor Location and direction

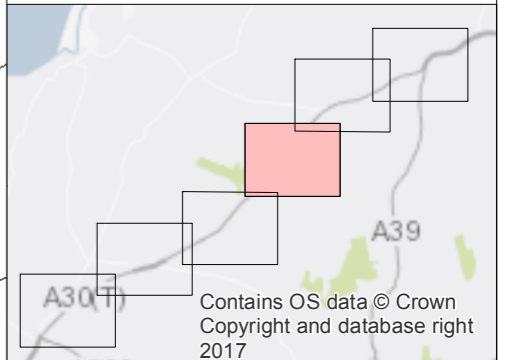
- Bat Species Observed**
- | | |
|----------|--------|
| NnocNlei | Myotis |
| Esero | Bbarb |
| Plecotus | Pnath |
| Nlei | P50 |
| Nnoc | P40 |
| Rfer | Ppyg |
| Rhip | Ppip |



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Title: **STATIC DETECTOR AND CROSSING POINT BAT SURVEY**
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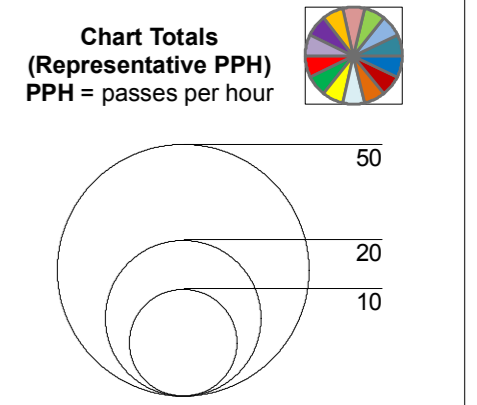
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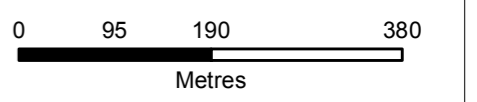
- Proposed Route
- Static Detector Location
- Crossing Points
- Extent of Aerial Image
- ▶ Surveyor Location and direction

Bat Species Observed

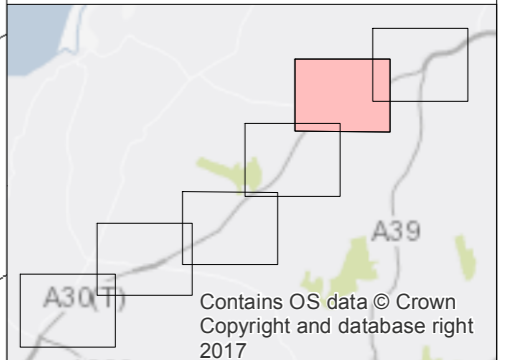
 NnocNlei	 Myotis
 Esero	 Bbarb
 Plecotus	 Pnath
 Nlei	 P50
 Nnoc	 P40
 Rfer	 Ppyg
 Rhip	 Ppip



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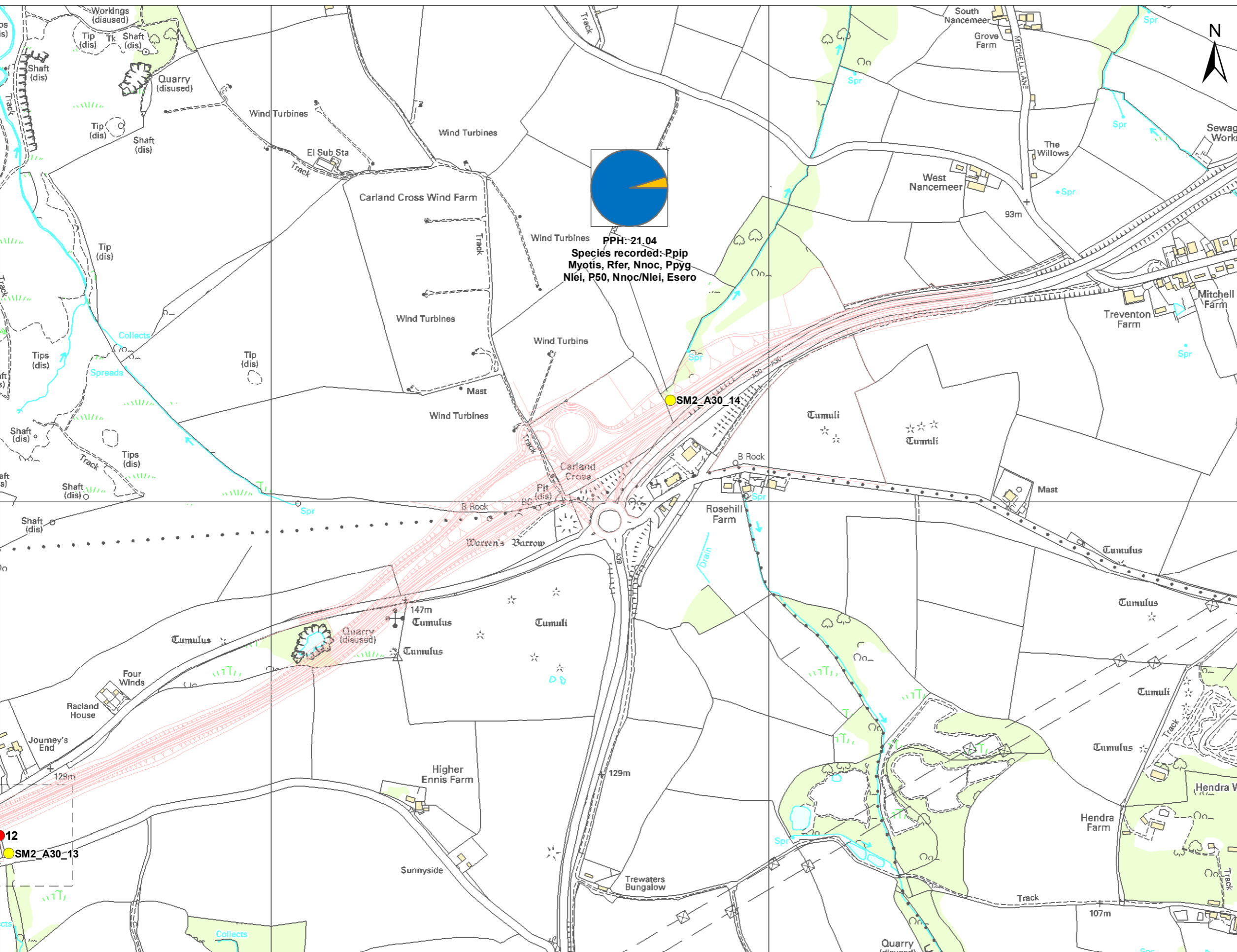
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Title: **STATIC DETECTOR AND CROSSING POINT BAT SURVEY PAGE 5 OF 6**

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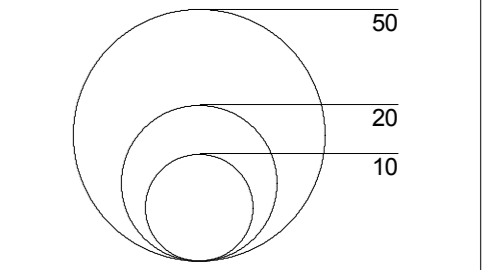
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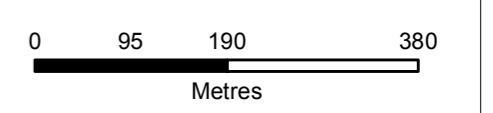
- Proposed Route
- Static Detector Location
- Crossing Points
- Extent of Aerial Image
- Surveyor Location and direction

- Bat Species Observed**
- | | |
|----------|--------|
| NnocNlei | Myotis |
| Esero | Bbarb |
| Plecotus | Pnath |
| Nlei | P50 |
| Nnoc | P40 |
| Rfer | Ppyg |
| Rhip | Ppip |

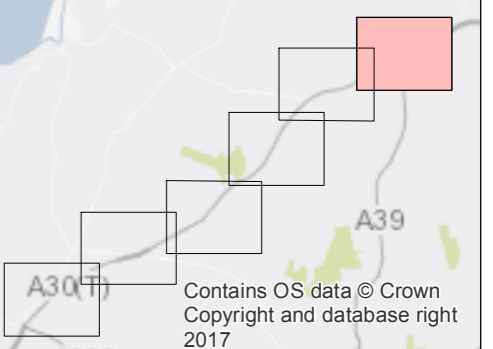
Chart Totals (Representative PPH)
 PPH = passes per hour



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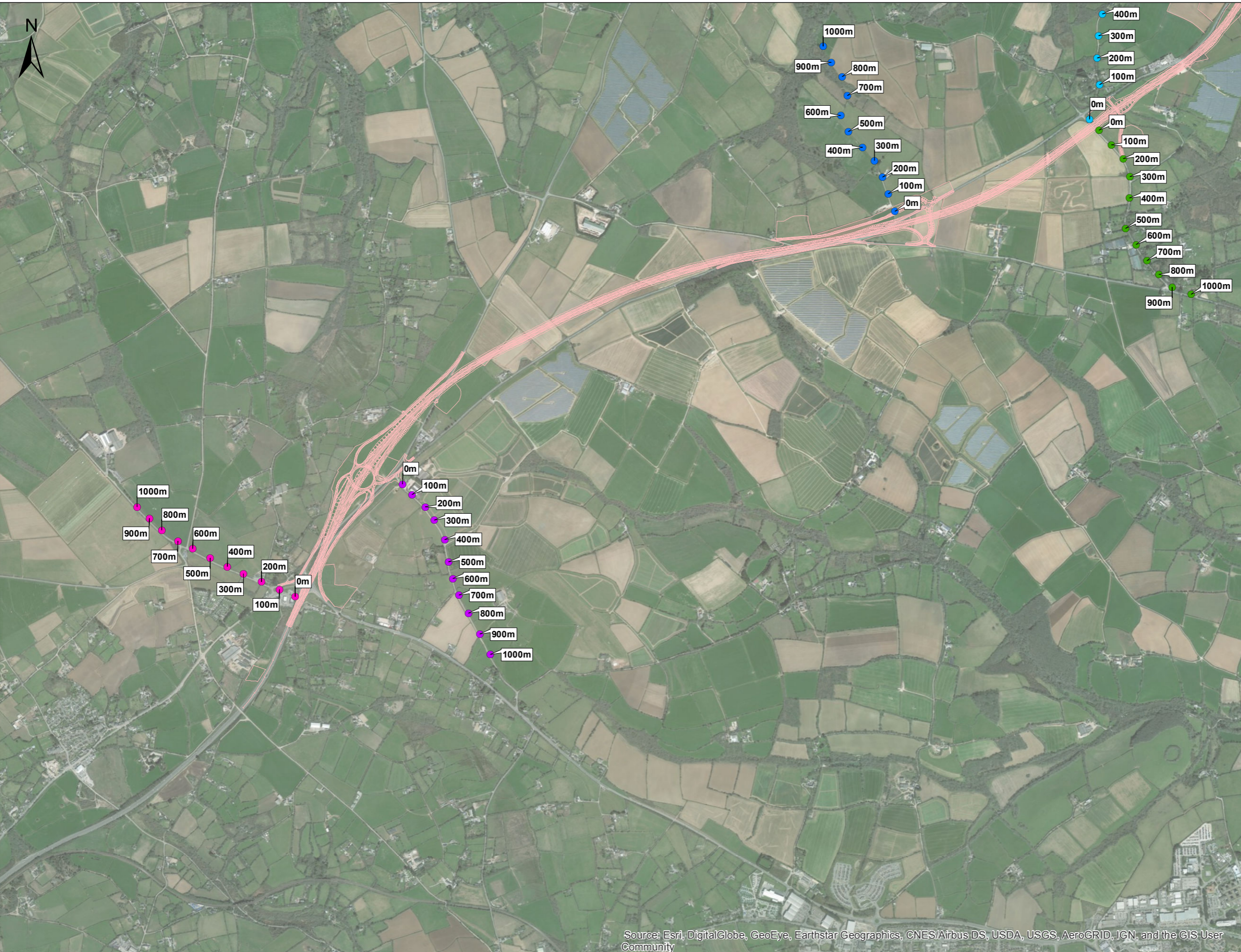
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Title: **STATIC DETECTOR AND CROSSING POINT BAT SURVEY PAGE 6 OF 6**

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Project Number: 70004582	Drawing Number: FIGURE 3

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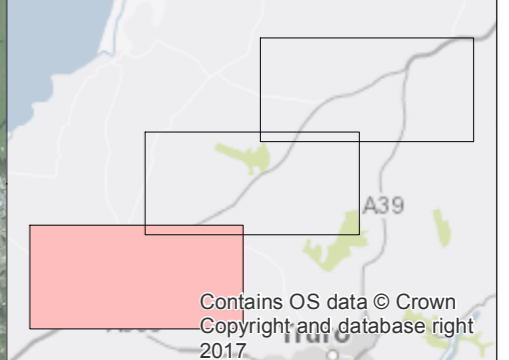
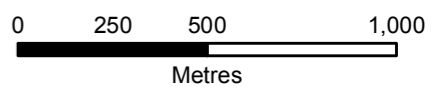


Proposed Scheme

Transects

- 1
- 2
- 3 - Transect walked twice in lieu of transect 4
- 4 - Not possible to survey due to Health and Safety restrictions
- 5
- 6
- 7
- 8
- 9
- 10

1000m Distance from Proposed Scheme



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Rev	Date	Description	By	Chk	App	Notes

WSP | **PARSONS BRINCKERHOFF**

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Client: **WSP**

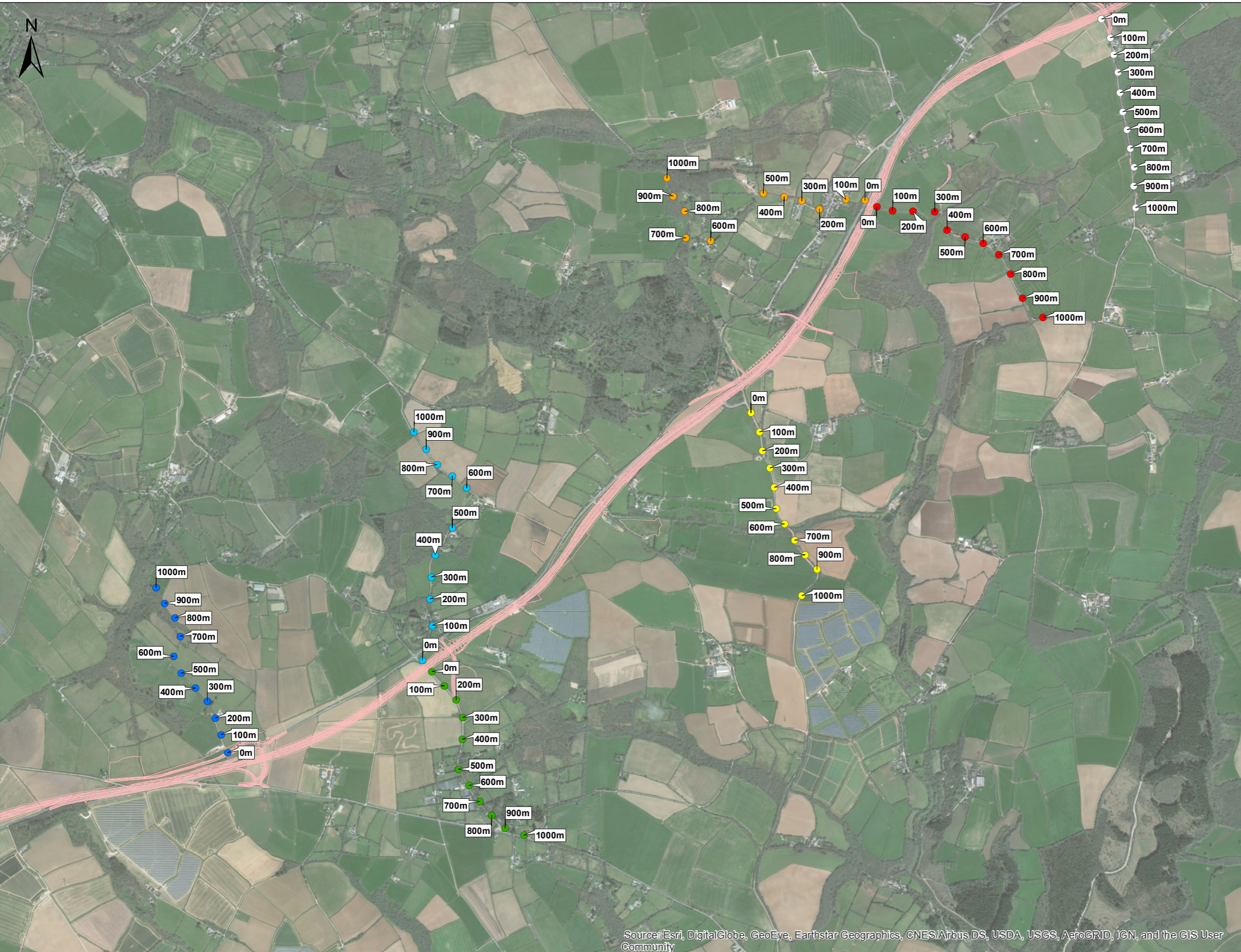
Project: **A30 CHIVERTON TO CARLAND CROSS**

Title: **LANDSCAPE SCALE BAT TRANSECT SURVEY PAGE 1 OF 3**

Drawn: JSdS	Checked: MC
Designed: MC	Approved: UD
Date: 07/11/2017	Scale: 1:20,000 A3 Sheet:
Project Number: 70004582	Drawing Number: FIGURE 4
	Revision:

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File Name: \\uk.wspgroup.com\central_data\Projects\70004582 - A30 Chiverton to Carland Cross PCF Stage 2\E Models and Drawings\GIS\Bat Activity Survey\Mxd\landscape_scale_Bat_Transect_Surveys.mxd
 Log in: DeSouzaJ
 Plot Date: 07/11/2017

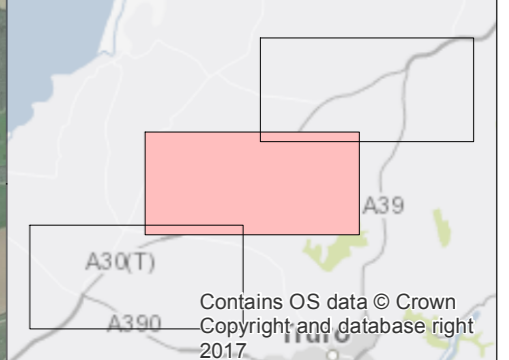
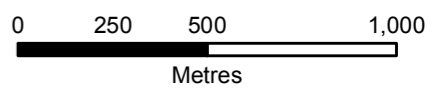


Proposed Scheme

Transects

- 1
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- 5
- 6
- 7
- 8
- 9
- 10

1000m Distance from Proposed Scheme



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Rev	Date	Description	By	Chk	App	Notes

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Project: **A30 CHIVERTON TO CARLAND CROSS**

Title: **LANDSCAPE SCALE BAT TRANSECT SURVEY PAGE 2 OF 3**

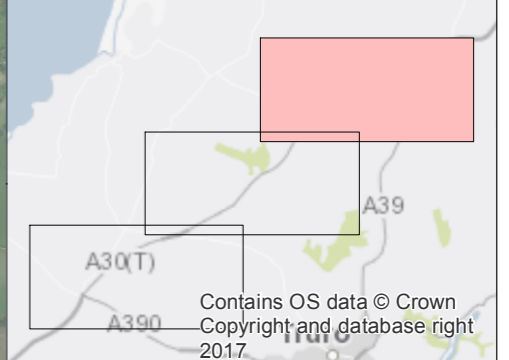
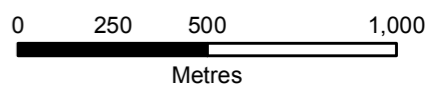
Drawn: JSdS	Checked: MC
Designed: MC	Approved: UD
Date: 07/11/2017	Scale: 1:20,000 A3 Sheet:
Project Number: 70004582	Drawing Number: FIGURE 4
	Revision:

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File Name: \uk.wspgroup.com\central_data\Projects\70004582\A30 Chiverton to Carland Cross PCF Stage 2\E Models and Drawings\GIS\Bat Activity Survey\Mxd\landscape_scale_Bat_Transect_Surveys.mxd
 Log in: DeSouzaJ
 Plot Date: 07/11/2017



- Proposed Scheme
- Transects**
- 1
 - 2
 - 3 - Transect walked twice in lieu of transect 4
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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Rev	Date	Description	By	Chk	App	Notes

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Project: **A30 CHIVERTON TO CARLAND CROSS**

Title: **LANDSCAPE SCALE BAT TRANSECT SURVEY**
PAGE 3 OF 3

Drawn: JSdS	Checked: MC
Designed: MC	Approved: UD
Date: 07/11/2017	Scale: 1:20,000 A3 Sheet:
Project Number: 70004582	Drawing Number: FIGURE 4
	Revision:

DESK STUDY:- EUROPEAN PROTECTED SPECIES LICENCES WITHIN 2 KM (MAGIC)

Case reference of granted application	2014-1956-EPS-MIT
Species group to which licence relates	Bat
Species on the licence	BLE,C-PIP
Site county of licence	Cornwall & Isles of Scilly
Licence Start Date	26/08/2014
Licence End Date	30/09/2019
Does licence impact on a breeding site	Y
Does licence allow damage of breeding site	N
Does licence allow damage of a resting place	Y
Does licence allow destruction of breeding site	Y
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown

Case reference of granted application	2014-1956-EPS-MIT-1
Species group to which licence relates	Bat
Species on the licence	BLE,C-PIP
Site county of licence	Cornwall & Isles of Scilly
Licence Start Date	08/04/2015
Licence End Date	30/09/2019
Does licence impact on a breeding site	Y
Does licence allow damage of breeding site	N
Does licence allow damage of a resting place	Y
Does licence allow destruction of breeding site	Y
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown

Case reference of granted application	2014-3850-EPS-MIT
Species group to which licence relates	Bat
Species on the licence	BLE,C-PIP
Site county of licence	Cornwall & Isles of Scilly
Licence Start Date	04/11/2014
Licence End Date	30/09/2015
Does licence impact on a breeding site	Y
Does licence allow damage of breeding site	Y
Does licence allow damage of a resting place	Y
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	N
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown

Case reference of granted application	2014-3861-EPS-MIT
Species group to which licence relates	Bat
Species on the licence	BLE,C-PIP
Site county of licence	Cornwall & Isles of Scilly
Licence Start Date	25/09/2014
Licence End Date	31/10/2019
Does licence impact on a breeding site	Y
Does licence allow damage of breeding site	Y
Does licence allow damage of a resting place	Y
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown
Case reference of granted application	2014-3317-EPS-MIT
Species group to which licence relates	Bat
Species on the licence	BARB,BLE,C-PIP,G-HORSE,L-HORSE,NATT
Site county of licence	Cornwall & Isles of Scilly
Licence Start Date	30/09/2014
Licence End Date	10/09/2019
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	N
Does licence allow damage of a resting place	Y
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	N
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown
Case reference of granted application	2014-3587-EPS-MIT
Species group to which licence relates	Bat
Species on the licence	BLE
Site county of licence	Cornwall & Isles of Scilly
Licence Start Date	17/10/2014
Licence End Date	30/09/2015
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	N
Does licence allow damage of a resting place	N
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown

Case reference of granted application	2014-3804-EPS-MIT
Species group to which licence relates	Bat
Species on the licence	C-PIP,L-HORSE
Site county of licence	Cornwall & Isles of Scilly
Licence Start Date	26/09/2014
Licence End Date	30/09/2025
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	N
Does licence allow damage of a resting place	Y
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown

Case reference of granted application	2014-3806-EPS-MIT
Species group to which licence relates	Bat
Species on the licence	C-PIP,L-HORSE,NATT
Site county of licence	Cornwall & Isles of Scilly
Licence Start Date	01/10/2014
Licence End Date	30/09/2025
Does licence impact on a breeding site	Y
Does licence allow damage of breeding site	N
Does licence allow damage of a resting place	N
Does licence allow destruction of breeding site	Y
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown

Case reference of granted application	2014-4407-EPS-MIT
Species group to which licence relates	Bat
Species on the licence	BLE,C-PIP
Site county of licence	Cornwall & Isles of Scilly
Licence Start Date	17/12/2014
Licence End Date	31/12/2019
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	N
Does licence allow damage of a resting place	N
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown

Case reference of granted application	2014-4162-EPS-MIT
Species group to which licence relates	Bat
Species on the licence	BLE,C-PIP,L-HORSE
Site county of licence	Cornwall & Isles of Scilly
Licence Start Date	20/11/2014
Licence End Date	01/01/2020
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	N
Does licence allow damage of a resting place	N
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown

Case reference of granted application	2014-4911-EPS-MIT
Species group to which licence relates	Bat
Species on the licence	BLE,C-PIP,L-HORSE
Site county of licence	Cornwall & Isles of Scilly
Licence Start Date	14/03/2014
Licence End Date	30/09/2016
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	N
Does licence allow damage of a resting place	Y
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown

Case reference of granted application	2015-11937-EPS-MIT
Species group to which licence relates	Bat
Species on the licence	C-PIP,L-HORSE
Site county of licence	Cornwall & Isles of Scilly
Licence Start Date	05/08/2015
Licence End Date	04/08/2020
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	N
Does licence allow damage of a resting place	N
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown

Case reference of granted application	2015-15953-EPS-MIT
Species group to which licence relates	Bat
Species on the licence	C-PIP,G-HORSE,L-HORSE
Site county of licence	Cornwall & Isles of Scilly
Licence Start Date	16/11/2015
Licence End Date	31/12/2022
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	N
Does licence allow damage of a resting place	N
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown

Case reference of granted application	2015-15433-EPS-MIT
Species group to which licence relates	Bat
Species on the licence	C-PIP,L-HORSE
Site county of licence	Cornwall & Isles of Scilly
Licence Start Date	19/10/2015
Licence End Date	31/12/2020
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	N
Does licence allow damage of a resting place	N
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown
Case reference of granted application	2015-16185-EPS-MIT
Species group to which licence relates	Bat
Species on the licence	C-PIP,L-HORSE
Site county of licence	Cornwall & Isles of Scilly
Licence Start Date	25/11/2015
Licence End Date	23/11/2025
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	N
Does licence allow damage of a resting place	Y
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown
Case reference of granted application	2015-16422-EPS-MIT
Species group to which licence relates	Bat
Species on the licence	BLE,C-PIP,DAUB,L-HORSE
Site county of licence	Cornwall & Isles of Scilly
Licence Start Date	09/02/2016
Licence End Date	28/02/2026
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	Y
Does licence allow damage of a resting place	N
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown

Case reference of granted application	2015-19309-EPS-MIT
Species group to which licence relates	Bat
Species on the licence	NATT
Site county of licence	Cornwall & Isles of Scilly
Licence Start Date	28/01/2016
Licence End Date	27/01/2026
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	Y
Does licence allow damage of a resting place	N
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	N
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown

Case reference of granted application	2015-19309-EPS-MIT-1
Species group to which licence relates	Bat
Species on the licence	NATT
Site county of licence	Cornwall & Isles of Scilly
Licence Start Date	09/05/2016
Licence End Date	08/05/2026
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	Y
Does licence allow damage of a resting place	N
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	N
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown

Case reference of granted application	2015-8301-EPS-MIT
Species group to which licence relates	Bat
Species on the licence	BLE,C-PIP,NATT
Site county of licence	Cornwall & Isles of Scilly
Licence Start Date	17/04/2015
Licence End Date	30/04/2020
Does licence impact on a breeding site	Y
Does licence allow damage of breeding site	N
Does licence allow damage of a resting place	N
Does licence allow destruction of breeding site	Y
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown

Case reference of granted application	2015-9108-EPS-MIT
Species group to which licence relates	Bat
Species on the licence	BLE
Site county of licence	Cornwall & Isles of Scilly
Licence Start Date	07/05/2015
Licence End Date	30/04/2020
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	N
Does licence allow damage of a resting place	N
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown
Case reference of granted application	2015-9108-EPS-MIT-1
Species group to which licence relates	Bat
Species on the licence	BLE
Site county of licence	Cornwall & Isles of Scilly
Licence Start Date	31/05/2016
Licence End Date	30/04/2020
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	N
Does licence allow damage of a resting place	N
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown
Case reference of granted application	EPSM2012-5115
Species group to which licence relates	Bat
Species on the licence	C-PIP;BLE;DAUB;L-HORSE;G-HORSE;NATT
Site county of licence	Cornwall
Licence Start Date	12/11/2012
Licence End Date	30/09/2015
Does licence impact on a breeding site	Y
Does licence allow damage of breeding site	
Does licence allow damage of a resting place	
Does licence allow destruction of breeding site	Y
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown

Case reference of granted application	EPSM2012-4392
Species group to which licence relates	Bat
Species on the licence	BLE;L-HORSE
Site county of licence	Cornwall
Licence Start Date	18/06/2012
Licence End Date	30/09/2015
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	
Does licence allow damage of a resting place	
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown

Case reference of granted application	EPSM2012-5197
Species group to which licence relates	Bat
Species on the licence	C-PIP
Site county of licence	Cornwall
Licence Start Date	23/11/2012
Licence End Date	31/08/2015
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	
Does licence allow damage of a resting place	
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown

Case reference of granted application	EPSM2013-6075
Species group to which licence relates	Bat
Species on the licence	C-PIP
Site county of licence	Cornwall
Licence Start Date	08/08/2013
Licence End Date	28/02/2015
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	
Does licence allow damage of a resting place	
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown

Case reference of granted application	EPSM2012-4547
Species group to which licence relates	Bat
Species on the licence	C-PIP
Site county of licence	Cornwall
Licence Start Date	20/07/2012
Licence End Date	30/09/2014
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	
Does licence allow damage of a resting place	

Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown
Case reference of granted application	EPSM2011-3821
Species group to which licence relates	Bat
Species on the licence	C-PIP
Site county of licence	Cornwall
Licence Start Date	01/01/2012
Licence End Date	31/05/2013
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	
Does licence allow damage of a resting place	
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	N
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown
Case reference of granted application	EPSM2012-4585
Species group to which licence relates	Bat
Species on the licence	C-PIP
Site county of licence	Cornwall
Licence Start Date	31/07/2012
Licence End Date	01/08/2014
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	
Does licence allow damage of a resting place	
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown
Case reference of granted application	EPSM2011-3876
Species group to which licence relates	Bat
Species on the licence	BLE
Site county of licence	Cornwall
Licence Start Date	15/12/2011
Licence End Date	30/09/2013
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	
Does licence allow damage of a resting place	
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown

Case reference of granted application	EPSM2012-4630
Species group to which licence relates	Bat
Species on the licence	C-PIP
Site county of licence	Cornwall
Licence Start Date	18/09/2012
Licence End Date	30/09/2014
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	
Does licence allow damage of a resting place	
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown
Case reference of granted application	EPSM2012-4670
Species group to which licence relates	Bat
Species on the licence	C-PIP;BLE;DAUB
Site county of licence	Cornwall
Licence Start Date	13/03/2013
Licence End Date	30/09/2016
Does licence impact on a breeding site	Y
Does licence allow damage of breeding site	
Does licence allow damage of a resting place	
Does licence allow destruction of breeding site	Y
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown
Case reference of granted application	EPSM2013-5691
Species group to which licence relates	Bat
Species on the licence	NATT;C-PIP
Site county of licence	Cornwall
Licence Start Date	31/05/2013
Licence End Date	28/02/2014
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	
Does licence allow damage of a resting place	
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown

Case reference of granted application	EPSM2012-4993
Species group to which licence relates	Bat
Species on the licence	C-PIP
Site county of licence	Cornwall
Licence Start Date	18/10/2012
Licence End Date	31/07/2014
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	
Does licence allow damage of a resting place	
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown
Case reference of granted application	2016-25749-EPS-MIT
Species group to which licence relates	Bat
Species on the licence	DAUB,L-HORSE
Site county of licence	Cornwall & Isles of Scilly
Licence Start Date	06/10/2016
Licence End Date	31/08/2020
Does licence impact on a breeding site	Y
Does licence allow damage of breeding site	N
Does licence allow damage of a resting place	N
Does licence allow destruction of breeding site	Y
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown
Case reference of granted application	EPSM2009-1236
Species group to which licence relates	Bat
Species on the licence	C-PIP;BLE
Site county of licence	Cornwall
Licence Start Date	21/09/2009
Licence End Date	30/09/2010
Does licence impact on a breeding site	Y
Does licence allow damage of breeding site	
Does licence allow damage of a resting place	
Does licence allow destruction of breeding site	Y
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown
Case reference of granted application	EPSM2010-2380
Species group to which licence relates	Bat
Species on the licence	BLE
Site county of licence	Cornwall
Licence Start Date	16/12/2010
Licence End Date	31/10/2012
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	
Does licence allow damage of a resting place	
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown

Case reference of granted application	EPSM2010-2391
Species group to which licence relates	Bat
Species on the licence	C-PIP;BLE
Site county of licence	Cornwall
Licence Start Date	25/11/2010
Licence End Date	31/10/2012
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	
Does licence allow damage of a resting place	
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown
Case reference of granted application	2016-24256-EPS-MIT
Species group to which licence relates	Bat
Species on the licence	C-PIP,S-PIP
Site county of licence	Cornwall & Isles of Scilly
Licence Start Date	19/07/2016
Licence End Date	18/07/2021
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	N
Does licence allow damage of a resting place	N
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown
Case reference of granted application	EPSM2009-1487
Species group to which licence relates	Bat
Species on the licence	C-PIP;BLE
Site county of licence	Cornwall
Licence Start Date	24/12/2009
Licence End Date	30/09/2011
Does licence impact on a breeding site	Y
Does licence allow damage of breeding site	
Does licence allow damage of a resting place	
Does licence allow destruction of breeding site	Y
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown
Case reference of granted application	EPSM2009-1558
Species group to which licence relates	Bat
Species on the licence	C-PIP;BLE;NATT
Site county of licence	Cornwall
Licence Start Date	19/01/2010
Licence End Date	30/09/2010
Does licence impact on a breeding site	Y
Does licence allow damage of breeding site	
Does licence allow damage of a resting place	
Does licence allow destruction of breeding site	Y
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown

Case reference of granted application	EPSM2013-6864
Species group to which licence relates	Bat
Species on the licence	C-PIP
Site county of licence	Cornwall
Licence Start Date	13/12/2013
Licence End Date	31/08/2015
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	
Does licence allow damage of a resting place	
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown
Case reference of granted application	EPSM2013-6422
Species group to which licence relates	Bat
Species on the licence	C-PIP;BLE;NATT
Site county of licence	Cornwall
Licence Start Date	17/10/2013
Licence End Date	30/09/2016
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	
Does licence allow damage of a resting place	
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown
Case reference of granted application	EPSM2013-5952
Species group to which licence relates	Bat
Species on the licence	C-PIP;BLE
Site county of licence	Cornwall
Licence Start Date	09/07/2013
Licence End Date	01/12/2016
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	
Does licence allow damage of a resting place	
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown

Case reference of granted application	EPSM2011-3811
Species group to which licence relates	Bat
Species on the licence	C-PIP
Site county of licence	Cornwall
Licence Start Date	30/10/2012
Licence End Date	01/09/2014
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	
Does licence allow damage of a resting place	
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown

DESK STUDY:- BAT RECORDS WITHIN 10 KM

Scientific name	Vernacular name	Grid Reference	Assigned 1km	Assigned Tetrad	Location	Start Date	End Date	Year	Type
Barbastella barbastellus	Barbastelle	confidential	SW8261	SW86F	confidential	2013-09-26	2013-09-26	2013	Seen
Barbastella barbastellus	Barbastelle	confidential	SW7851	SW75V	confidential	2012-05-05	2012-05-05	2012	Seen
Barbastella barbastellus	Barbastelle	confidential	SW7851	SW75V	confidential	2012-03-31	2012-03-31	2012	Seen
Barbastella barbastellus	Barbastelle	confidential	SW7653	SW75R	confidential	2012-09-19	2012-09-19	2012	Seen
Barbastella barbastellus	Barbastelle	confidential	SW7851	SW75V	confidential	2012-03-30	2012-03-30	2012	Seen
Barbastella barbastellus	Barbastelle	confidential	SW8144	SW84C	confidential	2007-01-01	2007-12-31	2007	Bat Detected
Eptesicus serotinus	Serotine	confidential	SW7851	SW75V	confidential	2012-08-31	2012-08-31	2012	Seen
Eptesicus serotinus	Serotine	confidential	SW8148	SW84E	confidential	2011-08-19	2011-08-25	2011	Bat Detected
Eptesicus serotinus	Serotine	confidential	SW7653	SW75R	confidential	2011-06-06	2011-06-06	2011	Bat Detected
Myotis daubentonii	Daubenton's Bat	confidential	SW8244	SW84H	confidential	2009-10-12	2009-10-12	2009	Bat Seen
Myotis mystacinus	Whiskered Bat	confidential	SW8458	SW85P	confidential	2013-09-07	2013-09-07	2013	Seen
Myotis mystacinus	Whiskered Bat	confidential	SW6741	SW64Q	confidential	2013-09-02	2013-09-02	2013	Seen
Myotis mystacinus	Whiskered Bat	confidential	SW7048	SW74E	confidential	2013-01-07	2013-01-07	2013	Bat Seen
Myotis mystacinus	Whiskered Bat	confidential	SW8444	SW84M	confidential	2012-10-09	2012-10-09	2012	Seen
Myotis mystacinus	Whiskered Bat	confidential	SW8144	SW84C	confidential	2010-09-01	2010-09-01	2010	Bat Seen
Myotis mystacinus	Whiskered Bat	confidential	SW8650	SW85Q	confidential	2010-07-06	2010-07-06	2010	Bat Seen
Myotis mystacinus	Whiskered Bat	confidential	SW8345	SW84H	confidential	2010-09-12	2010-09-12	2010	Bat Seen
Myotis mystacinus	Whiskered Bat	confidential	SW8663	SW86R	confidential	2009-09-20	2009-09-20	2009	Bat Seen
Myotis mystacinus	Whiskered Bat	confidential	SW6941	SW64V	confidential	2009-08-23	2009-08-23	2009	Bat Seen
Myotis mystacinus	Whiskered Bat	confidential	SW8244	SW84H	confidential	2009-08-17	2009-08-17	2009	Bat Seen
Myotis mystacinus	Whiskered Bat	confidential	SW8646	SW84T	confidential	2009-08-21	2009-08-21	2009	Bat Seen
Myotis mystacinus	Whiskered Bat	confidential	SW8462	SW86L	confidential	2007-07-31	2007-07-31	2007	Dead
Myotis mystacinus	Whiskered Bat	confidential	SW7048	SW74E	confidential	2007-01-02	2007-01-02	2007	Seen
Myotis nattereri	Natterer's Bat	confidential	SW7451	SW75K	confidential	2013-09-10	2013-09-10	2013	Bat Roost

Scientific name	Vernacular name	Grid Reference	Assigned 1km	Assigned Tetrad	Location	Start Date	End Date	Year	Type
Myotis nattereri	Natterer's Bat	confidential	SW8956	SW85Y	confidential	2012-09-17	2012-09-17	2012	Bat Roost
Myotis nattereri	Natterer's Bat	confidential	SW7851	SW75V	confidential	2012-09-06	2012-09-06	2012	Seen
Myotis nattereri	Natterer's Bat	confidential	SW7048	SW74E	confidential	2012-10-28	2012-10-28	2012	Bat Seen
Myotis nattereri	Natterer's Bat	confidential	SW7048	SW74E	confidential	2012-01-22	2012-01-22	2012	Bat Seen
Myotis nattereri	Natterer's Bat	confidential	SW7449	SW74P	confidential	2012-07-11	2012-07-11	2012	Seen
Myotis nattereri	Natterer's Bat	confidential	SW7048	SW74E	confidential	2012-11-24	2012-11-24	2012	Bat Seen
Myotis nattereri	Natterer's Bat	confidential	SW7048	SW74E	confidential	2012-02-04	2012-02-04	2012	Bat Seen
Myotis nattereri	Natterer's Bat	confidential	SW7851	SW75V	confidential	2012-09-09	2012-09-09	2012	Seen
Myotis nattereri	Natterer's Bat	confidential	SW7449	SW74P	confidential	2012-07-10	2012-07-10	2012	Seen
Myotis nattereri	Natterer's Bat	confidential	SW7654	SW75S	confidential	2012-09-10	2012-09-10	2012	Seen
Myotis nattereri	Natterer's Bat	confidential	SW7851	SW75V	confidential	2012-09-05	2012-09-05	2012	Seen
Myotis nattereri	Natterer's Bat	confidential	SW7653	SW75R	confidential	2012-09-10	2012-09-10	2012	Bat Roost
Myotis nattereri	Natterer's Bat	confidential	SW8956	SW85Y	confidential	2012-07-18	2012-07-18	2012	Bat Roost
Myotis nattereri	Natterer's Bat	confidential	SW7851	SW75V	confidential	2012-09-04	2012-09-04	2012	Seen
Myotis nattereri	Natterer's Bat	confidential	SW7851	SW75V	confidential	2012-09-08	2012-09-08	2012	Seen
Myotis nattereri	Natterer's Bat	confidential	SW7851	SW75V	confidential	2012-09-27	2012-09-27	2012	Seen
Myotis nattereri	Natterer's Bat	confidential	SW8050	SW85A	confidential	2011-07-20	2011-07-20	2011	Bat Roost
Myotis nattereri	Natterer's Bat	confidential	SW7048	SW74E	confidential	2011-12-31	2011-12-31	2011	Bat Seen
Myotis nattereri	Natterer's Bat	confidential	SW7048	SW74E	confidential	2011-12-01	2011-12-01	2011	Bat Seen
Myotis nattereri	Natterer's Bat	confidential	SW8261	SW86F	confidential	2011-10-19	2011-10-19	2011	Bat Detected
Myotis nattereri	Natterer's Bat	confidential	SW8050	SW85A	confidential	2011-06-16	2011-06-16	2011	Bat Roost
Myotis nattereri	Natterer's Bat	confidential	SW7653	SW75R	confidential	2011-06-06	2011-06-06	2011	Bat Detected
Myotis nattereri	Natterer's Bat	confidential	SW8050	SW85A	confidential	2011-05-19	2011-05-19	2011	Bat Roost
Myotis nattereri	Natterer's Bat	confidential	SW6947	SW64Y	confidential	2011-08-15	2011-08-15	2011	Bat Roost
Myotis nattereri	Natterer's Bat	confidential	SW8951	SW85V	confidential	2009-01-31	2009-01-31	2009	Bat Roost
Myotis nattereri	Natterer's Bat	confidential	SW7950	SW75V	confidential	2009-03-01	2009-03-01	2009	Seen

Scientific name	Vernacular name	Grid Reference	Assigned 1km	Assigned Tetrad	Location	Start Date	End Date	Year	Type
Myotis nattereri	Natterer's Bat	confidential	SW8244	SW84H	confidential	2009-10-20	2009-10-20	2009	Bat Seen
Myotis nattereri	Natterer's Bat	confidential	SW7740	SW74Q	confidential	2007-06-16	2007-06-16	2007	Dead
Myotis nattereri	Natterer's Bat	confidential	SW7950	SW75V	confidential	2007-03-25	2007-03-25	2007	Seen
Myotis nattereri	Natterer's Bat	confidential	SW8045	SW84C	confidential	2007-10-28	2007-10-28	2007	Seen
Myotis nattereri	Natterer's Bat	confidential	SW8040	SW84A	confidential	2007-06-16	2007-06-16	2007	Dead
Nyctalus noctula	Noctule Bat	confidential	SW7757	SW75T	confidential	2013-07-06	2013-07-06	2013	Field Record
Nyctalus noctula	Noctule	confidential	SW7343	SW74G	confidential	2013-09-01	2013-09-01	2013	Seen
Nyctalus noctula	Noctule	confidential	SW7940	SW74V	confidential	2013-08-21	2013-08-21	2013	Bat Detected
Nyctalus noctula	Noctule	confidential	SW7653	SW75R	confidential	2012-09-22	2012-09-22	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7654	SW75S	confidential	2012-06-01	2012-06-01	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7654	SW75S	confidential	2012-07-15	2012-07-15	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7145	SW74C	confidential	2012-05-10	2012-05-23	2012	Bat Detected
Nyctalus noctula	Noctule	confidential	SW7654	SW75S	confidential	2012-06-20	2012-06-20	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7654	SW75S	confidential	2012-07-13	2012-07-13	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7654	SW75S	confidential	2012-07-14	2012-07-14	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7654	SW75S	confidential	2012-08-18	2012-08-18	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7851	SW75V	confidential	2012-09-30	2012-09-30	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7851	SW75V	confidential	2012-05-04	2012-05-04	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7851	SW75V	confidential	2012-07-03	2012-07-03	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7851	SW75V	confidential	2012-09-02	2012-09-02	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7851	SW75V	confidential	2012-09-03	2012-09-03	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7851	SW75V	confidential	2012-09-26	2012-09-26	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7654	SW75S	confidential	2012-06-02	2012-06-02	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7851	SW75V	confidential	2012-09-09	2012-09-09	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7851	SW75V	confidential	2012-07-24	2012-07-24	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7851	SW75V	confidential	2012-09-28	2012-09-28	2012	Seen

Scientific name	Vernacular name	Grid Reference	Assigned 1km	Assigned Tetrad	Location	Start Date	End Date	Year	Type
Nyctalus noctula	Noctule	confidential	SW7654	SW75S	confidential	2012-06-04	2012-06-04	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7654	SW75S	confidential	2012-06-20	2012-06-20	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7654	SW75S	confidential	2012-09-14	2012-09-14	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7851	SW75V	confidential	2012-05-05	2012-05-05	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7851	SW75V	confidential	2012-07-02	2012-07-02	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7851	SW75V	confidential	2012-09-01	2012-09-01	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7851	SW75V	confidential	2012-09-27	2012-09-27	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7851	SW75V	confidential	2012-09-29	2012-09-29	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7654	SW75S	confidential	2012-06-19	2012-06-19	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7654	SW75S	confidential	2012-06-19	2012-06-19	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7851	SW75V	confidential	2012-09-05	2012-09-05	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7851	SW75V	confidential	2012-07-25	2012-07-25	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7851	SW75V	confidential	2012-07-26	2012-07-26	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7851	SW75V	confidential	2012-08-31	2012-08-31	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7851	SW75V	confidential	2012-09-08	2012-09-08	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7851	SW75V	confidential	2012-07-23	2012-07-23	2012	Seen
Nyctalus noctula	Noctule	confidential	SW7654	SW75S	confidential	2011-06-04	2011-06-04	2011	Bat Detected
Nyctalus noctula	Noctule	confidential	SW7654	SW75S	confidential	2011-06-14	2011-06-14	2011	Bat Detected
Nyctalus noctula	Noctule	confidential	SW7654	SW75S	confidential	2011-04-06	2011-04-06	2011	Bat Detected
Nyctalus noctula	Noctule	confidential	SW7653	SW75R	confidential	2011-06-03	2011-06-03	2011	Bat Detected
Nyctalus noctula	Noctule	confidential	SW8148	SW84E	confidential	2011-08-19	2011-08-25	2011	Bat Detected
Nyctalus noctula	Noctule	confidential	SW7654	SW75S	confidential	2011-06-03	2011-06-03	2011	Bat Detected
Nyctalus noctula	Noctule	confidential	SW7654	SW75S	confidential	2011-08-08	2011-08-08	2011	Bat Detected
Nyctalus noctula	Noctule	confidential	SW7653	SW75R	confidential	2011-06-06	2011-06-06	2011	Bat Detected
Nyctalus noctula	Noctule	confidential	SW7654	SW75S	confidential	2011-03-11	2011-03-11	2011	Bat Detected
Nyctalus noctula	Noctule	confidential	SW7654	SW75S	confidential	2011-05-20	2011-05-20	2011	Bat Detected

Scientific name	Vernacular name	Grid Reference	Assigned 1km	Assigned Tetrad	Location	Start Date	End Date	Year	Type
Nyctalus noctula	Noctule	confidential	SW7654	SW75S	confidential	2011-04-22	2011-04-22	2011	Bat Detected
Nyctalus noctula	Noctule	confidential	SW7654	SW75S	confidential	2011-08-16	2011-08-16	2011	Bat Detected
Nyctalus noctula	Noctule	confidential	SW8144	SW84C	confidential	2007-01-01	2007-12-31	2007	Seen
Nyctalus noctula	Noctule Bat	confidential	SW7541	SW74K	confidential	2007-07-21	2007-07-21	2007	Seen
Nyctalus noctula	Noctule Bat	confidential	SW8146	SW84D	confidential	2007-07-22	2007-07-22	2007	Seen
Nyctalus noctula	Noctule Bat	confidential	SW8241	SW84F	confidential	2007-07-25	2007-07-25	2007	Seen
Nyctalus noctula	Noctule Bat	confidential	SW8146	SW84D	confidential	2007-07-04	2007-07-04	2007	Seen
Nyctalus noctula	Noctule Bat	confidential	SW8241	SW84F	confidential	2007-07-12	2007-07-12	2007	Seen
Nyctalus noctula	Noctule	confidential	SW7638	SW73U	confidential	2007-08-18	2007-08-18	2007	Dead
Nyctalus noctula	Noctule	confidential	SW8762	SW86R	confidential	2007-06-14	2007-06-14	2007	Field record
Nyctalus noctula	Noctule Bat	confidential	SW8341	SW84F	confidential	2007-07-13	2007-07-13	2007	Seen
Pipistrellus nathusii	Nathusius' Pipistrelle	confidential	SW7940	SW74V	confidential	2011-10-03	2011-10-16	2011	Bat Detected
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7339	SW73J	confidential	2014-01-25	2014-01-25	2014	Bat Roost
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7537	SW73N	confidential	2013-10-21	2013-10-21	2013	Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7942	SW74W	confidential	2013-05-21	2013-05-21	2013	Bat Roost
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7451	SW75K	confidential	2013-09-10	2013-09-10	2013	Bat Roost
Pipistrellus pipistrellus	Pipistrelle	confidential	SW6948	SW64Z	confidential	2013-08-10	2013-08-10	2013	Bat Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7046	SW74D	confidential	2013-04-15	2013-04-15	2013	Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7641	SW74Q	confidential	2013-06-22	2013-06-22	2013	Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7147	SW74D	confidential	2013-07-24	2013-07-24	2013	Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW8450	SW85K	confidential	2013-09-15	2013-09-15	2013	Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW6945	SW64X	confidential	2013-05-03	2013-05-03	2013	Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7241	SW74F	confidential	2013-09-16	2013-09-16	2013	Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW8458	SW85P	confidential	2013-06-30	2013-06-30	2013	Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7744	SW74S	confidential	2013-12-05	2013-12-05	2013	Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW8056	SW85D	confidential	2013-09-09	2013-09-09	2013	Seen

Scientific name	Vernacular name	Grid Reference	Assigned 1km	Assigned Tetrad	Location	Start Date	End Date	Year	Type
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW8047	SW84D	confidential	2013-06-23	2013-06-23	2013	Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW8947	SW84Y	confidential	2013-08-30	2013-08-30	2013	Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW8458	SW85P	confidential	2013-09-03	2013-09-03	2013	Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7844	SW74X	confidential	2013-03-28	2013-03-28	2013	Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW8041	SW84A	confidential	2013-12-24	2013-12-24	2013	Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7950	SW75V	confidential	2013-08-13	2013-08-13	2013	Bat Roost
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7860	SW76V	confidential	2013-09-02	2013-09-02	2013	Bat Roost
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7940	SW74V	confidential	2013-09-18	2013-09-18	2013	Bat Detected
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7940	SW74V	confidential	2013-08-21	2013-08-21	2013	Bat Detected
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW8140	SW84A	confidential	2013-09-03	2013-09-03	2013	Bat Roost
Pipistrellus pipistrellus	Pipistrelle Bat	confidential	SW8160	SW86A	confidential	2013-06-25	2013-06-25	2013	Field Record
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7653	SW75R	confidential	2012-08-23	2012-08-23	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2012-02-29	2012-02-29	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2012-06-19	2012-06-19	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2012-08-17	2012-08-17	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2012-09-10	2012-09-10	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7851	SW75V	confidential	2012-09-05	2012-09-05	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7851	SW75V	confidential	2012-09-07	2012-09-07	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7851	SW75V	confidential	2012-05-05	2012-05-05	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7851	SW75V	confidential	2012-07-25	2012-07-25	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7851	SW75V	confidential	2012-09-03	2012-09-03	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7851	SW75V	confidential	2012-09-27	2012-09-27	2012	Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7552	SW75L	confidential	2012-06-19	2012-06-19	2012	Bat Roost
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8044	SW84C	confidential	2012-06-01	2012-08-30	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7342	SW74G	confidential	2012-08-23	2012-08-23	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8260	SW86F	confidential	2012-09-17	2012-09-17	2012	Seen

Scientific name	Vernacular name	Grid Reference	Assigned 1km	Assigned Tetrad	Location	Start Date	End Date	Year	Type
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7539	SW73P	confidential	2012-08-01	2012-08-01	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7137	SW73D	confidential	2012-03-02	2012-03-02	2012	Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7239	SW73J	confidential	2012-07-20	2012-07-20	2012	Bat Roost
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW8247	SW84I	confidential	2012-03-14	2012-03-14	2012	Bat Roost
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7145	SW74C	confidential	2012-05-10	2012-05-23	2012	Bat Detected
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8862	SW86W	confidential	2012-07-09	2012-07-09	2012	Bat Roost
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7449	SW74P	confidential	2012-07-09	2012-07-09	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8245	SW84H	confidential	2012-05-30	2012-05-30	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7653	SW75R	confidential	2012-03-01	2012-03-01	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7653	SW75R	confidential	2012-06-22	2012-06-22	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7653	SW75R	confidential	2012-04-30	2012-04-30	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7653	SW75R	confidential	2012-05-02	2012-05-02	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7653	SW75R	confidential	2012-08-22	2012-08-22	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7653	SW75R	confidential	2012-09-18	2012-09-18	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7653	SW75R	confidential	2012-09-19	2012-09-19	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7653	SW75R	confidential	2012-09-24	2012-09-24	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7147	SW74D	confidential	2012-07-23	2012-07-23	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2012-07-14	2012-07-14	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2012-09-11	2012-09-11	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2012-09-12	2012-09-12	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7851	SW75V	confidential	2012-09-06	2012-09-06	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7653	SW75R	confidential	2012-03-03	2012-03-03	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7653	SW75R	confidential	2012-03-30	2012-03-30	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7653	SW75R	confidential	2012-06-24	2012-06-24	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7653	SW75R	confidential	2012-09-20	2012-09-20	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7653	SW75R	confidential	2012-09-21	2012-09-21	2012	Seen

Scientific name	Vernacular name	Grid Reference	Assigned 1km	Assigned Tetrad	Location	Start Date	End Date	Year	Type
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2012-03-01	2012-03-01	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8244	SW84H	confidential	2012-02-28	2012-02-28	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8450	SW85K	confidential	2012-10-14	2012-10-14	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7851	SW75V	confidential	2012-10-01	2012-10-01	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7851	SW75V	confidential	2012-10-04	2012-10-04	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7851	SW75V	confidential	2012-08-31	2012-08-31	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7851	SW75V	confidential	2012-09-01	2012-09-01	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2012-06-20	2012-06-20	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2012-07-13	2012-07-13	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7851	SW75V	confidential	2012-09-04	2012-09-04	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7851	SW75V	confidential	2012-09-30	2012-09-30	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7851	SW75V	confidential	2012-07-26	2012-07-26	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7851	SW75V	confidential	2012-09-02	2012-09-02	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7742	SW74R	confidential	2012-08-16	2012-08-16	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7449	SW74P	confidential	2012-07-10	2012-07-10	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7449	SW74P	confidential	2012-07-11	2012-07-11	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7653	SW75R	confidential	2012-05-01	2012-05-01	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7653	SW75R	confidential	2012-05-03	2012-05-03	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7653	SW75R	confidential	2012-08-24	2012-08-24	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7653	SW75R	confidential	2012-09-22	2012-09-22	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2012-04-01	2012-04-01	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2012-06-01	2012-06-01	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2012-06-21	2012-06-21	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2012-08-18	2012-08-18	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2012-08-19	2012-08-19	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7851	SW75V	confidential	2012-09-08	2012-09-08	2012	Seen

Scientific name	Vernacular name	Grid Reference	Assigned 1km	Assigned Tetrad	Location	Start Date	End Date	Year	Type
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7851	SW75V	confidential	2012-10-02	2012-10-02	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7851	SW75V	confidential	2012-07-03	2012-07-03	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7851	SW75V	confidential	2012-07-04	2012-07-04	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8862	SW86W	confidential	2012-07-13	2012-07-13	2012	Bat Roost
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8956	SW85Y	confidential	2012-07-18	2012-07-18	2012	Bat Breeding Roost
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2012-03-03	2012-03-03	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2012-06-04	2012-06-04	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8956	SW85Y	confidential	2012-09-17	2012-09-17	2012	Bat Breeding Roost
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2012-03-30	2012-03-30	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2012-03-31	2012-03-31	2012	Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7540	SW74K	confidential	2012-03-01	2012-03-01	2012	Bat Roost
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2012-06-20	2012-06-20	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2012-06-21	2012-06-21	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2012-07-15	2012-07-15	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2012-06-19	2012-06-19	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2012-08-20	2012-08-20	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2012-09-13	2012-09-13	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7851	SW75V	confidential	2012-03-31	2012-03-31	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7851	SW75V	confidential	2012-05-04	2012-05-04	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7851	SW75V	confidential	2012-09-28	2012-09-28	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2012-09-14	2012-09-14	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2012-09-15	2012-09-15	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7851	SW75V	confidential	2012-09-09	2012-09-09	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7851	SW75V	confidential	2012-10-03	2012-10-03	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7851	SW75V	confidential	2012-07-23	2012-07-23	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7851	SW75V	confidential	2012-09-26	2012-09-26	2012	Seen

Scientific name	Vernacular name	Grid Reference	Assigned 1km	Assigned Tetrad	Location	Start Date	End Date	Year	Type
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW8045	SW84C	confidential	2012-06-28	2012-06-28	2012	Bat Roost
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7948	SW74Z	confidential	2012-08-04	2012-08-04	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW6742	SW64R	confidential	2012-12-13	2012-12-13	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7249	SW74J	confidential	2012-07-22	2012-07-22	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7851	SW75V	confidential	2012-09-29	2012-09-29	2012	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8059	SW85E	confidential	2011-08-11	2011-08-11	2011	Bat Breeding Roost
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8050	SW85A	confidential	2011-07-20	2011-07-20	2011	Bat Breeding Roost
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8050	SW85A	confidential	2011-06-16	2011-06-16	2011	Bat Breeding Roost
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW8245	SW84H	confidential	2011-06-09	2011-06-09	2011	Bat Roost
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7940	SW74V	confidential	2011-10-03	2011-10-16	2011	Bat Detected
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8654	SW85S	confidential	2011-06-13	2011-06-13	2011	Bat Roost
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7550	SW75K	confidential	2011-08-05	2011-08-05	2011	Bat Roost
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8654	SW85S	confidential	2011-05-09	2011-05-09	2011	Bat Roost
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7545	SW74M	confidential	2011-07-06	2011-07-06	2011	Bat Roost
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7944	SW74X	confidential	2011-09-05	2011-09-05	2011	Bat Roost
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7852	SW75W	confidential	2011-06-25	2011-06-25	2011	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7250	SW75F	confidential	2011-07-11	2011-07-11	2011	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW9260	SW96F	confidential	2011-07-27	2011-07-27	2011	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7944	SW74X	confidential	2011-12-24	2011-12-24	2011	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2011-08-27	2011-08-27	2011	Bat Detected
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2011-08-08	2011-08-08	2011	Bat Detected
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2011-06-14	2011-06-14	2011	Bat Detected
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7653	SW75R	confidential	2011-06-06	2011-06-06	2011	Bat Detected
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7945	SW74X	confidential	2011-05-23	2011-05-23	2011	Bat Roost
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7945	SW74X	confidential	2011-06-23	2011-06-23	2011	Bat Roost
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8050	SW85A	confidential	2011-05-19	2011-05-19	2011	Bat Breeding Roost

Scientific name	Vernacular name	Grid Reference	Assigned 1km	Assigned Tetrad	Location	Start Date	End Date	Year	Type
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8345	SW84H	confidential	2011-03-03	2011-03-03	2011	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7843	SW74W	confidential	2011-07-15	2011-07-15	2011	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8459	SW85P	confidential	2011-01-04	2011-01-04	2011	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7241	SW74F	confidential	2011-02-07	2011-02-07	2011	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8458	SW85P	confidential	2011-05-12	2011-05-12	2011	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8245	SW84H	confidential	2011-08-24	2011-08-24	2011	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8960	SW86V	confidential	2011-06-24	2011-06-24	2011	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8245	SW84H	confidential	2011-07-14	2011-07-14	2011	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8256	SW85I	confidential	2011-08-09	2011-08-09	2011	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7945	SW74X	confidential	2011-09-03	2011-09-03	2011	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7344	SW74H	confidential	2011-03-14	2011-03-14	2011	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7250	SW75F	confidential	2011-07-11	2011-07-11	2011	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8260	SW86F	confidential	2011-08-12	2011-08-12	2011	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW9249	SW94J	confidential	2011-11-13	2011-11-13	2011	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8059	SW85E	confidential	2011-09-08	2011-09-08	2011	Bat Breeding Roost
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8139	SW83E	confidential	2011-08-26	2011-08-26	2011	Bat Roost
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7552	SW75L	confidential	2011-01-06	2011-01-06	2011	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7244	SW74H	confidential	2011-08-04	2011-08-04	2011	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW6842	SW64W	confidential	2011-08-10	2011-08-10	2011	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW9160	SW96A	confidential	2011-08-21	2011-08-21	2011	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7744	SW74S	confidential	2011-10-17	2011-10-17	2011	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8056	SW85D	confidential	2011-10-29	2011-10-29	2011	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2011-06-03	2011-06-03	2011	Bat Detected
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2011-04-05	2011-04-05	2011	Bat Detected
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2011-06-04	2011-06-04	2011	Bat Detected
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2011-08-28	2011-08-28	2011	Bat Detected

Scientific name	Vernacular name	Grid Reference	Assigned 1km	Assigned Tetrad	Location	Start Date	End Date	Year	Type
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2011-05-10	2011-05-10	2011	Bat Detected
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2011-04-22	2011-04-22	2011	Bat Detected
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2011-08-16	2011-08-16	2011	Bat Detected
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7653	SW75R	confidential	2011-06-03	2011-06-03	2011	Bat Detected
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2011-05-20	2011-05-20	2011	Bat Detected
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2011-03-11	2011-03-11	2011	Bat Detected
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7948	SW74Z	confidential	2011-06-14	2011-06-14	2011	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2011-04-06	2011-04-06	2011	Bat Detected
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7654	SW75S	confidential	2011-04-15	2011-04-15	2011	Bat Detected
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8148	SW84E	confidential	2011-08-19	2011-08-25	2011	Bat Detected
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8444	SW84M	confidential	2011-09-26	2011-09-26	2011	Bat Roost
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7349	SW74J	confidential	2011-07-08	2011-07-08	2011	Bat Roost
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7148	SW74E	confidential	2010-03-13	2010-03-13	2010	Bat Roost
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7948	SW74Z	confidential	2010-09-04	2010-09-04	2010	Dung or other signs
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW8947	SW84Y	confidential	2010-06-18	2010-06-18	2010	Bat Roost
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7754	SW75S	confidential	2010-09-13	2010-09-13	2010	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7939	SW73Z	confidential	2010-08-26	2010-08-26	2010	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8144	SW84C	confidential	2010-06-19	2010-06-19	2010	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8261	SW86F	confidential	2010-08-03	2010-08-03	2010	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8058	SW85E	confidential	2010-03-11	2010-03-11	2010	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW6949	SW64Z	confidential	2010-03-17	2010-03-17	2010	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7041	SW74A	confidential	2010-09-26	2010-09-26	2010	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7543	SW74L	confidential	2010-08-22	2010-08-22	2010	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7858	SW75Z	confidential	2010-06-23	2010-06-23	2010	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7960	SW76V	confidential	2010-03-21	2010-03-21	2010	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8161	SW86A	confidential	2010-09-25	2010-09-25	2010	Bat Seen

Scientific name	Vernacular name	Grid Reference	Assigned 1km	Assigned Tetrad	Location	Start Date	End Date	Year	Type
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8462	SW86L	confidential	2010-09-30	2010-09-30	2010	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW6947	SW64Y	confidential	2010-08-15	2010-08-15	2010	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7041	SW74A	confidential	2010-09-11	2010-09-11	2010	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW9147	SW94D	confidential	2010-08-11	2010-08-11	2010	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8343	SW84G	confidential	2010-10-14	2010-10-14	2010	Bat Roost
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8160	SW86A	confidential	2010-07-28	2010-07-28	2010	Bat Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7147	SW74D	confidential	2010-03-13	2010-03-13	2010	Bat Roost
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8244	SW84H	confidential	2010-08-06	2010-08-06	2010	Bat Roost
Pipistrellus pipistrellus	Pipistrelle	confidential	SW9150	SW95A	confidential	2010-07-22	2010-07-22	2010	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7844	SW74X	confidential	2010-08-28	2010-08-28	2010	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7345	SW74H	confidential	2010-10-18	2010-10-18	2010	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8343	SW84G	confidential	2010-10-14	2010-10-14	2010	Bat Roost
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7342	SW74G	confidential	2010-08-11	2010-08-11	2010	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8860	SW86V	confidential	2010-07-29	2010-07-29	2010	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8047	SW84D	confidential	2010-09-01	2010-09-01	2010	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8463	SW86L	confidential	2010-10-26	2010-10-26	2010	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW6741	SW64Q	confidential	2010-09-03	2010-09-03	2010	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7844	SW74X	confidential	2010-10-25	2010-10-25	2010	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8343	SW84G	confidential	2010-10-14	2010-10-14	2010	Bat Roost
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7147	SW74D	confidential	2010-03-11	2010-03-11	2010	Dead
Pipistrellus pipistrellus	Pipistrelle	confidential	SW6742	SW64R	confidential	2010-09-15	2010-09-15	2010	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW9352	SW95G	confidential	2010-07-11	2010-07-11	2010	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7341	SW74F	confidential	2010-08-04	2010-08-04	2010	Bat Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8343	SW84G	confidential	2010-10-14	2010-10-14	2010	Bat Roost
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8261	SW86F	confidential	2010-01-21	2010-01-21	2010	Bat Roost
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW6941	SW64V	confidential	2010-07-17	2010-07-17	2010	Bat Roost

Scientific name	Vernacular name	Grid Reference	Assigned 1km	Assigned Tetrad	Location	Start Date	End Date	Year	Type
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW8056	SW85D	confidential	2010-02-28	2010-02-28	2010	Bat Roost
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7239	SW73J	confidential	2009-05-18	2009-05-18	2009	Bat Roost
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7948	SW74Z	confidential	2009-02-27	2009-02-27	2009	Auditory record
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7251	SW75F	confidential	2009-10-14	2009-10-14	2009	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7047	SW74D	confidential	2009-02-26	2009-02-26	2009	Auditory record
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW8952	SW85W	confidential	2009-09-11	2009-09-11	2009	Bat Roost
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7337	SW73I	confidential	2009-07-07	2009-07-07	2009	Bat Roost
Pipistrellus pipistrellus	Pipistrelle	confidential	SW6743	SW64R	confidential	2009-08-01	2009-08-01	2009	Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW8960	SW86V	confidential	2009-06-26	2009-06-26	2009	Bat Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW8260	SW86F	confidential	2009-05-06	2009-05-06	2009	Bat Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7139	SW73E	confidential	2009-06-05	2009-06-05	2009	Bat Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW8960	SW86V	confidential	2009-06-26	2009-06-26	2009	Bat Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW8360	SW86F	confidential	2009-06-29	2009-06-29	2009	Bat Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7337	SW73I	confidential	2009-07-15	2009-07-15	2009	Bat Roost
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7744	SW74S	confidential	2009-02-14	2009-02-14	2009	Bat Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW8244	SW84H	confidential	2009-08-21	2009-08-21	2009	Bat Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW6946	SW64Y	confidential	2009-07-08	2009-07-08	2009	Bat Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7342	SW74G	confidential	2009-10-02	2009-10-02	2009	Bat Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7451	SW75K	confidential	2009-07-01	2009-07-01	2009	Bat Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7337	SW73I	confidential	2009-07-06	2009-07-06	2009	Bat Roost
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW8141	SW84A	confidential	2009-06-04	2009-06-04	2009	Bat Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7337	SW73I	confidential	2009-07-06	2009-07-06	2009	Bat Roost
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7337	SW73I	confidential	2009-07-10	2009-07-10	2009	Bat Roost
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW9353	SW95G	confidential	2009-03-01	2009-03-01	2009	Bat Roost
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7543	SW74L	confidential	2009-03-15	2009-03-15	2009	Bat Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW6946	SW64Y	confidential	2009-06-17	2009-06-17	2009	Bat Seen

Scientific name	Vernacular name	Grid Reference	Assigned 1km	Assigned Tetrad	Location	Start Date	End Date	Year	Type
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW8345	SW84H	confidential	2009-09-22	2009-09-22	2009	Bat Seen
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7948	SW74Z	confidential	2009-07-22	2009-07-22	2009	Bat Roost
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7337	SW73I	confidential	2009-07-21	2009-07-21	2009	Bat Roost
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7337	SW73I	confidential	2009-07-07	2009-07-07	2009	Bat Roost
Pipistrellus pipistrellus	Common Pipistrelle	confidential	SW7337	SW73I	confidential	2009-07-15	2009-07-15	2009	Bat Roost
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7642	SW74R	confidential	2007-05-12	2007-05-12	2007	Dead
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7642	SW74R	confidential	2007-05-12	2007-05-12	2007	Dead
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7451	SW75K	confidential	2007-03-22	2007-03-22	2007	Dead
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8241	SW84F	confidential	2007-07-12	2007-07-12	2007	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8146	SW84D	confidential	2007-07-22	2007-07-22	2007	Seen
Pipistrellus pipistrellus	Pipistrelle Bat	confidential	SW6941	SW64V	confidential	2007-07-13	2007-07-13	2007	Field Record
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8341	SW84F	confidential	2007-07-13	2007-07-13	2007	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW6947	SW64Y	confidential	2007-07-14	2007-07-14	2007	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7738	SW73U	confidential	2007-04-04	2007-04-04	2007	Dead
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8040	SW84A	confidential	2007-09-30	2007-09-30	2007	Dead
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8146	SW84D	confidential	2007-07-04	2007-07-04	2007	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7541	SW74K	confidential	2007-07-12	2007-07-12	2007	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8241	SW84F	confidential	2007-07-25	2007-07-25	2007	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7237	SW73I	confidential	2007-05-18	2007-05-18	2007	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7137	SW73D	confidential	2007-05-18	2007-05-18	2007	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7541	SW74K	confidential	2007-07-21	2007-07-21	2007	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7640	SW74Q	confidential	2007-09-01	2007-09-30	2007	Bat Detected
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7848	SW74Z	confidential	2007-01-23	2007-01-23	2007	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7249	SW74J	confidential	2007-10-13	2007-10-13	2007	Dung or other signs
Pipistrellus pipistrellus	Pipistrelle Bat	confidential	SW7439	SW73P	confidential	2007-04-16	2007-04-16	2007	Dung or other signs
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7239	SW73J	confidential	2007-10-26	2007-10-26	2007	Dung or other signs

Scientific name	Vernacular name	Grid Reference	Assigned 1km	Assigned Tetrad	Location	Start Date	End Date	Year	Type
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7537	SW73N	confidential	2007-08-18	2007-08-18	2007	Bat Detected
Pipistrellus pipistrellus	Pipistrelle	confidential	SW6843	SW64W	confidential	2007-04-23	2007-04-23	2007	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7537	SW73N	confidential	2007-06-06	2007-06-06	2007	Bat Detected
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7537	SW73N	confidential	2007-06-06	2007-06-06	2007	Bat Detected
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7937	SW73Y	confidential	2007-06-05	2007-06-05	2007	Bat Detected
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7937	SW73Y	confidential	2007-06-05	2007-06-05	2007	Bat Detected
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8038	SW83E	confidential	2007-06-07	2007-06-07	2007	Bat Detected
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7637	SW73T	confidential	2007-06-06	2007-06-06	2007	Bat Detected
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7346	SW74I	confidential	2007-09-27	2007-09-27	2007	Dead
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8853	SW85W	confidential	2007-08-25	2007-08-25	2007	Dead
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7437	SW73N	confidential	2007-07-23	2007-07-23	2007	Dead
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7738	SW73U	confidential	2007-04-04	2007-04-04	2007	Dead
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7444	SW74M	confidential	2007-07-02	2007-07-02	2007	Dead
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7545	SW74M	confidential	2007-07-23	2007-07-23	2007	Dead
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8040	SW84A	confidential	2007-09-30	2007-09-30	2007	Dead
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8160	SW86A	confidential	2007-07-21	2007-07-21	2007	Dead
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8960	SW86V	confidential	2007-06-29	2007-06-29	2007	Dead
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7250	SW75F	confidential	2007-08-03	2007-08-03	2007	Dead
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8153	SW85B	confidential	2007-09-22	2007-09-22	2007	Dead
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7644	SW74S	confidential	2007-09-02	2007-09-02	2007	Dead
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8045	SW84C	confidential	2007-10-28	2007-10-28	2007	Seen
Pipistrellus pipistrellus	Pipistrelle	confidential	SW7346	SW74I	confidential	2007-09-27	2007-09-27	2007	Dead
Pipistrellus pipistrellus	Pipistrelle	confidential	SW8144	SW84C	confidential	2007-01-01	2007-12-31	2007	Bat Detected
Pipistrellus pygmaeus	Soprano Pipistrelle	confidential	SW7738	SW73U	confidential	2013-01-20	2013-01-20	2013	Seen
Pipistrellus pygmaeus	Soprano Pipistrelle	confidential	SW7757	SW75T	confidential	2013-06-30	2013-06-30	2013	Seen
Pipistrellus pygmaeus	Soprano Pipistrelle	confidential	SW8058	SW85E	confidential	2013-07-13	2013-07-13	2013	Seen

Scientific name	Vernacular name	Grid Reference	Assigned 1km	Assigned Tetrad	Location	Start Date	End Date	Year	Type
Pipistrellus pygmaeus	Soprano Pipistrelle	confidential	SW8141	SW84A	confidential	2013-04-04	2013-04-04	2013	Seen
Pipistrellus pygmaeus	Soprano Pipistrelle	confidential	SW8260	SW86F	confidential	2013-09-11	2013-09-11	2013	Seen
Pipistrellus pygmaeus	Soprano Pipistrelle	confidential	SW8952	SW85W	confidential	2013-04-03	2013-04-03	2013	Seen
Pipistrellus pygmaeus	Soprano Pipistrelle	confidential	SW7239	SW73J	confidential	2013-07-20	2013-07-20	2013	Seen
Pipistrellus pygmaeus	Soprano Pipistrelle	confidential	SW6941	SW64V	confidential	2013-08-22	2013-08-22	2013	Seen
Pipistrellus pygmaeus	Soprano Pipistrelle	confidential	SW8343	SW84G	confidential	2013-09-10	2013-09-10	2013	Seen
Pipistrellus pygmaeus	Soprano Pipistrelle	confidential	SW7037	SW73D	confidential	2007-05-18	2007-05-18	2007	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7339	SW73J	confidential	2014-01-25	2014-01-25	2014	Bat Roost
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7549	SW74P	confidential	2014-01-21	2014-01-21	2014	Bat Roost
Plecotus auritus	Brown Long-eared Bat	confidential	SW8442	SW84L	confidential	2013-08-27	2013-08-27	2013	Seen
Plecotus auritus	Brown Long-eared Bat	confidential	SW7952	SW75W	confidential	2013-10-04	2013-10-04	2013	Seen
Plecotus auritus	Brown Long-eared Bat	confidential	SW7952	SW75W	confidential	2013-10-04	2013-10-04	2013	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW6940	SW64V	confidential	2013-09-09	2013-09-09	2013	Bat Roost
Plecotus auritus	Brown Long-eared Bat	confidential	SW8646	SW84T	confidential	2013-07-18	2013-07-18	2013	Seen
Plecotus auritus	Brown Long-eared Bat	confidential	SW8444	SW84M	confidential	2013-09-21	2013-09-21	2013	Seen
Plecotus auritus	Brown Long-eared Bat	confidential	SW8747	SW84T	confidential	2013-09-03	2013-09-03	2013	Seen
Plecotus auritus	Brown Long-eared Bat	confidential	SW7944	SW74X	confidential	2013-08-28	2013-08-28	2013	Seen
Plecotus auritus	Brown Long-eared Bat	confidential	SW8243	SW84G	confidential	2013-03-13	2013-03-13	2013	Seen
Plecotus auritus	Brown Long-eared Bat	confidential	SW8244	SW84H	confidential	2013-10-07	2013-10-07	2013	Seen
Plecotus auritus	Brown Long-eared Bat	confidential	SW7743	SW74R	confidential	2013-08-13	2013-08-13	2013	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7542	SW74L	confidential	2013-08-20	2013-08-20	2013	Bat Roost
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7950	SW75V	confidential	2013-08-08	2013-08-08	2013	Bat Roost
Plecotus auritus	Brown Long-eared Bat	confidential	SW7248	SW74J	confidential	2013-05-05	2013-05-05	2013	Seen
Plecotus auritus	Brown Long-eared Bat	confidential	SW6843	SW64W	confidential	2013-09-01	2013-09-01	2013	Seen
Plecotus auritus	Brown Long-eared Bat	confidential	SW7444	SW74M	confidential	2013-08-29	2013-08-29	2013	Seen
Plecotus auritus	Brown Long-eared Bat	confidential	SW8344	SW84H	confidential	2013-09-08	2013-09-08	2013	Seen

Scientific name	Vernacular name	Grid Reference	Assigned 1km	Assigned Tetrad	Location	Start Date	End Date	Year	Type
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7940	SW74V	confidential	2013-08-21	2013-08-21	2013	Bat Detected
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7940	SW74V	confidential	2013-09-18	2013-09-18	2013	Bat Detected
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7447	SW74N	confidential	2013-05-23	2013-05-23	2013	Bat Roost
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7240	SW74F	confidential	2013-05-04	2013-05-04	2013	Bat Roost
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7853	SW75W	confidential	2012-08-08	2012-08-08	2012	Bat Breeding Roost
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7145	SW74C	confidential	2012-05-10	2012-05-23	2012	Bat Detected
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7658	SW75U	confidential	2012-08-02	2012-08-02	2012	Bat Droppings
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8956	SW85Y	confidential	2012-07-18	2012-07-18	2012	Bat Roost
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8043	SW84B	confidential	2012-12-30	2012-12-30	2012	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8955	SW85X	confidential	2012-02-10	2012-02-10	2012	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8141	SW84A	confidential	2012-08-18	2012-08-18	2012	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8244	SW84H	confidential	2012-09-24	2012-09-24	2012	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7653	SW75R	confidential	2012-05-02	2012-05-02	2012	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8244	SW84H	confidential	2012-10-01	2012-10-01	2012	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7240	SW74F	confidential	2012-08-11	2012-08-11	2012	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7654	SW75S	confidential	2012-08-20	2012-08-20	2012	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7654	SW75S	confidential	2012-09-11	2012-09-11	2012	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7851	SW75V	confidential	2012-09-05	2012-09-05	2012	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8454	SW85M	confidential	2012-09-06	2012-09-06	2012	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7851	SW75V	confidential	2012-09-01	2012-09-01	2012	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8956	SW85Y	confidential	2012-09-17	2012-09-17	2012	Bat Roost
Plecotus auritus	Brown Long-eared Bat	confidential	SW8141	SW84A	confidential	2012-08-29	2012-08-29	2012	Bat Roost
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7738	SW73U	confidential	2012-08-14	2012-08-14	2012	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8141	SW84A	confidential	2012-05-13	2012-05-13	2012	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7654	SW75S	confidential	2012-08-19	2012-08-19	2012	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW9050	SW95A	confidential	2012-05-29	2012-05-29	2012	Dead

Scientific name	Vernacular name	Grid Reference	Assigned 1km	Assigned Tetrad	Location	Start Date	End Date	Year	Type
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7449	SW74P	confidential	2012-07-09	2012-07-09	2012	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8244	SW84H	confidential	2012-11-01	2012-11-01	2012	Bat Droppings
Plecotus auritus	Brown Long-eared Bat	confidential	SW7341	SW74F	confidential	2012-06-15	2012-06-15	2012	Bat Roost
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7654	SW75S	confidential	2012-09-12	2012-09-12	2012	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7851	SW75V	confidential	2012-09-27	2012-09-27	2012	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7738	SW73U	confidential	2012-08-28	2012-08-28	2012	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7539	SW73P	confidential	2012-05-24	2012-05-24	2012	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8458	SW85P	confidential	2012-08-09	2012-08-09	2012	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8141	SW84A	confidential	2012-07-18	2012-07-18	2012	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7851	SW75V	confidential	2012-09-28	2012-09-28	2012	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8748	SW84U	confidential	2011-08-30	2011-08-30	2011	Bat Droppings
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8050	SW85A	confidential	2011-06-16	2011-06-16	2011	Bat Detected
Plecotus auritus	Brown Long-eared Bat	confidential	SW7738	SW73U	confidential	2011-08-23	2011-08-23	2011	Bat Roost
Plecotus auritus	Brown Long-eared Bat	confidential	SW8239	SW83J	confidential	2011-02-20	2011-02-20	2011	Bat Roost
Plecotus auritus	Brown Long-eared Bat	confidential	SW7944	SW74X	confidential	2011-09-05	2011-09-05	2011	Bat Roost
Plecotus auritus	Brown Long-eared Bat	confidential	SW8145	SW84C	confidential	2011-11-23	2011-11-23	2011	Bat Roost
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8654	SW85S	confidential	2011-05-09	2011-05-09	2011	Bat Roost
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8654	SW85S	confidential	2011-06-13	2011-06-13	2011	Bat Roost
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8050	SW85A	confidential	2011-05-19	2011-05-19	2011	Bat Detected
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8050	SW85A	confidential	2011-07-20	2011-07-20	2011	Bat Detected
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7940	SW74V	confidential	2011-10-03	2011-10-16	2011	Bat Detected
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8444	SW84M	confidential	2011-09-26	2011-09-26	2011	Bat Roost
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7444	SW74M	confidential	2011-08-30	2011-08-30	2011	Bat Roost
Plecotus auritus	Brown Long-eared Bat	confidential	SW7543	SW74L	confidential	2011-10-10	2011-10-10	2011	Bat Roost
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7450	SW75K	confidential	2011-06-14	2011-06-14	2011	Bat Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7738	SW73U	confidential	2011-07-22	2011-07-22	2011	Bat Seen

Scientific name	Vernacular name	Grid Reference	Assigned 1km	Assigned Tetrad	Location	Start Date	End Date	Year	Type
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7353	SW75G	confidential	2011-08-14	2011-08-14	2011	Bat Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8244	SW84H	confidential	2011-10-12	2011-10-12	2011	Bat Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8046	SW84D	confidential	2011-09-14	2011-09-14	2011	Bat Roost
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7444	SW74M	confidential	2011-09-26	2011-09-26	2011	Bat Roost
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8751	SW85Q	confidential	2011-03-14	2011-03-14	2011	Bat Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8458	SW85P	confidential	2011-03-21	2011-03-21	2011	Bat Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7743	SW74R	confidential	2011-08-25	2011-08-25	2011	Bat Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8244	SW84H	confidential	2011-10-05	2011-10-05	2011	Bat Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW6642	SW64R	confidential	2011-07-25	2011-07-25	2011	Bat Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7945	SW74X	confidential	2011-10-11	2011-10-11	2011	Bat Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7744	SW74S	confidential	2011-04-09	2011-04-09	2011	Bat Seen
Plecotus auritus	Brown Long-eared Bat	confidential	SW8756	SW85T	confidential	2011-10-08	2011-10-08	2011	Bat Roost
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7241	SW74F	confidential	2011-02-24	2011-02-24	2011	Bat Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8047	SW84D	confidential	2011-02-04	2011-02-04	2011	Bat Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8458	SW85P	confidential	2011-03-21	2011-03-21	2011	Bat Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8244	SW84H	confidential	2011-09-13	2011-09-13	2011	Bat Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7654	SW75S	confidential	2011-06-03	2011-06-03	2011	Bat Detected
Plecotus auritus	Brown Long-Eared Bat	confidential	SW6843	SW64W	confidential	2011-02-04	2011-02-04	2011	Bat Droppings
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8057	SW85D	confidential	2011-01-06	2011-01-06	2011	Bat Droppings
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7847	SW74Y	confidential	2011-10-27	2011-10-27	2011	Bat Roost
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8057	SW85D	confidential	2011-01-26	2011-02-09	2011	Bat Detected
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7847	SW74Y	confidential	2011-10-27	2011-10-27	2011	Bat Roost
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7444	SW74M	confidential	2011-07-06	2011-07-06	2011	Bat Roost
Plecotus auritus	Brown Long-eared Bat	confidential	SW8651	SW85Q	confidential	2011-09-07	2011-09-07	2011	Bat Roost
Plecotus auritus	Brown Long-eared Bat	confidential	SW7845	SW74X	confidential	2010-09-23	2010-09-23	2010	Bat Roost
Plecotus auritus	Brown Long-eared Bat	confidential	SW8951	SW85V	confidential	2010-07-03	2010-07-03	2010	Bat Roost

Scientific name	Vernacular name	Grid Reference	Assigned 1km	Assigned Tetrad	Location	Start Date	End Date	Year	Type
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8245	SW84H	confidential	2010-07-21	2010-07-21	2010	Bat Droppings
Plecotus auritus	Brown Long-Eared Bat	confidential	SW9150	SW95A	confidential	2010-09-05	2010-09-05	2010	Bat Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7347	SW74I	confidential	2010-07-15	2010-07-15	2010	Bat Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8950	SW85V	confidential	2010-09-04	2010-09-04	2010	Bat Roost
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8244	SW84H	confidential	2010-09-24	2010-09-24	2010	Bat Roost
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8244	SW84H	confidential	2010-10-11	2010-10-11	2010	Bat Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7651	SW75Q	confidential	2010-04-10	2010-04-10	2010	Bat Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8345	SW84H	confidential	2010-10-17	2010-10-17	2010	Bat Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8251	SW85F	confidential	2010-08-29	2010-08-29	2010	Bat Roost
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8244	SW84H	confidential	2010-09-17	2010-09-17	2010	Bat Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW9153	SW95B	confidential	2010-09-23	2010-09-23	2010	Bat Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8261	SW86F	confidential	2010-01-21	2010-01-21	2010	Bat Roost
Plecotus auritus	Brown Long-eared Bat	confidential	SW8955	SW85X	confidential	2010-06-14	2010-06-14	2010	Bat Roost
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7856	SW75Y	confidential	2010-03-15	2010-03-15	2010	Bat Droppings
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7250	SW75F	confidential	2010-07-28	2010-07-28	2010	Bat Droppings
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7746	SW74T	confidential	2010-06-24	2010-06-24	2010	Dead
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7854	SW75X	confidential	2010-04-12	2010-04-12	2010	Bat Droppings
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7450	SW75K	confidential	2010-03-03	2010-03-03	2010	Bat Droppings
Plecotus auritus	Brown Long-eared Bat	confidential	SW8752	SW85R	confidential	2009-03-11	2009-03-11	2009	Bat Roost
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8154	SW85C	confidential	2009-01-15	2009-01-15	2009	Dung or other signs
Plecotus auritus	Brown Long-eared Bat	confidential	SW8952	SW85W	confidential	2009-09-11	2009-09-11	2009	Bat Roost
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8140	SW84A	confidential	2009-01-17	2009-01-17	2009	Dung or other signs
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8154	SW85C	confidential	2009-01-15	2009-01-15	2009	Dung or other signs
Plecotus auritus	Brown Long-eared Bat	confidential	SW8244	SW84H	confidential	2009-07-14	2009-07-14	2009	Field Record
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8247	SW84I	confidential	2009-07-07	2009-07-07	2009	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8245	SW84H	confidential	2009-11-04	2009-11-04	2009	Bat Roost

Scientific name	Vernacular name	Grid Reference	Assigned 1km	Assigned Tetrad	Location	Start Date	End Date	Year	Type
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8247	SW84I	confidential	2009-06-03	2009-06-03	2009	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8752	SW85R	confidential	2009-04-11	2009-04-11	2009	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8244	SW84H	confidential	2009-10-02	2009-10-02	2009	Bat Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7250	SW75F	confidential	2009-02-17	2009-02-17	2009	Bat Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8245	SW84H	confidential	2009-09-14	2009-09-14	2009	Bat Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8244	SW84H	confidential	2009-10-11	2009-10-11	2009	Bat Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8245	SW84H	confidential	2009-09-19	2009-09-19	2009	Bat Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8244	SW84H	confidential	2009-09-25	2009-09-25	2009	Bat Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8244	SW84H	confidential	2009-09-29	2009-09-29	2009	Bat Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW9052	SW95B	confidential	2009-09-11	2009-09-11	2009	Bat Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8857	SW85Y	confidential	2009-09-25	2009-09-25	2009	Bat Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8244	SW84H	confidential	2009-09-19	2009-09-19	2009	Bat Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8752	SW85R	confidential	2009-04-11	2009-04-11	2009	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7544	SW74M	confidential	2007-08-23	2007-08-23	2007	Dead
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7544	SW74M	confidential	2007-08-23	2007-08-23	2007	Dead
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8358	SW85J	confidential	2007-07-14	2007-07-14	2007	Dead
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8646	SW84T	confidential	2007-06-01	2007-06-01	2007	Dung or other signs
Plecotus auritus	Brown Long-eared Bat	confidential	SW8140	SW84A	confidential	2007-08-15	2007-08-15	2007	Field Record
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7445	SW74M	confidential	2007-08-05	2007-08-05	2007	Dead
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7247	SW74I	confidential	2007-04-12	2007-04-12	2007	Dead
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8144	SW84C	confidential	2007-01-01	2007-12-31	2007	Bat Detected
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8140	SW84A	confidential	2007-08-04	2007-08-04	2007	Dung or other signs
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7542	SW74L	confidential	2007-03-20	2007-03-20	2007	Field record
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7240	SW74F	confidential	2007-04-13	2007-04-13	2007	Dung or other signs
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7542	SW74L	confidential	2007-07-02	2007-07-02	2007	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7249	SW74J	confidential	2007-11-30	2007-11-30	2007	Dung or other signs

Scientific name	Vernacular name	Grid Reference	Assigned 1km	Assigned Tetrad	Location	Start Date	End Date	Year	Type
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8447	SW84N	confidential	2007-03-01	2007-03-01	2007	Dung or other signs
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7239	SW73J	confidential	2007-06-08	2007-06-08	2007	Dung or other signs
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8356	SW85I	confidential	2007-11-23	2007-11-23	2007	Dung or other signs
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7746	SW74T	confidential	2007-11-09	2007-11-09	2007	Dung or other signs
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7542	SW74L	confidential	2007-05-01	2007-05-01	2007	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7540	SW74K	confidential	2007-05-03	2007-05-03	2007	Dung or other signs
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7439	SW73P	confidential	2007-04-16	2007-04-16	2007	Dung or other signs
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8144	SW84C	confidential	2007-06-05	2007-06-05	2007	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7750	SW75Q	confidential	2007-08-05	2007-08-05	2007	Dead
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8358	SW85J	confidential	2007-07-14	2007-07-14	2007	Dead
Plecotus auritus	Brown Long-Eared Bat	confidential	SW7353	SW75G	confidential	2007-12-30	2007-12-30	2007	Hibernating
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8045	SW84C	confidential	2007-10-28	2007-10-28	2007	Seen
Plecotus auritus	Brown Long-Eared Bat	confidential	SW6941	SW64V	confidential	2007-08-23	2007-08-23	2007	Dead
Plecotus auritus	Brown Long-Eared Bat	confidential	SW8247	SW84I	confidential	2007-10-28	2007-10-28	2007	Seen
Rhinolophidae	Horseshoe Bats	confidential	SW8145	SW84C	confidential	2011-07-05	2011-07-05	2011	Bat Roost
Rhinolophidae	Horseshoe Bats	confidential	SW8240	SW84F	confidential	2010-06-07	2010-06-07	2010	Bat Detected
Rhinolophus ferrumequinum	Greater Horseshoe Bat	confidential	SW7451	SW75K	confidential	2013-09-10	2013-09-10	2013	Bat Roost
Rhinolophus ferrumequinum	Greater Horseshoe Bat	confidential	SW7048	SW74E	confidential	2013-01-06	2013-01-06	2013	Bat Seen
Rhinolophus ferrumequinum	Greater Horseshoe Bat	confidential	SW7653	SW75R	confidential	2012-08-24	2012-08-24	2012	Seen
Rhinolophus ferrumequinum	Greater Horseshoe Bat	confidential	SW7654	SW75S	confidential	2012-02-29	2012-02-29	2012	Seen
Rhinolophus ferrumequinum	Greater Horseshoe Bat	confidential	SW7654	SW75S	confidential	2012-03-31	2012-03-31	2012	Seen
Rhinolophus ferrumequinum	Greater Horseshoe Bat	confidential	SW7654	SW75S	confidential	2012-08-19	2012-08-19	2012	Seen
Rhinolophus ferrumequinum	Greater Horseshoe Bat	confidential	SW7851	SW75V	confidential	2012-09-30	2012-09-30	2012	Seen
Rhinolophus ferrumequinum	Greater Horseshoe Bat	confidential	SW7851	SW75V	confidential	2012-10-03	2012-10-03	2012	Seen
Rhinolophus ferrumequinum	Greater Horseshoe Bat	confidential	SW7851	SW75V	confidential	2012-05-04	2012-05-04	2012	Seen
Rhinolophus ferrumequinum	Greater Horseshoe Bat	confidential	SW7851	SW75V	confidential	2012-07-25	2012-07-25	2012	Seen

Scientific name	Vernacular name	Grid Reference	Assigned 1km	Assigned Tetrad	Location	Start Date	End Date	Year	Type
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7048	SW74E	confidential	2012-05-26	2012-05-26	2012	Bat Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7048	SW74E	confidential	2012-10-28	2012-10-28	2012	Bat Droppings
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7048	SW74E	confidential	2012-02-04	2012-02-04	2012	Bat Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7653	SW75R	confidential	2012-08-22	2012-08-22	2012	Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7745	SW74S	confidential	2012-09-03	2012-09-03	2012	Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7654	SW75S	confidential	2012-07-15	2012-07-15	2012	Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7653	SW75R	confidential	2012-05-01	2012-05-01	2012	Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7653	SW75R	confidential	2012-09-20	2012-09-20	2012	Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7653	SW75R	confidential	2012-09-24	2012-09-24	2012	Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7851	SW75V	confidential	2012-09-06	2012-09-06	2012	Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7851	SW75V	confidential	2012-07-02	2012-07-02	2012	Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7851	SW75V	confidential	2012-08-31	2012-08-31	2012	Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7851	SW75V	confidential	2012-09-28	2012-09-28	2012	Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7654	SW75S	confidential	2012-08-18	2012-08-18	2012	Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7654	SW75S	confidential	2012-08-20	2012-08-20	2012	Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7654	SW75S	confidential	2012-09-14	2012-09-14	2012	Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7851	SW75V	confidential	2012-09-05	2012-09-05	2012	Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7654	SW75S	confidential	2012-06-19	2012-06-19	2012	Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7851	SW75V	confidential	2012-10-01	2012-10-01	2012	Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7851	SW75V	confidential	2012-09-29	2012-09-29	2012	Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7048	SW74E	confidential	2012-06-10	2012-06-10	2012	Bat Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7653	SW75R	confidential	2012-09-21	2012-09-21	2012	Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7654	SW75S	confidential	2012-06-01	2012-06-01	2012	Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7654	SW75S	confidential	2012-06-19	2012-06-19	2012	Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7654	SW75S	confidential	2012-09-13	2012-09-13	2012	Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7851	SW75V	confidential	2012-09-04	2012-09-04	2012	Seen

Scientific name	Vernacular name	Grid Reference	Assigned 1km	Assigned Tetrad	Location	Start Date	End Date	Year	Type
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW8444	SW84M	confidential	2011-09-26	2011-09-26	2011	Bat Roost
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW6947	SW64Y	confidential	2011-08-15	2011-08-15	2011	Bat Roost
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW8050	SW85A	confidential	2011-06-16	2011-06-16	2011	Bat Detected
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7048	SW74E	confidential	2011-11-08	2011-11-08	2011	Bat Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7654	SW75S	confidential	2011-06-03	2011-06-03	2011	Bat Detected
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW8050	SW85A	confidential	2011-05-19	2011-05-19	2011	Bat Detected
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW8050	SW85A	confidential	2011-07-20	2011-07-20	2011	Bat Detected
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW8947	SW84Y	confidential	2011-09-24	2011-09-24	2011	Dead
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7654	SW75S	confidential	2011-03-11	2011-03-11	2011	Bat Detected
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7654	SW75S	confidential	2011-08-28	2011-08-28	2011	Bat Detected
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7654	SW75S	confidential	2011-08-16	2011-08-16	2011	Bat Detected
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7653	SW75R	confidential	2011-06-06	2011-06-06	2011	Bat Detected
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7653	SW75R	confidential	2011-06-03	2011-06-03	2011	Bat Detected
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW8148	SW84E	confidential	2011-08-19	2011-08-25	2011	Bat Roost
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7048	SW74E	confidential	2011-11-15	2011-11-15	2011	Bat Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7444	SW74M	confidential	2010-09-25	2010-09-25	2010	Bat Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW8154	SW85C	confidential	2009-01-15	2009-01-15	2009	Dung or other signs
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7151	SW75A	confidential	2009-01-27	2009-01-27	2009	Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7944	SW74X	confidential	2009-10-22	2009-10-22	2009	Field record
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7151	SW75A	confidential	2009-03-22	2009-03-22	2009	Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7653	SW75R	confidential	2009-03-29	2009-03-29	2009	Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7048	SW74E	confidential	2009-03-14	2009-03-14	2009	Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7048	SW74E	confidential	2009-05-29	2009-05-29	2009	Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW8154	SW85C	confidential	2009-01-15	2009-01-15	2009	Dung or other signs
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7353	SW75G	confidential	2009-01-27	2009-01-27	2009	Seen
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	confidential	SW7950	SW75V	confidential	2009-03-01	2009-03-01	2009	Seen

Scientific name	Vernacular name	Grid Reference	Assigned 1km	Assigned Tetrad	Location	Start Date	End Date	Year	Type
Rhinolophus ferrumequinum	Greater Horseshoe Bat	confidential	SW8762	SW86R	confidential	2009-03-29	2009-03-29	2009	Seen
Rhinolophus ferrumequinum	Greater Horseshoe Bat	confidential	SW7353	SW75G	confidential	2009-03-22	2009-03-22	2009	Seen
Rhinolophus ferrumequinum	Greater Horseshoe Bat	confidential	SW7353	SW75G	confidential	2007-12-30	2007-12-30	2007	Hibernating
Rhinolophus ferrumequinum	Greater Horseshoe Bat	confidential	SW7251	SW75F	confidential	2007-12-30	2007-12-30	2007	Hibernating
Rhinolophus ferrumequinum	Greater Horseshoe Bat	confidential	SW8144	SW84C	confidential	2007-01-01	2007-12-31	2007	Bat Detected
Rhinolophus ferrumequinum	Greater Horseshoe Bat	confidential	SW6843	SW64W	confidential	2007-06-19	2007-06-19	2007	Seen
Rhinolophus ferrumequinum	Greater Horseshoe Bat	confidential	SW7251	SW75F	confidential	2007-01-07	2007-01-07	2007	Seen
Rhinolophus ferrumequinum	Greater Horseshoe Bat	confidential	SW7251	SW75F	confidential	2007-03-04	2007-03-04	2007	Seen
Rhinolophus ferrumequinum	Greater Horseshoe Bat	confidential	SW8762	SW86R	confidential	2007-03-18	2007-03-18	2007	Seen
Rhinolophus ferrumequinum	Greater Horseshoe Bat	confidential	SW7950	SW75V	confidential	2007-03-25	2007-03-25	2007	Seen
Rhinolophus ferrumequinum	Greater Horseshoe Bat	confidential	SW7048	SW74E	confidential	2007-01-02	2007-01-02	2007	Seen
Rhinolophus ferrumequinum	Greater Horseshoe Bat	confidential	SW7353	SW75G	confidential	2007-01-07	2007-01-07	2007	Seen
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7846	SW74Y	confidential	2013-03-20	2013-03-20	2013	Bat Roost
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7852	SW75W	confidential	2013-10-04	2013-10-04	2013	Bat Roost
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7447	SW74N	confidential	2013-05-23	2013-05-23	2013	Bat Roost
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7451	SW75K	confidential	2013-08-27	2013-08-27	2013	Bat Roost
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW8747	SW84T	confidential	2012-10-18	2012-10-18	2012	Bat Hibernacula
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7653	SW75R	confidential	2012-02-29	2012-02-29	2012	Seen
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7851	SW75V	confidential	2012-09-04	2012-09-04	2012	Seen
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7851	SW75V	confidential	2012-09-09	2012-09-09	2012	Seen
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7048	SW74E	confidential	2012-11-24	2012-11-24	2012	Bat Seen
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7048	SW74E	confidential	2012-04-24	2012-04-24	2012	Bat Seen
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7653	SW75R	confidential	2012-03-01	2012-03-01	2012	Seen
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7654	SW75S	confidential	2012-02-29	2012-02-29	2012	Seen
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7048	SW74E	confidential	2012-10-28	2012-10-28	2012	Bat Droppings
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7048	SW74E	confidential	2012-01-22	2012-01-22	2012	Bat Seen

Scientific name	Vernacular name	Grid Reference	Assigned 1km	Assigned Tetrad	Location	Start Date	End Date	Year	Type
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7653	SW75R	confidential	2012-09-19	2012-09-19	2012	Seen
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7851	SW75V	confidential	2012-09-27	2012-09-27	2012	Seen
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7851	SW75V	confidential	2012-05-04	2012-05-04	2012	Seen
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW8050	SW85A	confidential	2011-05-19	2011-05-19	2011	Bat Detected
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7444	SW74M	confidential	2011-08-30	2011-08-30	2011	Bat Roost
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7444	SW74M	confidential	2011-09-26	2011-09-26	2011	Bat Roost
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7437	SW73N	confidential	2011-08-08	2011-08-08	2011	Bat Roost
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW8050	SW85A	confidential	2011-07-20	2011-07-20	2011	Bat Detected
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW8145	SW84C	confidential	2011-11-23	2011-11-23	2011	Bat Roost
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW8247	SW84I	confidential	2011-05-03	2011-05-03	2011	Bat Roost
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW8444	SW84M	confidential	2011-09-26	2011-09-26	2011	Bat Roost
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW8361	SW86F	confidential	2011-04-20	2011-04-20	2011	Bat Droppings
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7847	SW74Y	confidential	2011-10-27	2011-10-27	2011	Bat Roost
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW8046	SW84D	confidential	2011-09-14	2011-09-14	2011	Bat Droppings
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7444	SW74M	confidential	2011-07-06	2011-07-06	2011	Bat Roost
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7048	SW74E	confidential	2011-12-31	2011-12-31	2011	Bat Seen
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW8050	SW85A	confidential	2011-06-16	2011-06-16	2011	Bat Detected
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7444	SW74M	confidential	2011-09-03	2011-09-03	2011	Bat Seen
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW8654	SW85S	confidential	2011-10-07	2011-10-07	2011	Bat Seen
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7654	SW75S	confidential	2011-05-10	2011-05-10	2011	Bat Detected
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7653	SW75R	confidential	2011-06-06	2011-06-06	2011	Bat Detected
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7940	SW74V	confidential	2011-10-03	2011-10-16	2011	Bat Detected
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7746	SW74T	confidential	2010-06-24	2010-06-24	2010	Bat Droppings
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW8240	SW84F	confidential	2010-06-07	2010-06-14	2010	Bat Detected
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW8240	SW84F	confidential	2010-04-14	2010-04-14	2010	Bat Droppings
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7950	SW75V	confidential	2009-03-01	2009-03-01	2009	Seen

Scientific name	Vernacular name	Grid Reference	Assigned 1km	Assigned Tetrad	Location	Start Date	End Date	Year	Type
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7048	SW74E	confidential	2009-05-29	2009-05-29	2009	Seen
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7151	SW75A	confidential	2009-01-27	2009-01-27	2009	Seen
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW8762	SW86R	confidential	2009-03-29	2009-03-29	2009	Seen
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7048	SW74E	confidential	2009-03-14	2009-03-14	2009	Seen
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW8144	SW84C	confidential	2007-01-01	2007-12-31	2007	Bat Detected
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7540	SW74K	confidential	2007-05-03	2007-05-03	2007	Dung or other signs
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7048	SW74E	confidential	2007-01-02	2007-01-02	2007	Seen
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW8762	SW86R	confidential	2007-03-18	2007-03-18	2007	Seen
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7540	SW74K	confidential	2007-06-02	2007-06-02	2007	Dead
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7251	SW75F	confidential	2007-12-30	2007-12-30	2007	Hibernating
Rhinolophus hipposideros	Lesser Horseshoe Bat	confidential	SW7540	SW74K	confidential	2007-06-02	2007-06-02	2007	Dead

BAT ACTIVITY TRANSECT: SURVEY DETAILS

MONTH	TRANSECT	DATE	START TIME	END TIME	START POINT	END POINT	WEATHER START				WEATHER END				SUNSET / RISE	NOTES / LIMITATIONS
							TEMP	RAIN	CLOUD COVER	WIND	TEMP	RAIN	CLOUD COVER	WIND		
May	1	23/05/2016	21:15	00:28	1	10	12	0	0	n/a	7	n/a	n/a	n/a	21:13	full moon
	2	23/05/2016	21:13	00:11	11	20	12	0	0	0	n/a	0	0	0	21:13	full moon, very bright, very few insects
	3	24/05/2016	21:10	00:10	21	31	12	0	0	2	n/a	n/a	n/a	n/a	21:14	
	4	34/05/2016	21:14	12:33	32	37	14	0	0	1	n/a	n/a	n/a	n/a	21:14	The Point Counts 32-34 were not possible due to aggressive livestock
	5	25/05/2016	21:15	00:30	41	50	10	0	6 - 8	still	7.5	n/a	n/a	n/a	21:15	
June	1	14/06/2016	21:19	23:56	10	1	12	0	7	3_4	12	0	8	2_3	21:32	
	2	14/06/2016	21:20	23:52	13	14	15	0	6	3	1	0	6	3	21:32	
	3	16/06/2016	21:13	00:15	27	26	17	0	4	1	12	0	0	0	21:33	
	4	15/06/2016	21:14	23:45	40	32	13	0	6	1	n/a	n/a	n/a	n/a	21:33	
	5	13/06/2016	21:14	23:45	48	47	14	2	8	4_5	14	1	7	3	21:29	
July Dusk	1	11/07/2016	21:55	00:44	4	3	15	0	2	3	n/a	n/a	n/a	n/a	21:29	
	2	11/07/2016	21:28	01:06	20	11	15	0	1	1	n/a	n/a	n/a	n/a	21:28	
	3	12/07/2016	21:28	00:52	29	28	13.5	0	4	1	n/a	n/a	n/a	n/a	21:27	
	4	12/07/2016	21:28	00:52	32	40	14	0	6	3	n/a	n/a	n/a	n/a	21:28	
	5	13/07/2016	21:26	00:54	45	44	14	0	2	3	14.5	0	2	2	21:26	
July Dawn	1	12/07/2016	02:24	04:55	4	3	13	0	4	3	n/a	n/a	n/a	n/a	05:24	
	2	12/07/2016	02:13	05:13	11	20	12	0	1	1	n/a	n/a	n/a	n/a	05:23	
	3	13/07/2016	02:28	05:14	29	28	13	0	2	1	n/a	n/a	n/a	n/a	05:24	
	4	13/07/2016	02:12	05:04	40	32	11	1	7	2	n/a	n/a	n/a	n/a	05:25	
	5	14/07/2016	02:34	05:16	45	44	14	0	1	3	12	0	8	3	05:26	
August	1	16/08/2016	03:24	06:10	7	1	13.5	0	0	1	n/a	n/a	n/a	n/a	06:11	

MONTH	TRANSECT	DATE	START TIME	END TIME	START POINT	END POINT	WEATHER START				WEATHER END				SUNSET / RISE	NOTES / LIMITATIONS
							TEMP	RAIN	CLOUD COVER	WIND	TEMP	RAIN	CLOUD COVER	WIND		
Dusk	2	16/08/2016	03:17	05:56	20	11	13.5	0	0	2_3	16	0	0	2	06:10	
	3	17/08/2016	03:30	06:08	24	25	15.5	0	3	3	17	0	7	4_5	06:13	
	4	17/08/2016	03:34	06:09	35	40	16	0	0	3	n/a	n/a	n/a	n/a	06:12	Point 32 inaccessible due to livestock
	5	18/08/2016	03:23	06:14	48	49	16	0	7	1	n/a	n/a	n/a	n/a	06:14	Thick fog, hard to see flight direction
August Dawn	1	15/08/2016	20:56	23:44	7	1	17	0	2	3	n/a	0	1	3	20:38	
	2	15/08/2016	20:42	23:32	20	11	16	0	1	2	15	0	1	2	20:38	
	3	16/08/2016	20:35	23:16	24	25	17	0	2	2_3	18.5	0	2	2	20:40	
	4	16/08/2016	20:36	23:27	35	40	17	0	0	2	16	0	0	2	20:36	
	5	17/08/2016	20:30	23:14	48	49	16.5	1	8	2	16	1	8	1	20:34	Thick fog, hard to see flight direction
September	1	19/09/2001	01:24	21:45	4	5	13.5	1	8	2	14	1	7	1	19:24	
	2	19/09/2016	19:24	22:12	16	15	13.5	0	7	2	14	1	7	1_2	19:24	
	3	20/09/2016	19:21	21:55	24	23	14.5	0	4	1	n/a	n/a	n/a	n/a	19:21	cows in field at 26
	4	20/09/2016	19:21	22:13	38	37	15	6	0	6	n/a	n/a	5	0	19:21	diversion for cows in field
	5	21/09/2016	19:19	22:01	45	46	14	0	8	2	14	0	8	2	19:19	
October	1	12/10/2016	18:33	20:53	1	10	13	0	3	1	11	0	1	2	18:33	
	2	12/10/2016	18:33	21:01	13	12	13	0	1	2	11	0	1	2	18:33	
	3	13/10/2016	18:31	20:47	23	21	11.5	0	3	1	10	0	2	1	18:31	
	4	13/10/2016	18:31	20:48	38	39	14	0	6	1	10	0	2	1	18:31	Point Count 9 completed at gate due to cows
	5	11/10/2016	18:35	21:13	41	42	12	0	6	3	10	0	3	2	18:35	

Point Count	Ppip	Ppyg	Bbarb	Myotis	Rhip	Rfer	Nnoc	Nlei	Plecotus	P40	P50	Esero	Nnoc / Nlei	Total
31	1	0	0	0	0	0	0	0	0	0	0	0	0	1
32	1	0	0	2	0	0	0	0	0	0	0	0	0	3
33	7	0	0	1	0	0	0	0	0	0	0	0	0	8
34	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	1	0	0	0	0	0	0	0	0	0	0	0	0	1
36	30	0	0	2	0	2	0	0	0	0	0	0	0	34
37	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	0	0	0	0	0	0	0	6	0	0	0	0	0	6
42	1	0	0	0	0	0	0	0	0	0	0	0	0	1
43	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0
total	113	0	0	5	12	2	0	6	0	0	0	0	0	138

Point Count	Ppip	Ppyg	Bbarb	Myotis	Rhip	Rfer	Nnoc	Nlei	Plecotus	P40	P50	Esero	Nnoc / Nlei	Total
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
35	1	0	0	10	0	0	0	0	0	0	0	0	0	11
36	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	0	0	0	2	0	1	0	0	0	0	0	0	0	3
38	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	1	0	0	1	0	0	0	0	0	0	0	0	0	2
41	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	10	0	0	1	0	0	0	0	0	0	0	0	0	11
44	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	16	0	0	0	0	0	1	0	0	0	0	0	0	17
48	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0
total	78	0	0	18	1	1	1	0	0	0	4	0	0	103

Point Count	Ppip	Ppyg	Bbarb	Myotis	Rhip	Rfer	Nnoc	Nlei	Plecotus	P40	P50	Esero	Nnoc / Nlei	Total
28	2	0	0	0	0	0	0	0	1	0	0	0	0	3
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
33	12	0	0	2	0	0	0	0	0	0	0	1	0	15
34	0	0	0	0	0	0	1	0	0	0	0	0	0	1
35	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	0	0	0	0	0	0	0	0	0	0	0	1	0	1
37	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	1	0	0	0	0	0	0	0	0	0	0	0	0	1
39	1	0	0	0	0	0	0	0	0	0	0	0	0	1
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	30	0	0	0	0	0	0	0	0	0	0	0	0	30
43	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	10	0	0	0	0	0	0	0	0	0	0	0	0	10
46	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0
total	153	0	0	6	0	1	1	0	1	0	0	3	0	165

Point Count	Ppip	Ppyg	Bbarb	Myotis	Rhip	Rfer	Nnoc	Nlei	Plecotus	P40	P50	Esero	Nnoc / Nlei	Total
28	2	0	0	0	0	0	0	0	0	0	0	0	0	2
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	3	0	0	0	0	0	0	1	0	0	0	0	0	4
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	17	0	0	0	0	0	0	0	0	0	0	0	0	17
33	30	0	0	0	0	0	0	0	0	0	0	0	0	30
34	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	20	0	0	1	0	0	0	0	0	0	0	0	0	21
36	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	1	0	0	0	0	0	0	0	0	0	0	0	0	1
42	3	0	0	0	0	0	0	0	0	0	0	0	0	3
43	2	0	0	0	0	0	3	0	0	0	0	0	0	5
44	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	6	0	0	0	0	0	0	1	0	0	0	0	0	7
46	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	2	0	0	0	0	0	4	0	0	0	0	0	0	6
48	1	0	0	0	0	0	3	0	0	0	0	0	0	4
49	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0
total	135	0	0	1	0	0	10	2	1	0	0	0	0	149

Point Count	Ppip	Ppyg	Bbarb	Myotis	Rhip	Rfer	Nnoc	Nlei	Plecotus	P40	P50	Esero	Nnoc / Nlei	Total
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	2	0	0	0	0	0	0	0	0	0	0	0	0	2
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	1	0	0	0	0	0	0	0	0	0	0	0	0	1
33	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	1	0	0	0	0	0	0	0	0	0	0	1	0	2
35	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	6	0	0	0	0	0	0	0	0	0	0	0	0	6
37	1	0	0	0	0	0	0	0	0	0	0	0	0	1
38	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	0	0	0	0	0	0	2	0	0	0	0	0	0	2
40	0	0	0	0	0	0	1	0	0	0	0	0	0	1
41	7	0	0	0	0	0	0	0	0	0	0	0	0	7
42	3	0	0	0	0	0	0	0	0	0	0	0	0	3
43	2	0	0	0	0	0	0	0	0	0	0	0	0	2
44	0	0	0	0	0	0	1	0	0	0	0	0	0	1
45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	8	0	0	0	0	0	0	0	0	0	0	0	0	8
48	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0
total	60	0	0	1	1	0	4	1	0	0	0	1	1	69

A30 BAT STATIC DETECTOR: SURVEY DATES AND TIMINGS

Table details the dates each SM2 static detector recorded on (highlighted blue), and the number of hours of each night.

MONTH	DATE	SM2_A30_01	SM2_A30_02	SM2_A30_03	SM2_A30_04	SM2_A30_05	SM2_A30_06	SM2_A30_07	SM2_A30_08	SM2_A30_09	SM2_A30_10	SM2_A30_11	SM2_A30_12	SM2_A30_13	SM2_A30_14	SM2_A30_15		
May	19/05/2016	08:21	08:21	08:21	Noise:-excluded	08:21	08:21	08:21	08:21	08:21	08:21	08:21	08:21	08:21	08:21	08:21		
	20/05/2016	08:18	08:18	08:18		08:18	08:18	08:18	08:18	08:18	08:18	08:18	08:18	08:18	08:18	08:18	08:18	
	21/05/2016	08:16	08:16	08:16		08:16	08:16	08:16	08:16	08:16	08:16	08:16	08:16	08:16	08:16	08:16	08:16	
	22/05/2016	08:14	08:14	08:14		08:14	08:14	08:14	08:14	08:14	08:14	08:14	08:14	08:14	08:14	08:14	08:14	
	23/05/2016	08:12	08:12	08:12		08:12	08:12	08:12	08:12	08:12	08:12	08:12	08:12	08:12	08:12	08:12	08:12	
June	15/06/2016	07:36	07:36	07:36	Noise:-excluded	07:36	07:36	07:36	07:36	07:36	SM2: Stolen NA	07:36	07:36	07:36	07:36	07:36		
	16/06/2016	07:36	07:36	07:36		07:36	07:36	07:36	07:36	07:36		07:36	07:36	07:36	07:36	07:36	07:36	
	17/06/2016	07:36	07:36	07:36		07:36	07:36	07:36	07:36	07:36		07:36	07:36	07:36	07:36	07:36	07:36	07:36
	18/06/2016	07:35	07:35	07:35		07:35	07:35	07:35	07:35	07:35		07:35	07:35	07:35	07:35	07:35	07:35	07:35
	19/06/2016	07:35	07:35	07:35		07:35	07:35	07:35	07:35	07:35		07:35	07:35	07:35	07:35	07:35	07:35	07:35
July	12/07/2016	07:56	07:56	07:56	Noise:-excluded	07:56	07:56	07:56	07:56	07:56	NA	NA	NA	NA	NA	07:56		
	13/07/2016	07:58	07:58	07:58		07:58	07:58	07:58	07:58	07:58	07:58	07:58	07:58	07:58	07:58	07:58		
	14/07/2016	08:00	08:00	08:00		08:00	08:00	08:00	08:00	08:00	08:00	08:00	08:00	08:00	08:00	08:00		
	15/07/2016	08:02	08:02	08:02		08:02	08:02	08:02	08:02	08:02	08:02	08:02	08:02	08:02	08:02	08:02		
	16/07/2016	08:04	08:04	08:04		08:04	08:04	08:04	08:04	08:04	08:04	08:04	08:04	08:04	08:04	08:04		
	17/07/2016	08:06	NA	NA		08:06	08:06	08:06	08:06	08:06	08:06	08:06	08:06	08:06	08:06	08:06		
August	19/08/2016	09:45	09:45	09:45	09:45	09:45	09:45	09:45	09:45	09:45	09:45	09:45	09:45	09:45	09:45	09:45		
	20/08/2016	09:48	09:48	09:48	09:48	09:48	NA	09:48	09:48	09:48	09:48	09:48	09:48	09:48	09:48	09:48		
	21/08/2016	09:52	09:52	09:52	09:52	09:52	09:52	09:52	09:52	09:52	09:52	09:52	09:52	09:52	09:52	09:52		
	22/08/2016	09:55	09:55	09:55	09:55	09:55	09:55	09:55	09:55	09:55	09:55	09:55	09:55	09:55	09:55	09:55		
	23/08/2016	09:59	09:59	09:59	09:59	09:59	09:59	09:59	09:59	09:59	09:59	09:59	09:59	09:59	09:59	09:59		
	24/08/2016	10:02	NA	NA	10:02	NA	10:02	10:02	10:02	10:02	10:02	10:02	10:02	10:02	10:02			
September	20/09/2016	11:42	11:42	11:42	11:42	11:42	11:42	Noise:-excluded	11:42	11:42	NA	11:42	11:42	11:42	11:42	11:42		
	21/09/2016	11:45	11:45	11:45	11:45	11:45	11:45		11:45	11:45	11:45	11:45	11:45	11:45	11:45	11:45		
	22/09/2016	11:49	11:49	11:49	11:49	11:49	11:49		11:49	11:49	11:49	11:49	11:49	11:49	11:49	11:49		
	23/09/2016	11:54	11:54	11:54	11:54	11:54	NA		11:54	11:54	11:54	11:54	11:54	11:54	11:54	11:54		
	24/09/2016	11:57	11:57	11:57	11:57	11:57	11:57		11:57	11:57	11:57	11:57	11:57	11:57	11:57	11:57		
	25/09/2016	NA	NA	NA	12:01	NA	12:01		12:01	12:01	12:01	12:01	NA	12:01	12:01	12:01		
October	13/10/2016	13:08	13:08	13:08	13:08	No Access	13:08	13:08	13:08	13:08	13:08	13:08	13:08	Noise:-excluded	13:08	13:08		
	14/10/2016	13:11	13:11	13:11	13:11		13:11	13:11	13:11	13:11	13:11	13:11	13:11		13:11			
	15/10/2016	13:15	13:15	13:15	13:15		13:15	13:15	13:15	13:15	13:15	13:15	13:15		13:15			
	16/10/2016	13:19	13:19	13:19	13:19		13:19	13:19	13:19	13:19	13:19	13:19	13:19		13:19			
	17/10/2016	NA	13:22	13:22	NA		NA	NA	NA	NA	NA	NA	13:22		NA	13:22	NA	
	Total Hours SM2 Recorded	325.46	320.6	320.6	261.49	262.91	316.45	234.99	337.47	337.47	248.68	331.12	329.91	277.38	331.12	337.47		

A30 Bat STATIC DETECTOR: Bat Activity Index

	MYOTIS	PIIP	RHIP	RFER	PLECOTUS	BBARB	NNOC	PPYG	PNATH	NLEI	P50	P40	NNOCNLEI	ESERO	BAT PPH
SM2_A30_01	1.077764	9.780208	0.040165	0.097066	0.020083	0.010041	0.110454	0.043512	0.006694	0.224255	0.010041	0.006694	0.174049	0.010041	11.61106772
SM2_A30_02	6.261905	9.380952	0.047619	0.020408	0	0.020408	0.037415	0.013605	0	0.081633	0.442177	0.006803	0	0.054422	16.36734694
SM2_A30_03	0.078231	2.370748	0.003401	0	0	0	0.006803	0	0	0	0.013605	0	0	0	2.472789116
SM2_A30_04	0.195802	25.91263	0.04005	0.01335	0	0.00445	0.489505	0.160202	0.00445	0.0267	1.793369	0.00445	0.04005	0.00445	28.6894608
SM2_A30_05	1.546682	27.77529	0.025995	0.008665	0	0.004332	0.008665	0.199292	0	0.008665	0.047657	0.004332	0.021662	0.025995	29.67723301
SM2_A30_06	1.123321	19.49067	0.216292	0.034886	0	0.003489	0.034886	0.331415	0	0.020931	0.2442	0.010466	0.006977	0.003489	21.52101866
SM2_A30_07	0.872105	21.61903	0.020864	0.008346	0.008346	0.004173	0	0.025037	0	0.004173	0.008346	0	0.004173	0	22.57458794
SM2_A30_08	0.26442	1.85429	0.020083	0.097066	0	0	0.066942	0.010041	0	0	0.006694	0.003347	0.010041	0.003347	2.336271338
SM2_A30_09	2.339618	41.02533	0.066942	0.013388	0.056901	0	0.528841	0.060248	0	0.739708	0.093719	0	0.190784	0.100413	45.21588754
SM2_A30_10	0.004112	10.04592	0.004112	0	0.004112	0	0.053458	0.004112	0	0	0	0	0	0.004112	10.11993695
SM2_A30_11	1.683103	63.35963	0.006575	1.025641	0.075608	0	0.131492	0.289283	0.006575	0	3.090072	0.003287	0.019724	0	69.69099277
SM2_A30_12	0.009906	2.559023	0	0	0	0	1.251445	0.006604	0	0.108965	0.003302	0.003302	0.01651	0.003302	3.962357603
SM2_A30_13	0.97213	28.4918	0.120016	0.052007	0.048006	0.024003	2.516336	0.080011	0.004001	0.280037	0.07201	0.020003	0.188025	0.07601	32.94439259
SM2_A30_14	0.14547	19.591	0	0.006325	0	0	0.967691	0.01265	0	0.142307	0.003162	0	0.135983	0.034786	21.03937174
SM2_A30_15	0.244112	0.893932	0.051573	0.006876	0.003438	0	0.003438	0.013753	0	0.099708	0.048135	0.003438	0	0.027506	1.395908544

A30 BAT STATIC DETECTOR: MONTHLY BREAKDOWN TOTAL NUMBER OF PASSES

ROW LABELS	BBARB	ESERO	MYOTIS	NLEI	NNOC	NNOCNLEI	P40	P50	PLECOTUS	PNATH	PPIP	PPYG	RFER	RHIP
SM2_A30_15		8	71	29	1		1	14	1		260	4	2	15
June			4								27	3		9
July			6								45		1	
September		3	31	18			1	10	1		107			5
August		3	5	7	1			3			33	1		
October		1	24	4				1			37		1	1
May		1	1								11			
SM2_A30_14		11	46	45	306	43		1			6195	4	2	
June			29		67						927	1	1	
July			12		109						1172	3		
September		5	1	16	12	8		1			286			
August				25	58	33					280			
October		6	2	4	4	2					39		1	
May			2		56						3491			
SM2_A30_13	6	19	243	70	629	47	5	18	12	1	7122	20	13	30
June		3	29		185				2		1379	2	2	4
July	5	4	46		214				5	1	1437	3	7	6
September	1	3	61	20	20	2	2	3			657	2	1	3
August		6	87	50	43	45	3	15			2612	4	3	10
May		3	20		167				5		1037	9		7
SM2_A30_12		1	3	33	379	5	1	1			775	2		
June			1		143						144			
July					79						141	2		

ROW LABELS	BBARB	ESERO	MYOTIS	NLEI	NNOC	NNOCNLEI	P40	P50	PLECOTUS	PNATH	PPIP	PPYG	RFER	RHIP
September		1	2	21	42	2	1	1			83			
August				12	35	3					14			
October					1						28			
May					79						365			
SM2_A30_11			512		40	6	1	940	23	2	19274	88	312	2
June			98		4				2		800	6		
July			151						1		883			
September			17		8			604			4025	13		
August			31		11			8			1610	3		2
October			57		12	6	1	328	14	2	4835	3		
May			158		5				6		7121	63	312	
SM2_A30_10		1	1		13				1		2443	1		1
July			1								934			
September					9						3			
August		1									529	1		1
October					4						8			
May									1		969			
SM2_A30_09		30	699	221	158	57		28	17		12257	18	4	20
June		1	234		6				4		1512	3		1
July			102		24				10		2671	1		2
September		7	256	198	93	49		9			1487			15
August		19	29	21	11	6		18			4082	1	3	2
October			5	2	6	2		1	1		16		1	
May		3	73		18				2		2489	13		
SM2_A30_08		1	79		20	3	1	2			554	3	29	6
June		1	3		1						57	3	28	4
July			53		3						137			

ROW LABELS	BBARB	ESERO	MYOTIS	NLEI	NNOC	NNOCNLEI	P40	P50	PLECOTUS	PNATH	PPIP	PPYG	RFER	RHIP
September			12		5		1	1			22		1	1
August			9		7	1					257			1
October					2	2		1			17			
May			2		2						64			
SM2_A30_07	1		209	1		1		2	2		5181	6	2	5
June	1		151						2		1660			3
July			18								1386		1	
August			38	1		1		2			1935	4		1
October													1	1
May			2								200	2		
SM2_A30_06	1	1	322	6	10	2	3	70			5587	95	10	62
June	1		47		2						987	43		8
July			123		5						889	20	2	37
September			15		1			49			493	5		5
August		1	44	6	1	2	3	13			2008	14	4	7
October			34					8			245	3	2	1
May			59		1						965	10	2	4
SM2_A30_05	1	6	357	2	2	5	1	11			6411	46	2	6
June	1	1	59								1985	11	1	1
July		1	2		2						605	7		
September		2	193	2		4	1	7			950	5		4
August		2	30			1		4			545	10	1	1
May			73								2326	13		
SM2_A30_04	1	1	44	6	110	9	1	403		1	5823	36	3	9
September		1	17		12	3		65		1	3974	13	1	6
August	1		24	6	9	6	1	333			1204	22	2	3
October			3		89			5			645	1		

ROW LABELS	BBARB	ESERO	MYOTIS	NLEI	NNOC	NNOCNLEI	P40	P50	PLECOTUS	PNATH	PPIP	PPYG	RFER	RHIP
SM2_A30_03			23		2			4			697			1
June			2								80			
July											4			
September											5			
August								2			67			
October			4					2			232			1
May			17		2						309			
SM2_A30_02	6	16	1841	24	11		2	130			2758	4	6	14
June	1	1	26		2						529		1	4
July	5	1	13		3						455	3	3	1
September		10	1526		3		2	38			695	1		8
August		3	40	24	2			88			956		1	
October		1	231					4			44			1
May			5		1						79		1	
SM2_A30_01	3	3	322	67	33	52	2	3	6	2	2922	13	29	12
June			59		6						648	1	3	2
July			2		12					2	902	6	16	
September		1	57	47	11	46	1		2		291		3	2
August	2	2	180	13	4	2	1	3	2		690	6	1	1
October				7		4					81		1	1
May	1		24						2		310		5	6
Grand Total	19	98	4772	504	1714	230	18	1627	62	6	78259	340	414	183

A30 Bat STATIC DETECTOR: MONTHLY BREAKDOWN Bat activity Bat passes per hour

	ROW LABELS	BBARB	ESERO	MYOTIS	NLEI	NNOC	NNOCNLEI	P40	P50	PLECOTUS	PNATH	PPIP	PPYG	RFER	RHIP
SM2_A30_15	June	0	0	0.10644	0	0	0	0	0	0	0	0.718467	0.07983	0	0.239489
	July	0	0	0.124844	0	0	0	0	0	0	0	0.93633	0	0.020807	0
	September	0	0.04220597	0.436128	0.253236	0	0	0.014069	0.140687	0.014069	0	1.505346	0	0	0.070343
	August	0	0.05066712	0.084445	0.118223	0.016889	0	0	0.050667	0	0	0.557338	0.016889	0	0
	October	0	0.01903674	0.456882	0.076147	0	0	0	0.019037	0	0	0.704359	0	0.019037	0.019037
	May	0	0.02426595	0.024266	0	0	0	0	0	0	0	0.266926	0	0	0
SM2_A30_14	June	0	0	0.771687	0	1.782863	0	0	0	0	0	24.66738	0.02661	0.02661	0
	July	0	0	0.299252	0	2.718204	0	0	0	0	0	29.22693	0.074813	0	0
	September	0	0.07034328	0.014069	0.225098	0.168824	0.112549	0	0.014069	0	0	4.023635	0	0	0
	August	0	0	0	0.422226	0.979564	0.557338	0	0	0	0	4.728931	0	0	0
	October	0	0.09070295	0.030234	0.060469	0.060469	0.030234	0	0	0	0	0.589569	0	0.015117	0
	May	0	0	0.048532	0	1.358893	0	0	0	0	0	84.71245	0	0	0
SM2_A30_13	June	0	0.0798297	0.771687	0	4.922831	0	0	0	0.05322	0	36.69505	0.05322	0.05322	0.10644
	July	0.124688	0.09975062	1.147132	0	5.336658	0	0	0	0.124688	0.024938	35.83541	0.074813	0.174564	0.149626
	September	0.014069	0.04220597	0.858188	0.281373	0.281373	0.028137	0.028137	0.042206	0	0	9.243106	0.028137	0.014069	0.042206
	August	0	0.10133423	1.469346	0.844452	0.726229	0.760007	0.050667	0.253336	0	0	44.11417	0.067556	0.050667	0.16889
	May	0	0.07279786	0.485319	0	4.052414	0	0	0	0.12133	0	25.1638	0.218394	0	0.169862
SM2_A30_12	June	0	0	0.02661	0	3.805216	0	0	0	0	0	3.831825	0	0	0
	July	0	0	0	0	1.970075	0	0	0	0	0	3.516209	0.049875	0	0
	September	0	0.01406866	0.028137	0.295442	0.590884	0.028137	0.014069	0.014069	0	0	1.167698	0	0	0
	August	0	0	0	0.202668	0.591116	0.050667	0	0	0	0	0.236447	0	0	0

	ROW LABELS	BBARB	ESERO	MYOTIS	NLEI	NNOC	NNOCNLEI	P40	P50	PLECOTUS	PNATH	PPIP	PPYG	RFER	RHIP
	October	0	0	0	0	0.019037	0	0	0	0	0	0.533029	0	0	0
	May	0	0	0	0	1.91701	0	0	0	0	0	8.857074	0	0	0
SM2_A30_11	June	0	0	2.60777	0	0.10644	0	0	0	0.05322	0	21.28792	0.159659	0	0
	July	0	0	3.765586	0	0	0	0	0	0.024938	0	22.01995	0	0	0
	September	0	0	0.287794	0	0.135433	0	0	10.22516	0	0	68.1395	0.220078	0	0
	August	0	0	0.52356	0	0.185779	0	0	0.135112	0	0	27.19135	0.050667	0	0.033778
	October	0	0	0.861678	0	0.181406	0.090703	0.015117	4.958428	0.21164	0.030234	73.09146	0.045351	0	0
	May	0	0	3.834021	0	0.12133	0	0	0	0.145596	0	172.7979	1.528755	7.570978	0
	July	0	0	0.024938	0	0	0	0	0	0	0	23.29177	0	0	0
SM2_A30_10	September	0	0	0	0	0.151873	0	0	0	0	0	0.050624	0	0	0
	August	0	0.01688904	0	0	0	0	0	0	0	0	8.934302	0.016889	0	0.016889
	October	0	0	0	0	0.076147	0	0	0	0	0	0.152294	0	0	0
	May	0	0	0	0	0	0	0	0	0.024266	0	23.51371	0	0	0
	June	0	0.0266099	6.226716	0	0.159659	0	0	0	0.10644	0	40.23417	0.07983	0	0.02661
SM2_A30_09	July	0	0	2.122347	0	0.499376	0	0	0	0.208073	0	55.57636	0.020807	0	0.041615
	September	0	0.09848059	3.601576	2.785594	1.308385	0.689364	0	0.126618	0	0	20.92009	0	0	0.21103
	August	0	0.32089174	0.489782	0.35467	0.185779	0.101334	0	0.304003	0	0	68.94106	0.016889	0.050667	0.033778
	October	0	0	0.095184	0.038073	0.11422	0.038073	0	0.019037	0.019037	0	0.304588	0	0.019037	0
	May	0	0.07279786	1.771415	0	0.436787	0	0	0	0.048532	0	60.39796	0.315457	0	0
	June	0	0.0266099	0.07983	0	0.02661	0	0	0	0	0	1.516764	0.07983	0.745077	0.10644
SM2_A30_08	July	0	0	1.102788	0	0.062422	0	0	0	0	0	2.850603	0	0	0
	September	0	0	0.168824	0	0.070343	0	0.014069	0.014069	0	0	0.30951	0	0.014069	0.014069
	August	0	0	0.152001	0	0.118223	0.016889	0	0	0	0	4.340483	0	0	0.016889

	ROW LABELS	BBARB	ESERO	MYOTIS	NLEI	NNOC	NNOCNLEI	P40	P50	PLECOTUS	PNATH	PPIP	PPYG	RFER	RHIP
	October	0	0	0	0	0.038073	0.038073	0	0.019037	0	0	0.323625	0	0	0
	May	0	0	0.048532	0	0.048532	0	0	0	0	0	1.553021	0	0	0
SM2_A30_07	June	0.02661	0	4.018095	0	0	0	0	0	0.05322	0	44.17243	0	0	0.07983
	July	0	0	0.374532	0	0	0	0	0	0	0	28.83895	0	0.020807	0
	August	0	0	0.641783	0.016889	0	0.016889	0	0.033778	0	0	32.68029	0.067556	0	0.016889
	October	0	0	0	0	0	0	0	0	0	0	0	0	0.019037	0.019037
	May	0	0	0.048532	0	0	0	0	0	0	0	4.853191	0.048532	0	0
	June	0.02661	0	1.250665	0	0.05322	0	0	0	0	0	26.26397	1.144226	0	0.212879
	July	0	0	2.559301	0	0.104037	0	0	0	0	0	18.49771	0.416146	0.041615	0.769871
SM2_A30_06	September	0	0	0.253635	0	0.016909	0	0	0.828542	0	0	8.336152	0.084545	0	0.084545
	August	0	0.02027164	0.891952	0.12163	0.020272	0.040543	0.060815	0.263531	0	0	40.70545	0.283803	0.081087	0.141901
	October	0	0	0.647249	0	0	0	0	0.152294	0	0	4.664002	0.05711	0.038073	0.019037
	May	0	0	1.431691	0	0.024266	0	0	0	0	0	23.41665	0.24266	0.048532	0.097064
	June	0.02661	0.0266099	1.569984	0	0	0	0	0	0	0	52.82065	0.292709	0.02661	0.02661
	July	0	0.02080732	0.041615	0	0.041615	0	0	0	0	0	12.58843	0.145651	0	0
SM2_A30_05	September	0	0.03385813	3.26731	0.033858	0	0.067716	0.016929	0.118503	0	0	16.08261	0.084645	0	0.067716
	August	0	0.04065867	0.60988	0	0	0.020329	0	0.081317	0	0	11.07949	0.203293	0.020329	0.020329
	May	0	0	1.771415	0	0	0	0	0	0	0	56.44261	0.315457	0	0
	September	0	0.01406866	0.239167	0	0.168824	0.042206	0	0.914463	0	0.014069	55.90884	0.182893	0.014069	0.084412
	August	0.016889	0	0.405337	0.101334	0.152001	0.101334	0.016889	5.62405	0	0	20.3344	0.371559	0.033778	0.050667
SM2_A30_04	October	0	0	0.05711	0	1.69427	0	0	0.095184	0	0	12.2787	0.019037	0	0
	June	0	0	0.05322	0	0	0	0	0	0	0	2.128792	0	0	0
	SM2_A30_03	0	0	0.05322	0	0	0	0	0	0	0	2.128792	0	0	0

	ROW LABELS	BBARB	ESERO	MYOTIS	NLEI	NNOC	NNOCNLEI	P40	P50	PLECOTUS	PNATH	PPIP	PPYG	RFER	RHIP
	July	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0
	September	0	0	0	0	0	0	0	0	0	0	0.084645	0	0	0
	August	0	0	0	0	0	0	0	0.040659	0	0	1.362065	0	0	0
	October	0	0	0.060469	0	0	0	0	0.030234	0	0	3.507181	0	0	0.015117
	May	0	0	0.412521	0	0.048532	0	0	0	0	0	7.49818	0	0	0
SM2_A30_02	June	0.02661	0.0266099	0.691857	0	0.05322	0	0	0	0	0	14.07664	0	0.02661	0.10644
	July	0.125	0.025	0.325	0	0.075	0	0	0	0	0	11.375	0.075	0.075	0.025
	September	0	0.16929067	25.83376	0	0.050787	0	0.033858	0.643305	0	0	11.7657	0.016929	0	0.135433
	August	0	0.06098801	0.813173	0.487904	0.040659	0	0	1.788982	0	0	19.43484	0	0.020329	0
	October	0	0.01511716	3.492063	0	0	0	0	0.060469	0	0	0.665155	0	0	0.015117
	May	0	0	0.12133	0	0.024266	0	0	0	0	0	1.91701	0	0.024266	0
SM2_A30_01	June	0	0	1.569984	0	0.159659	0	0	0	0	0	17.24321	0.02661	0.07983	0.05322
	July	0	0	0.041615	0	0.249688	0	0	0	0	0.041615	18.76821	0.124844	0.332917	0
	September	0	0.01692907	0.964957	0.795666	0.18622	0.778737	0.016929	0	0.033858	0	4.926359	0	0.050787	0.033858
	August	0.033778	0.03377808	3.040027	0.219558	0.067556	0.033778	0.016889	0.050667	0.033778	0	11.65344	0.101334	0.016889	0.016889
	October	0	0	0	0.133257	0	0.076147	0	0	0	0	1.541976	0	0.019037	0.019037
	May	0.024266	0	0.582383	0	0	0	0	0	0.048532	0	7.522446	0	0.12133	0.145596

BCP 3A													
Visit Number	Date	Start time	End time	Sunset/sunrise time	Temperature		Cloud cover (oktas)		Wind (Beaufort)		Rain		
					Start	End	Start	End	Start	End	Start	End	
1	22/08/2016	20:24	22:24	20:24	18	16	7	1	0	0	0	0	
2	28/09/2016	19:02	21:04	19:04	17	19	8	8	1	1	1	1	
3	15/06/2017	21:29	23:32	21:32	14	12	0	0	2	0	0	0	
4	10/07/2017	21:30	23:30	21:30	19	18	8	8	0	0	0	0	
5	15/08/2017	20:27	22:24	20:24	18	17	7	6	0	0	0	0	
6	23/08/2017	21:00	22:40	20:40	14	10.4	1	1	0	0	0	0	

BCP 3B													
Visit Number	Date	Start time	End time	Sunset/sunrise time	Temperature		Cloud cover (oktas)		Wind (Beaufort)		Rain		
					Start	End	Start	End	Start	End	Start	End	
1	22/08/2016	20:25	22:25	20:24	18	16	1	1	0	0	0	0	
2	28/09/2016	19:01	21:04	19:04	17	17	8	8	3	3	1	1	
3	15/06/2017	21:32	23:32	21:32	13	12	0	0	2	0	0	0	
4	10/07/2017	21:30	23:30	21:30	17	19	0	8	0	0	0	0	
5	15/08/2017	20:42	22:42	20:42	15	13	1	0	0	0	0	0	
6	23/08/2017	20:25	22:25	20:25	18	16	8	8	0	1	0	0	

BCP 3c													
SCOPED OUT AFTER THIRD SURVEY													
Visit Number	Date	Start time	End time	Sunset/sunrise time	Temperature		Cloud cover		Wind (Beaufort)		Rain		
					Start	End	Start	End	Start	End	Start	End	
1	15/06/2017	21:32	23:32	21:32	15	12	0	2	1	0	0	0	
2	10/07/2017	21:30	23:30	21:30	14	13	0	8	0	0	0	0	
3	08/08/2017	21:01	22:51	20:51	14	13	8	8	3	4	3	0	
4	-	-	-	-	-	-	-	-	-	-	-	-	
5	-	-	-	-	-	-	-	-	-	-	-	-	
6	-	-	-	-	-	-	-	-	-	-	-	-	

BCP 4A													
Visit Number	Date	Start time	End time	Sunset/sunrise time	Temperature		Cloud cover (oktas)		Wind (Beaufort)		Rain		
					Start	End	Start	End	Start	End	Start	End	
1	22/08/2016	20:24	22:24	20:24	17	16	2	2	0	0	0	0	
2	27/09/2016	19:07	21:07	19:07	15	14	7	8	2	2	0	0	
3	12/06/2017	21:30	23:30	21:30	13	12	7	7	0	0	0	0	
4	26/06/2017	21:40	23:36	21:36	18	17	8	0	0	0	0	0	
5	11/07/2017	21:29	23:29	21:29	18	16	8	8	2	2	0	2	
6	14/08/2017	20:42	22:42	20:42	15.9	14.9	6	6	0	0	0	0	

BCP 6													
Visit Number	Date	Start time	End time	Sunset/sunrise time	Temperature		Cloud cover (oktas)		Wind (Beaufort)		Rain		
					Start	End	Start	End	Start	End	Start	End	
1	23/08/2016	20:20	22:22	20:20	17	16	4	4	1	2	0	0	
2	27/09/2016	19:06	21:06	19:06	14.5	13	8	8	1	0	0	0	
3	22/08/2017	20:26	22:26	20:26	19.6	17	8	8	0	0	0	0	
4	24/08/2017	20:23	22:23	20:23	21	17	4	0	0	0	0	0	
5	29/08/2017	20:12	22:12	20:12	16	16	5	3	4	3	0	0	
6	30/08/2017	20:10	22:10	20:10	20	14	7	4	0	0	0	0	

BCP 7													
Visit Number	Date	Start time	End time	Sunset/sunrise time	Temperature		Cloud cover (oktas)		Wind (Beaufort)		Rain		
					Start	End	Start	End	Start	End	Start	End	
1	24/08/2016	20:20	22:20	20:25	16	15	3	6	2	2	0	0	
2	28/09/2016	05:44	07:16	07:16	13	13.5	2	1	1	1	0	0	
3	13/06/2017	21:30	23:31	21:30	16	13	0	0	0	0	0	0	
4	12/07/2017	21:28	23:28	21:28	17	16.1	8	4	1	1	0	0	
5	16/08/2017	20:38	22:34	20:38	18	16	8	6	3	3	1	1	
6	06/09/2017	19:57	21:57	19:57	18.1	13.4	8	8	0	0	0	0	

BCP 8													
SCOPED OUT AFTER SECOND SURVEY													
Visit Number	Date	Start time	End time	Sunset/sunrise time	Temperature		Cloud cover (oktas)		Wind (Beaufort)		Rain		
					Start	End	Start	End	Start	End	Start	End	
1	24/08/2016	20:20	22:20	20:20	19	19	7	8	0	0	0	0	
2	29/09/2017	19:00	21:01	19:01	14	12.5	1	1	4	2	0	0	
3	-	-	-	-	-	-	-	-	-	-	-	-	
4	-	-	-	-	-	-	-	-	-	-	-	-	
5	-	-	-	-	-	-	-	-	-	-	-	-	
6	-	-	-	-	-	-	-	-	-	-	-	-	

BCP 9													
Visit Number	Date	Start time	End time	Sunset/sunrise time	Temperature		Cloud cover (oktas)		Wind (Beaufort)		Rain		
					Start	End	Start	End	Start	End	Start	End	
1	24/08/2016	20:20	22:20	20:20	16	15	2	0	0	0	0	0	
2	28/09/2016	19:03	21:04	19:04	15	12	8	8	3	2	1	1	
3	13/06/2017	21:31	23:31	21:31	17	13	1	1	0	1	0	0	
4	12/07/2017	21:28	23:28	21:28	18	16	7	8	0	0	0	0	
5	16/08/2017	20:38	22:30	20:38	17.5	14.8	8	8	2	2	1	1	
6	17/08/2017	20:32	22:32	20:32	19	19	8	8	2	2	0	0	

BCP 10													
2016 SURVEYS NOT POSSIBLE DUE TO HEALTH AND SAFETY													
Visit Number	Date	Start time	End time	Sunset/sunrise time	Temperature		Cloud cover (oktas)		Wind (Beaufort)		Rain		
					Start	End	Start	End	Start	End	Start	End	
1	13/06/2017	21:30	23:30	21:31	16	13	0	0	0	0	0	0	
2	12/07/2017	21:28	23:28	21:28	17	16	7	7	0	0	0	0	
3	16/08/2017	20:39	22:30	20:38	18	18	8	8	1	1	1	1	
4	17/08/2017	20:36	22:36	20:36	19	16.5	8	8	2	1	0	0	
5	22/08/2017	20:26	22:26	20:26	20	20	8	8	1	1	0	0	
6	07/09/2017	19:51	21:51	19:51	19	18	8	8	3	2	0	0	

BCP 11													
Visit Number	Date	Start time	End time	Sunset/sunrise time	Temperature		Cloud cover (oktas)		Wind (Beaufort)		Rain		
					Start	End	Start	End	Start	End	Start	End	
1	25/08/2016	20:18	22:18	20:18	17	17	8	0	2	0	2	0	
2	29/09/2016	19:01	21:01	19:01	15	14	6	6	2	0	0	0	
3	14/06/2017	21:32	23:32	21:32	18	15	0	0	0	0	0	0	
4	27/06/2017	21:36	23:36	21:36	15	14	8	8	0	0	0	1	
5	13/07/2017	21:27	23:27	21:27	17	16	4	4	1	0	0	0	
6	15/08/2017	20:45	22:45	20:39	14	14	3	5	1	1	0	0	

BCP 12													
Visit Number	Date	Start time	End time	Sunset/sunrise time	Temperature		Cloud cover (oktas)		Wind (Beaufort)		Rain		
					Start	End	Start	End	Start	End	Start	End	
1	25/08/2016	20:18	22:18	20:18	15	14	7	7	1	1	1	0	
2	28/09/2016	19:04	21:04	19:04	16	16	8	8	2	2	1	1	
3	14/06/2017	21:32	23:32	21:32	18	15	7	3	0	0	0	0	
4	27/06/2017	21:35	23:35	21:35	15	15	8	8	1	1	0	1	
5	13/07/2017	21:27	23:27	21:27	16.1	16.1	3	5	2	2	0	0	
6	14/08/2017	20:41	22:41	20:41	17	16	7	7	1	1	0	0	

BCP 13													
Visit Number	Date	Start time	End time	Sunset/sunrise time	Temperature		Cloud cover (oktas)		Wind (Beaufort)		Rain		
					Start	End	Start	End	Start	End	Start	End	
1	25/08/2016	20:18	22:18	20:18	15	14	8	4	1	1	1	0	
2	29/09/2016	19:02	21:02	19:02	13	13	2	2	1	2	0	0	
3	14/06/2017	21:32	23:32	21:32	19	13	6	2	0	0	0	0	
4	27/06/2017	21:36	23:36	21:36	16	13	7	8	0	0	0	1	
5	13/07/2017	21:28	23:28	21:28	14	11	2	1	2	1	0	0	
6	17/08/2017	20:35	22:35	20:35	17	16	8	8	2	3	0	0	

A30 CROSSING POINT SURVEYS:- RAW DATA BATS CROSSING PER SURVEY

CROSSING POINT 1

	TOTAL NUMBER OF BATS CROSSING	USING THE FEATURE	USING THE FEATURE BELOW 5M
Survey 1	2.0	2.0	1.0
Survey 2	0	0	0
Survey 3	3	3	3
Survey 4	26	24	23
Survey 5	0	0	0
Survey 6	0	0	0
Min	0	0	0
Q1	0	0	0
Median	1.0	1.0	0.5
Q3	2.75	2.75	2.5
Max	26.0	24.0	23.0
Box1-hidden	0	0	0
Box2-lower	1	1	0.5
Box3-upper	1.75	1.75	2
Whisker top	23.3	21.3	20.5
Whisker bottom	0	0	0

CROSSING POINT 3A

	TOTAL NUMBER OF BATS CROSSING	USING THE FEATURE	USING THE FEATURE BELOW 5M
Survey 1	7.0	7.0	7.0
Survey 2	12	11	11
Survey 3	28	28	28
Survey 4	140	136	130
Survey 5	6	6	6
Survey 6	33	30	29
	226.0	218.0	211.0
Min	6.0	6.0	6.0
Q1	8.25	8	8
Median	20.0	19.5	19.5
Q3	31.75	29.5	28.75
Max	140.0	136.0	130.0
Box1-hidden	8.25	8	8
Box2-lower	11.75	11.5	11.5
Bo3-upper	11.75	10	9.25
Whisker top	108.3	106.5	101.3
Whisker bottom	2.25	2	2

CROSSING POINT 3B

	TOTAL NUMBER OF BATS CROSSING	USING THE FEATURE	USING THE FEATURE BELOW 5M
Survey 1	4.0	4.0	4.0
Survey 2	1	0	0
Survey 3	39	38	37
Survey 4	37	33	33
Survey 5	48	41	41
Survey 6	36	8	8
	165.0	124.0	123.0
Min	1.0	0.0	0.0
Q1	12	5	5
Median	36.5	20.5	20.5
Q3	38.5	36.75	36
Max	48.0	41.0	41.0
Box1-hidden	12	5	5
Box2-lower	24.5	15.5	15.5
Bo3-upper	2	16.25	15.5
Whisker top	9.5	4.3	5.0
Whisker bottom	11	5	5

CROSSING POINT 4A

	TOTAL NUMBER OF BATS CROSSING	USING THE FEATURE	USING THE FEATURE BELOW 5M
Survey 1	1	1.0	1.0
Survey 2	3	3	3
Survey 3	46	45	44
Survey 4	47	47	38
Survey 5	24	24	24
Survey 6	15	14	14
Min	1.0	1.0	1.0
Q1	6	5.75	5.75
Median	19.5	19.0	19.0
Q3	40.5	39.75	34.5
Max	47.0	47.0	44.0
Box1-hidden	6	5.75	5.75
Box2-lower	13.5	13.25	13.25
Bo3-upper	21	20.75	15.5
Whisker top	6.5	7.3	9.5
Whisker bottom	5	4.75	4.75

CROSSING POINT 4B

	TOTAL NUMBER OF BATS CROSSING	USING THE FEATURE	USING THE FEATURE BELOW 5M
Survey 1	5.0	5.0	5.0
Survey 2	0	0	0
Survey 3	42	16	16
Survey 4	2	2	0
Survey 5	26	6	6
Survey 6	4	4	4
Min	0.0	0.0	0.0
Q1	2.5	2.5	1
Median	4.5	4.5	4.5
Q3	20.75	5.75	5.75
Max	42.0	16.0	16.0
Box1-hidden	2.5	2.5	1
Box2-lower	2	2	3.5
Bo3-upper	16.25	1.25	1.25
Whisker top	21.3	10.3	10.3
Whisker bottom	2.5	2.5	1

CROSSING POINT 6

	TOTAL NUMBER OF BATS CROSSING	USING THE FEATURE	USING THE FEATURE BELOW 5M
Survey 1	14.0	8.0	8.0
Survey 2	8	3	3
Survey 3	181	181	181
Survey 4	99	99	37
Survey 5	36	35	24
Survey 6	58	58	50
Min	8.0	3.0	3.0
Q1	19.5	14.75	12
Median	47.0	46.5	30.5
Q3	88.75	88.75	46.75
Max	181.0	181.0	181.0
Box1-hidden	19.5	14.75	12
Box2-lower	27.5	31.75	18.5
Bo3-upper	41.75	42.25	16.25
Whisker top	92.3	92.3	134.3
Whisker bottom	11.5	11.75	9

CROSSING POINT 7

	TOTAL NUMBER OF BATS CROSSING	USING THE FEATURE / UNDERPASS
Survey 1	1.0	0.0
Survey 2	4	4
Survey 3	25	25
Survey 4	429	429
Survey 5	24	24
Survey 6	108	107
Min	1.0	0.0
Q1	9	9
Median	24.5	24.5
Q3	87.25	86.5
Max	429.0	429.0
Box1-hidden	9	9
Box2-lower	15.5	15.5
Bo3-upper	62.75	62
Whisker top	341.8	342.5
Whisker bottom	8	9

CROSSING POINT 9

	TOTAL NUMBER OF BATS CROSSING	USING THE FEATURE	USING THE FEATURE BELOW 5M
Survey 1	10.0	9.0	6.0
Survey 2	7	6	6
Survey 3	80	75	74
Survey 4	10	6	6
Survey 5	4	4	4
Survey 6	32	18	18
	143.0	118.0	114.0
Min	4.0	4.0	4.0
Q1	7.75	6	6
Median	10.0	7.5	6.0
Q3	26.5	15.75	15
Max	80.0	75.0	74.0
Box1-hidden	7.75	6	6
Box2-lower	2.25	1.5	0
Bo3-upper	16.5	8.25	9
Whisker top	53.5	59.3	59.0
Whisker bottom	3.75	2	2

CROSSING POINT 10

	TOTAL NUMBER OF BATS CROSSING	USING THE FEATURE	USING THE FEATURE BELOW 5M
Survey 1	22.0	18.0	17.0
Survey 2	20	20	17
Survey 3	12	7	7
Survey 4	16	16	16
Survey 5	74	74	69
Survey 6	27	27	27
Min	12.0	7.0	7.0
Q1	17	16.5	16.25
Median	21.0	19.0	17.0
Q3	25.75	25.25	24.5
Max	74.0	74.0	69.0
Box1-hidden	17	16.5	16.25
Box2-lower	4	2.5	0.75
Bo3-upper	4.75	6.25	7.5
Whisker top	48.3	48.8	44.5
Whisker bottom	5	9.5	9.25

CROSSING POINT 11

	TOTAL NUMBER OF BATS CROSSING	USING THE FEATURE	USING THE FEATURE BELOW 5M
Survey 1	0.0	0.0	0.0
Survey 2	10	6	6
Survey 3	297	297	292
Survey 4	208	208	208
Survey 5	377	377	377
Survey 6	145	145	145
Min	0.0	0.0	0.0
Q1	43.75	40.75	40.75
Median	176.5	176.5	176.5
Q3	274.75	274.75	271
Max	377.0	377.0	377.0
Box1-hidden	43.75	40.75	40.75
Box2-lower	132.75	135.75	135.75
Bo3-upper	98.25	98.25	94.5
Whisker top	102.3	102.3	106.0
Whisker bottom	43.75	40.75	40.75

CROSSING POINT 12

	TOTAL NUMBER OF BATS CROSSING	USING THE FEATURE	USING THE FEATURE BELOW 5M
Survey 1	6.0	5.0	5.0
Survey 2	3	1	1
Survey 3	8	8	5
Survey 4	18	18	12
Survey 5	69	66	65
Survey 6	14	14	14
Min	3.0	1.0	1.0
Q1	6.5	5.75	5
Median	11.0	11.0	8.5
Q3	17	17	13.5
Max	69.0	66.0	65.0
Box1-hidden	6.5	5.75	5
Box2-lower	4.5	5.25	3.5
Bo3-upper	6	6	5
Whisker top	52.0	49.0	51.5
Whisker bottom	3.5	4.75	4

CROSSING POINT 13

	TOTAL NUMBER OF BATS CROSSING	USING THE FEATURE	USING THE FEATURE BELOW 5M
Survey 1	29.0	27.0	26.0
Survey 2	3	3	3
Survey 3	45	45	45
Survey 4	59	59	59
Survey 5	24	24	24
Survey 6	22	22	22
Min	3.0	3.0	3.0
Q1	22.5	22.5	22.5
Median	26.5	25.5	25.0
Q3	41	40.5	40.25
Max	59.0	59.0	59.0
Box1-hidden	22.5	22.5	22.5
Box2-lower	4	3	2.5
Bo3-upper	14.5	15	15.25
Whisker top	18.0	18.5	18.8
Whisker bottom	19.5	19.5	19.5

CROSSING POINT 14

	TOTAL NUMBER OF BATS CROSSING	USING THE FEATURE	USING THE FEATURE BELOW 5M
Survey 1	0.0	0.0	0.0
Survey 2	0	0	0
Survey 3	0	0	0
Survey 4	0	0	0
Survey 5	0	0	0
Survey 6			
Min	0.0	0.0	0.0
Q1	0	0	0
Median	0.0	0.0	0.0
Q3	0	0	0
Max	0.0	0.0	0.0
Box1-hidden	0	0	0
Box2-lower	0	0	0
Bo3-upper	0	0	0
Whisker top	0.0	0.0	0.0
Whisker bottom	0	0	0

A30 CROSSING POINT SURVEYS:- DATA FOR CROSSING POINTS SCOPED OUT

CROSSING POINT 2: RAW DATA

SPECIES	TOTAL	TOTAL SEEN CROSSING	OF TOTAL SEEN CROSSING-USING FEATURE	HEARD AND NOT SEEN	CROSSING AT AN UNSAFE HEIGHT (0-5M BATS AND ROADS ALTRINGHAM AND KECH)
All Species	51	17	17	30	20
Common pipistrelle	43	16	16	24	15
Myotis	4	0	0	3	0
Noctule	1	0	0	1	0
Lesser horseshoe	1	0	0	1	0
Unidentified bat species	2	1	1	1	1

CROSSING POINT 2

	TOTAL NUMBER OF BATS CROSSING	USING THE STRUCTURE	CROSSING AT AN UNSAFE HEIGHT (0-5M BATS AND ROADS ALTRINGHAM AND KECH)
Survey 1	15.0	15.0	14.0
Survey 2	2	2	2
Survey 3			
Survey 4			
Survey 5			
Survey 6			
Min	2.0	2.0	2.0
Q1	5.25	5.25	5
Median	8.5	8.5	8.0
Q3	11.75	11.75	11
Max	15.0	15.0	14.0
Box1-hidden	5.25	5.25	5
Box2-lower	3.25	3.25	3
Bo3-upper	3.25	3.25	3
Whisker top	3.3	3.3	3.0
Whisker bottom	3.25	3.25	3

CROSSING POINT 3C RAW DATA

SPECIES	TOTAL	TOTAL SEEN CROSSING	OF TOTAL SEEN CROSSING- USING FEATURE	HEARD AND NOT SEEN	CROSSING AT AN UNSAFE HEIGHT (0-5M BATS AND ROADS ALTRINGHAM AND KECH)
All Species	45	10	10	34	10
Common pipistrelle	42	9	9	33	9
Myotis	1	0	0	1	0
Rhip	1	0	0	1	0
Nnoc	1	1	1	0	1

CROSSING POINT 3C RAW DATA

	TOTAL NUMBER OF BATS CROSSING	USING THE FEATURE	CROSSING AT AN UNSAFE HEIGHT (0-5M BATS AND ROADS ALTRINGHAM AND KECH)
Survey 1	1.0	1.0	1.0
Survey 2	9	9	9
Survey 3	0	0	0
Survey 4			
Survey 5			
Survey 6			
Min	0.0	0.0	0.0
Q1	0.5	0.5	0.5
Median	1.0	1.0	1.0
Q3	5	5	5
Max	9.0	9.0	9.0
Box1-hidden	0.5	0.5	0.5
Box2-lower	0.5	0.5	0.5
Bo3-upper	4	4	4
Whisker top	4.0	4.0	4.0
Whisker bottom	0.5	0.5	0.5

CROSSING POINT 4A RAW DATA

SPECIES	TOTAL	TOTAL CROSSING	OF TOTAL CROSSING- USING FEATURE	HEARD AND NOT SEEN	CROSSING AT AN UNSAFE HEIGHT (0-5M BATS AND ROADS ALTRINGHAM AND KECH)
All Species	109	28	26	66	29
Common pipistrelle	86	27	25	44	28
Myotis	8	0	0	8	0
Noctule	3	0	0	3	0
Leisler's	3	0	0	3	0
Barbastelle	2	0	0	2	0
Greater *horsshoe	1	1	1	0	1
Brown long-eared	6	0	0	6	0

*Possibly crossed the A30 at this point. Unconfirmed

CROSSING POINT 4A RAW DATA

	TOTAL NUMBER OF BATS CROSSING	USING THE STRUCTURE	CROSSING AT AN UNSAFE HEIGHT (0-5M BATS AND ROADS ALTRINGHAM AND KECH)
Survey 1	27.0	25.0	25.0
Survey 2			
Survey 3			
Survey 4			
Survey 5			
Survey 6			
Min	27.0	25.0	25.0
Q1	27	25	25
Median	27.0	25.0	25.0
Q3	27	25	25
Max	27.0	25.0	25.0
Box1-hidden	27	25	25
Box2-lower	0	0	0
Bo3-upper	0	0	0
Whisker top	0.0	0.0	0.0
Whisker bottom	0	0	0

CROSSING POINT 5 RAW DATA

	TOTAL NUMBER OF BATS CROSSING	USING THE STRUCTURE	CROSSING AT AN UNSAFE HEIGHT (0-5M BATS AND ROADS ALTRINGHAM AND KECH)
Survey 1	27.0	24.0	24.0
Survey 2			
Survey 3			
Survey 4			
Survey 5			
Survey 6			
Min	27.0	24.0	24.0
Q1	27	24	24
Median	27.0	24.0	24.0
Q3	27	24	24
Max	27.0	24.0	24.0
Box1-hidden	27	24	24
Box2-lower	0	0	0
Bo3-upper	0	0	0
Whisker top	0.0	0.0	0.0
Whisker bottom	0	0	0

CROSSING POINT 8 RAW DATA

SPECIES	TOTAL	TOTAL CROSSING	OF TOTAL CROSSING-USING FEATURE	HEARD AND NOT SEEN	CROSSING AT AN UNSAFE HEIGHT (0-5M BATS AND ROADS ALTRINGHAM AND KECH)
All Species	87	42	42	45	42
Common pipistrelle	63	35	35	28	35
Myotis	4	1	1	3	1
Leisler's	1	0	0	1	0
Soprano pipistrelle	17	6	6	11	6
Lesser horseshoe	1	0	0	1	0
Greater horseshoe	1	0	0	1	0

CROSSING POINT 8 RAW DATA

	TOTAL NUMBER OF BATS CROSSING	USING THE STRUCTURE	BELOW 5M
Survey 1	33.0	33.0	33.0
Survey 2	9	9	9
Survey 3			
Survey 4			
Survey 5			
Survey 6			
Min	9.0	9.0	9.0
Q1	15	15	15
Median	21.0	21.0	21.0
Q3	27	27	27
Max	33.0	33.0	33.0
Box1-hidden	15	15	15
Box2-lower	6	6	6
Bo3-upper	6	6	6
Whisker top	6.0	6.0	6.0
Whisker bottom	6	6	6

A30 CROSSING POINT SURVEYS: SUMMARY DATA FOR TABLE 3.5.1 (USING LINEAR FEATURE ONLY)

	NUMBER OF BATS RECORDED CROSSING PROPOSED SCHEME												
	CP1	CP3A	CP3B	CP4A	CP4B	CP6	CP7	CP9	CP10	CP11	CP12	CP13	
Survey 1	2.0	7.0	4.0	1	5.0	14.0	1.0	10.0	22.0	0.0	6.0	29.0	
Survey 2	0	12	1	3	0	8	4	7	20	10	3	3	
Survey 3	3	28	39	46	42	181	25	80	12	297	8	45	
Survey 4	24	140	37	47	2	99	429	10	16	208	18	59	
Survey 5	0	6	48	24	26	36	24	4	74	377	69	24	
Survey 6	0	33	36	15	4	58	108	32	27	145	14	22	
Min	0.0	6.0	1.0	1.0	0.0	8.0	1.0	4.0	12.0	0.0	3.0	3.0	
Q1	0	8.25	12	6	2.5	19.5	9	7.75	17	43.75	6.5	22.5	
Median	1.0	20.0	36.5	19.5	4.5	47.0	24.5	10.0	21.0	176.5	11.0	26.5	
Q3	2.75	31.75	38.5	40.5	20.75	88.75	87.25	26.5	25.75	274.75	17	41	
Max	24.0	140.0	48.0	47.0	42.0	181.0	429.0	80.0	74.0	377.0	69.0	59.0	
Box1-hidden	0	8.25	12	6	2.5	19.5	9	7.75	17	43.75	6.5	22.5	
Box2-lower	1.0	11.8	24.5	13.5	2.0	27.5	15.5	2.3	4.0	132.8	4.5	4.0	
Box3-upper	1.8	11.8	2.0	21.0	16.3	41.8	62.8	16.5	4.8	98.3	6.0	14.5	
Whisker top	21.3	108.3	9.5	6.5	21.3	92.3	341.8	53.5	48.3	102.3	52.0	18.0	
Whisker bottom	0.0	2.3	11.0	5.0	2.5	11.5	8.0	3.8	5.0	43.8	3.5	19.5	

A30 CROSSING POINT SURVEYS: THERMAL CAMERA USAGE

	CP1	CP3A	CP3B	CP4A	CP4B	CP6	CP7	CP9	CP10	CP11	CP12	CP13
Survey 1	No thermal imagers	No thermal imagers	No thermal imagers	No thermal imagers	No thermal imagers	No thermal imagers	No thermal imagers	No thermal imagers	No thermal imagers	No thermal imagers	No thermal imagers	No thermal imagers
Survey 2	No thermal imagers	No thermal imagers	No thermal imagers	No thermal imagers	No thermal imagers	No thermal imagers	No thermal imagers	No thermal imagers	No thermal imagers	No thermal imagers	No thermal imagers	No thermal imagers
Survey 3	No thermal imagers	Thermal imagers used	Thermal imagers used	Thermal imagers used	Thermal imagers used	Thermal imagers used	Thermal imagers used	Thermal imagers used	No thermal imagers	Thermal imagers used	No thermal imagers	Thermal imagers used
Survey 4	No thermal imagers	Thermal imagers used	Thermal imagers used	Thermal imagers used	Thermal imagers used	Thermal imagers used	Thermal imagers used	Thermal imagers used	No thermal imagers	Thermal imagers used	No thermal imagers	Thermal imagers used
Survey 5	No thermal imagers	Thermal imagers used	Thermal imagers used	Thermal imagers used	Thermal imagers used	Thermal imagers used	Thermal imagers used	Thermal imagers used	No thermal imagers	Thermal imagers used	No thermal imagers	Thermal imagers used
Survey 6	No thermal imagers	Thermal imagers used	Thermal imagers used	Thermal imagers used	Thermal imagers used	Thermal imagers used	Thermal imagers used	Thermal imagers used	No thermal imagers	Thermal imagers used	No thermal imagers	Thermal imagers used

A30 LANDSCAPE SCALE SURVEYS:- SURVEY DETAILS

ROUTE	DIRECTION	DATE	DISTANCE (M)	SUNSET	SUNSET (MIN)	SPOT START TIME	SPOT START TIME (MIN)	TIME AFTER SUNSET (MIN)	TEMP DEGREES C	WIND	HABITAT
1	Away	24/07/2017	0	21:14	1274.00	21:44	1304.00	30.00	16	2	1
1	Away	24/07/2017	100	21:14	1274.00	21:55	1315.00	41.00	16	2	1
1	Away	24/07/2017	200	21:14	1274.00	22:06	1326.00	52.00	17	3	2
1	Away	24/07/2017	300	21:14	1274.00	22:19	1339.00	65.00	16	3	2
1	Away	24/07/2017	400	21:14	1274.00	22:30	1350.00	76.00	16	2	2
1	Away	24/07/2017	500	21:14	1274.00	22:42	1362.00	88.00	16	2	2
1	Away	24/07/2017	600	21:14	1274.00	22:53	1373.00	99.00	16	2	2
1	Away	24/07/2017	700	21:14	1274.00	23:04	1384.00	110.00	16	2	2
1	Away	24/07/2017	800	21:14	1274.00	23:15	1395.00	121.00	16	2	2
1	Away	24/07/2017	900	21:14	1274.00	23:27	1407.00	133.00	16	2	2
1	Away	24/07/2017	1000	21:14	1274.00	23:38	1418.00	144.00	16	2	2
2	Towards	24/07/2017	0	21:14	1274.00	23:30	1410.08	136.08	16	1	2
2	Towards	24/07/2017	100	21:14	1274.00	23:25	1405.00	131.00	16	1	3
2	Towards	24/07/2017	200	21:14	1274.00	23:14	1394.00	120.00	16	1	3
2	Towards	24/07/2017	300	21:14	1274.00	23:03	1383.10	109.10	16	1	2
2	Towards	24/07/2017	400	21:14	1274.00	22:51	1371.67	97.67	17	1	2
2	Towards	24/07/2017	500	21:14	1274.00	22:40	1360.32	86.32	17	1	3
2	Towards	24/07/2017	600	21:14	1274.00	22:29	1349.32	75.32	16	1	3
2	Towards	24/07/2017	700	21:14	1274.00	22:18:10	1338.17	64.17	16	1	3
2	Towards	24/07/2017	800	21:14	1274.00	22:07:00	1327.00	53.00	16	1	2
2	Towards	24/07/2017	900	21:14	1274.00	21:55:30	1315.50	41.50	16	1	3
2	Towards	24/07/2017	1000	21:14	1274.00	21:44	1304.00	30.00	16	1	3
4	Towards	25/07/2017	0	21:13	1273.00	23:39:00	1419.00	146.00	18	0	2
4	Towards	25/07/2017	100	21:13	1273.00	22:26:32	1346.53	73.53	18	0	4
4	Towards	25/07/2017	200	21:13	1273.00	22:15:04	1335.07	62.07	18	0	4
4	Towards	25/07/2017	300	21:13	1273.00	22:03:40	1323.67	50.67	18	0	2
4	Towards	25/07/2017	400	21:13	1273.00	22:52:24	1372.40	99.40	18	0	5
4	Towards	25/07/2017	500	21:13	1273.00	22:40:20	1360.33	87.33	18	0	5
4	Towards	25/07/2017	600	21:13	1273.00	22:27:26	1347.43	74.43	19	0	2
4	Towards	25/07/2017	700	21:13	1273.00	22:16:25	1336.42	63.42	19	0	3
4	Towards	25/07/2017	800	21:13	1273.00	22:05:18	1325.30	52.30	18	0	3
4	Towards	25/07/2017	900	21:13	1273.00	21:54:14	1314.23	41.23	18	0	3
4	Towards	25/07/2017	1000	21:13	1273.00	21:43:00	1303.00	30.00	18	0	2
4	Away	27/07/2017	0	21:12	1272.00	21:45:54	1305.90	33.90	16	3	2
4	Away	27/07/2017	100	21:12	1272.00	21:58:01	1318.02	46.02	15	1	4
4	Away	27/07/2017	200	21:12	1272.00	22:09:26	1329.43	57.43	15	1	4
4	Away	27/07/2017	300	21:12	1272.00	22:20:31	1340.52	68.52	15	1	2

ROUTE	DIRECTION	DATE	DISTANCE (M)	SUNSET	SUNSET (MIN)	SPOT START TIME	SPOT START TIME (MIN)	TIME AFTER SUNSET (MIN)	TEMP DEGREES C	WIND	HABITAT
4	Away	27/07/2017	400	21:12	1272.00	22:31:26	1351.43	79.43	15	0	5
4	Away	27/07/2017	500	21:12	1272.00	22:43:06	1363.10	91.10	16	1	5
4	Away	27/07/2017	600	21:12	1272.00	22:55:55	1375.92	103.92	15	1	2
4	Away	27/07/2017	700	21:12	1272.00	23:06:50	1386.83	114.83	15	1	3
4	Away	27/07/2017	800	21:12	1272.00	23:17:42	1397.70	125.70	15	2	3
4	Away	27/07/2017	900	21:12	1272.00	23:28:34	1408.57	136.57	14	1	3
4	Away	27/07/2017	1000	21:12	1272.00	23:39:36	1419.60	147.60	14	1	2
5	Away	25/07/2017	0	21:13	1273.00	21:43:00	1303.00	30.00	17	1	1
5	Away	25/07/2017	100	21:13	1273.00	21:54:18	1314.30	41.30	19	1	1
5	Away	25/07/2017	200	21:13	1273.00	22:05:36	1325.60	52.60	18	1	1
5	Away	25/07/2017	300	21:13	1273.00	22:16:58	1336.97	63.97	18	1	3
5	Away	25/07/2017	400	21:13	1273.00	22:28:21	1348.35	75.35	17	1	2
5	Away	25/07/2017	500	21:13	1273.00	22:40:34	1360.57	87.57	19	1	5
5	Away	25/07/2017	600	21:13	1273.00	22:52:01	1372.02	99.02	20	1	5
5	Away	25/07/2017	700	21:13	1273.00	23:03:21	1383.35	110.35	20	1	5
5	Away	25/07/2017	800	21:13	1273.00	23:14:59	1394.98	121.98	20	1	5
5	Away	25/07/2017	900	21:13	1273.00	23:26:13	1406.22	133.22	20	1	4
5	Away	25/07/2017	1000	21:13	1273.00	23:38:05	1418.08	145.08	21	1	4
6	Away	27/07/2017	0	21:12	1272.00	21:43:10	1303.17	31.17	18.9	4	3
6	Away	27/07/2017	100	21:12	1272.00	21:54:11	1314.18	42.18	15.2	7	3
6	Away	27/07/2017	200	21:12	1272.00	22:06:40	1326.67	54.67	14.2	0	4
6	Away	27/07/2017	300	21:12	1272.00	22:14:55	1334.92	62.92	14.5	5	4
6	Away	27/07/2017	400	21:12	1272.00	22:26:53	1346.88	74.88	15.2	4	4
6	Away	27/07/2017	500	21:12	1272.00	22:39:38	1359.63	87.63	16.7	0	4
6	Away	27/07/2017	600	21:12	1272.00	22:52:24	1372.40	100.40	17	3	4
6	Away	27/07/2017	700	21:12	1272.00	23:05:15	1385.25	113.25	16.4	0	4
6	Away	27/07/2017	800	21:12	1272.00	23:18:13	1398.22	126.22	17.3	0.1	3
6	Away	27/07/2017	900	21:12	1272.00	23:30:10	1410.17	138.17	15.4	0	4
6	Away	27/07/2017	1000	21:12	1272.00	23:42:17	1422.28	150.28	15.2	5	3
7	Away	26/07/2017	0	21:13	1273.00	21:43:00	1303.00	30.00	17	1	5
7	Away	26/07/2017	100	21:13	1273.00	21:54:40	1314.67	41.67	16	0	5
7	Away	26/07/2017	200	21:13	1273.00	22:07:25	1327.42	54.42	16	0	5
7	Away	26/07/2017	300	21:13	1273.00	22:18:41	1338.68	65.68	16	1	5
7	Away	26/07/2017	400	21:13	1273.00	22:29:45	1349.75	76.75	17	0	5
7	Away	26/07/2017	500	21:13	1273.00	22:40:55	1360.92	87.92	16	0	4
7	Away	26/07/2017	600	21:13	1273.00	22:55:20	1375.33	102.33	16	1	5
7	Away	26/07/2017	700	21:13	1273.00	23:09:05	1389.08	116.08	16	2	5
7	Away	26/07/2017	800	21:13	1273.00	23:20:50	1400.83	127.83	16	1	5
7	Away	26/07/2017	900	21:13	1273.00	23:32:00	1412.00	139.00	16	0	5

ROUTE	DIRECTION	DATE	DISTANCE (M)	SUNSET	SUNSET (MIN)	SPOT START TIME	SPOT START TIME (MIN)	TIME AFTER SUNSET (MIN)	TEMP DEGREES C	WIND	HABITAT
7	Away	26/07/2017	1000	21:13	1273.00	23:43:40	1423.67	150.67	16	1	5
8	Away	26/07/2017	0	21:12	1272.00	21:51:38	1311.63	39.63	17	1	3
8	Away	26/07/2017	100	21:12	1272.00	22:02:35	1322.58	50.58	16	1	3
8	Away	26/07/2017	200	21:12	1272.00	22:13:45	1333.75	61.75	16	1	3
8	Away	26/07/2017	300	21:12	1272.00	22:25:07	1345.12	73.12	16	0	3
8	Away	26/07/2017	400	21:12	1272.00	22:36:33	1356.55	84.55	16	1	5
8	Away	26/07/2017	500	21:12	1272.00	22:47:42	1367.70	95.70	16	1	5
8	Away	26/07/2017	600	21:12	1272.00	22:58:43	1378.72	106.72	16	1	5
8	Away	26/07/2017	700	21:12	1272.00	23:09:43	1389.72	117.72	16	1	5
8	Away	26/07/2017	800	21:12	1272.00	23:20:41	1400.68	128.68	16	1	4
8	Away	26/07/2017	900	21:12	1272.00	23:32:01	1412.02	140.02	15	1	5
8	Away	26/07/2017	1000	21:12	1272.00	23:43:48	1423.80	151.80	16	1	5
9	Toward	26/07/2017	0	21:12	1272.00	23:51:01	1431.02	159.02	15	2	2
9	Toward	26/07/2017	100	21:12	1272.00	23:41:20	1421.33	149.33	14	1	2
9	Toward	26/07/2017	200	21:12	1272.00	23:30:15	1410.25	138.25	14	1	2
9	Toward	26/07/2017	300	21:12	1272.00	23:19:01	1399.02	127.02	14	1.5	3
9	Toward	26/07/2017	400	21:12	1272.00	23:07:45	1387.75	115.75	14	1.5	3
9	Toward	26/07/2017	500	21:12	1272.00	22:56:37	1376.62	104.62	14	1.5	3
9	Toward	26/07/2017	600	21:12	1272.00	22:44:43	1364.72	92.72	14	1	3
9	Toward	26/07/2017	700	21:12	1272.00	22:33:06	1353.10	81.10	14	1	3
9	Toward	26/07/2017	800	21:12	1272.00	22:22:16	1342.27	70.27	14	1	5
9	Toward	26/07/2017	900	21:12	1272.00	22:11:08	1331.13	59.13	14	0	3
9	Toward	26/07/2017	1000	21:12	1272.00	21:59:09	1319.15	47.15	14	0	3
10	Away	27/07/2017	0	21:12	1272.00	21:42:00	1302.00	30.00	15	2	2
10	Away	27/07/2017	100	21:12	1272.00	21:53:30	1313.50	41.50	14	1	2
10	Away	27/07/2017	200	21:12	1272.00	22:04:40	1324.67	52.67	14	1	2
10	Away	27/07/2017	300	21:12	1272.00	22:15:55	1335.92	63.92	14	1.5	2
10	Away	27/07/2017	400	21:12	1272.00	22:27:05	1347.08	75.08	14	1.5	2
10	Away	27/07/2017	500	21:12	1272.00	22:38:10	1358.17	86.17	14	1.5	2
10	Away	27/07/2017	600	21:12	1272.00	22:49:35	1369.58	97.58	14	1	2
10	Away	27/07/2017	700	21:12	1272.00	23:00:35	1380.58	108.58	14	1	2
10	Away	27/07/2017	800	21:12	1272.00	23:11:50	1391.83	119.83	14	1	2
10	Away	27/07/2017	900	21:12	1272.00	23:23:00	1403.00	131.00	14	0	2
10	Away	27/07/2017	1000	21:12	1272.00	23:34:10	1414.17	142.17	14	0	2

A30 LANDSCAPE SCALE SURVEYS:- R STATISTICAL PACKAGE RAW OUTPUT

```
> #Attach the data:
> attach(bats)
>
> #Tell R about the variables (numeric or factors):
> bats$Pass<-as.numeric(bats$Pass)
> bats$Dist<-as.numeric(bats$Dist)
> bats$Time<-as.numeric(bats$Time)
> bats$Hab<-as.factor(bats$Hab)
> bats$Route<-as.factor(bats$Route)
>
> #Displays the structure of the data and variable types:
> str(bats)
'data.frame': 110 obs. of 5 variables:
 $ Route: Factor w/ 9 levels "1","2","4","5",...: 1 1 1 1 1 1 1 1 1 1 ...
 $ Dist : num 0 100 200 300 400 500 600 700 800 900 ...
 $ Time : num 30 41 52 65 76 88 99 110 121 133 ...
 $ Pass : num 0 0 3 10 38 8 20 15 4 17 ...
 $ Hab : Factor w/ 5 levels "1","2","3","4",...: 1 1 2 2 2 2 2 2 2 2 ...
>
> #Install the packages required for the analysis
> install.packages("geepack")
Warning: package 'geepack' is in use and will not be installed
> install.packages("MESS")
Warning: package 'MESS' is in use and will not be installed
> install.packages("xlsx")
trying URL 'https://mirrors.ebi.ac.uk/CRAN/bin/windows/contrib/3.3/xlsx_0.5.7.zip'
Content type 'application/zip' length 401439 bytes (392 KB)
downloaded 392 KB

package 'xlsx' successfully unpacked and MD5 sums checked

The downloaded binary packages are in
 C:\Users\marianne.curtis\AppData\Local\Temp\RtmpI9oxzK\downloaded_packages
> install.packages("plotrix")
Warning: package 'plotrix' is in use and will not be installed
>
> #Load the packages required for the analysis
> library(geepack)
> library(MESS)
> library(xlsx)
Loading required package: rJava
Error : .onLoad failed in loadNamespace() for 'rJava', details:
 call: fun(libname, pkgname)
 error: JAVA_HOME cannot be determined from the Registry
Error: package 'rJava' could not be loaded
> library(plotrix)
>
> #Log the number of bat passes:
> LPass<-log(Pass+1)
>
> #Run models with different combinations of variables:
> M1<-geeglm(LPass~Dist+Hab+Time, family=gaussian, data=bats,id =Route, corstr="ar1", std.err="fij")
> M2<-geeglm(LPass~Dist+Hab+poly(Time,2,raw=TRUE), family=gaussian, data=bats,id =Route, corstr="ar1", std.err="fij")
> M3<-geeglm(LPass~Dist+Time, family=gaussian, data=bats,id =Route, corstr="ar1", std.err="fij")
> M4<-geeglm(LPass~Dist+poly(Time,2,raw=TRUE), family=gaussian, data=bats,id =Route, corstr="ar1", std.err="fij")
> M5<-geeglm(LPass~Dist+Hab, family=gaussian, data=bats,id =Route, corstr="ar1", std.err="fij")
> M6<-geeglm(LPass~Dist, family=gaussian, data=bats,id =Route, corstr="ar1", std.err="fij")
>
> #Use QIC model selection, choose model with lowest QICu:
> print(QIC(M1,M2,M3,M4,M5,M6),digits=6)
```

```

>
> #View the model output:
> summary(M5)

Call:
geeglm(formula = LPass ~ Dist + Hab, family = gaussian, data = bats,
        id = Route, corstr = "ar1", std.err = "fij")

Coefficients:
              Estimate Std.err   Wald Pr(>|W|)
(Intercept) 0.038342 0.097546    0.15 0.69427
Dist        0.001078 0.000289   13.91 0.00019 ***
Hab2       1.077039 0.132938   65.64 5.6e-16 ***
Hab3       1.094199 0.125331   76.22 < 2e-16 ***
Hab4       1.170349 0.086638  182.48 < 2e-16 ***
Hab5       1.486805 0.177868   69.87 < 2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Estimated Scale Parameters:
              Estimate Std.err
(Intercept)    1.63  0.0807

Correlation: Structure = ar1 Link = identity

Estimated Correlation Parameters:
              Estimate Std.err
alpha        0.53  0.0527
Number of clusters: 9  Maximum cluster size: 22
>
> #Model predictions for distance with other variables held constant:
>
> #Plot model predictions:
> All_new_Dist<-data.frame(Dist=seq(0,1000,length=11),Hab=c("5"))
> logPass_pred<-predict(M5,newdata=All_new_Dist,type="response")
> par(mar=c(4,4,4,4.5))
> count.overplot(Dist,LPass, cex.axis=1.2, pch=20,tol=0.2,xlab="Distance (m)",
+ ylab = "log(bat passes+1)", cex.lab=1.5,font=1,las=2,xaxt="n")
> xax<-c(0,200,400,600,800,1000)
> axis(1,at=xax,cex.axis=1.2,font=1)
> original_scale<-c(0,2,5,10,20,50,100,200,500,1000)
> original_scale_position<-log(original_scale+1)
> axis(side=4,at=original_scale_position,labels=original_scale, cex.axis=1.2,las=2)
> mtext(side = 4, line = 3.5, "No. bat passes",cex=1.5)
> lines(All_new_Dist$Dist, logPass_pred,lwd=2, lty=1)
>
> #Shows predictions for every 100 m (with habitat held constant at grade 5)
> Allpred_table_Dist<-cbind(All_new_Dist,logPass_pred)
> Allpred_table_Dist
      Dist Hab logPass_pred
1         0  5          1.53
2        100  5          1.63
3        200  5          1.74
4        300  5          1.85
5        400  5          1.96
6        500  5          2.06
7        600  5          2.17
8        700  5          2.28
9        800  5          2.39
10       900  5          2.50
>
> #can use values to calculate predicted percentage increase =(b-a)/a*100
> #Percentage change = 83%
>
> #Clear the R console and detach the data at end of session
>
> rm(list = ls())
> detach(bats)
> |

```


If you need help accessing this or any other Highways England information, please call **0300 123 5000** and we will help you.