



CLAVERTON DOWN CAMPUS, UNIVERSITY OF BATH

Horseshoe Bat Activity Surveys

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Horseshoe Bat Activity Surveys for the University of Bath Campus

Client: University of Bath

Reference: J006566

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Issue:	Date:	Written by:	Reviewed by:	Amended by:	Approved by:
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NON-TECHNICAL SUMMARY

Site location and size	Claverton Down Campus, University of Bath; ST 77083 64651; 74.5ha
Scope and purpose of works	Update Horseshoe Bat Activity Surveys. Previous surveys were undertaken in 2017 by Ecosulis (job ref: J006306). The purpose of this survey is to inform the proposed masterplan for development on site.
Dates of site visits and names of surveyors	Bat surveys were undertaken between April and October 2019 led by Annie Hatt, Chloe Tustain, Sofie Borek and Joseph Millington.
Overview	<p>During both the activity surveys and static detector recordings, horseshoe bats were recorded foraging and commuting most frequently along the eastern boundary of the site. The western edge of the transect also had similar numbers of horseshoe bats. The results of the 2019 survey were similar to those of the survey carried out in 2017, which also found the eastern tree line being used by horseshoe bats. However, many more records of horseshoe bats were also found along the southern boundary of the site in 2017 compared with the 2019 survey results.</p> <p>Overall, the surveys recorded moderate levels of common bat species activity along the boundaries of the site and across the central parkland area. There were low levels of bat activity across the rest of the site. In the 2017 surveys, this was also the case with higher levels of activity around the pond. The two most commonly recorded species were <i>Pipistrelle</i> and <i>Nyctalus/Eptesicus</i> species.</p>
Action required for planning and/or legal compliance	<p>Boundary habitats should be retained with an appropriate buffer. Woodland habitats should have a minimum 10m green buffer and hedgerows should have a 5m buffer to protect these corridors for bats. Areas of mature trees around the lake and central parkland on site should be retained.</p> <p>Retained habitats should be maintained as dark corridors to ensure continued use by horseshoe bats. Lighting levels should not exceed current levels, and a sensitive lighting scheme is required for the site with measures to maintain dark corridors for bats and reduce light spill onto adjacent and retained habitats.</p>
Recommendations for ecological enhancement (Site ecological enhancement is required under current planning policy)	To enhance the site for horseshoe bats, boundary vegetation should be retained and enhanced through additional planting, appropriate management (reduced cutting) and the creation of new dark corridors. Planting native species, including night-scented species and fruit and nut-bearing species will also provide a benefit to all species of bats.



	<p>Enhancing the central parkland area for other common bat species through creation of wildflower areas and reduced cutting within grassland edges.</p>
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CONTENTS

1	Introduction	1
	Objectives of Study	1
	General Description of Site	1
	Nomenclature	2
2	Methods	3
	Bat Activity Transect Surveys	3
3	Results	6
	Bat Activity Transect Surveys	6
4	Assessment & Recommendations	11
	Ecological Opportunities	12
5	Limitations of Survey and Report	13
	REFERENCES/BIBLIOGRAPHY	I
	Appendix I: Species List	II
	Appendix II: Full Bat Activity Survey Results	III
	Appendix III: Full Bat Static Detector Results	IV
	Appendix IV: 2017 Original Transect and Static Locations	VI



1 INTRODUCTION

- 1.1 In February 2019, Ecosulis was commissioned by the University of Bath to undertake update horseshoe bat activity surveys of land at Claverton Down Campus, University of Bath.
- 1.2 The purpose of the survey is to inform the proposed masterplan for the site, as well as subsequent planning applications for the campus.
- 1.3 Ecologists from Ecosulis visited the site between April and October 2019 to undertake the surveys. Access was provided by the landowner.
- 1.4 Previous surveys that have been undertaken by Ecosulis on site include: a Bat Activity Survey in 2011 (report ref: UNIBAT-UNITBAT-3366), a Preliminary Ecological Appraisal, which was last updated in May 2017 (report ref: J006306), and a Horseshoe Bat Activity Survey, which was carried out between April and October 2017 (report ref: J006306). All bat surveys have previously recorded horseshoe bats utilising the site.
- 1.5 The internationally important designation of Bath and Bradford-on-Avon Special Area of Conservation (SAC) lies within 1km of the Claverton Down Campus. This SAC is designated for its valuable greater and lesser horseshoe bat populations, and is used as both summer and hibernation roosts.

Objectives of Study

- 1.6 The objectives of this study are: to provide information on the existing ecological conditions at the site with regards to horseshoe bats; to inform the masterplan of the site, due to its close proximity to the Bath and Bradford-on-Avon SAC; to identify potential constraints and opportunities that horseshoe bats may pose to the development plans; and to identify further ecological studies that may be required to ensure that horseshoe bats are fully considered within the proposals.

General Description of Site

- 1.7 The site is dominated by buildings, hard-standing and amenity grassland, which form the main campus on site. The buildings dominate the northern and north-central part of the site. Amenity grassland, largely in the form of sports fields, dominates the southern and eastern parts of the site. A lake is present within the centre of the site surrounded by amenity grassland and mature trees.
- 1.8 At the northern and south-eastern edges of the site are areas of semi-natural broadleaved woodland and there is an area of scattered broadleaved trees in the



north-west of the site. Other borders include intact native species-rich hedges to the east and south-east of the site.

Nomenclature

- 1.9 The common name only of flora and fauna species is given in the main text of this report; however, Latin names are used for species where no common name is available. A full list of all species recorded on site during the surveys is given in Appendix I with their Latin names. All plant names follow the nomenclature of Stace (2010).



2 METHODS

Bat Activity Transect Surveys

- 2.1 Evening bat activity surveys were undertaken on the dates shown in Table 1 below. All surveys were undertaken in accordance with the Lesser Horseshoe Bat Conservation Handbook (The Vincent Wildlife Trust, 2008), the South Hams SAC Guidance (2019), the Bat Mitigation Guidelines (English Nature, 2004) and Bat Surveys for Professional Ecologists: Good Practice Guidelines (Bat Conservation Trust, 2016).
- 2.2 The 2019 survey has a different proposed transect route from the 2017 survey, covering areas further north of the site and excluding areas in the south-eastern corner. A map of the transect carried out for these surveys can be found in Figure 1. The 2017 survey transect can be found within Appendix IV for comparison.

Table 1: Bat Activity Transect Survey Dates

Date	Surveyor	Start	End	Weather
16 th April 2019	Sofie Borek, Chloe Tustain	20:05	23:05	Cool and calm Start: 100% cloud cover, 13°C End: 80% cloud cover, 10°C, no precipitation
14 th May 2019	Joseph Millington, Chloe Tustain	20:52	23:52	Cool and calm Start: 5% cloud cover, 15°C End: 5% cloud cover, 11°C, no precipitation
17 th June 2019	Joseph Millington, Chloe Tustain	21:29	00:29	Warm and calm Start: 100% cloud cover, 17°C End: 70% cloud cover, 15°C, no precipitation
1 st July 2019	Sofie Borek, Chloe Tustain	21:29	00:29	Cool and calm Start: 10% cloud cover, 17°C End: 5% cloud cover, 15°C, no precipitation
25 th July 2019	Sofie Borek, Joseph Millington	21:08	23:08	Warm and calm Start: 50% cloud cover, 24°C End: 50% cloud cover, 20°C, no precipitation
15 th August 2019	Sofie Borek, Darryn Nash	20:32	23:32	Cool and calm Start: 0% cloud cover, 15°C End: 0% cloud cover, 14°C, no precipitation



Date	Surveyor	Start	End	Weather
2 nd September 2019	Sofie Borek, Chloe Tustain	19:54	22:54	Cool and calm Start: 100% cloud cover, 15°C End: 100% cloud cover, 14°C, no precipitation
16 th September 2019	Joseph Millington, Chloe Tustain	19:22	22:22	Warm and calm Start: 100% cloud cover, 17°C End: 100% cloud cover, 15°C, occasional light drizzle
10 th October 2019	Sofie Borek, Joseph Millington	18:33	21:33	Cool and calm Start: 85% cloud cover, 14°C End: 70% cloud cover, 12°C, light drizzle at start
22 nd October 2019	Chloe Tustain, Joseph Millington	18:03	21:03	Cool and calm Start: 80% cloud cover, 14°C End: 60% cloud cover, 10°C, no precipitation

2.3 A transect was identified for the purpose of the activity surveys which covers a large area of the university campus. This was adapted slightly due to ongoing development works restricting access to the initial proposed route. The updated route is shown on Figure 1. The start location alternated between surveys. Each activity survey commenced at sunset and continued for three hours. Elekon Batlogger M bat detectors were used to record the calls and locations of bat passes with their flight lines and foraging areas being recorded on a survey form. Recordings were later analysed manually by an expert using Elekon BatExplorer computer software.

Static Bat Detectors Surveys

2.4 Anabat Express static bat detectors were deployed on the site between April and October 2019 for a total of five nights of survey effort per detector per month of deployment (total 50 nights). Locations of the detectors within this deployment are shown on Figure 1.

Data collected by these static detectors was later analysed by an expert using Analoop software to identify target species.



Table 2: Bat Static Survey Dates

Month	Dates	Locations
April	16–18 April	1, 2, 3
May	16–20 May	1, 2, 3
June	13–17 June	1, 3, 4, 5
July	1–5 July	1, 2, 3, 4
August	4–8 August 29–30 August	1, 3, 5 4
September	2–6 September	1, 3, 4, 5
October	8–12 October 22–26 October	1, 2, 3, 4 1, 3, 4, 5

2.5 Some discrepancies in data collection include:

- All statics in April only collected three days of data
- Static 1 only collected three days of data within October
- Bad weather in September meant that two surveys were undertaken within suitable weather conditions in October
- Static 3 in September collected three days of data
- Static 4 in August collected two days of data
- Within April and May only three detectors were initially set up across the site. It was decided to put an additional static detector out for the remaining months to gather more robust data across the site
- Locations 2 and 5 were switched over each month as these were two locations within the main campus that are not likely to be central to the master planning, therefore monitoring within these areas was for general bat activity.

2.6 Data was still collected for the required five days of data in the months May–October, in accordance with the lesser horseshoe bat guidelines. As a result, it is considered unlikely that the technical failures on site affected the validity of the results, especially when in combination with the transect surveys undertaken.



3 RESULTS

Bat Activity Transect Surveys

- 3.1 The lesser horseshoe bat, which is an Annex II species, was recorded commuting and foraging at multiple locations on site during the activity surveys (Figure 2). In total, 13 lesser horseshoe calls were detected during the activity surveys. Lesser horseshoe bats were predominately recorded commuting along the eastern and western boundaries of the site, with a few calls also recorded along the southern boundary tree line. There were no recordings of greater horseshoe bats during the survey, although these have previously been recorded within the site.
- 3.2 In 2017 (job ref: J006306), lesser horseshoe bats were recorded in the highest numbers in the south-eastern section of the site, which is not part of the 2019 surveys transect route. Lesser horseshoe bats were found to be using the eastern boundary in both years. Whilst no greater horseshoe bats were recorded during the transect surveys in 2019, there were six records of greater horseshoe bats in the previous survey carried out in 2017. Overall, the surveys recorded low horseshoe bat activity across the site.
- 3.3 Common species were recorded foraging and commuting through the site. Species recorded include common pipistrelle, soprano pipistrelle, noctule, *Myotis* species, long-eared bats, and lesser horseshoe bat. Areas of moderate activity included woodland habitats, the area surrounding the lake, and the southern and eastern boundaries. The site supports good levels of bat activity and the woodland habitats on the boundaries create good wildlife corridors for bats. Figure 2 summarises the results of the transect surveys, whilst a heatmap for the site's activity is shown on Figure 3. The majority of the activity across the site was by *Pipistrelle* species. Full species records can be found within Appendix II.

Table 3: Horseshoe Bat Activity Transect Results

Month	Greater horseshoe	Lesser horseshoe	Call location
April	0	3	ST 77711 64661; ST 77707 64639; ST 77694 64682
May	0	2	ST 77711 64662; ST 77707 64639
June	0	0	n/a



Month	Greater horseshoe	Lesser horseshoe	Call location
July	0 0	1 0	ST 77640 64121
August	0	1	ST 77284 64196
September	0 0	0 0	n/a
October	0	5	ST 76938 64447; ST 76933 64449; ST 76912 64480; ST 76912 64480; ST 76934 64446
	0	1	ST 77728 64604
Total per species	0	13	



Static Bat Detector Survey

- 3.4 Four static detectors were deployed at five different locations throughout the survey season. Lesser horseshoe and greater horseshoe bats, both Annex II species, were detected on the static bat detectors during the survey. Greater horseshoe bats were detected in all static locations except for Static 2, and lesser horseshoe bats were recorded in all static locations. The total numbers detected for each static are shown in Table 4 below.
- 3.5 In the 2017 survey, the highest number of calls recorded on a detector was 18 for greater horseshoes and 30 for lesser horseshoes. These were recorded on the eastern boundary of the site. The highest number of calls in the 2019 survey was 16 for greater horseshoes on Static 1, and 33 for lesser horseshoes on Static 3, both of which were located along the eastern boundary of the site. The results for both years had the highest number of calls along the eastern boundary of the campus.
- 3.6 *Pipistrelle* species and *Nyctalus/Eptesicus* species were recorded by the static detectors in high numbers. The number of calls for these species is estimated and recorded as 30+, 40+, 50+, 100+ etc. This corresponds with previous surveys, which also found moderate activity for these species across the site. Full survey results for general bat species can be found in Appendix III.



Table 4: Static Bat Detector Horseshoe Bat Survey Results

Static	Month	Greater horseshoe	Lesser horseshoe
1	April	n/a	n/a
	May	5	11
	June	2	1
	July	2	1
	August	2	1
	September	5	17
	October #2	0	1
	Totals	16	32
2	April	0	1
	May	0	5
	June	n/a	n/a
	July	0	0
	August	n/a	n/a
	September	n//a	n/a
	October	0	0
	Totals	0	6
3	April	0	12
	May	7	19
	June	4	2
	July	2	0
	August	0	1
	September	0	1
	October	0	0
	October #2	0	0



Static	Month	Greater horseshoe	Lesser horseshoe
	Totals	13	35
4	April	n/a	n/a
	May	n/a	n/a
	June	2	1
	July	n/a	n/a
	August	0	0
	September	1	0
	October #2	0	1
	Totals	3	2
5	April	n/a	n/a
	May	n/a	n/a
	June	1	2
	July	n/a	n/a
	August	0	0
	September	5	3
	October	0	1
	Totals	6	6



4 ASSESSMENT & RECOMMENDATIONS

- 4.1 All British species of bat and their place of shelter are protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2010 from deliberate capture, injury and killing, intentional or reckless disturbance, intentional or reckless obstruction of access to any structure or place which any such animal uses for shelter or protection, and deliberate damage or destruction of a breeding site or resting place. This includes buildings and trees and applies throughout the year, whether bats are present or not at the time of survey or work being carried out.
- 4.2 Although foraging areas and commuting routes are not legally protected, the effects of development proposals on these are a material consideration when assessing the impact of the proposal on the maintenance of favourable conservation status (NPPF).
- 4.3 Lesser and greater horseshoe bats have low activity levels across the site, with moderate activity located on the boundaries of the campus, particularly the eastern boundary. Both the activity survey and the static detectors suggest that the boundary habitats, including woodland edge and hedgerows, are the main habitats used by horseshoe bats on site. This is highlighted by both Static 1 and Static 3 having the highest incidence of recordings during the survey period. It is also considered likely that all boundary habitats provide good foraging and commuting opportunities for these species, given the habitats present, and the distance between the campus and the SAC.
- 4.4 Statics 1 and 3 are near to the proposed site of new residential accommodation. As such, the boundary habitats consisting of hedgerows and woodland should be retained with a 5m or 10m buffer, respectively. The buffers along the boundary habitats should be planted with suitable native species of benefit to bats, where possible.
- 4.5 A lighting plan must also be included within the new masterplan for the site and be designed to retain dark corridors for foraging and commuting bats. In particular, boundary habitats should be maintained as dark corridors to ensure their continued usage by horseshoe bats. Light levels within dark corridors should not be increased beyond current levels.
- 4.6 These proposals would also be beneficial to other bat species using the site. Bat activity in general was higher along the southern and eastern boundaries, and within the central green parkland. Areas of mature trees around the lake and central green parkland should also be maintained as dark corridors for use by a range of bat



species. It is likely that horseshoe bats could use this area to commute across the site.

- 4.7 There is a chance that Bechstein's, another Annex II species, may be present on site, however similarities in calls make distinguishing this species difficult. The majority of general bat activity on site was from *Pipistrelle* species, which accounted for 89% of activity during the transect surveys.
- 4.8 A Landscape and Ecology Management Plan is recommended for the campus, associated with the updated masterplan. This document should detail where habitats for bats will be protected and enhanced, as well as the location of mitigation to ensure connectivity for bats in the long term across the campus. The plan will also provide information relating to strategic habitat creation works, to ensure that an overall biodiversity net gain is provided on the site.

Ecological Opportunities

- 4.9 Any lighting required within the scheme should be kept to a minimum and carefully consider bats (BCT, 2008).
- 4.10 Further enhancement of the site for bat species should include the planting of night-scented flowers within the landscape scheme for the site. Night-scented flowers attract moths and other invertebrates that form the diet of UK bat species. Suitable plant species include honeysuckle, dog-rose, ivy, evening primrose and night-scented catchfly. More information can be found in the Bat Conservation Trust's Landscape and Urban Design for Bats and Biodiversity document.
- 4.11 Future management should aim to enhance the value of the site for wildlife whilst maintaining amenity function, such as leaving longer edge grassland zones (adjacent to boundaries and around the trees, for example) and rotational management of new planting.
- 4.12 Consideration should be given to closing up all gaps in hedgerows across the site to maintain continuity in commuting routes or enhance current hedgerows for horseshoe bats.

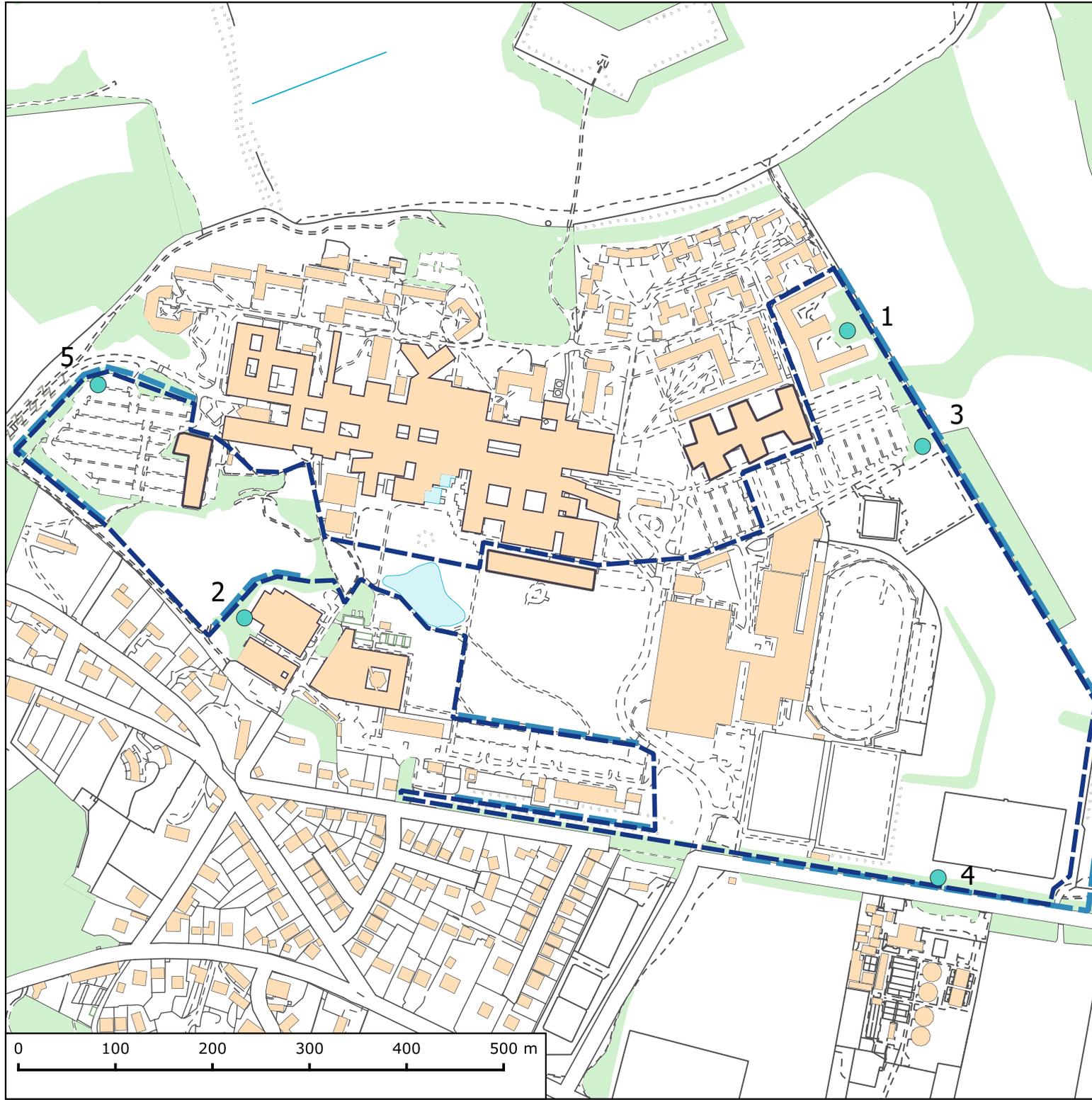


5 LIMITATIONS OF SURVEY AND REPORT

- 5.1 This report records wildlife found during the survey and anecdotal evidence of sightings. It does not record any plants or animals that may appear at other times of the year and were therefore not evident at the time of the visits. Some species that might use the site or be apparent at other times of year, or only in certain years, would not have been detected.
- 5.2 A national standard has not been adopted for minimum survey effort for bats, since the extent of surveys required is dependent upon species present and site-specific factors. Natural England will not comment on survey effort and they expect this decision to be made by the ecological consultant. There is also some difference in opinion between local authorities across the UK as to what constitutes sufficient survey effort. The recommended level of survey within this report is based upon extensive experience of surveying and assessment for similar sites and the Bat Conservation Trust Survey Guidelines 2016.
- 5.3 This report provides provisional ecological baseline for the site and should not be considered to be conclusive until the ecological considerations have been undertaken and all necessary further surveys completed. Likewise, the ecological considerations at this stage are not necessarily final and may be subject to change or additional proposals made following the results of further surveys and detailed development plans.
- 5.4 The behaviour of animals can be unpredictable and may not conform to standard patterns recorded in current scientific literature. This report therefore cannot predict with absolute certainty that animal species will occur in apparently suitable locations or habitats or that they will not occur in locations or habitats that appear unsuitable.
- 5.5 The Elekon Batlogger M bat detector uses a standard GPS system combined with GLONASS – Global Navigation Satellite System. The precision of the GPS receiver in this unit produces an accuracy of 2.37–4.65m for bat recordings. There is, however, always the potential for the range of accuracy of GPS units to decrease due to atmospheric and local weather conditions (cloud, static) and the structural nature of the habitat (i.e. dense woodland). All efforts are taken during surveys to ensure the accuracy and quality of captured data. This unit has a bat call detection range of 50m. Thus, bat calls can be recorded from outside the development site boundary. Whilst not always directly relevant to the habitats present on site, these recordings provide valuable context and species information regarding the importance of the site in relation to the surrounding habitats and landscape for bats.



- 5.6 The advice contained in this report relates primarily to factual survey results and general guidance only. On all legal matters you are advised to take legal advice.
- 5.7 Anabat Swifts were used for the static detector surveys. These require 4x AA batteries and an SD card. If there is a high level of bat activity, wind, or rain the detector could easily record several gigabytes of files in a single night. Therefore, the storage could reach capacity and recordings could end before the recommended five nights of data collection. Additionally, the microphones on the Anabat Swifts are delicate. Whilst they are designed to be waterproof, should they be knocked after mobilisation or over-tightened prior to mobilisation, this could impact the recordings.
- 5.8 The transect route was made up by an experienced ecologist, which included areas of higher potential for bat activity across the site. This was supposed to include the northern section of the parkland within the centre of the site, where there is open grassland and small patches of woodland. Due to construction taking place on site, this route was inaccessible and therefore was diverted along a concrete path/road through two university buildings. This section of the transect therefore had no natural features and was very well lit, therefore it was unlikely to be used by bats.



Key

-  Site Boundary
-  Transect Route
-  Static Detector Locations



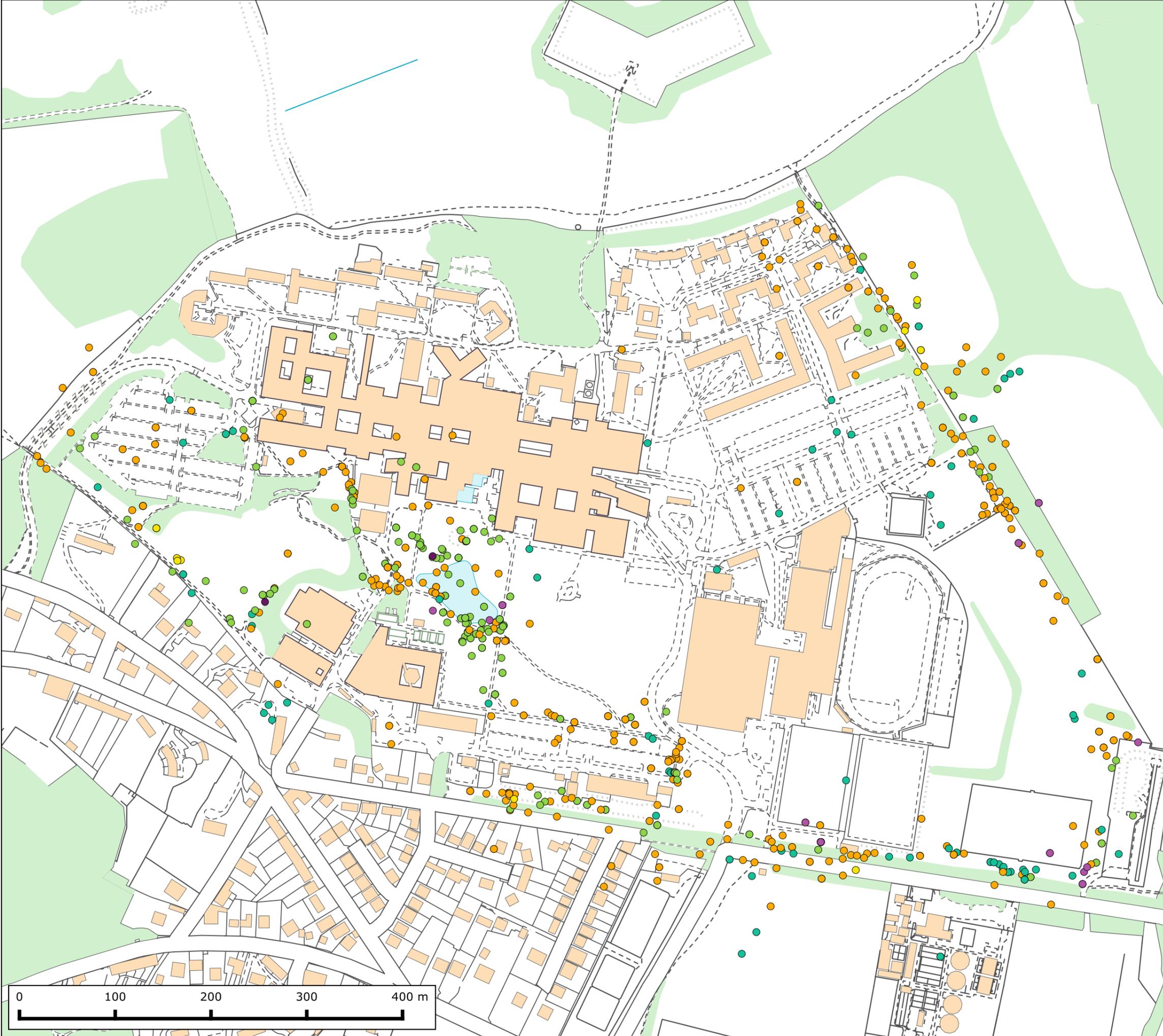
Client: University of Bath

Project: Site Wide Bat Surveys

Title: Bat Activity Survey Transect and Static Locations

November 2019

Figure 1



- Key**
- Myotis species
 - Soprano pipistrelle
 - Common pipistrelle
 - Nyctalus/Eptesicus species
 - Long-eared species
 - Greater horseshoe
 - Lesser horseshoe

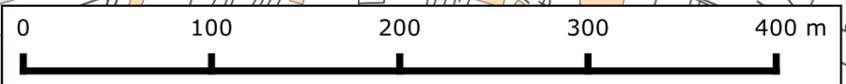


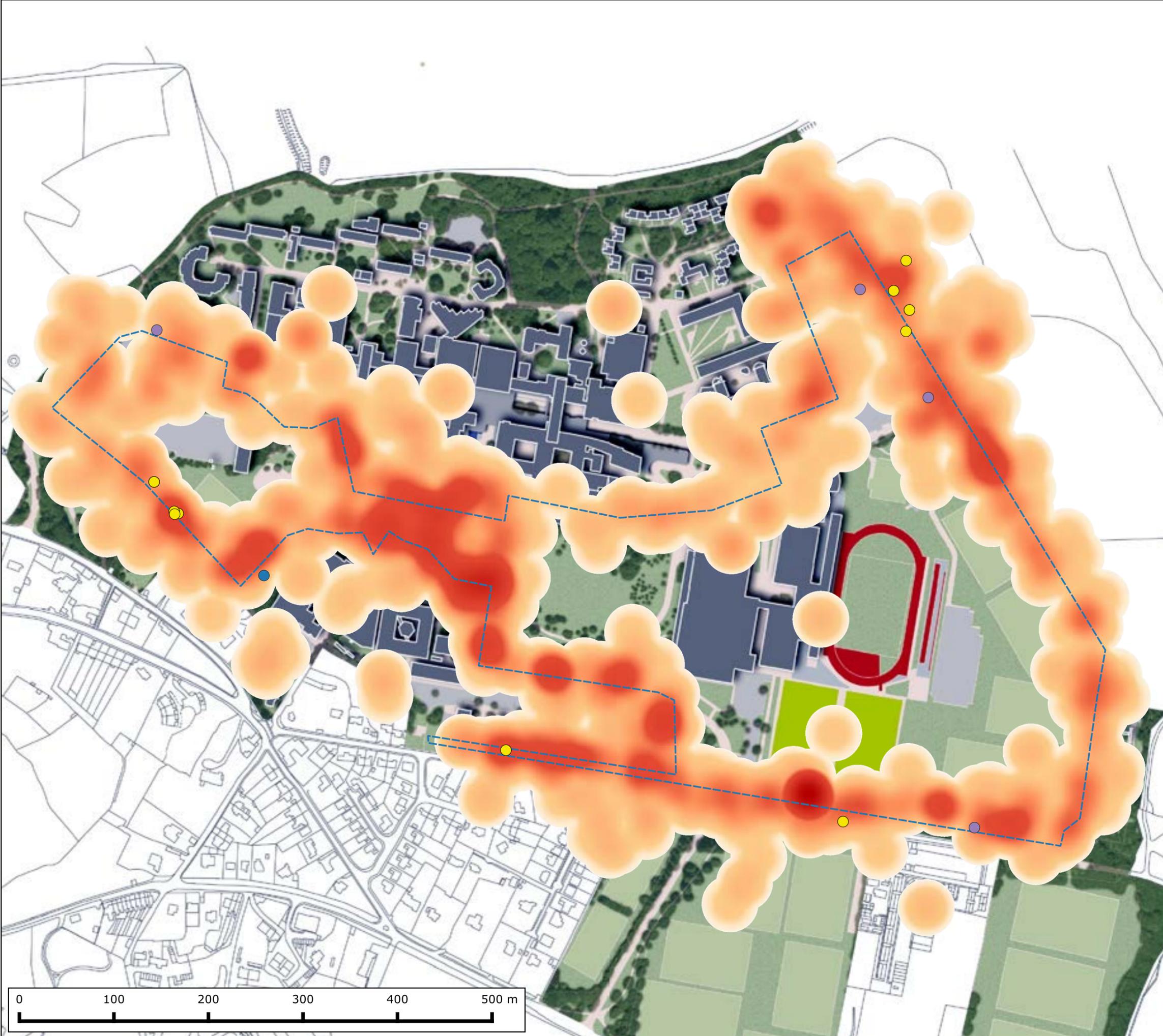
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Client: University of Bath
 Project: Horseshoe Monitoring at Claverton Down Campus, University of Bath
 Title: Activity Survey Results

January 2020 **Figure 2**

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Key

- - - Transect Route

Heatmap

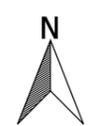
- Low activity
- .
- .
- .
- High activity

Activity points

- Greater horseshoe
- Lesser horseshoe

Static location records

- Lesser horseshoe bats
- Greater and lesser horseshoe bats



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Client: The University of Bath

Project: Claverton Down Campus, University of Bath

Title: Bat Activity Survey Heatmap





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Appendix I: SPECIES LIST

Fauna	
Common name	Latin name
Common pipistrelle	<i>Pipistrellus pipistrellus</i>
<i>Eptesicus/Nyctalus</i> species	<i>Eptesicus/Nyctalus sp.</i>
Greater horseshoe	<i>Rhinolophus ferrumequinum</i>
Lesser horseshoe	<i>Rhinolophus hipposideros</i>
<i>Myotis</i> species	<i>Myotis sp.</i>
Noctule	<i>Nyctalus noctula</i>
<i>Plecotus</i> species	<i>Plecotus sp.</i>
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>



Appendix II: FULL BAT ACTIVITY SURVEY RESULTS

Month	<i>Pipistrelle</i> species	Greater horseshoe	Lesser horseshoe	<i>Myotis</i> species	<i>Nyctalus/Eptesicus</i>	<i>Plecotus</i> species
April (1 survey)	78	0	3	3	6	0
May (1 survey)	81	0	2	5	0	0
June (1 survey)	102	0	0	0	7	0
July (2 surveys)	174 237	0 0	1 0	1 1	2 25	0 1
August (1 survey)	158	0	1	1	32	1
September (1 survey)	140 42	0 0	0 0	3 1	1 4	0 0
October (2 surveys)	91 15	0 0	5 1	0 1	6 20	0 0
Total per species	1,118	0	13	16	103	2



Appendix III: FULL BAT STATIC DETECTOR RESULTS

Static	Month	<i>Pipistrelle</i> species	Greater horseshoe	Lesser horseshoe	<i>Myotis</i> species	<i>Nyctalus/Eptesicus</i>	<i>Plecotus</i> species
1	April	n/a	n/a	n/a	n/a	n/a	n/a
	May	100+	5	11	1	3	0
	June	7	2	1	3	1	5
	July	30+	2	1	0	2	0
	August	30+	2	1	3	80+	0
	September	30+	5	17	0	30+	0
	October #2	30+	0	1	0	30+	0
	Totals	227+	16	32	7	146+	5
2	April	3	0	1	3	30+	0
	May	6	0	5	2	10	0
	June	n/a	n/a	n/a	n/a	n/a	n/a
	July	0	0	0	0	0	0
	August	n/a	n/a	n/a	n/a	n/a	n/a
	September	n/a	n/a	n/a	n/a	n/a	n/a
	October	0	0	0	0	0	0
	Totals	9	0	6	5	40+	0
3	April	1	0	12	3	5	0
	May	100+	7	19	0	40+	0
	June	80+	4	2	5	13	4
	July	30+	2	0	6	6	0
	August	40+	0	1	5	50+	0
	September	30+	0	1	1	30+	0
	October	60+	0	0	0	12	0



Static	Month	<i>Pipistrelle</i> species	Greater horseshoe	Lesser horseshoe	<i>Myotis</i> species	<i>Nyctalus/Eptesicus</i>	<i>Plecotus</i> species
	October #2	2	0	0	0	30+	0
	Totals	321+	13	35	20	186+	4
4	April	n/a	n/a	n/a	n/a	n/a	n/a
	May	n/a	n/a	n/a	n/a	n/a	n/a
	June	100+	2	1	0	0	2
	July	n/a	n/a	n/a	n/a	n/a	n/a
	August	30+	0	0	1	11	0
	September	50+	1	0	1	40+	0
	October #2	1	0	1	1	0	0
	Totals	180+	3	2	3	51+	2
5	April	n/a	n/a	n/a	n/a	n/a	n/a
	May	n/a	n/a	n/a	n/a	n/a	n/a
	June	6	1	2	0	2	1
	July	n/a	n/a	n/a	n/a	n/a	n/a
	August	0	0	0	0	0	0
	September	14	5	3	11	2	0
	October	1	0	1	1	0	0
	Totals	21	6	6	12	4	1

Appendix IV: 2017 ORIGINAL TRANSECT AND STATIC LOCATIONS

