

BAT SURVEY REPORT

SEPTEMBER 2021

Castlefield Viaduct Urban Park

Duke Street

Manchester

M3 4RU

U R B A N
G R E E N



QUALITY MANAGEMENT

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NON-TECHNICAL EXECUTIVE SUMMARY

The National Trust are proposing to develop land at Castlefield Viaduct in Castlefield, Manchester (hereafter referred to as 'the site'). The proposals include the development of an elevated urban park with integrated active travel hub that is open to the public within a disused railway viaduct.

Urban Green have been appointed to complete Bat Surveys and a Report of the site. A Preliminary Ecological Appraisal and a Preliminary Roost Assessment was conducted at the site in April 2021. Further surveys, in the form of nocturnal emergence and bat activity surveys were recommended to further assess the sites value for bats.

Three emergence surveys were undertaken on site and identified two non-breeding summer roosts in structure 1 supporting a low number of common pipistrelles. Due to the low number of common and widespread bats supported by these roosts they have been assessed as low conservation value roosts. The proposed works will not cause the destruction of this roost or lead to significantly increased level of disturbance and as such there is no need to obtain a licence for works to commence. Precautionary Working Methods have been outlined to minimise disturbance.

Five activity surveys were completed on site as well as the deployment of a static detector over four periods between June and September (inclusive). The results of which show the site to be used frequently by common pipistrelle, utilising the scrub on site for foraging purposes along the viaduct.

Mitigation in the form of habitat retention in the western and eastern sections of the viaduct, as well as planting to compensate for loss of commuting and foraging habitats is proposed, including native shrubs and species diverse vegetation to attract high levels of invertebrates.

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1 Introduction

1.1 Background to the Scheme

The National Trust are proposing to develop land at Castlefield Viaduct in Castlefield, Manchester (hereafter referred to as ‘the site’). The proposals include the development of an elevated urban park with integrated active travel hub that is open to the public within a disused railway viaduct.

Urban Green have been appointed to undertake further Nocturnal Bat Surveys following recommendations outlined within a Preliminary Ecological Appraisal (PEA) and Preliminary Roost Assessment (PRA), undertaken at the site by Urban Green in April 2021.

The author of the report is Jake Healy, Qualifying CIEEM, Assistant Ecologist at Urban Green. Jake has experience providing ecological consulting services for a range of development schemes across the UK, including residential and commercial schemes.

1.2 Site Context

The site is located at National Grid Reference SJ 83013 97624 and comprises a total area of 0.59ha (see Figure 1).

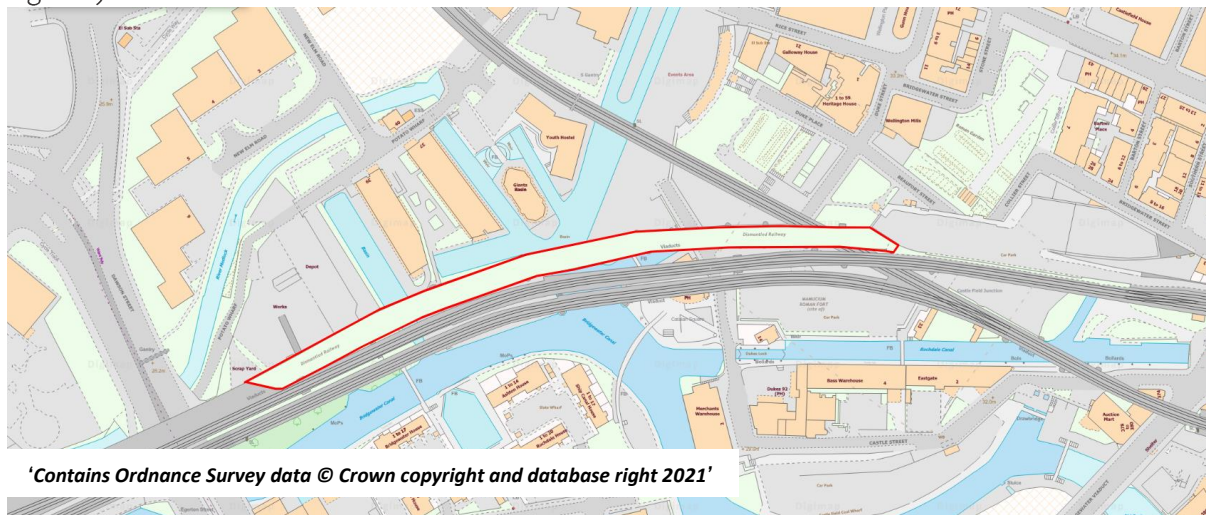


Figure 1 – Site Extent

The site is located in a densely urban area of Manchester city centre, adjacent to an active tram line. The site is also located above the Bridgewater Canal and approximately 260m east of the River Irwell. Buildings surrounding the site are mostly commercial offices to the north and high-density residential apartments to the south. Due to the sites location close to the city centre, there is a high level of disturbance present from main roads such as the A635 (M) present approximately 75m west of the site.

1.3 Purpose of this Report

This report has been produced to demonstrate the results of nocturnal bat surveys which were completed at the site. The surveys were conducted to confirm presence or likely absence of roosting bats and to present the results of nocturnal bat activity surveys which were completed at the site. The nocturnal bat activity surveys were conducted to confirm likely absence or presence of bats utilising the site and to assess the most valuable habitats for bat foraging and commuting.

Appropriate mitigation and suitable roost replacement (compensation) are detailed (if required). The report has been produced in support of the proposed planning application.

Relevant UK legislation of the protection of all UK bats are detailed in Appendix 1.

2 Previous Surveys

A PEA and PRA was completed at the site by Urban Green in April 2021 and is detailed within Report UG_922_ECO_PEA_01 (Urban Green, 2021). One structure (S1) was located within the site boundary and was subject to a PRA. Please refer to Table 1, which was extracted from Appendix 1 of the PEA report, summarising the assessment.

Table 1 - PRA Summary (UG_922_ECO_PEA_01, 2021).

Building Reference	Description and evidence	Category of Suitability
Structure (S) 1	Brick support structure at the eastern end of the Viaduct. This structure is approximately 20m in height and was constructed of brick throughout. Minor gaps were present within the brickwork at the top of the structure which was above the level of the viaduct which appeared dry and could extend back into the structure. There were also minor defects and missing bricks within the arches at the base of the structure on the northern and southern faces that could support low numbers of crevice dwelling species.	Moderate

As S1 was assessed as having moderate bat roosting potential, a minimum of two nocturnal emergence and/or re-entry bat surveys were recommended and are to follow guidance set out in Collins (2016).

3 Methods

3.1 Desk Study

Sources of information used in the desk study are presented in Table 2.

Table 2 – Desk Study Sources of Information

Source	Date Consulted	Information Sought
Online aerial imagery	27/07/2021	Review of satellite imagery.
MAGIC website (www.magic.gov.uk)	27/07/2021	Locations of granted EPSL within 5km of the site.

3.2 Nocturnal Bat Surveys

3.2.1 Emergence/Re-entry Surveys

Two emergence surveys were completed at each vantage point, following guidance set out in Collins (2016). All surveys were conducted by suitability qualified ecologists, and under the guidance of Katie Bird, Senior Ecologist at Urban Green who holds a Level 2 Class Licence for bats (2020-48950-CLS-CLS).

The surveys were conducted using handheld Echo Meter Touch and BatScanner bat detectors. Surveyors were positioned around the feature to observe the Potential Roosting Features (PRF) identified during the PRA. The emergence surveys started at least 15 minutes before sunset until approximately 1.5 hours after sunset.

Summary of the survey details are provided in Table 3. Surveyor survey results sheets are located within Appendix 2. Figure 2 provides a plan illustrating surveyor positions.

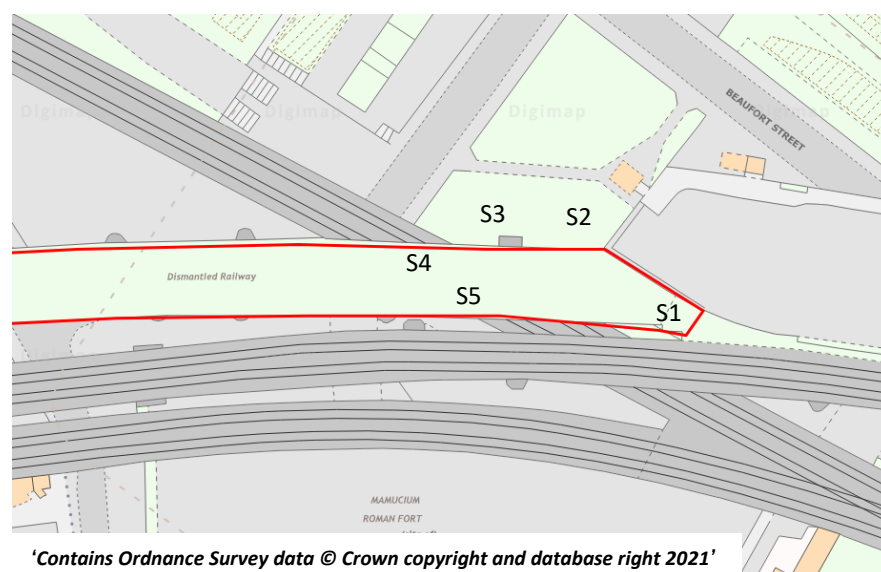


Figure 2 – Surveyor vantage points

Table 3 – Emergence Survey Details

Date	Survey Number	Sunset/sunrise time	Survey time	Surveyors	Weather conditions at sunset
24/05/21	Survey 1	21:17	21:17 – 22:47	S2 – Jake Healy S3 – Mark Blacker	Temp: 12°C Cloud cover: 7/8 oktas Wind: 1 Beaufort Precipitation (Ppt): None during survey
14/06/21	Survey 1	21:39	21:24 – 23:10	S1 – Katie Bird S4 – Amy Robinson S5 – Paige Hickey	Temp: 15°C Cloud cover: 7/8 oktas Wind: 1 Beaufort Precipitation (Ppt): None during survey
14/07/21	Survey 2	21:31	21:15 – 23:01	S1 – Andrew Bridge S2 – Amy Robinson S3 – Sally Collier S4 – Katy Ellen S5 – Paige Hickey	Temp: 18°C Cloud cover: 7/8 oktas Wind: 2 Beaufort Precipitation (Ppt): None during survey

Katie Bird – senior ecologist with over four year’s bat survey experience. Level 2 Class Licence for bats (2020-48950-CLS-CLS).

Mark Blacker – an ecologist with over four year’s bat survey experience

Jake Healy – an assistant ecologist with two year’s bat survey experience

Andrew Bridge – a seasonal ecologist with two year’s bat survey experience

Amy Robinson – a seasonal ecologist with one year’s bat survey experience

Sally Collier – a seasonal ecologist with one year’s bat survey experience

Katy Ellen – a seasonal ecologist with one year’s bat survey experience

Paige Hickey – a seasonal ecologist with one year’s bat survey experience

3.2.2 Bat Activity Surveys

Five activity transect surveys were undertaken following guidance set out in Collins (2016), spanning from June to September 2021 (inclusive) with a minimum period of two weeks between each survey. All surveys were conducted by two suitability qualified ecologists, and under the guidance of Katie Bird, Senior Ecologist at Urban Green who holds a Level 2 Class Licence for bats (2020-48950-CLS-CLS).

The survey effort involved two surveyors walking a pre-determined transect route recording observations of bats such as number of bats, species, flight direction, flight height, behaviour (e.g., commuting or foraging) appearance and relative speed using an Echo Meter Touch or Batbox Duet bat detector.

The predetermined route ensured coverage of all habitat types and features along the viaduct.

Summary of the survey details are provided in Table 4. Surveyor results are located in Appendix 2 and results are summarised in Section 4. Appendix 3 provides a plan illustrating the transect route.

Table 4 – Activity Survey Details

Activity Survey	Date	Sunset time	Survey time	Surveyors	Weather Conditions at sunset
Spring (June)	14/06/2021	22:39	22:39-23:30	Jake Healy Paige Hickey	Temp: 14°C Wind: 1 Beaufort Cloud cover: 5/8 Precipitation: None
Summer (June)	28/06/2021	21:42	21:42-23:47	Jake Healy Paige Hickey	Temp: 16°C Wind: 1 Beaufort Cloud cover: 8/8 Precipitation: None
Summer (July)	21/07/2021	21:22	21:35 – 23:39	James Robinson Katy Ellen	Temp: 26°C Wind: 1 Beaufort Cloud cover: 3/8 Precipitation: None
Summer (August)	09/08/2021	20:51	20:51 – 22:51	Jake Healy Brooklyn Bell	Temp: 18°C Wind: 0 Cloud cover: 3/8 Precipitation: None
Summer (September)	01/09/2021	20:00	20:00-22:00	Paige Hickey Bronwyn Dennis	Temp: 18°C Wind: 1 Cloud cover: 2/8 Precipitation: None

Jake Healy – an assistant ecologist with two year's bat survey experience

Paige Hickey – a seasonal ecologist with one year's bat survey experience

James Robinson – a seasonal ecologist with one year's bat survey experience

Katy Ellen – a seasonal ecologist with one year's bat survey experience

Brooklyn Bell – a seasonal ecologist with one year's bat survey experience

Bronwyn Dennis – a seasonal ecologist with one year's bat survey experience

A static bat detector (Anabat Express Bat Detector) was deployed at the site for a minimum of one week across four deployment periods from June to September

Dates of deployment and associated weather conditions are detailed within Table 5.

Table 5 – Static Deployment Weather

Deployment	Date	Sunset/sunrise time	Temperature		Precipitation
Deployment 1	14/06/2021	21:39 – 04:39	High: 15°C	Low: 8°C	No rain
	15/06/2021	21:39 – 04:39	High: 21°C	Low: 13°C	No rain

Deployment	Date	Sunset/sunrise time	Temperature		Precipitation
	16/06/2021	21:40 – 04:39	High: 21°C	Low: 14°C	No rain
	17/06/2021	21:40 – 04:39	High: 19°C	Low: 9°C	No rain
	18/06/2021	21:40 – 04:39	High: 15°C	Low: 7°C	No rain
	19/06/2021	21:41 – 04:39	High: 17°C	Low: 10°C	No rain
	20/06/2021	21:41 – 04:39	High: 17°C	Low: 8°C	No rain
	21/06/2021	21:41 – 04:40	High: 13°C	Low: 6°C	No rain
	22/06/2021	21:41 – 04:40	High: 19°C	Low: 5°C	No rain
	23/06/2021	21:42 – 04:40	High: 20°C	Low: 13°C	No rain
	24/06/2021	21:42 – 04:41	High: 15°C	Low: 13°C	Some rainfall
	25/06/2021	21:42 – 04:41	High: 13°C	Low: 11°C	No rain
	26/06/2021	21:41 – 04:42	High: 20°C	Low: 12°C	No rain
	27/06/2021	21:41 – 04:42	High: 19°C	Low: 12°C	No rain
Deployment 2	21/07/2021	21:22 – 05:09	High: 28°C	Low: 17°C	No Rain
	22/07/2021	21:20 – 05:10	High: 30°C	Low: 16°C	Thunderstorms, heavy rainfall
	23/07/2021	21:19 – 05:12	High: 20°C	Low: 14°C	No rain
	24/07/2021	21:17 – 05:13	High: 20°C	Low: 13°C	No rain
	25/07/2021	21:16 – 05:15	High: 23°C	Low: 13°C	No rain
	26/07/2021	21:14 – 05:16	High: 23°C	Low: 14°C	No rain
	27/07/2021	21:13 – 05:18	High: 19°C	Low: 14°C	No rain
Deployment 3	09/08/2021	20:49 – 05:40	High: 18°C	Low: 13°C	No rain
	10/08/2021	20:47 – 05:41	High: 19°C	Low: 13°C	No rain
	11/08/2021	20:45 – 05:43	High: 19°C	Low: 14°C	No rain
	12/08/2021	20:43 – 05:45	High: 19°C	Low: 11°C	No rain
	13/08/2021	20:41 – 05:47	High: 20°C	Low: 14°C	No rain
	14/08/2021	20:38 – 05:48	High: 15°C	Low: 14°C	No rain
	15/08/2021	20:36 – 05:50	High: 17°C	Low: 14°C	No rain

Deployment	Date	Sunset/sunrise time	Temperature	Precipitation
Deployment 4	01/09/2021	19:58 – 06:20	High: 18 Low: 10	No rain
	02/09/2021	19:55 – 06:21	High: 20.....Low: 13	No rain
	03/09/2021	19:53 – 06:23	High: 16.....Low: 14	No rain
	04/09/2021	19:51 – 06:25	High: 17.....Low:12	No rain
	05/09/2021	19:48 – 06:27	High: 23.....Low:13	No rain

The data collected on the static detector was analysed to provide further evidence of the sites use by foraging and commuting bats, using Analook software. Please refer to Figure 3 for the static location point.

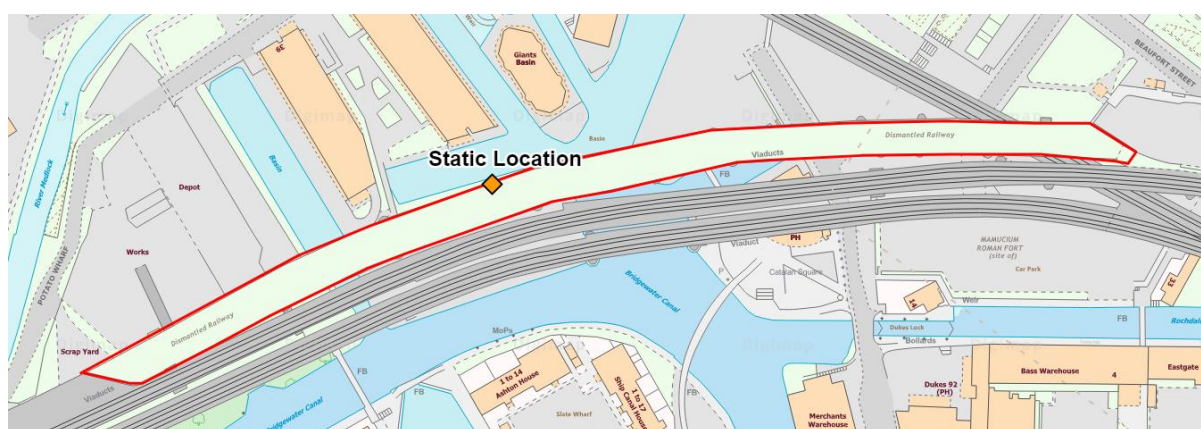


Figure 3 – Static detector deployment location

3.3 Constraints to the Survey

The first survey undertaken at the site on the 25th of May 2021 was originally scheduled as an activity survey, however, due to access to the viaduct being blocked this was unable to take place and surveyors on site carried out the part of first emergence survey instead. As such the first emergence survey has been divided in to two visits and visit 1 started later than is set out in the guidance, this is not anticipated to have had any impact on the reliability of the survey conducted due to the consistent results recorded and the isolated, dense urban location of the site. A static detector was also scheduled to be deployed on this visit but due to the access problems this was not possible. As such, the static detector was deployed for a period of two weeks in June to compensate and gather the required amount of early season activity data.

The guidance states that static detector surveys conducted on features assessed as moderate roosting potential requires two detectors present. However, the use of only one static detector was deemed suitable for the site due to the small size and lack of various habitats present. It is anticipated that this will not detract from the accuracy of the results.

The third deployment of the static detector between the 9th of August and the 15th of August did not record any data due to equipment failure. Due to the large amounts of consistent data gathered throughout the other static deployment periods and the activity surveys undertaken, this is not anticipated to have had an impact on the reliability of the report and its findings.

3.4 Lifespan of Reports

In accordance with the BCT guidance (Collins, 2016)), the details of this report will remain valid for a period of **24 months** from the date of the first survey (i.e. until 24th May 2023). After this date, this assessment should be reviewed to determine whether any update surveys are required.

4 Results

4.1 Nocturnal Surveys

4.1.1 Dusk Emergence Surveys

Survey 1

Dusk Emergence, visit 1 – 24th May 2021

The first bat pass was recorded at 21:28 (11 minutes after sunset) and was a common pipistrelle (*Pipistrelle pipistrellus*) emerging from the top of the middle arch at structure 1. Two other emergences were recorded from similar locations at 21:34 and 21:37, both common pipistrelle. Activity was then recorded frequently until the end of the survey at 22:47 mainly comprising foraging behaviour around the arch feature and over and along the viaduct.

Two bat roosts were identified during the survey.

Dusk Emergence, visit 2 – 14th June 2021

The first bat pass was recorded at 22:03 (24 minutes after sunset) and was common pipistrelle, as was all other activity recorded throughout the survey. Foraging behaviour was observed by both surveyors relating to the viaduct. However, no emergences were identified by either surveyor.

Survey 2

Dusk Emergence – 14th July 2021

The first bat pass was recorded at 21:48 (17 minutes after sunset) and was common pipistrelle. Three emergences were recorded by surveyor 2 between 21:51 and 21:52 all relating to common pipistrelle from the top of the middle arch at structure 1. Activity was then recorded frequently by all surveyors until the end of the survey at 23:02.

4.1.2 Nocturnal Bat Activity Surveys

Overall, all activity noted was of common pipistrelle, foraging up and along the viaduct throughout the surveys. The peak count of bats recorded on all surveys was 3.

Activity Survey 1 – 14/06/2021

Bat activity was recorded at each point consistently, after 22:12 (approximately 33 minutes after sunset). A peak number of passes was recorded at listening point 9 with 15 passes recorded and a total of 3 bats were noted to be foraging around the area. All activity was attributed to common pipistrelle.

Activity Survey 2 – 28/06/21

Bat activity was recorded throughout the survey with the first passes recorded at listening point 17 (approximately 7 minutes after sunset). The peak number of passes was recorded at listening point 9 with a total of 38 passes recorded. A peak count of 3 bats were identified. All activity was attributed to common pipistrelle.

Activity Survey 3 – 21/07/2021

Bat activity was recorded throughout the survey, with the first passes recorded at listening point 2 (approximately 19 minutes after sunset). The peak number of passes was recorded at listening point 7

with a total of 14 passes. A peak count of 3 bats were identified. All activity was attributed to common pipistrelle.

Activity Survey 4 – 09/08/2021

Bat activity was recorded throughout the survey, with the first passes recorded at listening point 4 (approximately 23 minutes after sunset). The peak number of passes was recorded at listening point 12 with a total of 28 passes recorded. A peak count of 3 bats were identified during the survey. All activity was attributed to common pipistrelle.

Activity Survey 5 – 01/09/2021

Bat activity was recorded throughout the survey, with the first bat pass recorded at listening point 2 (approximately 10 minutes after sunset). The peak number of passes was recorded at listening point 6 with a total of 21 passes recorded. All activity recorded was attributed to common pipistrelle.

4.1.3 Automated Static Detector Surveys

Overall, the same species detected during the activity surveys were recorded on the static detectors, along with the rare occurrence of a further two species detailed in Table 6.

Common pipistrelle dominated the vast majority of the recordings indicating that they are the most common species utilising the site. An extremely low number of calls (three calls) relating to a noctule (*Nyctalus noctula*) and an unidentified myotis (*Myotis sp.*) species were also recorded (two calls).

Table 6 – Detailed results from static deployments

Static Deployment Period	Deployment date	Number of passes recorded			
		Common pipistrelle	Myotis sp.	Noctule	Total
Deployment 1	14/06/2021	357	0	0	357
	15/06/2021	373	0	0	373
	16/06/2021	279	0	0	279
	17/06/2021	246	0	0	246
	18/06/2021	217	0	0	217
	19/06/2021	247	0	0	247
	20/06/2021	489	0	0	489
	21/06/2021	197	0	0	197
	22/06/2021	607	0	0	607
	23/06/2021	464	0	0	464
	24/06/2021	61	0	0	31
	25/06/2021	271	0	0	271
	26/06/2021	477	0	0	477
	27/06/2021	661	0	0	661
Deployment 2	21/07/2021	277	0	0	277
	22/07/2021	No passes recorded			
	23/07/2021	160	0	0	160
	24/07/2021	185	0	1	186
	25/07/2021	442	1	0	443
	26/07/2021	381	0	0	381
	27/07/2021	346	0	0	346
Deployment 3	09/08/2021	No data recorded due to equipment failure			
	10/08/2021				
	11/08/2021				

Static Deployment Period	Deployment date	Number of passes recorded			
		Common pipistrelle	Myotis sp.	Noctule	Total
	12/08/2021				
	13/08/2021				
	14/08/2021				
	15/08/2021				
Deployment 4	01/09/2021	127	0	0	127
	02/09/2021	192	0	1	193
	03/09/2021	328	0	1	329
	04/09/2021	367	1	0	368

4.2 Assessment

4.2.1 Dusk Emergence Surveys

Bat activity was recorded throughout the surveys, with all activity attributed to common pipistrelle. Foraging activity was mainly recorded around Structure 1 and along the viaduct.

Two common pipistrelle roosts were located during the first and third survey on the northern aspect of structure 1 (see Photograph 1). With a peak count of 3 individuals foraging on site at one time.

The low number of bats recorded using these roosts indicates that they are non-breeding summer roosts for low numbers of common pipistrelle which is a relatively common and widespread species of bat.



Photograph 1 – Area of emergences

4.2.2 Nocturnal Bat Activity and Static Surveys

Bat activity recorded throughout the activity surveys and static deployments indicate that the site is used predominantly by common pipistrelle for foraging purposes. Common pipistrelle are considered to be a relatively common species. A noctule and an unidentified Myotis species were also recorded as commuting through the site on one occasion each, suggesting that the site is of limited value to these species.

Survey results show that a peak number of passes through one night was 661, all of which were attributed to common pipistrelle. A peak count of three individual common pipistrelle was also recorded during the activity surveys.

Based on the consistent levels of bat passes recorded and species identified across the surveys, the viaduct and the scrub on site is considered to be of high value to the local population of common

pipistrelle as the open area with a relative lack of disturbance and the habitats present attracts a higher number of insects than surrounding areas.

5 Mitigation Recommendations

5.1 Impact Assessment

During surveys undertaken in 2021, two non-breeding summer roosts supporting a low number of common pipistrelle bats was identified. Bat activity was recorded, with only common and widespread species identified during the nocturnal surveys. Foraging and commuting was recorded mainly in association with the scrub along the viaduct.

The proposed development works are not anticipated to destroy or disturb the roosts directly and as such there is no need for a licence to be obtained in order for works to commence.

It should be noted however, that the scrub on site seems to be of high value for foraging purposes and the loss of this habitat may cause adverse effects. and so should be replaced with suitable, species diverse areas of vegetation that will attract high numbers of invertebrates.

5.2 Mitigation

The roosts identified support a common and widespread species and are of low conservation value (Mitchell-Jones, 2004) as non-breeding, summer roosts.

The activity surveys and automated static detector deployments confirmed the scrub and ephemeral/short perennial vegetation present on site to be the most valuable habitats for bats.

The landscape proposals for this site provide suitable foraging and commuting habitats through the retention of significant areas of scrub and short perennial/ephemeral vegetation. The majority of this habitat to be retained is found within the western end of the viaduct where it will not be subject to disturbance from increased visitor levels, however some habitat is also to be retained in the eastern section of the viaduct, adjacent to an access path. This will ensure that connectivity throughout the site is maintained and the value to bats of the site is maintained.

5.3 Lighting Mitigation

All bats have some degree of sensitivity to artificial, night-time lighting. Introducing artificial lighting to areas that are not currently illuminated may sever important bat flight lines and discourage bats from using roost provisions.

An External Lighting Scheme has been produced for this project (Arup, 2021) and has been designed to be low impact with minimal light spill over the onsite and adjacent habitats, with most lighting provided by the use of low level lighting integrated with the planting scheme and portable lanterns. It should be ensured that the lanterns and lighting on site:

- Lack UV elements and preferably LED lighting with a warm white light should be used over cool white light (ideally <2700Kelvin).
- Lighting should feature peak wavelengths greater than 550nm.
- Light placement should be downward facing to prevent excess horizontal or vertical light spill.
- The use of integrated fittings such as cowls, shields, louvres and hoods, that effectively contain light spill from unintended areas.

6 References

Arup (2021) Castlefield Viaduct Arup Report.

Bat Conservation Trust (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (Third Edition). The Bat Conservation Trust, London.

CIEEM (2019). Advice Note on the Lifespan of Ecological Reports and Surveys. CIEEM.

English Nature (2004). Bat Mitigation Guidelines. English Nature, Peterborough.

Hutson A. M. (1993). Action Plan for Conservation of Bats in the United Kingdom. The Bat Conservation Trust, London.

Joint Nature Conservation Committee (2004). Bat Workers Manual. JNCC, Peterborough.

Twelve Architects (2021) Castlefield Viaduct Design and Access Statement. Produced for National Trust.

Urban Green (2020). Preliminary Ecological Appraisal of Higher Moorgate Farm. Ref: UG_688_ECO_PEA_01.

Appendix 1 – Relevant Legislation

Legislation relating to European Protected Species (e.g. bats)

European Protected Species and their resting places (e.g. bat roosts) are protected under the Wildlife and Countryside Act 1981 (as amended), the Countryside and Rights of Way (CROW) Act 2000, and the Conservation of Habitats and Species Regulations 2017.

The Conservation of Habitats and Species Regulations 2017 transpose the European Union's 'Habitats Directive' (Council Directive 92/43/EEC) on the Conservation of Natural Habitats and of Wild Fauna and Flora (EC Habitats Directive) into UK law. The Regulations provide for the designation and protection of 'European Sites', the protection of 'European Protected Species' (EPS), and the adaptation of planning and other controls for the protection of European Sites. EPS are listed on Schedule 2 of the Conservation of Habitats and Species Regulations 2017.

Appendix 2 – Survey Sheets

First survey, first visit – Emergence/dusk survey – 24th May 2021

Bat Passes			
Surveyor	Time	Species	Activity
S1	21:28	Common pipistrelle	Emergence
	21:34	Common pipistrelle	Emergence
	21:37	Common pipistrelle	Emergence
	Foraging activity was noted throughout the survey after emergences spotted, three common pipistrelles utilising site for foraging purposes.		
S2	21:28	Common pipistrelle	Emergence then foraging around arches
	21:34	Common pipistrelle	Emergence
	21:37	Common pipistrelle	Emergence
	Constant foraging activity around arches at base of tower and along viaduct, social calls also recorded throughout.		

First survey, second visit – Dusk/Emergence survey – 14th June 2021

Bat Passes			
Surveyor	Time	Species	Activity
S1	22:03	Common pipistrelle	Heard not seen
	22:11	Common pipistrelle	Heard not seen
	22:14	Common pipistrelle	Heard not seen
	22:17	Common pipistrelle	Heard not seen
	22:26	Common pipistrelle	Heard not seen
	22:29	Common pipistrelle	Heard not seen – Foraging
	22:33	Common pipistrelle	Heard not seen
	22:49	Common pipistrelle	Heard not seen
S2	22:05	Common pipistrelle	Foraging flew from south to north
	22:13	Common pipistrelle	Heard not seen, passing
	22:21	Common pipistrelle	Heard not seen, passing
	22:25	Common pipistrelle	Flew west to east then back
	22:28	Common pipistrelle	Flew west to east then back
	22:31	Common pipistrelle	Heard not seen, passing

Bat Passes			
Surveyor	Time	Species	Activity
	22:38	Common pipistrelle	Foraging up and down
	22:51	Common pipistrelle	Heard not seen, foraging

Second survey – Dusk/Emergence survey 14th July 2021

Bat Passes			
Surveyor	Time	Species	Activity
S1	21:53	Common pipistrelle	Heard not seen
	21:55	Common pipistrelle	Heard not seen
	21:57	Common pipistrelle	Heard not seen – foraging
	22:03	Common pipistrelle	Commuting over viaduct to east
	22:04	Common pipistrelle	Commuting over viaduct to west
	22:09	Common pipistrelle x2	Foraging into viaduct then west
	22:10	Common pipistrelle x3	Foraging along viaduct
	22:23	Common pipistrelle x2	Foraging along viaduct
	22:38	Common pipistrelle	Foraging along viaduct
	22:45	Common pipistrelle x2	Foraging along viaduct
	22:53	Common pipistrelle	Heard not seen
	23:01	Common pipistrelle	Heard not seen
S2	21:49	Common pipistrelle	Flying overhead from behind
	21:51	Common pipistrelle	Emergence
	21:51	Common pipistrelle	Emergence
	21:52	Common pipistrelle	Emergence
	21:53	Common pipistrelle	Commuting flying towards stairs
	21:54	Common pipistrelle	Foraging
	21:55	Common pipistrelle	Foraging
	21:57	Common pipistrelle	Foraging
	22:01	Common pipistrelle	Commuting
	22:02	Common pipistrelle	Heard not seen – foraging

Bat Passes			
Surveyor	Time	Species	Activity
S2	22:03	Common pipistrelle	Foraging
	22:03	Common pipistrelle	Commuting
	22:04	Common pipistrelle	Foraging
	22:04	Common pipistrelle	Foraging
	22:08	Common pipistrelle	Foraging
	22:09	Common pipistrelle	Foraging
	22:10	Common pipistrelle	Foraging
	22:11	Common pipistrelle	Foraging
	22:17	Common pipistrelle	Foraging
	22:22	Common pipistrelle	Foraging
	22:24	Common pipistrelle	Heard not seen
	22:25	Common pipistrelle	Foraging
	22:26	Common pipistrelle	Foraging
	22:29	Common pipistrelle	Heard not seen, foraging
	22:38	Common pipistrelle	Heard not seen, foraging
	22:53	Common pipistrelle	Heard not seen, foraging
	22:56	Common pipistrelle	Heard not seen foraging
S3	21:49	Common pipistrelle	Heard not seen
	21:51	Common pipistrelle	Heard not seen
	21:52	Common pipistrelle	Commuting
	21:53	Common pipistrelle	Heard not seen
	21:55	Common pipistrelle	Heard not seen
	21:57	Common pipistrelle	Heard not seen
	22:01	Common pipistrelle	Heard not seen
	22:03	Common pipistrelle	Foraging active until 22:05
	22:04	Common pipistrelle	Foraging
	22:06	Common pipistrelle	Heard not seen
	22:08	Common pipistrelle	Foraging

Bat Passes			
Surveyor	Time	Species	Activity
S3	22:10	Common pipistrelle	Foraging continuous activity until 22:18
	22:22	Common pipistrelle	Heard not seen
	22:24	Common pipistrelle	Heard not seen
	22:25	Common pipistrelle	Foraging
	22:29	Common pipistrelle	Heard not seen
	22:38	Common pipistrelle	Heard not seen
	22:53	Common pipistrelle	Heard not seen
	22:56	Common pipistrelle	Heard not seen
S4	21:48	Common pipistrelle x2	Commuting
	21:52	Common pipistrelle x2	Commuting
	21:54	Common pipistrelle	Commuting
	21:56	Common pipistrelle	Commuting and foraging
	21:57	Common pipistrelle x2	Commuting and foraging
	21:59	Common pipistrelle x2	Commuting and foraging
	22:03	Common pipistrelle x2	Commuting and foraging
	22:25	Common pipistrelle	Heard not seen
	22:26	Common pipistrelle	Heard not seen
	22:35	Common pipistrelle	Heard not seen
	22:42	Common pipistrelle	Heard not seen
	22:51	Common pipistrelle	Heard not seen
S5	21:48	Common pipistrelle	Heard not seen
	21:54	Common pipistrelle	Commuting
	21:56	Common pipistrelle	Foraging
	21:59	Common pipistrelle x2	Foraging
	22:06	Common pipistrelle	Foraging
	22:18	Common pipistrelle	Heard not seen
	22:25	Common pipistrelle	Heard not seen
	22:32	Common pipistrelle	Heard not seen

Bat Passes			
Surveyor	Time	Species	Activity
S5	22:37	Common pipistrelle	Heard not seen
	22:44	Common pipistrelle	Heard not seen
	22:47	Common pipistrelle	Heard not seen
	22:51	Common pipistrelle	Heard not seen
	22:56	Common pipistrelle	Heard not seen

Appendix 3 Transect Route Map

