

Table 19. Number and percentage of sound files recorded at each automated bat detector location for each species in 2021 (cont.)

Survey period		Aug-21												Sep-21											
Detector location (see Figure 8)		Aug-01		Aug-02		Aug-03		Aug-04		Aug-05		Aug-06		Sep-01		Sep-02		Sep-03		Sep-04		Sep-05		Sep-06	
Species	No. of files	%	No. of files	%	No. of files	%	No. of files	%	No. of files	%	No. of files	%	No. of files	%	No. of files	%	No. of files	%	No. of files	%	No. of files	%	No. of files	%	
Common Pipistrelle	5	22	12	43	51	72	252	78	766	91	365	93	24	96	63	24	38	40	680	95	34	62	0	0	
Soprano Pipistrelle	7	30	1	3.6	0	0	52	16	45	5.3	7	1.8	1	4	25	9.5	21	22	10	1.4	0	0	0	0	
Pipistrellus sp. (common/soprano)	9	39	1	3.6	2	2.8	6	1.8	2	0.2	2	0.5	0	0	11	4.2	0	0	1	0.1	0	0	0	0	
Nathusius's pipistrelle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1	0	0	0	0	
Pipistrellus sp. (common/Nathusius's)	0	0	0	0	0	0	1	0.3	6	0.7	1	0.3	0	0	0	0	0	0	2	0.3	0	0	0	0	
Noctule	0	0	0	0	0	0	1	0.3	1	0.1	5	1.3	0	0	3	1.1	0	0	0	0	0	0	0	0	
Nyctalus sp.	0	0	0	0	0	0	0	0	0	0	1	0.3	0	0	0	0	0	0	0	0	0	0	0	0	
Serotine	0	0	3	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nyctalus/Eptesicus sp.	0	0	1	3.6	0	0	0	0	2	0.2	0	0	0	0	0	0	0	0	1	0.1	0	0	0	0	
Brown long-eared bat	0	0	1	3.6	0	0	0	0	0	0	2	0.5	0	0	0	0	0	0	5	0.7	0	0	0	0	
Lesser horseshoe bat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Myotis sp.	0	0	2	7.1	6	8.5	9	2.8	17	2	6	1.5	0	0	134	51	34	36	7	1	19	35	1	100	
WAB	0	0	0	0	0	0	1	0.3	7	0.8	1	0.3	0	0	10	3.8	0	0	6	0.8	0	0	0	0	
Daubentons bat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Natterer's bat	0	0	0	0	0	0	0	0	0	0	1	0.3	0	0	6	2.3	0	0	0	0	0	0	0	0	
Unidentified bat	2	8.7	7	25	12	17	3	0.9	0	0	1	0.3	0	0	10	3.8	1	1.1	6	0.8	2	3.6	0	0	
Total number of files	23		28		71		325		846		392		25		262		94		719		55		1		

Table 19. Number and percentage of sound files recorded at each automated bat detector location for each species in 2021 (cont.)

Survey period	Total number	
Detector location (see Figure 8)		
Species	No. of files	%
Common pipistrelle	5964	71.4
Soprano pipistrelle	755	9.0
<i>Pipistrellus</i> sp. (common/soprano) ⁶²	137	1.6
Nathusius' pipistrelle	5	0.1
<i>Pipistrellus</i> sp. (common/Nathusius') ⁶³	41	0.5
Noctule	145	1.7
<i>Nyctalus</i> sp. ⁶⁴	3	0.0
Serotine	5	0.1
<i>Nyctalus/Eptesicus</i> sp. ⁶⁵	11	0.1
Brown long-eared bat	8	0.1
Lesser horseshoe bat	3	0.0
<i>Myotis</i> sp. ⁶⁶	1071	12.8
WAB ⁶⁷	32	0.4
Daubenton's bat	2	0.0
Natterer's bat	11	0.1
Unidentified bat ⁶⁸	166	2
Total number of files	8356	

62 Where Pipistrelle calls were at approximately 50kHz these have been noted as *Pipistrellus* sp. Both common and soprano pipistrelle can produce calls at or around 50kHz and as such it is not possible to directly attribute a call of this frequency to either species.

63 Where Pipistrelle calls were at approximately 40-41kHz these have been noted as *Pipistrellus* sp. Both common and Nathusius' pipistrelle can produce calls at or around 40-41kHz and as such it is not possible to directly attribute a call of this frequency to either species.

64 Calls where it was not possible to identify which noctule species (common noctule or Leisler's) was present with absolute certainty.

65 Calls where it was not possible to identify which 'big bat' species (common noctule, Leisler's or serotine) was present with absolute certainty.

66 The use of the slope function in Analook is used to aid in the identification of *Myotis* species (*Myotis* calls are generally difficult to attribute to a specific species); however, where slope is ambiguous these have been noted as *Myotis* sp. The *Myotis* species above (Daubenton's bat, Natterer's bat, whiskered/Alcathoe/Brandt's bat) are probable identifications.

67 Whiskered/Alcathoe/Brandt's Bat. These three species produce calls with a similar structure and thus cannot be definitively identified to the species level from computer analysis alone.

68 For a small number of bat calls it was not possible to identify to the genus or species level due to poor quality recording and/or the presence of an atypical call.

3.4 Autumn swarming surveys: 2015 results

- 3.4.1 The two bat swarming surveys undertaken of three structures in September 2015 did not conclusively record or confirm the presence of swarming bats. However, one lesser horseshoe bat was noted roosting in structure B12 (a long stone retaining wall) during the 15th September 2015 survey (see table within **Appendix 1** for further detail).
- 3.4.2 **Table 20** below provides a summary of the number of sound files recorded by each surveyor during the period that the structure was observed for.

Table 20. The number of sound files recorded for each species during the autumn swarming surveys in 2015

Survey period		September 2015					
Date		15/09/2015			30/09/2015		
Sunset		19:29			18:54		
Location (see Figure 9)		B1	B11	B12	B1	B11	B12
Common pipistrelle		150	11	2	324	41	5
Soprano pipistrelle		113	32	7	158	10	58
<i>Pipistrellus</i> sp. (common/soprano) ⁶⁹		116	7	0	29	1	0
Nathusius' pipistrelle		1	0	0	0	0	0
<i>Pipistrellus</i> sp. (common/Nathusius') ⁷⁰		0	0	1	0	0	0
Noctule		0	0	1	0	0	0
<i>Plecotus</i> sp. ⁷¹		3	1	0	1	2	17
<i>Myotis</i> sp. ⁷²		1	53	13	2	6	32
Daubenton's bat		0	0	1	0	0	2
Social calls	Common pipistrelle	1	16	0	2	28	0
	Soprano pipistrelle	14	0	0	37	0	30
	<i>Pipistrellus</i> sp. (common/soprano)	182	7	0	122	1	0
	Daubenton's bat	0	0	1	0	0	1
	<i>Myotis</i> sp.	0	0	0	0	0	1

- 3.4.3 **Table 21** below provides the number of sound files recorded by the detectors deployed over the entire night at various locations adjacent to built structures/possible swarming sites during the swarming surveys. In order for the data to be comparable between each location, the results presented also incorporate the three-hour swarming survey results in **Table 20**.

69 Where Pipistrelle calls were at approximately 50kHz these have been noted as Pipistrelle sp. Both common and soprano pipistrelle can produce calls at or around 50kHz and as such it is not possible to directly attribute a call of this frequency to either species.

70 Where Pipistrelle calls were at approximately 40-41kHz these have been noted as Pipistrelle sp. Both common and Nathusius' pipistrelle can produce calls at or around 40-41kHz and as such it is not possible to directly attribute a call of this frequency to either species.

71 Likely brown long-eared bat.

72 The use of the slope function in Analook is used to aid in the identification of *Myotis* species (*Myotis* calls are generally difficult to attribute to a specific species); however, where slope is ambiguous these have been noted as *Myotis* sp. The *Myotis* species above (Daubenton's bat, Natterer's bat, Whiskered/Alcathoe/Brandt's bat) are probable identifications.

Table 21. The number of sound files for each species and location recorded by static detectors operating overnight during the swarming survey in 2015

Date		15/09/2015			30/09/2015			
Location (see Figure 9)		B1	B11	B12	B1	B11	B12	B14
Common Pipistrelle		176	36	2	67	102	6	0
Soprano Pipistrelle		124	32	6	110	8	79	0
Pipistrelle sp. (common/soprano) ⁷³		181	11	0	4	11	0	0
Nathusius' pipistrelle		1	0	0	0	0	0	0
Plecotus sp. ⁷⁴		4	9	1	2	6	8	1
Greater Horseshoe bat		0	0	1	0	0	0	0
Lesser Horseshoe bat		0	0	4	0	0	0	0
Myotis sp. ⁷⁵		1	57	261	8	12	128	0
Whiskered/ Alcahloe/ Brandt's bat ⁷⁶		0	0	0	0	1	76	62
Daubenton's bat		0	0	2	0	7	1	0
Natterer's bat		0	0	0	1	0	0	0
Social calls	Common pipistrelle	1	26	0	3	84	0	0
	Soprano pipistrelle	18	0	0	75	1	32	0
	Pipistrellus sp. (common/soprano)	249	12	0	152	20	0	0
	Daubenton's bat	0	0	1	0	0	1	0
	Myotis sp.	0	0	4	0	1	68	0
	Plecotus sp.	0	3	0	0	0	1	0

73 Where Pipistrelle calls were at approximately 50kHz these have been noted as Pipistrelle sp. Both common and soprano pipistrelle can produce calls at or around 50kHz and as such it is not possible to directly attribute a call of this frequency to either species.

74 Likely brown long-eared bat.

75 The use of the slope function in Analook is used to aid in the identification of *Myotis* species (*Myotis* calls are generally difficult to attribute to a specific species); however, where slope is ambiguous these have been noted as *Myotis* sp. The *Myotis* species above (Daubenton's bat, Natterer's bat, Whiskered/Alcahloe/Brandt's bat) are probable identifications.

76 Whiskered/Alcahloe/Brandt's Bat. These three species produce calls with a similar structure and thus cannot be definitively identified to the species level from computer analysis alone.

3.5 Emergence/ re-entry surveys: 2016 results

3.5.1 The two emergence and re-entry surveys undertaken of the five structures in August and September 2016 did not conclusively confirm the presence of any roosting bats. However, a minimum of two *Myotis* bats were observed flying around the entrance to tunnel B11 and then entering shortly before dawn. They were not subsequently observed re-emerging during the course of the survey. Thus whilst their specific roosting location/s was not confirmed, it is considered highly likely they were roosting within the structure.

3.5.2 Table 22 below provides a summary of the number of sound files recorded by each surveyor during the period that the structure was observed for. See Figure 9 for the locations of the structures surveyed.

Table 22. The number of sound files for each species and location recorded by the surveyors during the emergence/ re-entry surveys in 2016

Survey Period	August 2016				September 2016			
Date	23/08/2016		24/08/2016		15/09/2016		16/09/2016	
Survey Timing	Dusk		Dawn		Dusk		Dawn	
Sunrise/Sunset	20:19		06:13		19:27		06:50	
Location (see Figure 9)	B3a	B11	B1	B16	B14	B16	B3a	B11
Soprano pipistrelle	3	0	0	20	0	0	0	149
Common pipistrelle	112	0	2	2	0	0	0	0
<i>Myotis</i> sp. (probable Daubenton's bat)	0	0	0	43	0	0	0	83
Notes	No bats observed emerging	No bats observed emerging	No bats observed re-entering	No bats observed re-entering	No bats observed emerging	No bats observed emerging	No bats observed re-entering	Approximately 2-3 <i>Myotis</i> bats flying around tunnel entrance, then joined by a single soprano pipistrelle. Last <i>Myotis</i> probably entered tunnel at around 06:27. Soprano pipistrelle continued flying in front of entrance until 06:52 (two minutes after sunrise time) but did not appear to enter tunnel- possibly headed north-west.

3.6 Inspection of buildings/structures for hibernating and roosting bats: February 2016, September 2016 and March 2021

3.6.1 **Figure 9** shows the location of each of the built structures within the site that were subject to structural surveys for hibernating bats in February 2016 and March 2021, and for autumn roosting bats in September 2016. **Appendix 1** provides the results of these inspections along with photos of the structures, and a summary of the results of the autumn swarming or other surveys of the same structure carried out between 2015 and 2021 (where relevant).

3.6.2 In summary, four of structures surveyed were assessed to have high or moderate-high roosting potential, four were assessed as moderate, and the remaining 12 low or low-moderate. Of those specifically within the current application site, one (B6) is assessed as 'high' potential, two as 'moderate/high' (B7 and B8), one as 'low/moderate' (B5), and the remaining two as 'low' (B20 and B21).

3.6.3 There are four structures that have been identified as confirmed roosts by surveys undertaken by Bioscan. These include:

- B8: *Myotis* (likely Whiskered/Alcathoe/Brant's) summer roost within the stone bridge in 2021.
- B6: Brown long-eared bat summer roost and lesser horseshoe bat hibernation roost within the stone bridge abutments in 2016.
- B10: Brown long-eared bat hibernation roost within former chimney in 2016.
- B12: Lesser horseshoe bat roost summer roost within long retaining wall in 2015.

3.6.4 In addition, while specific roosting location/s have not been confirmed within tunnel B11, there is evidence from several surveys to indicate the possible presence of *Myotis* roosts within the tunnel (see results described at paragraph 3.5.1 and **Table 22** above). Similarly, desk study data from SEWBRc identified a brown long-eared hibernation roost (single individual observed) also in B11. The likely presence of a brown long-eared hibernation roost was further indicated by analysis of data from automated detector placed within the tunnel entrance in March 2021. This same data also indicated the likely presence of a greater horseshoe hibernation roost within the same structure (see **Appendix 1** for detail).

3.6.5 Of the confirmed roosts, two (bridges B8 and B6) are within the current application site.

3.7 Preliminary tree roost inspection surveys: 2021

3.7.1 **Figure 10** shows the locations of trees assessed to have greater than 'negligible' potential for bat roosting within the search area, and **Appendix 2** provides detailed survey results along with pictures of the trees where possible. Note that any trees considered to have negligible potential for bat roosting are not identified here nor on **Figure 10**.

3.7.2 In summary, within the search area, five trees were assessed as having either 'high' or 'moderate-high' for bat roosting potential. Three were assessed as 'moderate', whilst 20

are of either 'low-moderate' or 'low' potential. In addition, one tree (tree T29) located outside of the search area has been confirmed as a bat roost after a minimum of 10 brown long-eared bats were observed entering a roost feature on the 26th August 2021 (see **Figure 6k**, **Figure 10** and **Figure 11** for location).

4 DISCUSSION & CONCLUSIONS

4.1 Summary of Bat Interest at the Site

4.1.1 In summary, 14 species/species groups have been recorded within or near to the application site across all surveys conducted between 2015 and 2021. Species range from those that are common, widespread and fully to be expected on the site to those that are rare and range restricted. **Table 23** below provides a summary of the bat species recorded on the site, and their status within the site (as derived from the survey data) and their wider status in Wales.

Table 23. Summary of bat species recorded within the site, and its status within the site and in Wales

Species	Site summary	Notes	Status in Wales/ Glamorgan (sourced from SSSI selection criteria, Bat Action Plans for Wales, and JNCC)
Common pipistrelle	Widespread and very common across the site. By far the most common bat species encountered on the site typically accounting for around 65% of registrations from all bat detector surveys (activity, automated and swarming). Possible (but not confirmed) presence of a low number of small day roosts within/near the application site (mainly identified via automated detector/transect analysis). Historic records of a roost of this species in tunnel B1 outside the application site (via desk study).	As expected, given the size of the site, and the extent of woodland cover.	Widespread and common across Wales.
Soprano pipistrelle	Relatively widespread across the site. The second-most commonly recorded species within the site, accounting for around 10% of registrations from all bat detector surveys. Possible (but not confirmed) presence of a low number of small day roosts within/near the application site (mainly identified via automated detector/transect analysis).	As expected, given the abundance of waterbodies within the application site, and this species' apparent preference for riparian habitats and waterbodies.	Widespread and common across Wales.
Nathusius' pipistrelle	Only rarely detected within the site. Species calls meeting the published parameters of this species comprise around 0.8% of registrations.	Calls identified for this species with 95% confidence.	Scattered records across Wales, however, no maternity sites have been found in Wales and its status in Wales is unclear.
Barbastelle	Very rarely detected within the site. All registrations appear to be possible identifications, with these comprising around 0.4% of registrations.	Confidence levels are assigned as follows for calls identified via: -automated detectors and transect surveys in 2015, 90% confidence; -by transect surveys in 2016, 60% confidence; & -by transect surveys in 2018, 50% confidence.	Rare, with few known roosts. Records scattered throughout Wales, mainly in the southern half.

Species	Site summary	Notes	Status in Wales/ Glamorgan (sourced from SSSI selection criteria, Bat Action Plans for Wales, and JNCC)
<i>Myotis</i> sp.	Widespread and recorded throughout most of the site, particularly near water (e.g., pond P15). The percentage composition of the calls recorded within the application site for this genus typically constitutes around 14%. Transect survey in May 2015 indicated the possible use of the Merthyr-Aberdare railway tunnel (B11) as a roost, with the stone bridge B8 noted to be used as a roost in 2021.	Identifying species within the <i>Myotis</i> genus based on their calls is difficult due to the similarity of their calls, especially in areas with cluttered environments (such as the application site). Nevertheless, wherever possible, calls were identified to species level largely based on the slope function in Analook. Where there was ambiguity in the calls, these have been noted as <i>Myotis</i> sp. to avoid false precision.	See individual species accounts below
Daubenton's bat	As stated above, species within the <i>Myotis</i> genus are typically difficult to distinguish by call alone, therefore the 4% of registrations attributable to this species is likely to be an under-estimate. Where it was possible to identify to this species, records appeared to be concentrated over the waterbodies. Historic records of a roost of this species in tunnel B1 (identified via desk study).	The presence of this species is to be expected, especially in association with the large reservoir, P15.	Widely distributed species, commonly recorded foraging low over still waterbodies making identification relatively straight forward. Gaps in range in Wales are likely due to a lack of records rather than true absence.
Natterer's bat	Species within the <i>Myotis</i> genus are typically difficult to distinguish by call alone, and therefore the 0.15% of registrations attributable to this species is likely to be an under-estimate.	The presence of this species is to be expected given their preference for semi-natural broadleaved woodland for foraging habitat.	Widespread in the UK and has been recorded throughout Wales in all wooded landscapes
Whiskered/Alcathoe/ Brandt's (WAB)	As stated above, species within the <i>Myotis</i> genus are typically difficult to distinguish by call alone, therefore the 1.4% of registrations attributable to these three species is likely to be an under-estimate. A <i>Myotis</i> species, thought to be one of the WAB species, was noted to be roosting in bridge B8 in 2021 and the tunnel B11 was identified as a likely roosting site in 2015.	Due to the similarity of the bat calls from these three species, these species have been grouped. Identification to species requires capture and identification in the hand.	Whiskered bats are widely distributed across Wales. Some gaps in range in Wales are likely due to a lack of records rather than true absence. Whiskered and Brandt's bat are very similar to each other, and therefore the distribution and each species' status is difficult to ascertain. Swarming sites and roosts are patchier for Brandt's than for whiskered bats. ⁷⁷
Noctule	Uncommon here; infrequently recorded. Accounting for around 1.3% of registrations.	A species one would expect to be present within the application site, albeit in low numbers.	Insufficient information, but probably reasonably widespread in low

Species	Site summary	Notes	Status in Wales/ Glamorgan (sourced from SSSI selection criteria, Bat Action Plans for Wales, and JNCC)
			numbers across lowland Wales
Serotine	Very rarely detected within the site. Recorded only once during a transect survey and calls attributed to this species during automated detector surveys in 2021 accounted for <0.1%.	Some call parameters of this species, Leisler's bat and noctule overlap, and therefore it is difficult to always have certainty of the identifications of these species. Calls of this species identified during automated analysis in 2015 60 to 80%, 2021 (April) -60% confidence, (August) – 80% confidence, and transects in 2021 – 70% confidence.	Some records for this species show a reasonably widespread, but somewhat patchy distribution across Wales. Most records concentrated in the south. Not clear how much of this trend is due to under recording vs actual absence of the species.
<i>Nyctalus/Eptesicus</i> sp.	Rarely detected within the site, 0.4% of registrations.	Some call parameters of these three species overlap, and therefore it is difficult to have certainty of the identifications of these species.	Noctule and serotine: as above. Leisler's bat: Rare throughout Wales, but with a concentration of records in the south-east. Its status in Wales is unclear.
Brown long-eared bat	Insufficient information. Highly likely to be under-recorded due to the quiet nature of the calls of this species, and therefore the 0.7% of registrations attributable to this species is likely to be a significant under-estimate. Several roosts of this species within/near the application site; Six individuals hibernating in B10 in February 2016, and three individuals roosting in B6 in September 2016. Around 10-12 individuals found to be roosting in tree overlooking pond P15 in 2021. Desk study data and analysis of automated detector data from hibernation surveys in 2021 indicate the presence of hibernation roosts in B11.	It is difficult to distinguish between brown and grey long-eared bats, but given the known species distribution of these two species, the records from the site are considered most likely to be for brown long-eared bat.	Insufficient information, but probably widespread in low numbers across lowland Wales.
Greater horseshoe bat	Very rarely detected within the site. One registration from an automated detector in 2015 outside of the current site boundary. One registration during swarming survey of B12 in September 2015. Seven registrations found in March 2021 from a static detector deployed within the Merthyr-Aberdare railway tunnel (B11), comparison of the time of recorded registrations with sunset/sunrise times indicates the possible presence of a hibernation roost in this structure.	Presence not entirely unexpected given the location of the application site in south Wales and the number of abandoned/disused tunnels within/near site.	Restricted and fragmented distribution in Britain, scattered populations in south and south-west Wales.

Species	Site summary	Notes	Status in Wales/ Glamorgan (sourced from SSSI selection criteria, Bat Action Plans for Wales, and JNCC)
Lesser horseshoe bat	Very rarely detected within the site, albeit with slightly more records than greater horseshoe bat. 1no individual roosting in B12 in 2015, and 1no individual found hibernating in B6 in 2016. Two registrations from a static detector near B12 in 2018. Three registrations from static detectors in 2021, and four registrations during activity surveys in 2021. Seven registrations from a static detector deployed within the Merthyr-Aberdare railway tunnel (B11) in March 2021.	Presence not entirely unexpected given the location of the application site in south Wales and the number of abandoned/disused tunnels within/near site.	Restricted distribution in Britain, although widely distributed throughout lowland Wales.

4.2 Assigning a Value to the Assemblage of Bats at the Site

4.2.1 By reference to emerging guidance on impact assessment for bats (see **Table 24** below), common pipistrelle and soprano pipistrelle fall into the lowest rarity category, being ranked as 'abundant and widespread'. The guidance ranks brown long-eared bat, noctule, and several *Myotis* species (Daubenton's bat, Natterer's bat and whiskered/Brandt's bat) as 'less abundant' in Wales; whilst both horseshoe bats, Leisler's bat, Alcaho bat, Bechstein's bat, barbastelle, serotine and Nathusius' pipistrelle fall into the highest tier, termed 'Rare/Annex II/Red List/Vulnerable'.

Table 24. Bat rarity categorisation, extract reproduced from emerging CIEEM guidance⁷⁸

Rarity category	SW England & Wales
Abundant and widespread	- Common pipistrelle - Soprano pipistrelle
Less abundant +selected data-deficient	- Whiskered/Brandt's bat - Daubenton's bat - Natterer's bat - Noctule - Brown long-eared bat
Rare/Annex II /Red List Vulnerable or higher, + selected data-deficient	- Greater horseshoe bat - Lesser horseshoe bat - Alcaho bat - Bechstein's bat - Leisler's bat - Nathusius' pipistrelle - Serotine - Barbastelle - Grey long-eared bat

* Those species which were not confirmed as present within/near the application site are listed in grey

- 4.2.2 Roosts of a number of different species have been identified within or near the current application site. These are summarised in **Table 25** below. By reference to emerging CIEEM guidance⁷⁹, of the roosts within the current application site, the lesser horseshoe hibernation roost found in 2016 within bridge B6 could be classified under the highest tier of importance ('Regional/National'). However, the scale of importance in this instance is calibrated by the size of the roost, and given that only a single individual was observed, and that the roost appears to be infrequently used, the value of 'National' level importance is not warranted. As such the lesser horseshoe hibernation roost in B6 is assessed as of 'District' or 'County' level importance.
- 4.2.3 Similarly, with reference to the same guidance, the brown long-eared maternity roost confirmed within tree T29 could be assessed as 'County' level importance as a minimum.
- 4.2.4 All other roosts identified within the application site are assessed as no more than 'Local' level importance in-line with the guidelines.
- 4.2.5 With regards to identified roosts outside the application site, the summer roost within structure B12 (the long stone retaining wall) is assessed as being of 'District' level importance owing to its apparent infrequent use and the small number of bats observed. While the brown long-eared hibernation roost identified within the former chimney B10 in 2016 could be classified under the highest tier of importance ('County/Regional'), the scale of importance in this instance again needs to be calibrated by the size of the roost, and given that only six bats were observed and that the roost appears to be infrequently used, the value of 'Regional' level importance is not warranted. As such, it is assessed as 'County' level importance; likewise, also for the apparent brown long-eared hibernation roost in tunnel B11 (identified via desk study and automated analysis).
- 4.2.6 The probable greater horseshoe hibernation roost in B11 (identified via automated analysis, whereby seven registrations were recorded across 14 days of survey in March 2021) could be classed as 'Regional/National' level of importance dependent on the number of bats utilising the roost. However, this assessment is only preliminary as detailed inspections/surveys of the tunnel have not been carried out. If any evidence were to indicate the likely presence of greater numbers of hibernating bats, then the importance of this roost could be elevated to 'National'.
- 4.2.7 All other roosts outside the application site are assessed as no more than 'Local' level importance, with the exception of the lesser horseshoe/brown long-eared/common pipistrelle roost in a building in Merthyr (identified via desk study), which would likely be of District importance owing to the assemblage of species found (albeit in small numbers).

Table 25. Summary of bat roosts identified in or near the site, also see **Appendix 1 and 2** for detail.

79 CIEEM (June 2021). *Bat Mitigation Guidelines. A guide to impact assessment, mitigation and compensation for developments affecting bats*. Beta version 1.0. Pg. 19, Table 3.2.

Location/Feature	Bat roost type identified
On-site features	
B6 – Stone and metal bridge	Lesser horseshoe: confirmed hibernation roost. A single individual was present in the east abutment during a structure inspection carried out in February 2016. However, inspection surveys carried out in March 2021 revealed no evidence of bats roosting, suggesting the roost may be only infrequently used. Brown long-eared bat: confirmed summer day roost. A minimum of three bats present were present in cracks the west abutment during a structure inspection carried out in September 2016. However, inspection surveys carried out in March 2021 revealed no evidence of bats roosting, suggesting the roost may be infrequently used.
B8 – Stone bridge	Myotis species (likely Whiskered/Alcathoe/Brandt's): confirmed summer roost. A minimum of three bats were observed flying in and out of gaps between bricks under the bridge (south side) during a rain shower, on a dusk transect in September 2021. Although the structure has potential for hibernation, inspection surveys carried out in March 2021 revealed no evidence of bats. Suggesting this roost is likely a summer day roost only.
T29 – Alder tree north of reservoir P15	Brown long-eared bat: confirmed maternity roost. A minimum of 10 bats were observed swarming and then entering a large split on the western aspect of tree T29 during an August dusk transect in 2021. Based on the number of individuals observed roosting, and the time of year, it is considered that tree T29 is a maternity roost.
Other structures and trees present on site	No confirmed roosts but possible presence of small pipistrelle (common and soprano) and lesser horseshoe roosts in woodland/structures at several locations within/near the application site (Target Notes 1-4 on Figure 7). Identified via transect survey analysis.
Off-site features	
B12 – Stone retaining wall with tunnels	Lesser horseshoe: confirmed summer roost. A single individual was noted roosting during a swarming survey in September 2015. Subsequent structure inspections in February and September 2016 and March 2021 found no evidence of bats, suggesting this roost is infrequently used.
B10 – Base of collapsed chimney	Brown long-eared bat: confirmed hibernation roost. Six bats were found during inspection surveys carried out in February 2016. Subsequent inspections in September 2016 and March 2021 found no evidence of bats, suggesting this roost may be infrequently used.
B11 – Abercanaid-Aberdare tunnel	Brown long-eared bat: apparent small hibernation roost (min 1 individual). Identified via desk study c.2005. Automated detector analysis from hibernation surveys conducted by Bioscan in 2021 also indicates the likely presence of a brown long-eared hibernation roost. Myotis species: Possible roost. Displaying swarming/light-sampling activity observed at the entrance to the tunnel during the May 2015 transect was strongly indicative of a roost within the tunnel. Additionally, a minimum of 2-3 bats appeared to enter the tunnel at dawn during surveys conducted in September 2016, but roost not conclusively confirmed. Greater horseshoe bat: Automated detector analysis from hibernation surveys conducted by Bioscan in 2021 indicate also indicates the possible presence of a greater horseshoe hibernation roost.
Within Merthyr Tydfil (and within 2km radius)	Common pipistrelle/Pipistrelle species: Eight roosts in buildings within Merthyr dating from 2003-2018. Identified via desk study.

Location/Feature	Bat roost type identified
from the application site)	Brown long-eared bat: two roosts in buildings within Merthyr dated 2019 and 2020. Identified via desk study. Lesser horseshoe: one roost in a former YMCA building within Merthyr dated 2019. Identified via desk study.
B1 – Cyfartha Canal tunnel	Common pipistrelle: Bats of this species noted emerging from B1 during surveys carried out by other surveyors in 1997. Further surveys in 2002 found no bats emerging. Further repeated surveys by Bioscan have revealed no evidence of use by bats, so likely an infrequently used or now disused roost. Daubenton's bat: Bats of this species noted emerging from B1 during surveys carried out by other surveyors in 1997. Further surveys in 2002 found no bats emerging. Further repeated surveys by Bioscan have revealed no evidence of use by bats, so likely an infrequently used or now disused roost.
Other structures and trees present on site	No confirmed roosts but possible presence of small pipistrelle (common and soprano) roosts in woodland at several locations within/near the application site (Target Notes 1-4 on Figure 7). Identified via transect survey analysis.

4.2.8 An alternative method of determining the value of the bat assemblage on the application site is the methodology suggested by Wray *et al.*⁸⁰. This calculates the value of a site for bats in relation to the rarity of the species, the nature of the roost or approximate number of individuals present, the proximity of foraging/commuting habitat to roosts and the character and complexity of the habitat being used. Table 26 below provides the results for the bat species recorded during the surveys using this method.

Table 26. Species calculations and score, based on Wray *et al.* (2010).

Species	Species Weighting	Number of bats	Roosts	Foraging habitat characteristics	Score	Resulting geographical frame of reference
Common pipistrelle	2	10	4	4	20	District, local or parish
Soprano pipistrelle	2	10	4	4	20	District, local or parish
Nathusius' pipistrelle	20	5	2	4	31	Regional
Daubenton's bat	5	5	4	4	18	District, local or parish
Natterer's bat	5	5	4	4	18	District, local or parish
Noctule	20	5	2	4	31	Regional
Barbastelle	20	5	2	4	31	Regional
Brown long-eared bat	5	10	4	4	23	County
Greater horseshoe bat	20	5	3	4	32	Regional
Lesser horseshoe bat	5	5	3	4	17	District, local or parish

4.2.9 It should be noted that there is some significant subjectivity to the above calculations inherent in assessing the number of bats present, and the placing of a value on the

80 Wray, S., Wells, D., Long, E. and Mitchell-Jones, T. (2010). *Valuing Bats in Ecological Impact Assessment*. In Practice. CIEEM.

potential for roosts in and near to a site; however, it is considered that it can still provide a helpful alternative indication of the overall value of a site. It should also be noted that the value of the site to bats is not uniform across the application site, with some areas not likely to be graded at any geographical frame of reference above the 'immediate local' or 'site' context due to no or few bats having been recorded. Although there are species which fall within the 'Regional' category, these comprise species which are either very infrequently recorded or are 'possible' identifications (based on the call parameters, see **Appendix 1**). Therefore, overall, the cumulative grading of the bat assemblage of the application site would suggest the geographical frame of reference for the importance of foraging activity is, overall, at the 'District' level.

- 4.2.10 In summary, the bat assemblage of the application site can be considered a key receptor, being fairly diverse, with an evident high number of individuals of two pipistrelle species (common and soprano), and winter and summer roosting in some of the structures by various species including brown long-eared bat, lesser horseshoe bat, and *Myotis* species. On the basis of the presence and relative abundance of these species indicated by the survey data, the bat assemblage of the application site, considered in isolation, is placed at the 'District' level. In part, this is due to the position of the application site as an integral part of a wider landholding that contains high value roosting and foraging habitat for a diverse assemblage of species.

Figures

Figure 1

Application site location and pre-2021 survey areas

Key

- Application site
Wider landholding/2015 survey area
--- 2017/18 survey area



Title

Application site location and pre-2021 survey areas

Project

Cwm Glo

Marvel Ltd

Drawing No.

Revision

Project No.

Figure 1

2

E1835

Drawn

Checked

Date _____

WH	DW	November 2023
----	----	---------------

DW

DW

November

Bioscan (UK) Ltd



**The Old Parlour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU.**

T: +44 (0) 1865 341321

bioscan@bioscanuk.com

www.bioscanuk.com

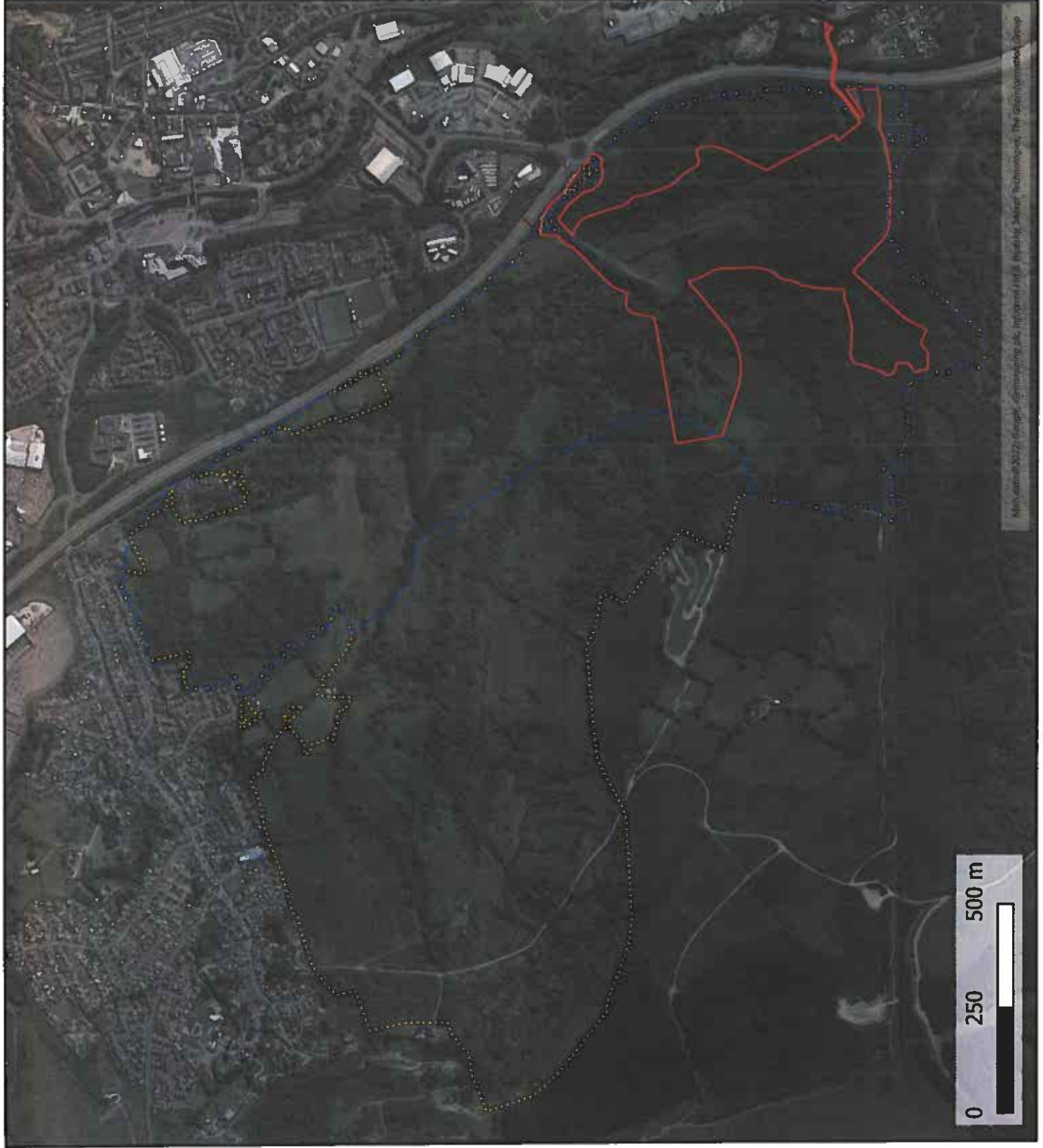
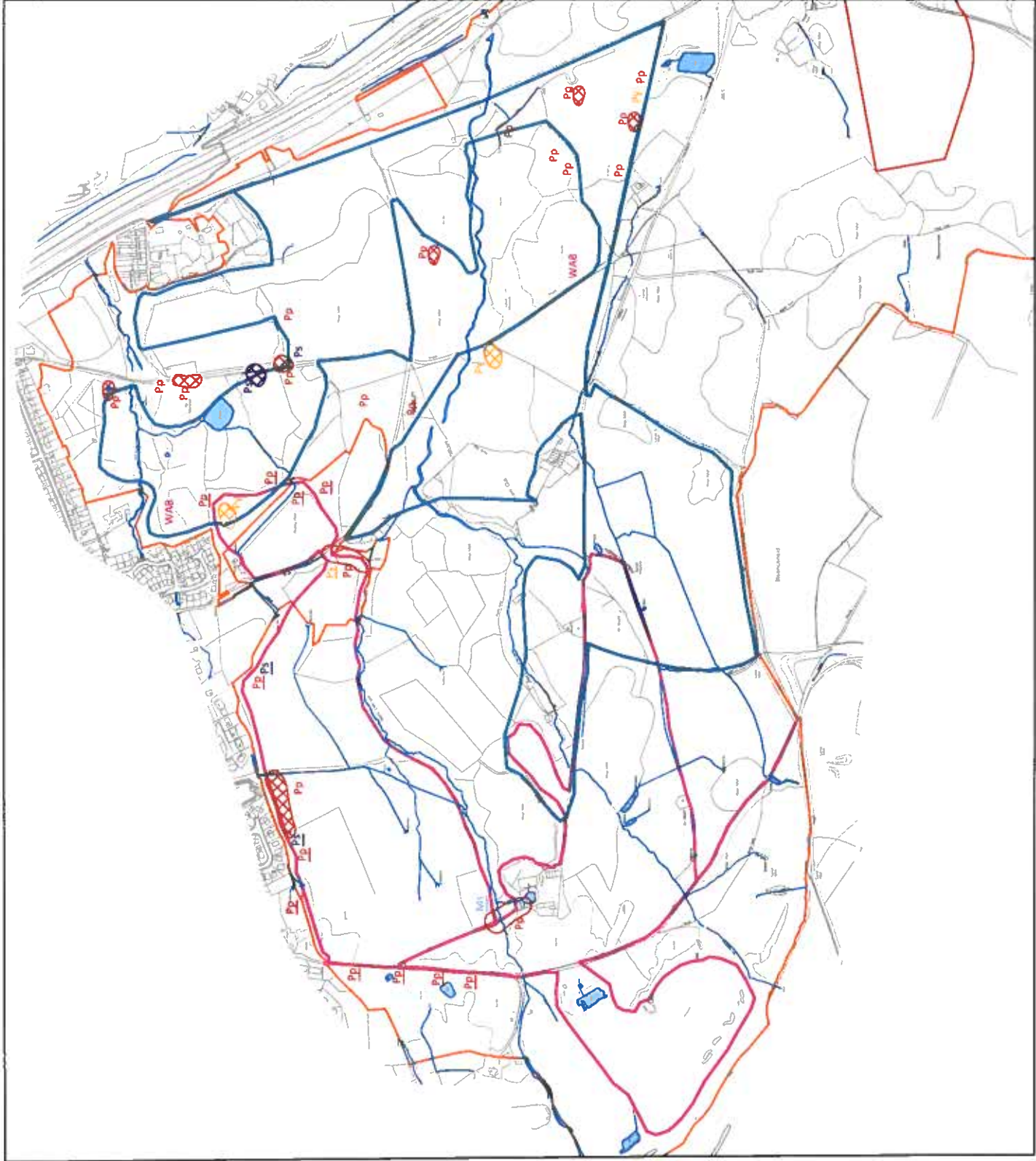


Figure 2a-f

Bat transect survey results - 2015



Key	
	Application site
	2015 study area
	Transect 1
	Transect 2
	Common pipistrelle
	Soprano pipistrelle
	Pipistrelle species (common/soprano)
	Whiskered/Alcathoe/ Brandt's
	Foraging
	Commuting (showing direction of flight)
	Social call
	Pass
	Number of bats

DO NOT SCALE	

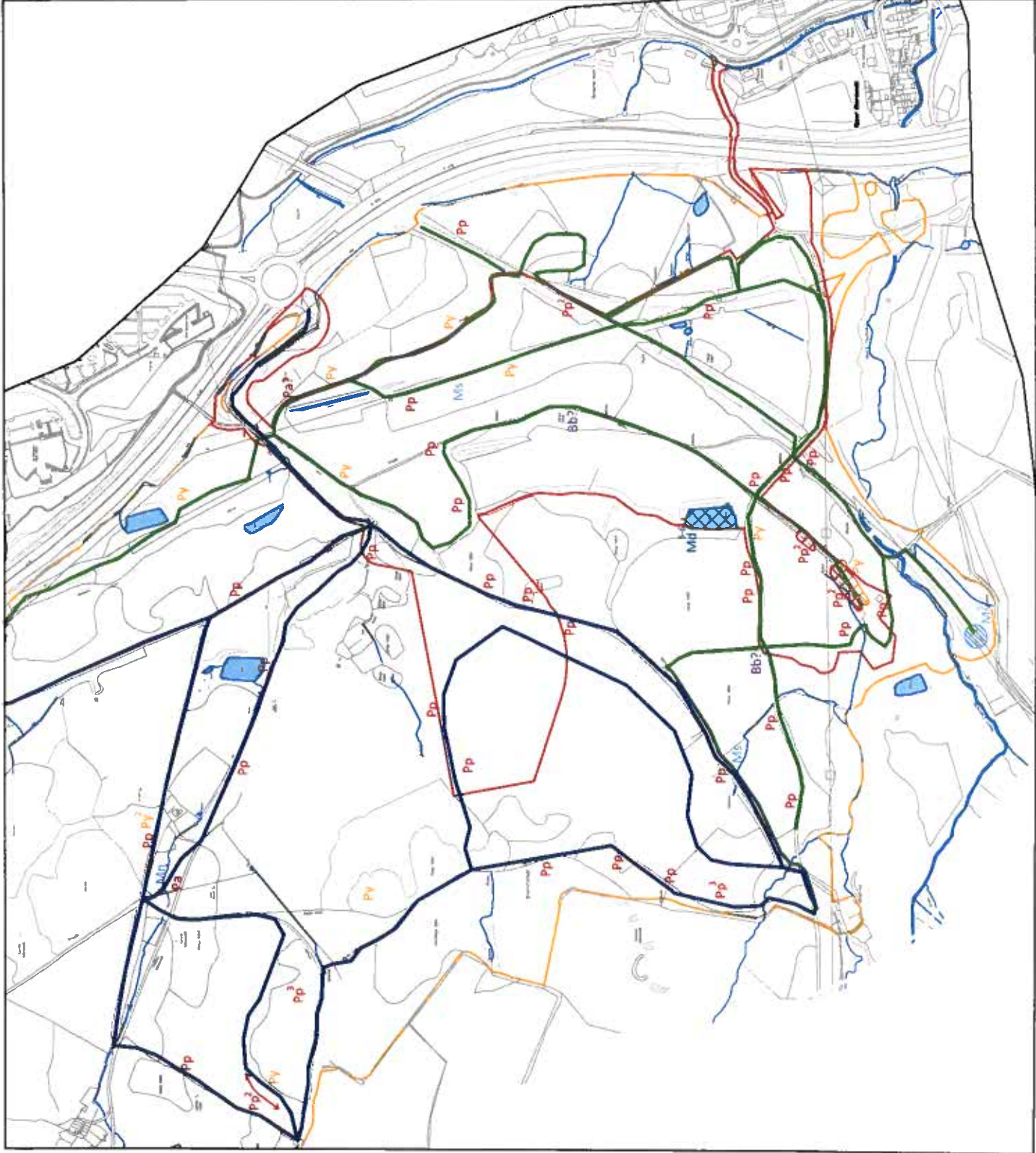
Title	
Bat activity transect results- May 2015 (Transects 1 and 2)	

Project	
Cwm Glo	Client Marvel Ltd.

Drawing No.	
Figure 2a	Project No. E1835

Drawn	
FM	Checked BC
Date	
November 2023	

Bioscan (UK) Ltd The Old Parlor, Little Baldon Farm, Little Baldon, Oxford, OX44 9PU T: +44 (0) 1865 341321 bioscan@bioscanuk.com www.bioscanuk.com	
Reproduced from Ordnance Survey © Crown Copyright. All rights reserved Licence No. 10005493	



Key

	Application site
	2015 study area
	Transect 3
	Transect 4
	Common pipistrelle
	Soprano pipistrelle
	Daubenton's bat
	Natterer's bat
	Myotis sp.
	Brown long-eared bat
	Barbastelle
	Foraging
	Swarming / light sampling
	Commuting (showing direction of flight)
	Social call
	Pass
	Number of bats

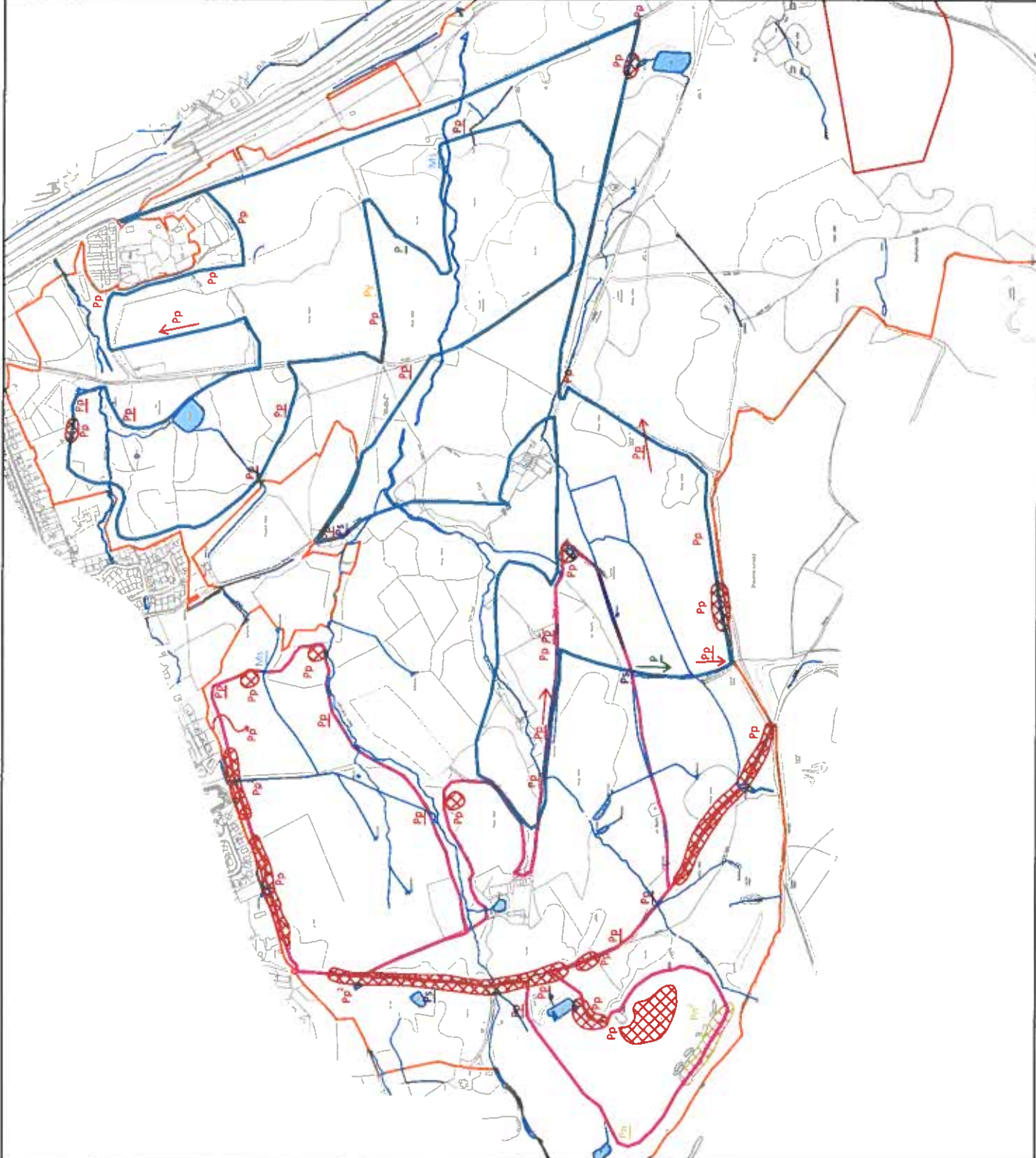
DO NOT SCALE

Title Bat activity transect results- May 2015 (Transects 3 and 4)	
Project Cwm Glo	Client Marvel Ltd.
Drawing No. Figure 2b	Revision Project No. £1835
Drawn FM	Checked BC
Date November 2023	

Bioscan (UK) Ltd
The Old Parlor,
Little Baldon Farm,
Little Baldon,
Oxford,
OX64 9PU

T: +44 (0) 1865 341321
bioscan@bioscanuk.com
www.bioscanuk.com

Reproduced from Ordnance Survey
© Crown Copyright. All rights reserved
Licence No. 100005491



Key

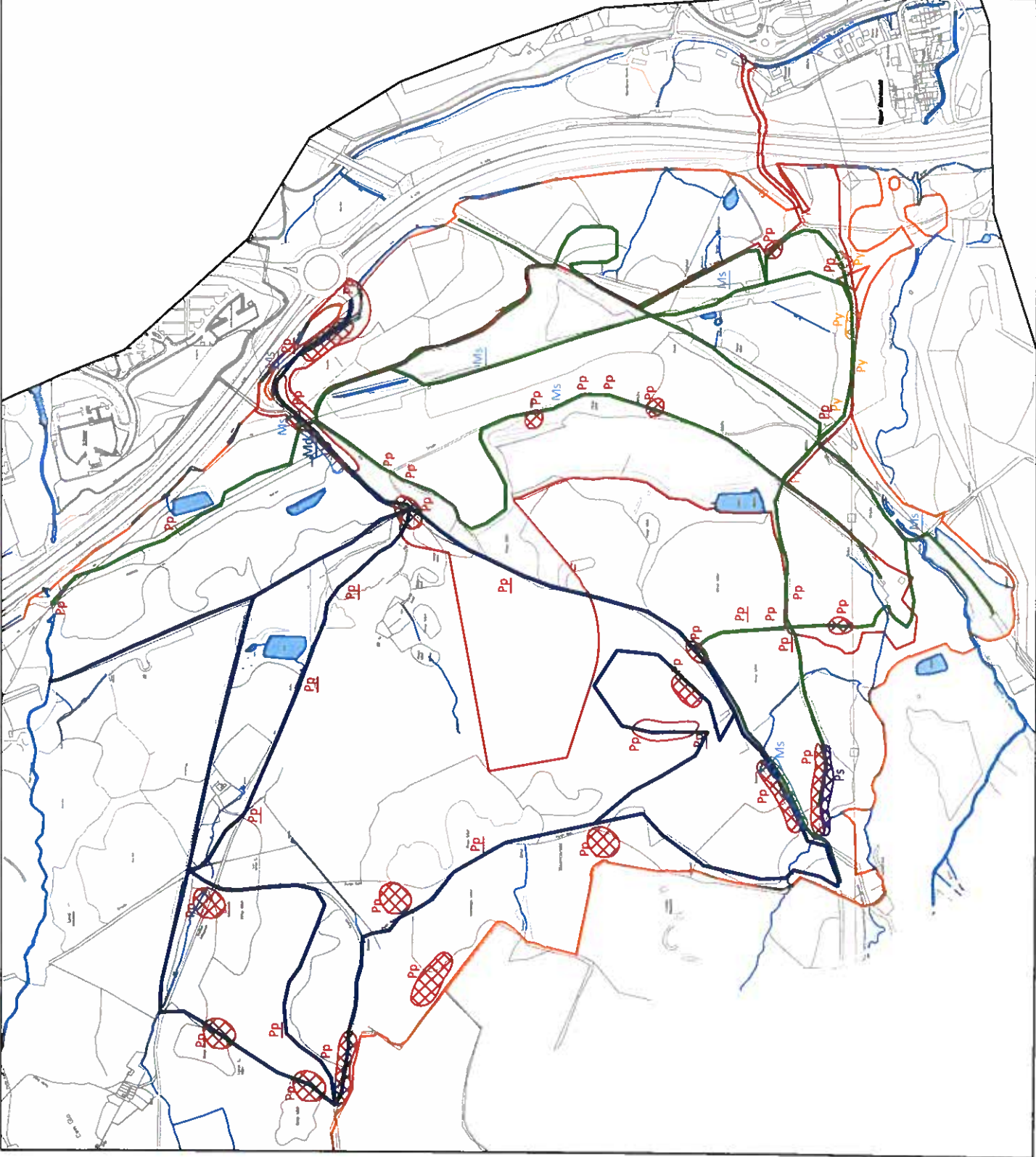
- Application site
- 2015 study area
- Transect 1
- Transect 2
- Common pipistrelle
- Soprano pipistrelle
- Pipistrelle species (common/soprano)
- Pipistrelle species (Nathusius' / Common)
- Nathusius' pipistrelle
- Myotis sp.
- Foraging
- Commuting (showing direction of flight)
- Social call
- Pass
- Pp2 Number of bats



DO NOT SCALE

Title		Bat activity transect results - June 2015 (Transects 1 and 2)	
Project	Cwm Glo	Client	Marvel Ltd.
Drawing No.	Figure 2c	Revision	Project No. £1835
Drawn	FM	Checked	BC
		Date	November 2023
Bioscan (UK) Ltd The Old Parlour, Little Baldon Farm, Little Baldon, Oxford, OX44 9PU T: +44 (0) 1865 341321 bioscan@bioscanuk.com www.bioscanuk.com Reproduced from Ordnance Survey © Crown Copyright. All rights reserved Licence No. 10005491			





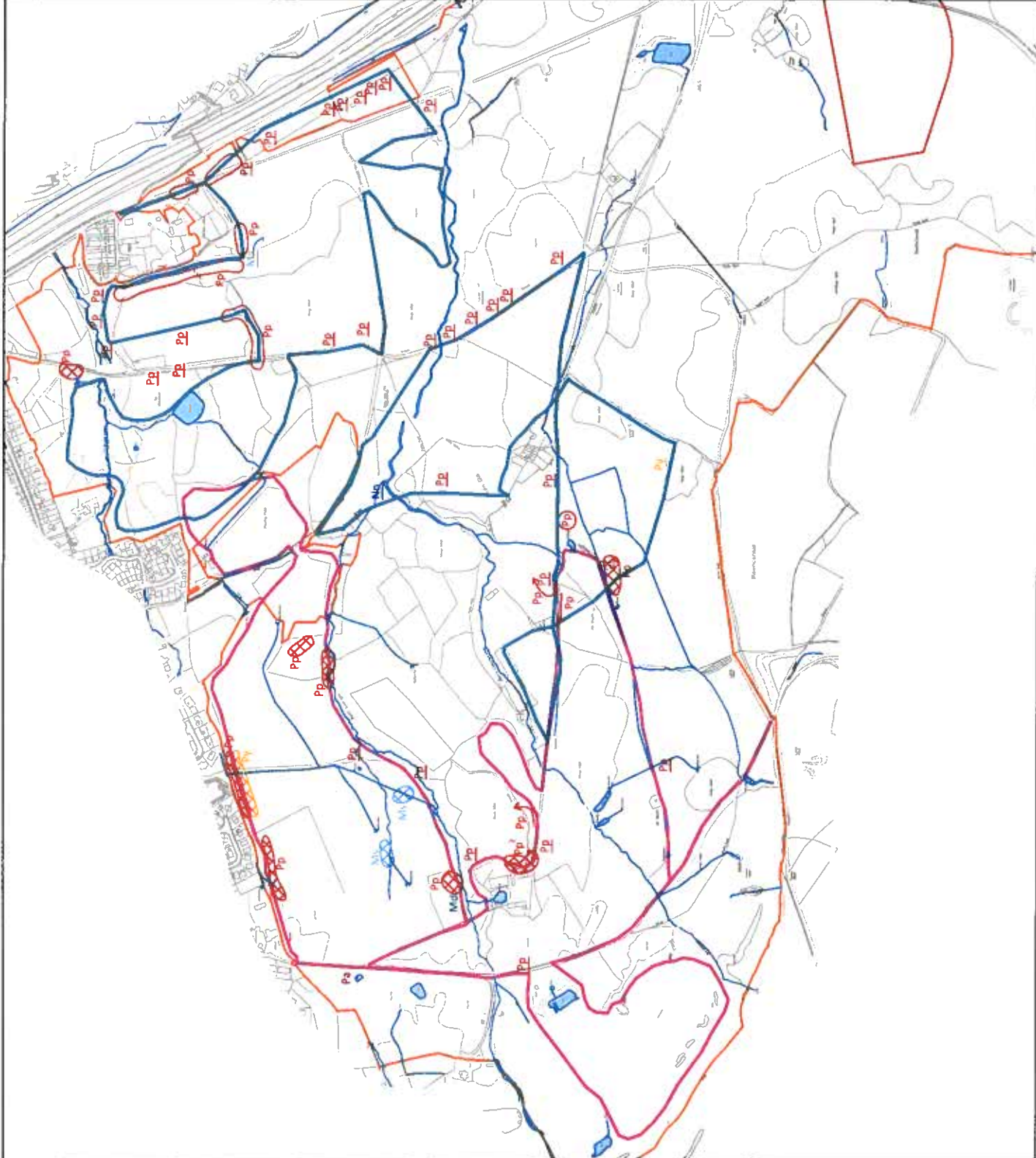
Key

- Application site
- 2015 study area
- Transect 3
- Transect 4
- Common pipistrelle
- Soprano pipistrelle
- Pipistrelle species (common/soprano)
- Daubenton's bat
- Myotis sp.
- Foraging
- Communting (showing direction of flight)
- Social call
- Pass
- Number of bats



DO NOT SCALE

Title				Bat activity transect results - June 2015 (Transects 3 and 4)			
Project		Cwm Glo		Client		Marvel Ltd.	
Drawing No.		Figure 2d		Revision		E1835	
Drawn		FM		Checked		BC	
Date		November 2023					
Bioscan (UK) Ltd The Old Parlour, Little Baldon Farm, Little Baldon, Oxford, OX44 9PU.				 BIOSCAN			
T: +44 (0) 1865 341321 www.bioscanuk.com				Reproduced from Ordnance Survey © Crown Copyright. All rights reserved Licence No. 100005491			



Key

- Application site
- 2015 study area
- Transect 1
- Transect 2
- Common pipistrelle
- Soprano pipistrelle
- Daubenton's bat
- Myotis sp.
- Noctule
- Brown long-eared bat
- Foraging
- Commuting (showing direction of flight)
- Social call
- Pass
- Pp2 Number of bats



DO NOT SCALE

Title	
Bat activity transect results - July 2015 (Transects 1 and 2)	
Project	Client
Cwm Glo	Marvel Ltd.
Drawing No.	Revision
Figure 2e	E1835
Drawn	Checked
FM	BC
Date	November 2023

bioscan (uk) Ltd
 The Old ParLOUR,
 Little Baldon Farm,
 Little Baldon,
 Oxford,
 OX44 9PU.

T: +44 (0) 1865 341321
 bioscan@bioscanuk.com
 www.bioscanuk.com

Reproduced from Ordnance Survey
 Crown Copyright. All rights reserved
 Licence No. 100009493

Key

- Application site
- 2015 study area
- Transect 3
- Transect 4
- Common pipistrelle
- Soprano pipistrelle
- Myotis sp.
- Noctule
- Foraging
- Communting (showing direction of flight)
- Social call
- Pass
- Number of bats



DO NOT SCALE

Title		Bat activity transect results - July 2015 (Transects 3 and 4)	
Project	Cwm Glo	Client	Marvel Ltd.
Drawing No.	Figure 2f	Revision	Project No. E1835
Drawn	FM	Checked	BC
		Date	November 2023
Bioscan (UK) Ltd The Old Parlour, Little Baldon Farm, Little Baldon, Oxford, OX44 9PU T: +44 (0) 1865 341321 bioscan@bioscanuk.com www.bioscanuk.com Reproduced from Ordnance Survey © Crown Copyright. All rights reserved Licence No. 10005491			

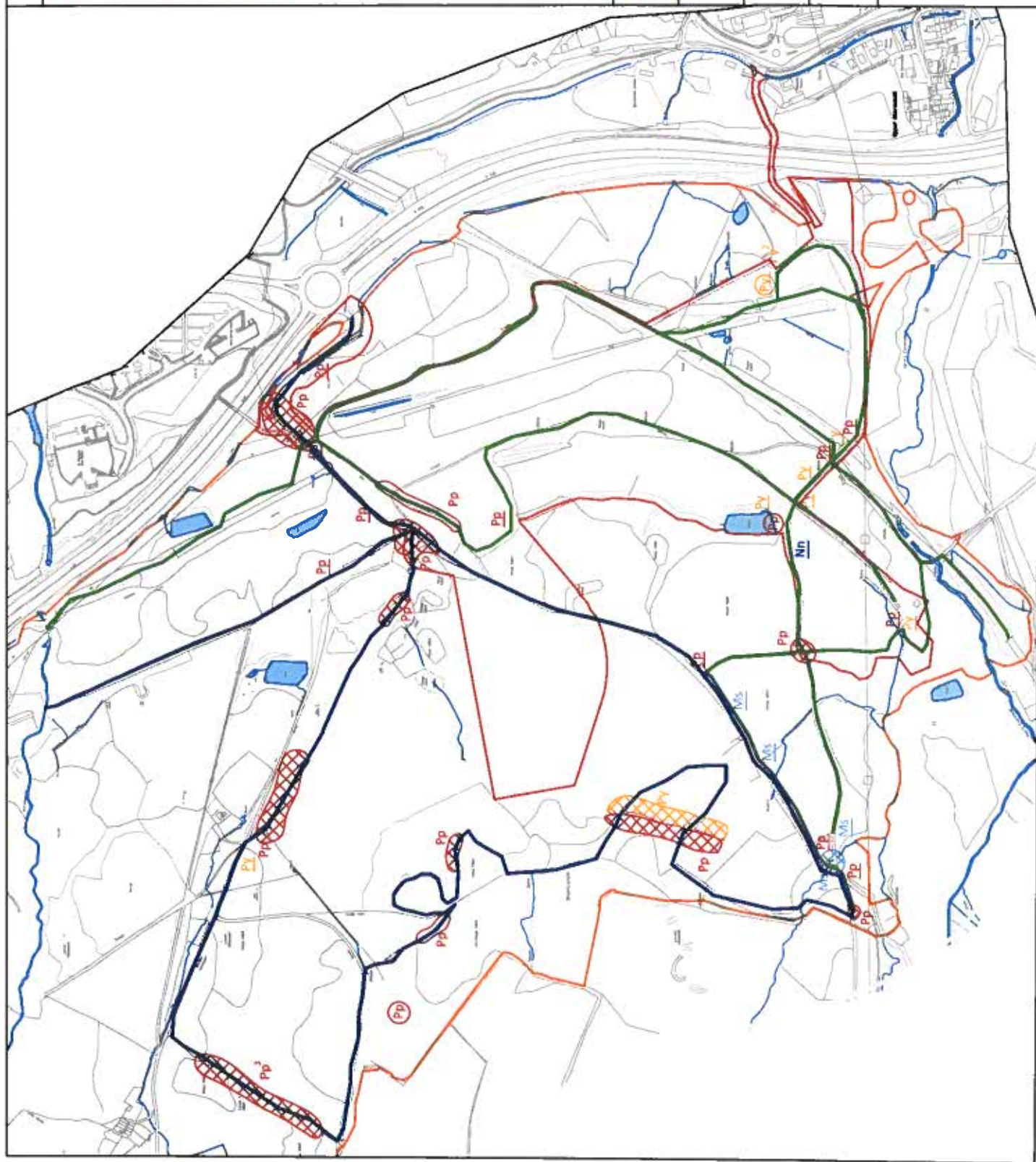
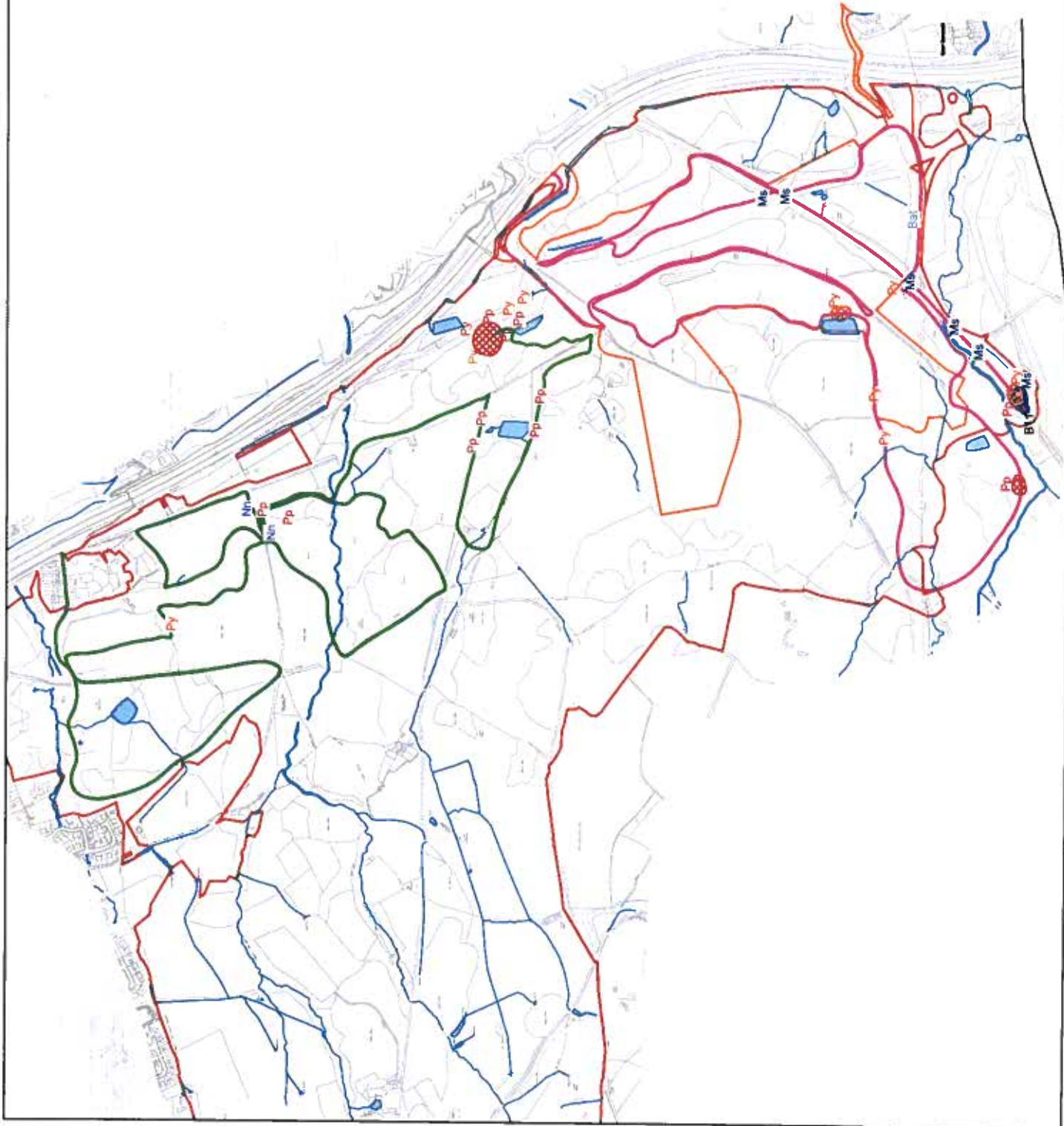


Figure 3a-d

Bat transect survey results - 2016



Key

- Application site boundary
- 2016 survey area
- Transect route 1
- Transect route 2
- Common pipistrelle
- Soprano pipistrelle
- Myotis sp.
- Noctule
- Unidentified bat
- Foraging



DO NOT SCALE

Title

Bat activity transect (dusk) results 23.08.16

Project

Cwm Glo

Client

Marvel Ltd

Drawing No.

Figure 3a

Revision

E1835

Project No.

Drawn

CD

Checked

DW

Date

November 2023

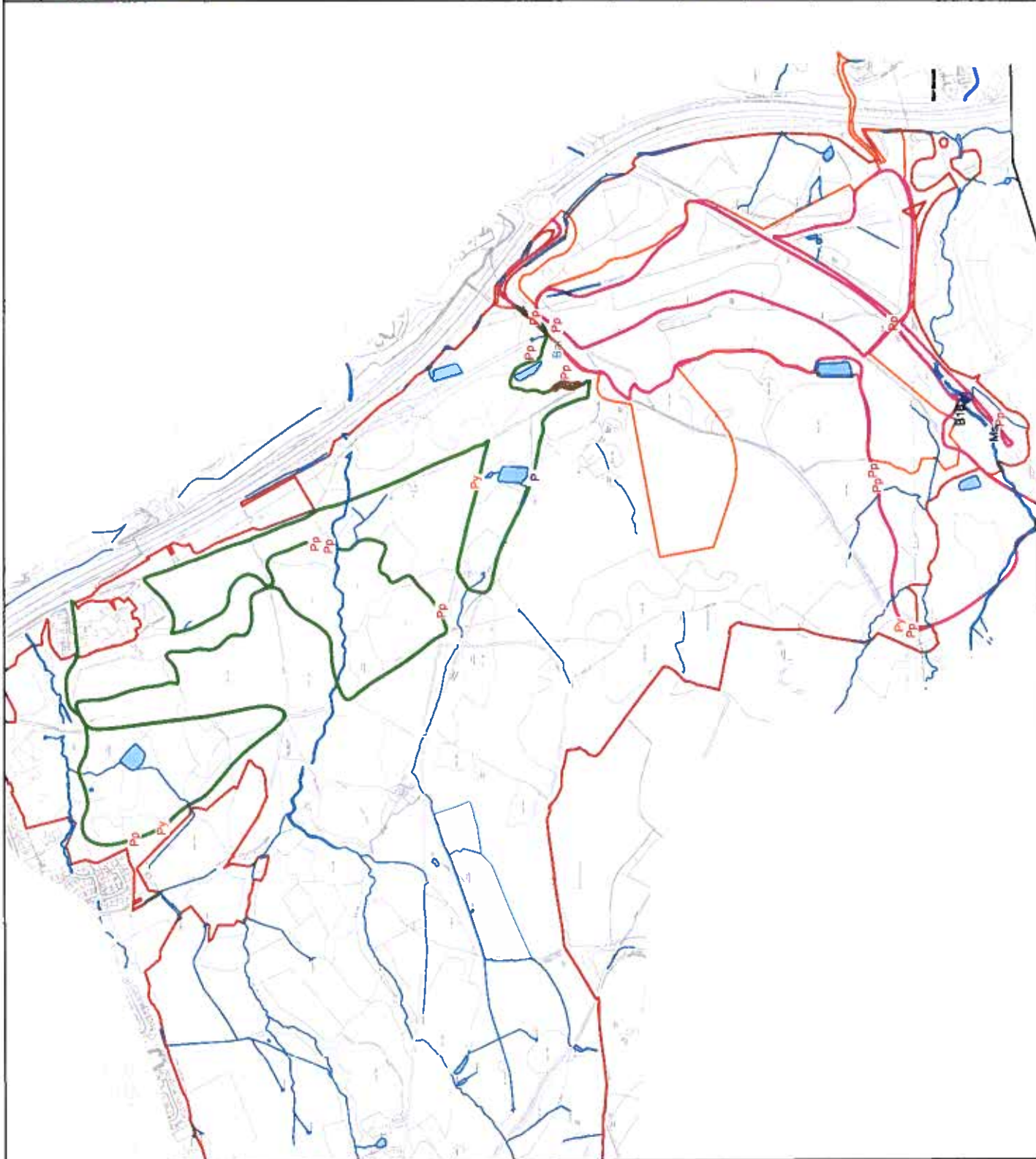
Bioscan (UK) Ltd

The Old Parlor,
Little Baldon Farm,
Orford,
OX44 9PU.



T: +44 (0) 1865 341321
bioscan@bioscanuk.com
www.bioscanuk.com

Reproduced from Ordnance Survey
© Crown Copyright and database right
Licence No. 100005481



Key

	Application site boundary
	2016 study area
	Transect route 1
	Transect route 2
	Common pipistrelle
	Soprano pipistrelle
	Pipistrelle species
	Unidentified bat
	Foraging

DO NOT SCALE

Title

Bat activity transect (dawn) results 24.08.16

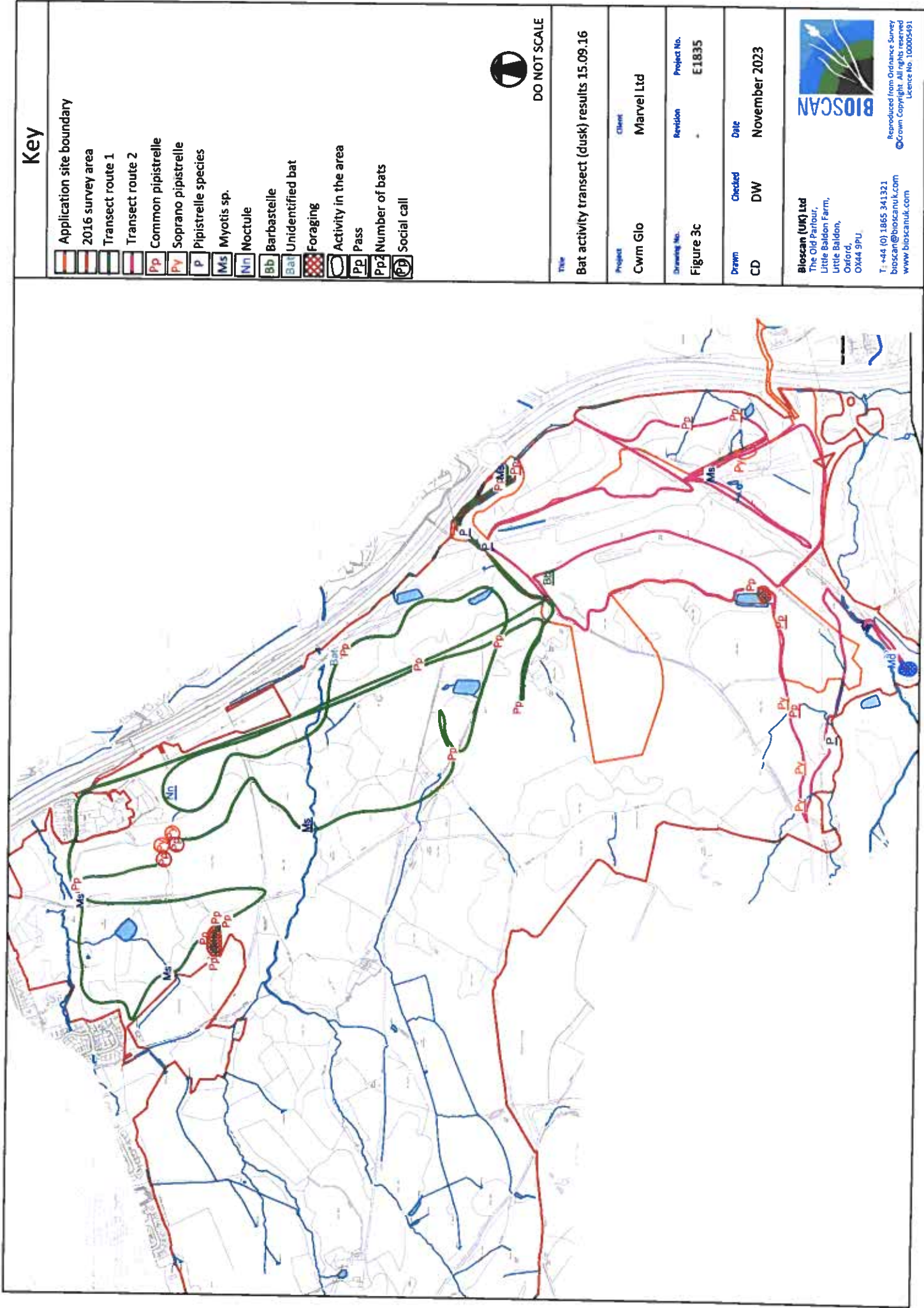
Project	Cwm Gŵ	Client	Marvel Ltd.
---------	--------	--------	-------------

Drawing No.	Figure 3b	Revision	-	Project No.	E1835
-------------	-----------	----------	---	-------------	-------

Drawn	CD	Checked	DW	Date	November 2023
-------	----	---------	----	------	---------------

Bioscan (UK) Ltd
The Old Parfleur,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU.
T: +44 (0) 1865 341321
bioscan@bioscanuk.com
www.bioscanuk.com

Reproduced from Ordnance Survey
© Crown Copyright. All rights reserved
Licence No. 10000491



Key

- Application site boundary
- 2016 survey area
- Transect route 1
- Transect route 2
- Common pipistrelle
- Soprano pipistrelle
- Pipistrelle species
- Myotis sp.
- Noctule
- Barbastelle
- Unidentified bat
- Foraging
- Activity in the area
- Pass
- Number of bats
- Social call



DO NOT SCALE

Title
Bat activity transect (dusk) results 15.09.16

Project
Cwm Glo

Client
Marvel Ltd

Drawing No.
Figure 3c

Revision
-

Project No.
E1835

Drawn
CD

Checked
DW

Date

November 2023



Bioscan (UK) Ltd
The Old Parlour,
Little Baldon Farm,
Oxford,
OX44 9PU

T: +44 (0) 1865 341321
bioscan@bioscanuk.com
www.bioscanuk.com

Reproduced from Ordnance Survey
© Crown Copyright. All rights reserved.
Licence No. 100005491

Key

- Application site boundary
- 2016 survey area
- Transect route 1
- Transect route 2
- Common pipistrelle
- Soprano pipistrelle
- Pipistrelle species
- Myotis sp.
- Noctule
- Long-eared bat
- Barbastelle
- Unidentified bat
- Foraging
- Activity in the area
- Pass
- Social call
- Number of bats



DO NOT SCALE

Title

Bat activity transect (dawn) results 16.09.16

Project

Cwm Glo

Client

Marvel Ltd

Drawing No.

Figure 3d

Revision

E1835

Project No.

E1835

Drawn

CD

Checked

DW

Date

November 2023

Bioscan (UK) Ltd
The Old Parfour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU



T: +44 (0) 1865 341321
www.bioscanuk.com

Reproduced from Ordnance Survey
© Crown Copyright. All rights reserved.
Licence No. 10005491

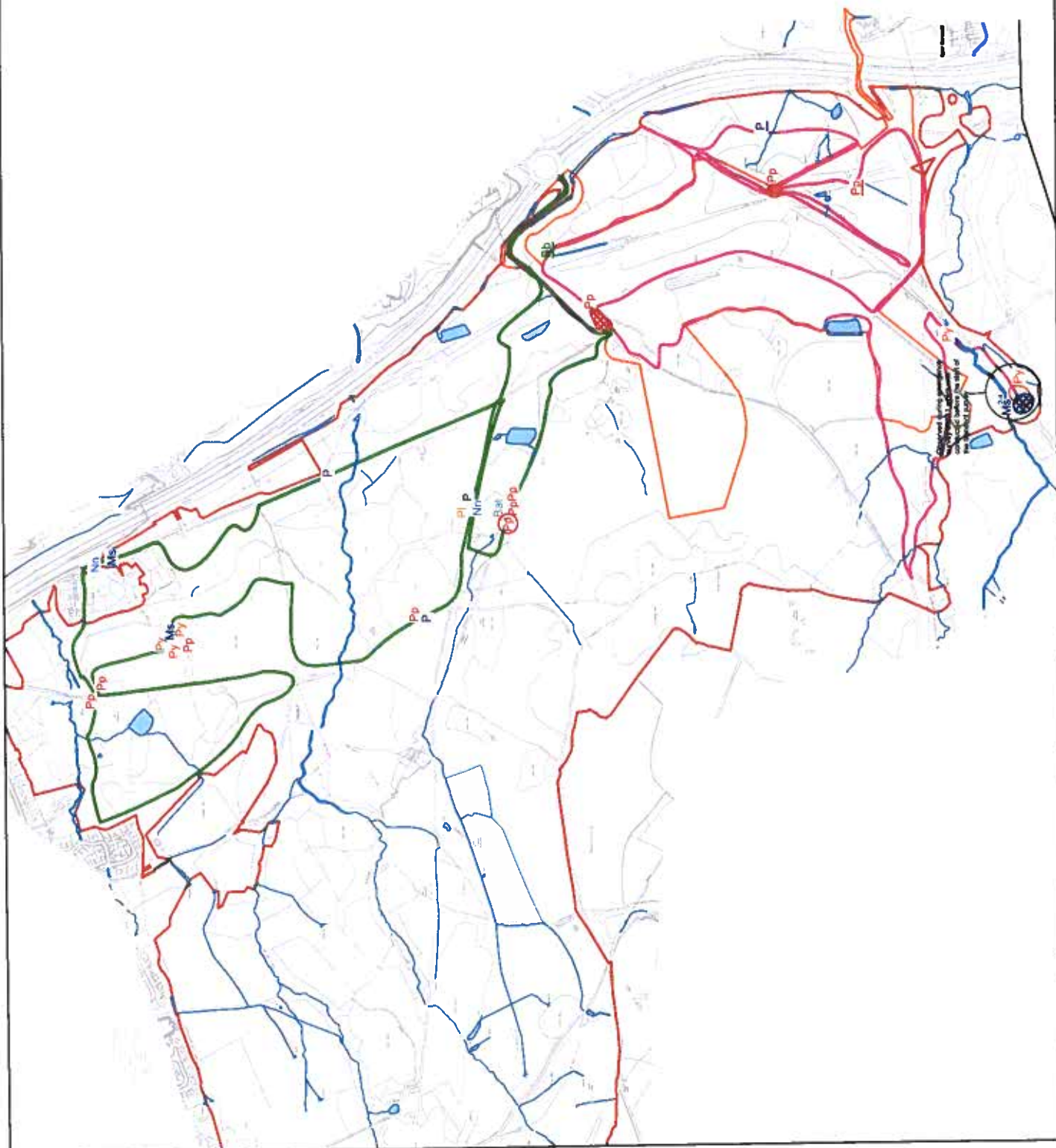
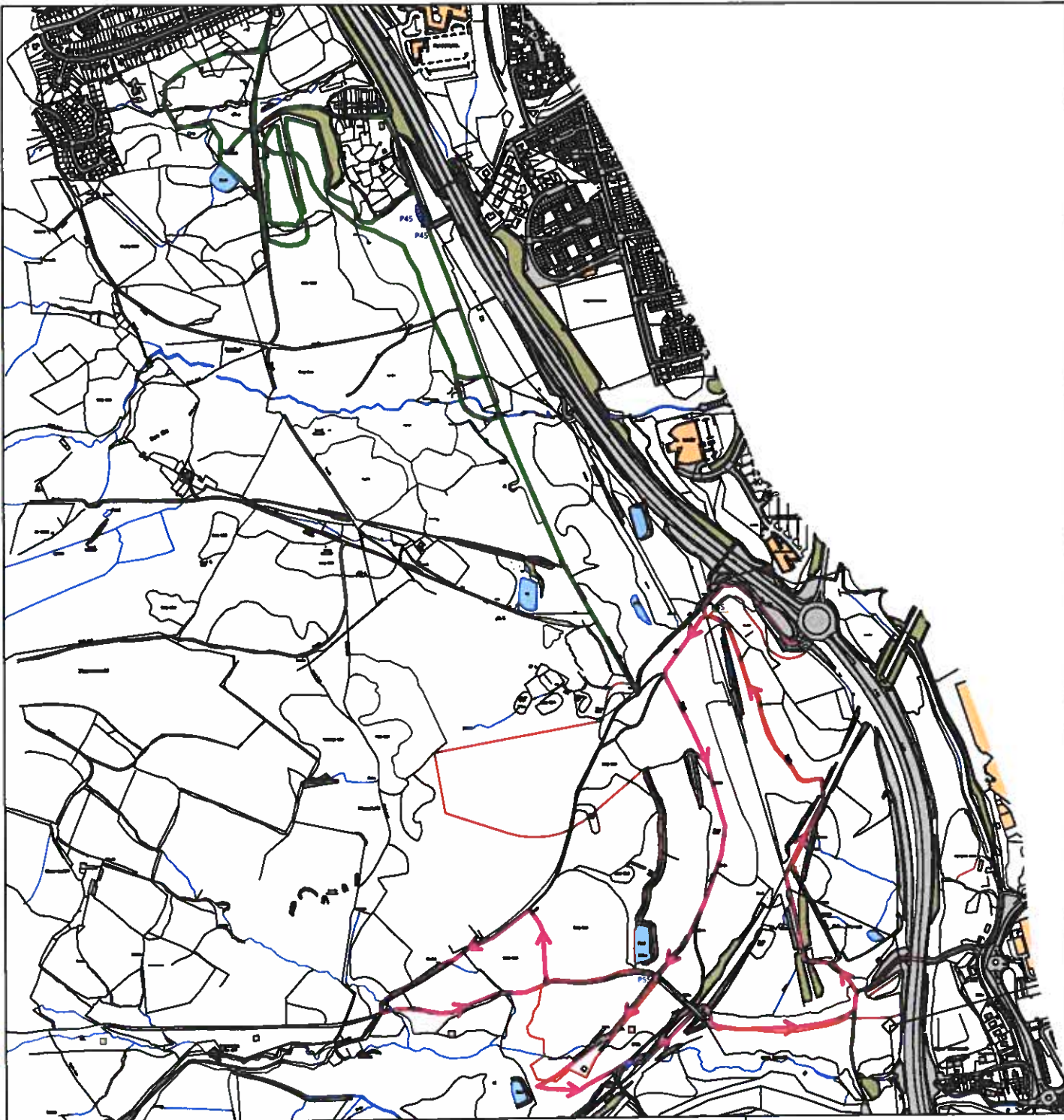


Figure 4a-k

Bat transect survey results - 2018



Key

- Application site
- Transect 1
- Transect 2
- P4S Common pipistrelle
- P5S Soprano pipistrelle
- MYC Myotis species
- Foraging area
- Bat Bat passing by

Title

Bat activity survey results 24.04.2018

Project

Cwm Glo

Client

Marvel Ltd.

Drawing No.

Figure 4a

Revision

-

Project No.

E1835

Drawn

CD

Checked

DW

Date

November 2023

Bioscan (UK) Ltd
The Old Parlour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU.

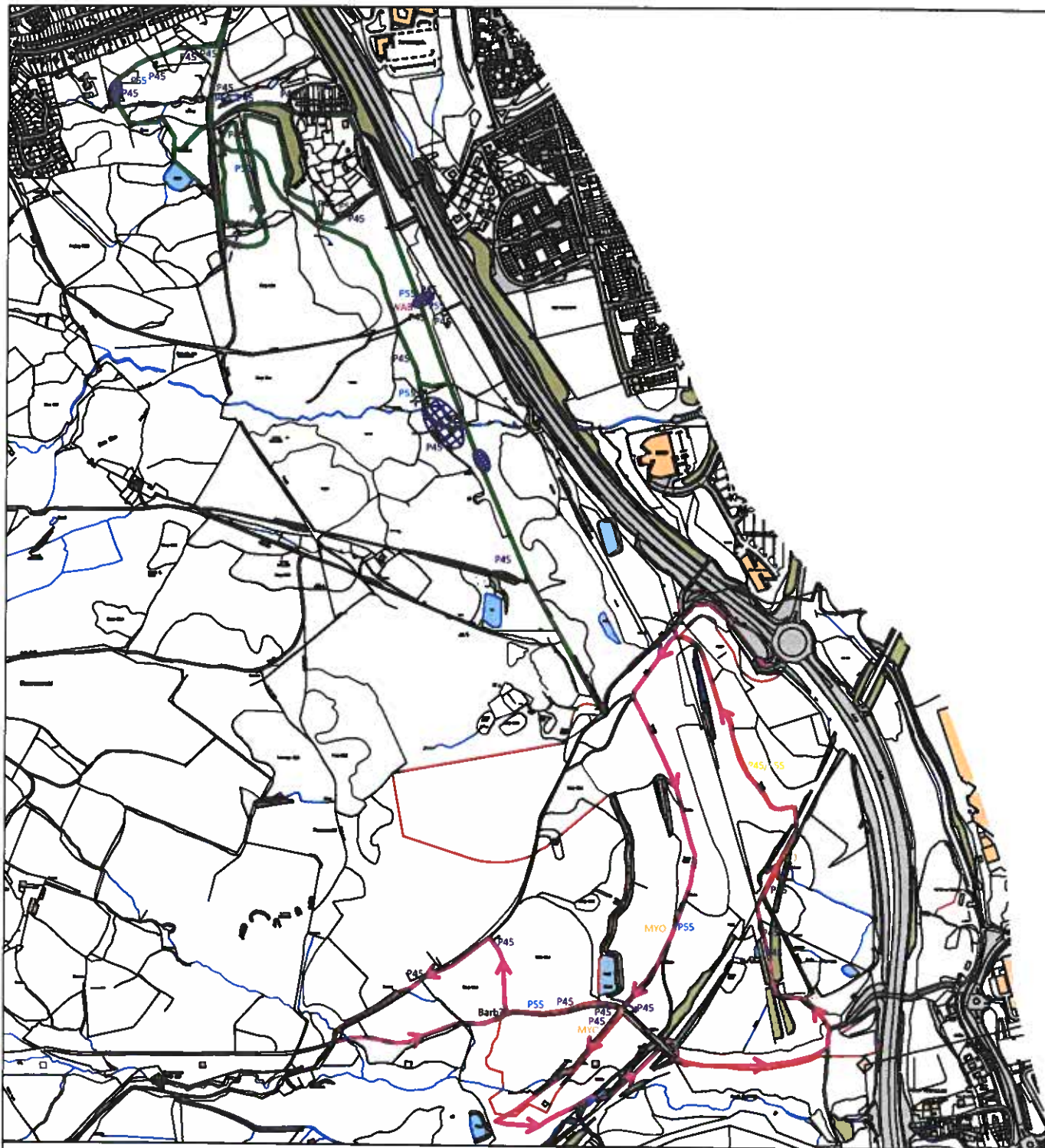
T: +44 (0) 1865 341321
bioscan@bioscanuk.com
www.bioscanuk.com



Reproduced from Ordnance Survey
© Crown Copyright. All rights reserved
Licence No. 100005491



DO NOT SCALE



Key

- Application site
- Transect 1
- Transect 2
- P45 Common pipistrelle
- P55 Soprano pipistrelle
- P45/P55 Common/soprano pipistrelle
- MYC Myotis species
- Barb Barbastelle (potential)
- WAB Whiskered/Alcathoe/Brandt's bat
- Foraging area
- Bat passing by
- Social call

Title

Bat activity transect results 17.05.2018

Project

Cwm Glo

Client

Marvel Ltd

Drawing No.

Figure 4b

Revision

-

Project No.

E1835

Drawn

CD

Checked

DW

Date

November 2023

Bioscan (UK) Ltd
The Old Parlour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU.

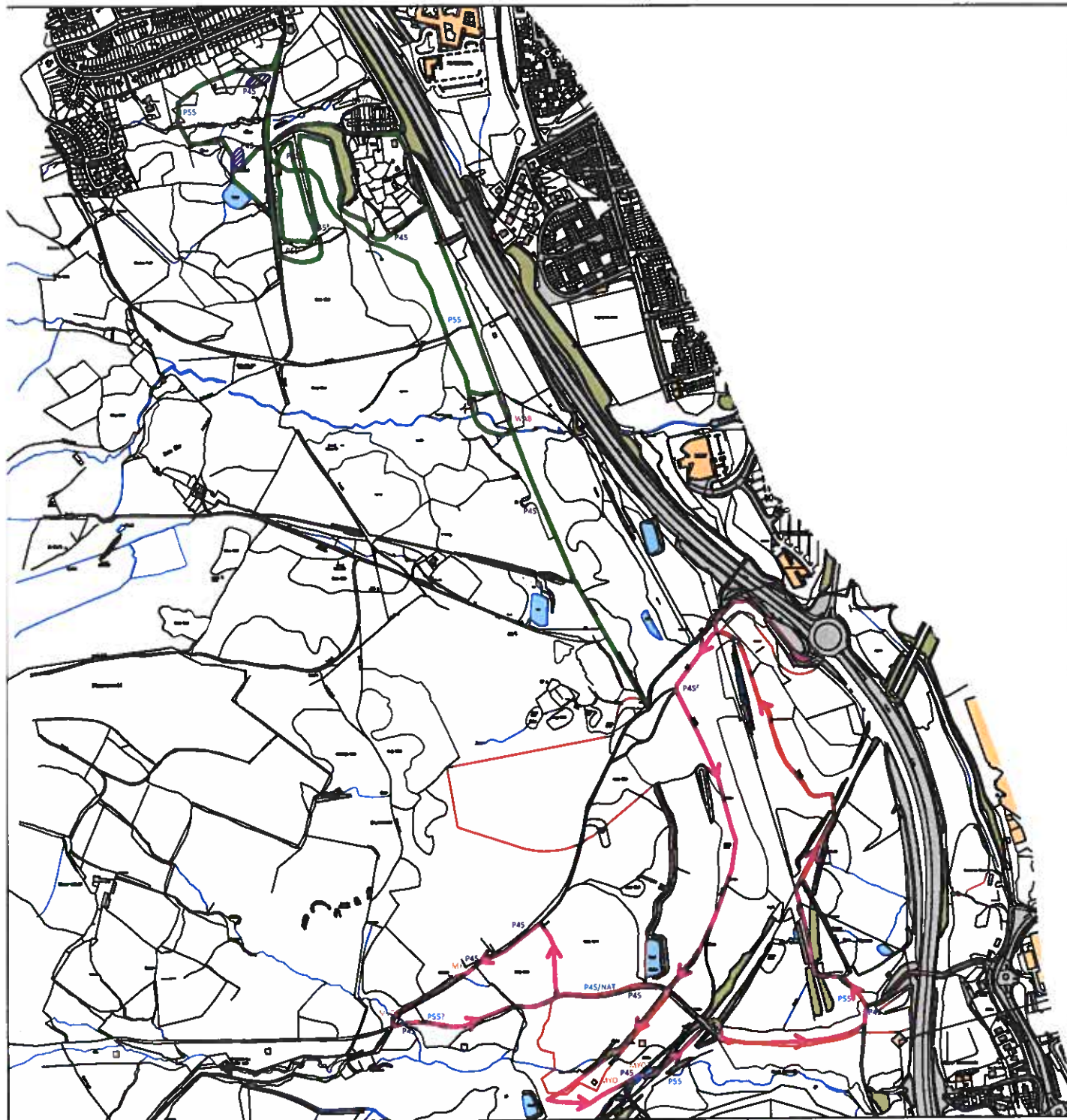
T: +44 (0) 1865 341321
bioscan@bioscanuk.com
www.bioscanuk.com



Reproduced from Ordnance Survey
© Crown Copyright. All rights reserved
Licence No. 100005491



DO NOT SCALE



Key

- Application site
- Transect 1
- Transect 2
- P45 Common pipistrelle
- P55 Soprano pipistrelle
- P45/NAT Common/nathusius' pipistrelle
- MYC Myotis species
- Bat² Two bats

Title

Bat activity transect results 14.06.2018

Project

Cwm Glo

Client

Marvel Ltd

Drawing No.

Figure 4c

Revision

-

Project No.

E1835a

Drawn

CD

Checked

DW

Date

November 2021

Bioscan (UK) Ltd
The Old Parlour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU.

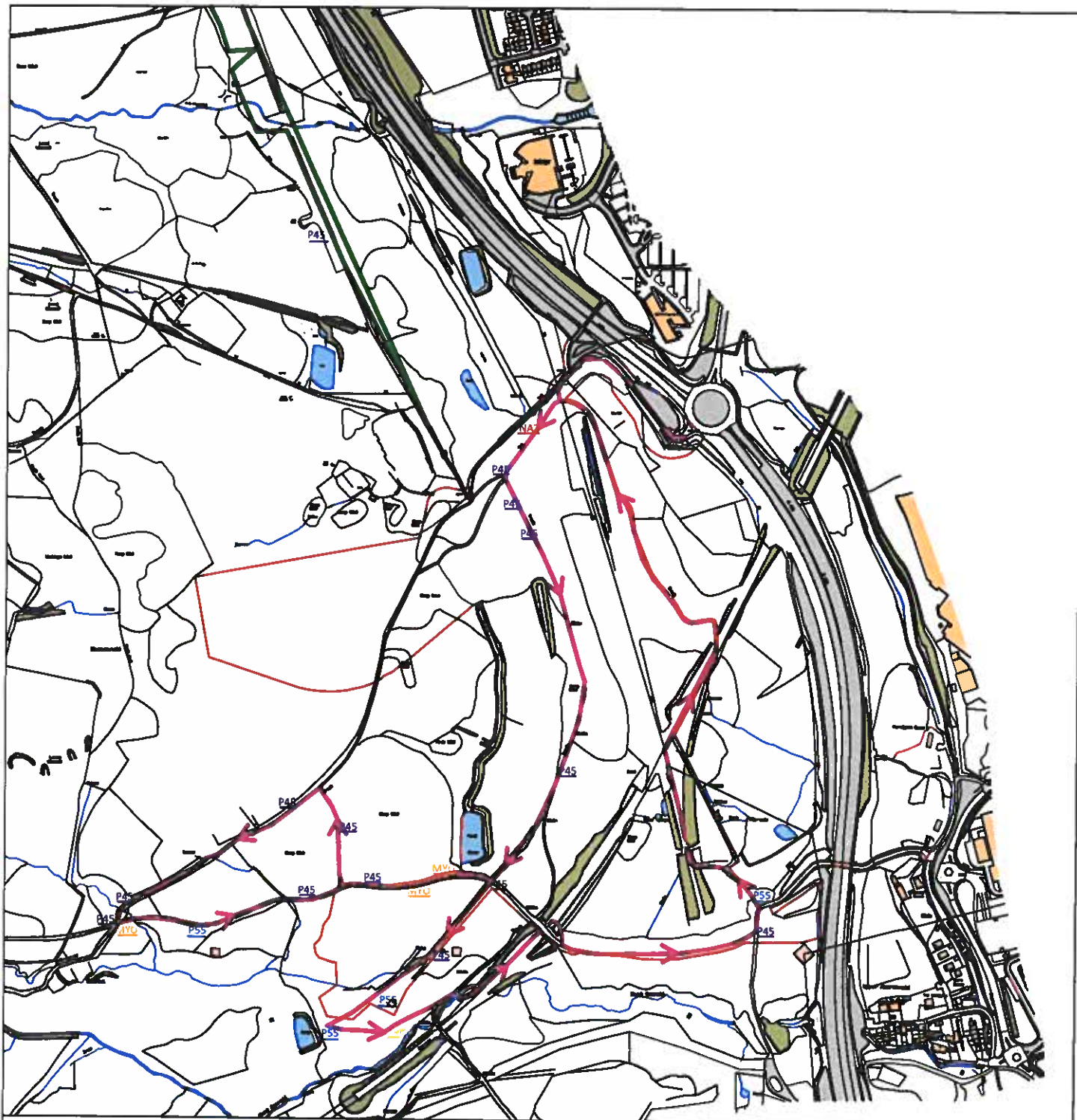


T: +44 (0) 1865 341321
bioscan@bioscanuk.com
www.bioscanuk.com

Reproduced from Ordnance Survey
© Crown Copyright. All rights reserved
Licence No. 100005491



DO NOT SCALE



Key

- Application site
- Transect 1
- Transect 2
- P45 Common pipistrelle
- P55 Soprano pipistrelle
- 45/55 Common/soprano pipistrelle
- MYC Myotis species
- Bat² Two bats
- Bat Bat passing by

Title

Bat activity transect results 26.06.2018

Project

Cwm Glo

Client

Marvel Ltd

Drawing No.

Figure 4d

Revision

Project No.

E1835

Drawn

CD

Checked

DW

Date

November 2023

Bioscan (UK) Ltd
The Old Parlour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU.

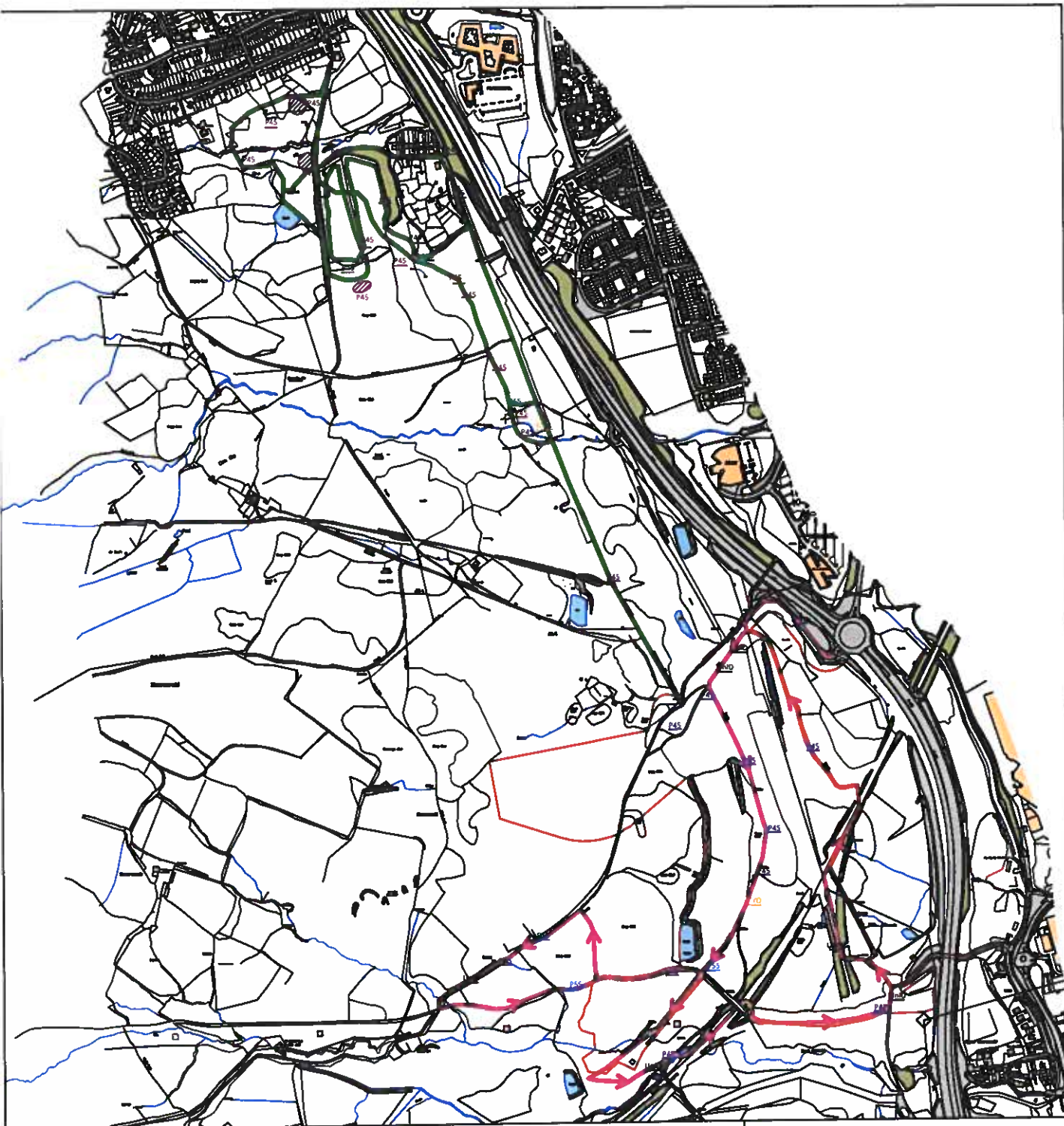
T: +44 (0) 1865 341321
bioscan@bioscanuk.com
www.bioscanuk.com



Reproduced from Ordnance Survey
© Crown Copyright. All rights reserved
Licence No. 100005491



DO NOT SCALE



Key

- Application site
- Transect 1
- Transect 2
- P45 Common Pipistrelle
- P55 Soprano Pipistrelle
- MYC Myotis Species
- UnID Unidentified Bat Species
- Foraging area
- Bat passing by



Title

Bat activity transect results 12.07.2018

Project

Cwm Glo

Client

Marvel Ltd

Drawing No.

Figure 4e

Revision

-

Project No.

E1835

Drawn

CD

Checked

DW

Date

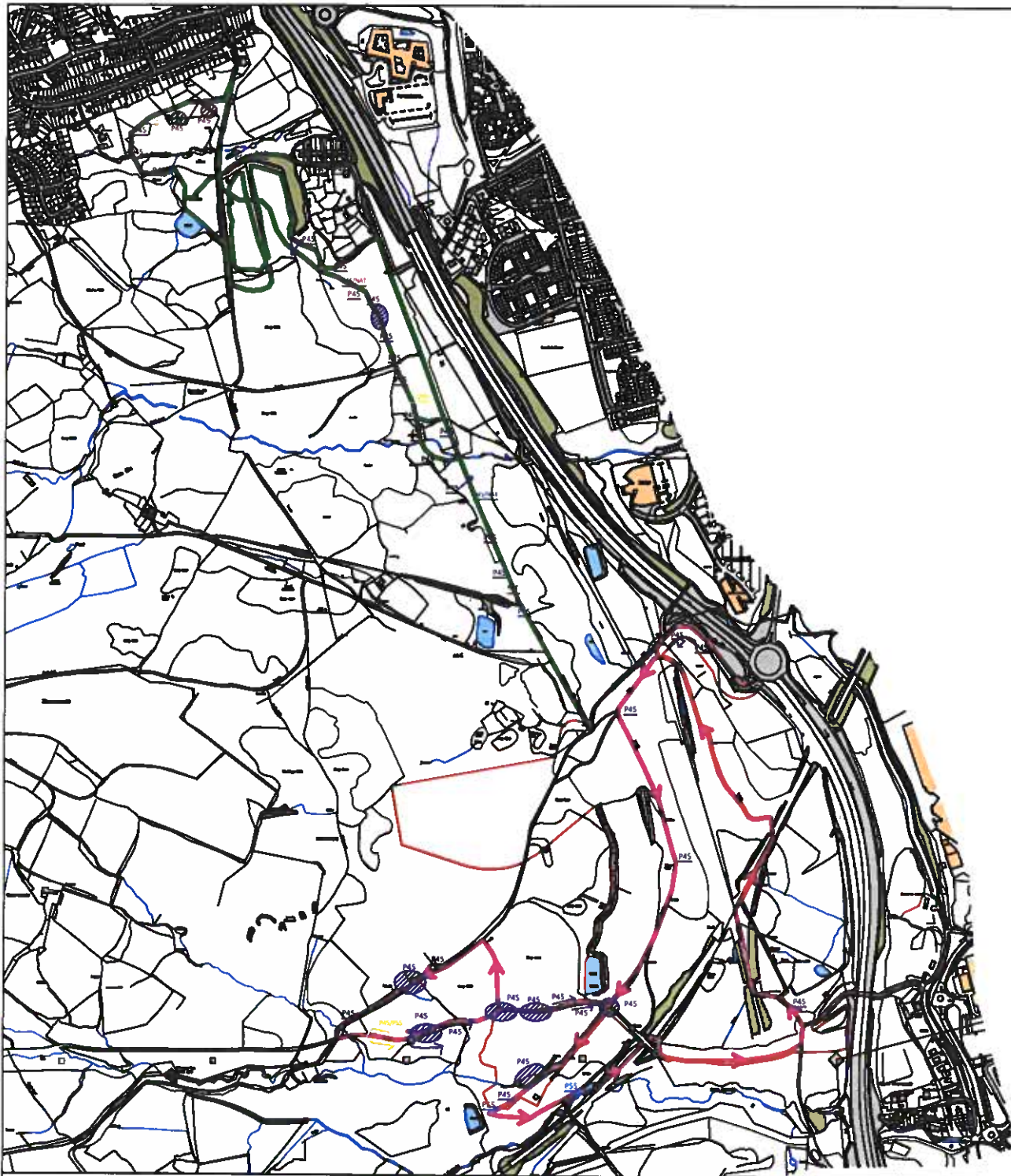
November 2023

Bioscan (UK) Ltd
The Old Parlour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU.



T: +44 (0) 1865 341321
bioscan@bioscanuk.com
www.bioscanuk.com

Reproduced from Ordnance Survey
© Crown Copyright. All rights reserved
Licence No. 100005491



Key

- Application site
- Transect 1
- Transect 2
- P45 Common pipistrelle
- P55 Soprano pipistrelle
- P45/P55 Common/soprano pipistrelle
- P45/NAT Common/nathusius' pipistrelle
- NAT Nathusius' pipistrelle
- Foraging area
- Bat Bat passing by
- Commuting

Title

Bat activity transect results 18.07.18

Project

Cwm Glo

Client

Marvel Ltd

Drawing No.

Figure 4f

Revision

-

Project No.

E1835

Drawn

CD

Checked

DW

Date

November 2023

Bioscan (UK) Ltd
The Old Parlour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU.

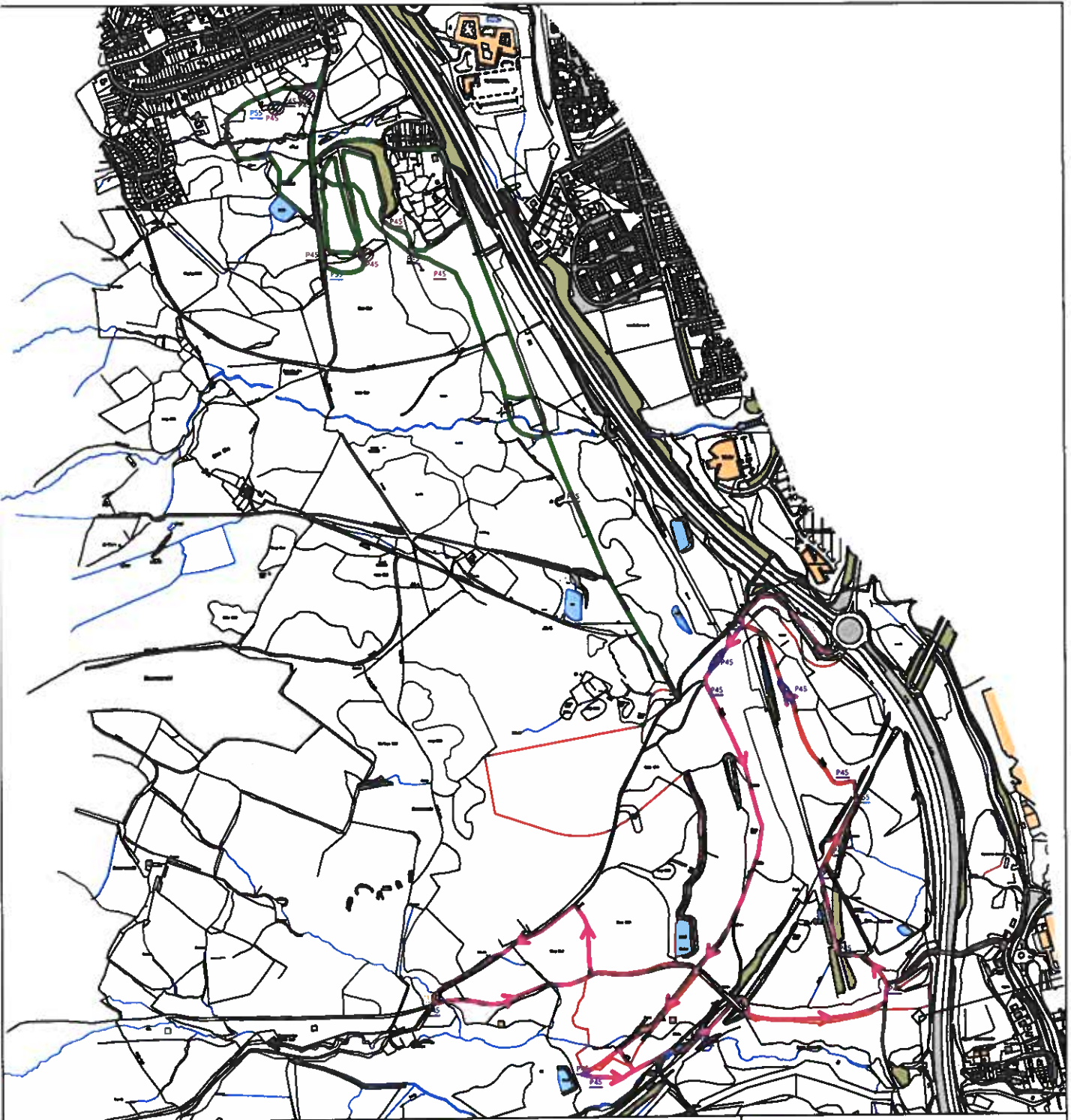
T: +44 (0) 1865 341321
bioscan@bioscanuk.com
www.bioscanuk.com



Reproduced from Ordnance Survey
© Crown Copyright. All rights reserved
Licence No. 100005491



DO NOT SCALE



Key

- Application site
- Transect 1
- Transect 2
- P45 Common pipistrelle
- P55 Soprano pipistrelle
- MYC Myotis species
- Foraging area
- Bat Bat passing by



Title
Bat activity transect results 09.08.18

Project Client
Cwm Glo Marvel Ltd

Drawing No. Revision Project No.
Figure 4g - E1835

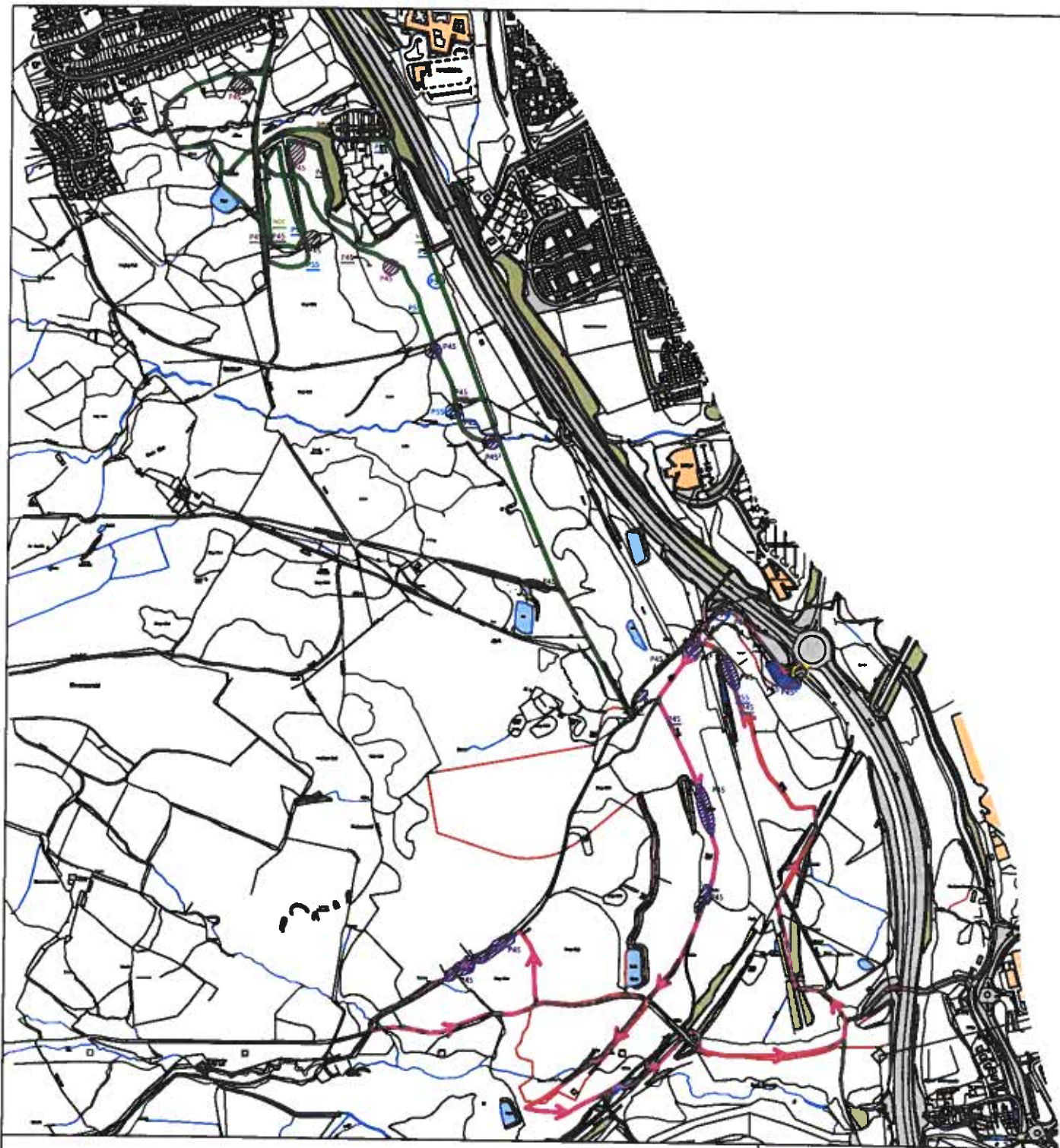
Drawn Checked Date
CD DW November 2023

Bioscan (UK) Ltd
The Old Parlour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU.

T: +44 (0) 1865 341321
bioscan@bioscanuk.com
www.bioscanuk.com



Reproduced from Ordnance Survey
© Crown Copyright. All rights reserved
Licence No. 100005491



Key

- Application site
- Transect 1
- Transect 2
- P45 Common pipistrelle
- P55 Soprano pipistrelle
- Common/soprano pipistrelle
- P45/NOC Common/nathusius' pipistrelle
- NOC Common noctule
- Foraging area
- Bat Bat passing by
- Commuting
- Bat social call

Title
Bat activity transect results 20.08.18

Project Client
Cwm Glo Marvel Ltd

Drawing No. Revision Project No.
Figure 4h - E1835

Drawn Checked Date
CD DW November 2023

Bioscan (UK) Ltd
The Old Parlour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU.

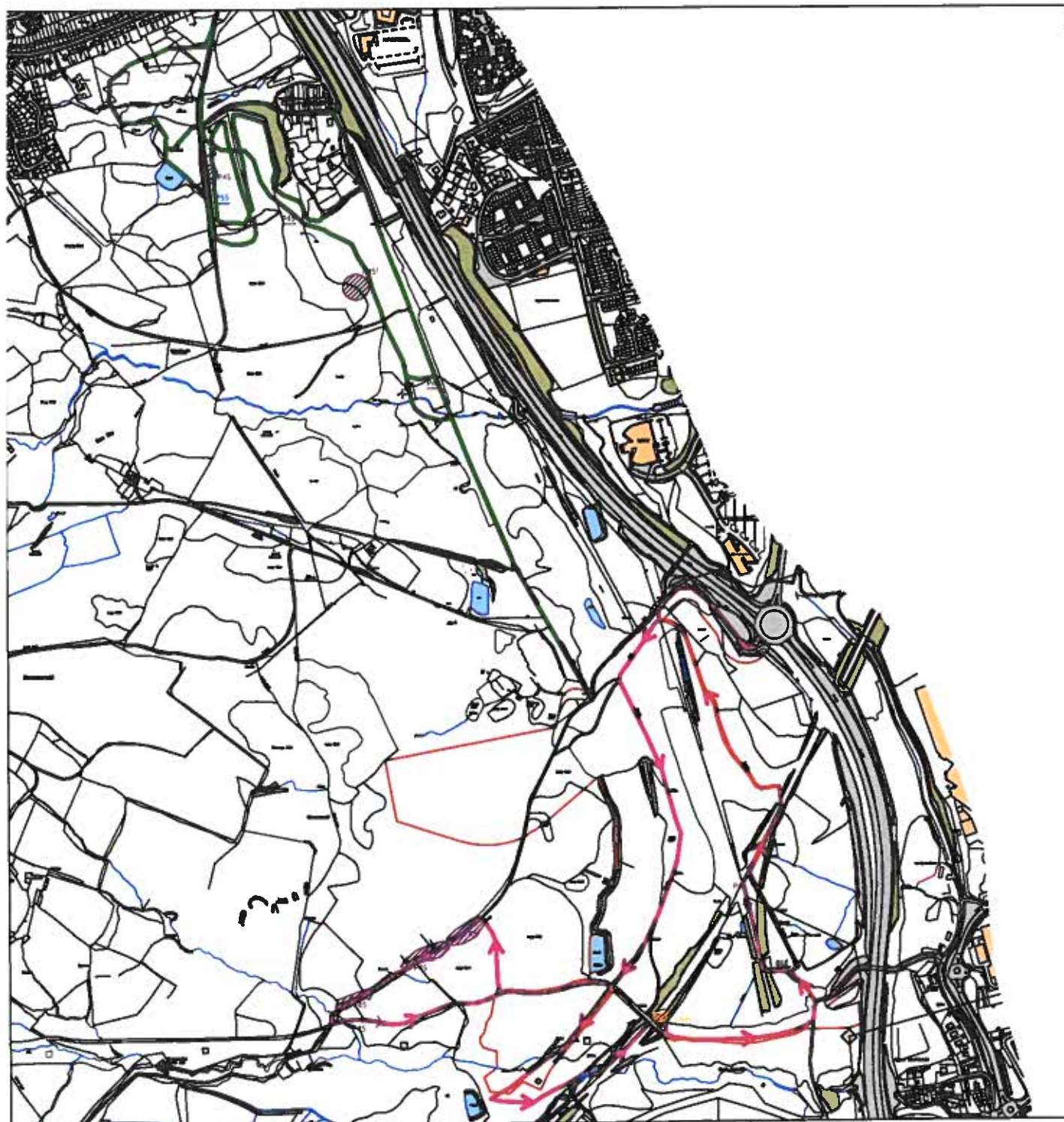
T: +44 (0) 1865 341321
bioscan@bioscanuk.com
www.bioscanuk.com



Reproduced from Ordnance Survey
© Crown Copyright. All rights reserved
Licence No. 100005493



DO NOT SCALE



Key

- Application site
- Transect 1
- Transect 2
- Common Pipistrelle
- Myotis
- Brown long-eared bat
- Soprano pipistrelle
- Common/soprano pipistrelle
- Foraging area
- Bat passing by
- Two bats
- Commuting

Title

Bat activity transect (dawn) results 21.08.18

Project

Cwm Glo

Client

Marvel Ltd.

Drawing No.

Figure 4i

Revision

-

Project No.

E1835

Drawn

CD

Checked

DW

Date

November 2023

Bioscan (UK) Ltd
The Old Parlour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU

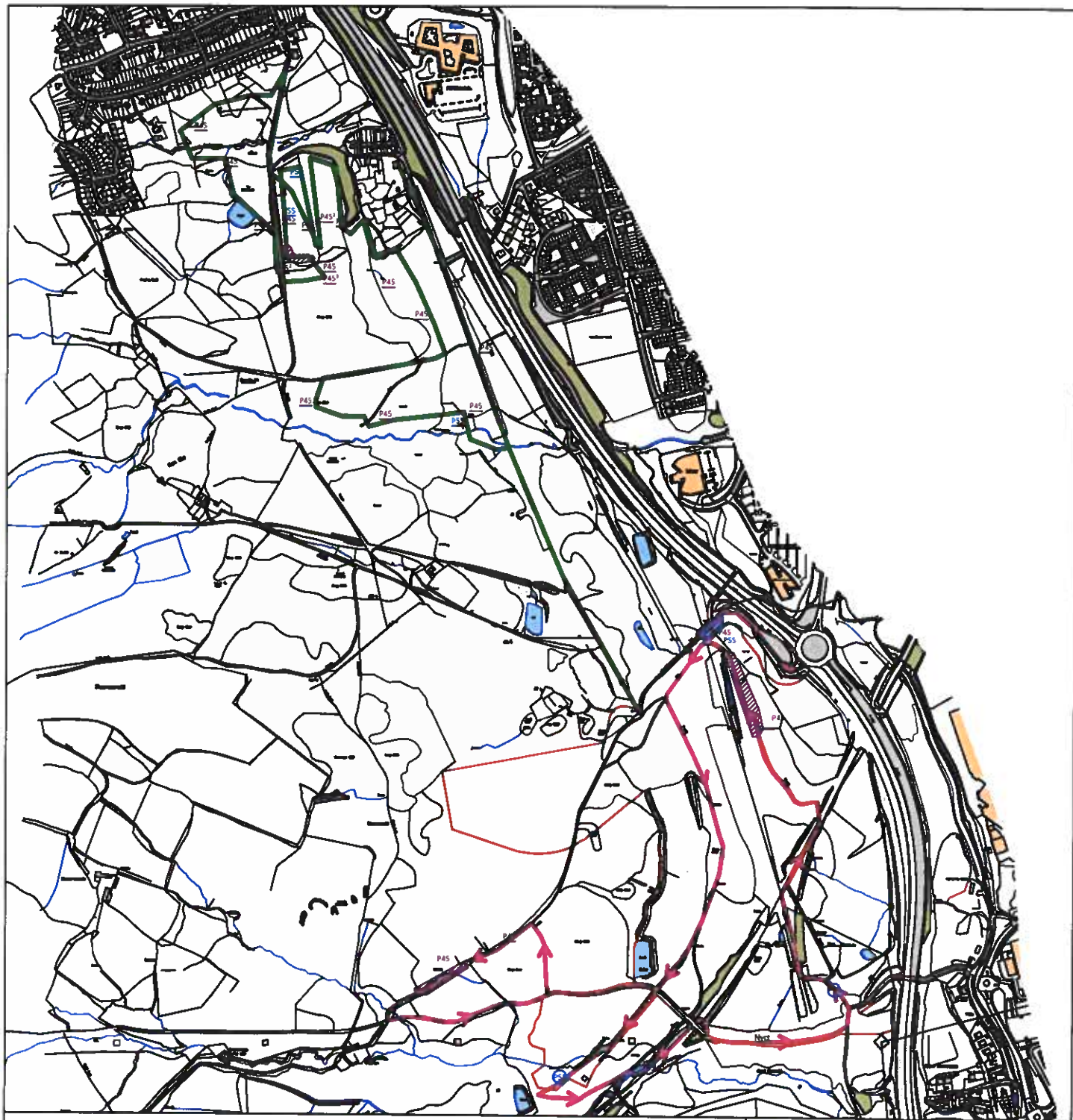


T: +44 (0) 1865 341321
bioscan@bioscanuk.com
www.bioscanuk.com

Reproduced from Ordnance Survey
© Crown Copyright. All rights reserved
Licence No. 100005491



DO NOT SCALE



Key

- Application site
- Transect 1
- Transect 2
- P45 Common Pipistrelle
- PSS Soprano Pipistrelle
- P45/PSS Common/Soprano Pipistrelle
- NYCT Nyctalus species
- BLE Brown Long-eared Bat
- Foraging area
- BAT Bat passing by
- BAT Two bats

Title

Bat activity transect results 13.09.18

Project

Cwm Glo

Client

Marvel Ltd

Drawing No.

Figure 4j

Revision

-

Project No.

E1835

Drawn

CD

Checked

DW

Date

November 2023

Bioscan (UK) Ltd
The Old Parlour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU.

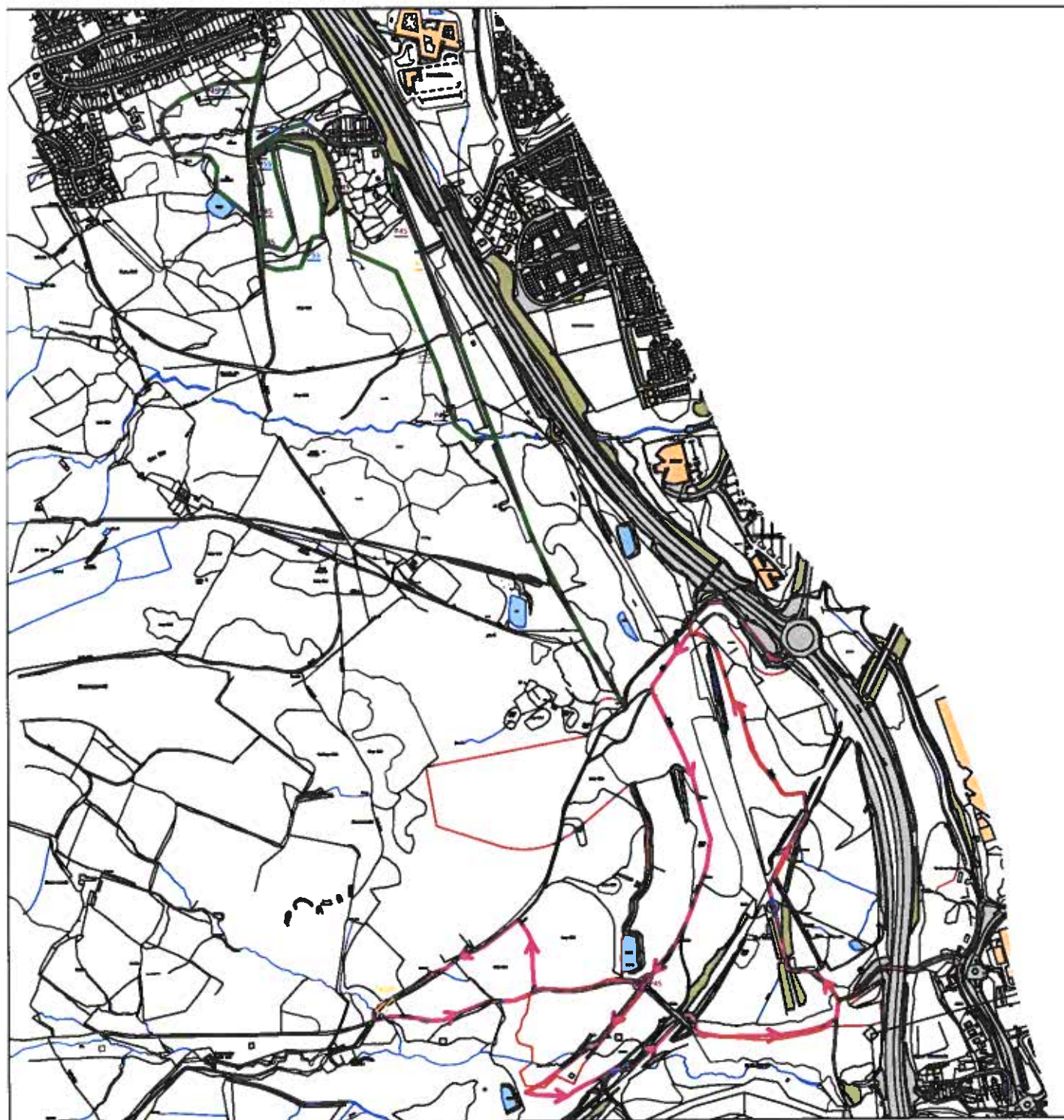
T: +44 (0) 1865 341321
bioscan@bioscanuk.com
www.bioscanuk.com



Reproduced from Ordnance Survey
© Crown Copyright. All rights reserved
Licence No. 100005491



DO NOT SCALE



Key

- Application site
- Transect 2
- Transect 2
- P45 Common pipistrelle
- PS5 Soprano pipistrelle
- Myotis species
- UnID Unidentified bat species
- Common/Soprano Pipistrelle
- Foraging area
- BAT Bat passing by

Title
Bat activity transect results 27.09.18

Project Cwm Glo **Client** Marvel Ltd

Drawing No. Figure 4k **Revision** - **Project No.** E1835

Drawn CD **Checked** DW **Date** November 2023

Bioscan (UK) Ltd
The Old Parlour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU.



T: +44 (0) 1865 341321
bioscan@bioscanuk.com
www.bioscanuk.com

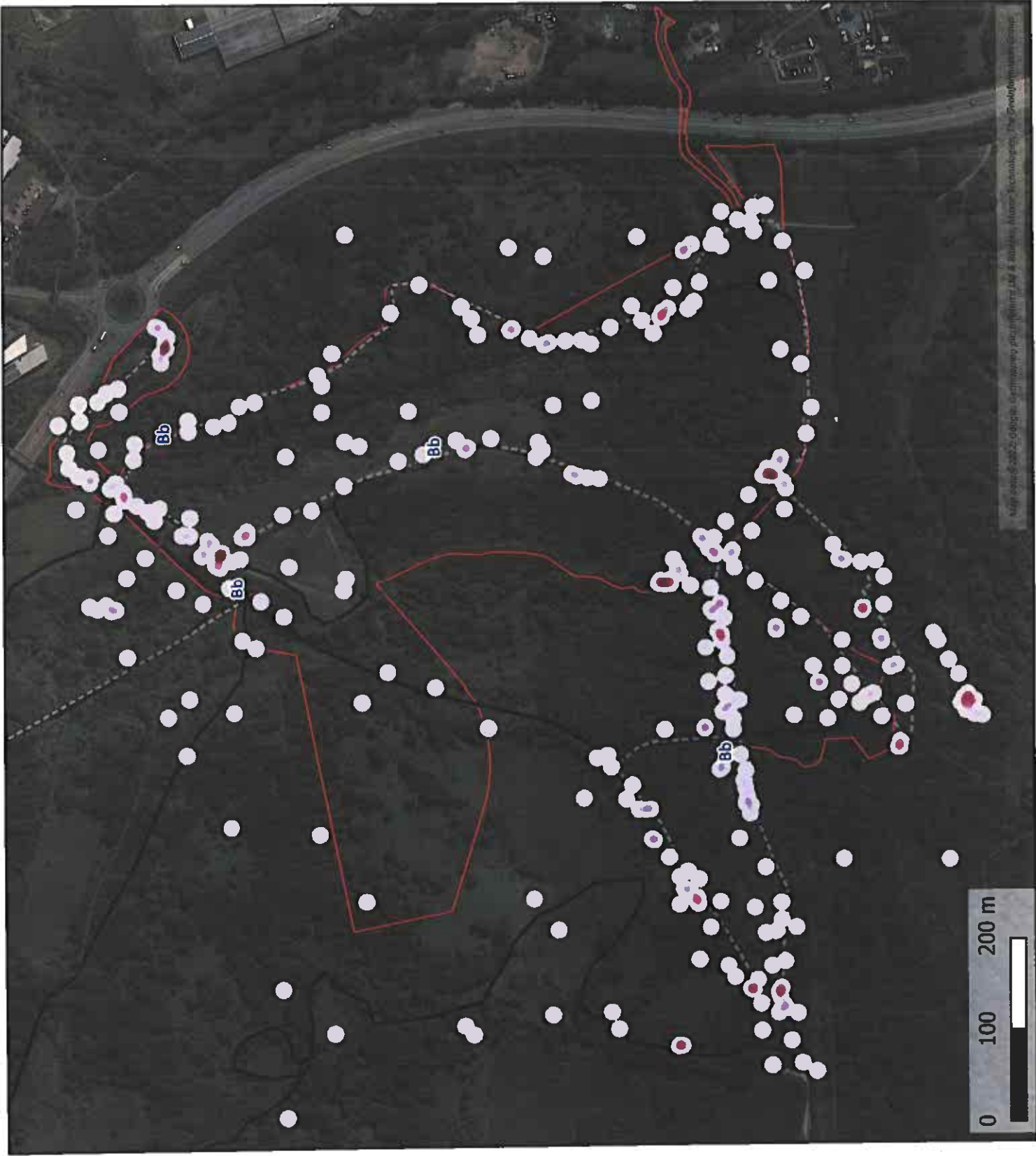
Reproduced from Ordnance Survey
© Crown Copyright All rights reserved
Licence No. 100005491


DO NOT SCALE

Figure 5

Pre-2021 Collated bat transect survey results

•



Key

- Application site
- Relative bat activity (collated 2015-2018)
 - Low
 - High
- Transect routes 2018
- Transect routes 2016
- Transect routes 2015
- Barbastelle bat detected during transects conducted in May 2015 and September 2016
- Bb

The heatmap was generated from collated point data from the pre-2021 transect surveys, whereby one point equated to one bat observed/heard. The areas of higher activity shown on the map indicate locations where multiple bats were observed/heard and/or bats were observed/heard on repeated visits. Note the assignment of activity as low-high here is relative to the site and pre-2021 data and is for qualitative purposes only.



Title

Pre-2021 collated bat activity results and notable bat species

Project Cwm Glo Client Marvel Ltd

Drawing No. Figure 5 Revision - Project No. E1835

Drawn RB Checked DW Date November 2023

Bioscan (UK) Ltd

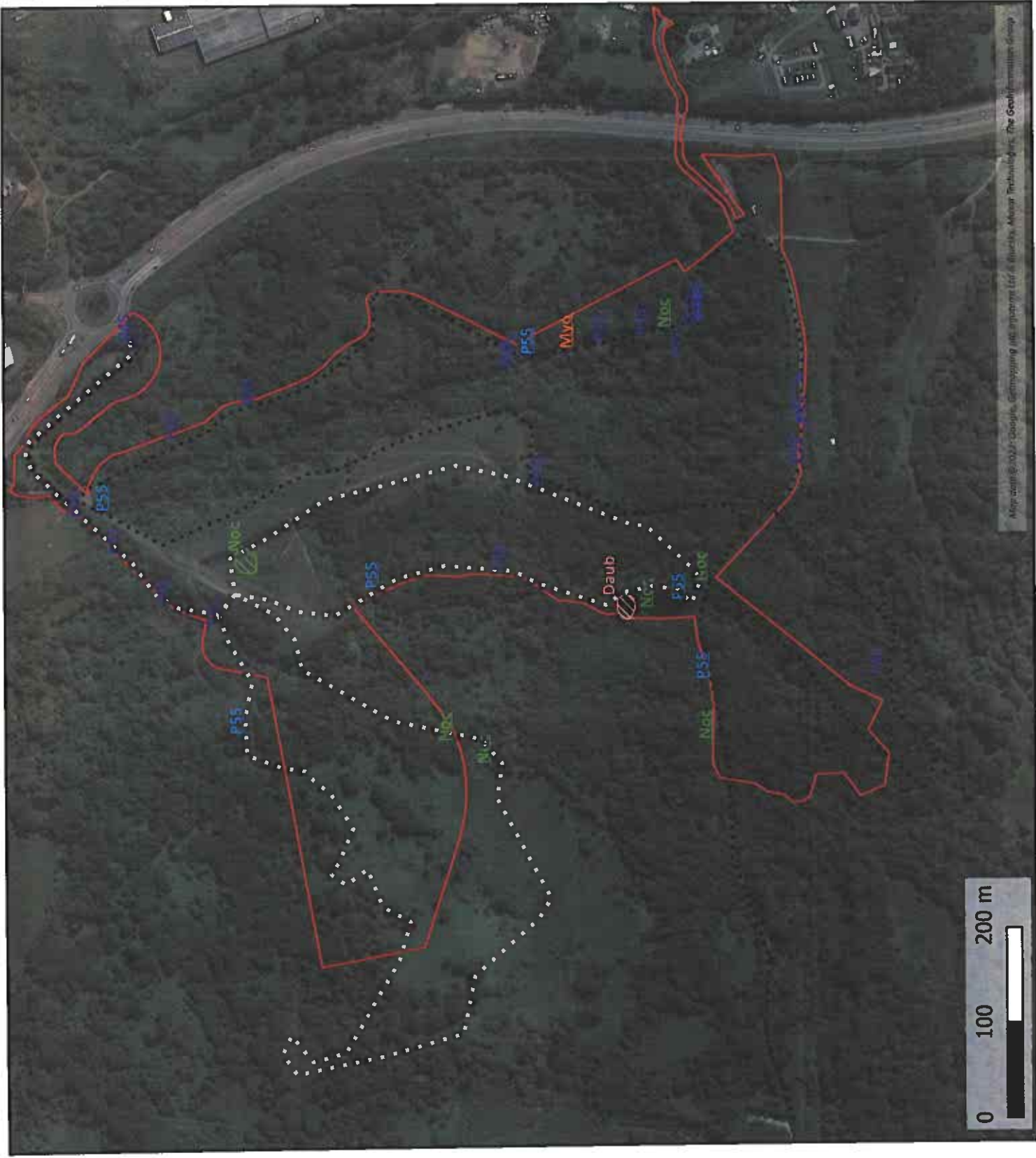
The Old Parlour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU.



T: +44 (0) 1865 341321
bioscan@bioscanuk.com
www.bioscanuk.com

Figure 6a-m

Bat transect survey results - 2021



Key

- Application site
- North transect (T1)
- South transect (T2)
- Bat pass
- Foraging activity
- Direction of commuting bat
- P45 Common pipistrelle
- P55 Soprano pipistrelle
- Daub Daubenton's bat
- Noc Common noctule
- Myo *Myotis* sp



Title

Bat activity transect results 21.04.2021

Project

Cwm Glo Client Marvel Ltd

Drawing No.

Figure 6a Revision - Project No. E1835

Drawn

CD DW Checked Date November 2023

Bioscan (UK) Ltd

The Old Parlour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU.

T: +44 (0) 1865 341321
bioscan@bioscanuk.com
www.bioscanuk.com





Key

- Application site
- North transect (T1)
- South transect (T2)
- Bat pass
- P45 Common pipistrelle
- P55 Soprano pipistrelle
- Noc Common noctule
- Myo *Myotis* sp
- NatPip Nathusius' pipistrelle



Title
Bat activity transect results 29.04.2021

Project
Cwm Glo

Client
Marvel Ltd

Drawing No.
Figure 6b

Revision
-

Project No.
E1835

Drawn
CD

Checked
DW

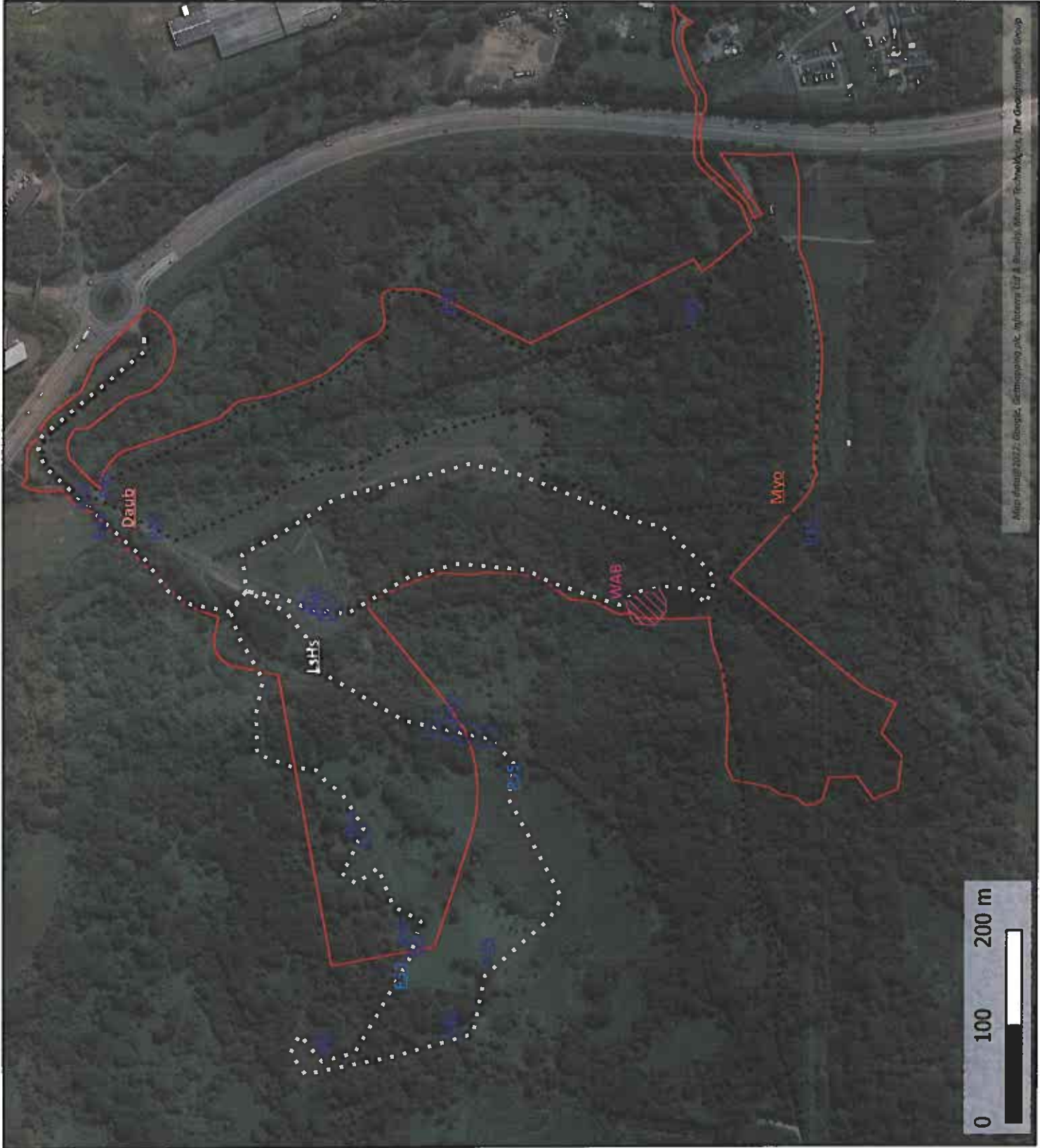
Date
November 2023

Bioscan (UK) Ltd

The Old Parlour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU



T: +44 (0) 1865 341321
bioscan@bioscanuk.com
www.bioscanuk.com



Key

- Application site
- North transect (T1)
- South transect (T2)
- Bat pass
- Social calling
- Foraging activity
- P45 Common pipistrelle
- P55 Soprano pipistrelle
- Myo *Myotis sp*
- Daub Daubenton's bat
- WAB Whiskered/Alcathoe/Brandt's bat
- LsHs Lesser horseshoe bat



Title

Bat activity transect results 17.05.2021

Project

Cwm Glo

Client

Marvel Ltd

Drawing No.

Figure 6c

Revision

-

Project No.

E1835

Drawn

CD

Checked

DW

Date

November 2023

Bioscan (UK) Ltd

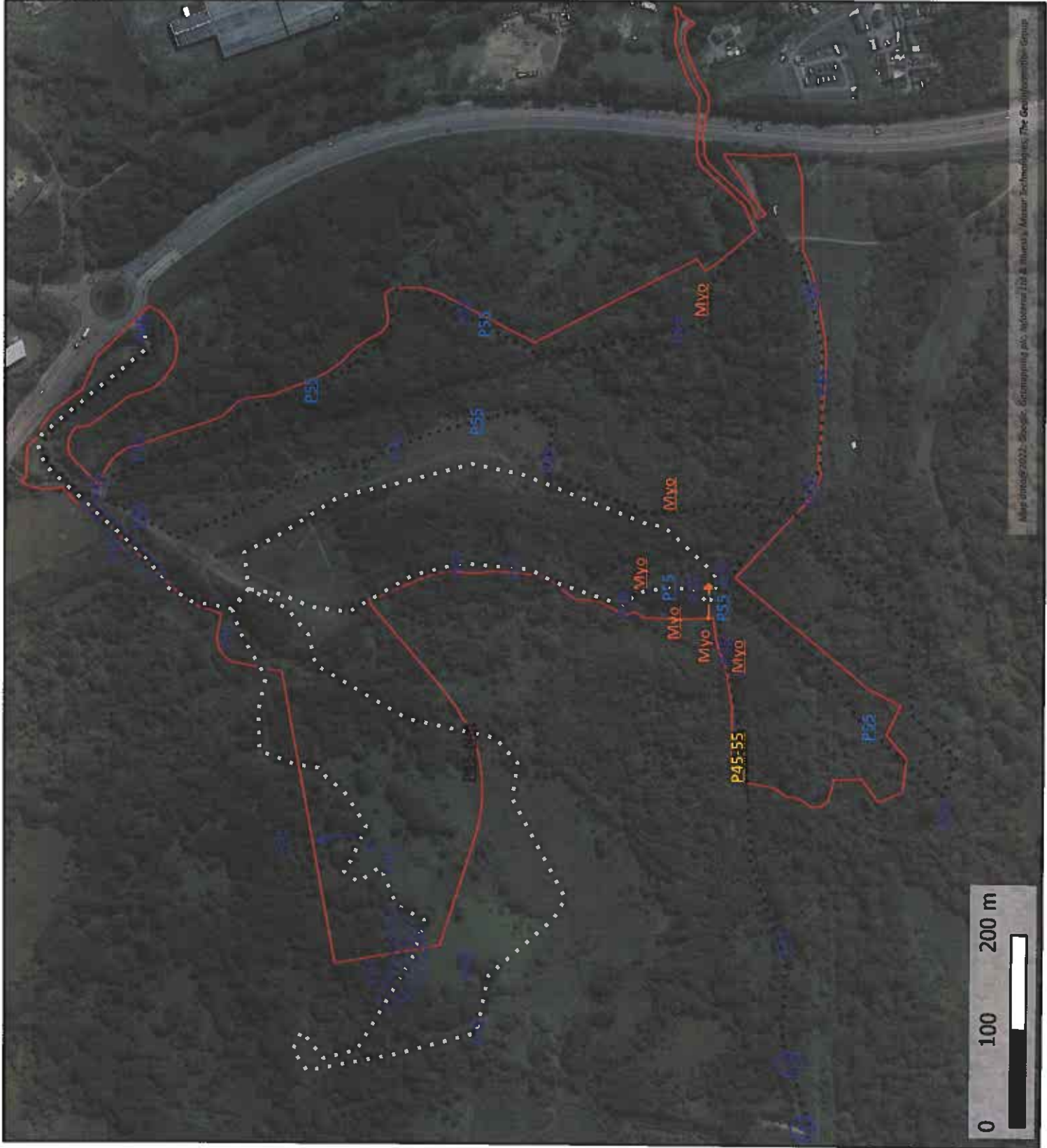
The Old Parlour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU.



T+44 (0) 1865 341321

bioscan@bioscanuk.com

www.bioscanuk.com



Key

- Application site
- North transect (T1)
- South transect (T2)
- Bat pass
- Social calling
- Direction of commuting bat
- Foraging activity
- P45 Common pipistrelle
- P55 Soprano pipistrelle
- Myo *Myotis sp*
- Daub Daubenton's bat
- P45-55 Common/soprano pipistrelle
- P45-Nat Common/Nathusius' pipistrelle
- UnID Unidentified bat



Title

Bat activity transect results 27.05.2021

Project

Cwm Glo

Client

Marvel Ltd

Drawing No.

Figure 6d

Revision

-

Project No.

E1835

Drawn

CD

Checked

DW

Date

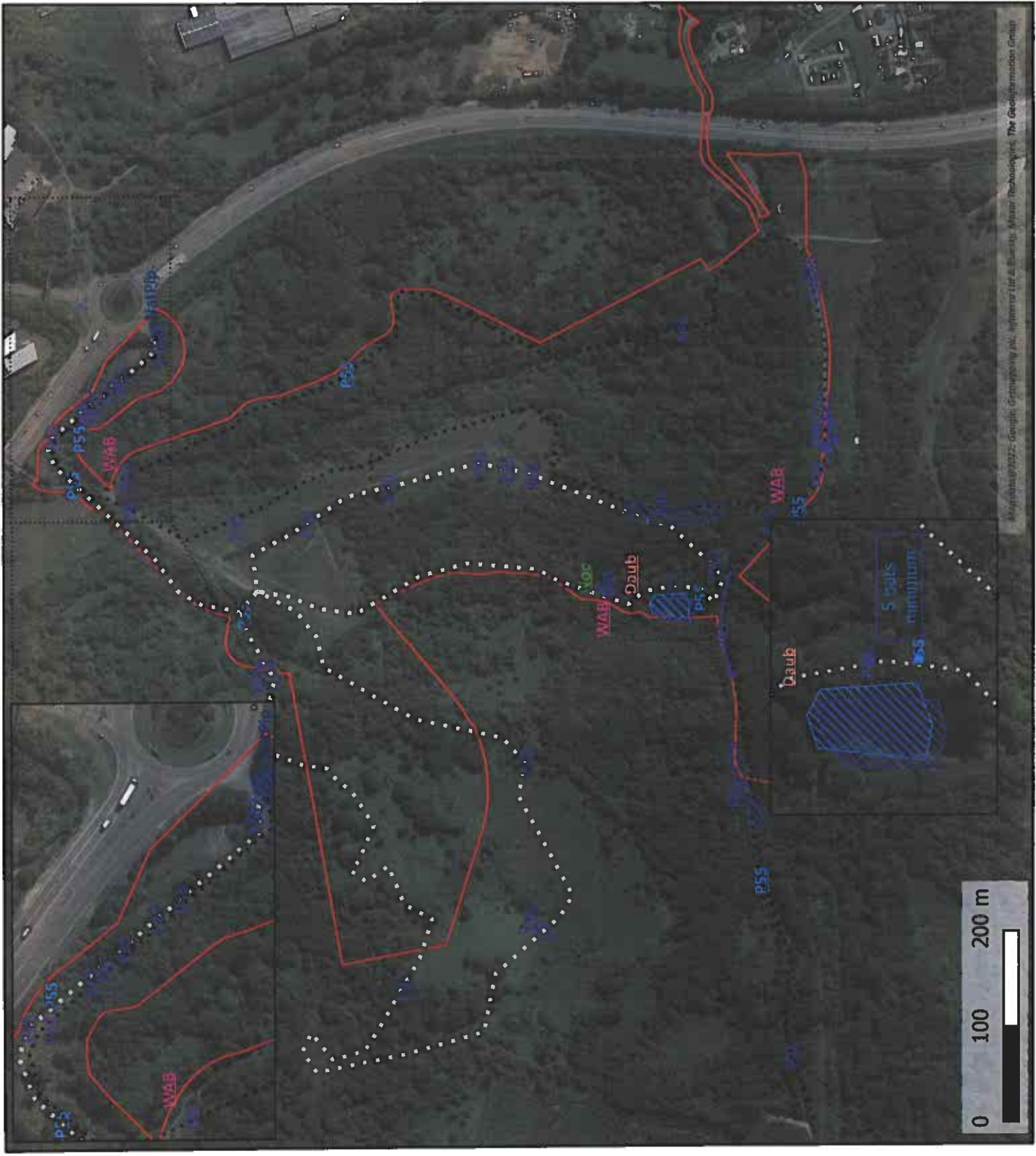
November 2023

Bioscan (UK) Ltd

The Old Parlour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU.



T: +44 (0) 1865 341321
bioscan@bioscanuk.com
www.bioscanuk.com



Key

- Application site
- North transect (T1)
- South transect (T2)
- Bat pass
- Social calling
- Direction of commuting bat
- Foraging activity
- Bat² Number of bats
- P45 Common pipistrelle
- P55 Soprano pipistrelle
- Myo *Myotis sp*
- Daub Daubenton's bat
- WAB Whiskered/Alcathoe/Brandt's bat
- Noc Common noctule
- NatPip Nathusius' pipistrelle



Title

Bat activity transect results 15.06.2021

Project

Cwm Glo

Drawing No.

Figure 6e

CD

November 2023

Bioscan (UK) Ltd

The Old Parlour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU

T: +44 (0) 1865 341321
bioscan@bioscanuk.com
www.bioscanuk.com





Key

- Application site
- North transect (T1)
- South transect (T2)
- Bat pass
- Direction of commuting bat
- Foraging activity
- P45 Common pipistrelle
- P55 Soprano pipistrelle
- Myo *Myotis sp*
- P45-Nat Common/Nathusius' pipistrelle
- Ser Serotine



Title

Bat activity transect results 12.07.2021

Project

Cwm Glo

Client

Marvel Ltd

Drawing No.

Figure 6g

Revision

-

Project No.

E1835

Drawn

CD

Checked

DW

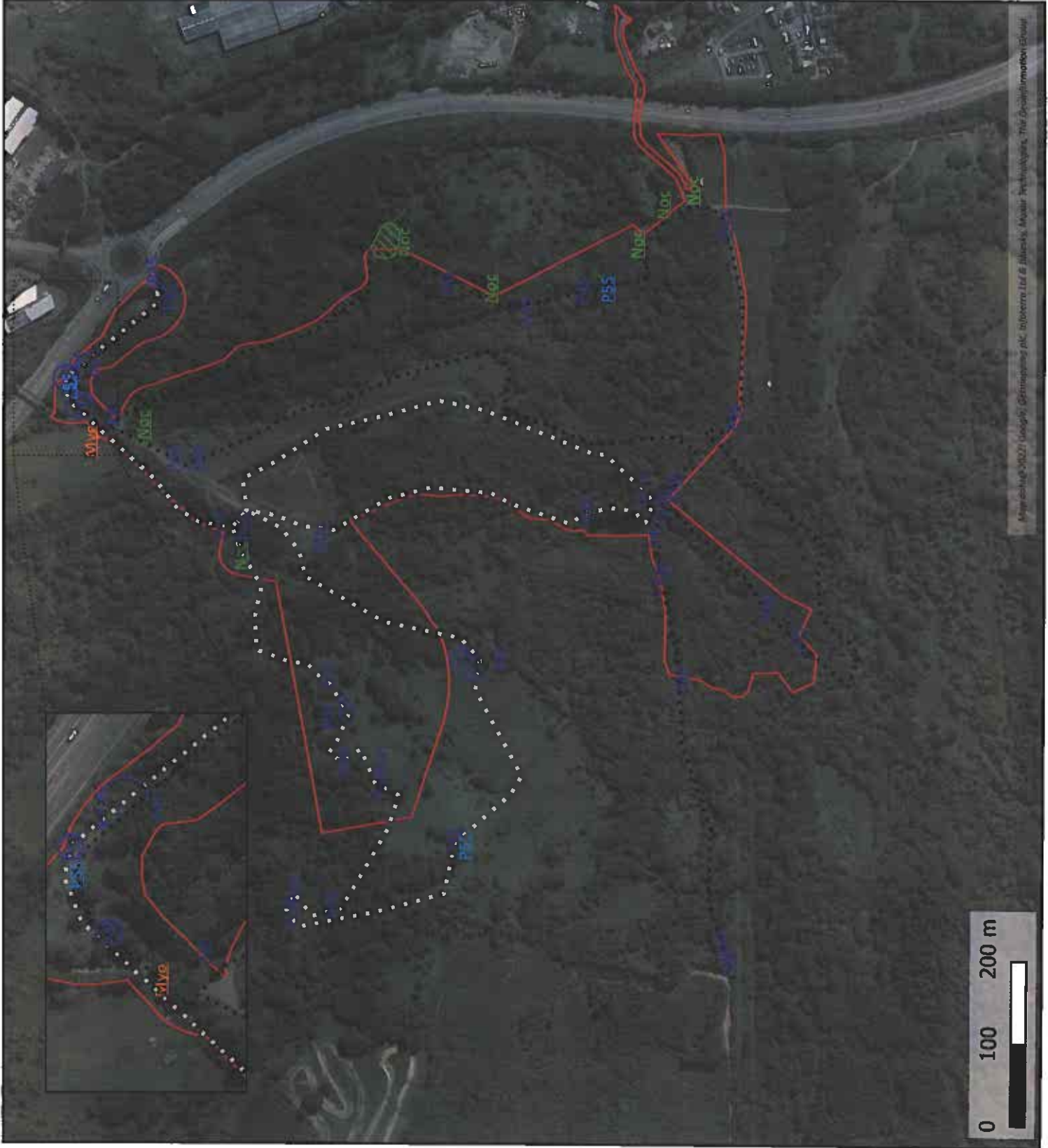
Date

November 2023

Bioscan (UK) Ltd

The Old Parlour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU.
T: +44 (0) 1865 341321
bioscan@bioscanuk.com
www.bioscanuk.com





Key

- Application site
- North transect (T1)
- South transect (T2)
- Bat pass
- Social calling
- Direction of commuting bat
- Foraging activity
- Bat² Number of bats
- P45 Common pipistrelle
- P55 Soprano pipistrelle
- Myo *Myotis* sp
- Noc Common noctule



Title

Bat activity transect results 26.07.2021

Project

Cwm Glo

Client

Marvel Ltd

Drawing No.

Figure 6h

Revision

-

Project No.

E1835

Drawn

CD

Checked

DW

Date

November 2023

Bioscan (UK) Ltd

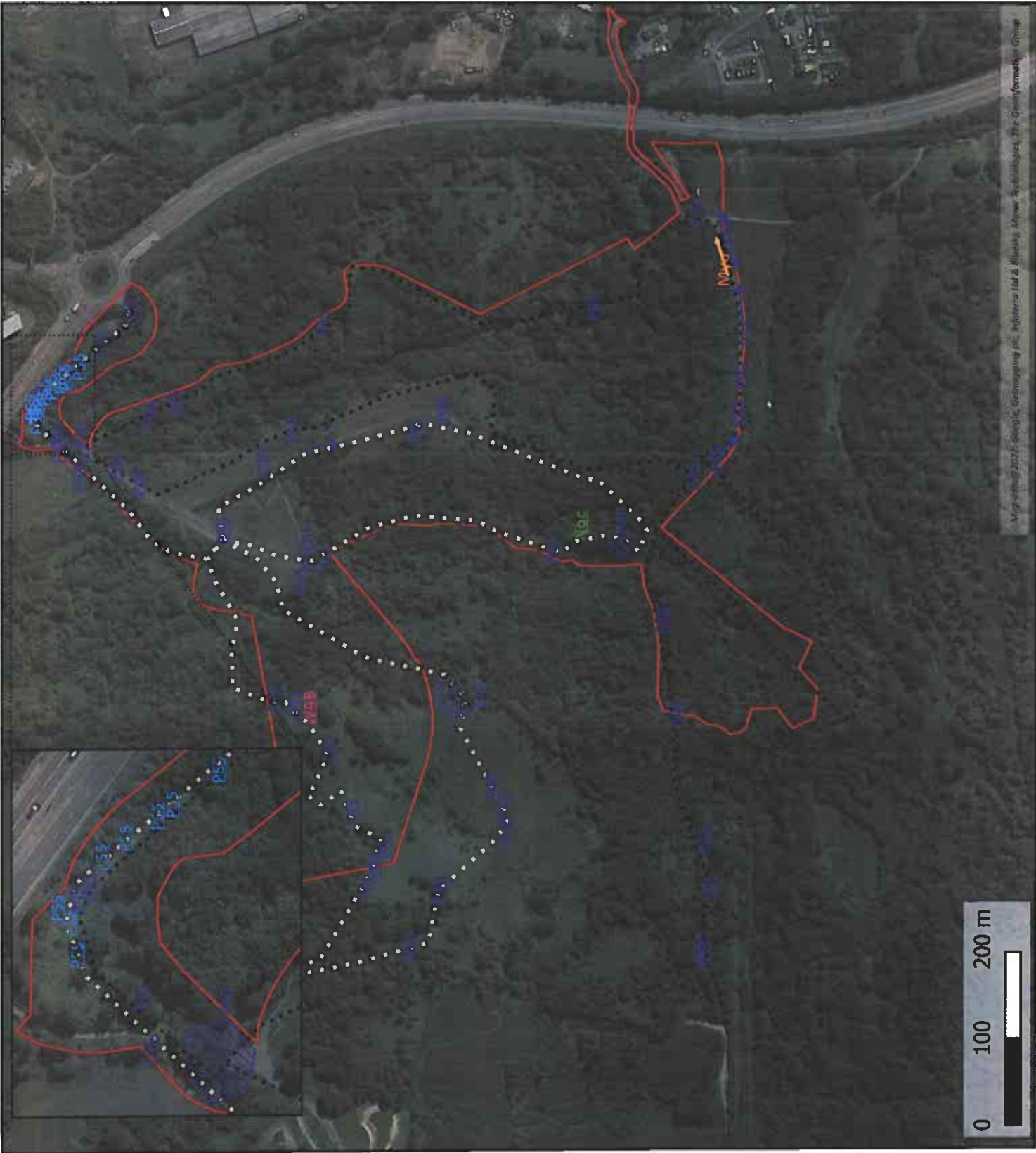
The Old Parlour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU.



T+44 (0) 1865 341321

bioscan@bioscanuk.com

www.bioscanuk.com



Key

- Application site
- North transect (T1)
- South transect (T2)
- Bat pass
- Social calling
- Direction of commuting bat
- Foraging activity
- P45 Common pipistrelle
- P55 Soprano pipistrelle
- Myo Myotis sp
- Noc Common noctule
- WAB Whiskered/Alcathoe/Brandt's



Title

Bat activity transect results 12.08.2021

Project

Cwm Glo

Client

Marvel Ltd

Drawing No.

Figure 6i

Revision

-

Project No.

E1835

Drawn

CD

Checked

DW

Date

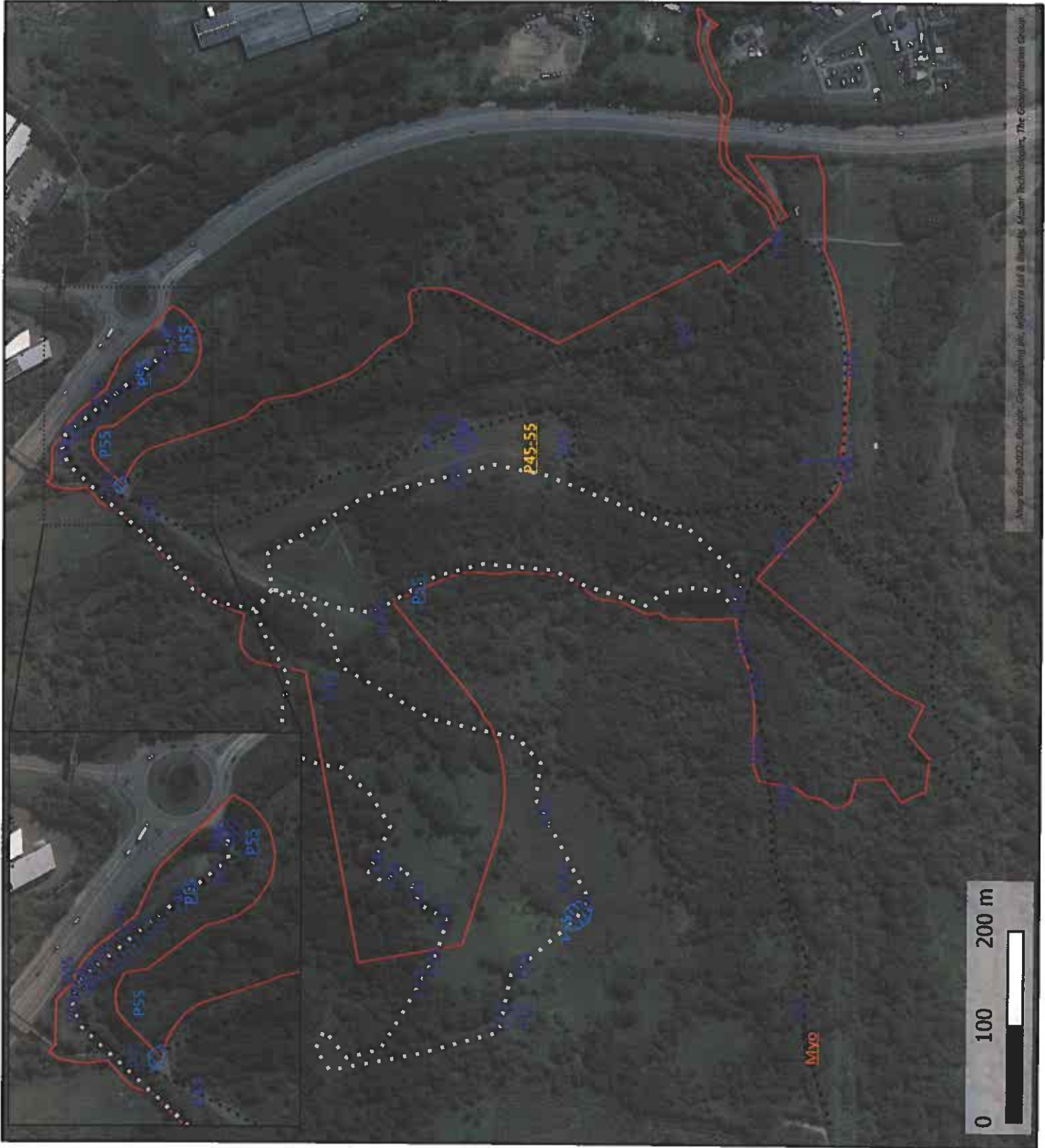
November 2023

Bioscan (UK) Ltd

The Old Parlour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU.



T: +44 (0) 1865 341321
bioscan@bioscanuk.com
www.bioscanuk.com



Key

- Application site
- North transect (T1)
- South transect (T2)
- Bat pass
- Direction of commuting bat
- Foraging activity
- P45 Common pipistrelle
- P55 Soprano pipistrelle
- Myo *Myotis sp*
- P45-S5 Common/soprano pipistrelle



Title

Bat activity transect results 25.08.2021

Project

Cwm Glo

Client

Marvel Ltd

Drawing No.

Figure 6j

Revision

-

Project No.

E1835

Drawn

CD

Checked

DW

Date

November 2023

Bioscan (UK) Ltd

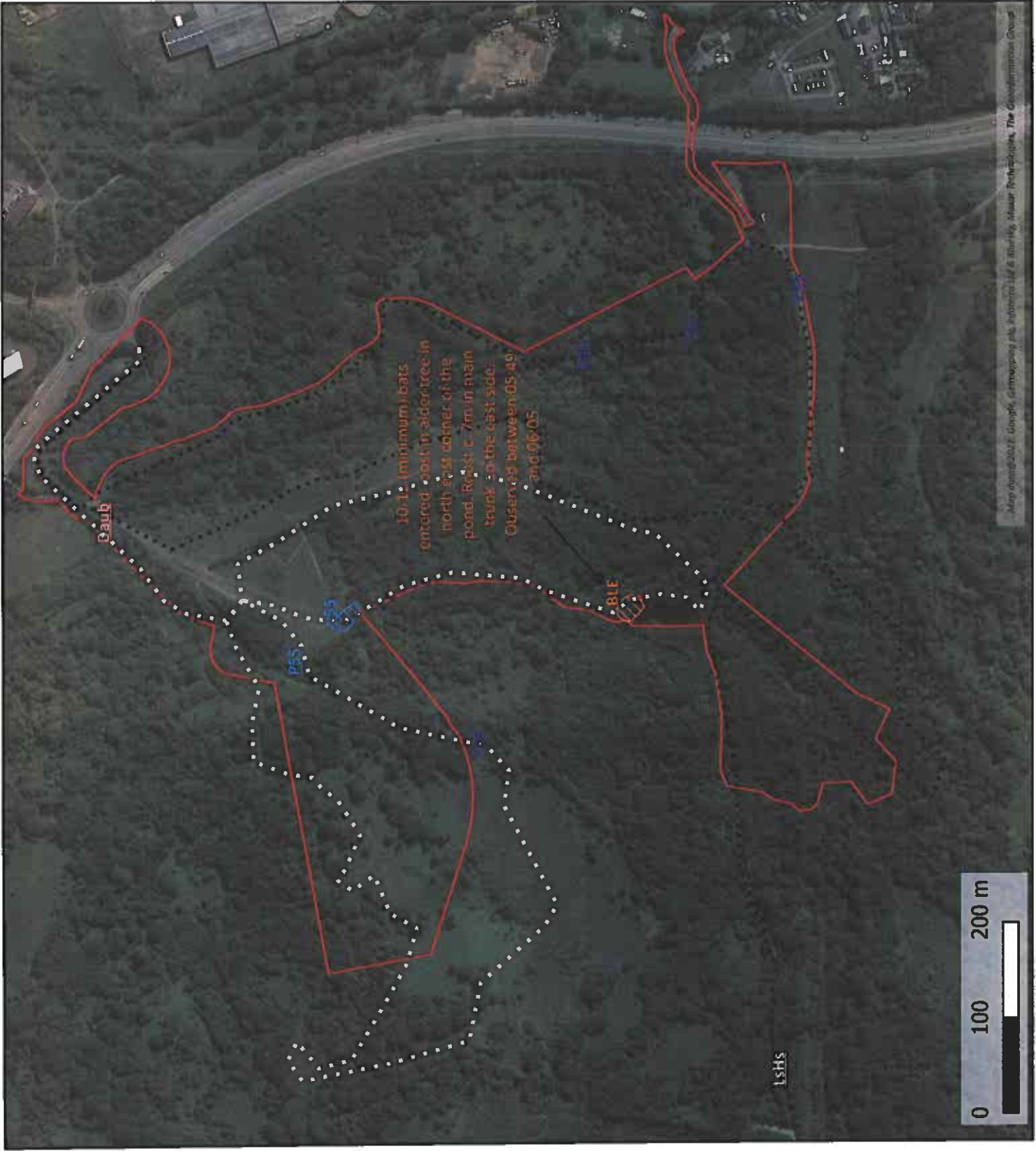
The Old Parlour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU.



T: +44 (0) 1865 341321

bioscan@bioscanuk.com

www.bioscanuk.com



Key

- Application site
- North transect (T1)
- South transect (T2)

P4S

Bat pass

Foraging activity

P4S

Common pipistrelle

P5S

Soprano pipistrelle

BLE

Brown long-eared bat

Daub

Daubenton's bat

LSHs

Lesser horseshoe bat



Title

Bat activity transect results 26.08.2021 (dawn)

Project

Cwm Glo

Client

Marvel Ltd

Drawing No.

Figure 6k

Revision

-

Project No.

E1835

Drawn

CD

Checked

DW

Date

November 2023

Bioscan (UK) Ltd

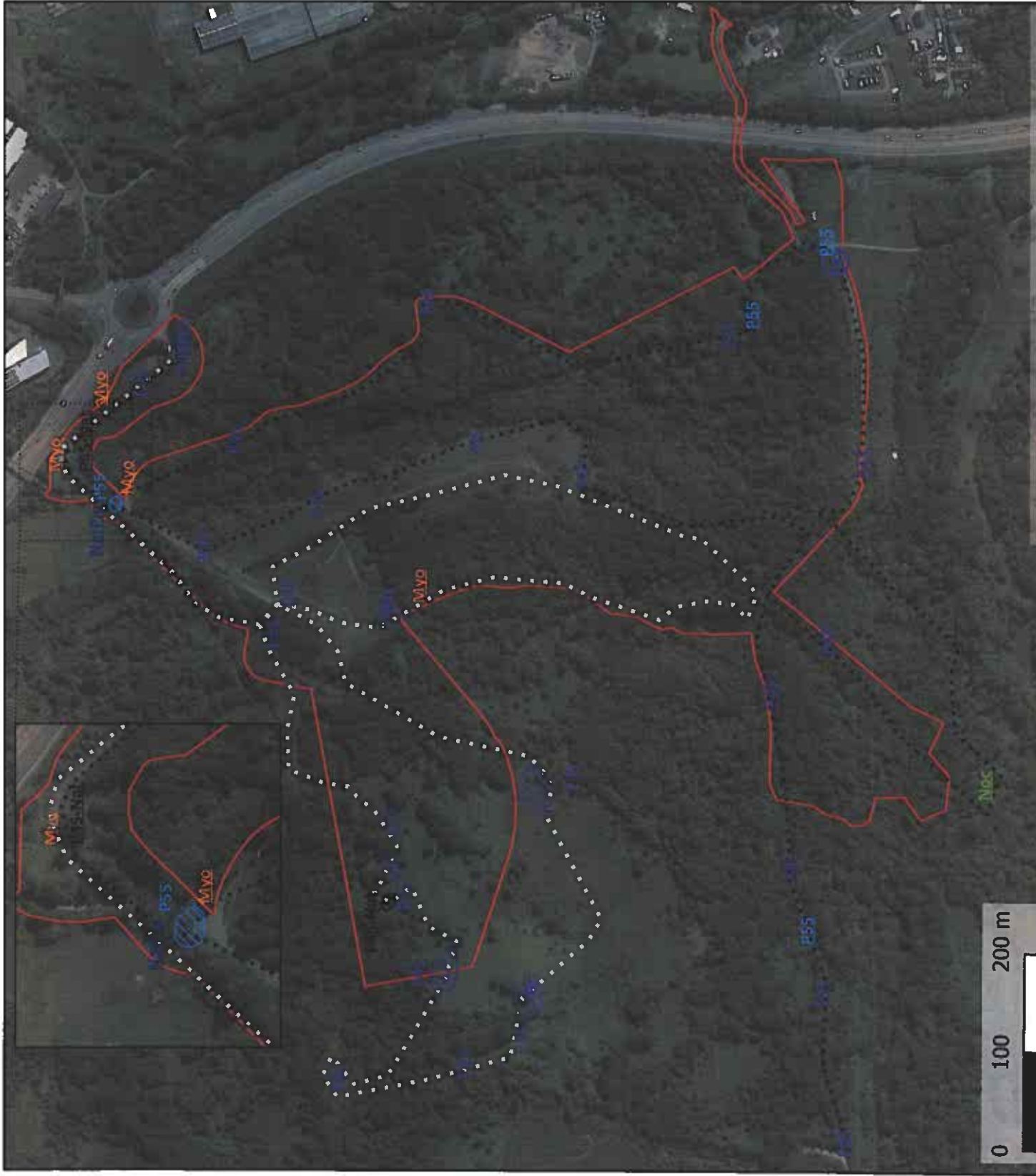
The Old Parlour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU.



T: +44 (0) 1865 341321

bioscan@bioscanuk.com

www.bioscanuk.com



Key

- Application site
- North transect (T1)
- South transect (T2)
- Bat pass
- Social calling
- Foraging activity
- Common pipistrelle
- Soprano pipistrelle
- Myotis sp*
- Common noctule
- NatPip
- Nathusius' pipistrelle
- P45-Nat
- Common/Nathusius' pipistrelle



Title

Bat activity transect results 15.09.2021

Project

Cwm Glo

Client

Marvel Ltd

Drawing No.

Figure 6f

Revision

-

Project No.

E1835

Drawn

CD

Checked

DW

Date

November 2023

Bioscan (UK) Ltd

The Old Parlour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU.



T: +44 (0) 1865 341321
bioscan@bioscanuk.com
www.bioscanuk.com

Figure 7

2021 collated bat transect survey results



Key

- Application site
- North transect (T1)
- South transect (T2)
- Relative bat activity
 - Low
 - High

Target note

Lesser horseshoe bat detected during transects conducted in May, June and August 2021

NatPip Nathusius' pipistrelle detected during transects conducted in April, June and September 2021

The heatmap was generated from collated point data from the 2021 transect surveys, whereby one point equated to one bat observed/heard. The areas of higher activity shown on the map indicate locations where multiple bats were observed/heard and/or bats were observed/heard on repeated visits. Note the assignment of activity as low-high here is relative to the site and 2021 data and is for qualitative purposes only.

Title

2021 collated bat activity results and notable bat species

Project

Cwm Glo

Client

Marvel Ltd

Drawing No.

Figure 7

Revision

-

Project No.

E1835

Drawn

CD

Checked

DW

Date

November 2023

Bioscan (UK) Ltd

The Old Parlour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU.



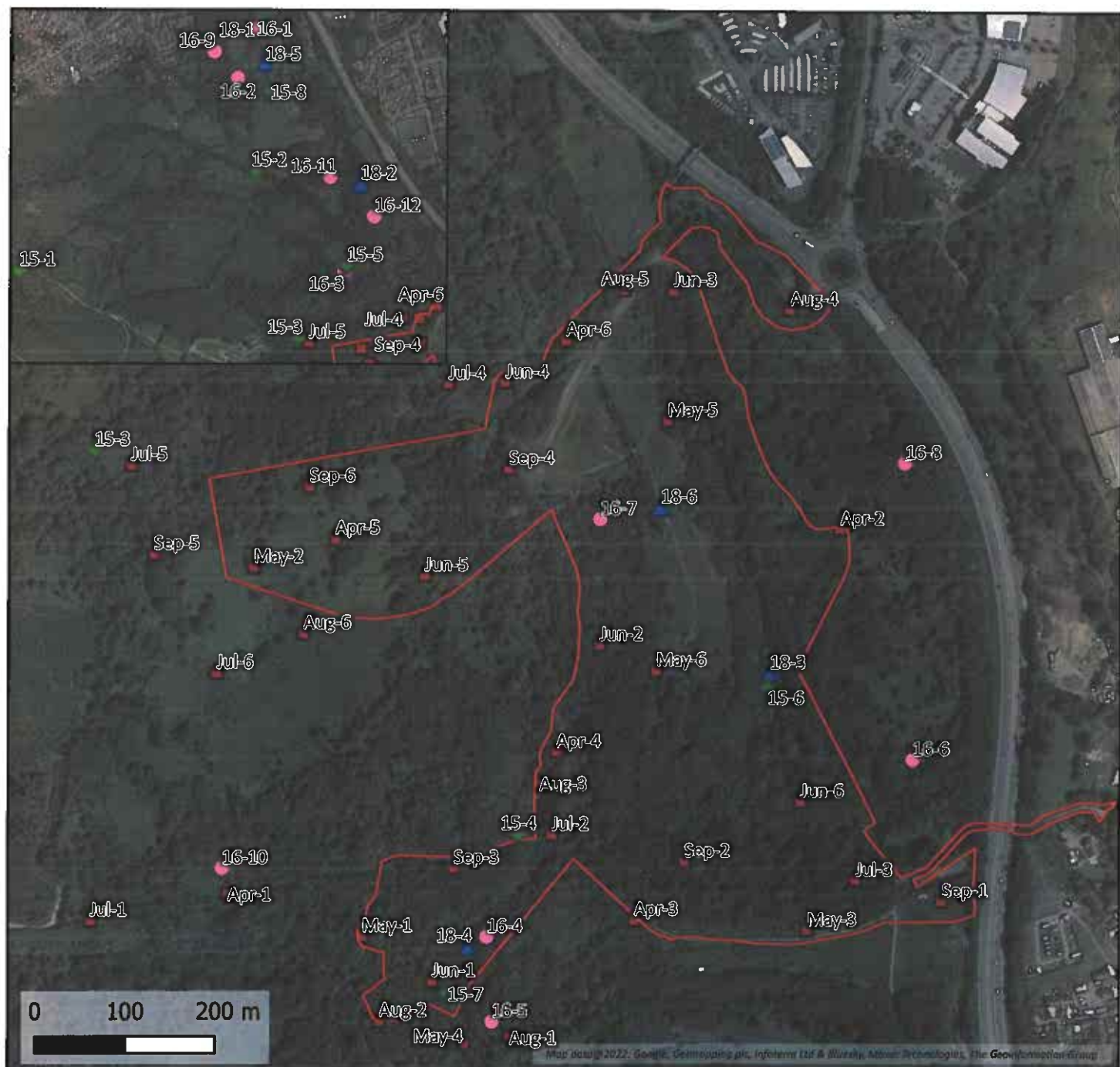
T: +44 (0) 1865 341321

bioscan@bioscanuk.com

www.bioscanuk.com

Figure 8

Automated detector locations – 2015 to 2021



Key

- Application site
- 2021 static detector location
- ▲ 2018 static detector location
- 2016 static detector location
- ◆ 2015 static detector location

Title

Automated detector locations 2015-2021

Project

Cwm Glo

Client

Marvel Ltd

Drawing No.

Figure 8

Revision

—

Project No.

E1835

Drawn

CD

Checked

DW

Date

November 2023

Bioscan (UK) Ltd

The Old Parlour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU



T: +44 (0) 1865 341321
bioscan@bioscanuk.com
www.bioscanuk.com

Figure 9

Buildings and structures surveyed for bats – 2015 to 2021



Key

— Application site

Roosting potential

- High
- Moderate-high
- Moderate
- Low-moderate
- Low
- Low-negligible



Title

Buildings and structures surveyed for bats 2015 - 2021

Project

Cwm Glo

Client

Marvel Ltd

Drawing No.

Figure 9

Revision

-

Project No.

E1835

Drawn

CD

Checked

DW

Date

November 2023

Bioscan (UK) Ltd

The Old Parlour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU.

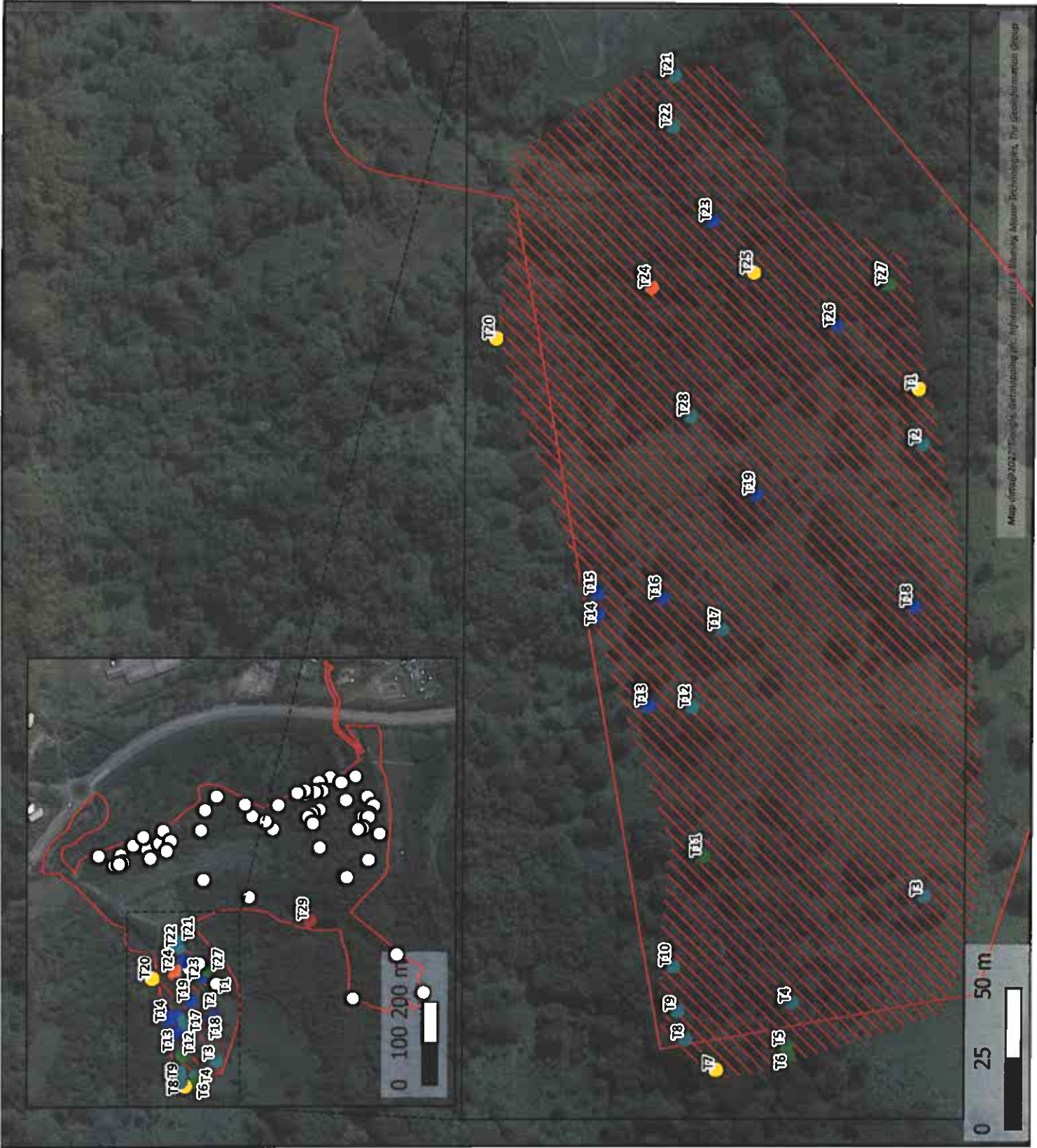


T: +44 (0) 1865 341321
bioscan@bioscanuk.com
www.bioscanuk.com

Reproduced from Ordnance
Survey © Crown Copyright. All
rights reserved Licence
No. 100005491

Figure 10

Preliminary tree roost assessment survey results –2021



Key

- Application site
- Approximate search/survey area

Roosting potential

- Confirmed roost
- High
- Moderate-high
- Moderate
- Low-moderate
- Low



Title

Preliminary tree roost assessment survey results

Project

Cwm Glo

Client

Marvel Ltd

Drawing No.

Figure 10

Revision

-

Project No.

E1835

Drawn

CD

Checked

DW

Date

November 2023

Bioscan (UK) Ltd

The Old Parlour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU.



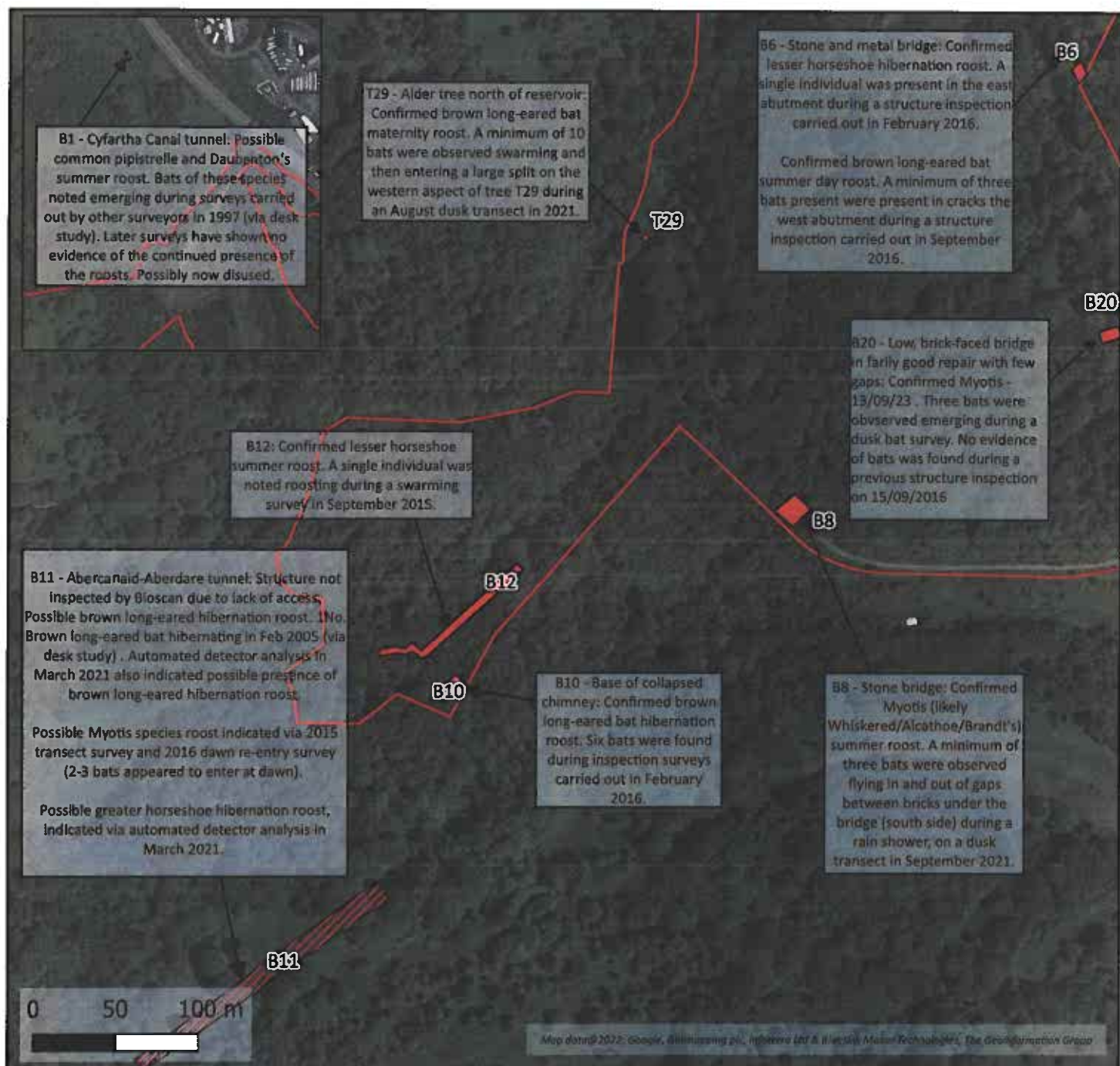
T: +44 (0) 1865 341321

bioscan@bioscanuk.com

www.bioscanuk.com

Figure 11

Confirmed/suspected bat roosts within or near site



Key

- Application site
- Structure/tree with confirmed roost
- Structure with suspected/potential roost

Title

Confirmed/suspected roosts within or near the application site

Project

Cwm Glo

Client

Marvel Ltd

Drawing No.

Figure 11

Revision

-

Project No.

E1835

Drawn

CD

Checked

DW

Date

November 2023

Bioscan (UK) Ltd

The Old Parlour,
Little Baldon Farm,
Little Baldon,
Oxford,
OX44 9PU.



T: +44 (0) 1865 341321
bioscan@bioscanuk.com
www.bioscanuk.com

Reproduced from Ordnance
Survey © Crown Copyright. All
rights reserved Licence
No. 100005491

Appendices

Appendix 1:

Results of inspection surveys and summary of confirmed/probable roosts (including hibernation use).

Refer to Figure 9 for locations.

Note text shaded in grey indicates structures that are outside the current application site.

Building/Structure Reference N° & Photographs	Building description	Potential bat hibernation/roosting features & evidence of bats	Results of activity surveys
B1- Cyfarthfa Canal tunnel entrance   (Scheduled Monument: GM467 - Cyfarthfa Canal Level)	Tunnel very damp, with water dripping through the tunnel ceiling, although some of the lower parts of the walls are drier. Some cracks on roof (mostly too damp) and in walls (some drier) of tunnel entrance. Cobweb over tunnel entrance on 15th September 2016 suggesting no recent bat passage. Some parts of protection grille had been cut through (likely to be due to past vandalism). Reported to be a bat roost in 1997 on the basis of pipistrelle and Daubenton's bats seen emerging.	Moderate bat hibernation/roost potential. Unable to inspect internally beyond the grille. <u>Structure inspection</u> (23-24th February 2016): No evidence of bats found. <u>Structure inspection</u> (15th September 2016): No evidence of bats found. <u>Structure inspection</u> (12th March 2021): No evidence of bats found.	<u>Autumn swarming survey</u> (24th September 2015): No evidence of swarming; however, species recorded flying over (in descending order of call frequency): - Common pipistrelle - Soprano pipistrelle - <i>Myotis</i> sp. - Long-eared bat - Nathusius' pipistrelle - Natterer's bat <u>Static detector survey</u> (September 2016): Results from static detector deployed for 8 nights near to this structure (in descending order of call frequency): - Common pipistrelle - <i>Myotis</i> sp. - Soprano pipistrelle - Pipistrelle sp. - Noctule <u>Static detector survey</u> (March 2021): Results from static detector deployed for 18 nights at entrance portal: - Common pipistrelle (92% of calls) - Soprano pipistrelle (7%) - <i>Myotis</i> sp. (1%) Bat activity recorded on every night except one between 15th and 25th March. Earliest bat call over the ten nights was 39 mins after sunset, with an average first call of the night at just over an hour after sunset. Only one bat call recorded occurring after 21:05 (at 06:23).

Building/Structure Reference N° & Photographs	Building description	Potential bat hibernation/roosting features & evidence of bats	Results of activity surveys
			The above results do not conclusively indicate the use of the structure for hibernation by bats, as the times of bat passes recorded do not indicate particularly 'early emerging' bats. Which might suggest the presence of a roost.
B2- Concrete wall  Structure Reference: "Industrial 429"	A well-sealed solid concrete structure; the only two crevices arising where metal additions had previously been affixed to the outer wall, but on inspection these crevices were only superficial. No internal access present. To the rear the structure was half collapsed but back-filled with earth. Some partially-open cavities have arisen where concrete slabs have fallen in on each other (lower photo). Sparse ivy growth on northern part.	Very low/negligible bat hibernation potential. The collapsed slabs (lower photo) has some limited potential as a minor day/night roost. <u>Structure inspection</u> (23-24th February 2016): No evidence of bats found. <u>Structure inspection</u> (15th September 2016): No evidence of bats found. <u>Structure inspection</u> (12th March 2021): No evidence of bats found.	Not surveyed due to very low roosting potential
B3a- Square stone structure	Walls comprise stones and crumbling mortar. External survey only. The structure contains holes and cracks of varying sizes. Bramble and blackthorn grow against the structure, with mounded earth and more vegetation (scrub) growing on top and leading to damp upper sections from vertical seepage. There is collapsed rubble inside.	Moderate to high bat hibernation/roost potential. Five to ten cavities in stonework capable of supporting roosting bats on each side of structure. East-facing wall is shaded but has 3-4 deep cavities. Scrub on eastern side is encroaching and increasingly rendering cavities	<u>Dusk emergence survey</u> (23rd August 2016): No bats observed emerging during dusk survey. <u>Dawn re-entry survey</u> (16th September 2016): No bats observed re-entering structure during dawn survey.

Building/Structure Reference N° & Photographs	Building description	Potential bat hibernation/roosting features & evidence of bats	Results of activity surveys
		inaccessible to bats. <u>Structure inspection</u> (23-24th February 2016): No evidence of bats found. <u>Structure inspection</u> (15th September 2016): No evidence of bats found. <u>Structure inspection</u> (12th March 2021): No evidence of bats found.	
B3b- Retaining wall 	A better-preserved structure, and therefore has fewer opportunities for roosting bats, with the west wall fairly well-mortared and increasingly rendered inaccessible to bats by dense scrub and ivy growth. It is also heavily shaded on both sides, and damp from vertical seepage. There is more vegetation growing on and against this structure than the adjacent B3a. The ground around B3b is littered with tins/bottles suggesting a highly disturbed location.	Low bat hibernation/roost potential. Holes too damp, shaded, obstructed or with rodent access to be suitable as roost sites. <u>Structure inspection</u> (23-24th February 2016): No evidence of bats found. <u>Structure inspection</u> (15th September 2016): No evidence of bats found. <u>Structure inspection</u> (12th March 2021): No evidence of bats found.	Not directly surveyed and no emergence/re-entry noted during survey of adjacent structure (B3a).
B4- Stone structure	Stone structure with occasional horizontal metal sheets between stones, and few external cavities due to intact mortar. The structure is largely covered in vegetation/ bramble and is banked up with earth to	Moderate bat hibernation/roost potential. <u>Structure inspection</u> (23-24th February 2016): No	Not surveyed

Building/Structure Reference N° & Photographs	Building description	Potential bat hibernation/ roosting features & evidence of bats	Results of activity surveys
	the rear. The two low-level alcoves have square holes in the ceiling (see lower photo) leading to cavities, one of which extends upward for 1-2m, but were found to be very wet. One of the square holes in February 2016 was noted to be clear of cobwebs although in September 2016 each square hole was covered by cobwebs. Two upper alcoves with a few crevices potentially suitable for bats.	evidence of bats found. <u>Structure inspection</u> (15th September 2016): No evidence of bats found. <u>Structure inspection</u> (12th March 2021): No evidence of bats found.	
B5- Paired stone retaining walls  Structure Reference: "Industrial 415"	Eastern side: fairly well sealed with a few larger cracks in upper section; cracks generally superficial in nature. Western side: partly missing/broken-facing with shallow crevices, but these mostly damp from seepage and/or exposed to illumination and rodent access, etc.	Revised after September 2016 visit to low-moderate bat hibernation/ roost potential. <u>Structure inspection</u> (23-24th February 2016): No evidence of bats found. <u>Structure inspection</u> (15th September 2016): No evidence of bats found. <u>Structure inspection</u> (12th March 2021): No evidence of bats found.	Not surveyed
B6- Stone bridge abutments with metal deck	Occasional large/deep putlog-type holes between abutment stones. Many	High potential for hibernation/	<u>Static detector survey</u> (March 2021):

Building/Structure Reference N° & Photographs	Building description	Potential bat hibernation/roosting features & evidence of bats	Results of activity surveys
	are wet and oozing with water, but some are dry and several appear quite clear.	roosting bats. Confirmed roosts. <u>Structure inspection</u> (23-24th February 2016): One lesser horseshoe bat present in east abutment. Hibernation roost. <u>Structure inspection</u> (15th September 2016): Three brown long-eared bats present, in west abutment. Summer roost. <u>Structure inspection</u> (12th March 2021): No evidence of bats found.	Results from static detector deployed for 14 nights under the deck of this structure revealed 47 bat registrations, all of which were considered to be Natterer's bat. These registrations occurred over five nights with the calls occurring between 88 minutes after sunset, and 80 minutes prior to sunrise. The above results do not conclusively indicate the use of the structure for hibernation by bats, as the times of bat passes recorded do not indicate particularly 'early emerging'¹ bats. Which might suggest the presence of a roost.
B7- Retaining wall 	Stone-built wall, with a number of deep putlog-type holes suitable for roosting bats, albeit some cavities very wet inside with occasional stalactite-type features, indicating frequently dripping-wet conditions.	Moderate/high bat hibernation/roosting potential. <u>Structure inspection</u> (23-24th February 2016): No evidence of bats found. <u>Structure inspection</u> (15th September 2016): No evidence of bats found. <u>Structure inspection</u> (12th March 2021): No evidence of bats found.	Not surveyed
B8- Stone bridge	A few holes suitable for bats (especially in ceiling near portal apexes) with some wetter than others. Some of these appeared as though they could turn the corner. Most apparent	Moderate/high bat hibernation/roost potential. Confirmed roost. <u>Structure inspection</u> (23-24th	Not surveyed

¹ With reference to pg. 100 in Russ (2012) Natterer's bat tends to emerge between 30 and 60 minutes after sunset.

Building/Structure Reference N° & Photographs	Building description	Potential bat hibernation/roosting features & evidence of bats	Results of activity surveys
 The above image shows the location of one crevice roost with a bat inside, noted on 27/09/21.	cavities in retaining abutments are only c.2.5cms deep before hitting mortar. Some holes in the outer section of the bridge were beyond the reach of a ladder and thus inaccessible for survey, (but appeared to be suitable for roosting bats). Overall, structure in fairly good repair.	February 2016): No evidence of bats found. <u>Structure inspection</u> (15th September 2016): No evidence of bats found. <u>Structure inspection</u> (12th March 2021): No evidence of bats found. <u>Dusk transect survey</u> (27th September 2021): <i>Myotis</i> sp. bats (min. 3) seen roosting in crevices (see photo) during a rain shower. The structure doesn't offer enough opportunities for larger roosts such as maternity. Confirmed summer roost.	
B9- Stone bridge with metal deck  Structure Reference: "Bridge 418"	Approximately 10-12 regularly spaced putlog-type holes extending c.0.5m into stonework. Seepage makes many of these too moist however. Mortar still intact in most other gaps. Some putlog-type holes contained evidence that they had supported bird's nests. It was not possible to check between the metal deck and the stone walls due to the height being beyond the reach of a ladder. Ivy and moss growing on bridge suggesting damp walls. Relatively limited opportunities for bat roosting.	Moderate bat hibernation/roost potential. <u>Structure inspection</u> (23-24th February 2016): No evidence of bats found. <u>Structure inspection</u> (15th September 2016): No evidence of bats found. <u>Structure inspection</u> (12th March 2021): No evidence of bats found.	Not surveyed

Building/Structure Reference N° & Photographs	Building description	Potential bat hibernation/roosting features & evidence of bats	Results of activity surveys
B10- Base of now collapsed chimney  (Listed Building: 81752 - Base of Chimney at Cwm Pit) Structure Reference: "Industrial 64/419"	Stone building with earth and vegetation collected on top. One arched alcove on each side with collapsed rubble inside. It was possible to only safely check one alcove. A large number of holes and crevices present on walls and the alcoves.	High potential for hibernation/roosting bats. Confirmed roost. <u>Structure inspection</u> (23-24th February 2016): Six brown long eared bats present in three different clusters, all in vertical cracks shoulder-high, south-west facing. The bats were all found to be relatively close to the entrance of the cracks. Hibernation roost. <u>Structure inspection</u> (15th September 2016): No evidence of bats found, but many cavities notable for 'clean' appearance. <u>Structure inspection</u> (12th March 2021): No evidence of bats found.	Not surveyed
B11- Abercanaid-Aberdare Tunnel 	Tunnel portal with stone facing with few gaps on tunnel entrance, some of which used by nesting birds (e.g., blue tit). Not able to safely check all opportunities in portal walls due to high elevation of structure. Internal access not possible; however, the tunnel appeared to consist of brick lining with occasional gaps and larger alcoves also present. Tunnel known to extend for c.1.4 miles and therefore doubtless offers numerous bat roosting opportunities	High bat hibernation/roost potential. Not surveyed to date due to lack of access but one record of one brown long-eared bat noted hibernating in February 2005 from SEWBRc.	<u>Dusk emergence/ Dawn re-entry survey</u> (26th May 2015): Light sampling/swarming activity by 5-6 <i>Myotis</i> sp. noted at tunnel entrance during dusk survey indicative of possible maternity roost. <u>Autumn swarming survey</u> (15th September 2015 and 30th September 2015): No evidence of autumn swarming; however, species recorded flying over (in descending order of call frequency):

Building/Structure Reference N° & Photographs	Building description	Potential bat hibernation/roosting features & evidence of bats	Results of activity surveys
 Structure Reference GM 606	at various locations along that length.		- Common pipistrelle - <i>Myotis</i> sp. - Soprano pipistrelle - Long-eared bat sp. <u>Autumn re-entry survey</u> (16th September 2016): Approximately 2-3 <i>Myotis</i> bats appearing to enter tunnel at dawn. One soprano pipistrelle constantly flying in front of tunnel entrance but did not appear to enter. <u>Static detector survey</u> (March 2021): Results from static detector deployed for 17 nights on the gate facing into the tunnel recorded 255 bat calls. The following species (and percentage of the calls) were recorded: - Long-eared bat (likely to be brown long-eared bat) (44% of calls) - Common pipistrelle (39%) - <i>Myotis</i> sp. (4%) - Greater horseshoe bat (2.7%) - Lesser horseshoe bat (2.3%) - Natterer's bat (0.8%). Comparison of the time of recorded registrations with sunset/sunrise times indicates the possible presence of brown long-eared hibernation roost (recorded as early as 18-27² minutes after sunset on 4 days), and a greater horseshoe hibernation roost (recorded as late as 15-

Building/Structure Reference N° & Photographs	Building description	Potential bat hibernation/roosting features & evidence of bats	Results of activity surveys
			24 minutes before sunrise on 2 days) in this structure.
B12- Long stone retaining wall 	Feature located beside a stream. Occasional cracks present. Regular brick-sized deep alcoves present. Some upper sections not comprehensively surveyed due to reduced ladder accessibility because of presence of stream. Includes several tunnels: including two long, two short and one larger/longer. One tunnel with chimney-type recess in ceiling.	High bat hibernation/roost potential. Confirmed roost. <u>Swarming survey</u> (15th September 2015): Single roosting lesser horseshoe bat in recess in roof of larger/longer tunnel, so a confirmed summer roosting site. <u>Structure inspection</u> (23-24th February 2016): No evidence of bats found. <u>Structure inspection</u> (15th September 2016): No evidence of bats found. <u>Structure inspection</u> (12th March 2021): No evidence of bats found.	<u>Autumn swarming survey</u> (15th September 2015 and 30th September 2015): No evidence of swarming; however, species recorded flying over (in descending order of call frequency): - <i>Myotis</i> sp. - Soprano pipistrelle - Long-eared bat sp. - Common pipistrelle - Whiskered/Alcathoe /Brandt's bat - Lesser horseshoe bat - Daubenton's bat - Noctule - Greater horseshoe bat
B13- Stone wall opposite B12 above 	Feature contains a large deep alcove, which experiences seepage, but with a few deep crevices that were not too wet. The few holes present, partly due to collapse, are not particularly suitable for bats however, and the whole alcove shows evidence of human disturbance.	Low/moderate bat hibernation/roost potential. <u>Structure inspection</u> (23-24th February 2016): No evidence of bats found. <u>Structure inspection</u> (15th September 2016): No evidence of bats found. <u>Structure inspection</u>	Not specifically surveyed, but results from B12 above also relevant to this structure.

Building/Structure Reference N° & Photographs	Building description	Potential bat hibernation/roosting features & evidence of bats	Results of activity surveys
		(12 th March 2021): No evidence of bats found.	
B14- Culvert carrying northern arm of Nant Cwm Pant Bach  Structure Reference: "Industrial 537"	Not able to access internally due to presence of grille. Nevertheless, the interstices in the stone within the culvert were seen to be very damp and dripping with water for the first few metres (although the structure was not entered for a full examination).	Low bat hibernation/roost potential. <u>Structure inspection</u> (23-24 th February 2016): No evidence of bats found. <u>Structure inspection</u> (15 th September 2016): No evidence of bats found. <u>Structure inspection</u> (February 2020): No evidence of bats found. Not surveyed in 2021.	<u>Static detector survey</u> (30 th September 2015): Species recorded (in descending order of call frequency) ³ - <i>Myotis</i> sp. - Long-eared bat sp. <u>Dusk emergence survey</u> (15 th September 2016): No bats emerged.
B15- Low stone culvert 	Calcium carbonate covering inside, indicating exceptionally wet conditions, and with no gaps found. One gap at western end where stonework has failed at apex of arch.	Low bat hibernation/roost potential. <u>Structure inspection</u> (23-24 th February 2016): No evidence of bats found. <u>Structure inspection</u> (15 th September 2016): No evidence of bats found. <u>Structure inspection</u> (12 th March 2021): No evidence of bats found.	Not surveyed
B16- Low stone culvert	Rough-faced stone interior with numerous cavities. Culvert acts as conduit for stream and is	High bat hibernation/roost potential.	<u>Dusk emergence survey</u> (15 th September 2016): No bats observed emerging.

Building/Structure Reference N° & Photographs	Building description	Potential bat hibernation/roosting features & evidence of bats	Results of activity surveys
	consequently very wet in winter.	<u>Structure inspection</u> (23-24th February 2016): No evidence of bats found. <u>Structure inspection</u> (15th September 2016): No evidence of bats found. Lots of roof cavities appear very 'clean'. <u>Structure inspection</u> (12th March 2021): No evidence of bats found.	
B17a- related small tunnel immediately to south-east of B17 	Long and low brick-lined tunnel with low height above silted floor. Too restricted to access. Any gaps likely to be rodent-vulnerable. Cobwebs over entrance in September 2016.	Low bat roost potential. <u>Structure inspection</u> (15th September 2016): No evidence of bats found. <u>Structure inspection</u> (12th March 2021): No evidence of bats found.	Not surveyed
B17b- Low stone bridge/culvert  Structure Reference: "Bridge 417"	Well-sealed internally, with calcium carbonate covering interior. A few opportunities particularly on the outer stone at the northern end. Over stream.	Moderate bat hibernation/roost potential. <u>Structure inspection</u> (23-24th February 2016): No evidence of bats found. <u>Structure inspection</u> (15th September 2016): No evidence of bats found (B17 and B17a). <u>Structure inspection</u> (12th March 2021): No evidence of bats found.	Not surveyed

Building/Structure Reference N° & Photographs	Building description	Potential bat hibernation/roosting features & evidence of bats	Results of activity surveys
B18- Long supporting wall 	East-facing wall with earth banked up to western side. Stonework interstices mostly quite shallow with a few larger cracks and hollows, and some sections of broken-facing. All mostly damp from seepage and/or exposed to rodent access etc.	Low-moderate bat hibernation/roost potential. <u>Structure inspection</u> (23-24 th February 2016): Not surveyed. <u>Structure inspection</u> (15 th September 2016): No evidence of bats found. <u>Structure inspection</u> (12 th March 2021): No evidence of bats found.	Not surveyed
B19- Retaining wall 	Wall in front of B10. Up to 1.7m in places. Comprising bricks and mortar. Very occasional holes which were all damp.	Low bat hibernation/roost potential. <u>Structure inspection</u> (23-24 th February 2016): No evidence of bats found. <u>Structure inspection</u> (15 th September 2016): No evidence of bats found. <u>Structure inspection</u> (12 th March 2021): No evidence of bats found.	Not surveyed
B20- Stone Bridge 	Low, brick-faced bridge in fairly good repair with few gaps.	Low bat hibernation/roost potential. <u>Structure inspection</u> (15 th September 2016): No evidence of bats found.	Not surveyed

Building/Structure Reference N ^o & Photographs	Building description	Potential bat hibernation/ roosting features & evidence of bats	Results of activity surveys
B21- Low stone culvert 	Long and low brick-lined tunnel with low height above silted floor. Too restricted to access. Any gaps likely to be rodent-vulnerable.	Low bat hibernation/roost potential. <u>Structure inspection</u> (15th September 2016): No evidence of bats found (although feature too low to access internally).	Not surveyed
B22- Culvert carrying southern arm of Nant Cwm Pant Bach	Not able to access internally due to presence of grille. Nevertheless, the interstices in the stone within the culvert were seen to be very damp and dripping with water for the first few metres (although the although the structure was not entered for a full examination).	Low bat hibernation/roost potential. <u>Structure inspection</u> (DATE): DW to confirm <u>Structure inspection</u> (25th February 2020): No evidence of bats found. Not surveyed in 2021.	Not surveyed

Appendix 2

Preliminary tree roost assessment survey results and details of confirmed tree roost

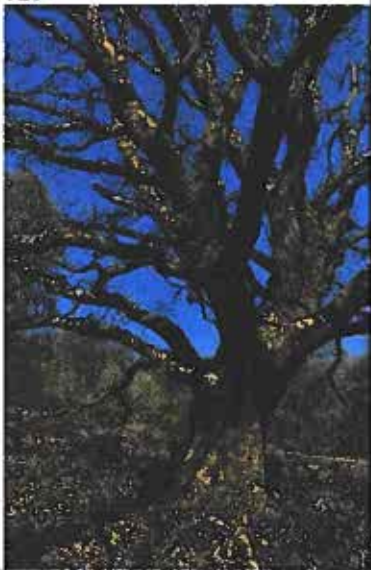
See Figure 10 for locations.

Tree reference number & photo	Description	Potential Roosting Features	Roosting potential
T1 	Large gnarled oak tree surrounded by smaller silver birch.	2No. woodpecker/knot holes on NE aspect at ~ 2m. Several patches of loose bark on dead looking branches on various aspects. 1No. woodpecker/knot hole on branch on E aspect at ~ 4 m.	Moderate-High
T2 	An oak situated in a small gully.	Crack in dead branch on S aspect.	Low-Moderate
T3 	Moderately-sized silver birch surrounded by bramble and other smaller silver birch	Potential crack in bark on N aspect at 2-3m, covered in moss. Not possible to tell if it is deep/hollow or superficial from the ground.	Low-Moderate

Tree reference number & photo	Description	Potential Roosting Features	Roosting potential
T4 	Multi-stemmed silver birch not far from southern edge of woodland.	Broken branch and adjoining crack in bark on S aspect at ~ 2.5m. Not possible to assess how deep it is from the ground.	Low-Moderate
T5 	Large oak with several snapped branches.	Loose bark on branch on W side at ~2-3m. 3No. potential holes due to cracks in bark/fallen branches visible from N aspect, not possible to assess how deep they are from the ground.	Moderate
T6 	Multi-stemmed large silver birch.	Large crack in stem on N aspect ~4m up.	Moderate

Tree reference number & photo	Description	Potential Roosting Features	Roosting potential
T7 	A large oak, largest of a group of 3 huge and sprawling trees. The branches on this oak are so long they touch the ground.	2No. large splits on N aspect of 2 branches on W aspect of the tree at ~ 2.5m. Loose bark on SW branch at ~2-3m. Loose bark on N branch at ~2-3m. Split in branch on S side.	Moderate-High
T8 [Photo not available]	A large oak, middle one of the three huge trees.	Loose bark on branches on S side at ~ 2m. No other PRFs observed from ground but given the age and size of tree it has potential for more.	Low-Moderate
T9 	Most easterly of the three huge trees. Beech.	Loose bark on S side ~ 6m up. No other PRFs observed from ground but given the age and size of tree it has potential for more.	Low-Moderate

Tree reference number & photo	Description	Potential Roosting Features	Roosting potential
T10 	Large oak.	Crack at base of branch on W side at ~2-3m. Loose bark on SE branch.	Low-Moderate
T11 	Huge oak with branches drooping close to the ground, surrounded by dense bracken & bramble, near the edge of the grassland.	Large crack on W branch at ~3-4m. Snapped branch on W side at ~5m. Knot hole/woodpecker hole on S side branch facing N. Loose bark on E branch at ~4-5m.	Moderate
T12 	Silver birch situated in a shallow pit with lots of bramble & bracken.	Cracks on tops of 3 branches on E aspect visible from the W side at ~ 4, 4 and 5m.	Low-Moderate
T13	Silver birch	Dense ivy.	Low

Tree reference number & photo	Description	Potential Roosting Features	Roosting potential
			
T14 [photo not available]	One of two ivy clad silver birches ~ 5m apart.	Dense ivy.	Low
T15 [photo not available]	One of two ivy clad silver birches ~ 5m apart.	Dense ivy.	Low
T16 	Largest of two big, old oaks near two smaller oaks. Surrounded by bramble & bracken.	Loose bark on a small branch on S side ~6m up.	Low
T17	Oak	Crack on E branch visible from the W, S or E at ~ 2m.	Low-Moderate

Tree reference number & photo	Description	Potential Roosting Features	Roosting potential
		Cracks on top of N branch visible from S.	
T18 	Huge two stemmed sprawling beech tree.	Cracks in bark visible on a few branches on E side at ~ 5m. Not obvious from the ground if these are deep or not. Loose bark on S branch ~2-3, up.	Low
T19 	Big sprawling oak in and near to a number of bell pits.	Split in small branch visible from NW side at ~ 10m. Potentially too small to allow bat access but not possible to tell from the ground.	Low
T20	Large oak with big fallen limb on the E side.	1No. woodpecker/knot hole on E side at ~ 3m. Loose bark on W branch.	Moderate -High

Tree reference number & photo	Description	Potential Roosting Features	Roosting potential
		Crack in base of dead branch on W side at ~ 5m. Crack in middle of forked branches at ~6-7m, visible from the W. 1No. potential woodpecker/knot hole on E branch ~ 6-7m up, visible from E facing NE. Might be superficial but can't assess this from the ground.	
T21 	Silver birch on eastern edge of woodland.	Large crack on W side. Might be superficial but can't assess this from the ground.	Low-Moderate
T22 	Silver birch ~ 5m from E woodland edge	Crack on W side at ~ 3m.	Low-Moderate
T23	Large gnarled oak.	No visible features from the ground but presence can't be	Low

Tree reference number & photo	Description	Potential Roosting Features	Roosting potential
		ruled out due to age and size of the tree.	
T24 	Huge oak.	1-2m long crack on branch at ~ 1-2m, visible from the N side. Loose bark on branch visible from W side looking E. 2No. knot/woodpecker holes visible on E side at 1 & 3m. Other features potentially present but not visible from the ground due to size and age of the tree.	High
T25 	Oak with huge flake of bark/cracked trunk at base.	Several small cracks in bark/broken branches. Big hole in trunk on w side at ~ 1.3m not clear how far up into the trunk it goes.	Moderate-high
T26	Oak on S side of rocky footpath.	1No. possible hole on S side branch visible from the W. Other than this no features visible from the ground but presence can't be ruled out due to the size and age of the tree.	Low

Tree reference number & photo	Description	Potential Roosting Features	Roosting potential
			
T27 	Large oak ~ 3m south of a path	Various sections of loose bark and cracks in trunk at base	Low-Moderate
T28 	Ivy covered oak growing on the edge of a bell pit	Few cracks/loose bark on dead branches, possibly more but ivy obscuring most of the trunk and base of branches.	Low-Moderate
T29	Alder tree on the north east corner of P15.	Large split/hole on western aspect of the tree (circled in photo). Minimum of 10No. brown long-eared bats observed swarming and then entering the	Confirmed roost

Tree reference number & photo	Description	Potential Roosting Features	Roosting potential
		roosting feature during dawn survey on 26.08.21.	

Mr D Woodfield
Bioscan (UK) Ltd
The Old Parlour
Little Baldon Farm
Oxford
OX44 9PU



14th November 2022

Re: Results of a climb and inspect survey of trees at Cwm Glo for their potential to hold roosting bats – Campaign 1

Dear Mr. Woodfield,

In accordance with your instructions Lee Gwyther (NRW bat licence S089870/1) and I (NRW bat licence S091229/1) attended your site at Cwm Glo to perform a climb and inspect survey of an initial 55 trees; hereafter referred to as the 'Campaign 1 trees'.

The Campaign 1 trees were ascended, inspected and recorded over three days; 7th to 11th November 2022. Inspections were performed using Ridgid CA350 endoscopes and torches as appropriate.

Features were assessed and recorded using the protocol set out within: -

BTHK 2018. Bat Roosts in Trees: A guide to identification and assessment for tree-care and ecology professionals. Pelagic Publishing, Exeter

Of the 55 trees: four were found to be dead and not safely accessible due to a lack of an adjacent living tree with an overhanging canopy; and, features on 27 trees were found to be either discontinuous or open and exposed and therefore did not offer a sheltered internal environment. This left 28 trees that offered Potential Roost Features that we judge to be superficially suitable to hold roosting bats. However, none of these trees were occupied by bats.

The data are provided in a free-standing Excel spreadsheet: -

AECOL & GT - PRF Data - Campaign 1 - Nov 2022

When you review the data, you will note that all the trees we could safely access you have comprehensive data. Some we could not safely ascend, and some it would have been irresponsible to ascend due to the risk of damaging the PRF; these are identified as red values. Those that were deemed unsuitable are identified with grey fill. For the remainder you will find

that the final two columns tell you that it is a viable PRF, and give you a broad assessment of its potential to hold maternity or mating groups.

Photographs have been provided to you via wetransfer.com on 14th November 2022.

The data for each of the PRF were processed through the BTHK predictive framework to provide a hypothesis of which bat species might occupy them, and when. The results are provided at Table 1.

Table 1. Predictive analysis results / Cwm Glo / Campaign 1.

TREE REF.	PRF type proven to be occupied in this habitat in winter period (Jan / Feb)	PRF type proven to be occupied in this habitat in spring-flux period (Mar / Apr)	PRF type proven to be occupied in this habitat in pregnancy period (May / Jun)	PRF type proven to be occupied in this habitat in nursery period (Jul / Aug)	PRF type proven to be occupied in this habitat in mating period (Sep / Oct)	PRF type proven to be occupied in this habitat in autumn-flux period (Nov / Dec)
GC2b	----	----	----	----	----	----
GC3	----	<i>M. nat</i>	----	<i>M. bec</i>	----	<i>M. nat</i>
GC4	----	----	----	----	----	----
GC7c	----	<i>M. nat</i>	----	<i>M. bec</i>	----	<i>M. nat</i>
GC11	----	<i>M. nat</i>	----	<i>M. bec</i>	----	<i>M. nat</i>
GC13a	----	----	----	----	----	----
GC13b	----	----	----	----	----	----
GC17	----	----	----	----	----	----
GC18a	----	----	----	----	----	----
GC18b	----	----	<i>M. dau</i>	<i>M. dau</i>	----	----
GC18c	----	----	<i>M. dau</i>	<i>M. dau</i>	----	----
GC18d	----	----	----	----	----	----
GC19a	----	----	----	----	----	----
GC20	----	<i>M. dau</i> <i>M. nat</i>	<i>P. pyg</i>	<i>P. aur</i>	<i>N. noc</i>	----
GC21	<i>N. noc</i>	----	----	----	----	----
GC27	----	----	----	----	----	----
GC30a	----	----	----	----	----	----
GC30b	----	----	----	----	----	----
GC31	----	----	----	----	----	----
GC34	----	----	<i>M. bec</i> <i>N. noc</i>	<i>M. dau</i> <i>N. noc</i>	<i>N. noc</i>	----
GC41	----	----	<i>P. pip</i>	----	----	----
GC43	<i>P. aur</i>	<i>P. aur</i>	<i>M. dau</i> <i>P. aur</i>	----	<i>B. bar</i> <i>M. dau</i>	----
GC45	----	----	----	----	<i>B. bar</i>	----
GC47	----	<i>P. aur</i>	<i>P. aur</i>	<i>M. dau</i>	<i>M. dau</i>	----
GC48	----	----	----	----	<i>B. bar</i>	----
GC49	----	<i>M. nat</i>	----	<i>M. bec</i>	----	<i>M. nat</i>

TREE REF.	PRF type proven to be occupied in this habitat in winter period (Jan / Feb)	PRF type proven to be occupied in this habitat in spring-flux period (Mar / Apr)	PRF type proven to be occupied in this habitat in pregnancy period (May / Jun)	PRF type proven to be occupied in this habitat in nursery period (Jul / Aug)	PRF type proven to be occupied in this habitat in mating period (Sep / Oct)	PRF type proven to be occupied in this habitat in autumn-flux period (Nov / Dec)
GC51	----	----	<i>M. dau</i>	<i>M. dau</i>	----	----
GC52a	<i>P. aur</i>	<i>B. bar</i> <i>M. nat</i> <i>P. aur</i>	<i>B. bar</i> <i>M. nat</i>	<i>P. aur</i>	<i>P. aur</i>	<i>P. aur</i>
GC52b	<i>P. aur</i>	<i>B. bar</i> <i>M. nat</i> <i>P. aur</i>	<i>B. bar</i> <i>M. nat</i>	<i>P. aur</i>	<i>P. aur</i>	<i>P. aur</i>
GC53	----	<i>M. nat</i> <i>P. aur</i>	----	----	<i>P. aur</i>	----
GC54	----	<i>M. bec</i>	<i>M. bec</i> <i>M. nat</i> <i>N. noc</i>	<i>M. bec</i> <i>M. nat</i> <i>N. noc</i> <i>P. aur</i>	<i>M. bec</i> <i>N. noc</i> <i>P. aur</i>	----
GC55	<i>P. aur</i>	<i>B. bar</i> <i>M. nat</i> <i>P. aur</i>	<i>B. bar</i> <i>M. nat</i>	<i>P. aur</i>	<i>P. aur</i>	<i>P. aur</i>

Key: ---- = No data to construct hypothesis (PRF does offer shelter but there is no comparative data on BTHK Database); Species abbreviations e.g., *M. nat* = *Myotis nattereri* Natterer's bat.

PRF in Campaign 1 may variously be exploited by eight species of bat, comprising: 1) barbastelle; 2) Bechstein's bat; 3) Daubenton's bat; 4) Natterer's bat; 5) noctule; 6) common pipistrelle; 7) soprano pipistrelle; and, 8) brown long-eared bat.

We will finish a second campaign of trees over Tuesday and Wednesday this week, and will submit the data by close of business on 18th November.

If you have any questions relating to our survey and assessment, you can contact me on 07896 013007.

Yours sincerely



Henry Andrews MSc CEng MCIEEM MRSB

Parcel	Phase 1 code	Phase 1 habitat	Canopy height minimum (m)	Canopy height maximum (m)	Canopy tree species	dbh minimum (cm)	dbh maximum (cm)	abundance (DAFOR)
Hedges / Scattered trees	12.3	Other / Boundaries / hedge with trees	6	18	Quercus robur	49.2	159.1	D

Insert a plan showing the different habitat parcels

Bat species inventory	Barbastella	Bechstein's bat	Alcathoe's bat	Brandt's bat	Daubenton's bat	Whiskered bat	Hatterer's bat	Leisler's bat	Noctule	Myotis pipistrellus	Common pipistrellus	Soprano pipistrellus	Brown long-eared bat	Lesser horseshoe bat
Species present in county?	y	n	n	n	y	y	y	n	y	n	y	n	y	y
Site is within CSZ of off-site roost? (take from the results of the data search)														
Site is within CSZ of location bat species recorded "in-flight"? (take from the results of the data search)														
Species historically recorded roosting on-site? (take from the results of the data search and any historic surveys)														

Insert a plan showing in-flight and roost records within range of the site

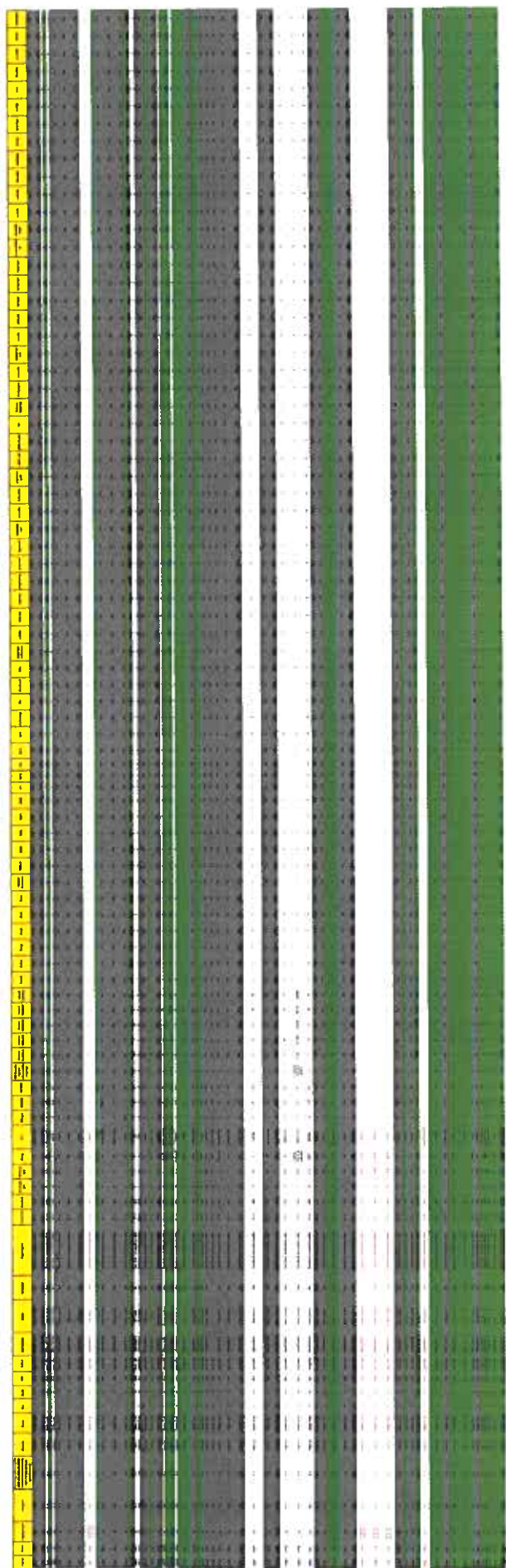
Family	Tree species	Scientific	Species recorded on site (y/n)	Maximum DBH present on site (cm)	Minimum DBH at which species is proven to form Decay PRF that are proven to be exploited by roosting bats	Trees within DBH range present on site (y/n)	Minimum DBH at which species is proven to form Damage PRF that are proven to be exploited by roosting bats	Trees within DBH range present on site (y/n)	Minimum DBH at which species is proven to form Association PRF that are proven to be exploited by roosting bats	Trees within DBH range present on site (y/n)
Alder	Common alder	<i>Alnus glutinosa</i>	y	45	15	y	31.2	y	N/A	n
Ash	Ash	<i>Fraxinus excelsior</i>	y	12	11.8	y	14.1	n	32.5	n

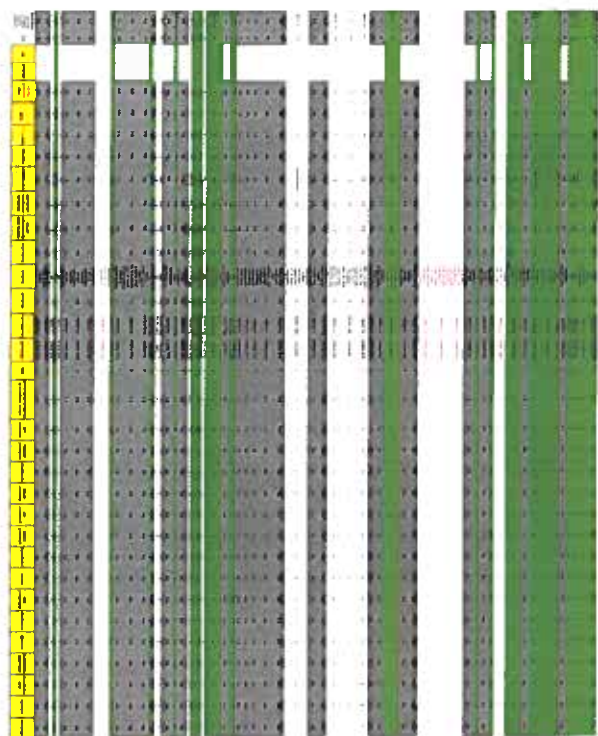
[illegible]

Bat species proven to occur in [County]		Bat species present in [County] that are proven to exploit PRF potentially present in the context of the site (this list is those that for which there is sufficient evidence to suggest might 'potentially' occur i.e. the habitat is correct and they occur in the county)		Bat species recorded within range of the site (this list is those for which there is sufficient evidence to suggest a "reasonable likelihood" of occurrence i.e. the habitat is correct, the species occurs in the county and there is a record of their presence within their respective CSZ)		Bat species that readily take to artificial bat boxes	Transitory capacity (y/n)	Maternity capacity (y/n)	Winter capacity (y/n)
Barbastelle	y	Barbastelle	y	Barbastelle	y	Barbastelle		n	n
Bechstein's bat	n	Bechstein's bat	y	Bechstein's bat	n	Bechstein's bat		n	n
Alcathoe's bat	n	Alcathoe's bat		Alcathoe's bat		Alcathoe's bat		n	n
Brandt's bat	n	Brandt's bat		Brandt's bat		Brandt's bat		n	n
Daubenton's bat	y	Daubenton's bat		Daubenton's bat		Daubenton's bat		n	n
Whiskered bat	y	Whiskered bat		Whiskered bat		Whiskered bat		n	n
Natterer's bat	y	Natterer's bat		Natterer's bat		Natterer's bat		n	n
Leisler's bat	n	Leisler's bat		Leisler's bat		Leisler's bat		n	n
Noctule	y	Noctule		Noctule		Noctule		n	n
Nathusius' pipistrelle	n	Nathusius' pipistrelle		Nathusius' pipistrelle		Nathusius' pipistrelle		n	n
Common pipistrelle	y	Common pipistrelle		Common pipistrelle		Common pipistrelle		n	n
Soprano pipistrelle	n	Soprano pipistrelle		Soprano pipistrelle		Soprano pipistrelle		n	n
Brown long-eared bat	y	Brown long-eared bat		Brown long-eared bat		Brown long-eared bat		n	n
Lesser horseshoe-bat	y	Lesser horseshoe-bat		Lesser horseshoe-bat		Lesser horseshoe-bat		n	n

*Korsten E 2012. Vleermuiskasten: Overzicht van toepassing, gebruik en succesfactoren. Zoogdier Vereniging, Bureau

Tree ref	PBF ID	Grid reference	Species	Alive/dead	Trunk/limb	Tree height (m)	PBF height (m)	Facing	Form	Enlarged	DBH (cm)	photo	First Recorder	Second Recorder	Also present	Comments	T&E
CGVG1	1	SO 04687 05071	<i>Corylus avellana</i>	alive	limb	11	5	N	transverse-map (map)	N/A	31	y	Lee Greyther	N/A	N/A		N/A
CGVG2	2a	SO 04669 05039	<i>Alnus glutinosa</i>	alive	stem	9	4.21	NE	transverse-map (map)	N/A	67	y	Lee Greyther	N/A	N/A		N/A
CGVG2	2b	SO 04669 05039	<i>Alnus glutinosa</i>	alive	stem	9	4.54	SSE	shearing-crack	N/A	67	y	Lee Greyther	N/A	N/A		N/A
CGVG3	3	SO 04669 05039	<i>Salix caprea</i>	alive	stem	7	5.39	SE	wound	N/A	60	y	Lee Greyther	N/A	N/A		N/A
CGVG4	4	SO 04671 05018	<i>Fraxinus excelsior</i>	alive	stem	12	1.2	E	bark-rot	N/A	98.5	y	Lee Greyther	N/A	N/A		N/A
CGVG5	5	SO 04694 05039	<i>Quercus petraea</i>	alive	stem	9	3.5	SW	knock-hole	N/A	46.5	y	Lee Greyther	N/A	N/A		N/A
CGVG6	6	SO 04721 04994	<i>Salix caprea</i>	alive	stem	7	4	NW	wound	N/A	16	y	Lee Greyther	N/A	N/A		N/A
CGVG7	7a	SO 04740 04972	<i>Salix caprea</i>	alive	limb	10	5	ENE	scar-out	N/A	41	y	Lee Greyther	N/A	N/A		N/A
CGVG7	7b	SO 04740 04972	<i>Salix caprea</i>	alive	limb	10	8	N	wound	N/A	41	y	Lee Greyther	N/A	N/A		N/A
CGVG7	7c	SO 04740 04972	<i>Salix caprea</i>	alive	stem	10	4.44	W & N	wound	N/A	30	y	Lee Greyther	N/A	N/A		N/A
CGVG8	8	SO 04728 04944	<i>Betula pubescens</i>	alive	limb	6	3	NE	transverse-map	N/A	16.6	y	Lee Greyther	N/A	N/A		N/A
CGVG9	9	SO 04690 04960	<i>Quercus petraea</i>	alive	limb	13	4	W	transverse-map	N/A	99	y	Lee Greyther	N/A	N/A		N/A
CGVG10	10	SO 04717 04922	<i>Fraxinus excelsior</i>	alive	stem	13	6	NE	wound	N/A	47	y	Lee Greyther	N/A	N/A		N/A
CGVG11	11	SO 04746 04919	<i>Salix caprea</i>	alive	stem	13	8	S	wound	N/A	63	y	Lee Greyther	N/A	N/A		N/A
CGVG12	12	S00473604914	<i>Alnus glutinosa</i>	dead	stem	5	1.2	N	bark-plate	N/A	23.5	y	Lee Greyther	N/A	N/A		N/A
CGVG13	13a	SO 04750 04832	<i>Salix caprea</i>	alive	stem	9	2	S	weld	N/A	28	y	Lee Greyther	N/A	N/A		N/A
CGVG13	13b	SO 04750 04832	<i>Salix caprea</i>	alive	stem	9	1.4	S	weld	N/A	28	y	Lee Greyther	N/A	N/A		N/A
CGVG14	14	SO 04828 04805	<i>Salix caprea</i>	alive	stem	9	5	S	wound	N/A	21.5	y	Lee Greyther	N/A	N/A		N/A
CGVG15	15	SO 04813 04737	<i>Salix sp</i>	alive	limb	10	5.92	N & S	hazard-beam	N/A	122	y	Lee Greyther	N/A	N/A		N/A
CGVG16	16	SO 04758 04672	<i>Betula pubescens</i>	alive	stem	9	1.2	E	knock-hole	N/A	35	y	Lee Greyther	N/A	N/A		N/A
CGVG17	17	SO 04812 04640	<i>Fraxinus excelsior</i>	alive	stem	13	1.2	W & E	compressive-fork	N/A	53	y	Lee Greyther	N/A	N/A		N/A
CGVG18	18a	SO 04843 04603	<i>Alnus glutinosa</i>	alive	stem	15	6.71	W	woodpecker-hole	N/A	89.5	y	Lee Greyther	N/A	N/A		N/A
CGVG18	18b	SO 04843 04603	<i>Alnus glutinosa</i>	alive	stem	15	6.25	NE	woodpecker-hole	N/A	89.5	y	Lee Greyther	N/A	N/A		N/A
CGVG18	18c	SO 04843 04603	<i>Alnus glutinosa</i>	alive	stem	15	4.34	N	woodpecker-hole	N/A	89.5	y	Lee Greyther	N/A	N/A		N/A
CGVG18	18d	SO 04843 04603	<i>Alnus glutinosa</i>	alive	stem	15	1.13	SSW & W	bark-rot	N/A	89.5	y	Lee Greyther	N/A	N/A		N/A
CGVG19	19a	SO 04848 04575	<i>Alnus glutinosa</i>	alive	stem	12	6.25	NNW	knock-hole	N/A	60.2	y	Lee Greyther	N/A	N/A		N/A
CGVG19	19b	SO 04848 04575	<i>Alnus glutinosa</i>	alive	stem	12	4	WSW	woodpecker-hole	N/A	60.2	y	Lee Greyther	N/A	N/A		N/A
CGVG20	20	SO 04846 04554	<i>Quercus petraea</i>	alive	limb	12	5.1	N & S	hazard-beam	N/A	75.9	y	Lee Greyther	N/A	N/A		N/A
CGVG21	21	SO 04845 04545	<i>Quercus petraea</i>	alive	stem	13	5.8	NNW	scar-out	N/A	110.9	y	Lee Greyther	N/A	N/A		N/A
CGVG22	22	SO 04848 04548	<i>Quercus petraea</i>	alive	stem	13	4.87	NNW	knock-hole	N/A	87.5	y	Lee Greyther	N/A	N/A		N/A
CGVG23	23	SO 04871 04530	<i>Quercus petraea</i>	alive	limb	11	3.15	ENE	transverse-map (map)	N/A	91.9	y	Lee Greyther	N/A	N/A		N/A
CGVG24	24	SO 04867 04495	<i>Salix caprea</i>	alive	limb	8	5.1	S & down	transverse-map (map)	N/A	27	y	Lee Greyther	N/A	N/A		N/A
CGVG25	25	SO 04882 04457	<i>Alnus glutinosa</i>	alive	stem	4	4	up	transverse-map (map)	N/A	30	y	Lee Greyther	N/A	N/A		N/A
CGVG26	26	SO 04834 04436	<i>Fraxinus excelsior</i>	alive	limb	14	8.2	ESE	transverse-map (map)	N/A	58.7	y	Lee Greyther	N/A	N/A		N/A
CGVG27	27	SO 04810 04413	<i>Alnus glutinosa</i>	alive	stem	12	9.5	N	knock-hole	N/A	62.2	y	Lee Greyther	N/A	N/A		N/A
CGVG28	28	SO 04797 04429	<i>Quercus petraea</i>	alive	limb	18	9.2	W	transverse-map (map)	N/A	105	y	Lee Greyther	N/A	N/A		N/A
CGVG29	29	SO 04783 04428	<i>Quercus petraea</i>	alive	limb	12	4	NE	shearing crack	N/A	65.9	y	Lee Greyther	N/A	N/A		N/A
CGVG30	30a	SO 04773 04439	<i>Quercus petraea</i>	alive	limb	13	4.38	W	shearing crack	N/A	59.2	y	Lee Greyther	N/A	N/A		N/A
CGVG30	30b	SO 04773 04439	<i>Quercus petraea</i>	alive	limb	13	2.9-5.1	ENE & SSW & up and down	shearing crack	N/A	59.2	y	Lee Greyther	N/A	N/A		N/A
CGVG31	31	SO 04780 04439	<i>Alnus glutinosa</i>	alive	stem	11	2.16	WNW	knock-hole	N/A	38.7	y	Lee Greyther	N/A	N/A		N/A
CGVG32	32	SO 04778 04438	<i>Quercus petraea</i>	alive	stem	7	2.29	SSW	knock-hole	N/A	35.2	y	Lee Greyther	N/A	N/A		N/A
CGVG33	33	SO 04764 04443	<i>Quercus petraea</i>	alive	limb	12	6.65	ESE	scar-out	N/A	53.5	y	Lee Greyther	N/A	N/A		N/A
CGVG34	34	SO 04760 04451	<i>Fraxinus excelsior</i>	alive	stem	11	5.42	SSW	woodpecker-hole	N/A	74.6	y	Lee Greyther	N/A	N/A		N/A
CGVG35	35	SO 04682 04436	<i>Quercus petraea</i>	alive	limb	9	2.23	up	wound	N/A	85.5	y	Lee Greyther	N/A	N/A		N/A
CGVG36	36	SO 04823 04484	<i>Quercus petraea</i>	alive	limb	13	5.28	NE	bark-plate	N/A	75.5	y	Lee Greyther	N/A	N/A		N/A
CGVG37	37	SO 04806 04552	<i>Fraxinus excelsior</i>	dead	stem	14	multiple	multiple	bark-plate	N/A	not possible	y	Lee Greyther	N/A	N/A		N/A
CGVG38	38	SO 04794 04568	<i>Fraxinus excelsior</i>	dead	stem	10	multiple	multiple	bark-plate	N/A	not possible	y	Lee Greyther	N/A	N/A		N/A
CGVG39	39	SO 04787 04574	<i>Fraxinus excelsior</i>	dead	stem	10	multiple	multiple	wound	N/A	not possible	y	Lee Greyther	N/A	N/A		N/A
CGVG40	40	SO 04762 04572	<i>Quercus petraea</i>	alive	stem	9	3.38	S	knock-hole	N/A	49.8	y	Lee Greyther	N/A	N/A		N/A
CGVG41	41	SO 04739 04554	<i>Alnus glutinosa</i>	dead	stem	3	1.7	S	bark-plate	N/A	29.8	y	Lee Greyther	N/A	N/A		N/A
CGVG42	42	SO 04713 04548	<i>Fraxinus excelsior</i>	dead	stem	6	4.77	S	knock-hole	N/A	65.2	y	Lee Greyther	N/A	N/A		N/A
CGVG43	43	SO 04646 04486	<i>Alnus glutinosa</i>	alive	stem	8	2.17	S	wound	N/A	28.7	y	Lee Greyther	N/A	N/A		N/A
CGVG44	44	SO 04645 04478	<i>Alnus glutinosa</i>	alive	stem	10	6	S	wound & knock-hole	N/A	not possible	y	Lee Greyther	N/A	N/A		N/A
CGVG45	45	SO 04436 04371	<i>Betula pubescens</i>	dead	stem	6	1.89-3.69	E	bark-plate	N/A	33	y	Lee Greyther	N/A	N/A		N/A
CGVG46	46	SO 04457 04347	<i>Alnus glutinosa</i>	alive	stem	4.5	4.32	WNW	transverse-map (map)	N/A	16.5	y	Lee Greyther	N/A	N/A		N/A
CGVG47	47	SO 04442 04353	<i>Alnus glutinosa</i>	dead	stem	6	2.53	WNW	scar-out	N/A	41.6	y	Lee Greyther	N/A	N/A		N/A
CGVG48	48	SO 04368 04303	<i>Betula pubescens</i>	dead	stem	5	2	E	bark-plate	N/A	33.1	y	Lee Greyther	N/A	N/A		N/A
CGVG49	49	SO 04351 04469	<i>Salix caprea</i>	alive	stem	9	3.26	NNE	wound	N/A	34.6	y	Lee Greyther	N/A	N/A		N/A
CGVG50	50	SO 04588 04713	<i>Alnus glutinosa</i>	alive	stem	9	5.27	W	knock-hole	N/A	33.5	y	Lee Greyther	N/A	N/A		N/A
CGVG51	51	SO 04461 04514	<i>Alnus glutinosa</i>	alive	stem	8	4.4	E	woodpecker-hole	N/A	45	y	Lee Greyther	N/A	N/A		N/A
CGVG52	52a	SO 04479 04684	<i>Quercus petraea</i>	alive	stem	12	1.81	ESE	lightning-strike	N/A	101.4	y	Lee Greyther	N/A	N/A		N/A
CGVG52	52b	SO 04479 04684	<i>Quercus petraea</i>	alive	stem	12	1.81	ESE	lightning-strike	N/A	101.4	y	Lee Greyther	N/A	N/A		N/A
CGVG53	53	SO 04436 04529	<i>Betula pubescens</i>	alive	stem	9	2.28	NW	wound	N/A	15.7	y	Lee Greyther	N/A	N/A		N/A
CGVG54	54	SO 04382 04788	<i>Quercus robur</i>	alive	stem	12	2.28	W	squirrel-hole	N/A	39	y	Lee Greyther	N/A	N/A		N/A
CGVG55	55	SO 04379 04685	<i>Quercus petraea</i>	alive	stem	12	1.83	NNW	lightning-strike	N/A	71.4	y	Lee Greyther	N/A	N/A		N/A





[illegible]

Bat species (recorded in the BTHK database to date)	Minimum internal volume (cm3) required for a maternity roost (BTHK 2018).
Barbastelle	979
Bechstein's bat	1,189
Daubenton's bat	1,076
Whiskered bat	678
Natterer's bat	912
Noctule	1,059
Leisler's bat	1598
Nathusius' pipistrelle	#VALUE!
Common pipistrelle	1,007
Soprano pipistrelle	#VALUE!
Brown long-eared bat	312
Lesser horseshoe-bat	#VALUE!

Mr D Woodfield
Bioscan (UK) Ltd
The Old Parlour
Little Baldon Farm
Oxford
OX44 9PU



18th November 2022

Re: Results of a climb and inspect survey of trees at Cwm Glo for their potential to hold roosting bats – Campaign 2

Dear Mr. Woodfield,

In accordance with your instructions Lee Gwyther (NRW bat licence S089870/1) and I (NRW bat licence S091229/1) attended your site at Cwm Glo to perform a climb and inspect survey of 54 trees that were additional to 55 trees already assessed; these additional trees are hereafter referred to as the 'Campaign 2 trees'.

Following some prior work, the bulk of the Campaign 2 trees were ascended, inspected and recorded over four days; 10th & 11th and 15th & 16th November 2022. Inspections were performed using Ridgid CA350 endoscopes and torches as appropriate.

Features were assessed and recorded using the protocol set out within: -

BTHK 2018. Bat Roosts in Trees: A guide to identification and assessment for tree-care and ecology professionals. Pelagic Publishing, Exeter

Of the 55 trees: two that held roosting brown long-eared bats *Plecotus auritus* are outside your red line boundary; one has already been identified by you as a brown long-eared bat roost and was climbed only in order to collect detailed data; three were found to be dead and not safely accessible due to a lack of an adjacent living tree with an overhanging canopy; and, features on 23 trees were found to be either discontinuous or open and exposed and therefore did not offer a sheltered internal environment. This left 26 trees that offered Potential Roost Features that we judge to be superficially suitable to hold roosting bats. Of these 26 trees, one held an individual roosting Daubenton's bat *Myotis daubentonii*.

The data are provided in a free-standing Excel spreadsheet: -

AECOL & GT - PRF Data - Campaign 2 - Nov 2022

When you review the data, you will note that all the trees we could safely access you have comprehensive data. Some we could not safely ascend, and some it would have been irresponsible to ascend due to the risk of damaging the PRF; these are identified as red values. Those that were deemed unsuitable are identified with grey fill. For the remainder you will find that the final two columns tell you that it is a viable PRF, and give you a broad assessment of its potential to hold maternity or mating groups.

Photographs have been provided to you via wetransfer.com on 17th November 2022.

The data for each of the roost trees (both outside and inside the red line boundary) and all other PRF were processed through the BTHK predictive framework to provide a hypothesis of which bat species might occupy them, and when. The results are provided at Table 1.

Table 1. Predictive analysis results / Cwm Glo / Campaign 2.

TREE REF.	PRF type proven to be occupied in this habitat in winter period (Jan / Feb)	PRF type proven to be occupied in this habitat in spring-flux period (Mar / Apr)	PRF type proven to be occupied in this habitat in pregnancy period (May / Jun)	PRF type proven to be occupied in this habitat in nursery period (Jul / Aug)	PRF type proven to be occupied in this habitat in mating period (Sep / Oct)	PRF type proven to be occupied in this habitat in autumn-flux period (Nov / Dec)
CGx1	----	<i>M. nat</i>	----	<i>M. bec</i>	<i>P. aur</i>	<i>M. nat</i> <i>P. aur</i>
CGx2a	<i>P. aur</i>	----	----	----	<i>M. nat</i> <i>P. aur</i>	<i>P. aur</i>
CGx2b	----	<i>M. nat</i>	----	<i>M. bec</i>	<i>P. aur</i>	<i>M. nat</i> <i>P. aur</i>
CGx3	----	<i>M. nat</i>	----	<i>M. bec</i>	<i>P. aur</i>	<i>M. nat</i> <i>P. aur</i>
CGx4	----	<i>M. nat</i>	----	<i>M. bec</i>	<i>P. aur</i>	<i>M. nat</i> <i>P. aur</i>
CGx5	----	<i>M. nat</i>	----	<i>M. bec</i>	<i>P. aur</i>	<i>M. nat</i> <i>P. aur</i>
CGx8	----	----	----	----	<i>P. plp</i>	----
CGx11	<i>P. aur</i>	<i>M. nat</i>	<i>M. nat</i> <i>P. pyg</i>	----	----	<i>M. dau</i> <i>P. plp</i> <i>P. aur</i>
CGx15	----	<i>M. nat</i>	----	<i>M. bec</i>	<i>P. aur</i>	<i>M. nat</i> <i>P. aur</i>
CGx20	----	----	----	----	----	----
CGx24	<i>P. aur</i>	<i>M. nat</i>	<i>M. nat</i> <i>P. pyg</i>	----	----	<i>M. dau</i> <i>P. plp</i> <i>P. aur</i>
CGx27	----	<i>M. dau</i> <i>M. nat</i>	<i>P. pyg</i>	<i>P. aur</i>	<i>N. nac</i>	----
CGx28	----	----	----	----	----	----

TREE REF.	PRF type proven to be occupied in this habitat in winter period (Jan / Feb)	PRF type proven to be occupied in this habitat in spring-flux period (Mar / Apr)	PRF type proven to be occupied in this habitat in pregnancy period (May / Jun)	PRF type proven to be occupied in this habitat in nursery period (Jul / Aug)	PRF type proven to be occupied in this habitat in mating period (Sep / Oct)	PRF type proven to be occupied in this habitat in autumn-flux period (Nov / Dec)
CGx30	----	----	----	----	----	----
CGx32	----	----	----	----	----	----
CGx33a	----	----	----	----	<i>M. nat</i>	----
CGx33b	----	----	----	----	<i>M. nat</i>	----
CGx33c	----	----	----	----	<i>M. nat</i>	----
CGx34	<i>P. aur</i>	<i>P. aur</i>	<i>M. dau</i> <i>P. aur</i>	----	<i>B. bar</i> <i>M. dau</i>	----
CGx37	----	<i>P. aur</i>	<i>P. aur</i>	<i>M. dau</i>	<i>M. dau</i>	----
CGc38	----	----	<i>M. dau</i>	<i>M. dau</i>	----	----
CGx39	<i>P. aur</i>	<i>P. aur</i>	<i>M. dau</i> <i>P. aur</i>	----	<i>B. bar</i> <i>M. dau</i>	----
CGx40	----	----	----	----	----	----
CGx41a	<i>P. aur</i>	<i>M. nat</i>	<i>M. nat</i> <i>P. pyg</i>	----	----	<i>M. dau</i> <i>P. pip</i> <i>P. aur</i>
CGx41b	<i>P. aur</i>	<i>M. nat</i>	<i>M. nat</i> <i>P. pyg</i>	----	----	<i>M. dau</i> <i>P. pip</i> <i>P. aur</i>
CGx44a	<i>P. aur</i>	<i>P. aur</i>	<i>M. dau</i> <i>P. aur</i>	----	<i>B. bar</i> <i>M. dau</i>	----
CGx44b	----	----	----	----	----	----
CGx46	----	<i>P. aur</i>	----	----	----	----
CGx49	<i>P. aur</i>	<i>P. aur</i>	<i>M. dau</i> <i>P. aur</i>	----	<i>B. bar</i> <i>M. dau</i>	----
CGx50	----	----	----	----	----	----
CGx51	----	----	----	----	----	----
CGx53a	----	----	<i>M. dau</i>	<i>M. dau</i>	----	----
CGx53b	----	----	<i>M. dau</i>	<i>M. dau</i>	----	----
CGx54	----	<i>P. aur</i>	<i>P. aur</i>	<i>M. dau</i>	<i>M. dau</i>	----
CG Lake <i>P. aur</i> roost	<i>P. aur</i>	<i>M. nat</i>	<i>M. nat</i> <i>P. pyg</i>	Bioscan own data suggest <i>P. aur</i> but there is no comparable data on BTHK Database	----	<i>M. dau</i> <i>P. pip</i> <i>P. aur</i>

Key: ---- = No data to construct hypothesis (PRF does offer shelter but there is no comparative data on BTHK Database); Species abbreviations e.g., *M. nat* = *Myotis nattereri* Natterer's bat.

PRF in Campaign 2 may variously be exploited by eight species of bat, comprising: 1) barbastelle; 2) Bechstein's bat; 3) Daubenton's bat; 4) Natterer's bat; 5) noctule; 6) common pipistrelle; 7) soprano pipistrelle; and, 8) brown long-eared bat.

This letter concludes our survey and assessment and all Grounded Trees & AEcol commissions from Bioscan.

If you have any questions relating to our survey and assessment, you can contact me on 07896 013007.

Yours sincerely

A handwritten signature in black ink, appearing to be 'H. Andrews', with a stylized, cursive script.

Henry Andrews MSc CEcol MCIEEM MRSB

Parcel	Phase 1 code	Phase 1 habitat	Canopy height minimum (m)	Canopy height maximum (m)	Canopy tree species	dbh minimum (cm)	dbh maximum (cm)	abundance (DAFOR)
<i>Hedges / Scattered trees</i>	<i>J2.3</i>	<i>Other / Boundaries / hedge with trees</i>	<i>6</i>	<i>18</i>	<i>Quercus robur</i>	<i>49.2</i>	<i>159.1</i>	<i>D</i>

Insert a plan showing the different habitat parcels

Bat species inventory	Barbastelle	Bechstein's bat	Alchorne's bat	Brandt's bat	Deubenton's bat	Whiskered bat	Natterer's bat	Leisler's bat	Hochule	Nathusius pipistrelle	Common pipistrelle	Soprane pipistrelle	Brown long-eared bat	Lesser horseshoe bat
Species present in county?	y	n	n	n	y	y	y	n	y	n	y	n	y	y
Site is within CSZ of off-site roost? (take from the results of the data search)														
Site is within CSZ of location bat species recorded 'in-flight'? (take from the results of the data search)														
Species historically recorded roosting on-site? (take from the results of the data search and any historic surveys)														

Insert a plan showing in-flight and roost records within range of the site

Family	Tree species	Scientific	Species recorded on site (y/n)	Maximum DBH present on site (cm)	Minimum DBH at which species is proven to form Decay PRF that are proven to be exploited by roosting bats	Trees within DBH range present on site (y/n)	Minimum DBH at which species is proven to form Damage PRF that are proven to be exploited by roosting bats	Trees within DBH range present on site (y/n)	Minimum DBH at which species is proven to form Association PRF that are proven to be exploited by roosting bats	Trees within DBH range present on site (y/n)
Alder	Common alder	<i>Alnus glutinosa</i>	y	45	15	y	31.2	y	N/A	n
Ash	Ash	<i>Fraxinus excelsior</i>	y	12	11.8	y	14.1	n	32.5	n
Ash	Manna ash	<i>Fraxinus ornus</i>			57.5	n	N/A	n	N/A	n
Beech	Sweet chestnut	<i>Castanea sativa</i>			37.4	n	32	n	N/A	n
Beech	Beech	<i>Fagus sylvatica</i>			11	n	15	n	66	n
Birch	Silver birch	<i>Betula pendula</i>			8	n	25.5	n	60	n
Birch	Downy birch	<i>Betula pubescens</i>			12	n	12.7	n	22.5	n
Birch	Hombeam	<i>Carpinus betulus</i>			17	n	20	n	45	n
Elder	Elder	<i>Sambucus nigra</i>			N/A	n	N/A	n	N/A	n
Elm	Wych elm	<i>Ulmus glabra</i>			7.9	n	N/A	n	N/A	n
Elm	English elm	<i>Ulmus procera</i>			N/A	n	33	n	N/A	n
Hawthorn	Hawthorn	<i>Crataegus monogyna</i>			28	n	N/A	n	N/A	n
Hazel	Hazel	<i>Corylus avellana</i>			10.2	n	N/A	n	N/A	n
Holly	Holly	<i>Ilex aquifolium</i>			25.4	n	N/A	n	45	n
Horse chestnut	Horse chestnut	<i>Aesculus hippocastanum</i>			50	n	33	n	N/A	n
Juniper	Montarey cypress	<i>Cupressus macrocarpa</i>			N/A	n	73	n	N/A	n
Lime	Small-leaved lime	<i>Tilia cordata</i>			36	n	N/A	n	N/A	n
Lime	Large-leaved lime	<i>Tilia platyphyllos</i>			258.2	n	N/A	n	148.6	n
Lime	Lime	<i>Tilia x europaea</i>			120	n	78.1	n	N/A	n
Maple	Field maple	<i>Acer campestre</i>			6.4	n	N/A	n	N/A	n
Maple	Norway maple	<i>Acer platanoides</i>			16.5	n	N/A	n	N/A	n
Maple	Sycamore	<i>Acer pseudoplatanus</i>			6.2	n	23.5	n	N/A	n
Oak	Turkey oak	<i>Quercus cerris</i>			121.3	n	N/A	n	N/A	n
Oak	Sessile oak	<i>Quercus petraea</i>			15.3	n	8.6	n	N/A	n
Oak	Pedunculate oak	<i>Quercus robur</i>			13	n	20	n	78.1	n
Pine	Lebanon cedar	<i>Cedrus libani</i>			N/A	n	120	n	N/A	n
Pine	European larch	<i>Larix decidua</i>			N/A	n	90	n	N/A	n
Pine	Scot's pine	<i>Pinus sylvestris</i>			31.5	n	34	n	N/A	n
Plane	London plane	<i>Platanus x acerifolia</i>			100	n	N/A	n	N/A	n
Redwood	Wellingtonia	<i>Sequoiadendron gigante</i>			N/A	n	189	n	N/A	n
Rose	Apple	<i>Malus domestica</i>			27	n	N/A	n	N/A	n
Rose	Crab apple	<i>Malus sylvestris</i>			40	n	N/A	n	N/A	n
Rose	Wild cherry	<i>Prunus avium</i>			36.4	n	N/A	n	N/A	n
Rose	Rowan	<i>Sorbus aucuparia</i>			9.7	n	25	n	N/A	n
Willow	Grey poplar	<i>Populus x canadensis</i>			117.5	n	N/A	n	N/A	n

Willow	White willow	<i>Salix alba</i>			N/A	n	66	n	N/A	n
Willow	Goat willow	<i>Salix caprea</i>			19	n	N/A	n	N/A	n
Willow	Grey willow	<i>Salix cinerea</i>			32.1	n	N/A	n	N/A	n
Willow	Crack willow	<i>Salix fragilis</i>			54	n	27.5	n	N/A	n
Witch-hazel	Sweetgum	<i>Liquidambar styraciflua</i>			69	n	N/A	n	N/A	n
Yew	Yew	<i>Taxus baccata</i>			26.8	n	47	n	38.1	n

[illegible]

[illegible]

Bat species proven to occur in [County]		Bat species present in [County] that are proven to exploit PRF potentially present in the context of the site (this list is those that for which there is sufficient evidence to suggest might 'potentially' occur i.e. the habitat is correct and they occur in the county)		Bat species recorded within range of the site (this list is those for which there is sufficient evidence to suggest a "reasonable likelihood" of occurrence i.e. the habitat is correct, the species occurs in the county and there is a record of their presence within their respective CSQ)		Bat species that readily take to artificial bat boxes	Transitory capacity (y/n)	Maternity capacity (y/n)	Winter capacity (y/n)
Barbastelle	y	Barbastelle	y	Barbastelle	y	Barbastelle			
Bechstein's bat	n	Bechstein's bat	y	Bechstein's bat	n	Bechstein's bat			
Alcathoe's bat	n	Alcathoe's bat		Alcathoe's bat		Alcathoe's bat			
Brandt's bat	n	Brandt's bat		Brandt's bat		Brandt's bat			
Daubenton's bat	y	Daubenton's bat		Daubenton's bat		Daubenton's bat			
Whiskered bat	y	Whiskered bat		Whiskered bat		Whiskered bat			
Natterer's bat	y	Natterer's bat		Natterer's bat		Natterer's bat			
Leisler's bat	n	Leisler's bat		Leisler's bat		Leisler's bat			
Noctule	y	Noctule		Noctule		Noctule			
Nathusius' pipistrelle	n	Nathusius' pipistrelle		Nathusius' pipistrelle		Nathusius' pipistrelle			
Common pipistrelle	y	Common pipistrelle		Common pipistrelle		Common pipistrelle			
Soprano pipistrelle	n	Soprano pipistrelle		Soprano pipistrelle		Soprano pipistrelle			
Brown long-eared bat	y	Brown long-eared bat		Brown long-eared bat		Brown long-eared bat			
Lesser horseshoe-bat	y	Lesser horseshoe-bat		Lesser horseshoe-bat		Lesser horseshoe-bat			

*Korsten E 2012. Vleermuiskasten: Overzicht van toepassing, gebruik en succesfactoren. Zoogdier Vereniging, Bureau

Tree ref	PRF ID	Grid reference	Species	Alive/dead	Stem/limb	Tree height (m)	PRF height (m)	Facing	Form	Enlarged	DBH (cm)	photo	First Recorder	Second Recorder	Also present	Comments	TAG
CGa1	x1	S0468185142	<i>Salix caprea</i>	alive	stem	6	1.7	NNE	wound	y	30.2	y	Lee Greyther	N/A	N/A		N/A
CGa2	x2	S0467295145	<i>Salix caprea</i>	alive	stem	8	1.75	SEW	knave-out	n	27	y	Lee Greyther	N/A	N/A		N/A
CGa3	x3	S00477104853	<i>Salix caprea</i>	alive	stem	10	7.29	NE	wound	n	35.8	y	Lee Greyther	N/A	N/A		N/A
CGa4	x4	S00477104856	<i>Salix caprea</i>	alive	stem	10	6.66	WSW	wound	n	29.5	y	Lee Greyther	N/A	N/A		N/A
CGa5	x5	S00477104852	<i>Salix caprea</i>	alive	stem	10	2.13	S	wound	n	24.8	y	Lee Greyther	N/A	N/A		N/A
CGa6	x6	S00476684794	<i>Salix caprea</i>	alive	stem	9	3.05	ESE	transverse-snap	n	23.9	y	Lee Greyther	N/A	N/A		N/A
CGa7	x7	S00481684829	<i>Salix caprea</i>	alive	stem	9	7.6	SSE	wound	n	80.1	y	Lee Greyther	N/A	N/A		N/A
CGa8	x8	S00481584522	<i>Prunus excelsior</i>	alive	stem	7	1.28	SSE & NNW	transverse-snap	n	13.6	y	Lee Greyther	N/A	N/A		N/A
CGa9	x9	S00484884510	<i>Quercus petraea</i>	alive	stem	10	1.26	SSW	wound	n	87.7	y	Lee Greyther	N/A	N/A		N/A
CGa10	x10	S00484884528	<i>Quercus petraea</i>	alive	limb	11	8.1	W & E	half-glass	n	77.4	y	Lee Greyther	N/A	N/A		N/A
CGa11	x11	S00484784530	<i>Quercus petraea</i>	alive	stem	10	0.5	NW	wound	n	58.1	y	Lee Greyther	N/A	N/A		N/A
CGa12	x12	S00482904599	<i>Alnus glutinosa</i>	alive	stem	10	7.2	NE	knave-hole	n	73.2	y	Lee Greyther	N/A	N/A		N/A
CGa13	x13	S00483184584	<i>Alnus glutinosa</i>	alive	stem	10	7.8	W	knave-hole	n	61.2	y	Lee Greyther	N/A	N/A		N/A
CGa14	x14	S00482884550	<i>Salix caprea</i>	alive	limb	7	5.88	SSW	hazard-beam	n	41.5	y	Lee Greyther	N/A	N/A		N/A
CGa15	x15	S00493304455	<i>Salix caprea</i>	alive	stem	9	3.1	ENE	wound	n	55.6	y	Lee Greyther	N/A	N/A		N/A
CGa16	x16	S00482784438	<i>Quercus petraea</i>	alive	limb	12	8.3	ESE	knave-out	n	53.9	y	Lee Greyther	N/A	N/A		N/A
CGa17	x17	S00484104417	<i>Alnus glutinosa</i>	alive	stem	4	3.1	W	transverse-snap	n	22	y	Lee Greyther	N/A	N/A		N/A
CGa18	x18	S00483168419	<i>Salix caprea</i>	alive	stem	9	7	NNW & SSE	hazard-beam	n	19.8	y	Lee Greyther	N/A	N/A		N/A
CGa19	x19	S00483168414	<i>Alnus glutinosa</i>	alive	stem	11	2.48	SSW	knave-hole	n	28.9	y	Lee Greyther	N/A	N/A		N/A
CGa20	x20	S00478984452	<i>Alnus glutinosa</i>	alive	stem	9	2.75	SSE	knave-hole	y	49.2	y	Lee Greyther	N/A	N/A		N/A
CGa21	x21	S00491188459	<i>Prunus excelsior</i>	alive	limb	14	8.5	E	wound	n	80.4	y	Lee Greyther	N/A	N/A		N/A
CGa22	x22	S00477884464	<i>Alnus glutinosa</i>	alive	stem	9	4.2	N	knave-out	n	24.7	y	Lee Greyther	N/A	N/A		N/A
CGa23	x23	S00471304423	<i>Prunus excelsior</i>	alive	stem	9	8.11	E	transverse-snap	n	88.3	y	Lee Greyther	N/A	N/A		N/A
CGa24	x24	S00467684438	<i>Quercus petraea</i>	alive	limb	7	5.56	E	wound	n	49.2	y	Lee Greyther	N/A	N/A		N/A
CGa25	x25	S00467684427	<i>Quercus petraea</i>	alive	limb	9	7.56	ENE	transverse-snap	n	80.4	y	Lee Greyther	N/A	N/A		N/A
CGa26	x26	S00466584426	<i>Quercus petraea</i>	alive	stem	10	6.22	E	knave-hole	n	69.5	y	Lee Greyther	N/A	N/A		N/A
CGa27	x27	S00468284443	<i>Quercus petraea</i>	alive	limb	11	4.36	ESE & WNW	hazard-beam	n	77	y	Lee Greyther	N/A	N/A		N/A
CGa28	x28	S00470284468	<i>Corylus avellana</i>	dead	stem	7	2.8	NW	thrust	n	37	y	Lee Greyther	N/A	N/A		N/A
CGa29	x29	S00472084476	<i>Alnus glutinosa</i>	dead	stem	6	5.1	NNW	woodpecker-hole	y	45.9	y	Lee Greyther	N/A	N/A		N/A
CGa30	x30	S00472984503	<i>Corylus avellana</i>	dead	stem	6	1.44	SW	lightning-strike	n	19.5	y	Lee Greyther	N/A	N/A		N/A
CGa31	x31	S00477884437	<i>Quercus petraea</i>	alive	stem	9	various	various	knave-out	n	65.6	y	Lee Greyther	N/A	N/A		N/A
CGa32	x32	S00478884437	<i>Betula pubescens</i>	alive	stem	7	1.9	S	knave-out	n	27	y	Lee Greyther	N/A	N/A		N/A
CGa33	x33a	S00477984505	<i>Quercus petraea</i>	alive	limb	11	2.88	WSW	knave-hole	y	63.2	y	Lee Greyther	N/A	N/A		N/A
CGa33	x33b	S00477984505	<i>Quercus petraea</i>	alive	limb	11	2.68	WSW	knave-hole	y	63.2	y	Lee Greyther	N/A	N/A		N/A
CGa33	x33c	S00477984505	<i>Quercus petraea</i>	alive	limb	11	2.68	WSW	knave-hole	y	63.2	y	Lee Greyther	N/A	N/A		N/A
CGa34	x34	S00477284510	<i>Alnus glutinosa</i>	alive	limb	8	3.19	SSE	wound	n	36.2	y	Lee Greyther	N/A	N/A		N/A
CGa35	x35	S00478884518	<i>Quercus petraea</i>	alive	limb	8	various	various	knave-out	n	46.3	y	Lee Greyther	N/A	N/A		N/A
CGa36	x36	S00478884590	<i>Alnus glutinosa</i>	alive	limb	13	6	SSE	woodpecker-hole	y	69.5	y	Lee Greyther	N/A	N/A		N/A
CGa37	x37	S00475884559	<i>Alnus glutinosa</i>	alive	stem	9	2.9	ESE	knave-out	n	44.4	y	Lee Greyther	N/A	N/A		N/A
CGa38	x38	S00476184562	<i>Alnus glutinosa</i>	dead	stem	8	4.06	WSW	woodpecker-hole	n	44.5	y	Lee Greyther	N/A	N/A		N/A
CGa39	x39	S00478884517	<i>Alnus glutinosa</i>	alive	stem	9	2.57	NE	wound	n	38.3	y	Lee Greyther	N/A	N/A		N/A
CGa40	x40	S00458584576	<i>Alnus glutinosa</i>	alive	stem	11	2.06	WSW & ESE	hazard-beam	n	15.2	y	Lee Greyther	N/A	N/A		N/A
CGa41	x41a	S00459884589	<i>Quercus petraea</i>	alive	stem	7	3.15	NNE	wound	n	18.1	y	Lee Greyther	N/A	N/A		N/A
CGa41	x41b	S00459884589	<i>Quercus petraea</i>	alive	stem	7	2.45	SW	wound	n	18.1	y	Lee Greyther	N/A	N/A		N/A
CGa42	x42	S00460184587	<i>Quercus petraea</i>	alive	limb	10	2.31	W	knave-out	n	67.2	y	Lee Greyther	N/A	N/A		N/A
CGa43	x43	S00458384485	<i>Quercus petraea</i>	alive	limb	10	5.62	E & W	hazard-beam	n	71.2	y	Lee Greyther	N/A	N/A		N/A
CGa44	x44a	S00457884490	<i>Alnus glutinosa</i>	alive	limb	11	1.14	SSE	wound	n	25.2	y	Lee Greyther	N/A	N/A		N/A
CGa44	x44b	S00457884490	<i>Alnus glutinosa</i>	alive	stem	11	0.73	SSE	knave-out	n	25.2	y	Lee Greyther	N/A	N/A		N/A
CGa45	x45	S00471984554	<i>Quercus petraea</i>	alive	stem	11	3.35	ENE	knave-hole	n	96	y	Lee Greyther	N/A	N/A		N/A
CGa46	x46	S00471184984	<i>Quercus petraea</i>	alive	stem	13	4.31	SSE	transverse-snap	n	60.3	y	Lee Greyther	N/A	N/A		N/A
CGa47	x47	S00455484663	<i>Betula pubescens</i>	dead	stem	6	5	B	woodpecker-hole	y	32	y	Lee Greyther	N/A	N/A		N/A
CGa48	x48	S00458384719	<i>Betula pubescens</i>	alive	stem	11	3.21	ENE	knave-hole	n	47.3	y	Lee Greyther	N/A	N/A		N/A
CGa49	x49	S00457884565	<i>Alnus glutinosa</i>	alive	stem	9	1.98	WNW	wound	n	27.4	y	Lee Greyther	N/A	N/A		N/A
CGa50	x50	S00455884599	<i>Alnus glutinosa</i>	alive	stem	16	1.34	unstable	knave-out	n	57.4	y	Lee Greyther	N/A	N/A		N/A
CGa51	x51	S00455884601	<i>Alnus glutinosa</i>	alive	stem	12	2.37	WSW	squint-hole	y	39.4	y	Lee Greyther	N/A	N/A		N/A
CGa52	x52	S00454884562	<i>Quercus petraea</i>	alive	limb	13	4.12	NNE	wound	n	74.3	y	Lee Greyther	N/A	N/A		N/A
CGa53	x53a	S00472484432	<i>Alnus glutinosa</i>	alive	stem	15	3.18	ENE	woodpecker-hole	n	47.1	y	Lee Greyther	N/A	N/A		N/A
CGa53	x53b	S00472484432	<i>Alnus glutinosa</i>	alive	stem	15	2.35	ENE	woodpecker-hole	n	47.1	y	Lee Greyther	N/A	N/A		N/A
CGa54	x54	S00472484432	<i>Alnus glutinosa</i>	alive	limb	15	8.4	NE	knave-out	n	69.2	y	Lee Greyther	N/A	N/A		N/A
CGa54	x54	S00453184572	<i>Quercus petraea</i>	alive	stem	15	6.69	ESE	wound	n	59.6	y	Lee Greyther	N/A	N/A		N/A

Like P. any road

Family	Tree species	Scientific	Phase 1 habitat recorded in	Phase 1 code	PFR Group	PFR Type	PFR recorded during ground truthing (y/n)	PFR type proven to be occupied in this habitat in winter period	PFR type proven to be occupied in this habitat in spring-flux period	PFR type proven to be occupied in this habitat in pregnancy period	PFR type proven to be occupied in this habitat in nursery period	PFR type proven to be occupied in this habitat in masting period	PFR type proven to be occupied in this habitat in autumn-flux period	(S1a) PFR ID
Birch	Alder	<i>Alnus glutinosa</i>	Woodland / Broadleaved / Semi-natural	A1.1.1	Decay	Burr-rot	y	y	y	y	y	y	y	2435_135
Birch	Alder	<i>Alnus glutinosa</i>	Woodland / Broadleaved / Semi-natural	A1.1.1	Decay	Knot-hole	y	y	y	y	y	y	y	2370
Birch	Alder	<i>Alnus glutinosa</i>	Woodland / Broadleaved / Semi-natural	A1.1.1	Decay	Tear-out	y	y	y	y	y	y	y	2371
Birch	Alder	<i>Alnus glutinosa</i>	Woodland / Broadleaved / Semi-natural	A1.1.1	Decay	Woodpecker hole	y	y	y	y	y	y	y	2372
Birch	Alder	<i>Alnus glutinosa</i>	Woodland / Broadleaved / Semi-natural	A1.1.1	Decay	Wound	y	y	y	y	y	y	y	2373
Birch	Alder	<i>Alnus glutinosa</i>	Woodland / Broadleaved / Semi-natural	A1.1.1	Decay	Squirrel-hole	y	y	y	y	y	y	y	2374
Birch	Alder	<i>Alnus glutinosa</i>	Woodland / Broadleaved / Semi-natural	A1.1.1	Decay	Hazard beam	y	y	y	y	y	y	y	2375
Birch	Swamy birch	<i>Betula pubescens</i>	Woodland / Broadleaved / Semi-natural	A1.1.2	Decay	Tear out	y	y	y	y	y	y	y	2376
Rosa	Hawthorn	<i>Crataegus monogyna</i>	Woodland / Broadleaved / Semi-natural	A1.1.1	Damage	Flute	y	y	y	y	y	y	y	2377
Rosa	Hawthorn	<i>Crataegus monogyna</i>	Woodland / Broadleaved / Semi-natural	A1.1.2	Damage	Lightning strike	y	y	y	y	y	y	y	2378
Olive	Ash	<i>Fraxinus excelsior</i>	Woodland / Broadleaved / Semi-natural	A1.1.1	Damage	Transverse split	y	y	y	y	y	y	y	2379
Oak	Sessile oak	<i>Quercus petraea</i>	Woodland / Broadleaved / Semi-natural	A1.1.1	Damage	Hazard beam	y	y	y	y	y	y	y	2380
Oak	Sessile oak	<i>Quercus petraea</i>	Woodland / Broadleaved / Semi-natural	A1.1.1	Damage	Transverse split	y	y	y	y	y	y	y	2381
Oak	Sessile oak	<i>Quercus petraea</i>	Woodland / Broadleaved / Semi-natural	A1.1.1	Decay	Knot-hole	y	y	y	y	y	y	y	2382
Willow	Goat willow	<i>Salix caprea</i>	Woodland / Broadleaved / Semi-natural	A1.1.1	Decay	Wound	y	y	y	y	y	y	y	2383
Willow	Goat willow	<i>Salix caprea</i>	Woodland / Broadleaved / Semi-natural	A1.1.1	Decay	Tear-out	y	y	y	y	y	y	y	2384
Willow	Willow	<i>Salix caprea</i>	Woodland / Broadleaved / Semi-natural	A1.1.1	Decay	Wound	y	y	y	y	y	y	y	2385

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80																				

Bat species (recorded in the BTHK database to date)	Minimum internal volume (cm³) required for a maternity roost (BTHK 2018).
Barbastelle	979
Bechstein's bat	1,189
Daubenton's bat	1,076
Whiskered bat	678
Natterer's bat	912
Noctule	1,059
Leisler's bat	1598
Nathusius' pipistrelle	#VALUE!
Common pipistrelle	1,007
Soprano pipistrelle	#VALUE!
Brown long-eared bat	312
Lesser horseshoe-bat	#VALUE!

Greena Ecological Consultancy

Stage II bat assessment surveys

Cwm-Glo pit area

Troed y rhiw

Merthyr Tydfil

CT48 1DL

3rd November 2023

Report compiled by:
Geoff Billington
Greena Ecological Consultancy,
Stonehaven
Witham Friary
Frome
Somerset
BA11 5HH
Email: geoffbillington@btconnect.com
Mb: 077487 42475

Client:
Dominic Woodfield
Bioscan UK Limited
The Old Parlour
Little Baldon Farm
Little Baldon
Oxford
OX44 9PU

Disclaimer:

No part of this report may be copied or reproduced by any means without prior written permission from Greena Ecological Consultancy (GEC), it remains the property of GEC until all associated costs are paid for in full.

If you have received this report in error, please destroy all copies in your possession or control and notify Greena Ecological Consultancy.

This report has been prepared for the exclusive use of the commissioning party and unless otherwise agreed in writing by GEC, no other party may use, make use of or rely on the contents of the report. No liability is accepted by GEC for any use of this report, other than for the purposes for which it was originally prepared and provided.

Opinions and information provided in the report are on the basis of Greena Ecological Consultancy using due skill, care and diligence in the preparation of the same and no explicit warranty is provided as to their accuracy. It should be noted and it is expressly stated that no independent verification of any of the documents or information supplied to Greena Ecological Consultancy has been made.

Please note basic biological record information obtained in this report may be shared with record centres; this would not include your personal information.

Contents

BRIEF	4
SUMMARY	5
1. INTRODUCTION	6
2. AIMS AND OBJECTIVES	6
3. SITE DESCRIPTION	6
4. METHODS	7
5. RESULTS	7
6. CONCLUSIONS	23

Brief

This bat survey is to resurvey structures within the red line area by a combination of inspection and repeat bat activity surveys ascertained sufficient information to evaluate the situation adequately in preparation of the above-mentioned works. The information gathered will be necessary to comply with European regulations, which are connected with planning regulations and with The Wildlife and Countryside Directives and Habitat Regulations.

Summary

- Greena Ecological Consultancy was instructed by Dominic Woodfield, agent for this property, to undertake this survey to support a planning application.
- The survey site is comprised of a number of structures in wooded area over and around Cwm-Glo coal pit.
- The proposals are unspecified.
- The site was surveyed in August, September and October 2023.
- There were individual bats found in barrel type arches of a tunnel and two bridges (B6, B12 & B20).
- There were no signs of birds nesting.

1. Background

Greena Ecological Consultancy was instructed by Dominic Woodfield, agent for this property, to undertake this survey to support a planning application.

Previous surveys of the structures and area by Bioscan were carried out between 2015 & 2022 found three species of small numbers of bats in summer and winter and at least nine species in flight.

The surrounding habitat offers high quality roosting and foraging opportunities for bats.

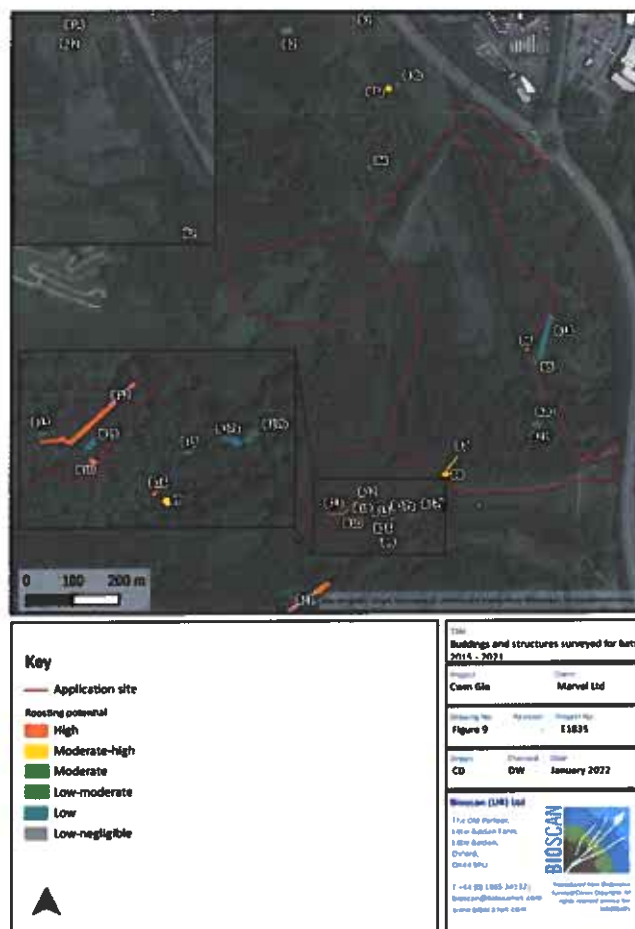
2. Aims and Objectives

The aim of the survey was to specifically resurvey 13 structures including bridges, culverts, walls, chimneys and tunnels previously surveyed between 2016 & 2022.

3. Site Description

The site is located on the west side of the A470 road west of Merthyr Tydfil around SO043047 (see Figure 1). The survey site is comprised of wooded area over part of Cwm-Glo disused coal pit, structures inside the red line area and within 100m of it were surveyed.

Figure 1 Survey area



4. Methods

Surveyors Geoff Billington MCIEEM Greena Ecological Consultancy (holder of bat survey licence S090974/1) and Rachel Denness Greena Ecological Consultancy undertook a daytime inspection of the structures on the 11th August 2023 with exception of metal bridge structure B6 abutment voids that were inspected on 3rd October 2023.

A re-assessment of structure bat roost potential was conducted triggering future survey requirements as shown below:

Table 1 Bat roost potential assessment and further survey methodology

Site and area	Bat roost potential	Inspection	Activity survey 1	Activity survey 2	Activity survey 2
B5 wall	Low	Y*	Y		
B6 bridge	Confirmed (2021)	Y	Y	Y	Y
B7 wall	Low	Y*	Y		
B8 bridge	Confirmed (2021)	Y* arch crevices 3x	Y	Y	Y
B10 chimney base & tunnel	Confirmed (2021)	Y*	Y	Y	Y
B12 wall face	Low	Y*	Y		
B12 wall 4x alcoves	Confirmed (2021)	Y 3x			
B13 wall face	Low	Y*	Y		
B13 wall alcove with chimney	High	Y 3x			
B15 culvert	Moderate	Y*	Y	Y	
B16 low culvert	Moderate	Y*	Y	Y	
B18 wall	Low	Y*	Y		
B19 vegetation covered wall	Negligible				
B20 culvert	Moderate	Y*	Y	Y	
B21 low culvert	Moderate	Y*	Y	Y	

*Not possible to fully inspect every potential roosting feature so activity survey(s) conducted

The structures were inspected with the aid of a high-powered torch, ladders and articulating endoscope to locate potential roosting sites, discover points of egress for bats or any signs of bats such as droppings, wear marks, staining and feeding remains.

5. RESULTS

INSPECTION SURVEYS

Inspections of all structures were carried on 11th August except for B6 voids that were inspected on 3rd October.

Follow up inspections were carried out on every visit of: B8 arch barrel crevices B10 alcoves, B12 alcoves and flues, B13 alcove and flue.

B5 Pair of parallel retaining walls

- West Wall 1. 75cm deep.
- West Wall 2. 75cm deep.
- West Wall 3. 30cm deep.
- West Wall 4. 30 cm deep. Crevice style.
- West Wall Hole 5. 30cm deep. No crevices.
- East wall. 15cm deep. Not fully enclosed.

Low potential, except west wall 4 moderate.

B6 Steel deck bridge

- Higher drain holes checked. Top of abutment cavities inspected on 3rd October.
- Several drain holes (60cm – 3.5m). Low potential.
- Confirmed bat roost in abutment voids previously.

High potential/confirmed roost.

B7 Retaining wall

- Drain holes:
- 1 – very wet.
- 2 – uneven corner in hole. Scoped. Medium potential as deep and convoluted.
- 3 – 1+m deep. Slightly open in character.
- 4 – 90cm. Open character.

Low potential, except drain hole 2 moderate.

B8 Stone bridge

- West Wall 1. 75cm deep.
- North end, top of the arch in the middle 2 feet deep.
- South (to West of centre). crevice 30cm deep.
- Confirmed bat roost in arch barrel voids previously.

High potential/confirmed roost.

B10 Chimney base and subterranean flue tunnel

- East side. Couple crevices 20cm deep.
- South Side. All shallow gaps in wall. Limited in alcove.
- West Side. Some deeper crevices.
- Flu tunnel. Extensive void unknown extent not entered as assessed as a confined space so requires specific RAM, entrance covered in activity surveys.

High potential/confirmed roost.

B12 Long retaining wall containing flue tunnel, culvert and shallow alcoves

- Deepest alcove/flue tunnel most southerly
 - SW facing
 - Where the back wall is an old flue extending 1m upwards. Empty upon August inspection, 20+ Lesser horseshoe bat droppings beneath it in September and 1x Lesser horseshoe bat (and droppings beneath) in October.
- Middle alcoves
 - SW facing

- Two joints up in the roof going about 90cm and 60cm. Empty upon inspection.
- High potential but unoccupied.
- Wide joint crevice at rear held Lesser horseshoe bat in October.
- Small, ground based alcove most northerly
 - 10+m long SE facing. 12m then blocked/dead end
 - Brick lined
 - Couple of cavities extending 20cm but unoccupied.
 - Moderate potential. Hibernation potential. Unoccupied.

Wall is low potential and alcoves moderate/high/confirmed.

B13 Kiln with flue

- Wall all shallow crevices less than 5cm deep.
- Alcove N facing.
- Could be good for lesser horseshoes.
- Chimney 2m tall dead ended.
- Unoccupied
- Chimney high potential. High hibernation potential

Wall is low potential and alcove/flue moderate/high.

B15 Stone culvert

- 12m long.
- Lots of crevices. Most shallow. Few more than 25cm deep.

Moderate potential.

B20 Stone bridge

- Shallow crevices on West end.
- Shallow crevices outside West end. Unoccupied.
- Up to 60cm on West end North facing

Moderate potential

B21 Low stone culvert

- 25/30m long
- Low tunnel
- Hibernation potential
- Few crevices on W end going up 30cm.
- Rest of it appears to be solid brick work.
- Moderate winter potential.

Low summer potential.

ACTIVITY SURVEYS

11th August

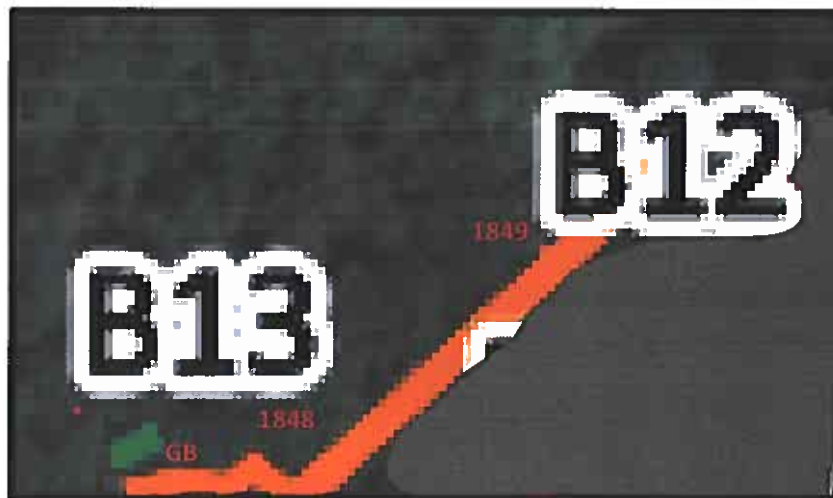
Survey was conducted between 2008 & 2207 (sunset 2044)

Weather

	Temp.	Cloud	Rainfall	Wind
Start	18C	80%	0	1
End	17C	60%	0	1

Weather conditions on the survey were highly suitable for the time of year for bats to be active and complied with BCT Survey Guidelines on seasonal timings and weather suitability

Figure 2 B12 & B13 survey locations



B12 wall

North section & B13 wall

Geoff Billington

time	species	Behaviour
2112	45P	Past
2115	Daub	Past
2120	45P	Past
2128	45P	Past
2137	45P	Past
2138	45P 3x	Circling
2140	45P	Foraging

45P – Common pipistrelle, Daub – Daubenton's

No bats emerged

South section

1848 south of wall

Batcorder records

time	species
2114	Natt

2118-2126	45P 6x
2132	Myt
2134-2141	45P 40x

45P – Common pipistrelle, Myt – Myotis, Natt – Natterer's

North section

1849 north of wall

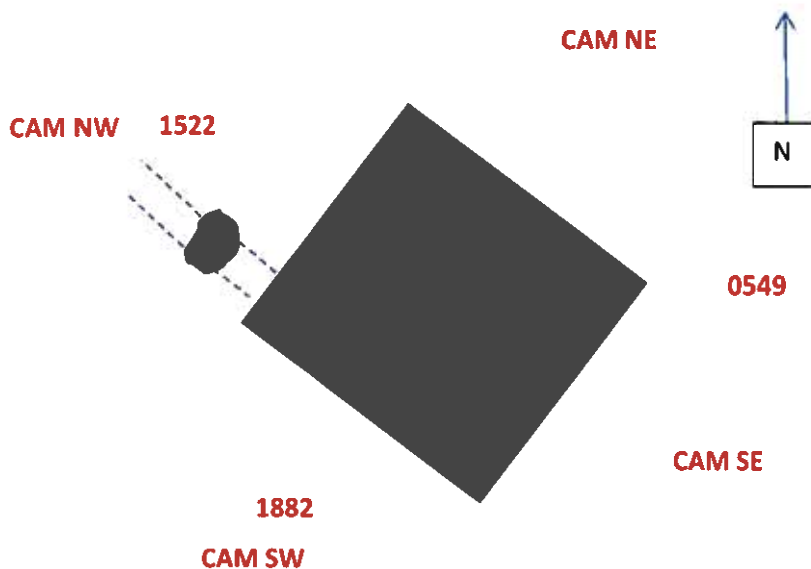
Batcorder records

time	species
2117	55P
2138-2143	45P 17x

45P – Common pipistrelle, 55P – Soprano pipistrelle

B10 chimney base and flue

Figure 3 B10 chimney base and flue tunnel survey locations



1882 SW

Batcorder records

time	species
2137-2143	45P
2207	55P

45P – Common pipistrelle, 55P – Soprano pipistrelle

CAM SW

No bats emerged

1522 NW

Batcorder records

No files recorded

CAM NW

No bats emerged

0549 E (NE & SE)

Batcorder records

time	species
2136+2142	45P 2x

45P – Common pipistrelle

CAM NE

No bats emerged

CAM SE

No bats emerged

B6 Steel deck bridge

North

Batcorder records

time	species
21:31	2x 45P

Video Results

No bats emerged.

South

Batcorder records

No calls recorded.

Video Results

No bats emerged.

B5 Wall south of bridge

Rachel Denness

time	species	Behaviour
2101	45P	Heard
2109	45P	Heard
2118	45P	Heard
2126	45P	Heard
2139	55P	Heard

45P – Common pipistrelle, 55P – Soprano pipistrelle

No bats emerged

South

Batcorder records

time	species
2100	45P
2108-2014	32x 45P
2113-2114	6x 55P
2115	Myt

2117-2120	6x 55P
2118	1x Myt + 7x 45P
2120-2124	11x 45P
2126-2155	92x 45P
2127	55P
2129-2133	6x 55P
2136-2147	13x 55P
2154	2x 55P
2157-2201	12x 55P

45P – Common pipistrelle, 55P – Soprano pipistrelle, Myt - Myotis

Video Results

time	species
2111-2112	1x circling under bridge
2113	1x flying from bridge – S
2118	1x flying S – N under bridge
2121	1x flying N – S under bridge
2125	2x circling under bridge
2127	1x flying S from trees to E

No bats emerged.

North

Batcorder records

time	species
2057	45P
2101	2x 45P
2108	2x 45P
2114	55P
2116	Myt
2118	2x 45P
2121-2122	7x 55P
2124-2127	2x 55P + 10x 45P
2130-2156	83x 45P
2130	2x 55P
2132-2134	4x 55P
2136-2138	3x 55P
2141-2143	6x 55P
2145-2148	5x 55P
2153-2155	8x 55P + 1x Myt
2158	55P

45P – Common pipistrelle, 55P – Soprano pipistrelle, Myt - Myotis

Video Results

time	species
2110	1x flying N – S under bridge
2114	1x flying N – S under bridge
2123	1x flying S – N under bridge

No bats emerged.

B8 Stone bridge

North

Batcorder records

time	species
2201	45P

45P – Common pipistrelle

Video Results

time	species
2101	1x W-E
2117	1x E-W
2118	1x NE-SW
2119	1x W-E
2122	1x S-N, 1x E-W
2123	1x S-N, 1x E-W

No bats emerged.

B15 Stone culvert

North

Batcorder records

No calls recorded.

Video Results

No bats emerged.

South

Batcorder records

time	species
2201	45P

45P – Common pipistrelle

Video Results

No bats emerged.

13th September

Survey was conducted between 1915 & 2042 (sunset 1933)

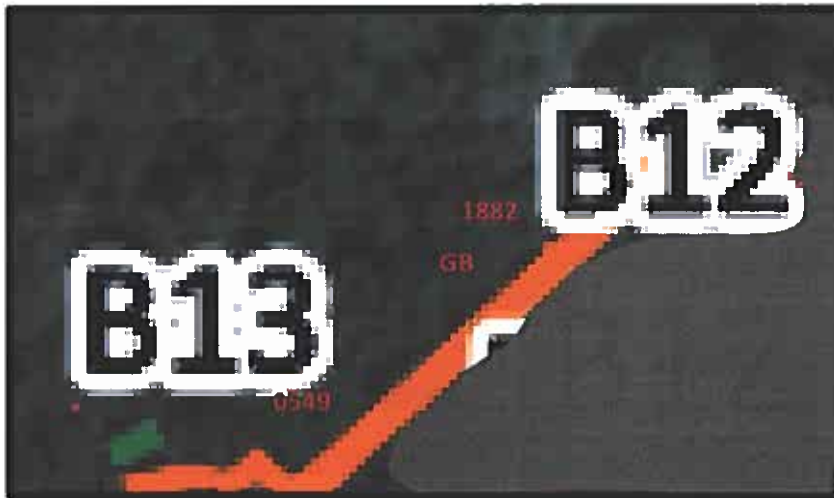
Weather

	Temp.	Cloud	Rainfall	Wind
Start	15C	40%	0	1
End	16C	90%	0	1

Weather conditions on the survey were suitable for the time of year for bats to be active and complied with BCT Survey Guidelines on seasonal timings and weather suitability

B12 Wall central section

Figure 4 B12 survey locations



Geoff Billington
No bats emerged

See below for detector records

0549 south of wall

Batcorder records

time	species
2008-2017	55P 5x
2028-2030	Myt 8x

55P – Soprano pipistrelle, Myt – Myotis

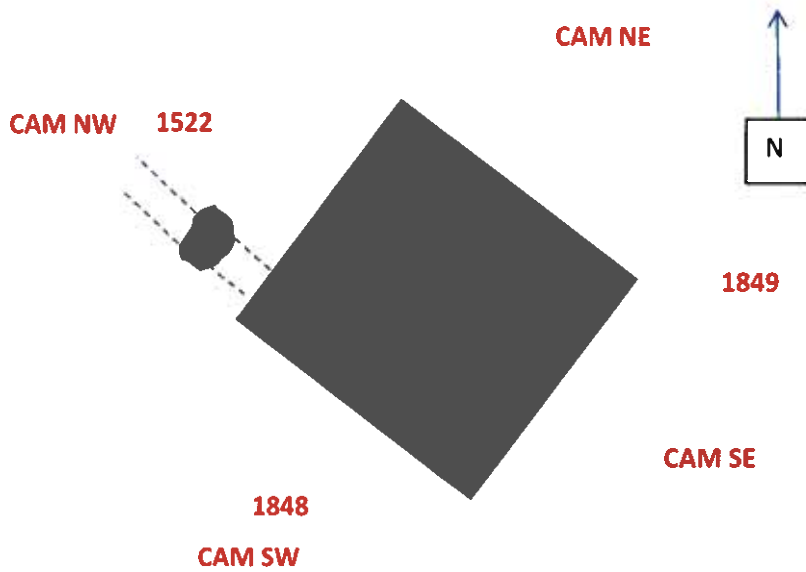
1882 north of wall

Batcorder records

time	species
1946-1950	55P 4x
2030-2031	Natt 2x

55P – Soprano pipistrelle, Natt – Natterer's

Figure 5 B10 chimney base and flue tunnel survey locations



1848 SW
Batcorder records

time	species
1935-1947	55P 13x
1947	Natt 8x

55P – Soprano pipistrelle, Natt – Natterer's

CAM SW
No bats emerged

1522 NW
Batcorder records

time	species
1937-1947	55P 7x

55P – Soprano pipistrelle

CAM NW
No bats emerged

1849 E (NE & SE)
Batcorder records

time	species
2147-2148	55P 10x

55P – Soprano pipistrelle

CAM NE
No bats emerged

CAM SE
No bats emerged

B6 Steel deck bridge

North

Batcorder records

time	species
2040	45P

45P – Common pipistrelle

Video Results

No bats emerged.

South

Batcorder records

time	species
2018-2021	Myt 32x
2024-2025	Myt 6x
2028	Myt 2x
2032	Myt 2x
2041-2047	Myt 56x

Myt – Myotis

Video Results

time	notes
2018	1x entering bridge abutment void, 2x flying under bridge S - N
2024	1x flying S, 1x flying N under bridge
2042	2x flying S – N under bridge
2043-2044	1x flying N – S – N under bridge

No bats emerged one Myotis entered into abutment roost

Figure 6 B6 bridge bat entry point



B20 Stone bridge & B21 Culvert

East

Batcorder records

time	species
1926-1931	55P 33x
1959	Myt 4x
2013	Myt
2023	Myt 3x
2026	Myt

Myt – Myotis

Video Results

time	notes
1927	1x Myt emerged from B20 & W over top of bridge
1931	1x Myt emerged from B20
1959	1x flying under B20 bridge E-W
2023	1x flying under B20 bridge to E

Two Myotis emerged from B20

B15 Low culvert

East

Batcorder records

No calls recorded.

Video Results

No bats emerged.

West

Batcorder records

No calls recorded.

Video Results

No bats emerged.

B8 Stone bridge

South

Batcorder records

time	species
1938	55P 2x
1946-1947	Sert 1x & 55p 11x
1950	45P 4x
1957-1958	45P 4x
2000-2001	45P 3x + 55P 2x
2008-2009	45P 8x

2014-2020	45P 15x + Myt 1x
2022-2025	55P 11x
2024-2026	45P 4x
2029	55P 2x
2033	45P
2035-2036	45P 3x

45P – Common pipistrelle, 55P – Soprano pipistrelle, Myt – Myotis

Video Results

time	notes
1946-1947	1x circling in tunnel

North

Batcorder records

time	species
1938	55P
1946	55p
1949	55P 3x
1958	45P
2005	55P
2007	55P
2007	45P 15x + Myt 1x
2008-2009	45P 12x
2009	55P
2011	45P 2x+ 55P 1x
2012-2020	45P 41x
2018	Myt
2020	Myt 2x
2024-2033	45P 18x
2025	55P
2029	55P 3x
2035-2036	45P 8x

45P – Common pipistrelle, 55P – Soprano pipistrelle, Myt – Myotis

Video Results

No bats emerged.

3rd October

Survey was conducted between 1835 & 1953 (sunset 1847)

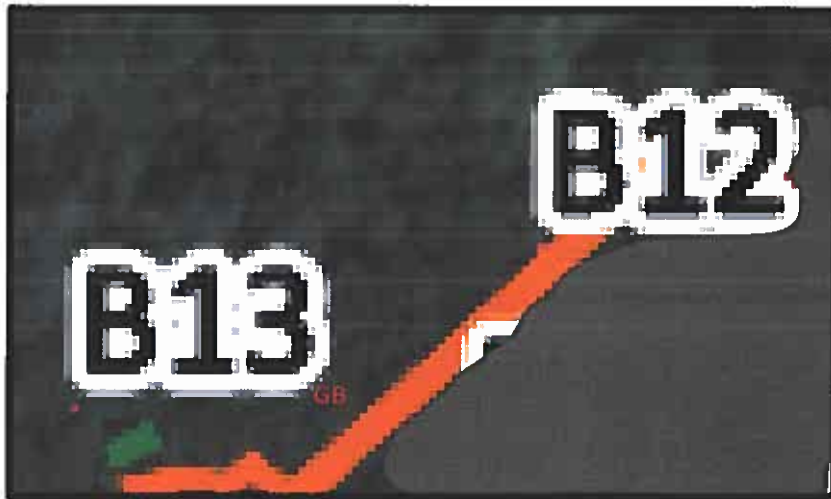
Weather

	Temp.	Cloud	Rainfall	Wind
Start	15C	90%	0	1
End	14C	60%	0	0

Weather conditions on the survey were highly suitable for the time of year and followed a protracted mild spell for bats to be active and complied with BCT Survey Guidelines on seasonal timings and weather suitability.

B12 Wall

Figure 7 B12 surveyor south location



Geoff Billington

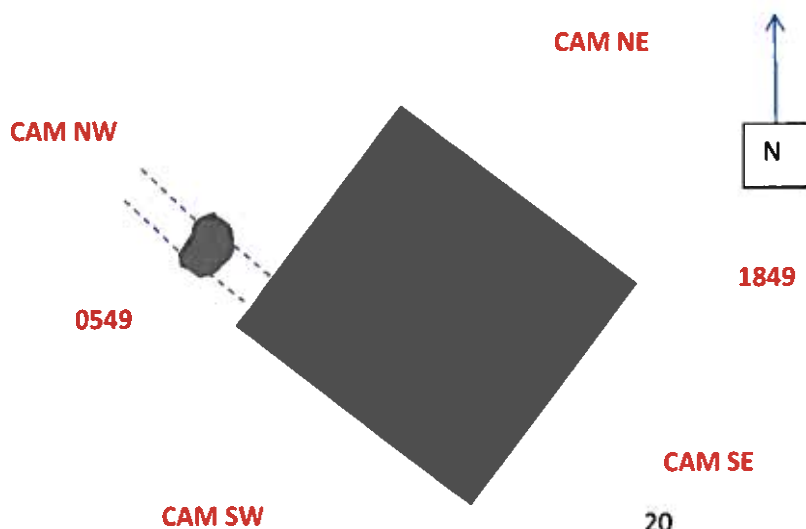
time	species	Behaviour
1919	45P	Past
1921	Natt & 45P	Past
1923-1925	Natt 2x	Foraging
1925-1928	Natt	Foraging
1931	Natt	Heard
1935-1947	Natt	Foraging

45P – Common pipistrelle, Natt – Natterer's

No bats emerged

B10 Chimney base and flue

Figure 7 B10 chimney base and flue tunnel survey locations



1849 East (NE & SE)

Batcorder records

time	species
1913+1916	55P 2x
1919	45P 82x
1920	Daub
1922-1923	45P 6x
1944-1951	55P 4x + social calls

45P – Common pipistrelle, 55P – Soprano pipistrelle, Daub – Daubenton's

CAM SE

No bats emerged

CAM NE

No bats emerged

0549 West (NW & SW)

Batcorder records

time	species
1854-1858	55P 7x
1905	Natt 2x
1910-1915	55P 8x
1919	Daub
1921-1922	45P 3x
1930-1950	55P 20x + lots social calls

45P – Common pipistrelle, 55P – Soprano pipistrelle, Natt – Natterer's, Daub – Daubenton's

CAM NW

No bats emerged

CAM SW

No bats emerged

B20 Stone bridge

Batcorder records

time	species
1920	Myt
1924	Myt
1927	Myt 5x
1930	Myt
1941	Myt 4x

Myt - Myotis

Video Results

No bats emerged.

B6 Steel deck bridge

North

Batcorder records

time	species
1920	55P 2x
1927	55P
1929	45P
1936	55P

45P – Common pipistrelle, 55P – Soprano pipistrelle

Video Results

No bats emerged.

South

Batcorder records

time	species
1920-1922	Myt 12x
1925-1926	Myt 6x

Myt - Myotis

Video Results

No bats emerged.

B8 Stone bridge

North

Batcorder records

time	species
1911-1912	45P 3x
1930	45P 2x
1939	45P 2x
1944	45P
1946-1949	55P 4x

45P – Common pipistrelle, 55P – Soprano pipistrelle

Video Results

No bats emerged.

South

Batcorder records

time	species
1910-1911	45P 2x
1929	45P
1938	45P
1943-1945	45P 10x

1945-1946	55P 4x
1948	55P 4x

45P – Common pipistrelle, 55P – Soprano pipistrelle

Video Results

No bats emerged.

6. CONCLUSIONS

Table 2 Confirmed bat roost roosts during these 2023 surveys

Structure	Date	Record
B6	13-09-23	1x Myotis emerged
B12 alcoves	13-09-23	LHS droppings in southern alcove
	03-10-23	1x LHS bat in southern alcove
	03-10-23	1x LHS bat in central alcove
B20	13-09-23	3x Myt emerged



Bioscan (UK) Ltd
The Old Parlour
Little Baldon Farm
Oxford
OX44 9PU

Tel: +44 (0) 1865 341321
Fax: +44 (0) 1865 343674

bioscan@bioscanuk.com
www.bioscanuk.com

