

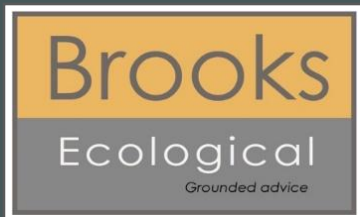
Land East of Leeds Road, Chidswell



Bat Activity Survey

27/10/2023

ER-6441-06 - Bat Activity



Report reference	ER-6441-06 - Bat Activity Report
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Date	27/10/2023
Report duration	In accordance with CIEEM (2019), unless otherwise stated the findings of this report remain valid for a period of 18 months. After this period advice should be sought on the scope of any updating work required.



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Summary Statement

Monthly bat activity surveys have been undertaken at the Site, covering the period April to October 2023.

The Site is occupied by intensive arable farmland, with narrow field margins, defunct hedgerows and minor watercourses providing limited opportunities for local bat populations within the site. Offsite, but within close proximity, are two isolated blocks of ancient woodland, which provide further opportunities for bat populations.

As could be expected, given the paucity of suitable foraging habitat, activity has remained relatively low throughout the year, with common pipistrelle consistently accounting for most of the bat activity recorded. Whilst other species have been recorded on site, including soprano pipistrelle, brown long eared, noctule, leisler's and at least one myotis bat species, activity attributed to these species has always been sporadic and generally very low.

Remote monitoring sampled a range of habitats, including the hedgerows, watercourse and woodland edge. Activity at each of these locations has been fairly similar, with activity fluctuating slightly between locations and months. The greatest levels of activity were recorded along the central hedgerow, towards the latter half of the season (August, September and October), however even this represented only moderate levels of foraging activity.

Overall, the Site is considered to be of value only to the local common pipistrelle population, offering only low (to occasionally moderate) levels of foraging.

A sensitive masterplan was designed and approved at the Outline Stage, which showed how structured habitat could be retained, protected and enhanced for bats, whilst further habitat could be created with green infrastructure and parcels of public open space. This provides an opportunity to greatly enhance the Site for bats.

Standard mitigation is recommended to realise these aspirations and to minimise any residual impacts.

Introduction

1. Brooks Ecological was commissioned by Church Commissioners for England to carry out detailed Bat Activity Survey at the proposed development Site at Land East of Leeds Road, Chidswell.
2. Outline Planning Permission (Ref. 2020/60/92331/E) has been granted for the Site known as Land East of Leeds Road, Chidswell. To support this application, a suite of detailed ecological studies were undertaken by Brooks Ecological. To bring survey information up to date and to support future Reserved Matters applications, Brooks Ecological was instructed to update all of the Ecology reports.
3. An updated Bat Survey was therefore undertaken across the 2023 survey period. The survey covered as much of the land within the red line boundary, as possible; see Figure 1 (right).

Purpose of Survey

4. These surveys are required to provide evidence of the baseline use of the Site by the local bat population, which in turn will then enable mitigation and enhancement strategies to be devised to support a planning application.
5. The scope of the survey has been devised based on an assessment of the habitats present, the results of previous activity surveys and in accordance with current best practice guidelines (Bat Conservation Trust, 2016).

Site Background

6. Previous survey was carried out by Brooks Ecological between April and September 2018; see Report Ref. R-3280-06 (November 2018). This survey demonstrated low-level use of the Site by a limited range of common bat species.
7. In accordance with CIEEM (2019), unless otherwise stated, the findings of this report remain valid for a period of 18 months. After this period advice should be sought on the scope of any updating work required

Figure 1 Site location plan



Method

8. Surveys were directed by Christopher Shaw BSc (Hons) MCIEEM. Chris has over 13 years' experience of carrying out bat surveys in a professional capacity and is registered to use the Class Survey Licence WML CL18 (Bat Survey Level 2) and Bat Mitigation Class Licence WML CL21 Annex B.
9. The objective of the survey was to collect up to date information on the Site's use by local bat populations, so that an accurate assessment of the potential impacts of development could be made. A transect and remote monitoring survey was carried out to collect the following data (Bat Conservation Trust, 2016):
 - The assemblage of bat species using the site;
 - The relative frequency with which the site is used by different species;
 - The nature of activity for different bat species, for example foraging, commuting and roosting.

Transects

10. Given its scale, the Site was split into two transect routes, to ensure a good coverage of habitats could be made. Transects began around sunset and continued up to two hours after when all bats were thought to have emerged, and thus were actively foraging and commuting.
11. The transects were walked by a team of two surveyors, equipped with a heterodyne detector as well as a Titley Scientific Anabat Express, used to track the transect route and aid species identification. Notes taken during the survey were then used to produce the activity 'heat map' seen in the below figures.
12. Blue shades on the heat map correspond with low activity defined by up to 2 individuals intermittently recorded, yellow tones indicate more prolonged spells of activity by 2 -5 individuals whilst red tones indicate higher and consistent activity levels of 5 or more bats.

Survey Conditions

13. Walked transects were undertaken on a monthly basis between April and October 2023, during optimal survey conditions for the season. Survey conditions are summarised below:

Table 1 Survey Conditions

Survey	Date	Sunset	Weather	Invertebrate Activity
April	12/04/23	20:02	6°C. Light wind (B2). Full cloud (100%).	Very low
	19/04/23	20:15	11-9°C. Light wind (B2). Clear (0% cloud).	Low
May	10/05/23	20:52	12-11°C. Light wind (B1). Partial cloud (20-30%).	Good
	15/05/23	21:01	13-10°C. Light wind (B1). Partial cloud (20-30%).	Low
June	15/06/23	21:32	20-18°C. Light wind (B1). Partial cloud (10%).	Moderate
	22/06/23	21:41	21-18°C. Light wind (B1). Partial cloud (10%).	Moderate
July	13/07/23	21:31	15°C. Light wind (B2). Partial cloud (30%).	Moderate
	20/07/23	21:23	16-14°C. Calm (B0). Partial cloud (20%).	Moderate
August	17/08/23	20:33	16-14°C. Light wind (B1/2). Full cloud (100%).	Moderate
	24/08/23	20:16	13-12°C. Calm (B0/1). No cloud (0%).	Moderate
Sept.	14/09/23	19:16	18-15°C. Calm (B0). Full cloud (90%).	Moderate
	21/09/23	19:08	14-12°C. Calm (B0/1). Partial cloud (40%).	Moderate
October	03/10/23	18:39	13°C. Light wind (B1). Cloudy (85%).	Low
	10/10/23	18:22	19-18°C. Light wind (B1). Cloudy (80%).	Low

Remote Monitoring

14. To supplement data collected during the walked transect, static monitoring device/s (Wildlife Acoustic SM4) were deployed in a strategic location on-site prior to the start of the walked transect.
15. Data collected during the period of remote monitoring has been run through Kaleidoscope Pro software, which can identify bat calls down to species level (except for *Myotis*). Identification is generally correct when using this software; however, results are double checked to ensure accurate data analysis.
16. Every effort is made to split up *Myotis* calls down to species level. This is done by analysing calls on Analook software and looking at parameters such as inter-pulse interval, call duration, slope and maximum/minimum/peak call frequency. However, this can often be difficult when registrations are short in duration, faint or distorted by cluttered environments.

Limitations

17. Static monitoring can only reliably provide information on what species of bat are regularly making use of a site. More detailed information on bat activity, such as frequency of bats, nature of activity (foraging, commuting, flight path), etc. can only be gleaned through walked transects.
18. The frequency of calls recorded can, to some extent, suggest whether activity on site is low, moderate or high, by comparing data collected with that of similar sites that have been surveyed.
19. A single registration can account for up to 15 seconds of continuous bat call. Large batches of registrations can be interpreted in several different ways, i.e. a single bat foraging continuously for only an hour can result in many hundreds of registrations being logged; similarly, many hundreds of bats commuting quickly past the detector can result in the same number of registrations.

Habitat Assessment

20. The Site is occupied primarily by intensive arable farmland, with field margins being very narrow and occupied by rank neutral grassland. Field hedgerows are generally defunct and overly managed, providing little in the way of cover or connectivity. Ploughing extends right up to the base of the field hedgerows, woodland edges and the tops of ditches/watercourses. As such, there is little in the way of semi-natural un-disturbed habitat on Site, and that which does persist is generally small, disjointed and impoverished. The Site is therefore considered to provide few opportunities for foraging bats.

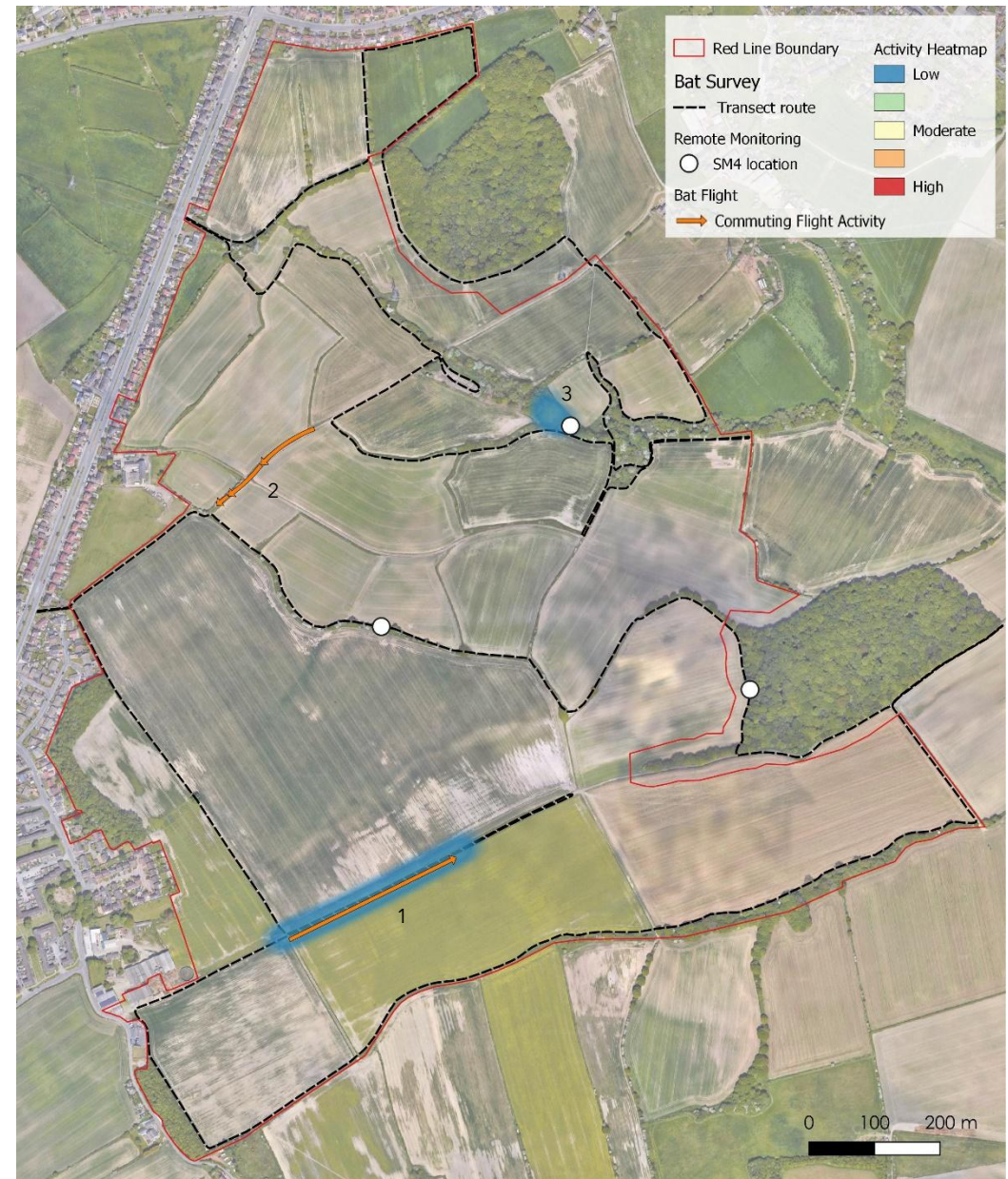
21. The damaged hedgerows and minor watercourses provide the best foraging and commuting resources on Site for this group, with Dum Wood and Dogloitch Wood providing the best foraging opportunities offsite. Survey therefore focussed on these areas.

April Survey

Walkover Transect

22. The Site was split into two transect routes, as indicated in the figure opposite, covering the northern and southern halves of the Site. The transects sought to cover as much of the site as possible but focussed on the most valuable habitats; these being the two watercourses and the woodland edges.
23. Activity was found to be very low, with only three bat contacts being made. These are referenced 1 - 3 on the figure opposite and described below.
24. (1) The first bat contact was made at 20:43, when a solitary common pipistrelle was noted foraging and gradually commuting eastwards along the farm track to the south of the Site. This activity was repeated again at 20:45 and 20:47 by a further two common pipistrelle bats. These are likely to be individuals that have emerged from housing to the west, flying towards foraging habitat to the east (i.e. Dogloitch Wood).
25. (2) A solitary common pipistrelle bat was then seen commuting northeast to southwest along a hedgerow to the west of the Site. This did not spend any time on site foraging.
26. (3) A solitary common pipistrelle bat was recording foraging within scrub to the centre/east of the Site, along the watercourse.

Figure 2 Summary of bat activity observed during April walked transect



April Survey

Remote Monitoring

27. Three remote detectors (Song Meter SM4BAT FS) were deployed in the locations shown in figure 2. These were positioned so as to sample a range of habitat types, namely hedgerow, watercourse and woodland edge. These were left to run for 5 consecutive nights.
28. Bat activity logged during the April monitoring period was low across all five nights, at each of the three monitoring stations. A summary of the data collected are presented in the tables opposite.
29. Only three species of bat were recorded on Site during this period, these being common pipistrelle, noctule and leisler's bat.
30. At the watercourse and hedgerow monitoring stations, common pipistrelle was found to be the most active species, with an average of 62 and 59 registrations per night, respectively. This could be attributed to sporadic foraging by solitary bats, as was seen during the walked transect. Noctule and leisler's bat were recorded at much lower levels (less than 10 registrations per night), which is likely to reflect small numbers of commuting bats.
31. At the Woodland edge monitoring station, common pipistrelle activity was slightly lower, with an average of only 17 reg. per night. Again this is likely to reflect sporadic foraging by solitary bats.
32. Activity by noctule and leisler's bat was slightly greater along the woodland edge, with averages of 40 and 108 registrations per night respectively. This still amounts to only low levels of activity, but indicates foraging by small numbers of these bats, rather than individuals commuting over the site.

Table 2a Total number of registrations logged for each bat species, at the Watercourse location (north)

Species	13 th April	14 th April	15 th April	16 th April	17 th April	Average
Common Pipistrelle	-	-	37	262	12	62
Noctule	-	-	9	2	22	7

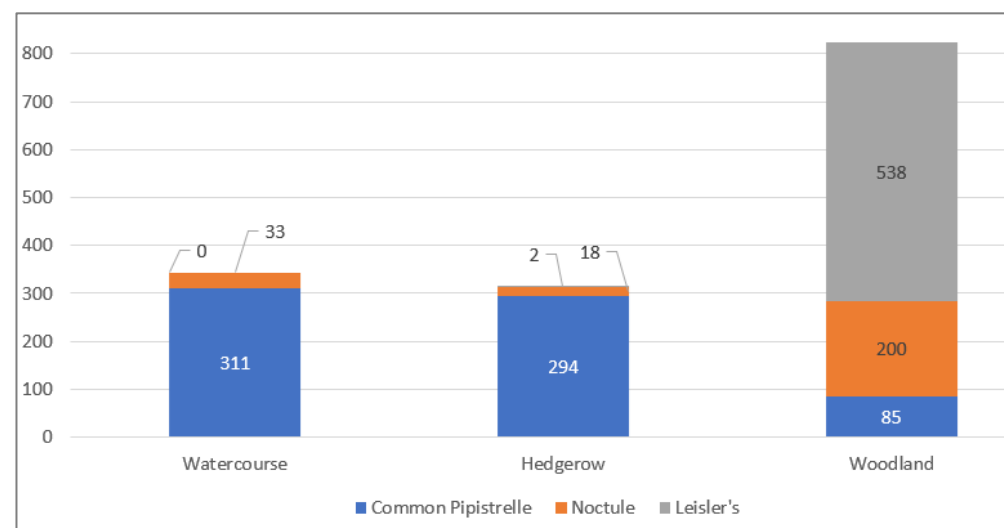
Table 2b Total number of registrations logged for each bat species, at the Central Hedgerow location (west)

Species	13 th April	14 th April	15 th April	16 th April	17 th April	Average
Common Pipistrelle	-	-	237	47	10	59
Noctule	-	-	1	-	17	4
Leisler's	-	-	2	-	-	<1

Table 2c Total number of registrations logged for each bat species, at the Woodland edge location (east)

Species	13 th April	14 th April	15 th April	16 th April	17 th April	Average
Common Pipistrelle	-	-	40	16	29	17
Noctule	15	-	72	27	86	40
Leisler's	-	-	64	51	423	108

Figure 3 Proportion of activity attributed to each bat species at each of the monitoring locations

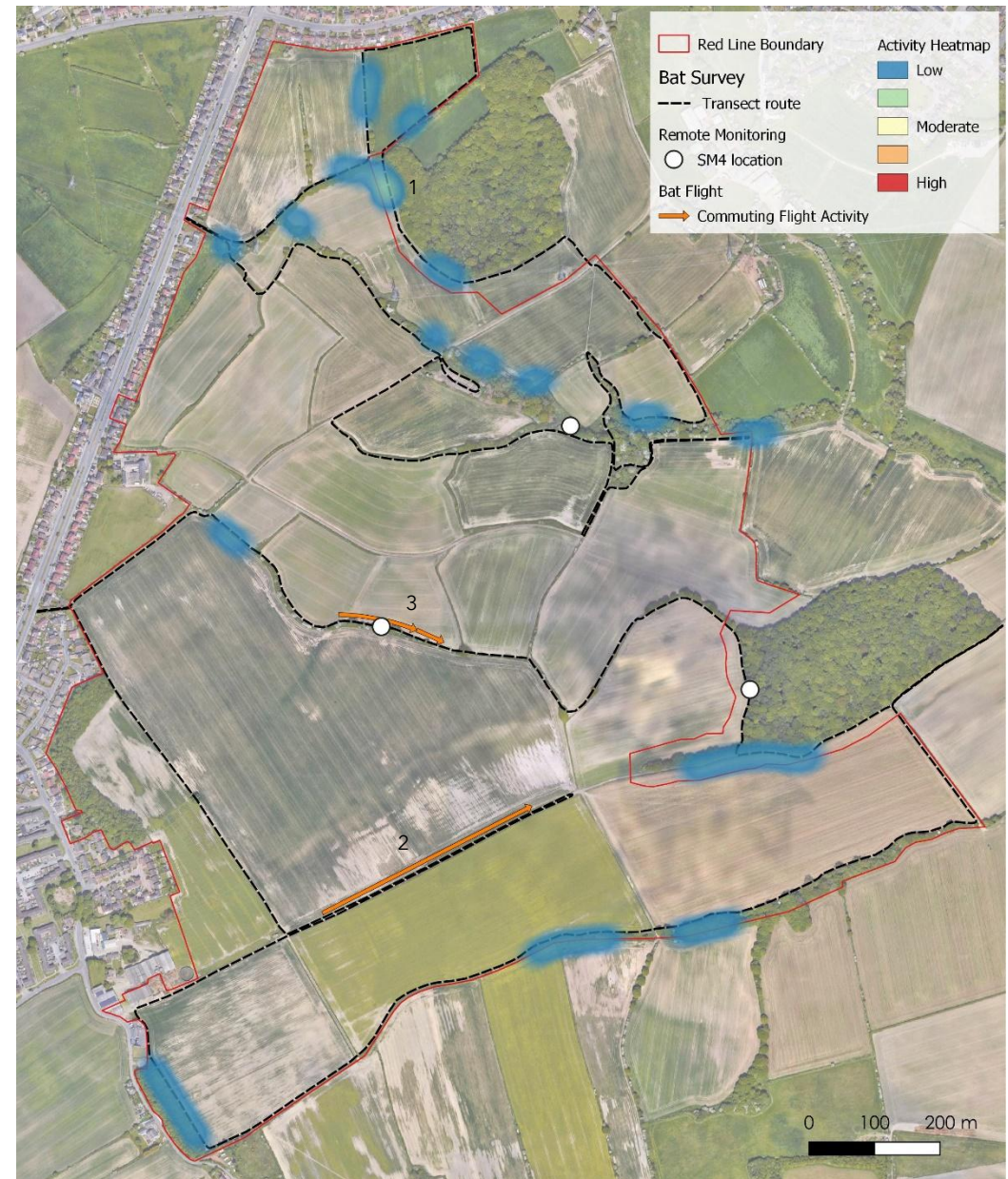


May Survey

Walkover Transect

33. As before, the Site was split into two transect routes, covering the northern and southern halves of the Site. The transects sought to cover as much of the site as possible but focussed on the most valuable habitats; these being the two watercourses and the woodland edges.
34. A marked increase in bat activity was recorded in May, when compared to April, with foraging and commuting focussed along the field boundaries, woodland edge and watercourses.
35. The approximate location and extent of foraging activity is illustrated in the figure opposite, with each area of blue showing where surveyors encountered foraging. With the exception of one encounter (1) where up to two bats were seen at any one time, all of the foraging activity shown on the plan can be attributed to a solitary common pipistrelle bat, with activity generally being short in duration.
36. (2) Commuting activity by up to 2 common pipistrelle bats was again noted along the farm track to the southern end of the Site, with bats flying in the direction of the woodland.
37. (3) A solitary common pipistrelle was also seen commuting in an eastly direction along the more mature, central hedgerow, again in the direction of mature woodland.
38. Whilst a notable increase in activity was recorded, this was limited to solitary common pipistrelles.

Figure 4 Summary of bat activity observed during May walked transect



May Survey

Remote Monitoring

39. Three remote detectors (Song Meter SM4BAT FS) were deployed in the same locations as in April (watercourse, central hedgerow and woodland edge); see figure 4. These were left to run for 5 consecutive nights.
40. A slight increase in bat activity was logged during the May monitoring period, but can still be considered low overall, at each of the three monitoring stations. A summary of the data collected are presented in the tables opposite.
41. As with April, only three species of bat were recorded on Site during this period, these being common pipistrelle, noctule and leisler's bat.
42. Data logged at the watercourse and hedgerow locations were again very similar, with common pipistrelle accounting for most of the activity. An average of 259 and 253 registrations were logged at these two locations, representing low levels of foraging activity. However, this fluctuated slightly between nights, ranging from lows of 31 to highs of 634 registrations. This suggests that the Site's use as a foraging resource by the local common pipistrelle population is sporadic.
43. Activity by noctule and leisler's bats at these two locations is negligible, and likely represents commuting by small numbers of bats.
44. At the woodland edge location, activity by all three species is low, and is likely to be attributable to sporadic foraging by solitary or low numbers of individuals.

Table 3a Total number of registrations logged for each bat species, at the Watercourse location (north)

Species	10 th May	11 th May	12 th May	13 th May	14 th May	Average
Common Pipistrelle	126	412	617	31	108	259
Noctule	6	1	7	8	9	6
Leisler's	7	9	-	4	6	5

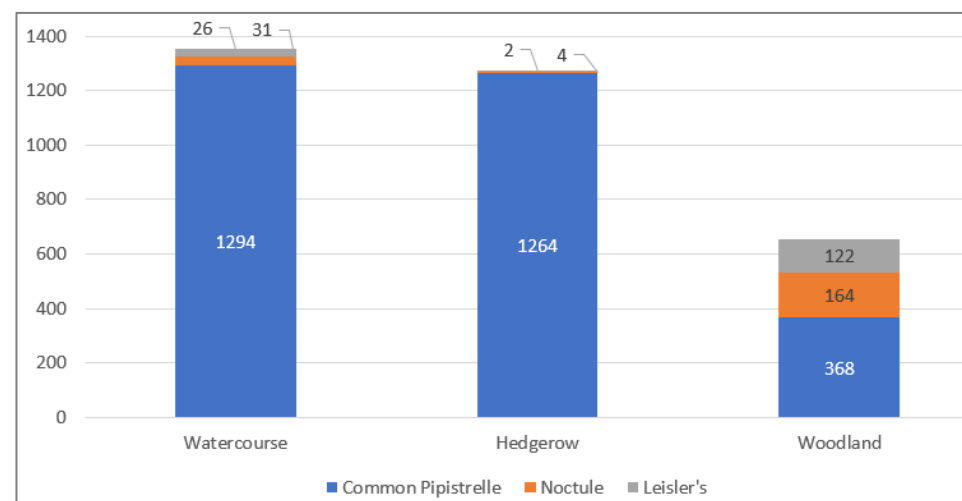
Table 3b Total number of registrations logged for each bat species, at the Central Hedgerow location (west)

Species	10 th May	11 th May	12 th May	13 th May	14 th May	Average
Common Pipistrelle	92	634	419	45	74	253
Noctule	-	2	2	-	-	<1
Leisler's	1	-	-	1	-	<1

Table 3c Total number of registrations logged for each bat species, at the Woodland edge location (east)

Species	10 th May	11 th May	12 th May	13 th May	14 th May	Average
Common Pipistrelle	82	156	4	44	82	74
Noctule	22	120	9	5	8	33
Leisler's	-	115	3	1	3	24

Figure 5 Proportion of activity attributed to each bat species at each of the monitoring locations

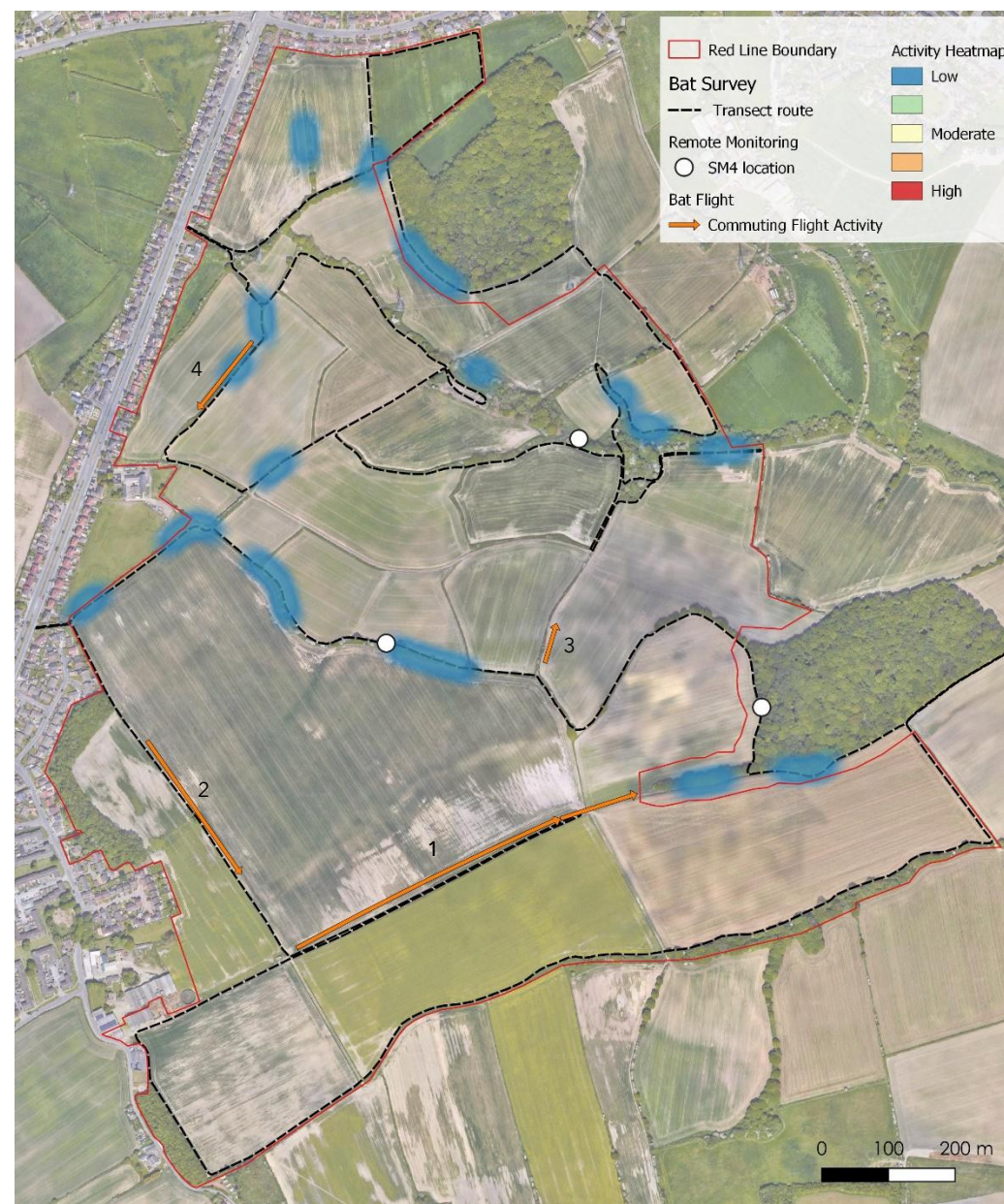


June Survey

Walkover Transect

45. As before, the Site was split into two transect routes, covering the northern and southern halves of the Site. The transects sought to cover as much of the site as possible but focussed on the most valuable habitats; these being the two watercourses and the woodland edges.
46. Similar levels of bat activity were recorded again in June, with foraging and commuting focussed along the field boundaries, woodland edge and watercourses.
47. The approximate location and extent of foraging activity is illustrated in the figure opposite, with each area of blue showing where surveyors encountered foraging. All of the foraging activity shown on the plan can be attributed to a solitary common pipistrelle bat, with activity generally being short in duration.
48. (1) Commuting activity by up to 3 common pipistrelle bats was noted along the farm track to the southern end of the Site, with bats flying in the direction of the woodland.
49. (2) A further two common pipistrelle bats were recorded commuting along the field boundary to the west of the Site, in the direction of the farm track.
50. (3) (4) Elsewhere, solitary common pipistrelles were noted commuting along field margins.
51. As was seen in May, bat activity on site is limited to low-level, sporadic foraging by solitary common pipistrelle bats. No areas of higher level or more sustained foraging was noted.

Figure 6 Summary of bat activity observed during June walked transect



June Survey

Remote Monitoring

52. Three remote detectors (Song Meter SM4BAT FS) were deployed in the same locations as before (watercourse, central hedgerow and woodland edge); see figure 6. These were left to run for 5 consecutive nights.
53. A summary of the data collected at the three monitoring locations are presented in the tables opposite.
54. Up to four species of bat were recorded on Site during this period, these being common pipistrelle, noctule, leisler's and a single myotis bat species (likely whiskered).
55. Common pipistrelle accounted for most of the activity registered at each of the three monitoring locations, with all other species being recorded at very low/insignificant levels.
56. Activity was greatest along the woodland edge, with an average of 260 registrations logged per night by common pipistrelle. This however is still considered to represent low-levels of activity, and can be attributed to irregular foraging by small numbers of bats.
57. Activity at the watercourse was slightly lower, with an average of only 107 registrations per night, again attributed by low level foraging by small numbers of bats.
58. Activity was lowest along the central hedgerow, with an average of 28 registrations per night for common pipistrelle. This represents very low levels of foraging activity.

Table 4a Total number of registrations logged for each bat species, at the Watercourse location (north)

Species	15 th June	16 th June	17 th June	18 th June	19 th June	Average
Common Pipistrelle	137	126	176	8	90	107
Noctule	-	44	5	15	-	13
Leisler's	-	4	2	-	-	1
Myotis	-	-	1	-	-	<1

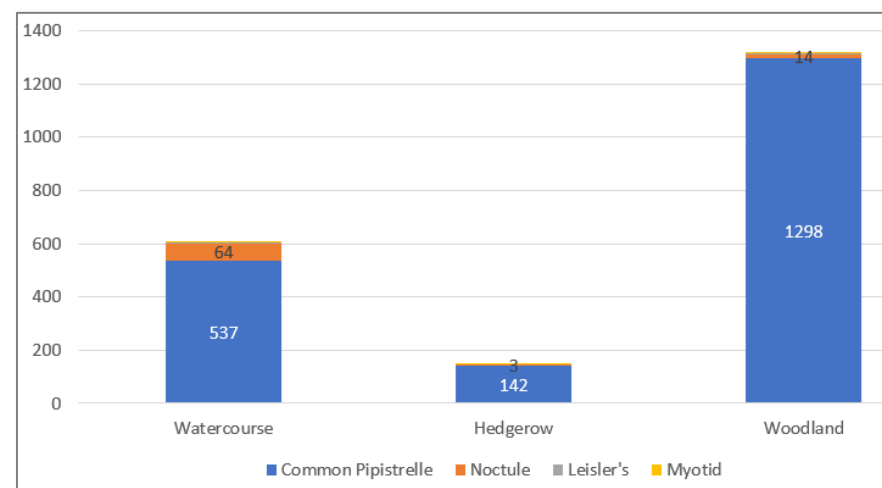
Table 4b Total number of registrations logged for each bat species, at the Central Hedgerow location (west)

Species	15 th June	16 th June	17 th June	18 th June	19 th June	Average
Common Pipistrelle	31	44	47	4	16	28
Noctule	-	1	-	-	2	<1
Leisler's	-	-	-	-	3	<1
Myotis	1	-	-	-	-	<1

Table 4c Total number of registrations logged for each bat species, at the Woodland edge location (east)

Species	15 th June	16 th June	17 th June	18 th June	19 th June	Average
Common Pipistrelle	275	170	184	400	269	260
Noctule	-	10	-	3	1	3
Leisler's	-	1	-	3	1	1
Myotis	-	1	1	-	-	<1

Figure 7 Proportion of activity attributed to each bat species at each of the monitoring locations.

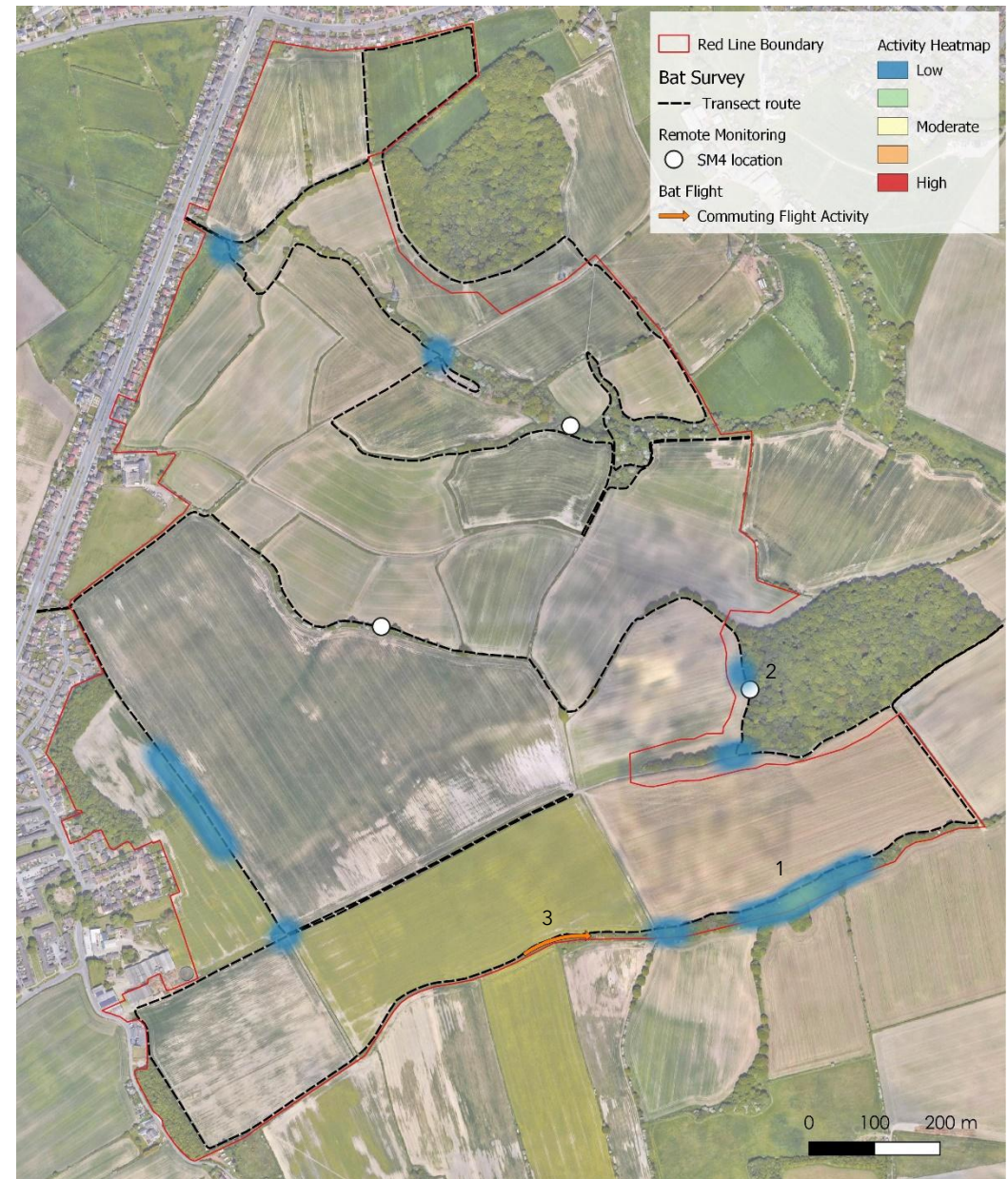


July Survey

Walkover Transect

59. As before, the Site was split into two transect routes, covering the northern and southern halves of the Site. The transects sought to cover as much of the site as possible but focussed on the most valuable habitats; these being the two watercourses and the woodland edges.
60. The July transects saw a marked decrease in bat activity. The approximate location and extent of foraging activity is illustrated in the figure opposite, with each area of blue showing where surveyors encountered foraging. With the exception of one encounter (1) where up to two bats were seen at any one time, all of the foraging activity shown on the plan can be attributed to a solitary pipistrelle bat, with activity generally being short in duration. Most of the encounters were attributed to common pipistrelle, with one contact (2) being a soprano pipistrelle.
61. (3) Commuting activity by a single soprano pipistrelle bat was also noted along the southern boundary, with the bat travelling in an easterly direction.
62. As has been seen with all other transects, bat activity on site is limited to low-level, sporadic foraging by solitary pipistrelle bats. No areas of higher level or more sustained foraging was noted.

Figure 8 Summary of bat activity observed during July walked transect



July Survey

Remote Monitoring

63. Three remote detectors (Song Meter SM4BAT FS) were deployed in the same locations as before (watercourse, central hedgerow and woodland edge); see figure 8. These were left to run for 5 consecutive nights.
64. A summary of the data collected at the three monitoring locations are presented in the tables opposite.
65. Up to four species of bat were recorded on Site during this period, these being common pipistrelle, noctule, leisler's and soprano pipistrelle.
66. Again, common pipistrelle accounted for most of the activity registered at the monitoring stations, with all other species being recorded at very low/insignificant levels.
67. Activity was greatest along the watercourse and woodland edge habitats, with an average of 306 and 260 registrations logged, respectively, per night by common pipistrelle. This however is still considered to represent low-levels of activity, and can be attributed to irregular foraging by small numbers of bats.
68. Activity along the central hedgerow was slightly lower, with an average of only 128 registrations per night, again attributed to low level foraging by small numbers of bats.

Table 5a Total number of registrations logged for each bat species, at the Watercourse location (north)

Species	14 th July	15 th July	16 th July	17 th July	18 th July	Average
Common Pipistrelle	498	149	549	244	92	306
Soprano Pipistrelle	10	-	-	-	-	2
Noctule	3	1	-	-	-	<1
Leisler's	4	-	-	-	-	<1

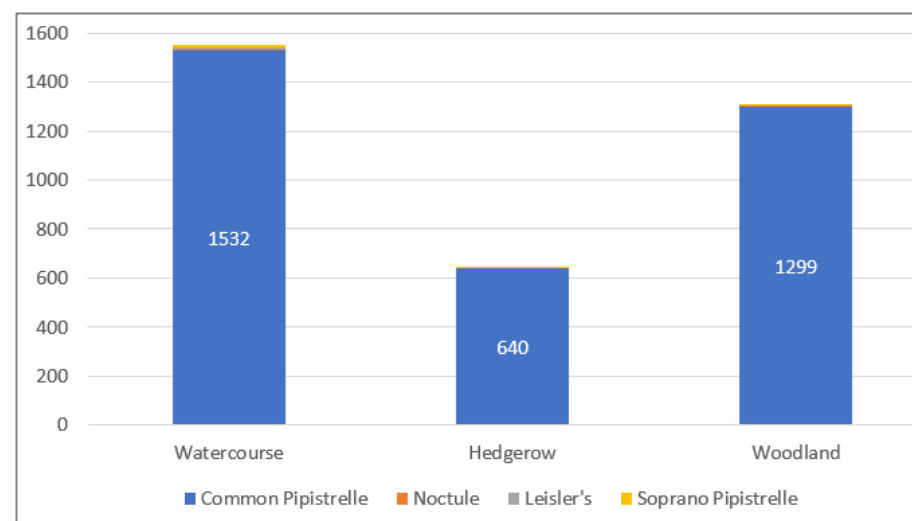
Table 5b Total number of registrations logged for each bat species, at the Central Hedgerow location (west)

Species	14 th July	15 th July	16 th July	17 th July	18 th July	Average
Common Pipistrelle	84	4	335	107	110	128
Soprano Pipistrelle	-	-	1	6	-	1

Table 5c Total number of registrations logged for each bat species, at the Woodland edge location (east)

Species	14 th July	15 th July	16 th July	17 th July	18 th July	Average
Common Pipistrelle	822	63	4	22	388	260
Soprano Pipistrelle	1	-	-	-	-	<1
Noctule	1	1	1	-	-	<1
Leisler's	1	-	-	-	2	<1

Figure 9 Proportion of activity attributed to each bat species at each of the monitoring locations

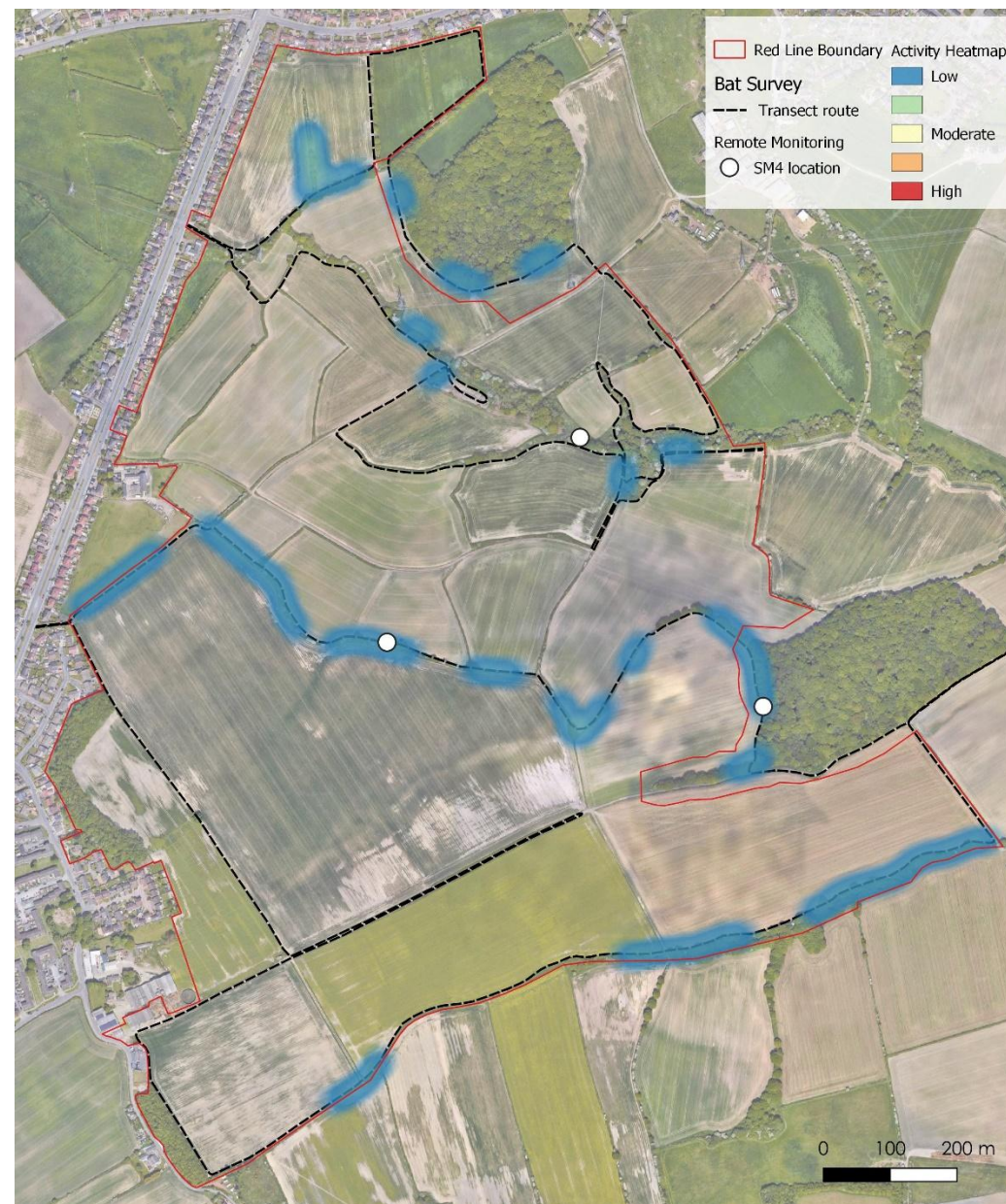


August Survey

Walkover Transect

69. As before, the Site was split into two transect routes, covering the northern and southern halves of the Site. The transects sought to cover as much of the site as possible but focussed on the most valuable habitats; these being the two watercourses and the woodland edges.
70. After a drop off in July, August saw an marked increase in bat activity, back up to levels seen in May and June.
71. Activity was limited to foraging by solitary bats, these being mostly common pipistrelle, with the occasional soprano pipistrelle noted. Commuting activity was not observed during this survey.
72. Bats were generally seen following longer foraging beats along boundary hedgerows, with foraging slightly more sustained than that seen in previous surveys. Of particular focus were the central mature hedgerow and the wooded watercourse to the south.

Figure 10 Summary of bat activity observed during August walked transect



August Survey

Remote Monitoring

73. Three remote detectors (Song Meter SM4BAT FS) were deployed in the same locations as before (watercourse, central hedgerow and woodland edge); see figure 10. These were left to run for 5 consecutive nights.
74. A summary of the data collected at the three monitoring locations are presented in the tables opposite.
75. Up to five species of bat were recorded on Site during this period, these being common pipistrelle, noctule, leisler's, soprano pipistrelle and brown long-eared bat.
76. Common pipistrelle accounted for most of the activity registered at each of the three monitoring locations, with all other species being recorded at very low/insignificant levels.
77. Activity was greatest along the central hedgerow, with an average of 2071 registrations logged per night by common pipistrelle. This represents moderate levels of activity, and is a notable increase in activity compared to previous months. This is likely to reflect more persistent foraging along the central hedgerow during the last three nights of monitoring, by a small group of bats.
78. Activity along the watercourse and woodland edge was significantly lower, with an average of 334 and 346 registrations per night, respectively, for common pipistrelle. This is more consistent with previous monitoring at the site, and is most likely attributable to low level/irregular foraging by individual or small numbers of bats.

Table 6a Total number of registrations logged for each bat species, at the Watercourse location (north)

Species	17 th Aug	18 th Aug	19 th Aug	20 th Aug	21 st Aug	Average
Common Pipistrelle	984	75	218	204	191	334
Soprano Pipistrelle	1	-	-	-	-	<1
Noctule	4	3	4	10	9	6
Leisler's	28	1	1	1	80	22

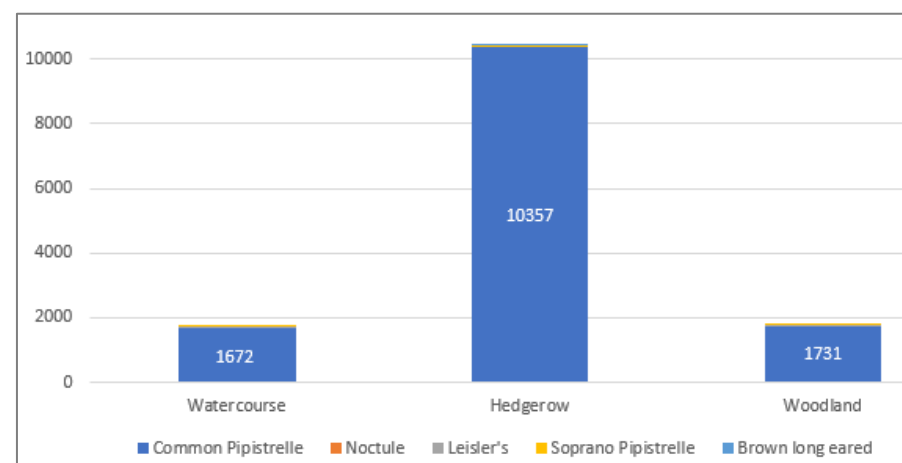
Table 6b Total number of registrations logged for each bat species, at the Central Hedgerow location (west)

Species	17 th Aug	18 th Aug	19 th Aug	20 th Aug	21 st Aug	Average
Common Pipistrelle	345	524	3394	1871	4223	2071
Soprano Pipistrelle	1	-	9	24	3	7
Noctule	10	3	-	-	3	3
Leisler's	1	1	-	-	-	<1
Brown long eared	1	1	3	2	2	2

Table 6c Total number of registrations logged for each bat species, at the Woodland edge location (east)

Species	17 th Aug	18 th Aug	19 th Aug	20 th Aug	21 st Aug	Average
Common Pipistrelle	604	29	299	573	226	346
Soprano Pipistrelle	1	-	-	-	-	<1
Noctule	8	1	2	1	2	3
Leisler's	4	2	1	-	1	2

Figure 11 Proportion of activity attributed to each bat species at each of the monitoring locations

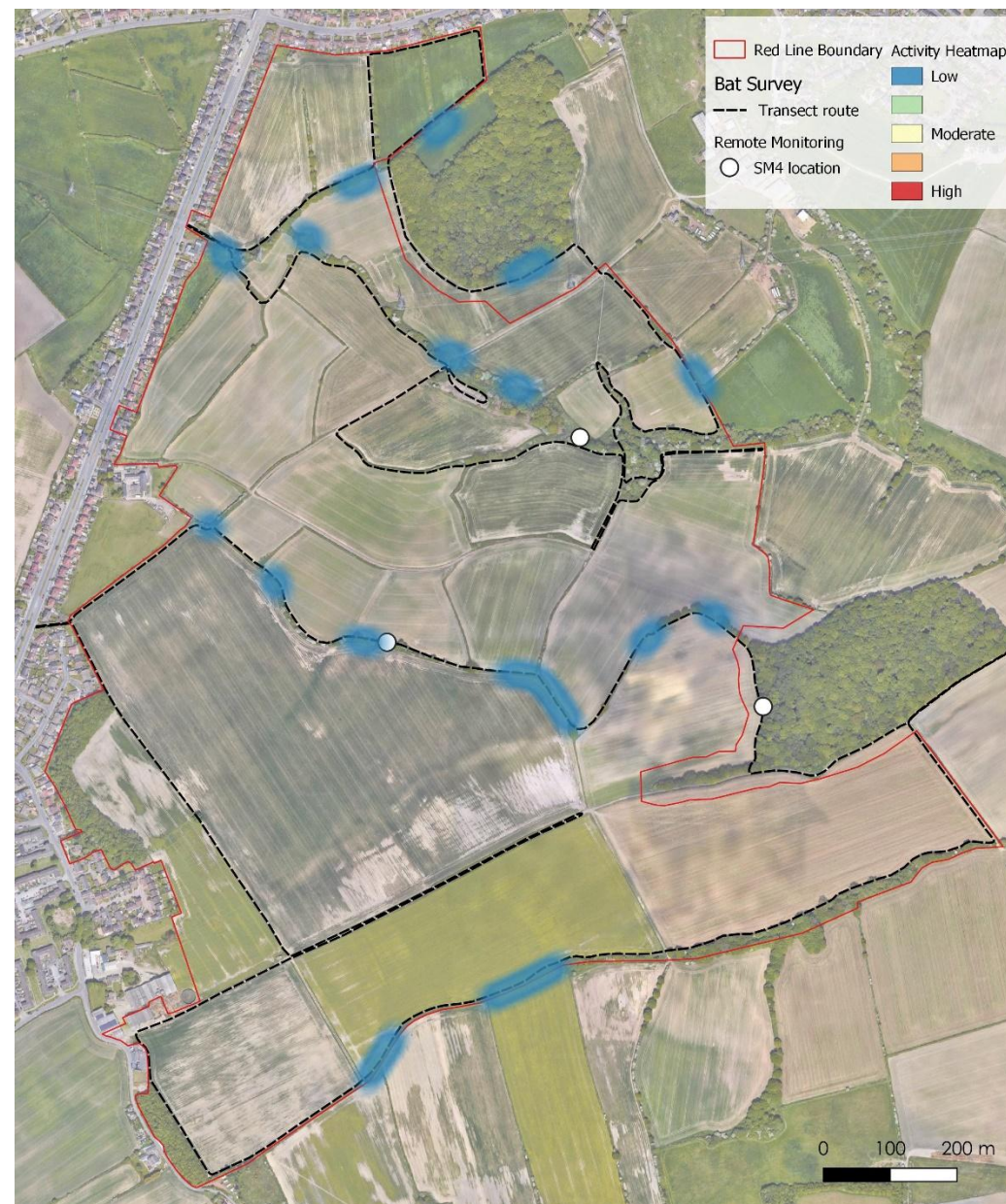


September Survey

Walkover Transect

79. As before, the Site was split into two transect routes, covering the northern and southern halves of the Site. The transects sought to cover as much of the site as possible but focussed on the most valuable habitats; these being the two watercourses and the woodland edges.
80. A slight drop in bat activity was recorded in September, when compared to August, with bats generally seen following shorter foraging beats along boundary hedgerows, or heard only briefly before moving on.
81. The approximate location and extent of foraging activity is illustrated in the figure opposite, with each area of blue showing where surveyors encountered foraging. As before, activity was limited to foraging by solitary bats, these being mostly common pipistrelle, with the occasional soprano pipistrelle noted. Commuting activity was not observed during this survey.

Figure 12 Summary of bat activity observed during September walked transect



September Survey

Remote Monitoring

82. Three remote detectors (Song Meter SM4BAT FS) were deployed in the same locations as before (watercourse, central hedgerow and woodland edge); see figure 12. These were left to run for 5 consecutive nights.
83. Detectors were deployed on the 14th September and collected in on the 18th September. However, the detector placed along the central hedgerow failed to record any activity, and thus was re-deployed on the 25th September.
84. A summary of the data collected at the three monitoring locations are presented in the tables opposite.
85. Up to five species of bat were recorded on Site during this period, these being common pipistrelle, noctule, leisler's, soprano pipistrelle and brown long eared.
86. Common pipistrelle accounted for most of the activity registered at the three monitoring locations, with all other species being recorded at very low / insignificant levels.
87. As was seen in August, activity was greatest along the central hedgerow, with an average of 1180 registrations logged per night by common pipistrelle. This again represents moderate levels of activity, but is less than that seen in the previous month. As before, this is thought to reflect more consistent foraging throughout the five nights of monitoring, by a small group of bats.
88. Activity at the watercourse was slightly lower, with an average of 664 registrations per night; this represents low-moderate levels foraging by small numbers of bats.
89. Activity was lowest along the woodland edge, with an average of 140 registrations per night for common pipistrelle. This represents low levels of foraging activity.

Table 7a Total number of registrations logged for each bat species, at the Watercourse location (north)

Species	14 th Sept	15 th Sept	16 th Sept	17 th Sept	18 th Sept	Average
Common Pipistrelle	216	1214	1757	120	13	664
Soprano Pipistrelle	1	-	-	-	-	<1
Noctule	8	4	-	1	-	3
Leisler's	11	8	2	4	-	5

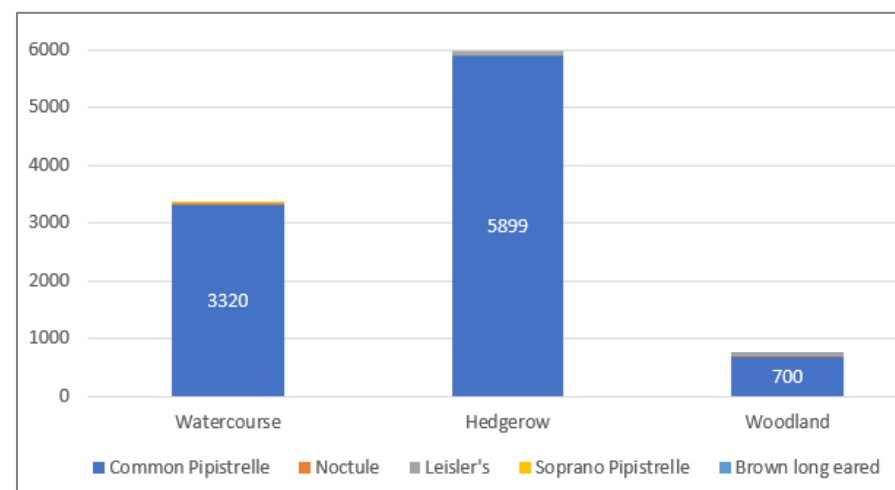
Table 7b Total number of registrations logged for each bat species, at the Central Hedgerow location (west)

Species	25 th Sept	26 th Sept	27 th Sept	28 th Sept	29 th Sept	Average
Common Pipistrelle	1559	1421	1091	1320	508	1180
Noctule	6	-	-	-	-	1
Leisler's	1	51	-	6	19	15

Table 7c Total number of registrations logged for each bat species, at the Woodland edge location (east)

Species	14 th Sept	15 th Sept	16 th Sept	17 th Sept	18 th Sept	Average
Common Pipistrelle	251	297	123	26	3	140
Soprano Pipistrelle	-	2	3	-	-	1
Noctule	3	-	3	2	-	2
Leisler's	9	-	1	12	-	4
Brown Long Eared	-	1	-	-	-	<1

Figure 13 Proportion of activity attributed to each bat species at each of the monitoring locations

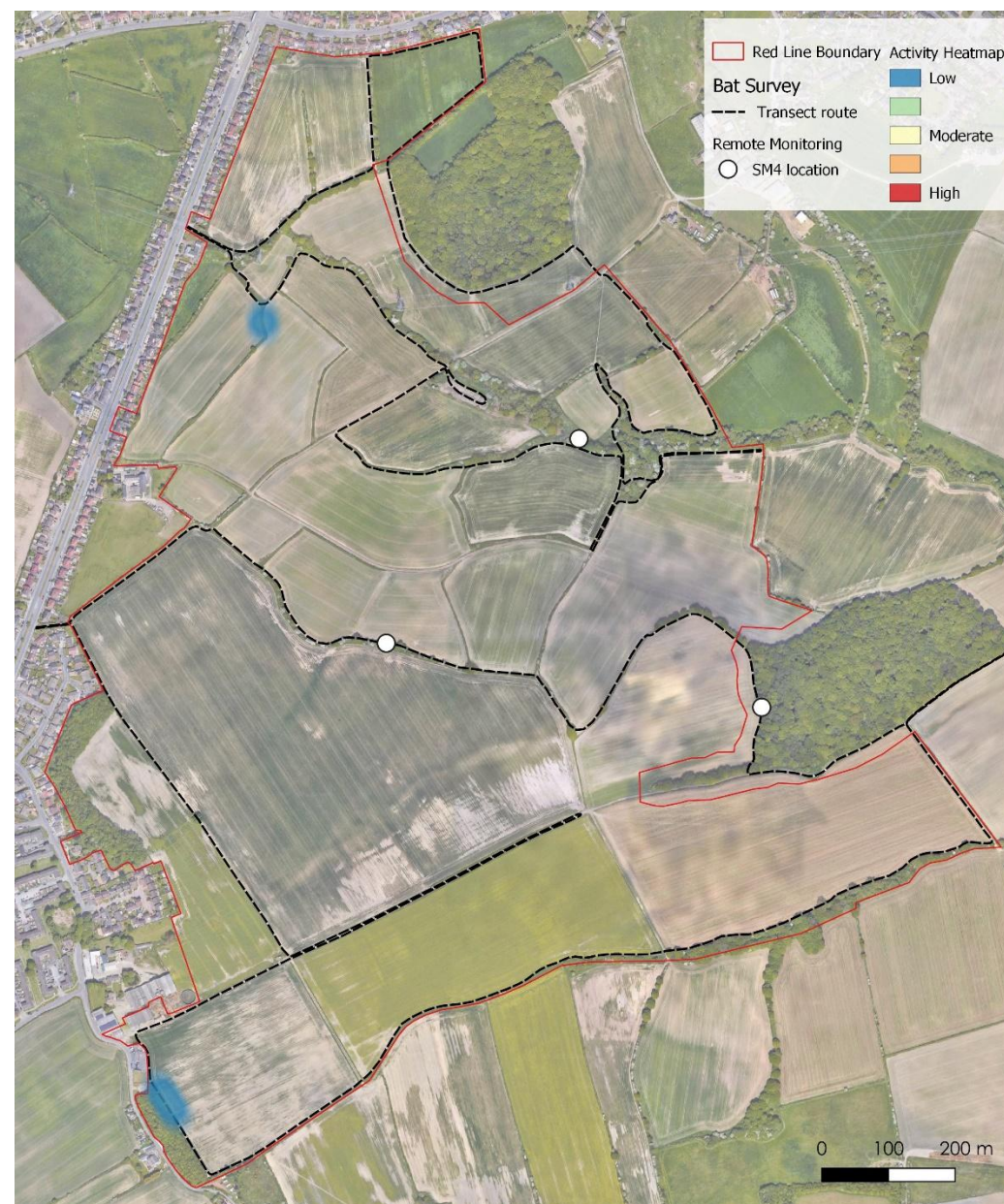


October Survey

Walkover Transect

90. As before, the Site was split into two transect routes, covering the northern and southern halves of the Site. The transects sought to cover as much of the site as possible but focussed on the most valuable habitats; these being the two watercourses and the woodland edges.
91. The October transects saw a marked decrease in bat activity, with only two bat contacts being made. Both contacts were attributed to brief foraging passes by solitary common pipistrelle bats, and are shown on the plan opposite.

Figure 14 Summary of bat activity observed during October walked transect



October Survey

Remote Monitoring

92. Three remote detectors (Song Meter SM4BAT FS) were deployed in the same locations as before (watercourse, central hedgerow and woodland edge); see figure 14. These were left to run for 5 consecutive nights.
93. A summary of the data collected at the three monitoring locations are presented in the tables opposite.
94. Up to five species of bat were recorded on Site during this period, these being common pipistrelle, noctule, leisler's, soprano pipistrelle and a single myotis bat (likely whiskered).
95. Common pipistrelle accounted for most of the activity registered at the three monitoring locations, with all other species being recorded at very low/insignificant levels.
96. As was seen in August and September, activity was again greatest along the central hedgerow, with an average of 1383 registrations logged per night by common pipistrelle. This again represents moderate levels of activity and is thought to reflect more consistent foraging throughout the five nights of monitoring, by a small group of bats.
97. Activity along the watercourse and woodland edge was significantly lower, with an average of 559 and 494 registrations per night, respectively, for common pipistrelle. This is consistent with previous monitoring at the site, and is most likely attributable to low level/irregular foraging by individual or small numbers of bats.

Table 8a Total number of registrations logged for each bat species, at the Watercourse location (north)

Species	3 rd Oct	4 th Oct	5 th Oct	6 th Oct	7 th Oct	Average
Common Pipistrelle	276	552	341	529	1095	559
Soprano Pipistrelle	-	-	-	-	1	<1
Noctule	-	3	-	-	9	2
Leisler's	3	1	-	9	8	4
Myotis	-	-	-	-	1	<1

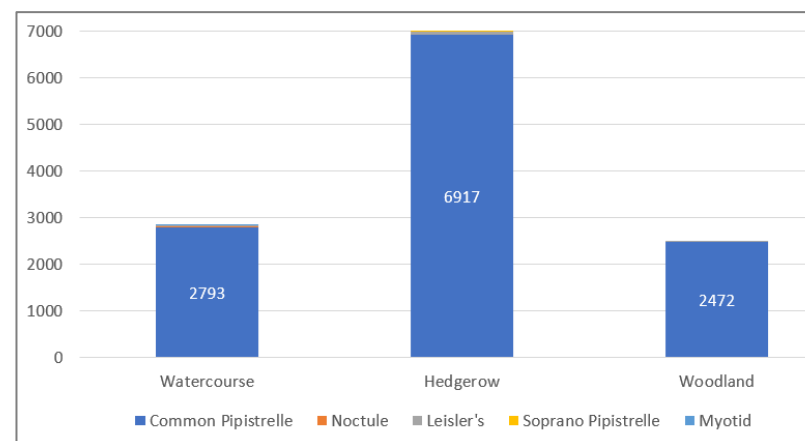
Table 8b Total number of registrations logged for each bat species, at the Central Hedgerow location (west)

Species	3 rd Oct	4 th Oct	5 th Oct	6 th Oct	7 th Oct	Average
Common Pipistrelle	1259	1883	907	1403	1465	1383
Soprano Pipistrelle	-	-	-	-	1	<1
Noctule	-	3	-	-	2	1
Leisler's	3	1	-	4	61	14

Table 8c Total number of registrations logged for each bat species, at the Woodland edge location (east)

Species	3 rd Oct	4 th Oct	5 th Oct	6 th Oct	7 th Oct	Average
Common Pipistrelle	2	3	1	1	2465	494
Leisler's	5	-	-	-	1	1

Figure 15 Proportion of activity attributed to each bat species at each of the monitoring locations



Evaluation

Walked transects

98. The Site provides only limited opportunities for local bat population, with most of land being occupied by intensive arable farmland, which is lacking in habitat structure and diversity. Management at the Site is very much aimed at maximising agricultural yields, with ploughing extending right up to the base of the field hedgerows, woodland edges and the tops of ditches/watercourses. As a result, field margins are very narrow and occupied by nutrient enriched neutral grassland. Field hedgerows are generally defunct and overly managed, providing little in the way of cover or connectivity.
99. The degraded field hedgerows and minor watercourses provide the best foraging and commuting resources on-Site for this group, whilst Dum Wood and Dogloitch Wood provide the best off-Site foraging opportunities within close proximity.
100. Bat activity was very much focussed on these features, but remained relatively low throughout the year. Whilst some months saw increases in the extent of foraging cover across the site, it was always attributed to solitary or low numbers (up to 2) bats.
101. Much of the activity noted on-Site was accountable to common pipistrelle, with occasional contacts by soprano pipistrelle recorded later in the season.
102. No significant commuting routes were identified, although early in the season, the farm track to the south of the Site was regularly seen to be used by smaller numbers (3-5) of bats, travelling towards the off-Site woodland.
103. In general, the walked transects have shown the site to be of limited value to the local common pipistrelle populations, with sporadic low-level foraging along field boundaries. Occasional, but not significant, use of the site by the local soprano pipistrelle population has also been noted.

Remote monitoring

104. Remote monitoring has sampled a range of habitats, including the Site's hedgerows, watercourse and woodland edge. For this, three remote detectors were deployed each month, covering five consecutive nights.
105. Whilst levels of activity have fluctuated slightly between locations and months, the overall composition trend has remained the same. This being that at all three monitoring locations, common pipistrelle has consistently contributed the greatest amount of activity, with all other species

contributing only very low levels of activity. This can be seen in Figures 16(a-c), below and overleaf.

106. The greatest levels of activity were recorded along the central hedgerow, towards the latter half of the season (August, September and October), however even this only represented moderate levels of foraging activity.
107. Overall, the Site is considered to only be of value to the local common pipistrelle population, and then only attracting low (to occasionally moderate) levels of foraging.

Figure 16a Total number of registrations logged for each bat species, across each month of monitoring at the northern (Watercourse) location

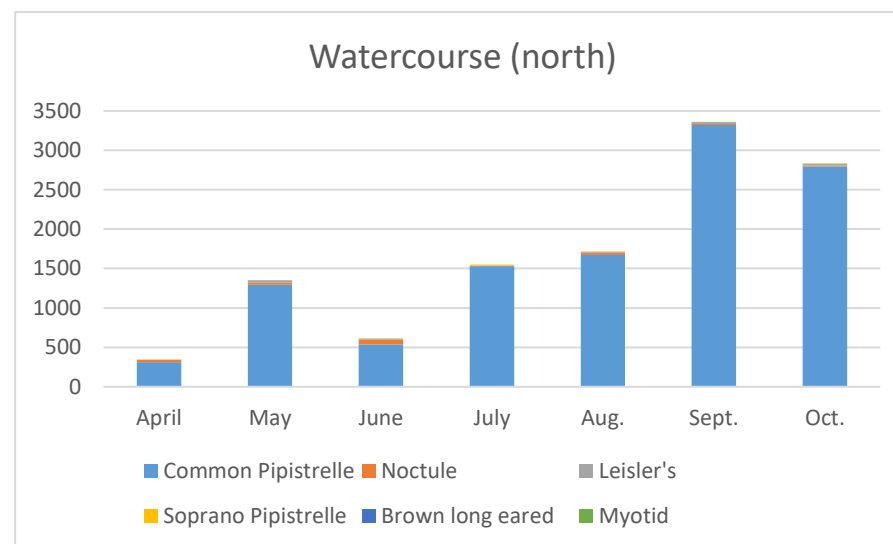


Figure 16b Total number of registrations logged for each bat species, across each month of monitoring at the western (Hedgerow) location

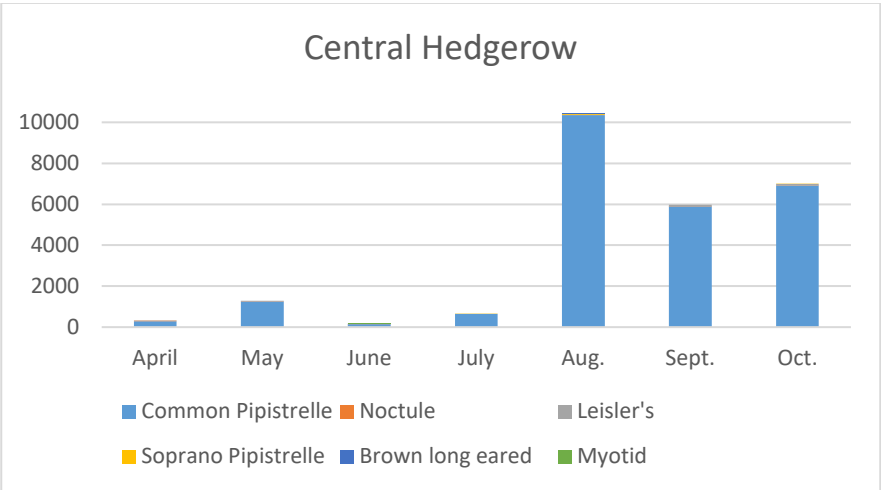
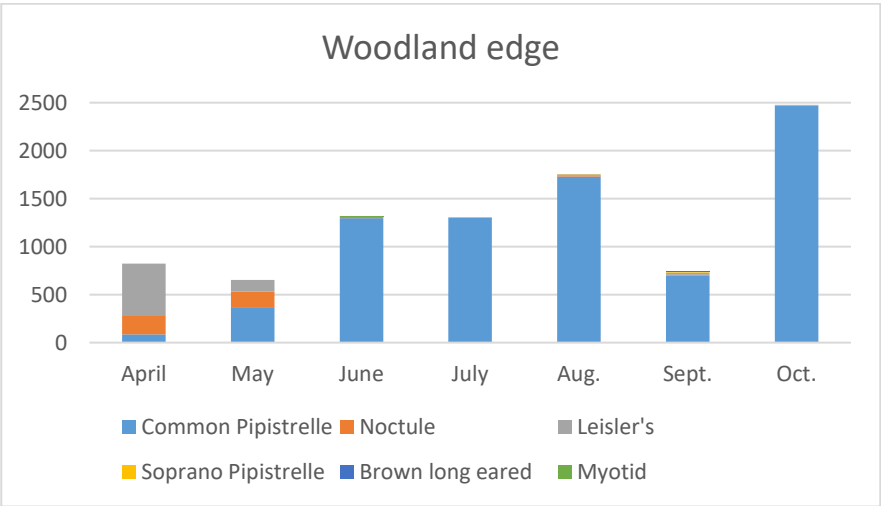


Figure 16c Total number of registrations logged for each bat species, across each month of monitoring at the eastern (Woodland Edge) location



Conclusions

108. Monthly walked transects have recorded only low-level irregular foraging by common pipistrelle bats, with activity restricted to field boundaries. There is no particular focus to foraging activity, with no one area of habitat appearing to be of greater importance to any other.
109. Remote monitoring recorded similar low-level activity, by up to five common bat species, with common pipistrelle making up the bulk of this activity. Moderate levels of foraging were recorded along the central hedgerow towards the latter half of the year, indicating that either low numbers of bats remain foraging within this part of the Site for more prolonged periods of time during these months, or there is an increase in the number of bats foraging within the Site at this time. The former is suspected to be more likely, given the results of the walked transects.
110. The data collected during both walked transects and remote monitoring, together with previous survey effort, does not indicate that the Site is of any significant importance to any local bat populations.
111. A sensitive Site Layout was produced (and approved) at the Outline Planning permission stage, which showed that development will be mostly confined to the field interiors, with existing structured habitat (i.e. hedgerow, watercourses and woodland edges) being largely retained, protected and made available for ecological enhancement.
112. Development of the Site is therefore unlikely to impact significantly on any local bat populations, including that of common pipistrelle, and in fact provide opportunities to provide long term gains for this group.

Recommendations

113. A Construction Environmental Management Plan (CEMP: Biodiversity) should be produced for each phase of development, which sets out how structured habitat will be retained and protected.
114. A Biodiversity Management Plan (BMP) should also be produced for each phase of development, showing how the value of new and retained habitats will be maximised for the benefit of this group, as well as other wildlife locally.
115. A joined-up approach to green/blue infrastructure and Public Open Space (POS) will need to be adopted between each phase of development. This should seek to strengthen corridors and provide a mosaic of semi-natural habitat, including wildflower rich grassland, wetland, mixed native scrub, woodland and tree planting.
116. A sensitive lighting plan should also be created for each phase of development, to demonstrate how light spill will be minimised/avoided on structured habitats, both existing and created.
117. The provision of new foraging and commuting habitats should be complimented with the provision of new roosting opportunities. To this end, a range of bat boxes should be installed within new builds and erected on mature trees.

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