3. RESULTS

3.1 External Inspection Analysis Results

B25

Building 25 is located off-site within close proximity of the northern area of the site (refer to Appendix A2, Figure 2). This building is being retained as part of the proposed development and has a tiled roof which is hipped at the east and west end with a central ridge. There is an intersecting hip to the south and a chimney in the centre of the roof with mostly close-fitting lead flashing at the base. All four elevations have wooden cladding, which is tight fitting on all sides except the west elevation where some cladding is lifted. There are also wooden soffits on all elevations with fascia boards between them. PRF's identified during the external inspection comprise lifted flashing and slightly lifted tiles at the rear elevation.

Outhouse

The Outhouse is located off-site within close proximity of the northern area of the site and directly to the north of B25 (refer to Appendix A2, Figure 2). This building is being retained as part of the proposed development and is a red brick building with single pitched / tiled roof. The tiles are relatively close-fitting with several lifted and one large hole in the tiling at the rear on the west pitch. The rear windows are broken, but sealed with security boarding and there are wooden soffits on the east and west elevations. There is dense cover of ivy on the south elevation. PRF's identified during the external inspection include the large hole in the tiling at the rear of the west elevation and a gap between the wall plate and eaves.

3.2 Ground Level Tree Assessment

Tree locations are provided at Appendix 2, Figure 2[21].

Table 3.1: Ground Level Tree Assessment and PRF Inspection Results

Tree	Species	Height (m)	Diameter at Breast Height (DBH) (m)	PRF Inspection	Comments
2419-1	English oak *Quercus robur*	12	0.75	PRF-M	
2419-2	Common Hawthorn *Crataegus monogyna*	6	0.12	PRF-I	
2419-3	Silver birch *Betula pendula*	10	0.17	PRF-M	
2419-4	Field maple *Acer campestre*	12	0.22 (dual)	PRF-M	
2419-5	Field maple	5	0.10	PRF-I	
2419-6	Silver birch	14	0.55 (multi)	PRF-I	
2419-7	Goat willow *Salix caprea*	10	0.38	PRF-M	
2419-8	English oak	18	0.85	PRF-I	

[21] Photographs of trees on site are available on request.

Tree	Species	Height (m)	Diameter at Breast Height (DBH) (m)	PRF Inspection	Comments
2419-9	Common ash *Fraxinus excelsior*	19	0.75	PRF-I	
2419-10	English oak	19	0.60	PRF-M	
2419-11	Common ash	11	0.18 (multi)	PRF-M	
2419-12	English oak	13	0.30	PRF-M	
2419-13	English oak	15	0.40	None	
2419-14	Field maple	8	0.14	PRF-I	
2419-15	Field maple	0.14	0.18 (dual)	PRF-M	
2419-16	English oak	18	0.40	None	
2419-17	Field maple	12	0.38	PRF-I	
2419-18	Field maple	5	0.12	PRF-I	
2419-20	English oak	20	0.65	PRF-I	
2419-21	Common ash	20	0.58	PRF-I	
2419-22	Common ash	18	0.55	-	Emergence surveys recommended
2419-23	English oak	17	0.79	PRF-I	
2419-24	Common ash	21	1.10	-	Emergence surveys recommended
2419-25	English oak	17	0.50	PRF-I	
2419-26	Field maple	5	0.13	PRF-I	
2419-27	English oak	21	0.60 (multi)	None	
2419-28	Field maple	6	0.12	PRF-I	
2419-29	Field maple	11	0.48	PRF-M	
2417	English oak	14	0.60	PRF-M	
Group 2418	English oak/Hawthorn		No access		
Group 2420	Ramboll reference to woodland parcel 2419		Group of trees		
2421	English oak	5	0.65	PRF-M	
2422	English oak	7	0.52	PRF-I	
2423	Field maple	8	0.25 (multi)	Negligible	
2424 A and B	English oak	10	0.90	-	Emergence surveys recommended
2425	Common ash	15	0.20 (multi)	-	Emergence surveys recommended
2427	Common ash	15	0.45 (multi)	PRF-I	

Tree	Species	Height (m)	Diameter at Breast Height (DBH) (m)	PRF Inspection	Comments
2428	Small-leaved lime *Tilia cordata*	16	0.45 (multi)	None	
2429	Field maple	10	0.60 (multi)	PRF-M	
2430	English oak	12	0.90	-	Emergence surveys recommended
2431	English oak	13	0.98	PRF-M	
2432	English oak	8.5	0.78	PRF-I	
2433	English oak	8	0.45	PRF-I	
2434	English oak	15	1.20	-	Emergence surveys recommended
2435	English oak	14	1.07	PRF-M	
2436	English oak	10	0.50	-	Emergence surveys recommended
2437	English oak	17	1.30	PRF-I	
2438	English oak	17	0.96	None	
2439	English oak	15	1.20	PRF-M	
2440	English oak	16	1.12	PRF-M	
2441	English oak	10	0.60	-	Emergence surveys recommended
2442	English oak	15	1.20	-	Tree to be retained
2443	Alder *Alnus glutinosa*	10	0.30 (multi)	-	Tree to be retained
2444a	Field maple	10	0.55	PRF-M	
2444b	Field maple	12	0.60	PRF-M	
2445	Common ash	10	0.60	-	Emergence surveys recommended
2446	English oak	6	0.60	-	Emergence surveys recommended
2447	English oak	14	0.70	PRF-I	
2448	English oak	13	1.15	PRF-I	
2449	English oak	14	1.30	PRF-M	
2450	Common ash	15	0.70	-	Emergence surveys recommended
2451	Common ash	13	0.60	-	Emergence surveys recommended
2452	English oak	15	0.80	PRF-M	

3.3 Tree Climbing Surveys

No evidence of roosting bats was found within the majority of the trees searched during the climbing surveys[22].

Tree 2431

Two bat roosts were recorded within Tree 2431 during the initial PRF inspection visit as part of the tree climbing surveys.

The first roost comprised a transverse-snap located to the side of an eastern facing limb, approximately 8 m above the ground. The diameter of the limb at the PRF site was 30 cm. The transverse-snap was 400 cm high and 20 cm wide with the internal height recorded as 200 cm, 25 cm wide and 50 cm deep. Droppings were identified in the top crevice behind the heartwood within the PRF.

The second roost comprised a woodpecker-hole located to the side of a western facing limb, approximately 9 m above the ground. The diameter of the limb at the PRF site was 25 cm. The woodpecker-hole was 9 cm high and 9 cm wide with the internal height recorded as more than 120 cm, 20 cm wide and 25 cm deep. One Natterer's bat was barely visible but identified within the PRF (see Photo 1 and 2 below).

Photo 1 – View of Natterer's bat roosting within Tree 2431.

Photo 2 – Alternative view of Natterer's bat roosting within Tree 2431.

Tree 2440

A bat roost was recorded within Tree 2440 during the second tree climbing survey visit. An endoscope was used to investigate a PRF comprising a tear-out located to the side of a north-east

Photo 3 – View of four Natterer's bats roosting within Tree 2440.

Photo 4 – Alternative view of four Natterer's bats roosting within Tree 2440.

[22] Raw data from tree climbing surveys is available on request.

facing limb, approximately 6.5 m above the ground. The diameter of the limb at the PRF site was 36 cm. The tear-out was 150 cm high and 12 cm wide with the internal height recorded as 20 cm and 12 cm wide. Four Natterer's bats were identified within the PRF (see Photos 3 and 4 below).

3.4 Bat Emergence Surveys

For figures showing locations of emergences see Appendix 2, Figure 3 and 4.

B25

One bat was observed emerging from B25 during the dusk emergence survey on the 1st July 2024. A common pipistrelle emerged from the first cladding board on the north elevation of the building at 22:05.

A moderate level of background foraging activity (five to ten passes per species) was recorded throughout the survey for common pipistrelle. A low level of background activity (less than five passes per species) was recorded for all other species comprising noctule and brown long-eared.

The majority of the activity comprised foraging passes along the tree line and road.

Outhouse

No bats were observed emerging from the Outhouse during the dusk emergence survey on the 1st July 2024.

A low level of background activity (less than five passes per species) was recorded for common pipistrelle, Nathusius' pipistrelle, brown long-eared and Daubenton's bat.

The majority of the activity comprised foraging and commuting passes in the garden to the south of the Outhouse and the tree line to the west.

Group 2419 – 22

No bats were observed emerging from G2419 - 22 during the first dusk emergence survey on the 6th August 2024.

Activity was dominated by foraging common pipistrelle, which had a high level of background activity (more than ten passes per species). A low level of background activity (less than five passes per species) was recorded for all other species comprising soprano pipistrelle and brown long-eared.

No bats were observed emerging from G2419 - 22 during the second dusk emergence survey on the 28th August 2024.

Activity was dominated by foraging common pipistrelle, which had a high level of background activity (more than ten passes per species). A low level of background activity (less than five passes per species) was recorded for all other species comprising noctule, brown long-eared and serotine.

No bats were observed emerging from G2419 - 22 during the third dusk emergence survey on the 18th September 2024.

Activity was dominated by foraging soprano pipistrelle, which had a high level of background activity (more than ten passes per species). A low level of background activity (less than five passes per species) was recorded for all other species comprising common pipistrelle and *Myotis* sp.

Group 2419 – 24

No bats were observed emerging from G2419 - 24 during the first dusk emergence survey on the 6th August 2024.

Activity was dominated by foraging common pipistrelle. A moderate level of background activity (between five and ten passes per species) was recorded for common pipistrelle, *Myotis* sp. and

noctule. A low level of background activity (less than five passes per species) was recorded for all other species comprising soprano pipistrelle.

The majority of the activity comprised commuting passes low in under story vegetation.

No bats were observed emerging from G2419 - 24 during the second dusk emergence survey on the 28th August 2024.

Activity was dominated by foraging common pipistrelle, which had a high level of background activity (more than ten passes per species). There were low numbers of other species (less than five passes per species) comprising noctule, soprano pipistrelle and *Myotis* sp.

The majority of the activity comprised foraging in the tree canopy.

No bats were observed emerging from G2419 - 24 during the third dusk emergence survey on the 18th September 2024.

Activity was dominated by foraging common pipistrelle, which had a high level of background activity (more than ten passes per species). There were low numbers of other species (less than five passes per species) comprising soprano pipistrelle.

The majority of the activity comprised foraging and commuting passes in the tree canopy to the west.

Group 2424 A

No bats were observed emerging from G2424 A during the first dusk emergence survey on the 6th August 2024.

Activity was dominated by foraging common pipistrelle. A high level of background activity (more than ten passes per species) was recorded throughout the survey of common pipistrelle. A low level of activity (less than five passes per species) was recorded throughout for all other species comprising serotine and soprano pipistrelle.

The majority of the activity comprised foraging / commuting passes over the top of the oak tree and foraging and low levels in the field.

Two bats were observed emerging from G2424 A during the second dusk emergence survey on the 28th August 2024. Non-echolocating bats were observed emerging at 20:24 from the ivy surrounding the lower portion of the tree trunk, flying left to right. These bats are likely to be common pipistrelles, given that activity has been dominated by this species (which is known not to always echolocate on emergence) throughout the surveys and considering the PRF (dense ivy coverage creating stem cavities) from which they emerged.

A moderate level of background activity (between five and ten passes per species) was recorded throughout the surveys for common pipistrelle. The remaining species comprising noctule, serotine, soprano pipistrelle and Leisler's bat had a low level of background activity (less than five passes per species).

The majority of the activity comprised foraging / commuting passes over the tree to the right (G2424 B).

No bats were observed emerging from G2424 A during the third dusk emergence survey on the 18th September 2024.

A high level of background foraging activity (more than ten passes per species) was recorded throughout the surveys for common pipistrelle. The remaining species comprising noctule, serotine

and brown long-eared had a low level of background foraging and commuting activity (less than five passes per species).

The majority of the activity comprised foraging / commuting passes over the tree to the right (G2424 B) and woodland either side of the tree.

Group 2424 B

No bats were observed emerging from G2424 B during the first dusk emergence survey on the 6th August 2024.

The majority of activity recorded during the survey comprised foraging around the canopy of the tree[23].

No bats were observed emerging from G2424 B during the second dusk emergence survey on the 28th August 2024.

Activity was dominated by foraging noctule and common pipistrelle. A moderate level of background activity (between five and ten passes per species) was recorded for common pipistrelle. A low level of background activity (less than five passes per species) was recorded throughout the surveys for all other species comprising noctule, soprano pipistrelle, serotine, and Leisler's bat.

The majority of the activity comprised foraging around the canopy of the tree and commuting along the tree line.

No bats were observed emerging from G2424 B during the third dusk emergence survey on the 18th September 2024.

Activity was dominated by foraging common pipistrelle. A low level of background activity (less than five passes per species) was recorded throughout the surveys comprising noctule, common pipistrelle, brown long-eared and serotine.

The majority of the activity comprised foraging overhead.

Tree 2425

No bat emergences were observed from T2425 during the first dusk emergence survey on the 6th August 2024.

A low level of background activity (less than five passes per species) was recorded throughout the surveys comprising common pipistrelle and serotine.

The majority of the activity comprised foraging around the tree and commuting to the south of the tree.

No bats were observed emerging from T2425 during the second dusk emergence survey on the 28th August 2024.

A moderate level of background foraging activity (between five and ten passes per species) was recorded throughout the surveys for common pipistrelle. The remaining species comprising noctule, serotine, *Myotis* sp. and soprano pipistrelle had a low level of background activity (less than five passes per species).

The majority of the activity comprised foraging along the tree line and field.

No bats were observed emerging from T2425 during the third dusk emergence survey on the 18th September 2024.

[23] Foraging species could not be identified due to an EMT2 Pro bat detector not recording correctly, and no audio data was therefore available for analysis. See Section 2.6 for details.

A high level of background activity (more than ten passes per species) was recorded throughout the surveys for common pipistrelle. The remaining species comprising serotine, *Myotis* sp. and soprano pipistrelle had a low level of background activity (less than five passes per species).

The majority of the activity comprised foraging along the tree line and field.

Tree 2430

No bats were observed emerging from T2430 during the first dusk emergence survey on the 6th August 2024.

A low level of background activity (less than five passes per species) was recorded throughout the surveys comprising common pipistrelle, serotine, *Myotis* sp. and brown long-eared bat.

The majority of the activity comprised foraging in front of and behind the tree.

No bats were observed emerging from T2430 during the second dusk emergence survey on the 28th August 2024.

A high level of background activity (more than ten passes per species) was recorded throughout the surveys for common pipistrelle and a moderate level of background activity (between five and ten passes per species) was recorded for serotines. The remaining species comprising noctule, *Myotis* sp., soprano pipistrelle and brown long-eared had a low level of background activity (less than five passes per species).

The majority of the activity comprised foraging and commuting passes along the hedgerow and over the grassland.

No bats were observed emerging from T2430 during the third dusk emergence survey on the 18th September 2024.

A high level of background activity (more than ten passes per species) was recorded throughout the surveys for common pipistrelle. The remaining species comprising serotine, *Myotis* sp. and brown long-eared had a low level of background activity (less than five passes per species).

The majority of the activity comprised foraging and commuting passes along the hedgerow.

Tree 2434

No bats were observed emerging from T2434 during the first dusk emergence survey on the 5th August 2024.

A low level of background activity (less than five passes per species) was recorded throughout the survey comprising common pipistrelle, brown long-eared and Leisler's bat.

The majority of the activity comprised foraging passes around the tree.

No bats were observed emerging from T2434 during the second dusk emergence survey on the 27th August 2024.

A moderate level of background activity (between five and ten passes per species) was recorded throughout the survey for common pipistrelle. A low level of background activity (less than five passes per species) was recorded for all other species comprising noctule, serotine, brown long-eared, brown long-eared, and *Myotis* sp.

Activity was dominated by common pipistrelles foraging throughout the survey.

No bats were observed emerging from T2434 during the third dusk emergence survey on the 17th September 2024.

A low level of background activity (less than five passes per species) was recorded throughout the survey comprising common pipistrelle, soprano pipistrelle and noctule.

Very limited activity was recorded throughout the survey.

Tree 2436

One bat was observed emerging from T2436 during the first dusk emergence survey on the 5th August 2024. A common pipistrelle emerged at 21:10 from the east side of the tree canopy and continued to fly east over the field.

A moderate level of background activity (between five and ten passes per species) was recorded throughout the survey for common pipistrelle. A low level of background activity (less than five passes per species) was recorded for all other species comprising soprano pipistrelle, noctule and brown long-eared bat.

Activity was dominated by common pipistrelles foraging throughout the survey.

No bats were observed emerging from T2436 during the second dusk emergence survey on the 27th August 2024.

A low level of background activity (less than five passes per species) was recorded throughout the survey comprising serotine, common pipistrelle, noctule, brown long-eared, *Myotis* sp. and Leisler's bat.

The majority of the activity comprised foraging around the tree and commuting along the hedgerow.

Two bats were observed emerging from T2436 during the third dusk emergence survey on the 17th September 2024. A common pipistrelle was observed emerging at 19:19pm and a non-echolocating individual was observed emerging at 19:22pm.

A low level of background activity (less than five passes per species) was recorded throughout the survey comprising common pipistrelle, noctule and *Myotis* sp.

The majority of the activity comprised foraging and commuting passes.

Tree 2441

No bats were observed emerging from T2441 during the first dusk emergence survey on the 6th August 2024.

A high level of background activity (more than ten passes per species) was recorded throughout the survey for serotines. A low level of background activity (less than five passes per species) was recorded throughout the survey for all other species comprising common pipistrelle, noctule, brown long-eared and *Myotis* sp.

The majority of the activity comprised foraging and commuting passes down east and up west of the field boundary.

No bats were observed emerging from T2441 during the second dusk emergence survey on the 27th August 2024.

A low level of background activity (less than five passes per species) was recorded throughout the survey comprising serotine, common pipistrelle, noctule, brown long-eared and brown long-eared.

The majority of the activity comprised foraging and commuting passes.

No bats were observed emerging from T2441 during the third dusk emergence survey on the 17th September 2024.

A low level of background activity (less than five passes per species) was recorded throughout the survey comprising serotine, common pipistrelle, noctule and brown long-eared bat.

The majority of the activity comprised foraging and commuting passes over the field and along the tree line.

Tree 2445

No bats were observed emerging from T2445 during the first dusk emergence survey on the 5th August 2024.

A moderate level of background activity (between five and ten passes per species) was recorded throughout the survey for common pipistrelles. A low level of background activity (less than five passes per species) was recorded for all other species comprising serotine, *Myotis* sp., noctule and Leisler's bat.

The majority of the activity comprised foraging along the tree line and over the field.

No bats were observed emerging from T2445 during the second dusk emergence survey on the 27th August 2024.

A moderate level of background activity (between five and ten passes per species) was recorded throughout the survey for common pipistrelles. A low level of background activity (less than five passes per species) was recorded for all other species comprising serotine, noctule and soprano pipistrelle.

The majority of the activity comprised foraging along the tree line.

No bats were observed emerging from T2445 during the third dusk emergence survey on the 17th September 2024.

Activity was dominated by foraging common pipistrelle and a moderate level of background activity (between five and ten passes per species) was also recorded throughout the survey for common pipistrelle. A low level of background activity (less than five passes per species) was recorded for all other species comprising *Myotis* sp.

The majority of the activity comprised foraging along the tree line.

Tree 2446

No bats were observed emerging from T2446 during the first dusk emergence survey on the 5th August 2024.

A moderate level of background activity (between five and ten passes per species) was recorded throughout the survey for common pipistrelle. A low level of background activity (less than five passes per species) was recorded for species comprising serotine, noctule and *Myotis* sp.

The majority of the activity comprised foraging and commuting passes to the south of the tree.

No bats were observed emerging from T2446 during the second dusk emergence survey on the 27th August 2024.

A high level of background activity (more than ten passes per species) was recorded throughout the survey for common pipistrelles. A low level of background activity (less than five passes per species) was recorded for all other species comprising serotine, noctule and soprano pipistrelle.

The majority of the activity comprised foraging and commuting passes over the hedgerow gap to the right of the tree.

No bats were observed emerging from T2446 during the third dusk emergence survey on the 17th September 2024.

Activity was dominated by foraging common pipistrelle. A high level of background activity (more than ten passes per species) was recorded throughout the survey for common pipistrelle and *Myotis* sp. A low level of background activity (less than five passes per species) was recorded for all other species comprising serotine and brown long-eared.

The majority of the activity comprised foraging along the hedgerow line.

Tree 2450

No bats were observed emerging from T2450 during the first dusk emergence survey on the 5th August 2024.

Activity was dominated by foraging common pipistrelle and a high level of background activity (more than ten passes per species) was recorded throughout the survey for this species. A low level of background activity (less than five passes per species) was recorded for all other species comprising soprano pipistrelle, serotine, noctule, brown long-eared and *Myotis* sp.

The majority of the activity comprised commuting passes along the field boundary and foraging over the field.

One bat was observed emerging from T2450 during the second dusk emergence survey on the 27th August 2024. A common pipistrelle emerged at 20:32 from the top left branch of the tree.

Activity was dominated by foraging common pipistrelle and soprano pipistrelle and a high level of background activity (more than ten passes per species) was recorded throughout the survey for both species. A low level of background activity (less than five passes per species) was recorded for all other species comprising serotine, noctule, brown long-eared and *Myotis* sp.

The majority of the activity comprised commuting passes from south to north along the field boundary.

No bats were observed emerging from T2450 during the third dusk emergence survey on the 17th September 2024.

Activity was dominated by foraging common pipistrelle. A high level of background activity (more than ten passes per species) was recorded throughout the survey for common pipistrelle and soprano pipistrelle. A low level of background activity (less than five passes per species) was recorded for all other species comprising noctule, and brown long-eared and *Myotis* sp.

The majority of the activity comprised foraging and commuting passes across the field and along the field boundaries.

Tree 2451

No bats were observed emerging from T2451 during the first dusk emergence survey on the 5th August 2024.

A moderate level of background activity (between five and ten passes per species) was recorded throughout the survey for common pipistrelle. A low level of background activity (less than five passes per species) was recorded for all other species comprising serotine, noctule, brown long-eared, soprano pipistrelle and *Myotis* sp.

The majority of the activity comprised commuting passes north and south along the hedgerow.

No bats were observed emerging from T2451 during the second dusk emergence survey on the 27th August 2024.

A high level of background activity (more than ten passes per species) was recorded throughout the survey for common pipistrelle and a moderate level of background activity (between five and ten passes per species) was recorded throughout the survey for soprano pipistrelle. A low level of background activity (less than five passes per species) was recorded for all other species comprising serotine and noctule.

The majority of the activity comprised commuting passes along the hedgerow.

No bats were observed emerging from T2451 during the third dusk emergence survey on the 17th September 2024.

Activity was dominated by foraging common pipistrelle and a high level of background activity (more than ten passes per species) was recorded throughout the survey for this species. A moderate level of background activity (between five and ten passes per species) was recorded throughout the survey for soprano pipistrelle. A low level of background activity (less than five passes per species) was recorded for *Myotis* sp.

The majority of the activity comprised commuting passes along the hedgerow.

Table 3.2 provides a summary of tree roost status following climbing and emergence surveys on site.

Table 3.2: Summary of Tree Roost Status on Site

Tree	Roost Status
2419-1	Likely Absent
2419-2	Likely Absent
2419-3	Likely Absent
2419-4	Likely Absent
2419-5	Likely Absent
2419-6	Likely Absent
2419-7	Likely Absent
2419-8	Likely Absent
2419-9	Likely Absent
2419-10	Likely Absent
2419-11	Likely Absent
2419-12	Likely Absent
2419-13	None
2419-14	Likely Absent
2419-15	Likely Absent
2419-16	None
2419-17	Likely Absent
2419-18	Likely Absent
2419-20	Likely Absent
2419-21	Unconfirmed
2419-22	Likely Absent

Tree	Roost Status
2419-23	Likely Absent
2419-24	Likely Absent
2419-25	Likely Absent
2419-26	Unconfirmed
2419-27	None
2419-28	Unconfirmed
2419-29	Likely Absent
2417	Likely Absent
Group 2418	N/A
Group 2420	N/A
2421	Likely Absent
2422	Likely Absent
2423	N/A
2424 (A and B)	**Present in 2424 A**
2425	Likely Absent
2427	Likely Absent
2428	None
2429	Likely Absent
2430	Likely Absent
2431	**Two Roosts Present**
2432	Likely Absent
2433	Likely Absent
2434	Likely Absent
2435	Likely Absent
2436	**Present**
2437	Unconfirmed
2438	None
2439	Likely Absent
2440	**Present**
2441	Likely Absent
2442	N/A
2443	N/A
2444a	Likely Absent
2444b	Likely Absent
2445	Likely Absent
2446	Likely Absent
2447	Likely Absent

Tree	Roost Status
2448	Likely Absent
2449	Likely Absent
2450	**Present**
2451	Likely Absent
2452	Likely Absent

4. EVALUATION

4.1 Survey Conclusions

Confirmed non-breeding day roosts of common pipistrelles and Natterer's Bat have been recorded at the following buildings and trees:

- B25;
- Group 2424 A;
- Tree 2431;
- Tree 2436;
- Tree 2440; and
- Tree 2450.

At least 10 species of bat were recorded foraging or commuting within the site, including common pipistrelle, soprano pipistrelle, noctule, serotine, brown long-eared, Nathusius' pipistrelle, Leisler's bat, and *Myotis* sp. (with call characteristics of Daubenton's, Brandt's, whiskered, Bechstein's and Natterer's bat).

The identification of Bechstein's bat is not unexpected, as there is a known presence of this Annex II species in the local area. It should be noted, however, that none of the emergences identified during emergence surveys were identified as *Myotis* sp. (or therefore potential Bechstein's).

High activity levels were recorded for common pipistrelle, soprano pipistrelle, serotine and *Myotis* sp. (with call characteristics of Daubenton's, Brandt's, whiskered, Bechstein's and Natterer's bat) in the months of August and September. Moderate activity levels were recorded for noctule in the month of August. Low activity levels were recorded throughout surveys for all other species recorded.

Table 4.1 provides a summary of all confirmed roosts recorded during surveys at the site.

Table 4.1: Summary of Confirmed Bat Roosts at Land West of Ifield

Structure/ Tree	Location on Structure/Tree	Access to Roost Description	Species	Max. Count / No. Droppings	Roost Type
B25[24]	North elevation of the building	First cladding board	Common Pipistrelle	1	Non-breeding day roost
Group 2424 A	North facing side of tree	Ivy at the bottom left side of the tree trunk	Likely common pipistrelle[25]	2	Non-breeding day roost
Tree 2431	West facing limb	Woodpecker hole	Natterer's Bat	1	Non-breeding day roost
Tree 2431	East facing limb	Transverse-snap	Droppings[26]	1	Non-breeding day roost
Tree 2436	North facing side of tree		Common pipistrelle	2	Non-breeding day roost
Tree 2440	North-east facing limb	Tear-out	Natterer's Bat	4	Possible satellite or non-breeding day roost

[24] B25 was last surveyed by Ramboll in 2020, where no roosting bats were found. Therefore, the 2024 surveys show an increase of one bat roost since the last surveys were undertaken.

[25] Likely to be common pipistrelle, which are known not to always echolocate on emergence and considering the PRF (dense ivy coverage creating stem cavities) from which they emerged.

[26] Assumed to be same species as recorded in an alternative PRF on the west side of the same tree (Natterer's Bat).

Structure/ Tree	Location on Structure/Tree	Access to Roost Description	Species	Max. Count / No. Droppings	Roost Type
Tree 2450	Top left branch of the tree		Common pipistrelle	1	Non-breeding day roost

Although common pipistrelles will use tree roosts year-round, only very exceptionally do females occupy trees when giving birth or suckling young[27]. In combination with the numbers recorded at confirmed roosts outlined above, it is considered realistic that (despite the lack of early maternity season surveys) all tree roosts recorded are non-breeding day roosts.

Given that the roost recorded at B25 was present at an external elevation, evidence of higher numbers (such as droppings or staining) would be anticipated if gaps behind cladding led to a suitable maternity cavity feature, used by higher numbers earlier in the season. It is therefore considered a reliable conclusion to assume that this PRF and confirmed roosts is used by a non-breeding individual.

4.2 Assessment of Bat Roost Importance

Table 4.2 presents the ecological importance of the confirmed roosts at the site, in accordance with current guidance.

Table 4.2: Ecological Importance of Roost Type Present by Species at Land West of Ifield[28]

Species	Roost Type	Ecological Importance
Common Pipistrelle	Non-breeding day roost (common and widespread species)	Site
Natterer's Bat	Non-breeding day roost (widespread but rare species)	Site
Natterer's Bat	Possible satellite roost (widespread but rare species)	Up to County Level

There are seven confirmed roosts of up to County Level Importance present at the site. The full details of the impact assessment in relation to bats as a result of the proposed development will be included in the Environmental Statement Biodiversity Chapter which will support the proposed planning application.

[27] BTHK (2018) Bat Roosts in Trees – A Guide to Identification and Assessment for Tree-Care and Ecology Professionals. Exter, Pelagic Publishing.
[28] In accordance with the UK Bat Mitigation Guidelines (2023) and in relation to the current survey area / effort.

5. RECOMMENDATIONS

5.1 Further Surveys and Considerations

Group 2418

The GLTA identified Group 2418 as being located outside of the site boundary and within a neighbour's curtilage, so no emergence surveys could take place (see Section 2.6 for details). However, there is still potential for indirect impacts to effect Group 2418 such as disturbance from lighting. Therefore, Group 2418 should be included within any future impact assessments where applicable.

Tree 2436 and 2450

If a bat license application is required in the future as part of the proposed development, additional daytime inspection surveys will be required for Tree 2436 and 2450. Bats were observed emerging from unknown roost features and so the purpose of these additional surveys would be to define the exact location and type of roost features being used to inform a licence application.

Tree 2419-29

The current roost status of T2419-29 has been assigned as 'likely absent' with no evidence of bats recorded during the 2024 survey effort. The current proposed plans also show that this tree is to be retained. Therefore, the 2024 survey effort is considered sufficient and there is no additional need for further surveys. However, should the proposed plans change, and T2419-29 is impacted by the proposed development, then this tree should be subject to a further summer endoscope inspection to mitigate for the fact that the third climbing survey visit was required to be undertaken out of season.

5.2 Mitigation

The following provides details regarding protocols to minimise the risk of killing or injuring individual bats during the proposed development plans, in line with the UK Bat Mitigation Guidelines (2023). The surveys have been undertaken to monitor the bat populations within the site to help inform the mitigation and enhancements for the site.

Due to the presence of bat roosts within the site and close proximity of the site (located at Building 25, Group 2424 A, Tree 2431, Tree 2436, Tree 2440 and Tree 2450), an appropriate licence may be required should these buildings or trees be disturbed, demolished or felled, to cover works that would otherwise constitute an offence under the relevant legislation. This would be due to permanent destruction of roosts, the potential to injure or kill bats, and the potential to disturb bats in their roosts. Any such licence will only be granted where it can be shown that there will be no detriment to the Favourable Conservation Status (FCS) of the species of bat concerned.

Where works are proposed at buildings with day roosts, the timing of works is flexible. Although it is considered unlikely that these roosts would be used by hibernating bats, it is best practice to avoid the hibernation season (November to March) wherever possible to ensure avoidance of impacts to torpid bats. Where works are proposed at trees with day roosts, new guidance suggests that bats may hibernate at these features. Therefore, the hibernation season should be avoided completely for works that could impact roosts at trees. Furthermore, in the event that the Natterer's bat roost within Tree 2440 is confirmed as a satellite roost and the tree is impacted by the proposed development, both the hibernation and peak maternity seasons should be avoided. In this instance, felling works can occur during the transitional seasons (spring and autumn).

After receipt of the correct licence documentation (if needed), and before commencing work on site, all contractors should be inducted by a licensed bat ecologist (or accredited agent) in a toolbox talk, to ensure that they are aware of the risks to wildlife, specifically focusing on bats, their legal protection, and the working practices required to avoid harm to bats.

The trees surveyed during this current survey period were identified as being unsafe to climb, or inaccessible due to their location on the site boundary. Where trees with bat roosts require felling but are unsafe to climb, the recommended precautionary method is to use a tracked MEWP to allow close inspection via endoscope by a suitably licensed bat ecologist, immediately prior to section-felling (i.e., removing parts of the tree with PRFs and lowering these slowly to the ground).

To avoid negative impacts on foraging habitat and commuting routes for bats, linear green infrastructure features should be retained wherever possible and specifically including the hedgerow field boundaries and tree lines throughout the site. Ecological input should be provided to inform the Construction Environmental Management Plan (CEMP) with regards protecting retained vegetation.

Where it is not possible (or is only partially possible) to retain existing connective features and foraging resources, appropriate compensation (such as the provision of replacement green infrastructure) should be considered. This may include hedgerow planting, with connectivity around the site and to off-site features, provision of grassland areas managed appropriately to encourage diverse invertebrate assemblages, or water features (such as swales or Sustainable Urban Drainage System features, designed for wildlife).

In addition to the retention of hedgerows and creation of compensatory habitat where necessary, the construction and operational lighting scheme should be designed to avoid wherever possible light spill onto new or retained habitats of value to bats (including retained roost access points) and other nocturnal wildlife. The lighting scheme will therefore follow guidelines as set out in the BCT Bats and Artificial Lighting at Night guidance note[29], including:

- Adopting a warm white light source (2700 Kelvin or lower) to reduce the blue light component;
- Using light sources which feature peak wavelengths higher than 550 nm to avoid the component of light most disturbing to bats;
- Carefully considering column heights to minimise light spill and glare visibility;
- Mounting luminaires horizontally, with no light output above 90° and/or no upward tilt;
- Where appropriate, using motion sensors or timers on security lighting, where risk assessment will allow;
- Directing lighting to where needed and avoiding spillage, including the use of hoods, cowls, shields etc. to avoid spillage onto areas of vegetation; and
- Only lighting areas which need to be lit and using the minimal level of lighting required to comply with building regulations.

For full details of species-specific mitigation, compensation, and enhancement, once prepared, please refer to the ES Biodiversity Chapter which will accompany the proposed planning application.

Table 5.1 below provides a summary of further actions required for buildings and trees on site or in close proximity of the site.

[29] 'Bats and Artificial Lighting at Night' ILP Guidance Note update released - News - Bat Conservation Trust (Accessed November 2024)

Table 5.1: Summary of Further Actions for Buildings and Trees on Site

Tree/Building	Further Action Required
B25	**Roost Present - licence may be required if impacted by the development, although this is unlikely as this building is off-site and being retained**
2419-1	Precautionary method of works
2419-2	Precautionary method of works
2419-3	Precautionary method of works
2419-4	Precautionary method of works
2419-5	Precautionary method of works
2419-6	Precautionary method of works
2419-7	Precautionary method of works
2419-8	Precautionary method of works
2419-9	Precautionary method of works
2419-10	Precautionary method of works
2419-11	Precautionary method of works
2419-12	Precautionary method of works
2419-13	None
2419-14	Precautionary method of works
2419-15	Precautionary method of works
2419-16	None
2419-17	Precautionary method of works
2419-18	Precautionary method of works
2419-20	None
2419-21	Precautionary method of works
2419-22	Precautionary method of works
2419-23	Precautionary method of works
2419-24	Precautionary method of works
2419-25	Precautionary method of works
2419-26	Precautionary method of works
2419-27	Precautionary method of works
2419-28	Precautionary method of works
2419-29	Precautionary method of works
2417	Precautionary method of works
Group 2418	Precautionary method of works[30]
Group 2420	N/A

30 Although access was not granted during the 2024 survey effort, in the event that this tree is impacted by the proposed development, a PMoW including pre-works inspections and surveys of sufficient scope will be required to adequately mitigate any impacts.

Tree/Building	Further Action Required
	-Ramboll reference to Ifield woodland 2419-
2421	Precautionary method of works
2422	Precautionary method of works
2423	None
2424 A	**Roost present - licence may be required if impacted by the proposed development**
2424 B	Precautionary method of works
2425	Precautionary method of works
2427	Precautionary method of works
2428	None
2429	Precautionary method of works
2430	Precautionary method of works
2431	**Roosts Present - licence may be required if impacted by the proposed development**
2432	Precautionary method of works
2433	Precautionary method of works
2434	Precautionary method of works
2435	Precautionary method of works
2436	**Roost present- licence may be required if impacted by the proposed development**
2437	Precautionary method of works
2438	None
2439	Precautionary method of works
2440	**Roost Present - licence may be required if impacted by the proposed development**
2441	Precautionary method of works
2442	Tree to be retained
2443	Tree to be retained
2444 A	Precautionary method of works
2444 B	Precautionary method of works
2445	Precautionary method of works
2446	Precautionary method of works
2447	Precautionary method of works
2448	Precautionary method of works
2449	Precautionary method of works
2450	**Roost present- licence may be required if impacted by the proposed development**
2451	Precautionary method of works
2452	Precautionary method of works

5.3 Compensation

The loss of a potential satellite roosting feature at Tree 2440 (if applicable as part of the proposed development) should be adequately compensated, by providing or creating a feature (i.e., via veteranisation or provision of a suitable bat box) that can be used by a high number of Myotis species. Such a feature should be installed on a nearby retained tree where impacts (such as any changes in lighting) will be avoided.

APPENDIX 1
LEGISLATION

The Conservation of Habitats and Species Regulations 2017

The Habitats Directive (Council Directive 92/43/EEC)[31] came into force in 1992, with The Conservation of Habitats and Species Regulations 2017[32] (commonly known as the 'Habitats Regulations') transposing the Habitats Directive into national law and sets out the provisions for the protection and management of species and habitats of European importance.

The Habitats Regulations provide strict protection for plant and animal species as European Protected Species. Derogations from prohibitions are transposed into the Habitats Regulations by way of a licensing regime that allows an otherwise unlawful act to be carried out lawfully for specified reasons and providing certain conditions are met. Under the Habitats Regulations, competent authorities have a general duty, in the exercise of any of their functions, to have regard to the Habitats Directive and Wild Birds Directive including in the granting of consents or authorisations. They may not authorise a plan or project that may adversely affect the integrity of a European site, with certain exceptions (considerations of overriding public interest).

Regulation 43 of the England and Wales Habitats Regulations makes it an offence to:

- Deliberately capture, injure, or kill a bat;
- Deliberately disturb bats (which includes disturbance which is likely to impair their ability to survive, to breed or reproduce, or to rear or nurture their young, or in the case of animals of a hibernating or migratory species, to hibernate or migrate or to affect significantly the local distribution or abundance of the species to which they belong);
- Damage or destroy a breeding site or resting place of a bat; or
- Possess, control, transport, sell or exchange, or offer for sale or exchange, any live or dead bat or part of a bat or anything derived from a bat or any part of a bat.

The Conservation of Habitats and Species Regulations 2017, as amended by The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019[33], require the Secretary of State and Welsh Ministers to secure compliance with the requirements of the Nature Directives. Any new powers in the 2019 Regulations must be exercised in line with the Directives and retained EU case law up to 1 January 2021.

The Wildlife and Countryside Act 1981 (as amended)

The Wildlife and Countryside Act 1981 (as amended)[34] forms the basis of much of the statutory wildlife protection in the UK, with Part I dealing with the protection of plants, birds and other animals.

Under Section 9, it is an offence (in relation to bats) to:

- Intentionally or recklessly disturb a bat while it is occupying a structure or place of shelter or protection;
- Intentionally or recklessly obstruct access to any structure or place used by a bat for shelter or protection; or
- Sell, offer or expose for sale or have in their possession or transports for the purpose of sale, any live or dead bat or any part of, or anything derived from a bat (or be responsible for adverts suggesting the intention to do this).

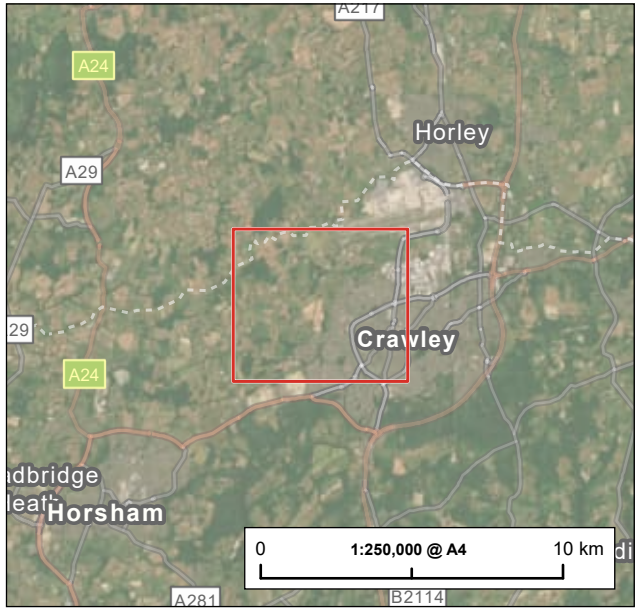
[31] European Commission, 1992. Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora.

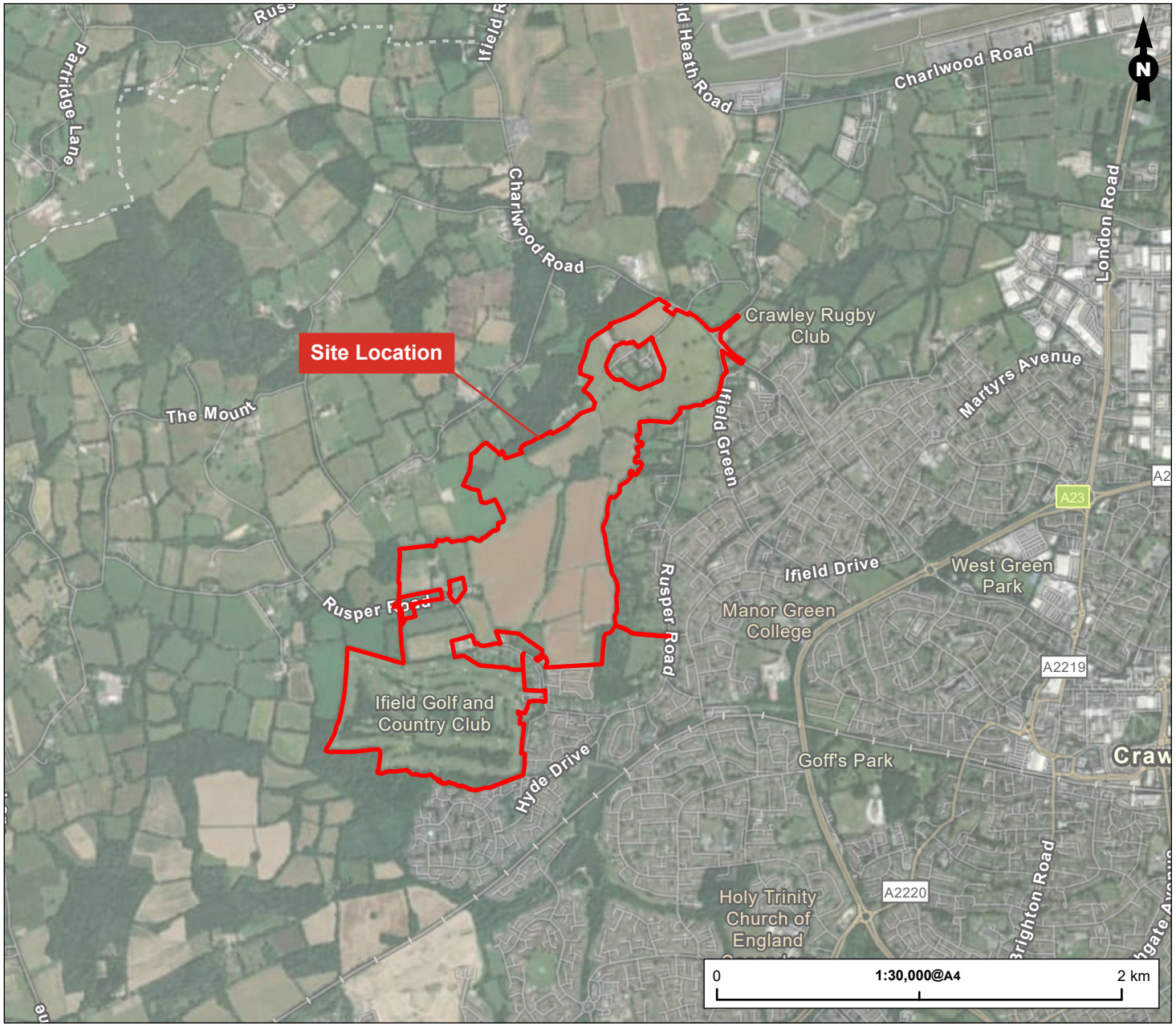
[32] Her Majesty's Stationery Officer (HMSO), 2017. The Conservation of Habitats and Species Regulations 2017. HMSO.

[33] Secretary of State (2019) The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. Her Majesty's Stationery Office (HMSO)

[34] Her Majesty's Stationery Office (HMSO), 1981. The Wildlife and Countryside Act 1981 [as amended in Quinquennial Review and by the Countryside and Rights of Way Act 2000 and the Natural Environment and Rural Communities Act 2006] HMSO.

APPENDIX 2
FIGURES

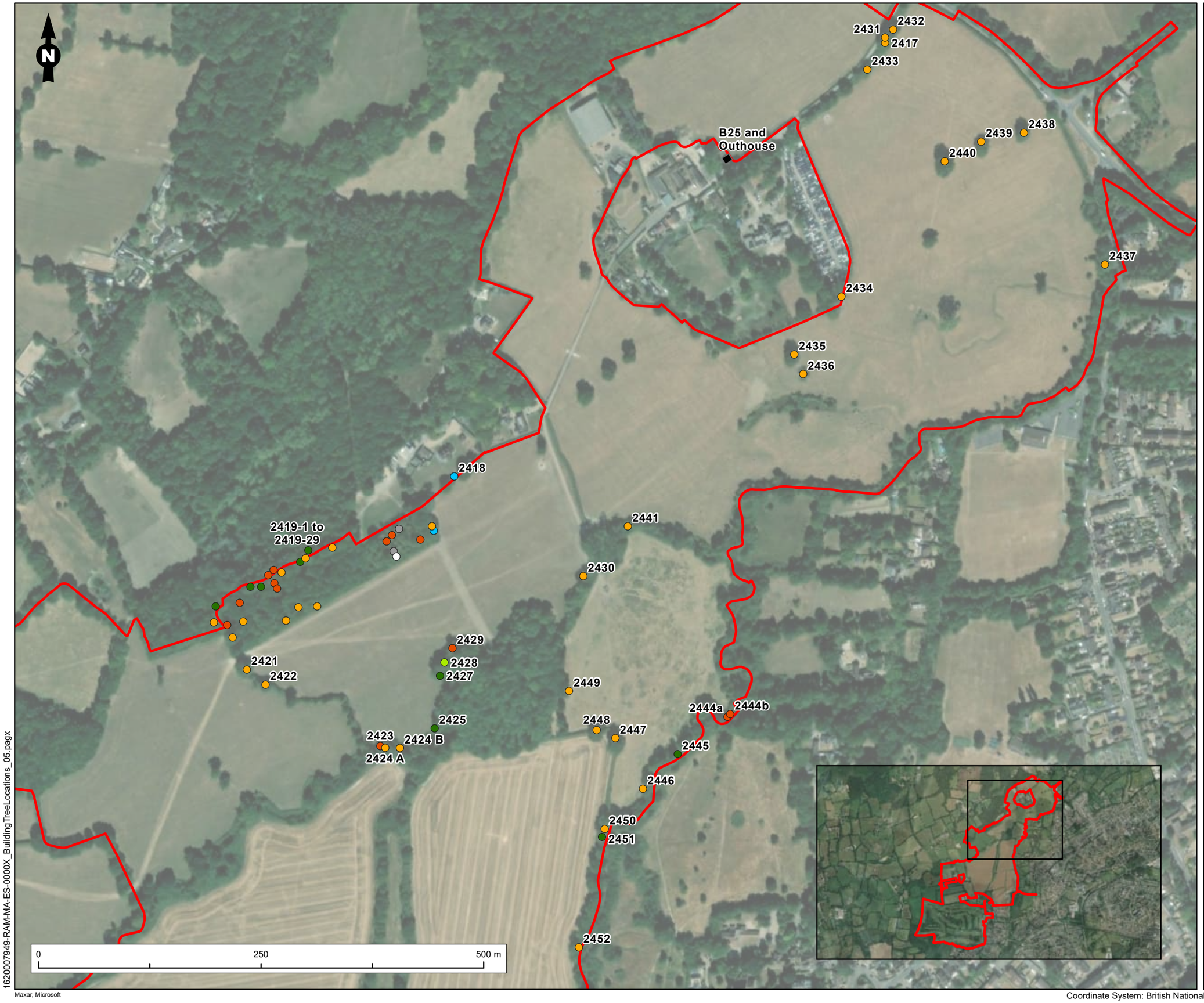




RAMBOLL

Figure Title: Site Location	Project Name: West of Ifield	Date: November 2024	
		Prepared By: AR	Figure No.: 1
Client: **Homes England**	Project No./Filery ID: 162007949	Scale: As Shown	Revision: 1.0

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.



Legend

- Site Boundary
- Building

Tree Species

- Ash
- Birch
- Hawthorn
- Lime
- Maple
- Oak
- Willow

Figure Title
Building and Tree Locations

Project Name
West of Ifield

Project No./Filery ID
1620007949-003

Date	Figure No.	Revision
January 2025	2	1.0

Prepared By	Scale
AR	1:4,000 @A3

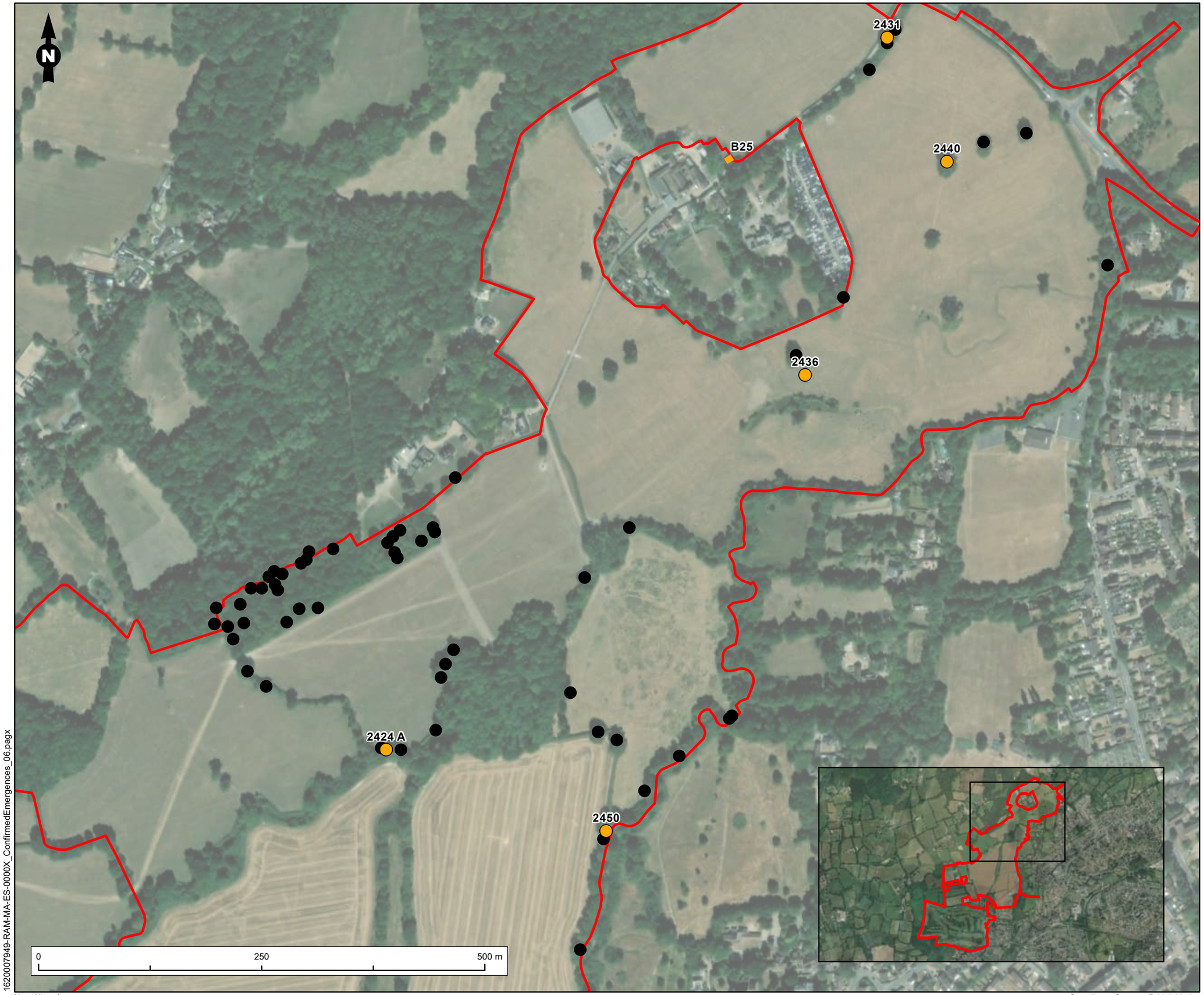
Client **Homes England**

RAMBOLL

1620007949-RAM-MA-ES-0000X_BuildingTreeLocations_05.pagx

Maxar, Microsoft

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.



Legend

Site Boundary

Building

Confirmed Bat Presence

Trees

No Bat Presence

Confirmed Bat Presence

T2424 - Survey 2: two non-echolocating bats, likely to be common pipistrelle

T2431 - Survey 3: Natterer's bat

T2436 - Survey 1: common pipistrelle

T2440: Survey 3: four Natterer's bats

T2450 - Survey 2: common pipistrelle

B25 - Survey 1: common pipistrelle

Figure Title
Confirmed Emergences

Project Name
West of Ifield

Project No./Filery ID
1620007949-003

Date	Figure No.	Revision
January 2025	3	1.0

Prepared By	Scale
AR	1:4,000 @A3

Client **Homes England**

RAMBOLL

1620007949-RAM-MA-ES-0000X_ConfirmedEmergences_06.pagx

Maxar, Microsoft

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

Legend

- Site Boundary
- Survey 1 Emergence: Common Pipistrelle

Figure Title
Confirmed Emergence from Building 25

Project Name
West of Ifield

Project No./Filery ID
1620007949-003

Date	Figure No.	Revision
November 2024	4	1.0

Prepared By	Scale
AR	1:150 @A3

Client **Homes England**

RAMBOLL

1620007949-RAM-MA-ES-0000X_EmergenceBuilding25_02.pagx

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

APPENDIX 8.22: LAND WEST OF IFIELD – BAT SURVEY REPORT 2023

Intended for
TURNER & TOWNSEND PROJECT MANAGEMENT LIMITED

On behalf of
HOMES ENGLAND

Document type
REPORT

Date
November 2023

Project number
1620007949

LAND WEST OF IFIELD
BAT SURVEY REPORT 2023

RAMBOLL Bright ideas. Sustainable change.

LAND WEST OF IFIELD
BAT SURVEY REPORT

Project name	**Land West of Ifield**
Project no.	**1620007949**
Recipient	**Homes England**
Document type	**Report**
Version	**1**
Date	**30/11/2023**
Prepared by	**James Hrynkiewicz**
Checked by	**Malcolm Robertson**
Approved by	**Matt Royall**
Description	**Bat Survey Report**

Revision	Date	Prepared by	Checked by	Approved by	Description
01	30/11/2023	JH	MR	MR	Issued to Client

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CONTENTS

LIST OF TABLES

APPENDICES

1. INTRODUCTION

1.1 Background

Ramboll UK Limited ('Ramboll') was commissioned by Turner & Townsend Project Management Ltd (the 'Client'), on behalf of Homes England to undertake a suite of bat surveys in relation to the proposed development plans for the Land West of Ifield, Ifield, West Sussex (the 'site'). The site is located at Ordnance Survey (OS) grid reference TQ 24625 38471, primarily within the administrative boundary of Horsham District as shown in Appendix 1. Ramboll previously conducted bat surveys across the site between 2020 and 2022 (See Section 1.3). This report presents the findings of further bat surveys comprising emergence / re-entry surveys at buildings which were carried out by Ramboll ecologists between May and September 2023.

Bat surveys were previously undertaken at the site by Arcadis Consulting Ltd ('Arcadis') between 2018 and 2019. Results from the 2019 survey report[1] confirmed that nine species of bats were recorded. Due to the time elapsed since these surveys were completed, update surveys were required at the site. The 2019 surveys by Arcadis also included the Ifield Brook Wood and Meadows Local Wildlife Site (LWS) to the east of the site, which was previously incorporated within the proposed development area, however, this area is no longer within the proposed red-line boundary (other than a potential cycle / pedestrian route crossing this area in one location).

1.2 Proposed Development

At the time of writing Ramboll understand the proposed development will comprise:

- 3,000 new residential units with associated infrastructure;
- Space for employment, retail, community uses and landscaping; and
- Access arrangements.

Further details regarding the proposed development will be determined in due course and may be subject to revision.

1.3 Objectives

The aim of this report is to outline the results of a suite of bat surveys undertaken in 2023.

The structure and content of the report is based on current ecological report writing guidance (CIEEM, 2017[2] and British Standards Institution, 2013[3]).

The content of this report is based on the findings of:

- Updated Building Inspection; and
- Bat dusk emergence / dawn re-entry surveys at buildings.

The specific objectives of the surveys and this report are to:

- Determine the presence / likely absence of bats roosting within buildings within off-site areas adjacent to the north of the site and, if present, to ascertain the species and number of bats present, and number, type(s) and location(s) of any bat roost(s) identified.

[1] Arcadis (October 2019). Land west of Ifield – Bat Survey Report. Report reference: WOI-AUK-XX-WS-RP-EC-00013-01-Bat Survey Report.
[2] CIEEM (2017). Guidelines on Ecological Report Writing. Chartered Institute of Ecology and Environmental Management, Winchester.
[3] British Standards Institution (2013). BS 42020:2013. Biodiversity – Code of Practice for Planning and Development. BSI Standards Limited, London.

Assessment of potential impacts arising from the proposed development on roosting, foraging and commuting bats will be included in the Biodiversity chapter of the Environmental Statement (ES) for (to be submitted with the planning application for the proposed development). Similarly, final mitigation, compensation and enhancement strategies and commitments will be outlined within the ES chapter. The impact assessment and subsequent mitigation strategy detail within the ES chapter will be informed by a combination of this report (addressing roosting bats and activity recorded during the surveys outlined above), the Static Detector Survey Report[4], 2022 Bat Emergence/re-entry Report[5] and the Bat Trapping and Radio-Tracking Baseline Report (DWE on behalf of Ramboll, 2022[6], and AEWC on behalf of Ramboll, 2021[7]).

The report is supported by the following appendix:

- Appendix 1: Figures.

1.4 Legislation and Policy Framework

Various legislation and planning policies refer to the protection of wildlife, with those relevant specifically to bats summarised below, although this summary should not be regarded as a definitive legal opinion. When dealing with individual cases, the full texts of the relevant documents should be consulted, and legal advice obtained if necessary.

All species of British bat are listed on Schedule 5 of the *Wildlife and Countryside Act 1981 (as amended)* and are afforded protection under Section 9 of this Act. In addition, all British bat species are listed on Schedule 2 of *The Conservation of Habitats and Species Regulations 2017 (as amended)* and are protected under Regulation 39 of these Regulations.

Under this legislation it is an offence to: -

- Intentionally kill, injure, take (handle) or capture a wild bat;
- Intentionally or recklessly disturb a bat in its roost or deliberately disturb a group of bats;
- Damage or destroy a place used by bats for breeding or resting (roosts) (even if bats are not occupying the roost at the time);
- Possess or advertise / sell / exchange a bat of a species found in the wild in the UK (dead or alive) or any part of a bat; or
- Intentionally or recklessly obstruct access to a bat roost.

Lesser horseshoe bat *Rhinolophus hipposideros*, greater horseshoe bat *Rhinolophus ferrumequinum*, Bechstein's bat *Myotis bechsteinii* and barbastelle *Barbastella barbastellus* are also listed in Annex II of the European Union (EU) Habitats Directive and core areas of their habitat are protected under the UK "National Site Network" as Special Areas of Conservation (SACs).

[4] Ramboll, 2023. Ifield Bat Activity Report. R1620007949_2-Ifield_Bat Activity Report.docx

[5] Ramboll, 2023. Ifield Bat Emergence/Re-entry Report (Buildings and Trees). R1620007949_1A_Ifield_Bat Report.docx

[6] David-Watts Ecology Ltd. (DWE), 2022. Bat Trapping and Radio-tracking Baseline Report and Evaluation For Land West of Ifield, Crawley For Ramboll, 26th September 2022.

[7] Animal Ecology & Wildlife Consultants Ltd. (AEWC), 2021. Advanced Bat Survey Report Baseline Trapping and Radiotracking Survey Results Land West of Ifield, November 2021.

2. METHODOLOGY

2.1 Bat Emergence and Dawn Re-entry Bat Surveys

During the building inspection conducted by Ramboll in 2023 12 buildings as shown in Figure 1 in Appendix 1 were assessed for their suitability to support roosting bats. Previous surveys of remaining on-site or adjacent buildings were still considered to be valid. However, the previous surveys for the 12 buildings in question were considered to have 'expired' and they therefore required surveying once again to obtain up to date baseline data.

Of the 12, nine buildings were classified as having various levels of bat roosting potential and were subsequently subject to bat emergence / re-entry surveys. The number of surveys at each building was dependent upon the potential of the building (low, moderate, or high) and complied with standard survey guidance.

The potential of each building (and subsequent number of surveys required) is outlined below and in Figure 1 (See Appendix 1):

- B16 – High: Three surveys;
- B16A- High: Three surveys;
- B17A- High: Three surveys;
- B17B- Low: One survey;
- B20- High: Three surveys;
- B21A- High: Three surveys;
- B21C- High: Three surveys;
- B21C2- High: Three surveys; and
- B22- High: Three surveys.

The buildings listed below were scoped out after the building inspections as they were found to have no suitable roosting features to support bats:

- B18;
- B19; and
- B23.

Dusk emergence / dawn re-entry surveys of the nine buildings were conducted between May and September 2023. The surveys generally followed appropriate methodology as detailed in the Bat Conservation Trust (BCT) Good Practice Guidelines (2023)[8] and Bat Workers Manual (2004)[9]. The surveyors used ultrasonic bat detectors with in-built recorders, allowing bat calls to be recorded and analysed at a later date in order to identify the bat to genus / species level. For the dusk emergence surveys, the surveys were conducted from 15 minutes before sunset and carried on for at least 1 hour 30 minutes after sunset (dependent upon levels of bat activity). For the dawn re-entry surveys, the surveys were conducted from two hours before sunrise and carried on until up to 15 minutes after sunrise (dependent upon levels of bat activity).

The bat emergence/re-entry surveys were conducted by suitably qualified Ramboll ecologists.

Night vision aids (NVA) (infrared or thermal) were utilised throughout the survey process.

[8] Collins J, 2023. Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edition). Bat Survey Guidelines 23)
[9] Mitchell-Jones & McLeish (2004). Bat Workers Manual (3rd ed). Joint Nature Conservation Committee.

Table 1 summarises the locations, timings, weather conditions and equipment used during each bat survey on buildings.

Table 1 Building Survey Data

Building	Date	Dusk or Dawn	Sunset or Sunrise (24 hour)	Start/ Finish Times (24 hour)	Start/ Finish Temperatures (°C)	Weather at Start	Detector Used
B16A and B16B	22/06/2023	Dawn	04:47	03:01/05:01	14/14	Rain-0/Wind-0/Cloud Cover 100%	EMT2 Pro and BatLogger
B16A and B16B	27/06/2023	Dusk	21:20	21:05/23:05	18/18	Rain-0/Wind-5/Cloud Cover 100%	EMT2 Pro and BatLogger
B16A and B16B	22/08/2023	Dusk	20:08	19:54/21:54	20/18	Rain-0/Wind-1/ Cloud cover 25%	EMT2 Pro and BatLogger
B16A and B16B	25/07/2023	Dusk Front Only	20:58	20:43/22:43	18/20	Rain-0/Wind-1/Cloud Cover 25%	EMT2 Pro and BatLogger
B16A and B16B	12/09/2023	Dusk	19:23	19:08/21:08	23/21	Rain-0/Wind-1/ Cloud Cover 5%	EMT2 Pro and BatLogger
B17A and B17B	21/06/2023	Dusk	21:19	21:07/23:07	17/16	Rain-0/Wind-0/Cloud Cover 100%	EMT2 Pro and BatLogger
B17A and B17B	19/07/2023	Dawn	05:08	03:23/05:23	15/14	Rain-0/Wind-0/ Cloud Cover 100%	EMT2 Pro and BatLogger
B17A	07/09/2023	Dusk	19:54	19:19/21:19	25/23	Rain-0/Wind-0/ Cloud Cover 20%	EMT2 Pro and BatLogger
B20	28/06/2023	Dusk	21:19	21:03/23:04	19/17	Rain-0/Wind-0/ Cloud Cover 100%	EMT2 Pro and BatLogger
B20	26/07/2023	Dawn	05:17	03:32/05:32	10/9	Rain-0/Wind-1/ Cloud Cover 0%	EMT2 Pro and BatLogger
B20	09/08/2023	Dusk	22:04	21:49/22:49	18/16	Rain-0/Wind-0/ Cloud Cover 100%	EMT2 Pro and BatLogger
B21A	28/06/2023	Dawn	04:48	03:03/05:03	17/17	Rain-0/Wind-2/ Cloud Cover 100%	EMT2 Pro and BatLogger
B21A	18/07/2023	Dusk	21:17	21:02/23:02	16/14	Rain-0/Wind-2/ Cloud Cover 100%	EMT2 Pro and BatLogger
B21A	08/08/2023	Dusk	20:36	20:21/22:21	16/16	Rain-Light drizzle/Wind-1/ Cloud Cover 100%	EMT2 Pro and BatLogger
B21C	05/07/2023	Dusk	21:17	21:02/22:02	15/13	Rain-0/Wind-2/ Cloud Cover 100%	EMT2 Pro and BatLogger
B21C	01/08/23 (east)	Dawn	05:26	03:41/05:41	14/14	Rain-0/Wind-1/ Cloud Cover 60%	EMT2 Pro and BatLogger

B21C	16/08/2023 (west)	Dawn	05:49	04:04/06:04	18/13	Rain-0/Wind-0/ Cloud Cover 0%	EMT2 Pro and BatLogger
B21C	31/08/2023 (Part 1)	Dusk	19:49	19:34/21:34	14/15	Rain-0/Wind-1/ Cloud Cover 100%	EMT2 Pro and BatLogger
B21C	07/09/2023 (Part 2)	Dusk	19:36	19:21/21:21	27/27	Rain-0/Wind-0/ Cloud Cover 10%	EMT2 Pro and BatLogger
B21C2	28/06/2023	Dawn	04:48	02:26/05:26	18/18	Rain-0/Wind-2/ Cloud Cover 100%	EMT2 Pro and BatLogger
B21C2	19/07/2023	Dusk	21:05	20:50/22:50	20/19	Rain-0/Wind-0/ Cloud Cover 60%	EMT2 Pro and BatLogger
B21C2	23/08/2023	Dusk	20:06	19:51/22:51	21/21	Rain-Light/Wind-1/ Cloud Cover 100%	EMT2 Pro and BatLogger
B22	27/06/2023	Dusk	21:20	21:05/23:05	19/17	Rain-0/Wind-2/ Cloud Cover 100%	EMT2 Pro and BatLogger
B22	15/08/2023	Dusk	20:22	20:07/22:07	18/17	Rain-0/Wind-1/ Cloud Cover 25%	EMT2 Pro and BatLogger
B22	08/09/2023	Dawn	06:25	04:40/06:40	16/17	Rain-0/Wind-1/ Cloud Cover 0%	EMT2 Pro and BatLogger

2.2 Sound Analysis

Where necessary, digital recordings of bat echolocation calls recorded during bat emergence / re-entry surveys were analysed using AnalookWTM (version 4.6e) and Kaleidoscope Pro to aid with species identification, with reference to published bat call parameter data[10].

Digital recordings from automated detector surveys were batch analysed using Kaleidoscope Pro (version 5.4.8) analysis software. Call batches were subsequently manually audited to confirm auto-identification.

Species of myotis (*Myotis* sp.) and long-eared bats (*Plecotus* sp.) were identified to the genus level in some cases where the available data was limited, on the basis of the inherent difficulty in distinguishing between species solely from their echolocation calls.

2.3 Limitations

All bat surveys were undertaken at an appropriate time of year, under suitable weather conditions and in accordance with BCT guidelines.

Bats are mobile creatures and can occupy different habitats at different times. Bat emergence/re-entry surveys do not consider seasonal differences or the physical changes to the site and its features after the survey date due to weathering, maintenance, deterioration, or damage. The absence of a species cannot be confirmed by a lack of field signs.

[10] Russ, J. (2012). British Bat Calls: A Guide to Species Identification. Pelagic Publishing, Exeter.

It is widely accepted that some bat species (including *Myotis* sp. and *Plecotus* sp.) cannot be identified to species levels by acoustic analysis alone, however, call characteristics may give some indication of species and allow some species to be ruled out with a degree of confidence based on multiple call parameters. Advanced survey methods, such as trapping and radio-tracking, are recommended in situations where rare species of these genus', such as Bechstein's bat (*Myotis bechsteinii*, may be using the proposed development site. The results of such surveys in relation to Land West of Ifield can be found within the Bat Trapping and Radio-Tracking Baseline Report (DWE on behalf of Ramboll, 2022).

The identification of bat species based on echolocation calls using computer sonogram analysis software is dependent upon the clarity of the sonogram / recording. The quality is subject to weather conditions, the distance of bats from the detector, the presence of physical obstructions and the level of background noise.

All areas within the proposed development footprint were fully accessible during the survey(s) for all the buildings apart from Building 16A/16B. Surveyors during the building 16A/16B surveys were not allowed to access the back gardens by the homeowners. Therefore, the elevations were not surveyed at all during the three surveys. During the first survey on the 22nd June 2023 the team was notified of the limited access prior to the survey starting, along with a surveyor being ill the left side of B16B was not covered on the first survey and was then surveyed during a dusk survey on the 27th June 2023. An infrared camera was utilised during the survey as explained in Section 3.1.

Cameras were used during the survey period. On several occasion cameras were moved out of position by an unknown member of the public. The cameras were fixed on a set feature covering the full elevations on each of the buildings when used and they did not cover the whole building and therefore, would have missed other emergences/re-entries during the surveys.

Ramboll is satisfied that this report represents a robust appraisal of the site. If any action or development has not taken place on this land within 12 months of the date of this report, the findings of this survey should be reviewed by a suitably qualified ecologist and may need to be updated in line with CIEEM's 'Advice Note on the Lifespan of Ecological Reports and Surveys' (2019)[11].

[11] Chartered Institute of Ecology and Environmental Management (CIEEM), 2019. Advice Note on the Lifespan of Ecological Reports and Surveys. CIEEM, Winchester. Available online: https://cieem.net/wp-content/uploads/2019/04/Advice-Note.pdf [Accessed 04/09/2019]

3. RESULTS

3.1 Bat Emergence and Dawn Re-entry Bat Surveys

Building 16A/16B

No bats were observed re-entering B16A/B16B during the dawn re-entry surveys on the 22nd June 2023 and 27th June 2023, the first survey was split over two days, see section 2.3 for further details.

A moderate level of background activity with (>5 to 10 passes per species) was recorded throughout the surveys, comprising common pipistrelle (*Pipistrellus pipistrellus)*, soprano pipistrelle (*Pipistrellus pygmaeus)* and brown long-eared *(Plecotus auritus)*. There was a low number of other species (1 to 4 passes) recorded throughout the survey, comprising myotis (*Myotis sp,* serotine *(Eptesicus serotinus)* and noctule (*Nyctalus noctula*). The majority of the activity comprised foraging/commuting passes along the country lane going east to west to the north of the building. A low number of bats were recorded foraging and commuting along the sides of each building during the survey.

The thermal camera recorded no emergences from the building on the 27th June 2023.

No bats were observed emerging from B16A/B16B (front only) dusk emergence survey on the 25th July 2023. One bat was observed emerging from B16A/B16B (sides only) dusk emergence survey on the 22nd August 2023 (as shown in Appendix 1: Figure 3).

A low level of background activity (<5 passes) was recorded throughout the survey of common pipistrelle and soprano pipistrelle. There were low numbers of other species (1 to 4 passes) was recorded throughout the survey, comprising noctules and brown long-eared bats. All the activity occurred along the western side of B16A. The surveyor of B16B recorded no bats.

No bats were observed emerging from B16A during the dusk emergence survey on the 12th September 2023. No third survey was required for B16B, as it was identified that no bats were utilising the building for roosting purposes.

A low level of background activity (<5 passes) was recorded throughout the survey of common pipistrelle and one brown long-eared bat. The common pipistrelle activity was recorded along the along the country lane going east to west.

Building 17a/17b

No bats were observed emerging from B17A and B17B (Part 1) during the dusk emergence survey on the 21st June 2023.

A moderate level of background activity (>5 to 10 passes per species) was recorded throughout the surveys, comprising common, soprano pipistrelle and pipistrellus species. The majority of the activity comprised foraging/commuting passes along the country lane (east to west), northern and western edge of the house around the trees and hedgerow present there.

The NVA recorded no emergences coming from B17A. No NVA was utilised on B17B during the first survey.

No bats were observed emerging from or re-entering B17A or B17B during the dawn re-entry survey on the 19th July 2023.

A high level of background activity (>10 passes) was recorded throughout the survey of common pipistrelle. There were low numbers of other species (1 to 4 passes) was recorded throughout the

survey, comprising noctules, brown long-eared and soprano pipistrelle. The majority of the activity comprised foraging/commuting passes along the country lane (east to west), northern and western edge of the house around the trees and hedgerow.

The NVA recorded no emergences coming from B17B.

A bat was observed possibly emerging from B17A during the dusk emergence survey on the 7th September 2023 19:47pm but was later confirmed to not be an emergence (See Section 4.1 for further details).

A moderate level of background activity (>5 to 10 passes per species) was recorded throughout the survey of common pipistrelle, soprano pipistrelle and brown long-eared. There were low numbers of other species (1 to 4 passes) recorded throughout the survey, comprising noctule and myotis species. The majority of the activity comprised foraging/commuting passes along the country lane (east to west) and eastern edge of the house around the dog kennels and open area of the garden present there.

The NVA recorded no emergences coming from B17A.

Building 20

An emergence was seen but not recorded along the south-west corner of B20 during the dusk emergence survey on the 28th June 2023 21:57pm (as shown in Appendix 1: Figure 2).

A moderate level of background activity (>5 to 10 passes per species) was recorded throughout the survey of common pipistrelle, brown long-eared and noctule bats. There were low numbers of other species (1 to 4 passes) recorded throughout the survey, comprising noctule species (*Nyctalus* sp) and serotine. The majority of the activity comprised foraging/commuting passes along southern edge of the building.

No bats were observed emerging from or re-entering B20 during the dawn re-entry survey on the 26th July 2023.

A low level of background activity (<5 passes) was recorded throughout the survey of common pipistrelle. There were low numbers of other species (1 to 4 passes) recorded throughout the survey, comprising myotis species, noctule and brown long-eared bats. A single common pipistrelle was observed foraging north-east and south of the building.

The NVA recorded no emergences coming from B20.

No bats were observed emerging from B20 during the dusk emergence survey on the 9th August 2023.

A low level of background activity (<5 passes per species) was recorded throughout the survey of common pipistrelle, soprano pipistrelle and noctule species. There were low numbers of other species (1 to 4 passes) recorded throughout the survey, comprising brown long-eared. The majority of the activity comprised foraging/commuting passes between B20 and other farm buildings in the north and south.

Building 21A

A re-entry was seen but not recorded on the detector into B21A during the dawn re-entry survey on the 28th June 2023 03:59am, along the southern end of the building entering the southern corner gable (see Appendix 1: Figure 2). A moderate level of background activity (>5 passes per species) was recorded throughout the survey of common pipistrelle, soprano pipistrelle and brown long-

eared. There was one pass of a myotis bat. The majority of the activity comprised foraging/commuting passes over the building and through B21A as the barn doors are left open which allowed bats to fly in and out of the building the building.

A number of emergence and re-entries were observed from B21A during the dusk emergence survey on the 18th July 2023. Seven re-entries were recorded between 21:08pm to 22:30pm. Approximately 27 common pipistrelles emerged/re-entered from the gable end on the north of the building. One brown long-eared bat emerged from the entrance to the building.

The NVA recorded a common pipistrelle emergence coming from B21A at 21:25pm from the wooden cladding.

A high level of background activity (>10 passes per species) was recorded throughout the survey of common pipistrelle, soprano pipistrelle, noctule and brown long-eared bats. There were low numbers of other species (1 to 2 passes) recorded throughout the survey, comprising serotine, myotis species and nathusius' pipistrellus *Pipistrellus nathusii*. The majority of the activity comprised oforaging/commuting passes over the building and through the building.

An emergence was observed from B21A during the dusk emergence survey on the 8th August 2023 (Survey 3). The common pipistrelle was observed emerging at 20:30pm from the east of the building via the barn door east elevation.

A moderate level of background activity (5 to 10 passes per species) was recorded throughout the survey of common pipistrelle, soprano pipistrelle, myotis species and brown long-eared bats. Single passes were recorded for serotine and noctule species. The majority of the activity comprised foraging/commuting passes over the building and through the building.

Building 21c

An emergence was observed from B21C during the dusk emergence survey on the 5th July 2023 (Survey 1). The common pipistrelle was observed emerging at 21:29pm from the eaves at the west gable end.

The NVA recorded no emergences coming from B21C.

A moderate level of background activity (>5 to 10 passes) was recorded throughout the survey of common pipistrelle. There were low numbers of other species (2 to 4 passes) recorded throughout the survey, comprising soprano pipistrelle, noctule and brown long-eared bats. The majority of the activity comprised foraging/commuting passes to the east and south of the building.

A re-entry was observed into B21C during the dawn re-entry survey on the 1st August 2023. The common pipistrelle was observed re-entering the building at 04:15am along the eastern corner of the building (as shown in Appendix 1: Figure 1). One possible common pipistrelle emergence was observed during the dawn re-entry survey on the 16th August 2023.

A low level of background activity (<5 passes per species) was recorded throughout the survey of common pipistrelle and brown long-eared bats. There were low numbers of other species (1 to 4 passes) recorded throughout the survey, comprising serotine and myotis species. The majority of the activity comprised foraging/commuting passes to the east and south of the building.

The NVA recorded no emergences coming from B21C (east and west).

Approximately 7 emergences were observed from B21C during the dusk emergence survey on the 31st August 2023. The brown long-eared bats were observed emerging between 20:14pm and 20:28pm from the east elevation of the building from the lower extension apex from the gable. The

NVA recorded one from the south side of the building from a tile under the apex. No bats were observed emerging from B21C during the dusk emergence survey on the 7th September 2023.

A moderate level of background activity (>5 to 10 passes per species) was recorded throughout the survey of common pipistrelle and brown long-eared bats. A low number of other species were recorded (1 to 4 passes) throughout the survey, comprising serotine, myotis species and soprano pipistrelle. The majority of the activity comprised foraging/commuting passes to the north, east and south of the building.

Building 21c2

Two re-entries were observed into B21C2 during the dawn re-entry survey on the 28th June 2023 from the NVA which recorded two bats (of unknown species) emerging through the cladding at B21C2.

A low level of background activity (<5 passes per species) was recorded throughout the survey of common pipistrelle, soprano pipistrelle and brown long-eared bats. One myotis species was recorded during the survey. The majority of the activity comprised foraging/commuting passes within the courtyard between B21C and B21A.

A possible emergence was observed during the dusk emergence survey on 19th July 2023, the common pipistrelle was recorded at 21:27pm emerging from a tile below the ridge of the building on the northern end.

A moderate level of background activity (>5 to 10 passes per species) was recorded throughout the survey of common pipistrelle, noctule, soprano pipistrelle, myotis species and brown long-eared bats. There were low numbers of serotine recorded throughout the survey. The majority of the activity comprised foraging/commuting passes within the courtyard between B21C and B21A as well as over the building.

No bats were observed emerging from B21C2 during the dusk emergence survey on the 23rd August 2023.

A low level of background activity (<5 passes per species) was recorded throughout the survey of common pipistrelle, soprano pipistrelle and brown long-eared. There were low numbers of other species (1 to 3 passes) recorded throughout the survey, comprising noctule and myotis species. The majority of the activity comprised foraging/commuting passes within the courtyard between B21C and B21A as well as over the building.

Building 22

An emergence was observed during the dusk emergence survey on 27th June 2023, the common pipistrelle was recorded at 22:05pm leaving a tile on the northern side of the building adjacent to the hip.

A moderate level of background activity (>5 to 10 passes per species) was recorded throughout the surveys of common pipistrelle and soprano pipistrelle. There were low numbers of other species (1 to 2 passes) recorded throughout the survey, comprising brown long-eared and myotis species. The majority of the activity comprised foraging/commuting passes around the whole building and mainly above the adjacent buildings (B21C and B21C2).

Emergence was observed during the dusk emergence survey on the 15th August 2023 from the northern end of the building from a tile adjacent to the hip. The two possible common pipistrelle emergences were recorded at 20:46pm from the southern end of the building.

A low level of background activity (<5 passes per species) was recorded throughout the survey of common pipistrelle, soprano pipistrelle and brown long-eared bats. There were low numbers of other species (1 to 2 passes) recorded throughout the survey, comprising myotis species and noctule species. The majority of the activity comprised foraging/commuting passes around the whole building and mainly above the adjacent buildings (B21C and B21C2).

No bats were observed emerging from B22 during the dusk emergence survey on the 8th September 2023.

A low level of background activity (<5 passes) was recorded throughout the survey of common pipistrelle. There were low numbers of other species (1 to 3 passes) recorded throughout the survey, comprising noctules and myotis species. The limited activity comprised foraging/commuting passes around the eastern side of the building and over the adjacent buildings (B21C and B21C2).

4. RECOMMENDATIONS

This section collates the information gained during the bat surveys, presents potential ecological constraints and makes initial recommendations for mitigation. It has been prepared in view of the potential development of the site. The recommendations detailed below may be subject to change dependent on the finalisation of development proposals from the emerging masterplan.

Recommendations should be reviewed prior to any development, to ensure that the proposed mitigation strategy remains relevant to the final development proposals.

4.1 Summary of Results

Confirmed day roosts of common pipistrelles *Pipistrellus pipistrellus* and a confirmed maternity roost for brown long-eared *Plecotus auritus* have been recorded at the following buildings:

- B16a
- B20;
- B21a;
- B21c;
- B21C2; and
- B22.

It has been confirmed that brown long-eared are using the lower extension of B21C as a maternity roost.

A possible emergence was observed during survey 3 of B17A. It was later identified when looking back at the footage on the thermal camera that the bat had not emerged from the building and therefore, confirmed that B17A did not support roosting bats.

At least 10 species of bats were recorded foraging or commuting within the site, including common pipistrelle, soprano pipistrelle *Pipistrellus pygmaeus*, noctule, brown long-eared, serotine, common myotis. (with call characteristics of Daubenton's *Myotis daubentonii*, Brandt's *Myotis brandti*, Natterer's *Myotis nattereri* and whiskered bat *Myotis mystacinus*) and very infrequent nathusius' pipistrellus.

Activity levels were generally highest during the mid-summer months.

The linear habitats along the pastoral fields and clusters of buildings within the northern area. The surrounding habitat around the buildings provides good foraging habitat and potential roosting opportunities.

4.2 Mitigation

It has been confirmed that none of the buildings surveyed will be demolished as part of the proposed development. The buildings will be retained in their current status. The surveys have been undertaken to monitor the bat populations within Area 1 to help inform the proposed development's mitigation and enhancements for the site.

To avoid negative impacts on existing buildings and foraging habitat and commuting routes for bats, linear green infrastructure features should be retained wherever possible and specifically including

the hedgerows throughout the site. Ecological input should be provided to inform the Construction Environmental Management Plan (CEMP) with regards protecting retained vegetation.

Where it is not possible (or is only partially possible) to retain existing connective features and foraging resources, appropriate compensation (such as the provision of replacement green infrastructure) should be considered. This may include hedgerow planting, with connectivity around the site and to off-site features, provision of grassland areas managed appropriately to encourage diverse invertebrate assemblages, or water features (such as swales or Sustainable Urban Drainage System features, designed for wildlife).

In addition to the retention of hedgerows and creation of compensatory habitat where necessary, the construction and operational lighting scheme should be designed to avoid wherever possible light spill onto new or retained habitats of value to bats and other nocturnal wildlife.

The detailed lighting strategy for the proposed development should be devised to ensure that spillage of artificial light into new areas of landscape planting and/or existing off-site habitat is minimised (notably around B21C and the surrounding habitats) as brown long-eared are very light sensitive. In addition to complying with building regulations, the lighting scheme would be designed following guidelines from the BCT Bats and Artificial Lighting At Night guidance note[12]. These include:

- Adopting a warm white light source (2700Kelvin or lower) to reduce the blue light component;
- Using light sources which feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats;
- Carefully considering column heights to minimise light spill and glare visibility;
- Mounting luminaires horizontally, with no light output above 90° and/or no upward tilt;
- Where appropriate, using motion sensors or timers on security lighting, where risk assessment will allow;
- Directing lighting to where needed and avoiding spillage, including the use of hoods, cowls, shields etc. to avoid spillage onto areas of vegetation; and
- Only lighting areas which need to be lit and using the minimal level of lighting required to comply with building regulations.

12 Bat Conservation Trust, 2023. Bats and Artificial Lighting At Night. Guidance Note 08/23.

APPENDIX 1
FIGURES

Legend

- Red Line Boundary

Building Survey 2023

- Bat absence
- Confirmed bat presence
- No update survey required
- Building has negligible potential
- Scoped out

Figure Title	2023 Building Bat Survey (Area 1)
Project Name	West of Ifield 2023 Ecology Surveys
Project Number: 1620007949	Figure No.: 1
Date: December 2023	Prepared By: AB
Scale: 1:1,800 @A3	Issue: 1
Client	**Homes England**

RAMBOLL

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

Legend

- Red Line Boundary

Building Survey 2023

- Confirmed bat presence
- No update survey required
- Building has negligible potential
- Scoped out

Emergence/Re-Entry Points by Building

- B20
- B21a
- B21c
- B21c2
- B22

Figure Title
Emergence/Re-Entry Points

Project Name
West of Ifield
2023 Ecology Surveys

Project Number	Figure No.
1620007949	2
Date	**Prepared By**
December 2023	AB
Scale	**Issue**
1:450 @A3	1

Client
Homes England

RAMBOLL

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

Legend

- Red Line Boundary

Building Survey 2023

- Bat absence
- Confirmed bat presence
- Building has negligible potential

Emergence/Re-Entry Points by Building

- B16a

Figure Title
Emergence/Re-Entry Points

Project Name
West of Ifield
2023 Ecology Surveys

Project Number	Figure No.
1620007949	3
Date	**Prepared By**
December 2023	AB
Scale	**Issue**
1:250 @A3	1

Client
Homes England

RAMBOLL

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

APPENDIX 8.23: LAND WEST OF IFIELD – BAT SURVEY REPORT

Intended for
TURNER & TOWNSEND PLC

On behalf of
HOMES ENGLAND

Document type
REPORT

Date
FEBRUARY 2023

Project number
1620007949

LAND WEST OF IFIELD
BAT SURVEY REPORT

RAMBOLL Bright ideas. Sustainable change.

LAND WEST OF IFIELD
BAT SURVEY REPORT

Project name	**Land West of Ifield**
Project no.	**1620007949**
Recipient	**Homes England**
Document type	**Report**
Version	**1**
Date	**28/02/2023**
Prepared by	**Adam Levesley**
Checked by	**Ellie Frew**
Approved by	**Matt Royall**
Description	**Bat Survey Report**

Revision	Date	Prepared by	Checked by	Approved by	Description
01	28/02/2023	AL	EF	MR	Issued to Client

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CONTENTS

LIST OF TABLES

APPENDICES

1. INTRODUCTION

1.1 Background

Ramboll UK Limited ('Ramboll') was commissioned by Turner & Townsend plc, on behalf of Homes England (the 'Client') to undertake a suite of bat surveys in relation to the proposed development plans for the Land West of Ifield, Ifield, West Sussex (the 'site'). The site is located at Ordnance Survey (OS) grid reference TQ 23679 36673, within the administrative boundary of West Sussex as shown in Appendix 1. This report presents the findings of bat surveys comprising emergence / re-entry surveys at buildings and trees which were carried out by Ramboll ecologists between May and October 2022. Activity surveys have also been completed and will be reported in a separate Ramboll report.

Bat surveys were previously undertaken at the site by Arcadis Consulting Ltd ('Arcadis') between 2018 and 2019. Results from the 2019 survey report[1] confirmed that nine species of bats were recorded. Due to the time elapsed since these surveys were completed, update surveys were required at the site. The 2019 surveys by Arcadis also included the Ifield Brook Wood and Meadows Local Wildlife Site (LWS) to the east of the site, which was previously incorporated within the proposed development area, however, this area is no longer within the proposed red-line boundary (other than a potential cycle / pedestrian route crossing this area in one location).

1.2 Proposed Development

At the time of writing Ramboll understand the proposed development will comprise:

- 3,000 new residential units with associated infrastructure;
- Space for employment, retail, community uses and landscaping; and
- Access arrangements.

Further details regarding the proposed development will be determined in due course and may be subject to revision.

1.3 Objectives

The aim of this report is to outline the results of a suite of bat surveys undertaken at the site.

The structure and content of the report is based on current ecological report writing guidance (CIEEM, 2017[2] and British Standards Institution, 2013[3]).

The content of this report is based on the findings of:

- A desk study;
- Update ground level roost assessment; and
- Bat dusk emergence / dawn re-entry surveys at trees identified as having Potential Roosting Features (PRFs) during the ground level roost assessment.

The specific objectives of the surveys and this report are to:

[1] Arcadis (October 2019). Land west of Ifield – Bat Survey Report. Report reference: WOI-AUK-XX-WS-RP-EC-00013-01-Bat Survey Report.
[2] CIEEM (2017). Guidelines on Ecological Report Writing. Chartered Institute of Ecology and Environmental Management, Winchester.
[3] British Standards Institution (2013). BS 42020:2013. Biodiversity – Code of Practice for Planning and Development. BSI Standards Limited, London.

- Determine the presence / likely absence of bats roosting within trees on the site and, if present, to ascertain the species and number of bats present, and number, type(s) and location(s) of any bat roost(s) identified; and
- Determine the use of the site as a whole by bats.

Assessment of potential impacts arising from the proposed development on roosting, foraging and commuting bats will be included in the Ecology chapter of the Environmental Statement (ES) after the site layout has been fixed. Similarly, final mitigation, compensation and enhancement strategies and commitments will be outlined within the ES chapter. The impact assessment and subsequent mitigation strategy detail within the ES chapter will be informed by a combination of this report (addressing roosting bats and activity recorded during the surveys outlined above), the separate Static Detector Survey Report and the Bat Trapping and Radio-Tracking Baseline Report (DWE on behalf of Ramboll, 2022)

The report is supported by the following appendix:

- Appendix 1: Figures.

1.4 Legislation and Policy Framework

Various legislation and planning policies refer to the protection of wildlife, with those relevant specifically to bats summarised below, although this summary should not be regarded as a definitive legal opinion. When dealing with individual cases, the full texts of the relevant documents should be consulted and legal advice obtained if necessary.

All species of British bat are listed on Schedule 5 of the *Wildlife and Countryside Act 1981 (as amended)* and are afforded protection under Section 9 of this Act. In addition, all British bat species are listed on Schedule 2 of *The Conservation of Habitats and Species Regulations 2017 (as amended)* and are protected under Regulation 39 of these Regulations.

Under this legislation it is an offence to:-

- Intentionally kill, injure, take (handle) or capture a wild bat;
- Intentionally or recklessly disturb a bat in its roost or deliberately disturb a group of bats;
- Damage or destroy a place used by bats for breeding or resting (roosts) (even if bats are not occupying the roost at the time);
- Possess or advertise / sell / exchange a bat of a species found in the wild in the UK (dead or alive) or any part of a bat; or
- Intentionally or recklessly obstruct access to a bat roost.

Lesser horseshoe bat *Rhinolophus hipposideros*, greater horseshoe bat *Rhinolophus ferrumequinum*, Bechstein's bat *Myotis bechsteinii* and barbastelle *Barbastella barbastellus* are also listed in Annex II of the European Union (EU) Habitats Directive and core areas of their habitat are protected under the UK "National Site Network" as Special Areas of Conservation (SACs).

2. METHODOLOGY

2.1 Bat Emergence and Dawn Re-entry Bat Surveys

During the building inspection conducted by Ramboll in 2021, 15 buildings were assessed for their suitability to support roosting bats (See Appendix 1). Of these 15, six were classified as having various levels of bat roosting potential and were subsequently subject to bat emergence / re-entry surveys. The number of surveys at each building was dependent upon the potential of the building (low, moderate or high) and complied with standard survey guidance.

The potential of each building (and subsequent number of surveys required) is outlined below:

- B1 – Low: One survey;
- B2/3 – High : Three surveys;
- B4 – Low: One survey;
- B9 – High: Three surveys;
- B21D – Low: Three surveys[4]; and
- B27 – High: Three surveys.

During the ground level roost assessment of trees conducted by Ramboll in 2021, 55 trees were assessed for their suitability to support roosting bats (See Appendix 1). Of these 55, six were classified as having bat roosting potential and were subsequently subject to bat emergence / re-entry surveys.

The number of surveys at each tree was dependent upon the potential of the tree (moderate or high) and complied with standard survey guidance.

The potential of relevant trees (and subsequent number of surveys required) is outlined below:

- G443A – Moderate: Two surveys;
- G570A – Moderate: Two surveys;
- T108A – Moderate: Two surveys;
- T225 – Moderate: Two surveys;
- T296A – Moderate: Two surveys; and
- T293A – High: Three surveys.

Dusk emergence / dawn re-entry surveys of all buildings and trees were conducted between May and September 2022. The surveys generally followed appropriate methodology as detailed in the Bat Conservation Trust (BCT) Good Practice Guidelines (2016)[5] and Bat Workers Manual (2004)[6]. The surveyors used ultrasonic bat detectors with in-built recorders, allowing bat calls to be recorded and analysed at a later date in order to identify the bat to genus / species level. For the dusk emergence surveys, the surveys were conducted from 15 minutes before sunset and carried on for at least 1 hour 30 minutes after sunset (dependent upon levels of bat activity). For the dawn re-entry surveys, the surveys were conducted from two hours before sunrise and carried on until up to 15 minutes after sunrise (dependent upon levels of bat activity).

The bat emergence/re-entry surveys were conducted by suitably qualified Ramboll ecologists.

Table 1 summarises the locations, timings, weather conditions and equipment used during each bat survey on buildings, whilst Table 2 summaries the same variables for the bat surveys on trees.

[4] Three surveys were conducted due to bat emergence on initial dawn survey

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

[6] Mitchell-Jones & McLeish (2004). Bat Workers Manual (3rd ed). Joint Nature Conservation Committee.

Table 1 Building Survey Data

Building	Date	Dusk or Dawn	Sunset or Sunrise (24 hour)	Start/ Finish Times (24 hour)	Start/ Finish Temperatures (°C)	Weather at Start	Weather at End	Detector Used
B1	08/08/2022	Dusk	20:35	20:20/ 22:35	22/ 18	Warm and dry	Warm and dry	EMT2 Pro
B1	21/09/2022	Dawn	06:45	05:00/ 07:00	7/ 8	Cold and clear	Cold and clear	EMT2 Pro
B2/ 3	21/07/2022	Dusk	21:02	21:01/ 22:59	21/ 18	Warm and dry	Warm and dry	EMT2 Pro
B2/ 3	22/07/2022	Dawn	05:11	03:10/ 05:19	16/ 16	Warm with very light drizzle	Warm and dry	EMT2 Pro
B2/ 3	11/08/2022	Dusk	20:30	20:14/ 22:30	25/ 21	Warm and dry	Warm and dry	EMT2 Pro
B2/ 3	12/08/2022	Dawn	05:43	03:37/ 05:50	16/ 16	Warm and dry	Warm and dry	EMT2 Pro
B2/ 3	13/09/2022	Dusk	19:19	19:09/ 21:19	17/ 17	Constant light drizzle	Light drizzle	EMT2 Pro and Batlogger
B2/ 3	20/09/2022	Dawn	06:43	04:43/ 07:00	9/ 7	Mild and clear	Mild and clear	EMT2 Pro
B4	24/08/2022	Dusk	20:08	19:49/ 22:08	23/ 20	Warm and dry	Warm and dry	EMT2 Pro
B4	09/09/2022	Dawn	06:26	04:41/ 06:41	15/ 15	Damp and cool	Damp and cool	EMT2 Pro
B4	22/09/2022	Dawn	06:46	04:46/ 07:01	9/ 8	Damp and cool	Damp and cool	EMT2 Pro
B5*								
B9	10/08/2022	Dusk	20:30	20:15/ 22:30	25/ 21	Warm and dry	Warm and dry	EMT2 Pro
B9	31/08/2022	Dusk	19:50	19:35/ 21:50	21/ 18	Warm and dry	Warm and dry	EMT2 Pro
B9	15/09/2022	Dawn	06:35	04:35/ 06:50	11/ 12	Mild and cloudy	Mild and cloudy	EMT2 Pro
B21A	18/08/2022	Dusk	20:17	20:02/ 22:17	23/ 21	Warm and dry	Warm and dry	EMT2 Pro
B21A	01/09/2022	Dawn	06:13	04:28/ 06:30	15/ 16	Warm and dry	Warm and dry	EMT2 Pro
B21A	15/09/2022	Dawn	06:35	04:35/ 06:50	12/ 12	Mild and cloudy	Mild and cloudy	EMT2 Pro
B27	20/07/2022	Dusk	21:05	20:50/ 23:05	21/ 18	Warm and dry	Warm and dry	EMT2 Pro
B27	10/08/2022	Dawn	05:39	03:39/ 05:54	14/ 13	Mild and damp	Mild and damp	EMT2 Pro
B27	25/08/2022	Dusk	20:02	19:45/ 22:02	18/ 16	Warm and dry	Warm and dry	EMT2 Pro

*Not assessed during 2022 surveys

Table 2 Tree Survey Data

Tree	Date	Dusk or Dawn	Sunset or Sunrise (24 hour)	Start/ Finish Times (24 hour)	Start/ Finish Temperatures (°C)	Weather at Start	Weather at End	Detector Used
G443A	10/08/2022	Dusk	20:32	20:18/ 22:32	25/ 21	Dry and warm	Dry and warm	EMT2 Pro
G443A	09/09/2022	Dawn	06:26	04:41/ 06:41	15/ 15	Warm with light rain	Warm and dry	EMT2 Pro
G570A	04/08/2022	Dawn	05:29	03:30/ 05:50	18/ 16	Warm and overcast	Warm and overcast	EMT2 Pro
G570 A	04/08/2022	Dusk	20:05	19:55/ 22:05	22/ 19	Warm and dry	Warm and dry	EMT2 Pro
G570 A	13/09/2022	Dusk	19:20	19:20/ 21:09	17/ 16	Warm with rain	Warm with rain	EMT2 Pro
T108A	09/08/2022	Dusk	20:34	20:19/ 22:34	23/ 20	Warm and dry	Warm and dry	EMT2 Pro
T108A	20/09/2022	Dawn	06:42	04:48/ 06:58	9/ 7	Cold and clear with misty spells	Cold and clear with misty spells	EMT2 Pro
T225	11/08/2022	Dawn	05:40	03:40/ 05:55	15/ 14	Warm and dry	Warm and dry	EMT2 Pro
T225	20/09/2022	Dawn	06:43	04:58/ 06:58	8/ 7	Cool and clear	Cool and clear	EMT2 Pro
T296A	09/08/2022	Dusk	20:34	20:34/ 22:34	23/ 20	Warm and dry	Warm and dry	EMT2 Pro
T296A	09/09/2022	Dawn	06:26	04:33/ 06:41	15/ 15	Mostly dry with light drizzle	Mostly dry with light drizzle	EMT2 Pro
W293 A	03/08/2022	Dusk	20:45	20:30/ 22:45	23/ 20	Warm and dry	Warm and dry	EMT2 Pro
W293 A	19/08/2022	Dawn	05:53	03:53/ 06:08	19/19	Warm and dry	Warm and dry	EMT2 Pro
W293 A	09/09/2022	Dawn	06:26	04:41/ 06:41	15/ 15	Damp and cool	Damp and cool	EMT2 Pro

2.2 Sound Analysis

Where necessary, digital recordings of bat echolocation calls recorded during bat emergence / re-entry surveys were analysed using AnalookWTM (version 4.6e) and Kaleidoscope Pro to aid with species identification, with reference to published bat call parameter data[7].

Digital recordings from automated detector surveys were batch analysed using Kaleidoscope Pro (version 5.4.8) analysis software. Call batches were subsequently manually audited to confirm auto-identification.

Species of myotis (*Myotis* sp.) and long-eared bats (*Plecotus* sp.) were identified to the genus level in some cases where the available data was limited, on the basis of the inherent difficulty in distinguishing between species solely from their echolocation calls.

[7] Russ, J. (2012). British Bat Calls: A Guide to Species Identification. Pelagic Publishing, Exeter.

2.3 Limitations

The availability and quality of the data obtained during desk studies is reliant on third party responses. This varies from region to region and for different species groups. Furthermore, the comprehensiveness of data often depends on the level of coverage, the expertise and experience of the recorder and the submission of records to the local recorder. Accordingly, the conclusions in this report are valid only to the extent that the information provided to Ramboll was accurate, complete, and available to Ramboll within the reporting schedule.

All bat surveys were undertaken at an appropriate time of year, under suitable weather conditions and in accordance with BCT guidelines. Two dawn surveys undertaken during the latter part of the activity season (i.e. in September) either began or ended with temperatures below 8°C, although the average temperature over these surveys was 8°C, with temperatures never falling below 7°C and bat activity recorded during both surveys.

Bats are mobile creatures and can occupy different habitats at different times. Bat emergence/re-entry surveys do not consider seasonal differences or the physical changes to the site and its features after the survey date due to weathering, maintenance, deterioration, or damage. The absence of a species cannot be confirmed by a lack of field signs.

It is widely accepted that some bat species (including *Myotis* sp. and *Plecotus* sp.) cannot be identified to species levels by acoustic analysis alone, however, call characteristics may give some indication of species and allow some species to be ruled out with a degree of confidence based on multiple call parameters. Advanced survey methods, such as trapping and radio-tracking, are recommended in situations where rare species of these genus', such as Bechstein's bat (*Myotis bechsteinii*, may be using the proposed development site. The results of such surveys in relation to Land West of Ifield can be found within the Bat Trapping and Radio-Tracking Baseline Report (DWE on behalf of Ramboll, 2022).

The identification of bat species based on echolocation calls using computer sonogram analysis software is dependent upon the clarity of the sonogram / recording. The quality is subject to weather conditions, the distance of bats from the detector, the presence of physical obstructions and the level of background noise.

All areas within the proposed development footprint were fully accessible during the survey(s) for all the buildings and trees apart from Building 4. Surveyors during the building 4 surveys were not always able to observe elevations adjacent to off-site land from the optimal position due to no access onto 3rd party land, although these elevations were still covered adequately from the best on-site location that could be achieved.

Ramboll is satisfied that this report represents a robust appraisal of the site. If any action or development has not taken place on this land within 12 months of the date of this report, the findings of this survey should be reviewed by a suitably qualified ecologist and may need to be updated in line with CIEEM's 'Advice Note on the Lifespan of Ecological Reports and Surveys' (2019)[8].

[8] Chartered Institute of Ecology and Environmental Management (CIEEM), 2019. Advice Note on the Lifespan of Ecological Reports and Surveys. CIEEM, Winchester. Available online: https://cieem.net/wp-content/uploads/2019/04/Advice-Note.pdf [Accessed 04/09/2019]

3. RESULTS

3.1 Bat Emergence and Dawn Re-entry Bat Surveys

Building 1

No bats were observed emerging (or associated with) B1 during the dusk emergence survey on the 8th August 2022.

A moderate level of background activity (>5 passes per species) was recorded throughout the survey, comprising common pipistrelle (*Pipistrellus pipistrellus*) and noctule (*Nyctalus noctula*). The majority of the activity comprised foraging/ commuting passes along the eastern and northern aspects of the building. The aforementioned species are light-tolerant and were foraging/ commuting beneath external security lights.

No bats were observed re-entering (or associated with) B1 during the dawn re-entry survey on the 21st September 2022.

A low level of background activity (<5 passes per species) was recorded throughout the survey, comprising common pipistrelle, noctule and Natterer's myotis (*Myotis nattereri*). No bats were directly observed during this survey, therefore specific activity is unknown but presumed to be foraging based on timings.

Building 2 and 3

Building 2/3 surveys were split across six surveys as both buildings adjoined together. Therefore, three visits were undertaken at either dusk/dawn back-to-back to complete the surveys on the buildings of either side of the buildings.

An emergence of a single common pipistrelle was recorded from the ridge tiles on the dusk survey on the 21st July 2022. This emergence occurred at 21:14 and was recorded by the surveyor on the northern aspect of B2. Based on results from the surveys for the re-entering / emerging during later surveys. Ramboll can confidently say that the actual emergence identified would not change the mitigation required and a precautionary approach would be required.

A high level of commuting and foraging activity was also recorded throughout the survey, predominately of common pipistrelles with lower numbers of soprano pipistrelles (*Pipistrellus pygmaeus*) and noctules.

A single common pipistrelle was confirmed re-entering the building on the northern aspect at 04:55 during the dawn re-entry survey on the 22nd July 2022. A second bat was recorded re-entering at 4:51, although this individual was not recorded echolocating. It is considered likely that this was an additional common pipistrelle due to flight pattern and lack of echolocation, characteristic of pipistrelles leaving and entering roosts.

A high level of commuting and foraging activity was also recorded throughout the survey, predominately of common pipistrelles with lower numbers of soprano pipistrelles and noctules and infrequent passes from brown long-eared (*Plecotus auritus*) and myotis species.

Six common pipistrelles were confirmed emerging from the western and southern aspects of B2/3 roof (See Appendix 1: Emergence Map) during the dusk survey on the 11th August 2022. These emergences occurred at 20:43, 20:50, 21:14 and 21:21. In addition to this, one soprano pipistrelle was also recorded emerging from the hanging tiles on the western aspect of B2/3.

A high level of commuting and foraging activity was also recorded throughout the survey, predominately of common pipistrelles with lower numbers of soprano pipistrelles.

Nine common pipistrelles were confirmed re-entering the tiles long the roof on the western and southern aspects of B2/3 during the dawn survey on the 12th August 2022 (as shown in Appendix 1: re-entry map). These re-entries occurred at 05:14, 05:15, 05:20, 05:24 and 05:25. There re-entries were recorded along the northern and western aspects of B2/3.

A high level of commuting and foraging activity was also recorded throughout the survey, predominately of common pipistrelles with lower numbers of soprano pipistrelles and noctules.

A single common pipistrelle was confirmed to have emerged from the western aspect of B2/3 during the dusk survey on the 13th September 2022. This emergence occurred at 19:39.

A moderate level of background activity was recorded throughout the survey, comprising common pipistrelle and a single brown long-eared bat. The majority of the activity comprised foraging/ commuting passes along the western and northern aspects of the building.

No re-entries were recorded during the dawn re-entry survey on the 20th September 2022.

A low level of myotis species was recorded on review of the call data and a low level of common pipistrelles were also recorded foraging and commuting around the western aspect of the building.

Building 4

No bats were observed emerging (or associated with) B4 during the dusk emergence survey on the 24th August 2022.

A high level of commuting and foraging activity was recorded throughout the survey, predominately of common pipistrelles with lower numbers of soprano pipistrelles and noctules. A single brown long-eared bat was also recorded passing the building at 21:42.

No bats were observed re-entering (or associated with) B4 during the dawn re-entry survey on the 9th September 2022.

A low level of bat activity was recorded throughout the survey, this consisted of whiskered myotis (*Myotis mystacinus*), common pipistrelle, Natterer's and noctule.

No bats were recorded or observed re-entering (or associated with) B4 during the dawn re-entry survey on the 22nd September 2022.

Building 9

Six common pipistrelles were observed emerging from B9 during the dusk emergence survey on the 10th August 2022. These emergences occurred at 20:43, 20:44, 20:45, 20:52, 20:55 and 20:58 from both the northern and southern aspects of roof.

A high level of commuting and foraging activity was recorded throughout the survey period, predominately consisting of common pipistrelles and a single noctule pass at 21:03.

An emergence of a single common pipistrelle was recorded on the dusk survey on the 31st August 2022. This emergence occurred at 21:12 by the surveyor on the western aspect of building 9 from the roof.

A high level of commuting and foraging activity was recorded throughout the survey period, predominately consisting of common pipistrelles, brown long-eared and a single noctule pass at 20:22.

No bats were recorded or observed re-entering (or associated with) B9 during the dawn re-entry survey on the 15th September 2022.

A high level of commuting and foraging activity was recorded throughout the survey period, predominately consisting of common pipistrelles, brown long-eared, unidentified plecotus species and unidentified myotis species were recorded foraging and commuting around the building.

Following the analysis of bat calls at Building 9, Ramboll identified two passes where the call parameters align most closely with grey long eared bats. However, due to the similarity in call parameters of grey and brown long eared bats, and the rarity of grey long eared bats further surveys are potentially required (dependent on final development proposals) to verify whether grey long eared bats are roosting and foraging around the building.

Building 21D

Four common pipistrelles were observed emerging from the southern aspect of B21D during the dusk emergence survey, undertaken on the 18th August 2022. These emergences occurred at 20:22 and 20:47.

A high level of background activity was recorded throughout the survey, comprising common pipistrelle, soprano pipistrelle, noctule, brown long-eared, myotis species were recorded foraging and commuting around the building.

Three common pipistrelles were observed re-entering the southern aspect of B21D. These re-entries occurred at 05:33, 05:35 and 05:43 on the 1st September 2022.

A high level of background activity was recorded throughout the survey, comprising common pipistrelle, soprano pipistrelle, myotis species with calls characteristic of Daubenton's (*Myotis daubentonii*), Brandt's (*Myotis brandtii*), Bechstein's (*Myotis bechsteinii*), noctule, brown long-eared were recorded foraging and commuting around the building.

One re-entry by a single soprano pipistrelle was observed on the south-west aspect of B21D at 06:08 on the 15th September 2022.

A high level of background activity was recorded throughout the survey, comprising common pipistrelle, noctule, Natterer's and brown long-eared bat were recorded foraging and commuting around the building.

During the surveys at B21D, there were a small number of recordings (not associated with emerging bats) auto-identified as grey long eared bat. Due to the similarity in call parameters of grey and brown long eared bats and the rarity of grey long-eared bats, further surveys (comprising internal buildings inspections and DNA analysis of any droppings collected) are potentially required (dependent on final development proposals) to ascertain whether long-eared bats (and of which species) are roosting within the building.

Building 27

No bats were observed emerging (or associated with) B27 during the dusk emergence survey on the 20th July 2022.

A high level of background activity (>10 passes per species) was recorded throughout the survey, comprising common pipistrelle, soprano pipistrelle, noctule and Natterer's.

No bats were observed re-entering (or associated with) B27 during the dawn re-entry survey on the 10th August 2022.

A high level of background activity (>10 passes per species) was recorded throughout the survey, comprising mostly of common pipistrelle, with a single recording of an unidentified *Plecotus* individual.

No bats were observed re-entering (or associated with) B27 during the dusk emergence survey on the 25th August 2022.

A high level of background activity (>10 passes per species) was recorded throughout the survey, comprising common pipistrelle, soprano pipistrelle, noctule and Natterer's.

Tree G443A

No bats were observed emerging from (or associated with) G443A during the dusk emergence survey on the 10th August 2022.

A moderate level of background activity was recorded throughout the survey, comprising mostly common pipistrelles with a single noctule pass at 21:39. A single call was auto-identified as grey long-eared bat during this survey, although it was not associated with any emergences or activity immediately surrounding G443A.

No bats were observed emerging from (or associated with) G443A during the dawn re-entry survey on the 9th September 2022. In addition, no activity was recorded or observed in the vicinity.

Tree G570A

No bats were observed emerging from (or associated with) G570A during the dawn re-entry survey on the 4th August 2022.

A high level of background activity was recorded throughout the survey, comprising predominately common pipistrelles with infrequent myotis species and soprano pipistrelles.

One potential emergence by a common pipistrelle was recorded at 20:30 from the southern aspect of the tree during the dusk emergence survey on the 24th August 2022.

A high level of background activity was recorded throughout the survey, comprising predominately of common pipistrelles with infrequent soprano pipistrelles, noctules and a single brown long-eared pass at 21:35.

T108A

Two emergences of common pipistrelles were recorded at 21:24 and 21:26 from the southern and western aspects of T108A during the dusk emergence survey on the 9th August 2022.

A high level of background activity was recorded throughout the survey, comprising predominately common pipistrelles, with infrequent noctules and a single myotis pass at 21:19.

No bats were observed returning to (or associated with) T108A during the dawn re-entry survey on the 20th September 2022.

A low level of background activity was recorded approximately halfway through the survey with a single brown long-eared bat recorded foraging at 06:01.

T225

No bats were observed returning to (or associated with) T225 during the dawn re-entry survey on the 11th August 2022.

A moderate level of background activity was recorded throughout the survey, comprising predominately of common pipistrelles, with infrequent soprano pipistrelles and noctules. At the end of this survey, a buzzard (*Buteo buteo*) was recorded emerging from this tree.

No bats were observed returning to (or associated with) T225 during the dawn re-entry survey on the 20th September 2022.

A low level of background activity was recorded throughout the survey, comprising predominately of noctules, with infrequent Natterer's and unidentified *Plecotus* species.

T296A

No bats were observed emerging from (or associated with) T296A during the dusk emergence survey on the 9th August 2022.

A high level of background activity was recorded throughout the survey, comprising predominately common pipistrelles, with infrequent noctules.

No bats were observed returning to (or associated with) T296A during the dawn re-entry survey on the 9th September 2022.

A moderate level of background activity was recorded throughout the survey, comprising solely common pipistrelles.

W293A

No bats were observed emerging from (or associated with) W293A during the dusk emergence survey on the 9th August 2022.

A high level of background activity was recorded throughout the survey, comprising predominately of common pipistrelles with infrequent soprano pipistrelles, unidentified myotis and a single noctule pass at 21:59.

No bats were observed returning to (or associated with) W293A during the dawn re-entry survey on the 19th August 2022.

A low level of background activity was recorded throughout the survey, comprising of common pipistrelles and noctules.

4. RECOMMENDATIONS

This section collates the information gained during the bat surveys, presents potential ecological constraints and makes initial recommendations for mitigation. It has been prepared in view of the potential development of the site. The recommendations detailed below may be subject to change dependent on the finalisation of development proposals from the emerging masterplan.

Recommendations should be reviewed prior to any development, to ensure that the proposed mitigation strategy remains relevant to the final development proposals.

4.1 Summary of Results

Several confirmed day roosts of common pipistrelles *Pipistrellus pipistrellus* have been recorded at the following buildings and trees:

- Buildings; B2, B3, B9, B13, B17a, B21a, B21b, B22 and B27; and
- Trees: T365.

Additional trees, on and adjacent to the site but not impacted by the current development proposals (particularly along the southern and eastern boundary) may provide bat roosting potential and / or contain bat roosts. Should the development proposals / site layout change, any amendments must be reviewed and the implications for bats (and requirements for additional surveys) re-assessed.

At least 12 species of bats were recorded foraging or commuting within the site, including common pipistrelle, noctule *Nyctalus noctula*, serotine *Eptesicus serotinus*, common *Myotis* sp. (with call characteristics of Daubenton's *Myotis daubentonii*, Brandt's *Myotis brandti*, Natterer's *Myotis nattereri* and whiskered bat *Myotis mystacinus*) and very infrequent grey long eared *Plecotus austriacus* and soprano pipistrelle *Pipistrellus pygmaeus*.

Activity levels were generally highest during the mid-summer months, with infrequent activity from rarer species including barbastelle and Bechstein's *Myotis bechsteinii*.

The woodland blocks and clusters of buildings within the site provide good foraging habitat and potential roosting opportunities, with the habitat to the south-east likely to be less suitable due to its proximity to a nearby housing estate, although it is likely to still be used by light-tolerant species such as pipistrelles. The linear lines of trees connecting the woodland areas also act as good commuting routes between the woodland blocks.

4.2 Mitigation

Due to the presence of several low conservation status bat roosts within the site, a suitable licence will be required if demolition or significant works are required to buildings containing bat roosts, that may damage or destroy these roosts, or works that may disturb roosting bats. Due to the low number and common species of roosts present, a Bat Mitigation Class Licence (BMCL) site registration would be sufficient to proceed lawfully.

Compensation for the destruction of bat roosts can comprise tree-mounted bat boxes, such as Schwegler 2F with double front panel (suitable for pipistrelle bats), ridge tile features built directly into rooflines and bespoke roosting features integrated into new buildings.

To avoid negative impacts on existing foraging habitat and commuting routes for bats, linear green infrastructure features should be retained wherever possible and specifically including the tree lines throughout the site. Ecological input should be provided to inform the Construction Environmental Management Plan (CEMP) with regards protecting retained vegetation.

Where it is not possible (or is only partially possible) to retain existing connective features and foraging resources, appropriate compensation (such as the provision of replacement green infrastructure) should be considered. This may include hedgerow planting, with connectivity around the site and to off-site features, provision of grassland areas managed appropriately to encourage diverse invertebrate assemblages, or water features (such as swales or Sustainable Urban Drainage System features, designed for wildlife).

In addition to the retention of hedgerows and creation of compensatory habitat where necessary, the construction and operational lighting scheme should be designed to avoid wherever possible light spill onto new or retained habitats of value to bats and other nocturnal wildlife.

Any lighting strategy for the site should be sensitive to bats and should follow guidelines as set out by BCT[9], adhering to the following parameters:

- Using low or high-pressure sodium lights or LEDs instead of mercury or metal halide lamps where possible;
- Directing lighting to where needed and avoiding spillage, including the use of hoods, cowls, shields etc. to avoid spillage onto the creek and areas of vegetation;
- Only lighting areas which need to be lit, and using the minimal level of lighting required to comply with building regulations;
- Using where possible movement sensors or timers on security lighting; and
- Avoiding the use of lamps greater than 150 W.

9 Bat Conservation Trust (2018) Bats Artificial Lighting in the UK. Guidance Note 08/18

APPENDIX 1
FIGURES

Legend

- Red Line Boundary

Last Surveyed in 2022; Results

- Bat absence
- Confirmed bat presence

Last Surveyed in 2019; Notes

- Building surveyed by Arcadis in 2018 and 2019

Note:
This figure presents the locations of the bat buildings within the West of Ifield Golf Course Area.

The buildings last surveyed by Ramboll in 2022 and the results of the surveys are presented here.
In addition, there were a number of buildings last surveyed by Arcadis in 2019; their locations have been marked and labelled in this figure.

Figure Title
Bats Client Summary Results - Golf Course

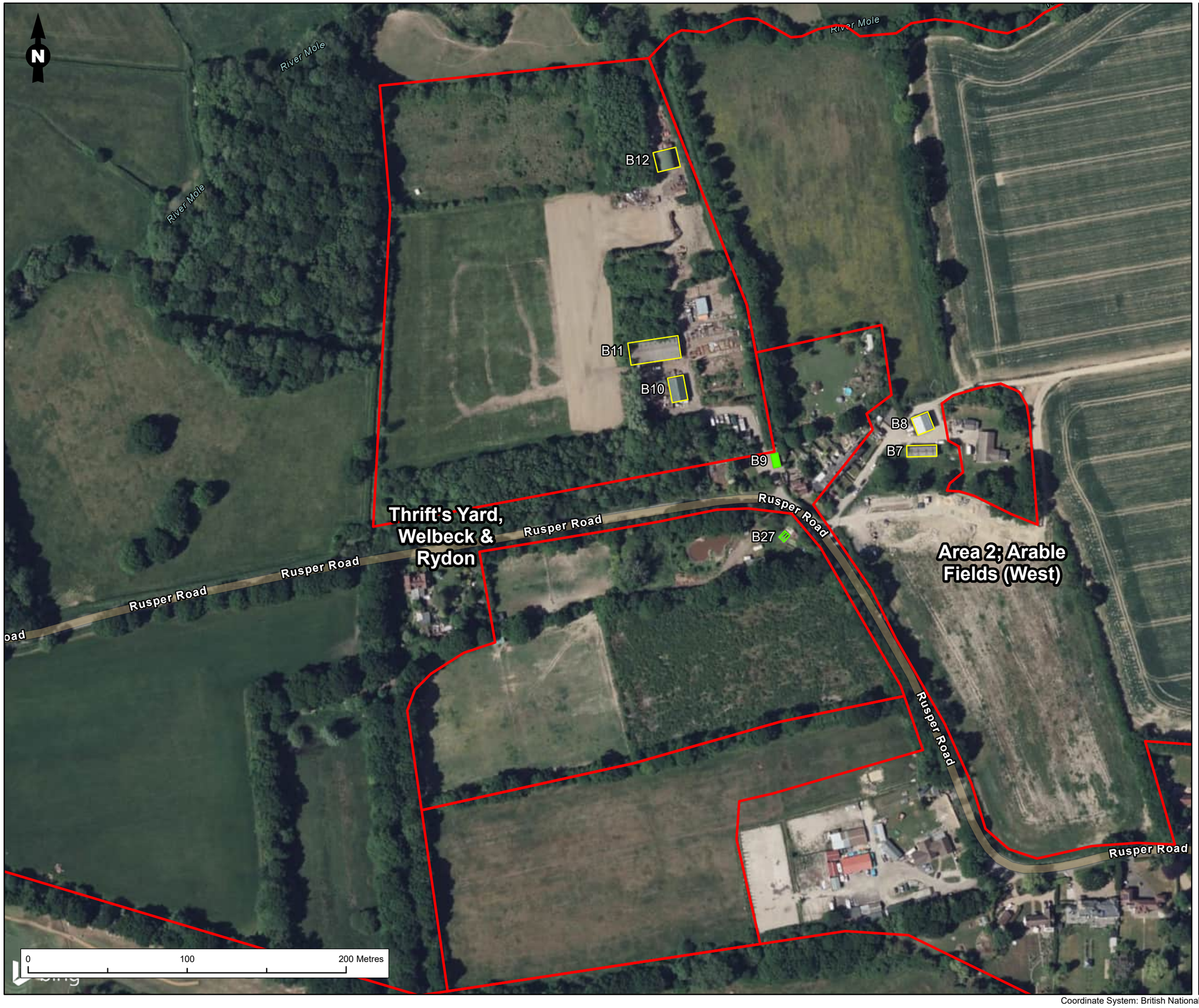
Project Name
West of Ifield
2022 Ecology Surveys

Project Number	Figure No.
1620007949	1
Date	**Prepared By**
December 2022	HX
Scale	**Issue**
1:3,250 @A3	1

Client
Homes England

RAMBOLL

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.



Legend

- Red Line Boundary

Last Surveyed in 2022; Results

- Bat absence
- Confirmed bat presence

Last Surveyed in 2019; Notes

- Building surveyed by Arcadis in 2018 and 2019

Note:
This figure presents the locations of the bat buildings within the West of Ifield Golf Course Area.

The buildings last surveyed by Ramboll in 2022 and the results of the surveys are presented here.
In addition, there were a number of buildings last surveyed by Arcadis in 2019; their locations have been marked and labelled in this figure.

Figure Title: Bats Client Summary Results - TWR and Area 2 (West)	
Project Name: West of Ifield 2022 Ecology Surveys	
Project Number: 1620007949	Figure No.: 2
Date: December 2022	Prepared By: HX
Scale: 1:2,250 @A3	Issue: 1
Client: **Homes England**	

RAMBOLL

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

Legend

- Red Line Boundary

Last Surveyed in 2022; Results

- Confirmed bat presence

Last Surveyed in 2020; Results

- Bat absence

Last Surveyed in 2019; Notes

- Building surveyed by Arcadis in 2018 and 2019

Note:
This figure presents the locations of the bat buildings within the West of Ifield Golf Course Area.

The buildings last surveyed by Ramboll in 2020-2022 and the results of the surveys are presented here.
In addition, there were a number of buildings last surveyed by Arcadis in 2019; their locations have been marked and labelled in this figure.

Figure Title
Bats Client Summary Results - Area 1

Project Name
West of Ifield
2022 Ecology Surveys

Project Number	Figure No.
1620007949	3
Date	**Prepared By**
December 2022	HX
Scale	**Issue**
1:1,800 @A3	1

Client
Homes England

RAMBOLL

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

Legend

- Red Line Boundary

Building Survey Planned for 2023; Notes

- Building to be surveyed in 2023, Access required
- No survey required in 2023, Results available from 2022
- No survey required in 2023, Building has Negligible potential

Note:
This figure presents the locations of the bat buildings within the West of Ifield Golf Course Area.
Buildings in blue show the locations of the buildings where bat surveys are planned to be executed in 2023.
Any buildings of Negligible Potential will not be surveyed in 2023.

Figure Title
Buildings Requiring Bat Surveys in 2023 - Golf Course

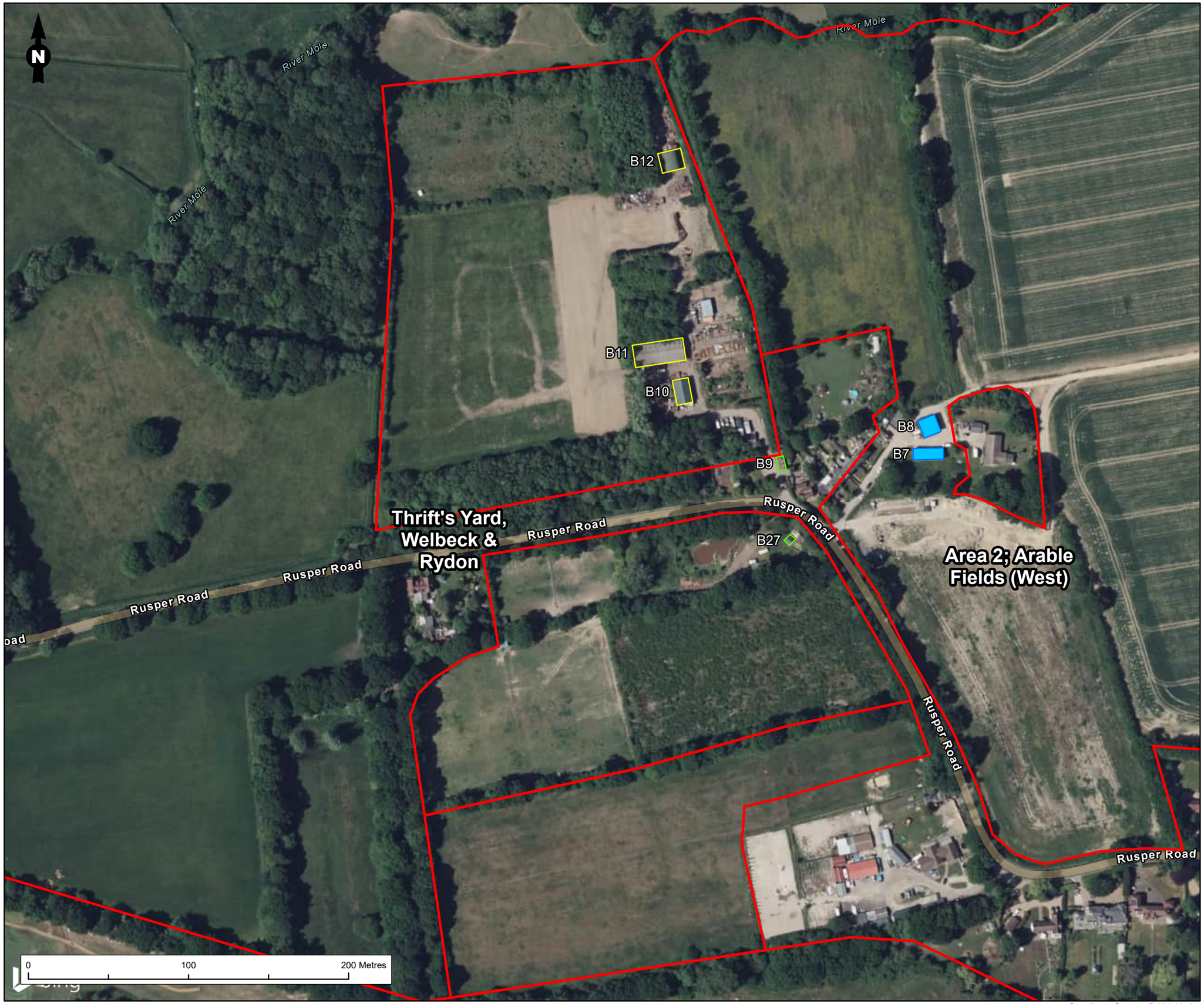
Project Name
West of Ifield
2022 Ecology Surveys

Project Number	Figure No.
1620007949	4
Date	Prepared By
December 2022	HX
Scale	Issue
1:3,250 @A3	1

Client
Homes England

RAMBOLL

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.



Legend

- Red Line Boundary

Building Survey Planned for 2023; Notes

- Building to be surveyed in 2023, Access required
- No survey required in 2023, Results available from 2022
- No survey required in 2023, Building has Negligible potential

Note:
This figure presents the locations of the bat buildings within the West of Ifield Golf Course Area.
Buildings in blue show the locations of the buildings where bat surveys are planned to be executed in 2023.
Any buildings of Negligible Potential will not be surveyed in 2023.

Figure Title
Buildings Requiring Bat Surveys in 2023 - TWR and Area 2 (West)

Project Name
West of Ifield
2022 Ecology Surveys

Project Number	Figure No.
1620007949	5
Date	**Prepared By**
December 2022	HX
Scale	**Issue**
1:2,250 @A3	1

Client
Homes England

RAMBOLL

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

Legend

- Red Line Boundary

Building Survey Planned for 2023; Notes

- Building to be surveyed in 2023, Access required
- No survey required in 2023, Results available from 2022
- No survey required in 2023, Results available from 2020
- No survey required in 2023, Building has Negligible potential

Note:
This figure presents the locations of the bat buildings within the West of Ifield Golf Course Area.
Buildings in blue show the locations of the buildings where bat surveys are planned to be executed in 2023.
Any buildings of Negligible Potential will not be surveyed in 2023.

Figure Title
Buildings Requiring Bat Surveys in 2023 - Area 1

Project Name
West of Ifield
2022 Ecology Surveys

Project Number	Figure No.
1620007949	6
Date	**Prepared By**
December 2022	HX
Scale	**Issue**
1:1,800 @A3	1

Client
Homes England

RAMBOLL

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

Legend

- Site Boundary
- Common Ash
- European Beech
- European Hornbeam
- Goat Willow
- Pedunculate Oak
- Poplar-other
- Trees with bats emerge/re-enter

Figure Title
Figure 7: Golf Course Tree Map

Project Name
West of Ifield, Crawley

Project Number	Figure No.
162007949	7
Date	**Prepared By**
February 2023	NJ
Scale	**Issue**
1:5,000 @A3	1

Client
Turner and Townsend

RAMBOLL

Legend

Emergence / Re-entry Bats Locations

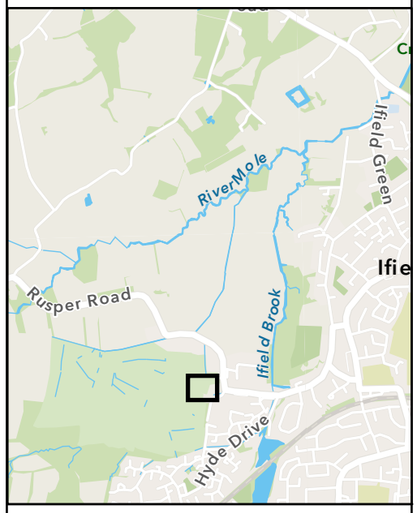


Figure Title

Figure 8: Building 2/3 Emergence / Re-entry Bat Location Plan

Project Name

West of Ifield, Crawley

Project Number	Figure No.
162007949	8
Date	**Prepared By**
March 2023	JBM
Scale	**Issue**
1:500 @A3	1

Client

Turner and Townsend

RAMBOLL

Legend

△ Emergence / Re-entry Bats Locations

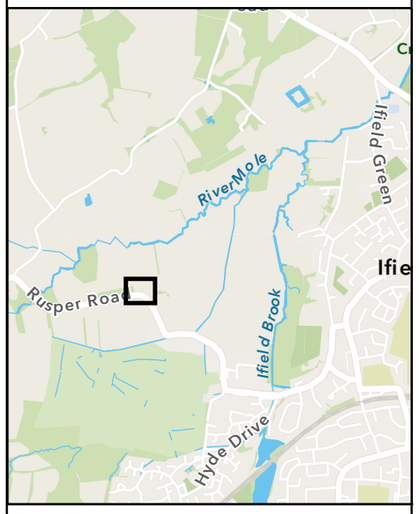


Figure Title

Figure 9: Building 9 Emergence / Re-entry Bat Location Plan

Project Name

West of Ifield, Crawley

Project Number	Figure No.
162007949	9
Date	**Prepared By**
March 2023	JBM
Scale	**Issue**
1:500 @A3	1

Client

Turner and Townsend

RAMBOLL

Legend

Emergence / Re-entry Bats Locations

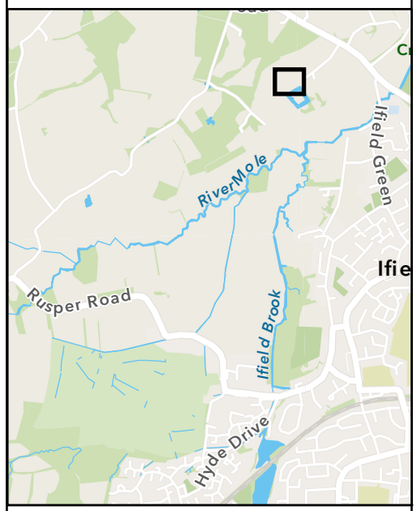


Figure Title

Figure 10: Building 21D Emergence / Re-entry Bat Location Plan

Project Name

West of Ifield, Crawley

Project Number	Figure No.
162007949	10
Date	**Prepared By**
March 2023	JBM
Scale	**Issue**
1:500 @A3	1

Client

Turner and Townsend

RAMBOLL

APPENDIX 8.24: LAND WEST OF IFIELD – BAT ACTIVITY SURVEY REPORT (TRANSECT 5)

Intended for
TURNER & TOWNSEND PLC

On behalf of
HOMES ENGLAND

Document type
REPORT

Date
APRIL 2023

Project number
1620007949

LAND WEST OF IFIELD
BAT ACTIVITY SURVEY REPORT (TRANSECT 5)

RAMBOLL Bright ideas. Sustainable change.

LAND WEST OF IFIELD
BAT ACTIVITY SURVEY REPORT (TRANSECT 5)

Project name	**Land West of Ifield**
Project no.	**1620007949**
Recipient	**Homes England**
Document type	**Report**
Version	**2**
Date	**06/04/2023**
Prepared by	**James Hrynkiewicz**
Checked by	**Ellie Frew**
Approved by	**Matt Royall**
Description	**Bat Activity Survey Report**

Revision	Date	Prepared by	Checked by	Approved by	Description
01	24/03/2023	JH	EF	MR	Issued to Client
02	06/04/2023	JH	EF	MR	Updated Appendix 2

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CONTENTS

LIST OF TABLES

APPENDICES

1. INTRODUCTION

1.1 Background

Ramboll UK Limited ('Ramboll') was commissioned by Turner & Townsend plc, on behalf of Homes England (the 'Client') to undertake a suite of bat surveys in relation to development plans for the Land West of Ifield, Ifield, West Sussex (the 'site'). The site is located at Ordnance Survey (OS) grid reference TQ 23679 36673, within the administrative boundary of West Sussex as shown in Appendix 1. This report presents the findings of bat activity surveys, carried out by Ramboll and Simlaw ecologists between May and October 2022.

Bat surveys were previously undertaken at the site by Arcadis Consulting Ltd ('Arcadis') between 2018 and 2019. Results from the 2019 survey report[1] comprised nine species of bats recorded using the site during these surveys. Due to the time elapsed since these surveys were completed, update surveys were required at the site.

The 2019 surveys by Arcadis also included the Ifield Brook Wood and Meadows Local Wildlife Site (LWS), to the east of the site, which was previously incorporated within the proposed development area, however, this area is no longer within the proposed red-line boundary (with the exception of a potential cycle / pedestrian route crossing this area in one location).

The main body of this report only includes the results for the Transect 5 which was undertaken by Ramboll. Transects 1, 2, 3 and 4 were undertaken by Simlaw[2] and the results of the surveys are found in Appendix 2.

1.2 Proposed Development

At the time of writing, Ramboll understands that the proposed development will comprise:

- 3,000 new residential units with associated infrastructure;
- Space for employment, retail, community uses and landscaping; and
- Access arrangements.

Further details regarding the proposed development will be determined in due course and may be subject to revision.

1.3 Objectives

The aim of this report is to outline the results of a suite of bat activity surveys undertaken at the site during the 2022 survey season.

The structure and content of the report is based on current ecological report writing guidance (CIEEM, 2017[3] and British Standards Institution, 2013[4]).

The content of this report is based on the findings of bat activity transects and automated static detector surveys, repeated on a monthly basis throughout the survey season.

The specific objectives of the surveys and this report were:

[1] Arcadis (October 2019). Land west of Ifield – Bat Survey Report. Report reference: WOI-AUK-XX-WS-RP-EC-00013-01-Bat Survey Report.
[2] Bat Activity Assessment: Land west of Ifield, Crawley. December 2022: Reference SE22-451b
[3] CIEEM (2017). Guidelines on Ecological Report Writing. Chartered Institute of Ecology and Environmental Management, Winchester.
[4] British Standards Institution (2013). BS 42020:2013. Biodiversity – Code of Practice for Planning and Development. BSI Standards Limited, London.

Assessment of potential impacts arising from the proposed development on foraging and commuting bats will be included in the Ecology chapter of the Environmental Statement (ES) after the site development layout has been fixed. Similarly, final mitigation, compensation and enhancement strategies and commitments will be outlined within the ES chapter.

The impact assessment and subsequent mitigation strategy detailed within the ES chapter will be informed by a combination of this report (addressing bat activity recorded during transects and static detector surveys), the Emergence/Re-entry Survey Report (Ramboll, 2023)[5] and the Bat Trapping and Radio-Tracking Baseline Report (DWE on behalf of Ramboll, 2022).

The report is supported by the following appendices:

- Appendix 1: Figures.
- Appendix 2: Simlaw Bat Survey Report.

1.4 Legislation and Policy Framework

Various legislation and planning policies refer to the protection of wildlife, with those relevant specifically to bats summarised below, although this summary should not be regarded as a definitive legal opinion. When dealing with individual cases, the full texts of the relevant documents should be consulted, and legal advice obtained if necessary.

All species of British bat are listed on Schedule 5 of the *Wildlife and Countryside Act 1981 (as amended)* and are afforded protection under Section 9 of this Act. Several bat species are also listed on Section 41 of the *Natural Environment and Rural Communities Act 2006*. The presence of a protected species is of material consideration when Local Planning Authorities (LPAs) evaluate development proposals that, if carried out, have potential to result in disturbance or harm to the species or its habitat

The *National Planning Policy Framework (2021)* outlines that LPAs have a duty to protect and enhance biodiversity, and that consented development proposals should identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks. Lesser horseshoe bat *Rhinolophus hipposideros*, greater horseshoe bat *Rhinolophus ferrumequinum*, Bechstein's bat *Myotis bechsteinii* and barbastelle *Barbastella barbastellus* are also listed in Annex II of the European Union (EU) Habitats Directive and core areas of their habitat are protected under the UK "National Site Network" as Special Areas of Conservation (SACs). Members of SAC populations may rely on habitat outside of the official SAC designation, resulting in this habitat constituting functionally linked habitat.

[5] R1620007949_1_Ifield_Bat_Report (February 2023)

2. METHODOLOGY

2.1 Bat Transect Surveys

In accordance with Bat Conservation Trust (BCT) Good Practice Guidelines (2016)[6], bat activity surveys were undertaken to determine the overall levels of bat activity across the site, and to ascertain seasonal or spatial variation in bat activity levels within the site. Bat activity surveys were undertaken by Ramboll (Transect 5) and Simlaw (Transects 1, 2, 3 and 4) in 2022 (See Appendix 2).

The transect locations and which team undertook them are outlined below and at Figure 2, Bat Transect Plan (Appendix 1):

- Transect 1 (Ifield Golf Course) - Simlaw;
- Transect 2 (Arable Fields) - Simlaw;
- Transect 3 (Pastoral Fields) - Simlaw;
- Transect 4 (Ifield Brook Meadows) Simlaw; and
- Transect 5 (Thrifts Yard, Rydon, and Welbeck Land) - Ramboll.

For sites with Moderate quality bat foraging habitat, guidelines[7] stipulate that one bat activity survey should be undertaken per month between April and October, in appropriate weather conditions. At least one of the surveys should comprise dusk and pre-dawn (or dusk to dawn) surveys within one 24hr period.

In this instance, five separate dusk transect surveys and one dusk / dawn were carried out, between May and October 2022. Five transect routes were walked during each survey, with each transect designed to ensure that all habitat types within the site were sampled (with the habitats providing the best suitability for bats comprising the main focus of the surveys) and including both open areas of grassland and vegetated boundaries / linear features, as shown in Figure 2, Bat Activity Transect Plan (Appendix 1).

Simlaw[8] undertook the bat activity surveys of Transect 1, 2, 3 and 4. They produced a report detailing the results of their surveys as shown in Appendix 2. Ramboll undertook the activity surveys on Transect 5.

Listening stops were conducted at suitable intervals along each transect route and lasted for three minutes each. Each survey commenced at either sunset or 2hrs before sunrise and lasted approximately two hours. The direction in which the route was walked was alternated between surveys, to ensure that various parts of the site were surveyed at various times during the survey, across the full suite of surveys.

All activity transects surveys undertaken at Transect 5 were conducted by suitably qualified Ramboll ecologists.

In this instance, five separate dusk transect surveys and one dusk / dawn were carried out, between May and October 2022.

Five transect routes were established and walked during each survey and designed to ensure that the habitat types within the site were sampled. The habitats providing the best suitability for bats comprising the main focus of the surveys), and which included vegetated boundaries/ linear features, pastoral fields, arable fields, hedgerows, and grassland.

[6] Collins, J. Editor (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines, 3rd Edition. BCT.
[7] Collins, J. Editor (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines, 3rd Edition. BCT.
[8] Bat Activity Assessment: Land west of Ifield, Crawley. December 2022: Reference SE22-451b

Table 1 summarises the locations, timings, weather conditions and equipment used during each Transect 5 survey.

Table 1 Transect Survey Data (Not including Transects 1, 2, 3 and 4)

Transect	Date	Dusk or Dawn	Sunset or Sunrise (24 hour)	Start/ Finish Times (24 hour)	Start/ Finish Temperatures (°C)	Weather at Start	Weather at End	Detector Used
Transect 5	12/05/2022	Dusk	20:41	20:26/22:41	14/12	Warm and clear	Warm and clear	EMT2 Pro
Transect 5	28/06/2022	Dusk	21:22	21:07/23:22	17/16	Warm and clear	Overcast	EMT2 Pro
Transect 5	21/07/2022	Dusk	21:20	21:05/23:15	16/15	Warm and clear	Clear	EMT2 Pro
Transect 5	09/08/2022	Dusk	20:36	20:21/22:36	23/20	Sunny	Clear and mild	EMT2 Pro
Transect 5	26/09/2022	Dusk	18:52	18:37/20:52	13/12	Cloudy but dry	Clear	EMT2 Pro
Transect 5	27/09/2022	Dawn	06:50	04:50/06:50	8/9	Cloudy but dry	Clear	EMT2 Pro
Transect 5	13/10/2022	Dusk	18:13	17:58/20:13	16/11	Cloudy but dry	Clear	EMT2 Pro

Eight statics were deployed across Transects 1, 2, 3 and 5 between May and October for five consecutive nights.

2.2 Sound Analysis

Where necessary, digital recordings of bat echolocation calls recorded during activity transect surveys were analysed using AnalookW (version 4.6e) and Kaleidoscope Pro (version 5.4.8), to aid with species identification and with reference to published bat call parameter data[9].

Digital recordings from automated detector surveys were batch analysed using Kaleidoscope Pro (version 5.4.8) analysis software. Call batches were subsequently manually audited to confirm auto-identification.

Species of myotis (*Myotis* sp.) and long-eared bats (*Plecotus* sp.) were identified to the genus level in some cases where the available data was limited, on the basis of the inherent difficulty in distinguishing between species solely from their echolocation calls.

2.3 Limitations

All areas within the proposed development footprint were fully accessible during the survey(s).

All bat surveys were undertaken at an appropriate time of year, under suitable weather conditions and in accordance with BCT Guidelines (2016).

The activity transects followed a representative route around the site. As surveyors can only be positioned in one location at any given time, it is possible for bat activity to have occurred elsewhere on the site, which would not have been recorded during the surveys. Reversal of the transect route aims to reduce the impact of this limitation in as far as is pragmatic during field surveys.

[9] Russ, J. (2012). British Bat Calls: A Guide to Species Identification. Pelagic Publishing, Exeter.

It is widely accepted that some bat species (including *Myotis* sp. and *Plecotus* sp.) cannot be identified to species levels by acoustic analysis alone, however, call characteristics may give some indication of species and allow some species to be ruled out with a degree of confidence based on multiple call parameters. Advanced survey methods, such as trapping and radio-tracking, are recommended in situations where rare species of these genus,' such as Bechstein's bat (*Myotis bechsteinii*), may be using the proposed development site. The results of such surveys in relation to Land West of Ifield can be found within the Bat Trapping and Radio-Tracking Baseline Report (DWE on behalf of Ramboll, 2022). Similarly, pipistrelle bats (*Pipistrellus* sp.) often change the frequency of their calls depending on their surroundings and the presence of other pipistrelles in the area. Therefore, pipistrelle calls at 50kHz may be from either common or soprano pipistrelles and cannot always be confidently distinguished. Considering species within the same genus tend to require similar mitigation (in the context of this site and the development proposals), this is not considered to be a significant limitation to the conclusions and subsequent recommendations produced by these surveys.

The identification of bat species based on echolocation calls using computer sonogram analysis software is dependent upon the clarity of the sonogram / recording. The quality is subject to weather conditions, the distance of bats from the detector, the presence of physical obstructions and the level of background noise.

Some files for calls recorded during the May and July transect surveys at Transect 5 were corrupted when transferred to the computer for analysis and as such, could not undergo review. However, the surveys were undertaken by an experienced bat ecologist on site during both months and was able to confidently identify the species during the surveys.

The activity transects occasionally had to be diverted away from the predetermined route due to lack of access, presence of livestock or health and safety concerns. Bats are highly mobile animals and bat activity recorded just adjacent to the transect route is likely to have been representative of bat activity along the transect route itself. The lack of access to certain areas of the route during this activity transects was, therefore, not considered to have significantly affected the assessment.

Transect 4 did not have any statics deployed during the survey period. This was due to the fact that Ifield Brook Meadows has been removed from the site boundary. However, the transect was undertaken to gather further information on the foraging and commuting habits of bats within the adjacent habitat.

Ramboll is satisfied that this report represents a robust appraisal of the site. If any action or development has not taken place on this land within 12 months of the date of this report, the findings of this survey should be reviewed by a suitably qualified ecologist and may need to be updated in line with CIEEM's 'Advice Note on the Lifespan of Ecological Reports and Surveys' (2019)[10].

[10] Chartered Institute of Ecology and Environmental Management (CIEEM), 2019. Advice Note on the Lifespan of Ecological Reports and Surveys. CIEEM, Winchester. Available online: https://cieem.net/wp-content/uploads/2019/04/Advice-Note.pdf [Accessed 04/09/2019]

3. RESULTS

3.0.1 May 2022

During the May transect, five bats were observed during the survey, comprising common pipistrelles (*Pipistrellus pipsitrellus*) only. Three bats were observed foraging in the Thrifts Yard area of the site, along the woodland boundaries (See Figure 2A) and by Building 9, where it has been confirmed common pipistrelles were roosting. Two bats were observed by Listening Stop (LS) 14 and LS15 foraging.

3.0.2 June 2022

During the June transect, eight bats were observed during the survey, comprising common pipistrelles and noctules (*Nyctalus noctula*). Two noctules were observed at LS19 and LS15, commuting across the Rydon area of the site (See Figure 2B). A single common pipistrelle was observed foraging around the mature oak trees by LS14. Five common pipistrelles were observed foraging across the Thrifts Yard area of the site. Two of these bats were observed foraging over LS8 and LS1 and three were observed foraging in between listening stops, using linear features such as hedgerow and woodland boundaries.

3.0.3 July 2022

During the July transect, ten bats were observed during the survey, comprising common pipistrelles and noctules (See Figure 2C). Two noctules were observed commuting across the Thrifts Yard area of the site from LS1 and between LS1 and LS2. One common pipistrelle was recorded flying around Building 9, which is a confirmed common pipistrelle day roost. One common pipistrelle was observed foraging within the Welbeck area of the site between LS9 and LS10, and a second common pipistrelle was observed foraging around LS14. Within the Rydon area of the site, four common pipistrelle were observed foraging over LS16, LS17, LS19 and LS20, with one common pipistrelle foraging between LS17 and LS18.

3.0.4 August 2022

During the August transect, twelve bats were observed during the survey, comprising common pipistrelles, soprano pipistrelles (*Pipsitrellus pygmeus*) and noctules (See Figure 2D). One noctule was observed commuting across the Rydon area of the site at LS20 and one noctule was observed commuting over LS18. One common pipistrelle was observed foraging between LS14 and LS13. Within the Welbeck area of the site, a common pipistrelle was observed foraging by LS11, a common pipistrelle was observed foraging around LS10 and a common pipistrelle was observed commuting between LS10 and LS9. At the Thrifts Yard area of the site, one common pipistrelle was observed foraging around Building 9, a second common pipistrelle was observed foraging up and down the woodland edge by LS7, and a third common pipistrelle was observed consistently foraging between LS4 and LS3. One soprano pipistrelle was also observed commuting over LS2 and a second soprano pipistrelle was observed foraging up and down the hedgerow at LS1.

3.0.5 September 2022

During the September transect Ramboll undertook back-to-back surveys. Across both surveys eleven bats were observed (See Figure 2E). The species recorded comprised common pipistrelles, soprano pipistrelles and noctules. During the dusk transect one noctule was seen flying over the Thrifts Yard site and one common pipistrelle was observed commuting over LS1. One common pipistrelle was observed foraging along the woodland boundary by LS7, with a soprano pipistrelle

observed foraging around the paddocks adjacent to LS10 and a second soprano pipistrelle observed foraging around LS12 (within the Welbeck area of the site). During the dawn transect two common pipistrelle were observed foraging around LS13 and one common pipistrelle was observed foraging up and down the road between LS13 and LS14.

3.0.6 October 2022

During the October transect, eight bats were observed during the survey comprising common pipistrelles only (See Figure 2F). One common pipistrelle was observed in the Rydon area of the site at LS19, with a second observed foraging around LS18, a third observed foraging between LS18 and LS17 and a fourth observed foraging between LS15 and LS16. One common pipistrelle was observed foraging under the tree line between LS14 and LS13 with another observed foraging along the woodland boundary within the Thrifts Yard area of the site, between LS4, LS3 and LS2, and a third common pipistrelle was observed foraging along the hedgerow by LS1. Within the Rydon area of the site, one common pipistrelle was observed foraging around LS15, with a second observed foraging along the woodland edge between LS17 and LS18. One common pipistrelle was observed foraging between the woodland and the road at LS19 and a second was observed foraging around LS20.

3.1 Static Detector Surveys

Static A (Top of Pastoral Fields)

Static A is located along the hedgerow boundary within the top cattle field (See Appendix 1: Figure 3). Common pipistrelle were the most common species recorded at this location throughout the survey season, with a peak count in July as shown in Table 3.1.

Compared to other static locations, this static showed moderate activity for common pipistrelles and low activity for brown long-eared bats (*Plecotus auritus*), myotis species, noctules, soprano and Nathusius' pipistrelles (*Pipistrellus nathusii*), which were infrequently recorded throughout the season as shown in Table 3.1.

Static B (West of Pastoral Fields)

This static was installed at a line of trees, in close proximity to a woodland that is within the redline boundary of the site and runs along the north-west of the middle pastoral field (see Appendix 1: Figure 3).

Common pipistrelle was the most common species recorded at this location throughout the survey season, with a peak count in May.

In October, high counts of common pipistrelles and moderate levels of myotis species were recorded, which was higher than at any other static location during the final month of surveys. Likewise, common pipistrelle counts in May were high compared to other static locations for the month.

The static recorded low levels of brown long eared, leisler's, noctules, serotine, soprano and Nathusius' pipistrelles infrequently.

Static C (North-west of Arable Fields by stream)

This static was installed along the tree line, north-west of the arable fields following the River Mole (S=see Appendix 1: Figure 3).

Common pipistrelles were the most common species recorded at this location throughout the survey season, with the peak count of June. Low levels of myotis were recorded in June, July,

September, and October. One grey long-eared pass was recorded at this location in June and one barbastelle pass was recorded in September.

Low levels of activity were recorded throughout the survey season for all other species recorded at this location, which comprised leisler's, brown long eared, noctule, serotine and soprano pipistrelles

This static location had a moderate level of activity compared to other static locations which may indicate that this is a good commuting corridor for a common assemblage of species.

Static D (Central of Arable Fields)

Static D is located along a line of trees within the centre of the arable fields. Common pipistrelle was the most common species at this location throughout the survey season, with a peak count of 490 in July.

One grey long-eared pass was recorded at this location in July.

The static location also recorded brown long eared, Leisler's, noctule, serotine, soprano and Nathusius' pipistrelles infrequently.

Static E (Thrifts Yard)

This static was installed along the eastern hedgerow of Thrifts Yard, at the edge of a small pocket of woodland.

Common pipistrelle was the most common species at this location and throughout the survey season, with peak count being 631 in July. The level of common pipistrelle is deemed to be of moderate activity.

The static recorded barbastelle in June (3 passes) and October (1 passes). The static also recorded brown long eared, Leisler's, myotis, serotine, soprano and Nathusius' pipistrelles infrequently.

Static F (Welbeck)

Static F was installed along a hedgerow boundary between the Welbeck and Rydon areas. Common pipistrelle was the most common species recorded at this location and throughout the survey season, with a peak count in June.

A single grey long-eared bat pass was recorded in June, with moderate levels of myotis species recorded throughout the season, with a peak number of 191 records in September.

The static recorded barbastelle in August (4 passes), September (2 passes) and October (36 passes). The static location also recorded brown long eared, Leisler's, myotis, serotine, soprano and Nathusius' pipistrelles infrequently.

Static G (Northern Boundary of Golf Course)

Static G was installed along the ancient woodland boundary within Ifield Golf Course. Common pipistrelle was the most common species recorded at this location and throughout the survey season, with a peak count in July.

This location recorded the lowest overall level of bat activity throughout the season, with the majority of recordings comprising common pipistrelles. It also recorded 323 which was the fewest number of species across the season.

Four grey long-eared passes were recorded in July. The static location also recorded brown long eared, Leisler's, myotis, serotine, noctule and soprano pipistrelles infrequently.

Static H (Southern boundary of Golf Course)

Static H was installed along a woodland boundary at the bottom of the Ifield Golf Course, adjacent to the Rydon area. Common pipistrelles were the most common species recorded at this location and throughout the survey season, with a peak count in July and high levels of pipistrelle activity also recorded in May.

Ten grey long-eared passes were recorded in July and barbastelle were recorded in July (3 passes), September (25 passes) and October (9 passes). The static location also recorded brown long eared, Leisler's, myotis, serotine, noctule and soprano/Nathusius' pipistrelles infrequently

Summary of Results

Overall, common pipistrelles were by far the most recorded species during the static detector surveys, with peaks in May, June, and July.

Noctules, Leisler's, barbastelles, serotines, brown long-eared, soprano and Nathusius' pipistrelle bats were frequently recorded across the statics, although at low levels. Grey long-eared bats were the rarest species of bat recorded at only two locations, comprising Static C and Static F (see Appendix 1: Figure 3). Various myotis species, were recorded across the site at low to moderate levels, with the moderate levels of *Myotis sp.* recorded by Static B and Static F. Myotis species recorded at Static B had call characteristics of whiskered, Natterer's bat, Brandt's, Daubenton's, and Bechstein's. Myotis species recorded at Static F had call characteristics of whiskered, Natterer's bat, Brandt's, Daubenton's, and Bechstein's.

Table 3.1: Static Detector Survey Results – Static A

Bat Species	Monthly Count (Number of Passes)					
	May 2022	**June 2022**	**July 2022**	**August 2022**	**September 2022**	**October 2022**
Brown long-eared				3	1	1
Grey long-eared						
Barbastelle						
*Myotis sp.**			1	1	1	34
Leisler's						
Noctule		5	1	1		1
Common pipistrelle	24	103	491	269	433	306
Soprano pipistrelle		1	1	1	1	1
Nathusius' pipistrelle	1					
Serotine			4			
*With call characteristics of Brandt's, Daubenton's, Bechstein's (max. 12 passes at one location) and whiskered						

Table 3.2: Static Detector Survey Results - Static B

Bat Species	Monthly Count (Number of Passes)					
	May 2022	June 2022	July 2022	August 2022	September 2022	October 2022
Brown long-eared			1	1		
Grey long-eared						
Barbastelle						
*Myotis sp.**	1		9	2	9	227
Leisler's			2			
Noctule	8	3	2	5	6	1
Common pipistrelle	1843	31	95	11	401	3099
Soprano pipistrelle	10		2	1	13	28
Nathusius' pipistrelle	2					
Serotine		3				
*With call characteristics of whiskered, Natterer's bat, Brandt's, Daubenton's, and Bechstein's (max. 12 passes at one location)						

Table 3.3: Static Detector Survey Results - Static C

Bat Species	Monthly Count (Number of Passes)					
	May 2022	June 2022	July 2022	August 2022	September 2022	October 2022
Brown long-eared			2		2	
Grey long-eared		1				
Barbastelle					1	
*Myotis sp.**		3	4		6	5
Leisler's		1	7			
Noctule	2	14	37		1	
Common pipistrelle	22	875	556		238	23
Soprano pipistrelle		8	7		1	1
Nathusius' pipistrelle						
Serotine		1	60		2	
*With call characteristics of Brandt's, Daubenton's, Natterer's, Bechstein's (max. 12 passes at one location) and whiskered						

Table 3.4: Static Detector Survey Results - Static D

Bat Species	Monthly Count (Number of Passes)					
	May 2022	June 2022	July 2022	August 2022	September 2022	October 2022
Brown long-eared		1	1	4	1	
Grey long-eared			1			
Barbastelle						
*Myotis sp.**		1		5	2	
Leisler's		3	2			
Noctule		26	34	6	1	
Common pipistrelle		198	490	92	147	
Soprano pipistrelle		5	9	22	6	
Nathusius' pipistrelle		3				
Serotine		2	18		3	

*With call characteristics of Brandt's, Daubenton's, Natterer's, Bechstein's (max. 4 passes at one location) and whiskered

Table 3.5: Static Detector Survey Results - Static E

Bat Species	Monthly Count (Number of Passes)					
	May 2022	June 2022	July 2022	August 2022	September 2022	October 2022
Brown long-eared		1			1	
Grey long-eared						
Barbastelle		3				1
*Myotis sp.**	2	2	1	3	2	10
Leisler's		11				
Noctule	2	68	14	9	2	
Common pipistrelle	169	302	631	267	140	131
Soprano pipistrelle	1	1	11	2		
Nathusius' pipistrelle		1			1	
Serotine		1				

* With call characteristics of whiskered, Natterer's bat, Brandt's, Daubenton's, and Bechstein's (max. 12 passes at one location)

Table 3.6: Static Detector Survey Results - Static F

Bat Species	Monthly Count (Number of Passes)					
	May 2022	June 2022	July 2022	August 2022	September 2022	October 2022
Brown long-eared		1			8	8
Grey long-eared		1				
Barbastelle				4	2	36
*Myotis sp.**		1		32	191	32
Leisler's				2		
Noctule		42		5		1
Common pipistrelle		1481		573	223	259
Soprano pipistrelle		1		23		3
Nathusius' pipistrelle					1	
Serotine				13	2	

* With call characteristics of whiskered, Natterer's bat, Brandt's, Daubenton's, and Bechstein's (max. 12 passes at one location)

Table 3.7: Static Detector Survey Results - Static G

Bat Species	Monthly Count (Number of Passes)					
	May 2022	June 2022	July 2022	August 2022	September 2022	October 2022
Brown long-eared				1	1	3
Grey long-eared			4			
Barbastelle						
Myotis sp.			3			1
Leisler's			1			
Noctule		1	89		5	
Common pipistrelle		36	117		54	7
Soprano pipistrelle					1	
Nathusius' pipistrelle						
Serotine						

*With call characteristics of Brandt's, Daubenton's, Bechstein's (max. 12 passes recorded at one location), whiskered and Natterer's

Table 3.8: Static Detector Survey Results - Static H

Bat Species	Monthly Count (Number of Passes)					
	May 2022	June 2022	July 2022	August 2022	September 2022	October 2022
Brown long-eared			11		14	
Grey long-eared			10			
Barbastelle			1		25	9
*Myotis sp.**		5	62		20	22
Leisler's		4	41			
Noctule		68	158		3	
Common pipistrelle		1493	7124		445	529
Soprano pipistrelle		73	150		47	104
Nathusius' pipistrelle		1	2		1	
Serotine			8			

* With call characteristics of whiskered, Natterer's bat, Brandt's, Daubenton's, and Bechstein's (max. 12 passes at one location)

4. CONCLUSIONS

This section collates the information gained during the bat activity surveys, draws appropriate conclusions regarding the use of the site by bats, and makes initial recommendations for mitigation in relation to the potential development of the site.

The recommendations detailed below may be subject to change dependent on the finalisation of development proposals from the emerging masterplan. Recommendations should be reviewed prior to any development, to ensure that the proposed mitigation strategy remains relevant to the final development proposals.

4.1 Summary of Bat Activity

At least ten species of bats were recorded foraging or commuting within the site during the 2022 activity surveys, including common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, noctule, Leisler's, serotine, barbastelle, brown long-eared, grey long-eared and myotis species (with call characteristics of whiskered, Natterer's bat, Brandt's, Daubenton's, and Bechstein's).

Common pipistrelles were clearly the most frequent species across the transect and static detector surveys, although this is not necessarily indicative of exceptionally high overall numbers of common pipistrelle bats using the site, as the number of recordings is likely to be exaggerated by the tendency for common pipistrelle to stay in a single location whilst foraging. Noctules were also frequently recorded, particularly between June and September.

Activity levels were generally highest during the May, June, and July months, however in some static locations, high levels of common pipistrelles were also recorded in October. The rarer species, including barbastelle, brown long-eared, grey long-eared, Nathusius' pipistrelle, Leisler's and serotines were more infrequently recorded.

Barbastelle were recorded on statics C, E, F and H. These results are indicative of a small number of individuals using hedgerow or tree canopy at those locations.

Grey long eared were recorded on statics C, D, F, G and H. These results are indicative of a small number of individuals using hedgerow or tree canopy at those locations

Areas of known higher bat activity are at Statics B, F and H as there is suitable habitat for bats to forage and commute down in the form of hedgerows and woodland boundaries. Static B (located to the west of the pastoral fields) was within close proximity to a pocket of woodland at the north-west of the site. Static H, located at the south of the golf course, recorded a wide variety of bat species, and shows high activity near the ancient woodland to the south/south-east of the golf course, extending beyond the site boundary.

Across the site, there is good connectivity and pockets of woodland, which provide good foraging and commuting habitat. At the golf course, Static G showed the lowest level of activity. This static detector was located along the treeline at the northern boundary of the golf course. Whilst there were lower levels of activity, this tree line is still considered a good commuting route to Welbeck land and the surrounding landscape.

Static H had high activity of bat recordings which indicates that the ancient woodland to the south and south-east of the golf course is a good foraging and potential roosting area for common and soprano pipistrelle which were the most recorded bat species across the survey period. The tree lines around the golf course provide good commuting opportunities and connectivity to the wider landscape.

During transect surveys of Transect 5, higher bat activity was noticed around LS9, within close proximity to Building 9, which has a known bat roost.

4.2 Mitigation

To avoid negative impacts on existing foraging habitat and commuting routes for bats, linear green infrastructure features should be retained wherever possible, specifically existing tree lines throughout the site. Ecological input should be provided to inform the Construction Environmental Management Plan (CEMP) with regards protecting retained vegetation.

Where it is not possible (or is only partially possible) to retain existing connective features and foraging resources, appropriate compensation (such as the provision of replacement green infrastructure) should be considered. This may include hedgerow planting, with connectivity around the site and to off-site features, provision of grassland areas managed appropriately to encourage diverse invertebrate assemblages, or water features (such as swales or Sustainable Urban Drainage System features, designed for wildlife).

In addition to the retention of hedgerows and creation of compensatory habitat where necessary, the construction and operational lighting scheme should be designed to avoid minimise light spill, specifically at new or retained habitats of value to bats and other nocturnal wildlife.

Any lighting strategy for the site should be sensitive to bats and should follow guidelines as set out by BCT[11], adhering to the following parameters:

- Using low or high-pressure sodium lights or LEDs instead of mercury or metal halide lamps where possible;
- Directing lighting to where needed and avoiding spillage, including the use of hoods, cowls, shields etc. to avoid spillage onto the creek and areas of vegetation;
- Only lighting areas which need to be lit, and using the minimal level of lighting required to comply with building regulations;
- Using where possible movement sensors or timers on security lighting; and
- Avoiding the use of lamps greater than 150 W.

11 Bat Conservation Trust (2018) Bats Artificial Lighting in the UK. Guidance Note 08/18

APPENDIX 1
FIGURES

Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS, © 2023 Microsoft Corporation © 2022 Maxar ©CNES (2022) Distribution Airbus DS

Legend

- Site Boundary
- Transect 5 Route
- Transect 5 Stops

Bat Activity Survey Records, Species include (Common pipistrelles, Soprano pipistrelles and Noctules)

- May
- June
- July
- August
- September
- October

1. Thrift Yard
2. Welbeck
3. Rydon

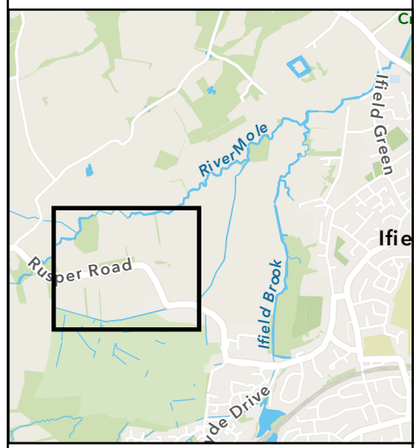

Figure Title

Figure 2: Land West of Ifield: Bat Activity Survey - Results

Project Name

West of Ifield, Crawley

Project Number	Figure No.
162007949	2
Date	Prepared By
March 2023	BE/JBM
Scale	Issue
1:2,500 @A3	2

Client

Turner and Townsend

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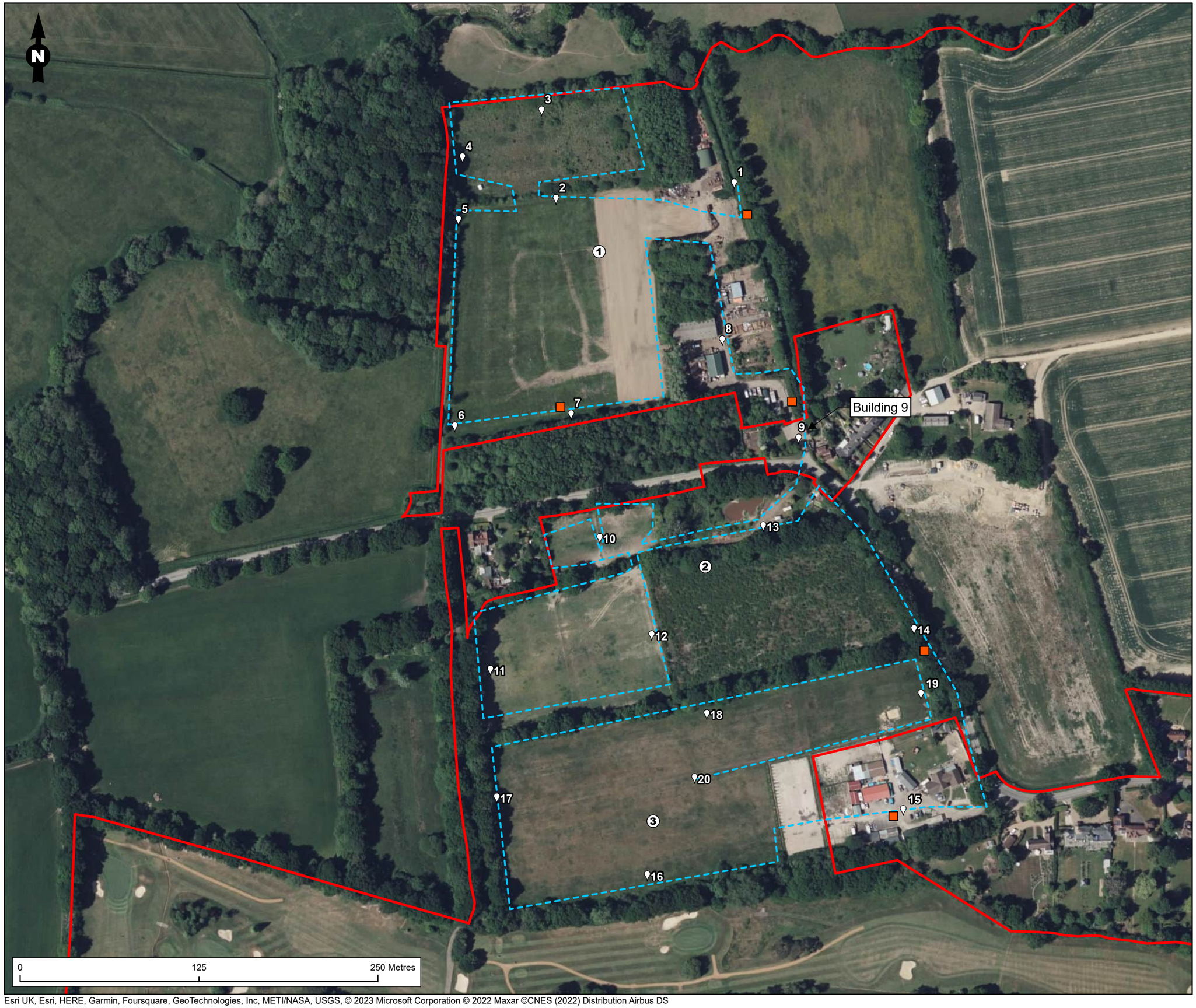

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Legend

- Site Boundary
- Transect 5 Route
- Transect 5 Stops

Bat Activity Survey Records, Species include (Common pipistrelles, Soprano pipistrelles and Noctules)

- May

1. Thrift Yard
2. Welbeck
3. Rydon

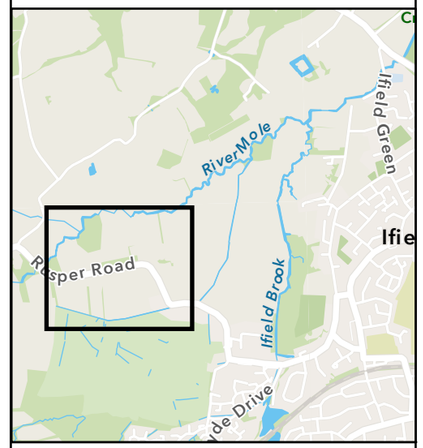

Figure Title

Figure 2: Land West of Ifield: Bat Activity Survey - May Results

Project Name

West of Ifield, Crawley

Project Number	Figure No.
162007949	2a
Date	**Prepared By**
March 2023	BE/JBM
Scale	**Issue**
1:2,500 @A3	2

Client

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Legend

- Site Boundary
- Transect 5 Route
- Transect 5 Stops

Bat Activity Survey Records, Species include (Common pipistrelles, Soprano pipistrelles and Noctules)

- June

1. Thrift Yard
2. Welbeck
3. Rydon

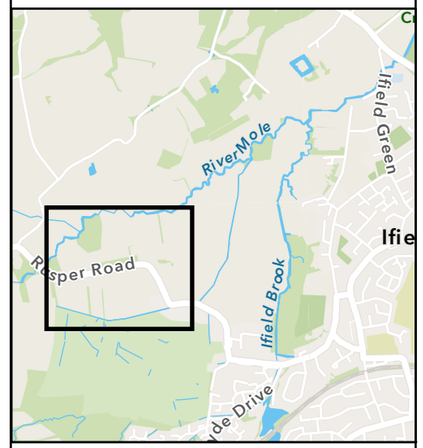

Figure Title

Figure 2: Land West of Ifield: Bat Activity Survey - June Results

Project Name

West of Ifield, Crawley

Project Number	Figure No.
162007949	2b
Date	**Prepared By**
March 2023	BE/JBM
Scale	**Issue**
1:2,500 @A3	2

Client

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N

Building 9

0 125 250 Metres

Legend

- Site Boundary
- Transect 5 Route
- Transect 5 Stops

Bat Activity Survey Records, Species include (Common pipistrelles, Soprano pipistrelles and Noctules)

- July

1. Thrift Yard
2. Welbeck
3. Rydon

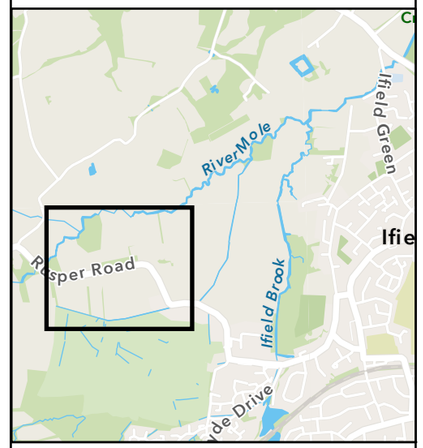

Figure Title

Figure 2: Land West of Ifield: Bat Activity Survey - July Results

Project Name

West of Ifield, Crawley

Project Number	Figure No.
162007949	2c
Date	**Prepared By**
March 2023	BE/JBM
Scale	**Issue**
1:2,500 @A3	2

Client

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RAMBOLL

N

Building 9

0 125 250 Metres

Legend

- Site Boundary
- Transect 5 Route
- Transect 5 Stops

Bat Activity Survey Records, Species include (Common pipistrelles, Soprano pipistrelles and Noctules)

- August

1. Thrift Yard
2. Welbeck
3. Rydon

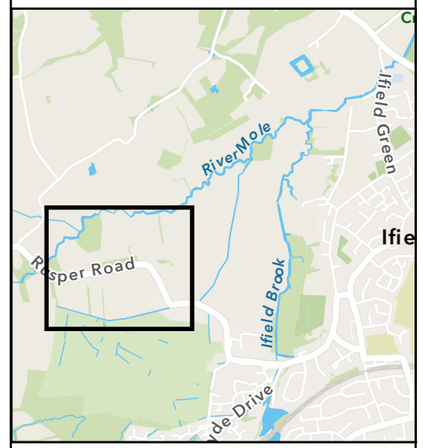

Figure Title

Figure 2: Land West of Ifield: Bat Activity Survey - August Results

Project Name

West of Ifield, Crawley

Project Number	Figure No.
162007949	2d
Date	**Prepared By**
March 2023	BE/JBM
Scale	**Issue**
1:2,500 @A3	2

Client

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N

Building 9

0 125 250 Metres

Legend

- Site Boundary
- Transect 5 Route
- Transect 5 Stops

Bat Activity Survey Records, Species include (Common pipistrelles, Soprano pipistrelles and Noctules)

- September

1. Thrift Yard
2. Welbeck
3. Rydon

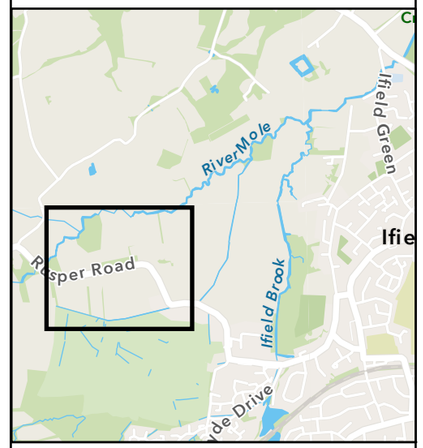

Figure Title

Figure 2: Land West of Ifield: Bat Activity Survey - September Results

Project Name

West of Ifield, Crawley

Project Number	Figure No.
162007949	2e
Date	**Prepared By**
March 2023	BE/JBM
Scale	**Issue**
1:2,500 @A3	2

Client

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N

Building 9

0 125 250 Metres

Legend

- Site Boundary
- Transect 5 Route
- Transect 5 Stops

Bat Activity Survey Records, Species include (Common pipistrelles, Soprano pipistrelles and Noctules)

- October

1. Thrift Yard
2. Welbeck
3. Rydon

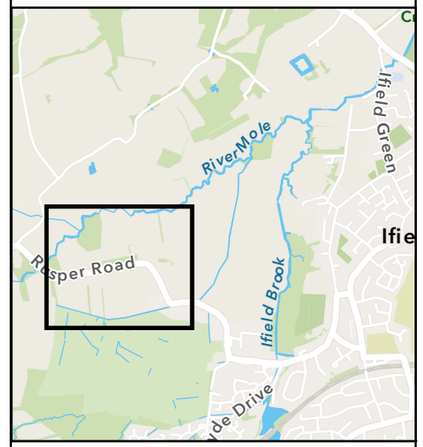

Figure Title

Figure 2: Land West of Ifield: Bat Activity Survey - October Results

Project Name

West of Ifield, Crawley

Project Number	Figure No.
162007949	2f
Date	**Prepared By**
March 2023	BE/JBM
Scale	**Issue**
1:2,500 @A3	2

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Legend

- Site Boundary
- Transect 5 Route
- Static Report Points

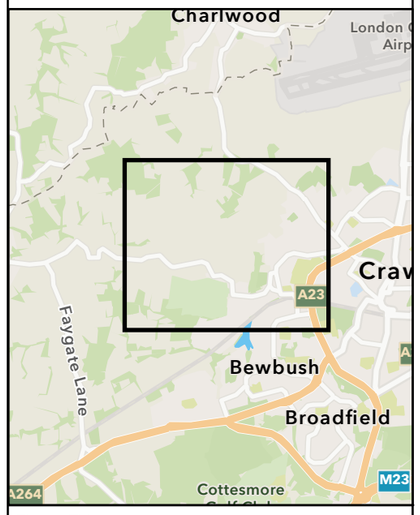

Figure Title
Figure 3: Static Locations

Project Name
West of Ifield, Crawley

Project Number	Figure No.
162007949	3
Date	**Prepared By**
March 2023	JBM
Scale	**Issue**
1:10,000 @A3	1

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APPENDIX 2
SIMLAW BAT ACTVITY REPORT

Bat Activity Assessment

Land west of Ifield, Crawley

Ramboll UK Limited

Reference: SE22-451b
Version: V.02
Date: 20 December 2022

CONTENTS

List of Tables

List of Figures

Control Sheet

Project Information	
Project No.	SE22-451b
Client	Ramboll
Site	Ifield, Crawley
Survey Type	Bat Activity Assessment
Survey Dates	28-29 April 2022 – Dusk/Dawn Bat Activity Survey 12-13 May 2022 – Dusk/Dawn Bat Activity Survey 15-16 June 2022 – Dusk/Dawn Bat Activity Survey 14-15 July 2022 – Dusk/Dawn Bat Activity Survey 11-12 August 2022 – Dusk/Dawn Bat Activity Survey 14-15 September 2022 – Dusk/Dawn Bat Activity Survey 13-14 October 2022 – Dusk/Dawn Bat Activity Survey
Document History	
Authored By	Ella Meekins MSc on 15 November 2022
Checked By	Hannah Rodgers MSc ACIEEM on 18 November 2022
Reviewed By	Daniel Simmons BSc (Hons) on 28 November 2022
Version 1	**Amended:** Ella Meekins MSc on 07 December 2022 **Authorised:** Daniel Simmons BSc (Hons) MCIEEM on 20 December 2022

Non-Technical Summary	
Purpose of Report	To determine the levels of bat activity within the application site; to confirm the bat species assemblage, abundance and use of the Application Site.
Methods used in Assessment	The scope of the surveys comprised dusk or dawn bat activity transect surveys carried out over four transect routes within the land west of Ifield site, Crawley. Each transect route was subject to one dusk or dawn bat activity transect survey in every month between April and October 2022. The findings of the surveys were supported by a data search from the local bat records holder (Sussex Biodiversity Record Centre) and a review of relevant online resources.
Ecological Features	Eight bat species were recorded in flight within the Application Site during the course of the surveys: brown long-eared bat, common pipistrelle, Leisler's bat, *Myotis* sp, Nathusius' pipsitrelle, noctule, serotine and soprano pipistrelle. Transect 3 receievd the most overall bat activity, with 585 bat passes recorded between April and October. Transect 3 was also the transect on which the most bat species were recorded, 7 species, while the other transects recorded 6. The highest frequency of bat passes recorded in a single survey was on Transect 1 in May, during which 218 bat passes were recorded, 216 of which were common pipistrelles. The most bat species were recorded during August and September, with 7 species being recorded across all transects.

1 INTRODUCTION

Background to the Project

Instruction

1.1 Simlaw Ecology was commissioned by Ramboll in April 2022 to conduct a Bat Activity Assessment at the land west of Ifield, Crawley.

Survey Area

1.2 Most of the survey area consisted of farmland, in addition to areas of woodland and the Ifield golf course. Habitats within the survey area included hard standing, amenity grassland, unmanaged grassland, arable fields, planted mature trees and shrubs, scattered scrub, woodland, ponds and streams.

1.3 The survey area was split into 4 transects: Transect 1 (T1) comprised the golf course to the south of the site; Transect 2 (T2) comprised arable fields bound by hedgerows in the centre of the site; Transect 3 (T3) comprised pasture fields bound by hedgerows in the north of the site; and, Transect 4 (T4) comprised an area of woodland and a recreational meadows and an amenity grassland sports pitch to the east. The distribution of each transect route within the wider application site and a maps of each transect can be found in Figures 4 – 8. These transects combined will hereafter be referred to as the 'Application Site'.

1.4 The Application Site was located to the south of Ifield Wood, Crawley. Ifield village was located immediately to the east, and Gatwick airport to the northeast. Arable fields continued beyond the Application site to the west and southwest (Figure 2). A network of hardstanding pathways provided pedestrian access between the different transects.

1.5 The Application Site measured approximately 205 hectare (ha) and was centred on Ordnance Survey National Grid Reference TQ 24005 37537.

Development Proposals

1.6 The full development proposals are understood to comprise the construction of approximately 3000 residential dwellings, three schools and associated infrastructure.

Purpose of the Assessment

1.7 The purpose of the Bat Activity Assesment was to provide data that will enable the Client to determine:

(a) The bat species assemblage that the Application Site supports,

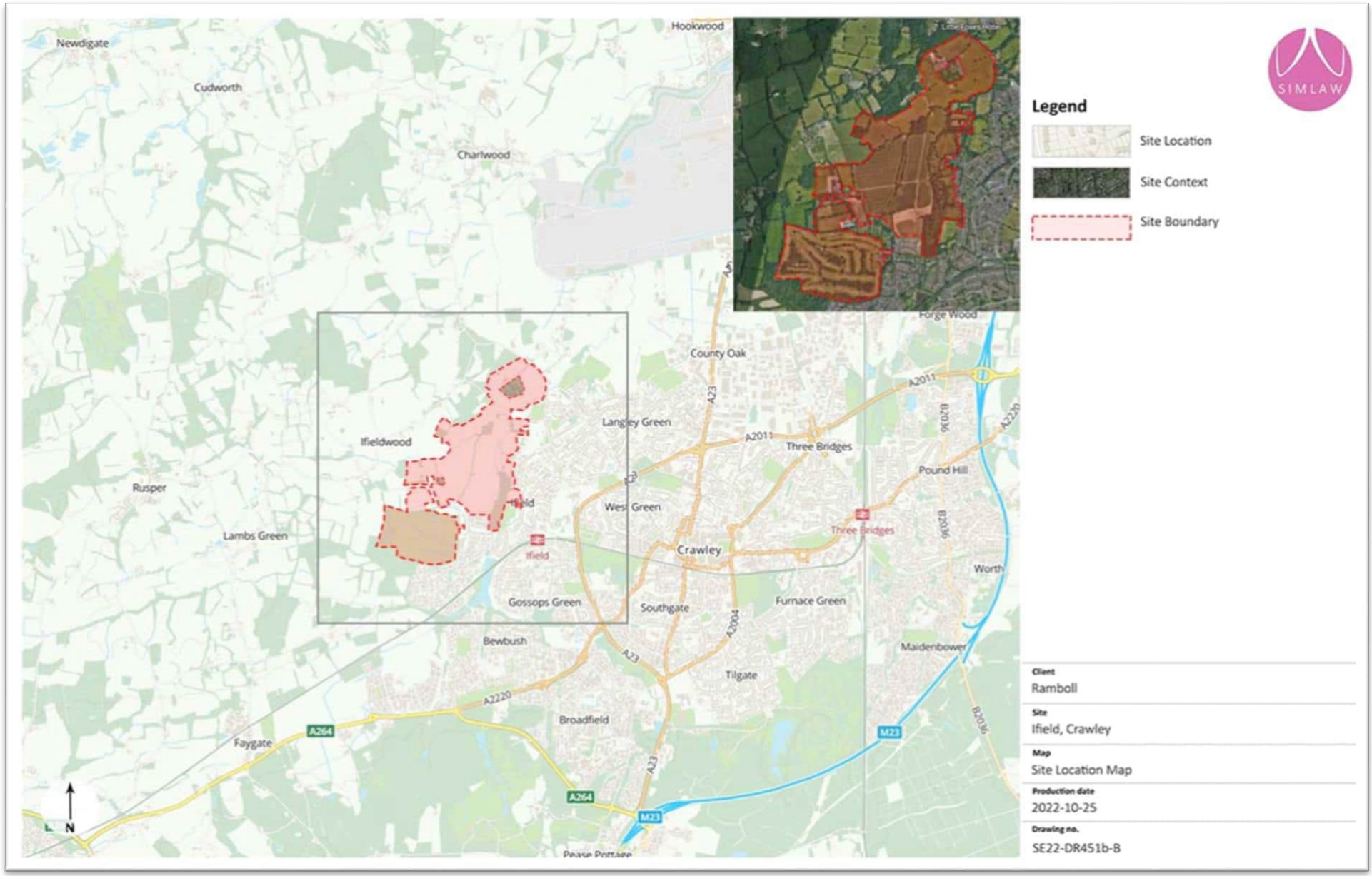
(b) The spatial and temporal distribution of bat activity accross the Application Site

(c) The type of bat activity the Application Site receives from each species; and,

(d) How the Application Site functions in relation to bat habitats in the wider landscape;

Figure 1. Site Boundary (Contains Google Earth Pro data (c) Google Inc. 2022)

Figure 2. Site Location and Context (Contains Ordinance Survey Data (c) Crown Copyright and Database right 2022)



2 METHODOLOGY

Bat Activity Assessment

Desk Study

2.1 The desk study comprised a request for relevant records from the local biological records centre.

Data Search

2.2 The Sussex Biodiversity record centre (SBRC) was commissioned to provide records of bats from within a two-kilometre (km) radius of the Application Site.

2.3 The data were received on 11 November 2022 and all records from the past 20 years are provided within this report.

Nocturnal Bat Surveys

Dusk and Dawn Bat Activity Transect Surveys

2.4 The Bat Activity Assessment was informed by the findings of twenty-eight bat activity surveys, comprising fourteen dusk bat activity surveys (carried out on 28 April, 12 May, 15 June, 14 July, 11 August, 14 September, and 13 October) and fourteen dawn activity surveys (carried out on 29 April, 13 May, 16 June, 15 July, 12 August, 15 September, 14 October).

2.5 The surveys were spread across a seven-month period, with approximately one month in between survey dates. Each of the four transects was surveyed seven times, alternating between dusk and dawn activity surveys, and with the direction of the transect reversed for at least three of these surveys.

2.6 The surveys involved nocturnal observation and recording of bat activity on each transect route over a number of listening posts. Ten Listening Posts (LP1-LP10) were set across each transect and two surveyors walked at a steady pace between these locations, stopping at each one for three-six minutes to record bat passes. The time spent at listening posts varied as surveys continued to best fit the desired survey time of 2.5 hours. The transect routes walked and all LP's are detailed in Figure 3, overleaf.

2.7 Where recorded, bat passes were categorised as 'Emergence', 'Commuting', 'Foraging' and 'Song-flight'[1].

2.8 Two surveyors carried out each survey. Each surveyor was equipped with an Echo Meter Touch 2 Pro bat detector supported by an Apple iPad Mini 5 interface, on which all bat activity was recorded. Recordings were later analysed using Wildlife Acoustics' Kaleidoscope Pro software to aid the identification of species according to current guidelines[2]. Sonogram stills of each species recorded during the surveys, and containing the date and time of each recording, are provided in Appendix 1 of this report.

2.9 All dusk and dawn bat activity transect surveys were carried out across the activity period for bats (April – October, inclusive) and in suitable temperature and weather conditions. The dusk bat activity transect surveys began at sunset and continued until at least 2-3 hours after sunset. The dawn bat activity surveys began 2.5 hours before sunrise and ended at sunrise.

2.10 All survey methods were in accordance with The Bat Conservation Trust's Bat Surveys for Professional Ecologists: Good Practice Guidelines – 3rd Edition (Collins, J. (ed.) (2016), and The Bat Worker's Manual (Mitchell-Jones and McLeish, 2004).

Table 1. Bat Activity Transect Survey Details

Date of survey	Survey Timing	Structure reference/ location	Equipment used (bat detector and logging equipment)	Weather
28.04.2022	Sunset: 20:17 Start: 19:55 End: 22:45	T3 and T4	**Bat Detector:** Echo Meter Touch 2 Pro **Interface:** Apple iPad Mini 5 running Echo Meter Application (Version 2.8.5) **Sound Analysis:** Kaleidoscope Pro (Version 5.4.3)	Temp: 9-13°C Cloud: 90% Wind: Beaufort 2-3 Rain: None

1 During which male bats emit high volumes of social calls in order to denote territory and attract females.
2 Russ, J. (2012) British Bat Calls: *A Guide to Species Identification*. Pelagic Publishing, Exeter

Date of survey	Survey Timing	Structure reference/ location	Equipment used (bat detector and logging equipment)	Weather
29.04.2022	Sunrise: 05:40 Start: 03:30 End: 5:40	T1 and T2	**Bat Detector:** Echo Meter Touch 2 Pro **Interface:** Apple iPad Mini 5 running Echo Meter Application (Version 2.8.5) **Sound Analysis:** Kaleidoscope Pro (Version 5.4.3)	Temp: 6-7°C Cloud: 30% Wind: Beaufort 0 Rain: None
12.05.2022	Sunset: 20:48 Start: 20:48 End: 22:45	T1 and T2	**Bat Detector:** Echo Meter Touch 2 Pro **Interface:** Apple iPad Mini 5 running Echo Meter Application (Version 2.8.5) **Sound Analysis:** Kaleidoscope Pro (Version 5.4.3)	Temp: 11-13°C Cloud: 40% Wind: Beaufort 2 Rain: None
13.05.2022	Sunrise: 05:14 Start: 03:15 End: 05:20	T3 and T4	**Bat Detector:** Echo Meter Touch 2 Pro **Interface:** Apple iPad Mini 5 running Echo Meter Application (Version 2.8.5) **Sound Analysis:** Kaleidoscope Pro (Version 5.4.3)	Temp: 8-10°C Cloud: 0% Wind: Beaufort 1 Rain: None
15.06.2022	Sunset: 21:19 Start: 21:19 End: 23:20	T3 and T4 (reverse)	**Bat Detector:** Echo Meter Touch 2 Pro **Interface:** Apple iPad Mini 5 running Echo Meter Application (Version 2.8.5) **Sound Analysis:** Kaleidoscope Pro (Version 5.4.3)	Temp: 19°C Cloud: 5% Wind: Beaufort 0 Rain: None
16.06.2022	Sunrise: 04:47 Start: 02:30 End: 04:47	T1 and T2 (reverse)	**Bat Detector:** Echo Meter Touch 2 Pro **Interface:** Apple iPad Mini 5 running Echo Meter Application (Version 2.8.5) **Sound Analysis:** Kaleidoscope Pro (Version 5.4.3)	Temp: 11-12°C Cloud: 0% Wind: Beaufort 0 Rain: None

Date of survey	Survey Timing	Structure reference/ location	Equipment used (bat detector and logging equipment)	Weather
14.07.2022	Sunset: 21:13 Start: 21:13 End: 23:30	T1 and T2 (reverse)	**Bat Detector:** Echo Meter Touch 2 Pro **Interface:** Apple iPad Mini 5 running Echo Meter Application (Version 2.8.5) **Sound Analysis:** Kaleidoscope Pro (Version 5.4.3)	Temp: 17-20°C Cloud: 5% Wind: Beaufort 0 Rain: None
15.07.2022	Sunrise: 05:05 Start: 02:35 End: 05:05	T3 and T4 (reverse)	**Bat Detector:** Echo Meter Touch 2 Pro **Interface:** Apple iPad Mini 5 running Echo Meter Application (Version 2.8.5) **Sound Analysis:** Kaleidoscope Pro (Version 5.4.3)	Temp: 12-15°C Cloud: 0% Wind: Beaufort 1 Rain: None
11.08.2022	Sunset: 20:33 Start: 20:33 End: 22:37	T3 and T4	**Bat Detector:** Echo Meter Touch 2 Pro **Interface:** Apple iPad Mini 5 running Echo Meter Application (Version 2.8.5) **Sound Analysis:** Kaleidoscope Pro (Version 5.4.3)	Temp: 20-25°C Cloud: 0% Wind: Beaufort 0 Rain: None
12.08.2022	Sunrise: 05:44 Start: 03:14 End: 05:44	T1 and T2	**Bat Detector:** Echo Meter Touch 2 Pro **Interface:** Apple iPad Mini 5 running Echo Meter Application (Version 2.8.5) **Sound Analysis:** Kaleidoscope Pro (Version 5.4.3)	Temp: 17-18°C Cloud: 0% Wind: Beaufort 1 Rain: None
14.09.2022	Sunset: 19:21 Start: 19:21 End: 21:23	T1 and T2	**Bat Detector:** Echo Meter Touch 2 Pro **Interface:** Apple iPad Mini 5 running Echo Meter Application (Version 2.8.5) **Sound Analysis:** Kaleidoscope Pro (Version 5.4.3)	Temp: 14-18°C Cloud: 5% Wind: Beaufort 1 Rain: None

Date of survey	Survey Timing	Structure reference/ location	Equipment used (bat detector and logging equipment)	Weather
15.09.2022	Sunrise: 06:38 Start: 04:05 End: 06:38	T3 and T4	**Bat Detector:** Echo Meter Touch 2 Pro **Interface:** Apple iPad Mini 5 running Echo Meter Application (Version 2.8.5) **Sound Analysis:** Kaleidoscope Pro (Version 5.4.3)	Temp: 11-12°C Cloud: 100% Wind: Beaufort 1 Rain: None
13.10.2022	Sunset: 18:18 Start: 18:18 End: 20:12	T3 and T4 (reverse)	**Bat Detector:** Echo Meter Touch 2 Pro **Interface:** Apple iPad Mini 5 running Echo Meter Application (Version 2.8.5) **Sound Analysis:** Kaleidoscope Pro (Version 5.4.3)	Temp: 14-15°C Cloud: 50% Wind: Beaufort 1 Rain: None
14.10.2022	Sunrise: 07:24 Start: 04:50 End: 07:24	T1 and T2 (reverse)	**Bat Detector:** Echo Meter Touch 2 Pro **Interface:** Apple iPad Mini 5 running Echo Meter Application (Version 2.8.5) **Sound Analysis:** Kaleidoscope Pro (Version 5.4.3)	Temp: 10-11°C Cloud: 70% Wind: Beaufort 1 Rain: None

Figure 3. Location of the Transect Routes within the Application Site

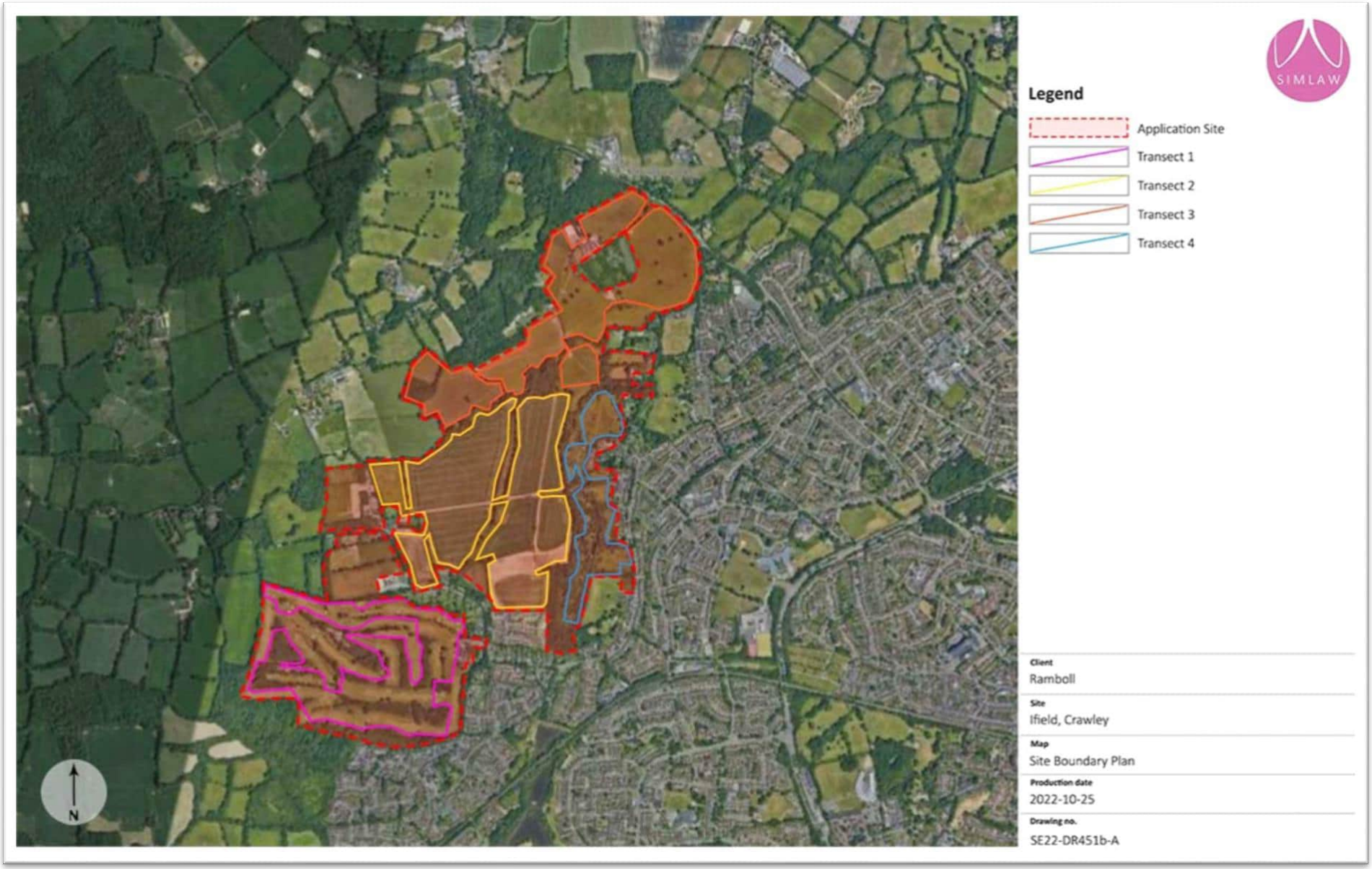


Figure 4. Bat Activity Transect Route 1 and Listening Points (Contains Google Earth Pro data © Google Inc. 2022)

Figure 5. Bat Activity Transect Route 2 and Listening Points (Contains Google Earth Pro data © Google Inc. 2022)

Figure 6. Bat Activity Transect Route 3 and Listening Points (Contains Google Earth Pro data © Google Inc. 2022)

Figure 7. Bat Activity Transect Route 4 and Listening Points (Contains Google Earth Pro data © Google Inc. 2022)

Bat Sound Analysis and Interpretation

Defining a 'Bat Pass'

2.11 Bat activity within this report is referenced in terms of number of 'bat passes' recorded during each survey. The Echo Meter Touch detectors trigger each time bat echolocation is detected by the microphone and, once triggered, the detector will record the echolocation for 3-15 seconds, before creating a new file. Each triggered recording file is then regarded as one 'bat pass' within this report.

2.12 Each file may contain one or several bats; therefore, the number of 'bat passes' does not equate to the number of bats within audible range of the detector. It does, however, provide data on the duration of bat activity within audible range of the detector, during the surveys.

Surveyor Information

Bat Activity Assessment

2.13 The bat activity assessment was designed by Daniel Simmons BSc, MCIEEM, Principal Ecologist at Simlaw Ecology. Daniel holds a BSc in Biodiversity, Conservation and Management from the Durell Institute of Conservation and Ecology, University of Kent, Canterbury. He is a licensed bat ecologist (Level 2 Bat Survey Class Licence and Bat Mitigation Class Licence Registered Consultant); has over twelve years ecological consultancy experience; and, is a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM).

2.14 Daniel was assisted in carrying out the surveys by Ecologist Hannah Rodgers MSc ACIEEM and Assistant Ecologists Natasha Wilson BSc, Ella Meekins MSc and Ada Lewis BSc.

Limitations

Interpretation of Desk Study Data

Data Search

2.15 Records of bats and bat roosts returned by the data search are limited by the availability of records to the local records holder and so may not account for all species potentially present within the Application Site or locally. This limitation has been addressed through undertaking a thorough desk study, which took account of the general geographical distributions of bat species and habitats in the wider landscape, and a precautionary approach to interpreting field survey findings.

Bat Activity Transect Route

Access

2.16 The bat activity transect routes occasionally had to be diverted away from the route due to lack of access, presence of livestock and health and safety concerns. Bats are highly mobile animals and bat activity recorded just adjacent to the transect route would have been representative of bat activity within the transect as a whole. The lack of access to certain areas of the route during the walked bat activity transects was, therefore, not considered to have significantly affected the assessment.

Survey Validity

Bat Activity Assessment

2.17 Owing to the highly mobile nature of bats, and the inherent unpredictability of their roosting habits, this assessment will be valid for a maximum of 12 months from the date of the most recent survey (i.e., until October 2023), in accordance with published guidance[3]. Beyond this period, new bat roosts may have established within the suitable roosting features within the habitat.

2.18 **There were not considered to be any further limitations to the methodology described above.**

[3] CIEEM (2019) *Guidance Note on the Lifespan of Ecological Reports and Surveys*. Chartered Institute of Ecology and Environmental Management, Winchester.

3 RESULTS

Desk Study

Data Search

Sussex Biodiversity record centre

3.1 Sussex biodiversity record centre (SBRC) provided the following records of bats from within a 2 km radius[4] of the Application Site, within the last 20 years[5].

Table 2. Bat Records Returned by the Data Search (in order of abundance)

Species	No.	Date range of all Records	Location and Date of Nearest Roost	Roosting habitat of species
Common pipistrelle *Pipistrellus pipistrellus*	729	2004 - 2021	Within Application Site: East of listening point 1 on Transect 1 in 2015.	Crevices in buildings, trees, bridges and other structures
Bechstein's bat *Myotis bechsteinii*	238	2021	Within Application Site: Near listening point 4 on Transect 2 in 2021. West of listening point 4 on Transect 1 in 2021.	Crevices, mostly in trees, but also in caves, bridges, mines and other structures.
Pipistrelle genus *Pipistrellus sp.*	91	2003 - 2014	570m west of listening point 2 on Transect 2 in 2006.	Crevices in buildings, trees, bridges and other structures
Soprano pipistrelle *Pipistrellus pygmaeus*	81	2005 - 2021	N/A	Crevices in buildings, trees, bridges and other structures.

4 SBRC provide records of bats over a 4 x 1km^2 grid, centred on the Site, which provides bat records from within at least a 2 km radius of the site.

5 Sussex Biodiversity Record Centre (11.11.2022) Bat records from 2002 onwards: Request for Bat Records in an Area Around Ifield.

Species	No.	Date range of all Records	Location and Date of Nearest Roost	Roosting habitat of species
Brown long-eared bat Plecotus auritus	61	2003 - 2021	Within Application Site: Land between T2 and T4 in 2021. Northeast of listening point 6 on Transect 4 in 2021. Near listening point 1 on Transect 4 in 2007.	Voids in trees, buildings, and other structures
Noctule *Nyctalus noctula*	41	2005 - 2021	1.3 km southeast from listening point 7 on Transect 4 in 2006	Crevices and voids in trees only
Natterers bat *Myotis nattereri*	36	2021	400m northwest of listening point 3 on Transect 3 in 2021	Crevices in buildings, trees, bridges and other structures
Whiskered bat *Myotis mystacinus*	19	2015 - 2021	N/A	Crevices in buildings, trees, caves and other structures
Myotis genus *Myotis sp.*	18	2005 - 2011	N/A	Crevices in buildings, trees, bridges, caves and other structures
Daubentons's bat *Myotis daubentonii*	10	2011 - 2021	N/A	Crevices in trees, bridges and other structures
Serotine *Eptesicus serotinus*	3	2008 - 2018	900m east of listening point 5 on Transect 2 in 2008.	Crevices, mostly in buildings but occasionally in trees
Long-eared bat sp. *Plecotus*	2	2003 - 2018	960m northeast of listening point 10 on Transect 3 in 2015.	Voids in buildings, trees, bridges, caves and other structures
Western Barbastelle *Barbastella barbastellus*	2	2021	N/A	Crevices, mostly in trees and barns but occasionally in buildings and other structures
Nathusius's pipistrelle *Pipistrellus nathusii*	1	2018	N/A	Crevices in buildings, trees, bridges and other structures.

3.2 The data search returned 1,332 records of bats within the search area between 2003 and 2021, comprised of eleven bat species (Bechstein's bat, brown long-eared bat, common pipistrelle, Daubenton's bat, Nathusius' pipistrelle, Natterer's bat, noctule, serotine, soprano pipistrelle, western barbastelle and whiskered bat). Genus level records were also recorded for long-eared bats (*Plecotus)*, pipistrelle (*Pipistrellus)* and myotis (*Myotis)* bats.

3.3 The nearest roosts were located directly in or around the Application site. They belonged to Bechstein's bats, brown long-eared bats and common pipistrelles. Notable roosts included that of Annex II species Bechstein's bats located near listening point 4 on Transect 2 and west of listening point 4 on Transect 1 in 2021,. Maternity roosts located within 500 metres of the application site included that of: Bechstein bats, 260 and 360 metres northwest of transect 3 listening point 2; natterers bats, 60 and 270 metres northwest of transect 3 listening point 3.

Nocturnal Bat Survey Results

3.4 The following table(s) contains the results of all nocturnal bat surveys carried out at the Application Site, with the following Figure(s) representing the field sightings on each transect.

Table 3. Nocturnal Bat Activity Transect Results: April 2022

Transects 3 and 4 **Dusk:** 19:55 - 22:50	**Transects 1 and 2** **Dawn:** 03:50 - 05:40
BAT ACTIVITY: Transect 3 **Noctule:** One noctule bat pass was recorded between LP4 and LP5, at 20:54 **Soprano pipistrelle:** A total of two soprano pipistrelle bat passes were recorded, one at LP7, at 21:29, and one at LP8, at 21:44.	**BAT ACTIVITY: Transect 1** **No bat activity recorded.**
BAT ACTIVITY: Transect 4 **Common pipistrelle:** A total of 17 common pipistrelle bat passes were recorded between 20:35 and 22:33.	**BAT ACTIVITY: Transect 2** **No bat activity recorded.**

Figure 8. Field Sightings Recorded Across All Transects: April 2022

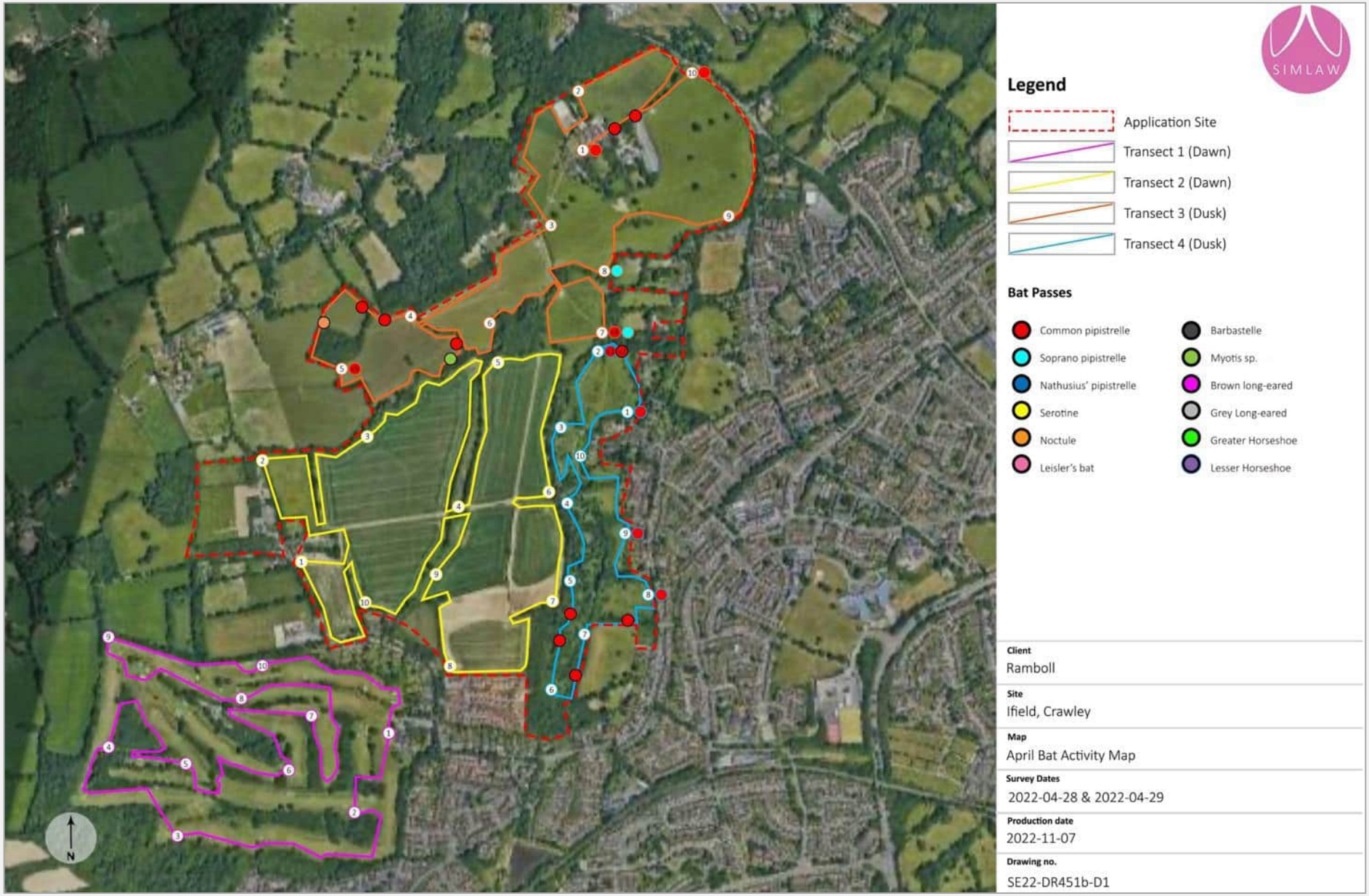


Table 4. Nocturnal Bat Activity Transect Results: May 2022

Transects 1 and 2 **Dusk: 20:35 – 22:45**	**Transects 3 and 4** **Dawn: 03:15 – 05:20**
BAT ACTIVITY: Transect 1 **Common pipistrelle:** A total of 216 common pipistrelle bat passes were recorded between 20:52 and 22:29. 28 common pipistrelle bat passes were recorded within the anticipated emergence time for this species (20- 32 minutes after sunset), indicating that these bat(s) may have been roosting between listening point 5 and 6. **Soprano pipistrelle:** A total of two soprano pipistrelle bat passes were recorded between 20:52 and 22:39, one near LP 4 and one near LP 10. One soprano pipistrelle pass was recorded within the anticipated emergence time for this species (20- 28 minutes after sunset), indicating that this bat may have been roosting close to Listening Point 4.	**BAT ACTIVITY: Transect 3** **Brown long-eared bat:** A total of two brown long-eared bat passes recorded between 03:28, one near listening point 2 and one between listening points 2 and 3. **Common pipistrelle**: A total of 35 common pipistrelle bat passes were between 03:27 and 04:45.
BAT ACTIVITY: Transect 2 **Brown long-eared bat:** A total of one brown long-eared bat pass recorded at 22:53, between listening points 8 and 9. **Common pipistrelle**: A total of 90 common pipistrelle bat passes were recorded between 21:06 and 23:27. Two common pipistrelle passes were recorded within the anticipated emergence time for this species (20-32 minutes after sunset), indicating that these bat(s) may have been roosting between listening points 2 and 3. **Noctule:** A total of one noctule bat pass was recorded at 21:01, between listening points 1 and 2. **Soprano pipistrelle:** A total of two soprano pipistrelle bat passes were recorded between 21:50, one near listening point 4 and one between listening points 9 and 10.	**BAT ACTIVITY: Transect 4** **Common pipistrelle:** A total of 26 common pipistrelle passes were recorded on between 03:58 and 04:39. **Soprano pipistrelle: A total of** one soprano pipistrelle pass was recorded at 04:40, between listening points 6 and 7.

Figure 9. Field Sightings Recorded Across All Transects: May2022

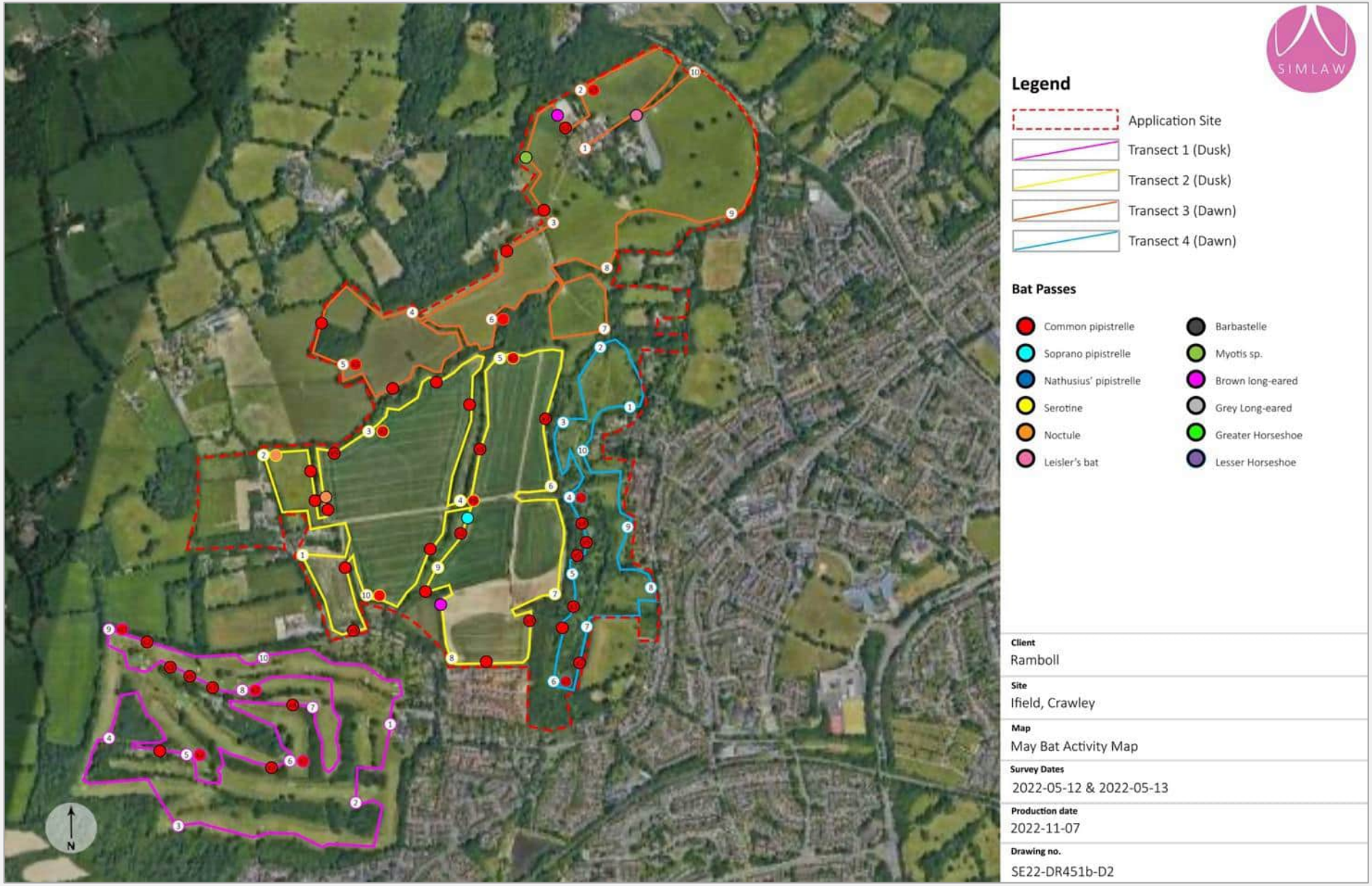


Table 5. Nocturnal Bat Activity Transect Results: June 2022

Transects 3 and 4 reverse **Dusk: 21:19 – 23:45**	**Transects 1 and 2 reverse** **Dawn 02:30 – 4:50**
BAT ACTIVITY: Transect 3 **Common pipistrelle:** A total of 94 common pipistrelle bat passes were recorded between 21:53 and 23:44. **Myotis bats**: A total of six myotis bat passes were recorded between 22:24 and 23:42, 4 around listening point 6-7, one at listening point 4 and one at listening point 1. Four myotis bat passes were recorded within the anticipated emergence time for this species (25-70 minutes after sunset), indicating that these bat(s) may have been roosting between listening points 6 and 7. **Noctule:** A total of four noctule bat passes were recorded between 22:05 and 23:03, 2 between listening points 7 and 8, one between listening points 5 and 6, and one between listening points 3 and 4. **Soprano pipistrelle:** A total of two soprano pipistrelle bat passes were recorded between 22:05 and 22:44, one between listening points 7 and 8, and one between listening points 5 and 6.	**BAT ACTIVITY: Transect 1** **Common pipistrelle:** A total of 44 common pipistrelle bat passes were recorded between 02:38 and 04:00. **Myotis:** A total of two myotis bat passes were recorded between 02:47, one at listening point 10 and one between listening points 6 and 7. **Noctule**: A total of three noctule bat passes were recorded between 02:49 and 04:05, one at listening point 10, and two at listening point 4.
BAT ACTIVITY: Transect 4 **Common pipistrelle:** A total of 49 common pipistrelle bat passes were recorded between 21:47 and 22:58. One common pipistrelle bat pass was recorded within the anticipated emergence time (20-32 minutes after sunset), indicating that this bat may have been roosting between listening points 8 and 9. **Noctule:** A total of one noctule bat pass was recorded at 22:08, at listening point 6. **Soprano pipistrelle:** A total of three soprano pipistrelle bat passes were recorded between 22:25 and 23:06, one at listening point 5, one at listening point 4 and one at listening point 1.	**BAT ACTIVITY: Transect 2** **Common pipistrelle:** A total of 11 common pipistrelle bat passes were recorded between 02:42 and 03:39. **Noctule:** A total of one noctule bat pass was recorded at 03:39, at listening point 7. **Soprano pipistrelle:** A total of one soprano pipistrelle bat pass was recorded at 03:52, between listening points 5 and 6.

Figure 10. Field Sightings Recorded Across All Transects: June 2022

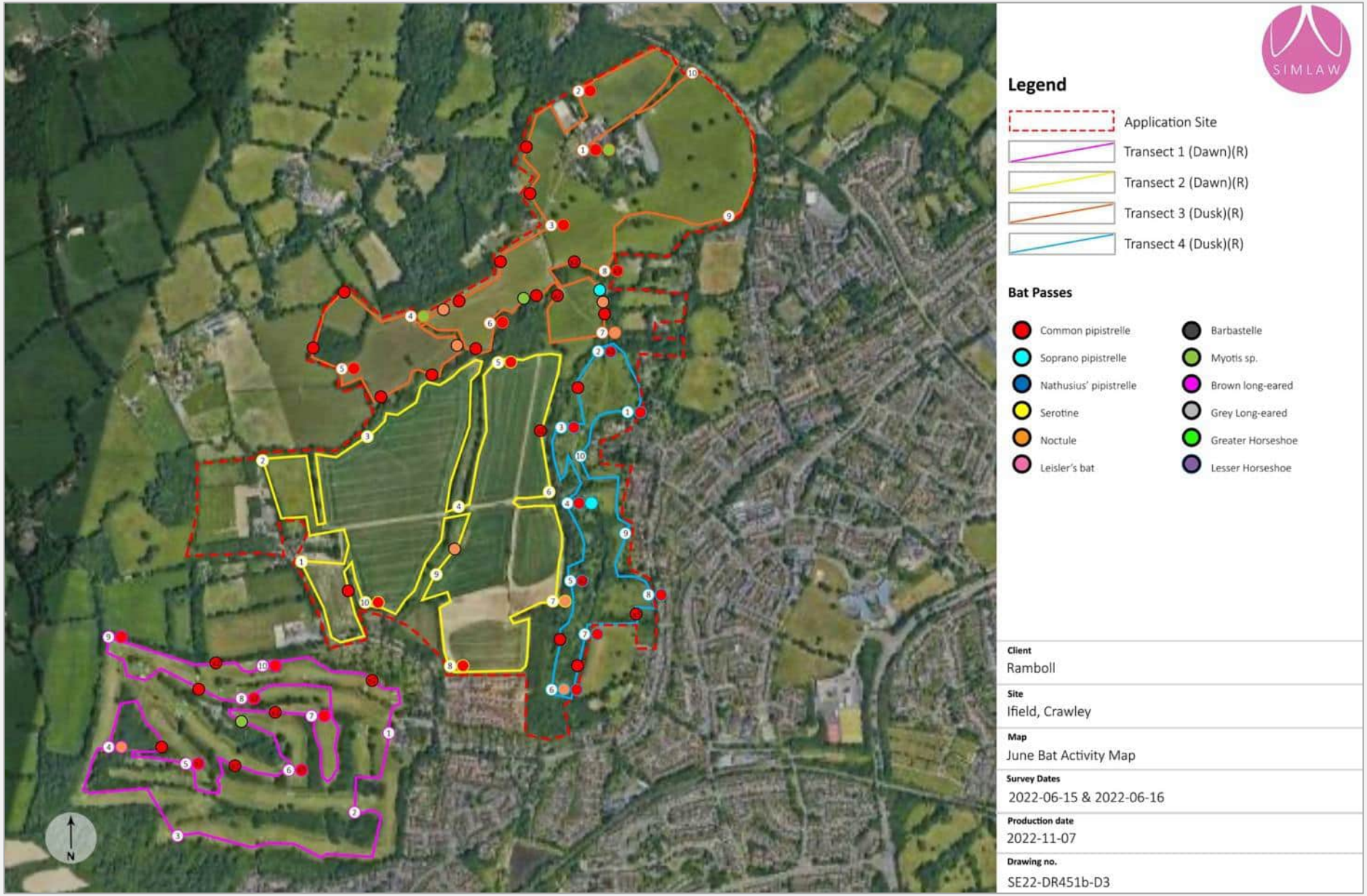


Table 6. Nocturnal Bat Activity Transect Results: July 2022

Transects 1 and 2 reverse **Dusk: 21:10 – 23:15**	**Transects 3 and 4 reverse** **Dawn: 02:32 – 05:05**
BAT ACTIVITY: Transect 1 **Brown long-eared:** A total of three brown long-eared bat passes were recorded between 22:06 and 23:20, two at listening point 7 and one between listening points 1 and 2. Two brown long-eared bat passes were recorded within the anticipated emergence time for this species (40-60 minutes after sunset), indicating that these bat(s) may have been roosting close to listening point 7. **Common pipistrelle:** A total of 158 common pipistrelle passes were recorded between 21:28 and 23:29. 49 common pipistrelle passes were recorded within the anticipated emergence time for this species (20-32 minutes after sunset), indicating that these bat(s) may have been roosting between listening point 9 and 10. **Myotis:** A total of two myotis bat passes were recorded between 22:26 and 23:00, one between listening point 5 and 6 and one between listening points 2 and 3. **Noctule:** A total of seven noctule bat passes were recorded between 21:30 and 21:37, all between listening points 9 and 10.	**BAT ACTIVITY: Transect 3** **Brown long-eared:** A total of five brown long-eared bat passes were recorded between 02:32 and 04:34, spread across the transect route. **Common pipistrelle:** A total of 37 common pipistrelle bat passes were recorded between 02:32 and 04:35. **Myotis:** A total of one myotis bat pass was recorded at 04:03, between listening point 2 and 3. **Soprano pipistrelle:** A total of one soprano pipistrelle bat pass was recorded at 04:21, listening point 2.
BAT ACTIVITY: Transect 2 **Common pipistrelle:** A total of 58 common pipistrelle passes were recorded between 21:53 and 23:13. **Noctule:** A total of three noctule bat passes were recorded between 22:02 and 22:17, two at listening point 6 and one at listening point 5.	**BAT ACTIVITY: Transect 4** **Brown long-eared:** A total of one brown long-eared bat pass was recorded at 03:40, between listening points 5 and 6. **Common pipistrelle:** A total of 46 common pipistrelle bat passes were recorded between 02:47 and 04:35. **Serotine:** A total of two serotine bat passes were recorded between 03:00 and 03:14, one at listening point 9 and one at listening point 7.

Figure 11. Field Sightings Recorded Across All Transects: July 2022

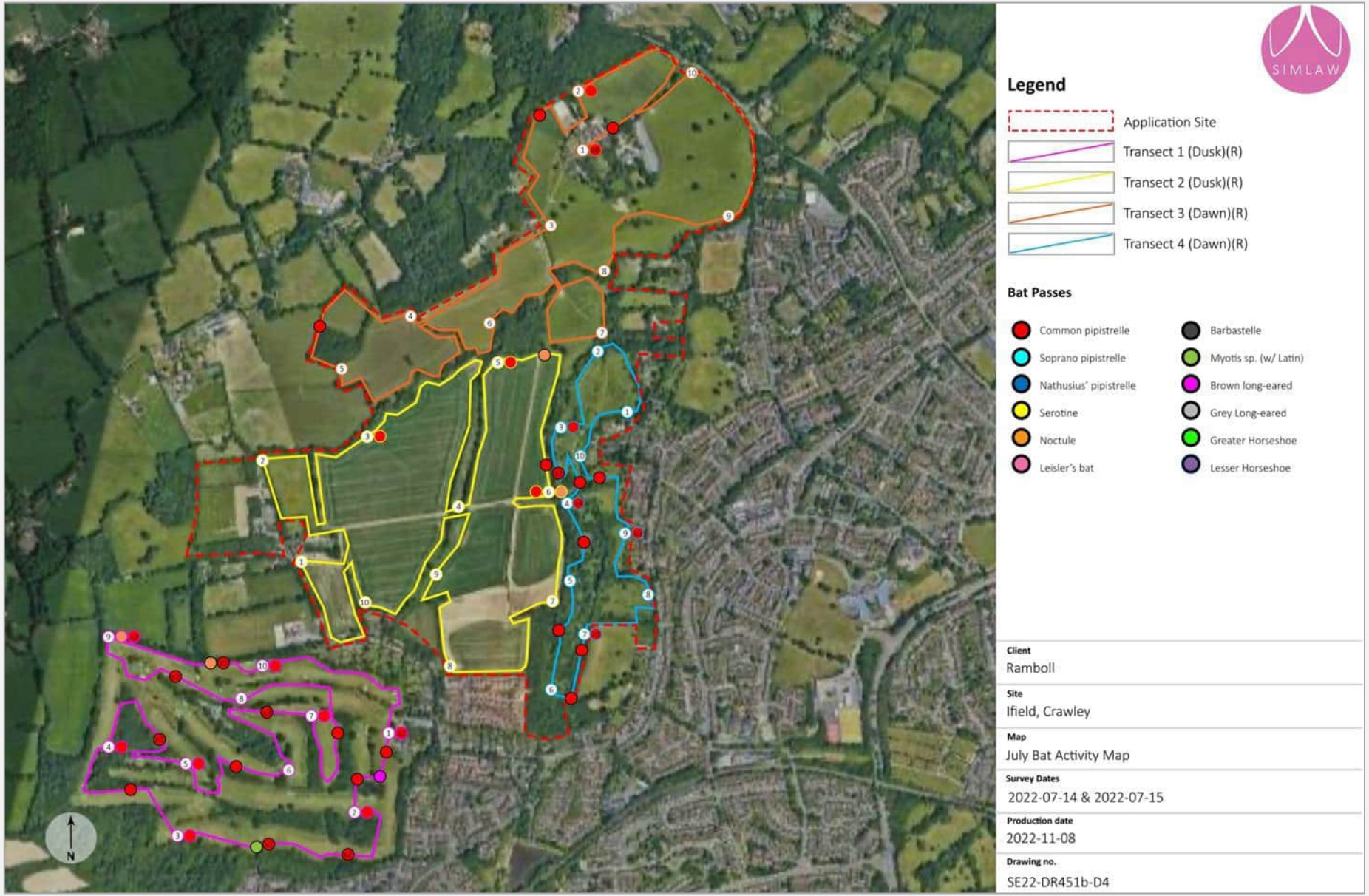


Table 7. Nocturnal Bat Activity Transect Results: August 2022

Transect 3 and 4 **Dusk: 20:33 – 22:50**	**Transect 1 and 2** **Dawn: 03:14 – 05:45**
BAT ACTIVITY: Transect 3 **Brown long-eared bat:** A total of seven brown long-eared bat passes were recorded between 21:50 and 22:43, two between listening points 5 and 6, one at listening point 7, three at listening point 8, and one at listening point 10. **Common pipistrelle:** A total of 97 common pipistrelle bat passes were recorded between 20:47 and 22:48. Ten common pipistrelle bat passes were recorded within the anticipated emergence time for this species (20 - 32 minutes after sunset), indicating that these bat(s) may have been roosting close to listening point 2. **Leisler's bat:** A total of three leisler's bat passes were recorded between 21:14 and 22:48, one at listening point 3, one between listening points 3 and 4, and one at listening point 10. **Myotis:** A total of three myotis bat passes were recorded between 21:22 and 21:56, one at listening point 4, one between listening points 4 and 5, and one between listening points 5 and 6. One myotis bat pass was recorded within the anticipated emergence time for this species (25-70 minutes after sunset), indicating that this bat may have been roosting between listening points 4 and 5. **Noctule:** A total of five noctule bat passes were recorded between 20:38 and 21:14, one at listening point 1, one between listening points 1 and 2, two between listening points 2 and 3, and one at listening point 3. One noctule bat pass was recorded within the anticipated emergence time for this species (4-8 minutes after sunset), indicating that this bat may have been roosting near listening point 1. **Serotine**: A total of 13 serotine bat passes were recorded between 21:17 and 22:47, one between listening points 3 and 4, three between listening points 4 and 5, six	**BAT ACTIVITY: Transect 1** **Common pipistrelle:** A total of 47 common pipistrelle bat passes were recorded between 03:39 and 04:41. **Myotis:** A total of one myotis bat pass was recorded at 03:42, listening point 3. **Serotine:** A total of one serotine bat pass was recorded at 03:56, listening point 4.

between listening points 5 and 6, one at listening point 7, and two at listening point 10.	
BAT ACTIVITY: Transect 4 **Common pipistrelle:** A total of 107 common pipistrelle bat passes were recorded between 20:43 and 22:34. 19 common pipistrelle passes were recorded within the anticipated emergence time for this species (20-32 minutes after sunset), indicating that these bat(s) may have been roosting between listening points 2 and 3. **Myotis:** A total of two myotis bat passes were recorded between 21:30 and 22:24, one at listening point 6 and one at listening point 10. One of these passes was recorded 25-70 minutes after sunset, indicating a possible nearby roost near listening point 6. **Noctule:** A total of two noctule bat passes were recorded at 21:30, both at listening point 6. **Serotine:** A total of one serotine bat pass was recorded at 21:16, at listening point 5. **Soprano pipistrelle:** A total of three soprano pipistrelle bat passes were recorded between 22:05 and 22:35, one between listening points 8 and 9 and two at listening point 6.	**BAT ACTIVITY: Transect 2** **Brown long-eared bat:** A total of five brown long-eared bat passes were recorded between 03:23 and 04:28, spread evenly across transect. **Common pipistrelle:** A total of 13 common pipistrelle bat passes were recorded between 03:24 and 04:45. **Myotis:** A total of one myotis bat pass was recorded at 04:08, between listening point 4 and 5. **Noctule:** A total of three noctule bat passes were recorded at 04:59, listening point 8. **Soprano pipistrelle:** A total of two soprano pipistrelle bat passes were recorded between 04:43 and 04:44, both between listening points 6 and 7.

Figure 12. Field Sightings Recorded Across All Transects: August 2022

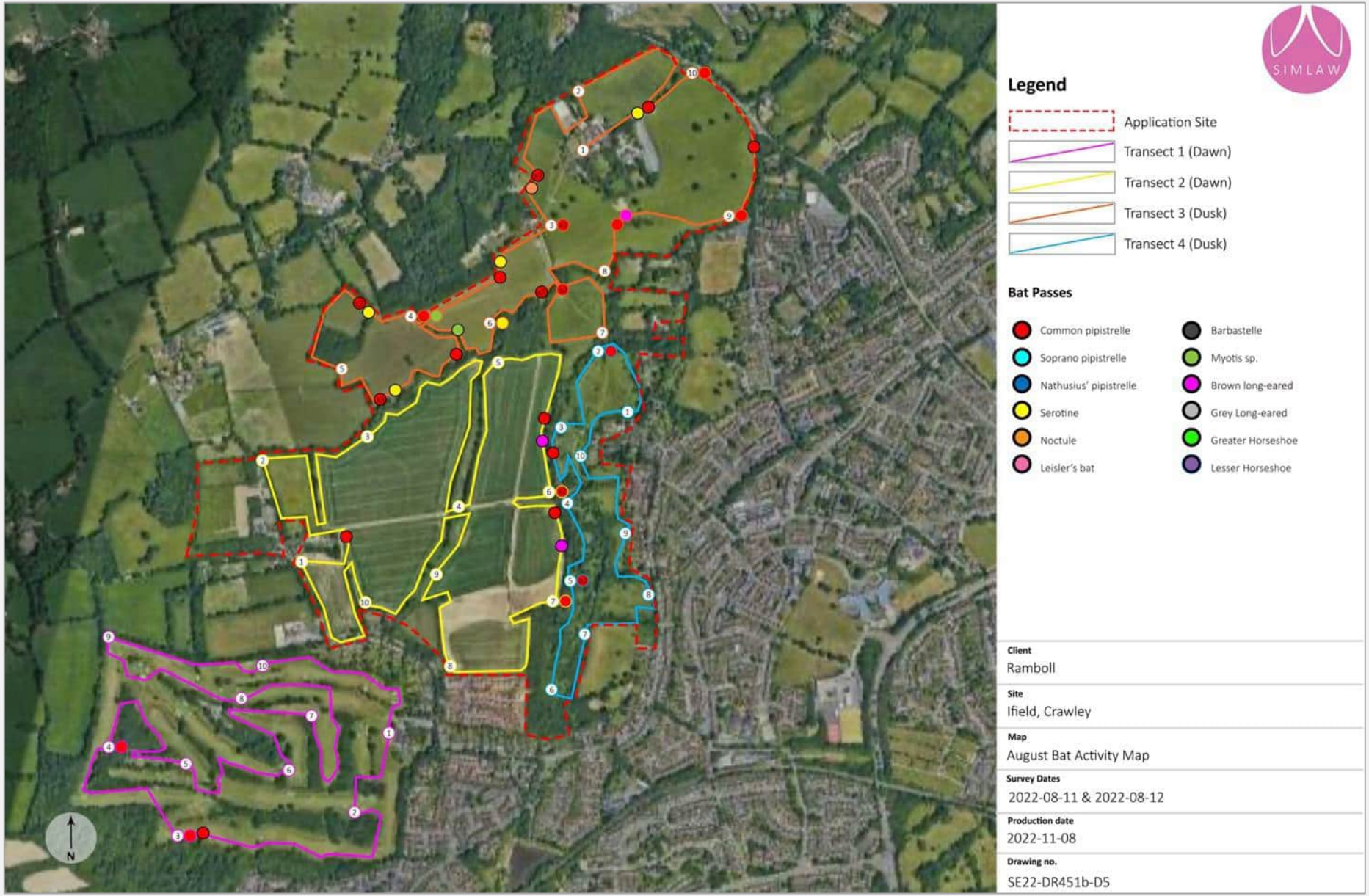


Table 8. Nocturnal Bat Activity Transect Results: September 2022

Transect 1 and 2 **Dusk: 19:21 – 21:25**	**Transect 3 and 4** **Dawn: 04:05 – 06:38**
BAT ACTIVITY: Transect 1 (reverse) **Common pipistrelle:** A total of 39 common pipistrelle bat passes were recorded between 19:28 and 21:17. Six common pipistrelle passes were recorded within the anticipated emergence time for this species (20-32 minutes after sunset), indicating that these bat(s) may have been roosting between listening points 9 and 10. **Myotis:** A total of one myotis bat pass was recorded at 20:28, between listening points 5 and 6. One myotis bat pass was recorded within the anticipated emergence time for this species (25-70 minutes after sunset), indicating that this bat may have been roosting between listening points 5 and 6. **Soprano pipistrelle:** A total of three soprano pipistrelle bat passes were recorded between 20:50 and 21:11, two between listening points 4 and 5, and one between listening points 3 and 4.	**BAT ACTIVITY: Transect 3** **Brown long-eared bat:** A total of 47 brown long-eared bat passes were recorded between 05:53 and 06:16. All of these passes were recorded at listening point 1 near to sunrise. A large number of brown long-eared bats were observed exhibiting swarming behaviour before returning to their roost in one of the farm buildings near listening point 1. **Common pipistrelle:** A total of six common pipistrelle bat passes were recorded between 05:29 and 05:35. **Myotis:** A total of two *Myotis* bat passes were recorded between 04:24 and 05:18. **Serotine:** A total of one serotine bat pass was recorded at 05:30, listening point 3.
BAT ACTIVITY: Transect 2 **Common pipistrelle:** A total of 165 common pipistrelle bat passes were recorded between 19:28 and 21:25. 47 common pipistrelle bat passes were recorded within the anticipated emergence time for this species (20-32 minutes after sunset), indicating that these bat(s) may have been roosting between listening points 1 and 3. **Myotis:** A total of one myotis bat pass was recorded at 20:30 between listening points 5 and 6. **Nathusius' pipistrelle**: A total of two nathusius' pipistrelle bat passes were recorded between 20:49 and 20:57, one between listening points 6 and 7, and one between listening points 7 and 8.	**BAT ACTIVITY: Transect 4** **Brown long-eared bat:** A total of two brown long-eared bat passes were recorded between 04:10 and 05:03, one at listening point 1 and the other in an unrecorded location.

Noctule: A total of three noctule bat passes were recorded between 19:32 and 19:37, between listening points 1 and 2. **Soprano pipistrelle:** A total of three soprano pipistrelle bat passes were recorded between 19:47 and 20:43, one between listening points 2 and 3, one at listening point 5, and one between listening points 6 and 7. One soprano pipistrelle bat pass was recorded within the anticipated emergence time for this species (20-28 minutes after sunset), indicating a possible nearby roost between listening points 2 and 3.	

Figure 13. Field Sightings Recorded Across All Transects: September 2022

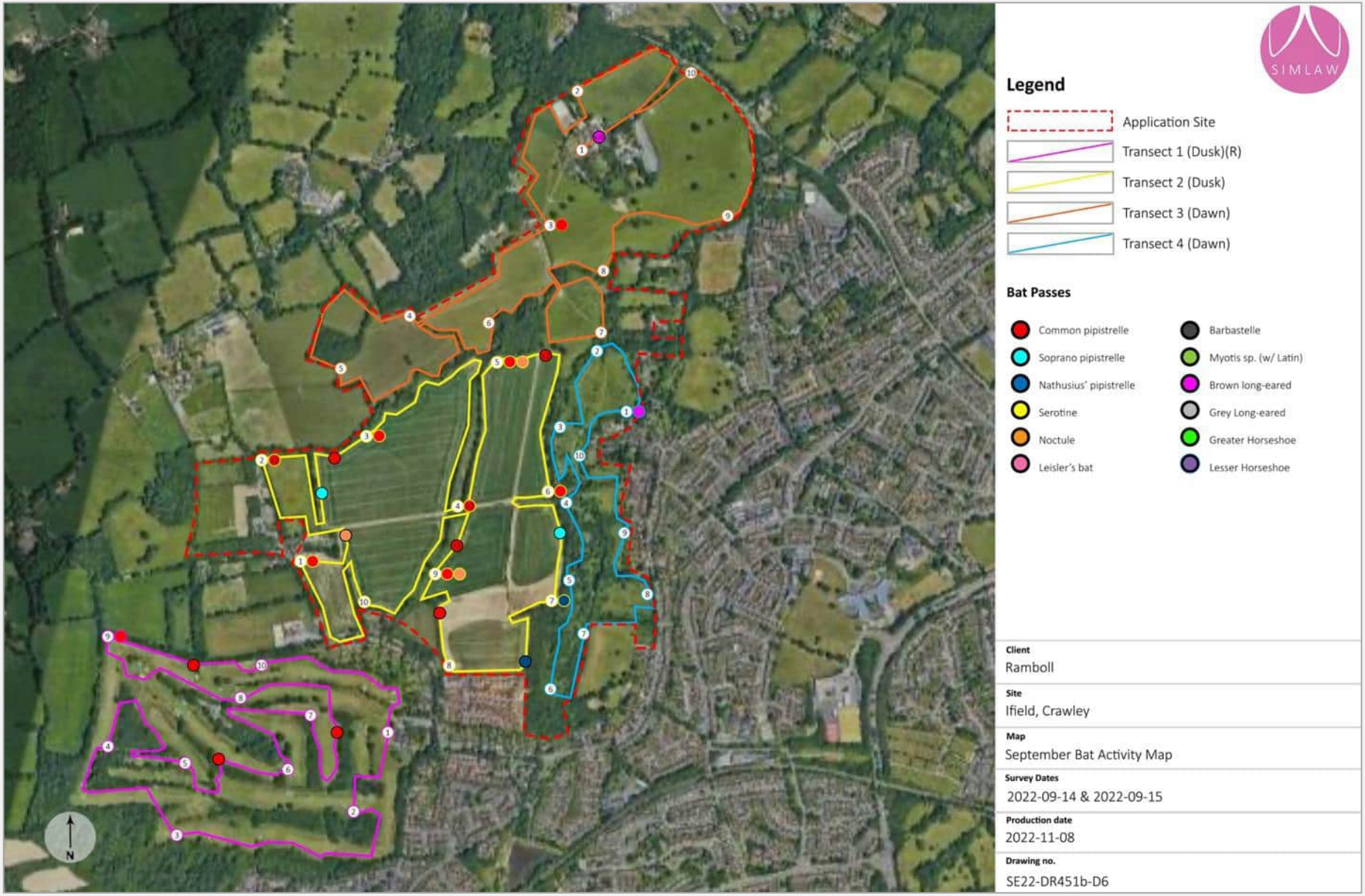
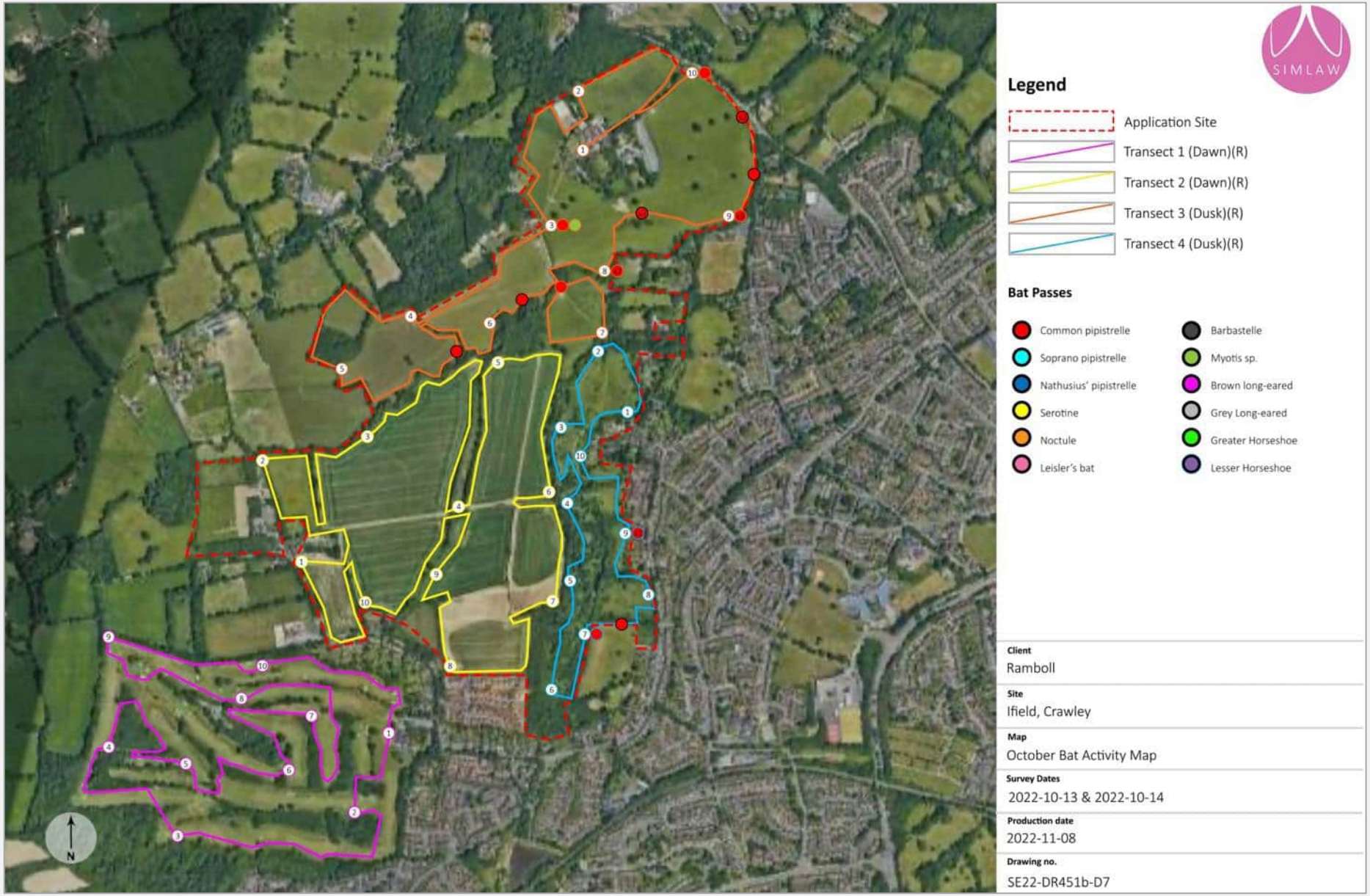


Table 9. Nocturnal Bat Activity Transect Results: October 2022

Transect 3 and 4 (reversed) **Dusk: 18:15 – 20:25**	**Transect 1 and 2** **Dawn: 04:54 – 07:24**
BAT ACTIVITY: Transect 3 **Brown long-eared bat:** A total of four brown long-eared bat passes were recorded between 19:37 and 20:08, one at listening point 4, one at listening point 3 and two between listening points 2 and 3. **Common pipistrelle:** A total of 139 common pipistrelle bat passes were recorded between 18:27 and 19:55. 49 common pipistrelle bat passes were recorded within the anticipated emergence time for this species (20-32 minutes after sunset), indicating that these bat(s) may have been roosting between listening points 9 and 10. **Myotis:** A total of nine myotis bat passes were recorded between 18:39 and 19:52, one at listening point 9, one between listening points 6 and 7, and seven near listening point 3. Two myotis bat passes were recorded within the anticipated emergence time for this species (25-70 minutes after sunset), indicating that these bat(s) may have been roosting near listening point 9, and between listening points 6 and 7. **Soprano pipistrelle:** A total of two soprano pipistrelle bat passes were recorded between 18:51 and 19:02, one at listening point 8, and one between listening points 7 and 8.	**BAT ACTIVITY: Transect 1** **Common pipistrelle:** A total of three common pipistrelle bat passes were recorded at 06:16.
BAT ACTIVITY: Transect 4 **Brown long-eared bat:** A total of two brown long-eared bat passes were recorded between 19:10 and 20:07, one between listening points 6-7, and one unknown. One brown long-eared bat pass was recorded within the anticipated emergence time for this species (40-60 minutes after sunset), indicating that this bat may have been roosting near listening point 6.	**BAT ACTIVITY: Transect 2** **No bat activity recorded.**

Common pipistrelle: A total of 41 common pipistrelle bat passes were recorded between 18:26 and 19:45. Five common pipistrelle passes were recorded within the anticipated emergence time for this species (20-32 minutes after sunset), indicating that these bat(s) may have been roosting near listening point 9 **Myotis:** A total of one myotis bat pass was recorded at 19:35, at an unrecorded location. **Noctule:** A total of one noctule bat pass was recorded at 18:34, between listening points 9 and 10. **Soprano pipistrelle:** A total of two soprano pipistrelle bat passes were recorded at 19:07, between listening points 6 and 7.	

Figure 14. Field sightings recorded at the Application site in October 2022



	April				May				June				July				August				September				October				Totals			
Transect	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Brown long-eared bat (*Plecotus auritus*)	0	0	0	0	0	1	2	0	0	0	0	0	3	0	5	1	0	5	7	0	0	0	47	2	0	0	4	2	3	6	65	5
Common Pipistrelle (*Pipistrellus pipistrellus*	0	0	57	17	216	90	35	26	44	11	94	49	158	58	37	46	47	13	97	107	39	165	6	0	3	0	139	41	507	337	465	286
Leisler's bat (*Nyctalus leisleri*)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	3	0
Myotis sp. (*Myotis*)	0	0	0	0	0	0	0	0	2	0	6	0	2	0	1	0	1	1	3	2	1	1	2	0	0	0	9	1	6	2	21	3
Nathusius' Pipistrelle (*Pipistrellus nathusii*)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0
Noctule (*Nyctalus noctula*)	0	0	1	0	0	1	0	0	3	1	4	1	7	3	0	0	0	3	5	2	0	3	0	0	0	0	0	1	10	11	10	4
Serotine (*Eptesicus serotinus*)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	13	1	0	0	1	0	0	0	0	0	1	0	14	3
Soprano Pipistrelle (*Pipistrellus pygmaeus*)	0	0	2	0	2	2	0	1	0	1	2	3	0	0	1	0	0	2	0	3	3	3	0	0	0	0	2	2	5	8	7	9

Table 10. Nocturnal Bat Activity Transect Results: April – October 2022.

Figure 15. Temporal Distribution of bat Activity: April – October 2022 (incl. PIPPIP)

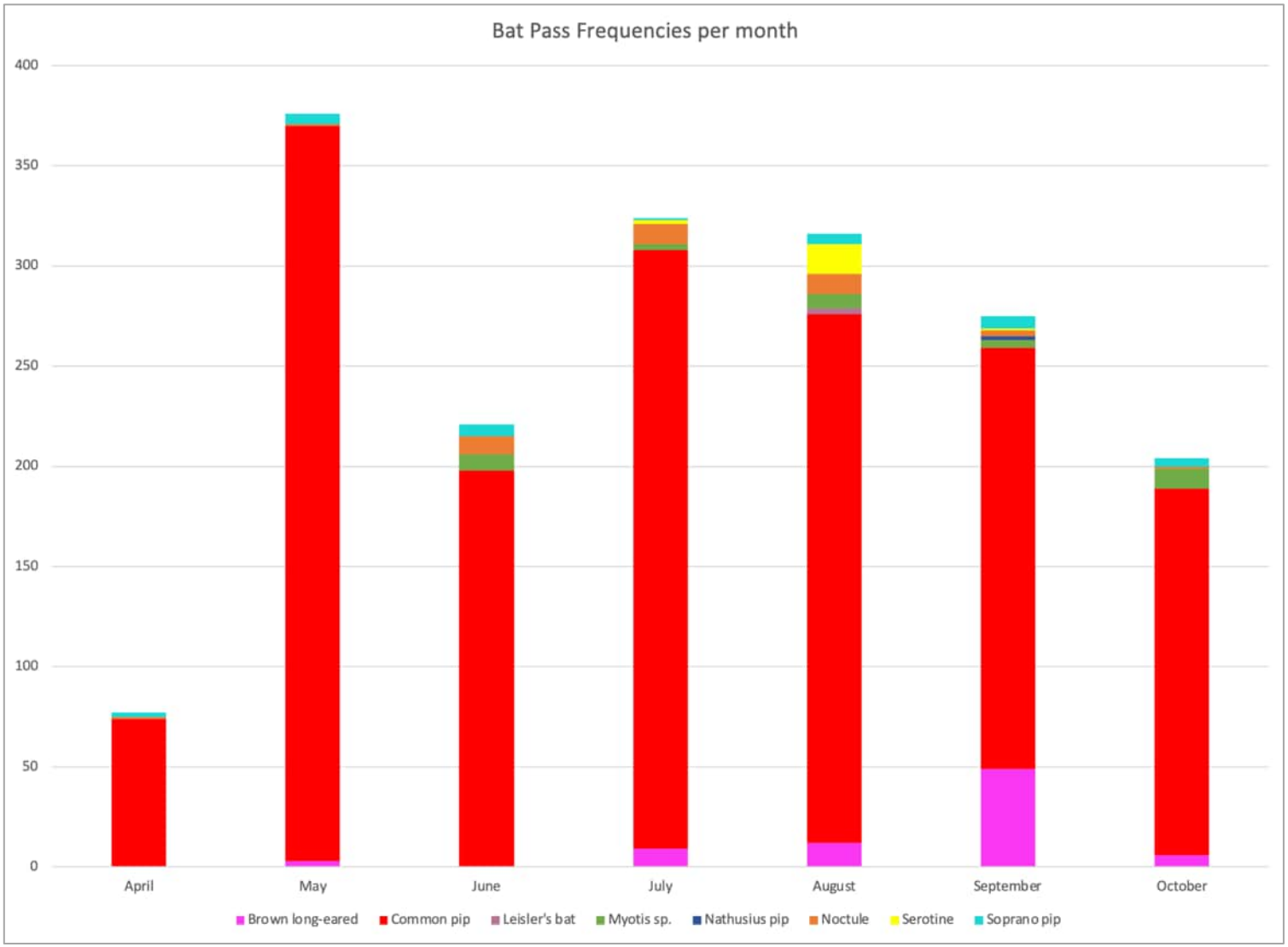


Table 11. Temporal Distribution of Species Records Across Survey Months (excl. PIPPIP)

Chart 1: Temporal distribution of Myotis sp. bats between transect months

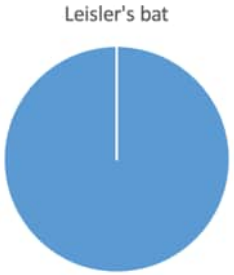


Chart 2: Temporal distribution of Leisler's bats between transect months

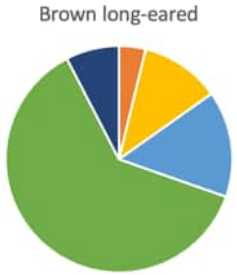


Chart 3: Temporal distribution of brown long-eared bats between transect months

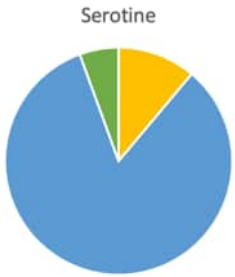


Chart 4: Temporal distribution of serotine bats between transect months

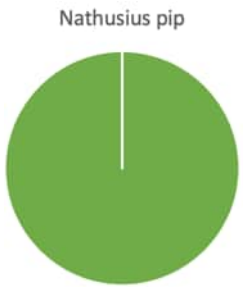


Chart 5: Temporal distribution of Nathusius' pipistrelle bats between transect months

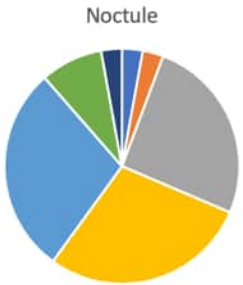


Chart 6: Temporal distribution of noctule bats between transect months

Chart 7: Temporal distribution of soprano pipistrelle bats between transect months

Figure 16. Spatial Distribution of Bat Species Recorded by Transect Route (incl. PIPPIP)