Vyrnwy Reserve

Bat Activity Surveys

HABITAT WORKS

March 2025

HABITAT WORKS

Report Title: Vyrnwy Reserve
Bat Activity Surveys

Report to: Canal & River Trust
National Waterways Museum Ellesmere Port
South Pier Road
Ellesmere Port
Cheshire
CH65 4FW

Version: *V1.0*

Issue Date: March 2025

Prepared by:

Joe Travis BSc (Hons), MSc, ACIEEM

Senior Ecologist Date: 21.02.2025

Reviewed and Approved by:

Nick Birkinshaw BSc (Hons), MSc, ACIEEM

Managing Director Date: 13.03.2025

Prepared by:
Habitat Works, Suite 8, Westleigh House, Denby Dale, Huddersfield HD8 8QJ

Version History	Author	Description	Date
V1.0	Joe Travis	Final Version for Issue	14.03.2025

Contents

EXECUTIVE SUMMARY ..... **IV**

1. INTRODUCTION **1**

1.1 BACKGROUND 1

2. METHODOLOGY **2**

2.1 NIGHTTIME BAT WALKOVER SURVEYS 2
2.2 AUTOMATED STATIC MONITORING SURVEYS 3
2.3 STATIC DATA ANALYSIS 3
2.4 ASSUMPTIONS AND LIMITATIONS 4

3. FINDINGS AND EVALUATION **5**

3.1 NIGHTTIME BAT WALKOVER SURVEYS 5
3.2 AUTOMATED STATIC MONITORING SURVEYS 6

4. IMPACT ASSESSMENT AND ENHANCEMENTS **9**

4.1 PROPOSALS 9
4.2 LEGISLATION 9
4.3 ASSESSMENT 9

5. REFERENCES **11**

FIGURE 1. SITE LOCATION **12**

FIGURES 2.1 – 2.3. NIGHTTIME BAT WALKOVER (NBW) SURVEY RESULTS **14**

FIGURE 3. STATIC BAT DETECTOR LOCATIONS **18**

FIGURE 4. OVERALL BAT PASSES PER MONTH **20**

FIGURES 5. OVERALL BAT PASSES PER GENUS PER LOCATION **22**

APPENDIX 1. STATIC MONITORING SURVEY WEATHER CONDITIONS **24**

Executive Summary

Habitat Works Limited (Habitat Works) was commissioned by Canal and River Trust to undertake a suite of bat activity surveys located at the area of land adjacent to the Montgomery Canal and the River Vyrnwy, (central Ordnance Survey National Grid Reference (OS NGR) SJ 25850 19534), hereafter referred to as 'the Site'.

The bat surveys were required to inform consideration into the appropriateness of putting the land forward as a location for a wetland habitat creation scheme to create an offline wetland reserve that provides suitable habitat for floating water plantain *Luronium natans* and other key macrophytes associated with the Mongomery Canal.

The Nighttime Bat Walkover (NBW) surveys and automated static monitoring surveys carried out at the Site have identified varying levels of bat activity during the 2024 bat activity season. NBW surveys recorded low numbers of bats in flight, however these were concentrated around higher value foraging and commuting features, in particular the River Vyrnwy and the Montgomery Canal corridors on the northern and southern boundaries of the Site respectively.

During the automated static monitoring surveys, Location 2 recorded the greatest number of bat calls, accounting for 75.8% of the total calls recorded, with Location 1 recording just 24.2%.

At least 10 bat species were recorded using the Site, with soprano pipistrelle the most frequently recorded bat species during both the NBW surveys and static monitoring surveys, accounting for 71.2% of the calls recorded during the static monitoring surveys. common pipistrelle were the second most frequently recorded (17.5%), followed by noctule (8.6%), *Myotis* sp. (1.7%), lesser horseshoe (<1%), Nathusius' pipistrelle (<1%), brown long-eared bat (<1%), Leisler's bat (<1%),barbastelle (<1%) and serotine (<1%).

Based on the findings of the surveys, with predominantly low levels of bat activity by the at least nine bat species recorded, it is considered that the Site is of up to local level importance for foraging and commuting bats. The River Vyrnwy and the Montgomery Canal on the northern and southern boundaries of the Site respectively provide dark foraging and commuting corridors that extend for significant distances and create good quality commuting corridors for the local landscape.

The proposed development is anticipated to result in the partial loss of the habitats in the centre of the Site, to create a series of backwater excavations that will be flooded by the River Vyrnwy. Habitats on the boundaries of the Site recorded higher levels of activity, which are to be retained as per the proposals. It is considered that the creation of the backwater ponds post-development will represent an improvement in the foraging value of the site to bats, which will likely see an increase in invertebrates associated with the central areas of the Site.

As an enhancement for the Site, it is recommended that tree-mounted bat boxes should be installed onto mature trees on the River Vyrnwy or Montgomery Canal corridors. These boxes should be suitable for crevice dwelling bat species such as the Schwegler 2FN Bat Box. The bat boxes should be placed at a minimum height of 4 m facing southern aspects to maximise chances of occupation.

1. Introduction

1.1 *Background*

1.1.1 Habitat Works Limited (Habitat Works) was commissioned by Canal and River Trust to undertake a suite of bat activity surveys located at the area of land adjacent to the Montgomery Canal and the River Vyrnwy, (central Ordnance Survey National Grid Reference (OS NGR) SJ 25850 19534), hereafter referred to as 'the Site' and as displayed in Figure 1.

1.1.2 The Site is located between the Montgomery Canal and the River Vyrnwy on land near Pentreheylin Hall. The Site is surrounded by greenspace on all sides in the form of pastoral farmland and arable cropland, with other greenspaces such as Laundry Wood and Oak Coppice located in the wider landscape.

1.1.3 The requirement for bat activity surveys were identified by the Preliminary Ecological Appraisal (PEA) undertaken by Habitat Works in October 2023 ('*Vyrnwy Reserve – Preliminary Ecological Appraisal*').

1.1.4 The bat surveys were required to inform consideration into the appropriateness of putting the land forward as a location for a wetland habitat creation scheme to create an offline reserve that provides suitable habitat for floating water plantain *Luronium natans* and other key macrophytes associated with the Mongomery Canal.

1.1.5 This report details the methodologies employed and the findings of Nighttime Bat Walkovers (NBWs) and static monitoring undertaken at the Site, to determine the status and level of bat activity over the season, spanning from May to October 2024 inclusive. This report also includes an assessment of potential ecological impacts resulting from the construction and operational phases of the development with respect to foraging and commuting bats, together with recommendation to avoid, minimise and/or mitigate potential impacts on the bat species and assemblage associated with the Site.

2. Methodology

2.1 *Nighttime Bat Walkover Surveys*

2.1.1 The Site is considered to be of Moderate suitability for foraging and commuting bats, based upon good practice guidance (Collins, 2023).

2.1.2 As per good practice guidance, a total of three Nighttime Bat Walkover (NBW) surveys were undertaken across the survey period comprising one spring survey (April/May), one summer survey (June/July/August) and one autumn survey (September/October) (Collins, 2023). These surveys were separated by a minimum of three weeks where possible.

2.1.3 Following the published survey methodology (Collins, 2023) each NBW was undertaken by a pair of suitable experienced bat surveyors using handheld bad detectors to record bat calls. The number, species, behaviour and location of any bats encountered was recorded onto a survey sheet and field map. This also included observation of any foraging or commuting flight lines.

2.1.4 The NBW comprised a predetermined route which was designed to incorporate all areas and habitats within the Site, including the grassland and hedgerow boundaries. The NBWs commenced at sunset and continued for a minimum of two hours.

2.1.5 The NBW was walked at a consistent pace and incorporated 12 Point Counts (PCs). The NBW route was alternated between survey visits and was either walked in a clockwise or anti-clockwise direction, in addition to differing the starting PCs for each survey. These actions ensures that each part of the Site was surveyed at different times during the survey period (i.e. zero to two hours after sunset) to help identify usage of the Site by bats at different times of the evening. Surveyors remained at the starting point for a minimum of 30 minutes after sunset in attempt to locate any nearby roosts, before completing the predetermined route, stopping at each PC for three minutes.

2.1.6 NBWs were undertaken during appropriate weather conditions for bats, with temperatures above 10°C, generally low wind speeds and predominantly dry conditions. Details of the survey dates, timings and weather conditions are detailed in Table 1 below. Results of the NBW surveys are displayed in Figures 2.1 to 2.3.

Table 1 – Nighttime Bat Walkover Survey Details

Survey Date	Timings	Surveyors	Weather Conditions	Bat Detector
30.05.2024	Sunset: 21:25 hrs Start: 21:20 hrs End:23:40 hrs	Nick Birkinshaw and Stuart Silver	15°C, Beaufort Scale (BS) 2 wind speed, 80% cloud cover, dry	Echometer Touch 2 Pro
29.08.2024	Sunset: 20:06 Start: 20:06 End: 22:06	Nick Birkinshaw and Ellie Collier	14°C, BS 1 wind speed, 0% cloud cover, dry	Echometer Touch 2 Pro

16.09.2024	Sunset: 19:24 Start: 19:24 End: 21:24	Chris Birkinshaw and Ellie Collier	14°C, BS 1 wind speed, 10% cloud cover, dry	Echometer Touch 2 Pro

2.2 *Automated Static Monitoring Surveys*

2.2.1 As the Site displayed Moderate suitability for foraging and commuting bats, the NBWs were accompanied by the monthly deployment of two static bat detectors: an Anabat Chorus detector with an omnidirectional microphone, in accord with good practice guidance (Collins, 2023). The static bat detectors were attached to the trunks of trees, with the microphone facing outwards i.e. into the Site, so as to record bat activity from within the proximity of their location.

2.2.2 Static bat detectors were deployed and left in-situ over a minimum of five consecutive nights in suitable weather conditions. Static bat detectors were set to record echolocation calls continuously between 30 minutes before sunset and 30 minutes after sunrise during this time period. Weather conditions for each survey period are provided in Appendix 1.

2.2.3 A total of 12 static bat detectors were utilised across the Site during the survey period (Figure 3). This comprised two detectors deployed monthly in order to collect additional bat activity data to inform the understanding of the use of the Site by bats. The statics were placed upon the northern and southern boundaries of the Site, adjacent to the River Vyrnwy and the Montgomery Canal respectively. These locations were chosen as they were considered the habitats of greater quality for bat activity, as both offer a dark commuting corridor for bats to utilise.

2.3 *Static Data Analysis*

2.3.1 Analysis of sound files collected during the NBW surveys and static monitoring survey period was undertaking using Kaleidoscope Pro software with bat calls determined to species level or genus, where appropriate (Russ, 2021). The Auto ID feature of the Kaleidoscope Pro software was utilised in the first stage of analysis. The Auto ID was then verified manually, with the following parameters used for the number of files checked:

- *Pipistrelle* files: 10% of total files checked
- No ID files: 10% of total files checked
- Noise files: 10% of total files checked
- All other bat Auto ID: 100% of total files checked

2.3.2 The files selected for the manual check was formed by random number generators to remove potential bias from the selection.

2.3.3 Ordinarily, Ecobat would have been utilised to compare the bat activity recorded on the Site with those expected in the local area, and as such offer a quantifiable comparison between the activity levels and therefore the likely significance of the Site for local bat species. However, Ecobat is currently offline for essential maintenance at the time of witing, and as such cannot be utilised.

2.3.4 As Ecobat was not available, to aid comparison between data collected during different survey periods, Bat Activity Indices (BAI) values were calculated using the formulas below:

- *BAI (per night) = Bat sound files / total nights detector deployed*
- *BAI (per hour) = Bat sound files / total survey night hours*

2.3.5 The BAI (per night) measures the mean nightly rate of sound files that were recorded during the survey period. The BAI (per hour) measures the mean hourly rate of sound files that were recorded during the survey period. Analysis of the sound file data allowed the determination of how many bat sound files there were over the five-night period (abundance) and the regularity of the sound files.

2.3.6 BAI categories are based on the professional judgement in the absence of published guidance. For this assessment, BAI (per hour) was categorised as:

- Low – 0-14 bat sound files per hour
- Medium – 15-29 bat sound files per hour
- High – 30-60 bat sound files per hour
- Very high – 60+ bat sound files per hour

2.4 *Assumptions and Limitations*

2.4.1 The detection range of a bat detector can be affected by atmospheric factors (including ambient temperature, relative humidity and air pressure), habitat factors (as a result of sound absorption and bat/habitat interactions) and the bat species being recorded. Bats with high frequency, quiet or directional calls, such as brown long-eared bats *Plecotus auritus,* may sometimes only recorded at distances less than 5 metres (m), whereas bats with low frequency and loud calls such as noctule *Nyctalus noctula,* may be detected form over 100 m away. This creates an element of bias within the data between bat species and their apparent level of activity on or near the Site.

2.4.2 Identification of bat calls to species level is not always be possible, as calls may be faint, of poor quality or contain sound elements (including echoes or ambient noise) which distort the recording. Additionally, it is frequently difficult to differentiate calls of different bat species within the same genus due to overlapping bat call parameters. In particular, there is considerable overlap between the echolocation calls of species within the *Myotis* genus. As such, in instances where it has been possible to confidently ID a particular *Myotis* to species level, the species has been added to the Site's species list, and the AutoID for that species is used to calculate the number of passes for that particular species. In the instance where the AutoID states a species that has not been confidently identified, these have just been classified within the results as *Myotis* sp..

2.4.3 During the July static monitoring period, both static bat detectors failed and recorded no data. Given the amount of data recorded over the other five monitoring periods, it is considered that information can be extrapolated from this information, and provide a robust understanding of the importance of the Site to local bat populations and how the proposals may impact the importance of the Site post-development.

2.4.4 Due to poor weather conditions, the beginning of the May static surveys were delayed, meaning that the full five-day monitoring period was not wholly in May, and instead extended into June. Although this is not in line with good practice guidance, it is considered that this would provide a better understanding of the Site than only taken the data from the three days at the end of May that the statics were recording in appropriate weather conditions.

3. Findings and Evaluation

3.1 *Nighttime Bat Walkover Surveys*

Spring NBW Survey – 30th May 2024

3.1.1 During the spring NBW, low levels of bat activity were recorded for common pipistrelle *Pipsistrellus pipistrellus,* soprano pipistrelle *Pipistrellus pygmaeus* and noctule *Nyctalus noctula* with only 24 passes recorded throughout the survey.

3.1.2 The passes were noted at PCs 1, 2, 3, 5, 7, 8 and 9 (including the 30 stationary start). During the initial 30-minute start of the survey, a single bat pass was recorded comprising a noctule observed commuting over the adjacent hedgerows. The earliest bat recorded pertained to a noctule at 21:20 hrs (at sunset).

3.1.3 The remaining bat passes recorded where three soprano pipistrelles at PC2; three soprano pipistrelle passes and a noctule pass between PC2 and PC3; a noctule pass at PC3; two noctule passes at PC5; a single common pipistrelle pass and a single soprano pipistrelle pass between PC6 and PC7; a single common pipistrelle bat observed continually foraging at PC7; a soprano pipistrelle pass between PC7 and PC8; four soprano pipistrelle passes and a singular common pipistrelle pass at PC8; two soprano pipistrelle passes between PC8 and PC9; and a single soprano pipistrelle pass and a single common pipistrelle pass at PC9. The latest recording was of a common pipistrelle which was not observed by the surveyors at PC9 at 23:25 (125 minutes after sunset).

3.1.4 Bats were recorded in both fields on the Site, recorded most prevalently along mature tree and hedge lines along the field boundaries.

Summer NBW Survey – 29th August 2024

3.1.5 During the summer NBW, low levels of bat activity were recorded for soprano pipistrelle and *Myotis* sp. only, with only 21 passes recorded throughout the survey.

3.1.6 The passes were noted between PCs 9, 8, 7, 6, 4 and 1. The earliest bat pertained to a soprano pipistrelle that was recorded flying eastwards across the Site at 29:29 hrs (23 minutes after sunset).

3.1.7 Other bats recorded included soprano pipistrelle foraging and commuting around PC9. All other bats were not observed in flight by the surveyors. These however included two soprano pipistrelle passes at PC 8 and at PC 7, while single soprano pipistrelle passes were recorded at each of PCs 6, 4 and 1. The last bat was recorded at 21:52, pertaining to an unidentified *Myotis* sp. at PC 1 at 21:52 hrs (106 minutes after sunset).

Autumn NBW Survey – 17th September 2024

3.1.8 During the autumn NBW, low levels of bat activity were recorded for common pipistrelle, soprano pipistrelle and brown long-eared bat *Plecotus auritus*, with only 10 passes recorded throughout the survey.

3.1.9 The passes were noted at PCs 1, 2, 6, 7, 8, 9 and 10, in addition to a single soprano pipistrelle that was observed in flight along the hedgerow heading northwards along the hedgerow from PC4 to PC3. This was the first bat recorded at 19:54 hrs (30 minutes after sunset). The latest recording pertained to a common pipistrelle which was heard consistently at PC9, however was not observed in flight by the surveyors. The bat passed the surveyors a total of 10 times, with the last pass at 21:07 hrs (103 minutes after sunset).

3.1.10 Bats were recorded in both fields on the Site, with the most activity located within the southwestern corner of the southern field at PC9.

Summary

3.1.11 The bat species identified and total number of passes per survey are summarised in Table 2 below.

3.1.12 During the NBW surveys, low levels of bat activity only were recorded on each of the three surveys.

Table 2 – Summary of Nighttime Bat Walkover Survey Data

Survey Date	Bast Species	Total No. of Passes	Overall Bat Activity
30.05.2024	Soprano pipistrelle	15	Low
	Noctule	5	
	Common pipistrelle	4	
29.08.2024	Soprano pipistrelle	20	Low
	Myotis sp.	1	
16.09.2024	Soprano pipistrelle	5	Low
	Common pipistrelle	3	
	Brown long-eared bat	2	

3.2 *Automated Static Monitoring Surveys*

3.2.1 The findings of the automated static monitoring surveys during each month are provided below. Static Locations are displayed on Figure 3, with overall bat passes recorded during the monitoring displayed in Figure 4, and proportion of the genus of the bat passes recorded across the Site in Figure 5. The prevailing weather conditions throughout the monitoring periods are displayed within Appendix 1.

May Monitoring

3.2.2 During the May static monitoring period, a total of 10,073 sound files attributable to bats were recorded across the two detectors. These included at least nine species of bats including soprano pipistrelle (7,887 recordings), common pipistrelle (1,087 recordings), noctule (698 recordings), Nathusius' pipisitrelle *Pipistrellus nathusii* (78 recordings), lesser horseshoe *Rhinolophus hipposideros* (36 recordings), brown long-eared bat (eight recordings), Leisler's bat *Nyctalus leslerii* (six recordings) and barbastelle *Barbastella barbastellus* (two recordings), in addition to *Myotis sp.* (271 recordings) which could not confidently be attributed to species level.

3.2.3 Location 2 recorded the most activity during this period 9,106 recordings. Soprano pipistrelle recorded Very High levels of bat activity, while common pipistrelle recorded Medium levels of bat activity, both at Location 2. All other species recorded Low levels of bat activity overall. The two barbastelle passes recorded at Location 1 were the only recordings of the species throughout the whole 2024 survey period at either location.

June Monitoring

3.2.4 During the June static monitoring period, a total of 9,841 sound files attributable to bats were recorded across the two detectors. These included at least eight species of bats including soprano pipistrelle (5,916 recordings), common pipistrelle (2,098 recordings), noctule (1,611 recordings), lesser horseshoe (101 recordings), brown long-eared bat (13 recordings), Nathusius' pipisitrelle (one recording) and serotine *Eptesicus serotinus* (one recording), in addition to *Myotis sp.* (100 recordings) which could not confidently be attributed to species level.

3.2.5 Location 2 recorded the most activity during this period 7,188 recordings. Soprano pipistrelle again recorded Very High levels of bat activity at Location 2, while also recording Medium levels of bat activity at Location 1. Common pipistrelle and noctule both recorded High levels of bat activity at Location 2 and Location 1 respectively. All other species recorded Low levels of bat activity overall. The single serotine pass recorded at Location 2 was the only recording of the species throughout the whole 2024 survey period.

August Monitoring

3.2.6 During the August static monitoring period, a total of 805 sound files attributable to bats were recorded across the two detectors. These included at least four species of bats including soprano pipistrelle (705 recordings), common pipistrelle (73 recordings) and noctule (eight recordings), in addition to *Myotis sp.* (19 recordings) which could not confidently be attributed to species level.

3.2.7 Location 2 recorded the most activity during this period 568 recordings. All species recorded Low levels of bat activity overall.

September Monitoring

3.2.8 During the September static monitoring period, a total of 2,770 sound files attributable to bats were recorded across the two detectors. These included at least seven species of bats including common pipistrelle (1,384 recordings), soprano pipistrelle (1,322 recordings), brown long-eared bat (26 recordings), noctule (13 recordings), lesser horseshoe (one recording), and Leisler's bat (one recording), in addition to *Myotis sp.* (23 recordings) which could not confidently be attributed to species level.

3.2.9 Location 1 recorded the most activity during this period 2,673 recordings. Both common pipistrelle and soprano pipistrelle recorded Medium levels of bat activity at Location 1, while all other species recorded Low levels of bat activity overall.

October Monitoring

3.2.10 During the October static monitoring period, a total of 4,056 sound files attributable to bats were recorded across the two detectors. These included at least seven species of bats including soprano pipistrelle (3,802 recordings), common pipistrelle (169 recordings), noctule (12 recordings), lesser horseshoe (12 recordings), brown long-eared bat (seven recordings), and Nathusius' pipistrelle (two recordings), in addition to *Myotis sp.* (52 recordings) which could not confidently be attributed to species level.

3.2.11 Location 2 recorded the most activity during this period 3,997 recordings. Soprano pipistrelle recorded High levels of bat activity at Location 2, all other species recorded Low levels of bat activity overall.

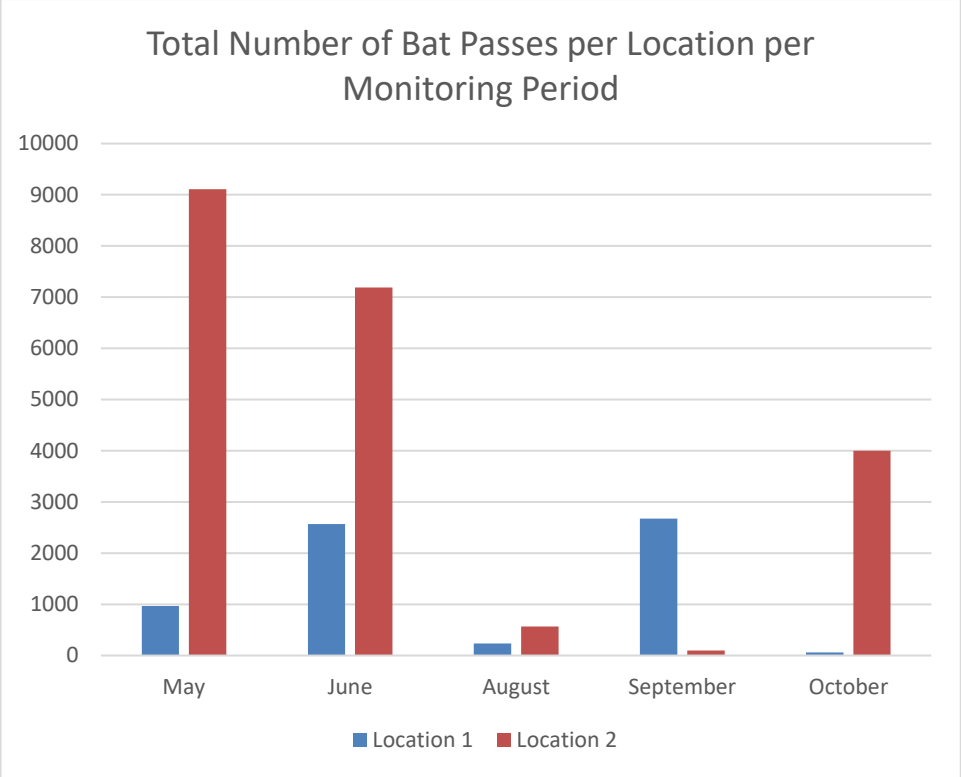
Summary

3.2.12 At least 10 bat species were recorded using the Site, with soprano pipistrelle the most frequently recorded bat species during both the NBW surveys and static monitoring surveys, accounting for 71.2% of the calls

recorded during the static monitoring surveys. common pipistrelle were the second most frequently recorded (17.5%), followed by noctule (8.6%), *Myotis* sp. (1.7%), lesser horseshoe (<1%), Nathusius' pipistrelle (<1%), brown long-eared bat (<1%), Leisler's bat (<1%),barbastelle (<1%) and serotine (<1%).

3.2.13 Location 2 recorded significantly more bat passes than Location 1 each month with the exception of August, as displayed below in Graph 1. Location 2 recorded the greatest number of bat calls, accounting for 75.8% of the total calls recorded, with Location 1 recording just 24.2%.

Graph 1 – Total Number of Bat Passes per Location per Monitoring Period



Both static bat detectors failed during the July monitoring period.

3.2.14 Common pipistrelle soprano pipistrelle and noctule all recorded greater than Low activity levels for spells of the monitoring period and were the most prevalent species recorded throughout the survey period. Soprano pipistrelle were the most recorded species, accounting for 71.2% of the total bats recorded. *Pipistrellus* sp. bats were recorded most throughout the surveys, with common pipistrelle accounting for a further 17.5% of the total calls recorded.

4. Impact Assessment and Enhancements

4.1 *Proposals*

4.1.1 Proposals for the Site comprises the creation of a nature reserve for aquatic botanical interests. Proposals include the creation of backwater excavations to create standing water on the floodplain, in addition to hedgerow planting along the eastern boundary of the Site.

4.2 *Legislation*

4.2.1 All species of bat occurring within the UK are included in Schedule 2 of the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. Under regulation 41 bats are protected from deliberate capture, injury or killing, from deliberate disturbance and from deliberate damage or destruction of a breeding site or resting place (roost).

4.2.2 All UK bats are also included on Schedule 5 of the WCA 1981 (as amended). However, their protection is limited to certain offences. Under the 1981 Act (as amended) it is an offence to intentionally or recklessly disturb bats while they are occupying a structure or place used for shelter or protection, or to obstruct access to any such place.

4.2.3 Barbastelle, Bechstein's *Myotis bechsteinii*, brown long-eared bat, greater horseshoe *Rhinolophus ferrumequinum*, lesser horseshoe, noctule and soprano pipistrelle bats are included as priority species under Section 41 of the NERC Act 2006.

4.3 *Assessment*

4.3.1 The Nighttime Bat Walkover (NBW) surveys and automated static monitoring surveys carried out at the Site have identified varying levels of bat activity during the 2024 bat activity season. NBW surveys recorded low numbers of bats in flight, however these were concentrated around higher value foraging and commuting features, in particular the River Vyrnwy and the Montgomery Canal corridors on the northern and southern boundaries of the Site respectively.

4.3.2 During the automated static monitoring surveys, Location 2 recorded the greatest number of bat calls, accounting for 75.8% of the total calls recorded, with Location 1 recording just 24.2%.

4.3.3 At least 10 bat species were recorded using the Site, with soprano pipistrelle the most frequently recorded bat species during both the NBW surveys and static monitoring surveys, accounting for 71.2% of the calls recorded during the static monitoring surveys. common pipistrelle were the second most frequently recorded (17.5%), followed by noctule (8.6%), *Myotis* sp. (1.7%), lesser horseshoe (<1%), Nathusius' pipistrelle (<1%), brown long-eared bat (<1%), Leisler's bat (<1%),barbastelle (<1%) and serotine (<1%).

4.3.4 Based on the findings of the surveys, with predominantly low levels of bat activity by the at least nine bat species recorded, it is considered that the Site is of up to local level importance for foraging and commuting bats. The River Vyrnwy and the Montgomery Canal on the northern and southern boundaries of the Site respectively provide dark foraging and commuting corridors that extend for significant distances and create good quality commuting corridors for the local landscape.

4.3.5 The proposed development is anticipated to result in the partial loss of the habitats in the centre of the Site, to create a series of backwater excavations that will be flooded by the River Vyrnwy. Habitats on the boundaries of the Site recorded higher levels of activity, which are to be retained as per the proposals. It is considered that the creation of the backwater ponds post-development will improve the foraging value to

bats, which will likely see an increase in invertebrates associated with the central areas of the Site.

4.3.6 As an enhancement for the Site, it is recommended that tree-mounted bat boxes should be installed onto mature trees on the River Vyrnwy or Montgomery Canal corridors. These boxes should be suitable for crevice dwelling bat species such as the Schwegler 2FN Bat Box. The bat boxes should be placed at a minimum height of 4 m facing southern aspects to maximise chances of occupation.

5. References

Collins, J. (2023) '*Bat Surveys for Professional Ecologists: Good Practice Guidelines* (4th edn)'. The Bat Conservation Trust, London.

Habitat Works (2023) '*Vyrnwy Reserve – Preliminary Ecological Appraisal*'.

Russ, J. (2021). '*Bat Calls of Britian and Europe: A Guide to Species Identification'*. Pelagic Publishing, London. ISBN 9781784272258.

Figure 1. Site Location

Legend

Reserve Boundary

0 100 200 300 400 m

HABITAT WORKS

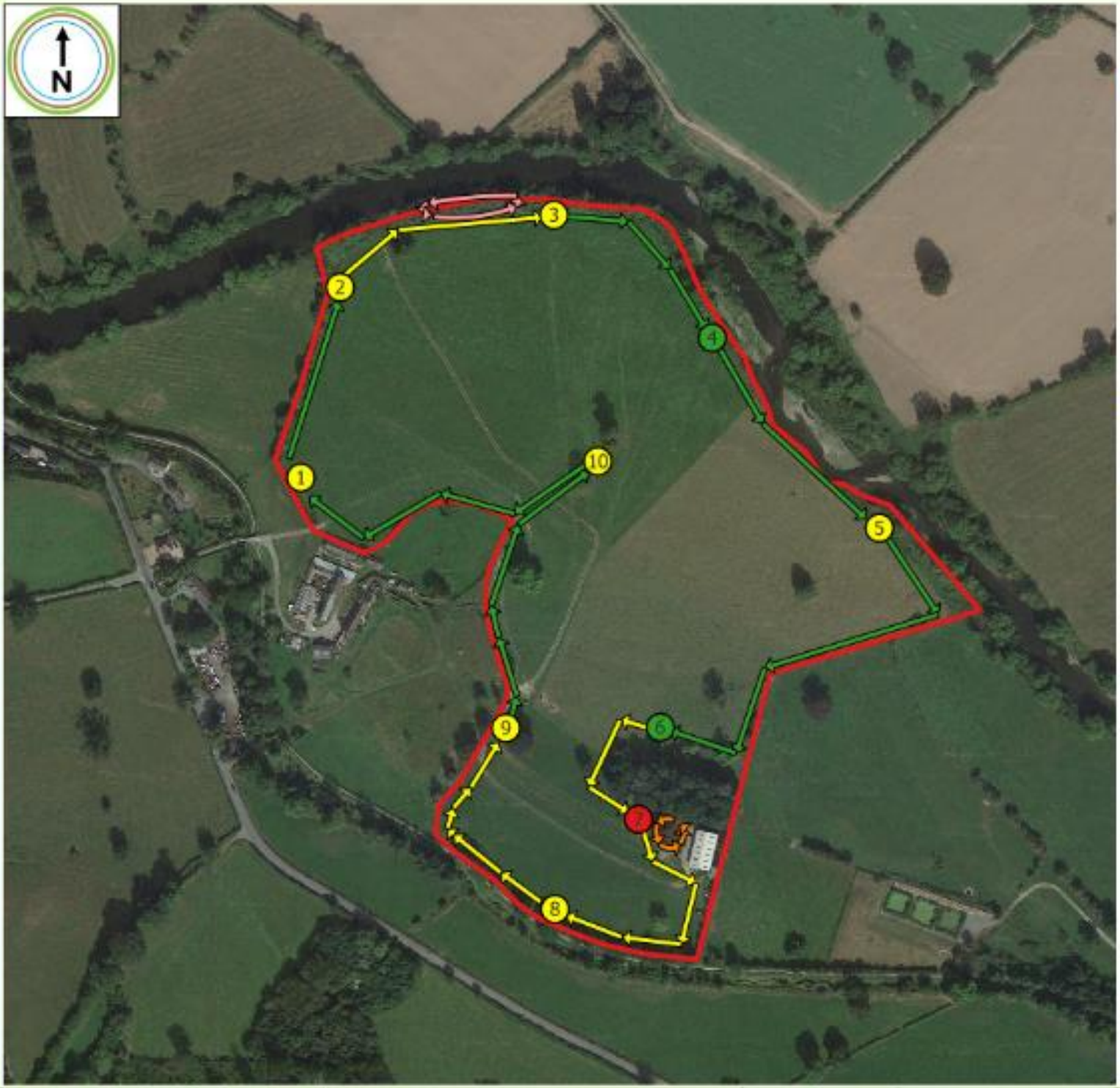
The Canal & River Trust

Vyrnwy Reserve
Bat Activity Surveys

Figure 1
Site Location

Basemap: Copyright Google 2025 | February 2025 | Scale - 1:7500 @ A4 | Drawing Reference: 250221/F1/JT

Figures 2.1 – 2.3. Nighttime Bat Walkover (NBW) Survey Results



Legend

- Reserve Boundary

Point Count Bat Passes

- 0 Passes
- 1-5 Passes
- 6-10 Passes
- 11+ Passes

Walked Section Bat Passes

- 0 Passes
- 1-5 Passes

Bat Flight Paths

- Common pipistrelle
- Soprano pipistrelle

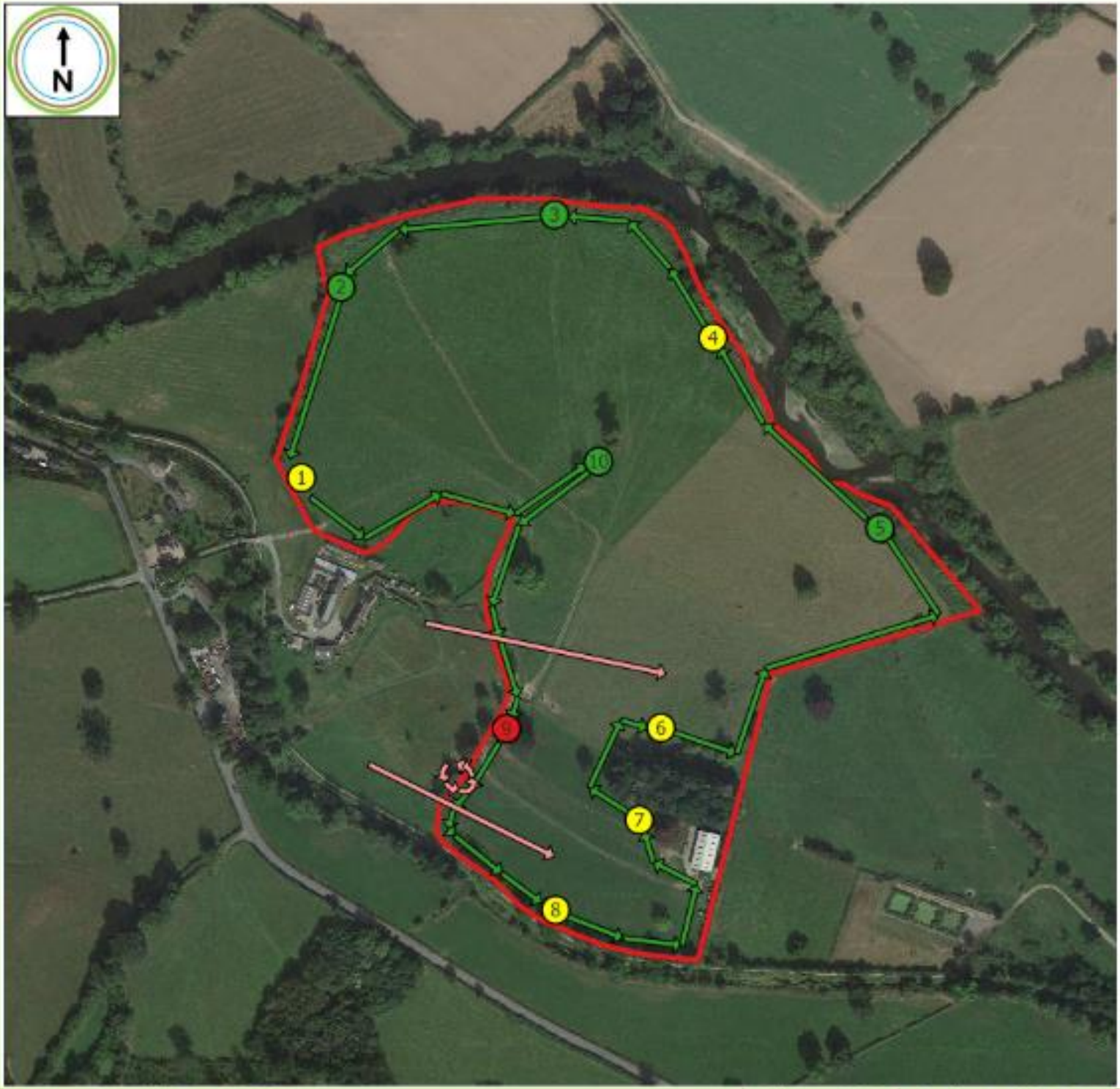
0 50 100 150 200 m

HABITAT WORKS

The Canal & River Trust

Vyrnwy Reserve
Bat Activity Surveys

Figure 2.1
Spring Nighttime Bat Walkover Results



Legend

- Reserve Boundary

Point Count Bat Passes

- 0 Passes
- 1-5 Passes
- 6-10 Passes
- 11+ Passes

Walked Section Bat Passes

- 0 Passes
- 1-5 Passes

Bat Flight Paths

- Soprano pipistrelle

0 50 100 150 200 m

HABITAT WORKS

The Canal & River Trust

Vyrnwy Reserve
Bat Activity Surveys

Figure 2.2
Summer Nighttime Bat Walkover Results

February 2025 | Scale - 1: 4000 @ A4 | Drawing Reference: 250225/F2.2/JT

Legend

Reserve Boundary

Point Count Bat Passes

- 0 Passes
- 1-5 Passes
- 6-10 Passes
- 11+ Passes

Walked Section Bat Passes

- 0 Passes
- 1-5 Passes

Bat Flight Paths

- Soprano pipistrelle

0 50 100 150 200 m

HABITAT WORKS

The Canal & River Trust

Vyrnwy Reserve
Bat Activity Surveys

Figure 2.3
Autumn Nighttime Bat Walkover Results

Basemap: Copyright Google 2025 | February 2025 | Scale - 1:4000 @ A4 | Drawing Reference: 250225/F2.3/JT

Figure 3. Static Bat Detector Locations

Legend

- Reserve Boundary
- Static Bat Detector Locations

0 50 100 150 200 m

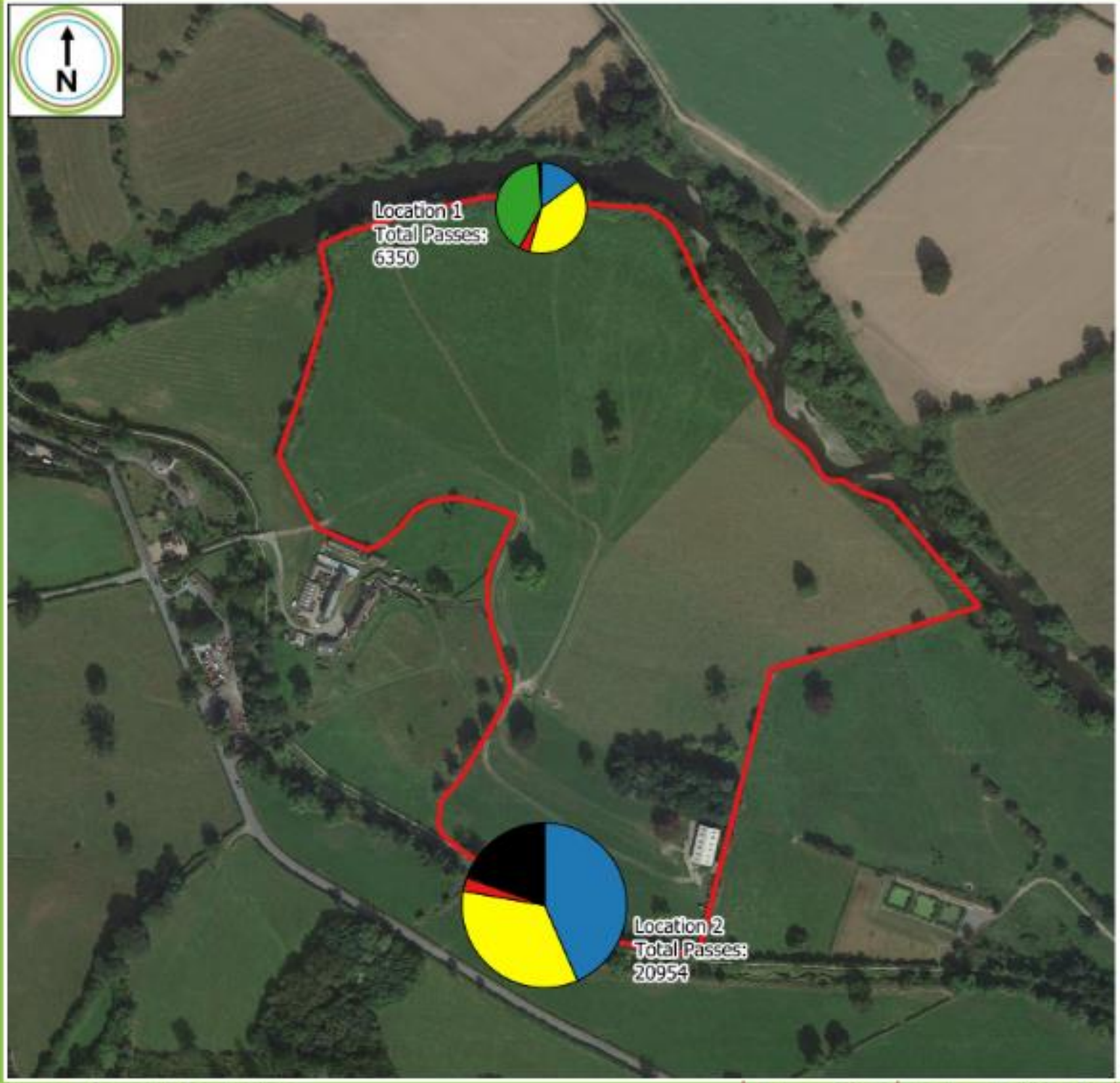
HABITAT WORKS

The Canal & River Trust

Vyrnwy Reserve
Bat Activity Surveys

Figure 3
Static Bat Detector Locations

Figure 4. Overall Bat Passes per Month



Legend

- Reserve Boundary

Monthly

- May
- June
- August
- September
- October

0 50 100 150 200 m

HABITAT WORKS

The Canal & River Trust

Vyrnwy Reserve
Bat Activity Surveys

Figure 4
Number of passes per Month at each location during 2024 Monitoring Period

Figures 5. Overall Bat Passes per Genus per Location

Legend

- Reserve Boundary

Genus

- Pipistrellus sp.
- Nyctalus sp.
- Myotis sp.
- Plecotus sp.
- Rhinolophidae sp.

0 50 100 150 200 m

HABITAT WORKS

The Canal & River Trust

Vyrnwy Reserve
Bat Activity Surveys

Figure 5
Proportion of species recordings per Location throughout 2024 Monitoring Period

Appendix 1. Static Monitoring Survey Weather Conditions

Month	Date	Mean wind speed (mph)	Min overnight temp (°C)	Max overnight temp (°C)	Mean overnight temp (°C)	Rainfall	Humidity (%)
May	30/05/2024	10	12	15	10	None	86
	31/05/2024	7	10	12	13	None	90
	01/06/2024	5	7	17	11	None	87
	02/06/2024	6	12	17	14	None	77
	03/06/2024	5	10	16	13	None	82
June	24/06/2024	4	14	23	17	None	76
	25/06/2024	5	16	22	19	None	68
	26/06/2024	7	15	20	17	None	85
	27/06/2024	7	14	24	19	None	76
	28/06/2024	7	13	17	15	None	69
	29/06/2024	8	10	17	13	None	84
August	01/08/2024	5	16	18	12	None	75
	02/08/2024	5	12	23	17	None	85
	03/08/2024	7	15	20	17	None	86
	04/08/2024	7	12	19	15	None	78
	05/08/2024	11	16	20	18	None	70
September	10/09/2024	12	13	14	13	None	79
	11/09/2024	9	8	13	10	None	78
	12/09/2024	11	6	12	8	None	84
	13/09/2024	4	3	11	7	None	89
	14/09/2024	6	10	13	11	None	74
October	24/10/2024	10	11	12	11	None	86
	25/10/2024	9	14	15	14	None	88
	26/10/2024	2	6	13	9	None	97
	27/10/2024	5	4	13	7	None	87
	28/10/2024	11	11	12	11	Light Rain	90