Bat Activity Survey Report

Tess Square and Butts Close Hybrid Scheme, Marnhull

October 2023

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Non-technical Summary

A series of three dusk bat activity transect and static detector surveys were carried out between May and September 2023, during the main active season for bats, at land off Church Hill and Butts Close, Marnhull.

Current proposals are for a commercial centre at land off Church Hill, to be known as Tess Square, and a residential development at land off Butts Close, to be known as Butts Close. The survey area extended over approximately 13.5 hectares (ha).

The main findings of the surveys are as follows:

- Whilst activity levels varied between seasons, an overall low level of bat activity was typically recorded across both site areas (Tess Square and Butts Close).
- At least seven different species were confirmed as present at the northern site area (Tess Square). These were soprano pipistrelle (*Pipistrellus pygmaeus*), common pipistrelle (*Pipistrellus pipistrellus*), myotis species (*Myotis* sp.), brown long-eared bat (*Plecotus auritus*), serotine (*Eptesicus serotinus*), Leisler's bat (*Nyctalus leisleri*), and noctule (*Nyctalus noctula*). Common pipistrelle dominated the bat activity, with the other species generally recorded at low densities.
- At the northern site area (Tess Square), consistently high levels of bat activity were recorded in the areas of developed land, cereal crop, ruderal vegetation and hedgerow in the southeast corner of the field; the strip of ruderal vegetation and scattered trees to the southwest of the pharmacy; the fen marsh and swamp, scattered trees, and ruderal vegetation in the northeast of the site; and the cereal crop in the northwest of the site. Development works within and/or the introduction of artificial lighting to these areas could have a more significant impact on foraging and commuting bats.
- At least six different species were confirmed as present at the southern site area (Butts Close). These were soprano pipistrelle, common pipistrelle, myotis species, serotine, Leisler's bat, and noctule. Common pipistrelle dominated the bat activity, with the other species generally recorded at low densities.
- At the southern site area (Butts Close), consistently high levels of bat activity were recorded in the areas of cereal crop and hedgerow along the eastern site boundary; the ruderal vegetation and bramble scrub along the northern site boundary; the cereal crop, ruderal vegetation, and hedgerow in the northwest corner of the site; and the cereal crop and along the hedgerow at the southwest of the site. Development works within and/or the introduction of artificial lighting to these areas could have a more significant impact on foraging and commuting bats.

- Given the main development footprint is focused around the northeast of the northern site area (Tess Square) and the centre of the southern site area (Butts Close), there is not expected to be significant areas of habitat loss for foraging and commuting bats. The areas of high bat activity mostly fall outside of the development footprint.
- It has been recommended that a bat-sensitive lighting strategy is devised, which should keep overall light levels to a minimum and retain dark corridors with dark buffer zones around important habitat features, such as boundary vegetation and hedgerows.
- It has also been recommended that habitat creation and enhancements are delivered effectively, as set out in a Landscape and Ecological Management Plan (LEMP) or similar, to maximise the site's value for foraging and commuting bats.

1. Introduction

Background

1.1 Phlorum Limited was commissioned by Chapman Lily Planning to carry out a series of three bat activity transect and static detector surveys across land off Church Hill and Butts Close, Marnhull (hereafter referred to as "the site") prior to development.

1.2 The bat surveys follow on from a Preliminary Ecological Appraisal (PEA) and this report should be read in conjunction with the PEA report (Phlorum 2023). The PEA assessed the site to contain habitat with a low potential for foraging and commuting bats. It was therefore recommended that a series of seasonal surveys be carried out during the main active season for bats, to include a walked transect survey and static bat detector survey.

1.3 It is understood current proposals are for a commercial centre at land off Church Hill, to be known as Tess Square, and a residential development at land off Butts Close, to be known as Butts Close.

1.4 This report provides an assessment of the status of foraging and commuting bats within the site, providing information on their presence/likely absence and distribution. Potential impacts of the proposed development are identified and measures to mitigate the effects of the proposed development on foraging and commuting bats are discussed in outline.

Site Description

1.5 The site is situated in a rural location in the village of Marnhull, Sturminster Newton, and predominantly comprises agricultural fields. The site area is split across two locations, separated by New Street and its associated properties. The northern site area (for Tess Square) includes part of the agricultural fields adjacent to Church Hill and Burton Street, as well as Marnhull Pharmacy and barns to the south of the fields. The southern site area (for Butts Close) includes a single agricultural field that is enclosed by Butts Close, New Street, Schoolhouse Lane, and Chippel Lane. The surrounding area predominantly comprises agricultural land and residential properties.

1.6 The site comprises buildings, developed land; sealed surface, cereal crop, modified grassland, ruderal/ephemeral, fen marsh and swamp, hedgerow, hedgerow with trees, scattered trees, other rivers and streams, and bramble scrub.

1.7 The National Grid Reference for the centre of the northern site area (Tess Square) is ST 78019 18944 and for the centre of the southern site area (Butts Close) is ST 78008 18471. The total survey area extended over approximately 13.5 hectares (ha).

2. Methodology

Desk Study

Data Search

2.1 Records for bats within a 5km radius of the site were obtained from the Dorset Environmental Records Centre (DERC, 2023) as part of the Preliminary Ecological Appraisal.

Designated Sites

2.2 A search for any Special Areas of Conservation (SACs) that have been designated for bats within 15km of the site was undertaken using Multi-Agency Geographic Information for the Countryside (MAGIC).

Personnel

2.3 The surveys were led by Billie Clifford, an ecological consultant with over 2 years' survey experience. Billie has previous experience leading a large number of bat emergence/re-entry and activity transect surveys.

Dusk Activity Transect Surveys

2.4 A series of three dusk activity transect surveys were carried out at the site, commencing in May 2023 and completing in September 2023. The surveys were carried out seasonally during the main active season for bats (April to October inclusive). The survey dates were 17th May 2023, 27th July 2023, and 12th September 2023.

2.5 Two surveyors were used for each survey, one at the northern site area and one at the southern site area. Echometer Touch 2 Pro detectors were used for the surveys.

2.1 The transect route covered the whole site with a particular focus on boundary features (hedgerows) where bats would most likely be recorded. The route was walked at a slow, steady pace, and all bats seen and/or heard during the survey were recorded. The transect route included eight listening points for each site area, spaced at regular intervals, at which surveyors would stand for approximately 5 minutes to record bat activity. Each surveyor walked the route once, with the route including two laps of the field boundaries. The starting positions were shifted for each survey to further ensure that each part of the route was being surveyed at varying times after sunset.

2.2 The dusk activity transect surveys commenced at sunset and were completed in approximately 2 and a half hours. Surveys were carried out on nights of appropriate weather conditions for bats, that is a sunset temperature of at least 10°C and no strong wind or rain.

2.3 The transect route and listening points are shown in Figures 1 and 2 in Appendix A.

Static Detector Surveys

2.4 A series of three static detector surveys were carried out at the site, commencing in May 2023 and completing in September 2023. The surveys were carried out seasonally during the main active season for bats (April to October inclusive). For each survey, one static detector was deployed within each of the two site areas to continuously record bat activity for five consecutive nights.

2.5 Anabat Express and Chorus passive bat detectors were used for the surveys. The detectors were set to begin recording 30 minutes prior to sunset and stop recording 30 minutes after sunrise.

2.6 The static detectors were deployed on the night of the activity transect survey each month. Surveys were planned with the aim of enabling the static detector surveys to record five consecutive nights of appropriate weather conditions.

2.7 Different locations were used for the static detectors for each survey, with the aim of covering a range of different locations on the site across the three surveys, providing it was deemed safe to leave a detector out. Detectors were not deployed within the cereal crop in the centre of both sites.

2.8 The static detector locations used for each survey are shown in Figures 1 and 2 in Appendix A.

Constraints

Data Search Constraints

2.9 It is important to note that, even where data is held, a lack of records for a defined geographical area does not necessarily mean that there is a lack of ecological interest; the area may be simply under-recorded.

Bat Survey Constraints

2.10 Bats are mobile animals which can cover a large area within any one night and may travel over different locations on different nights. The recordings from the activity transect surveys reflect a snapshot of bat activity from the survey area only.

2.11 The static detector surveys enable a much longer period of bat activity to be recorded and are therefore more likely to identify all species that typically pass over the location of the detector. However, since only bats within close proximity to the detector will be recorded, the results reflect bat activity within a small part of the site only, and bats using other parts of the site may be missed. Data from static detector surveys is also limited since there is no observational context to the recordings.

2.12 Bat activity is inherently variable from night to night and is linked to several factors including weather. As such, any given night of survey may not always be representative of average bat activity levels.

2.13 However, it is considered that the surveys carried out were sufficiently thorough to assess how the site is typically used by commuting and foraging bats.

3. Results

Desk Study

Data Search

3.1 The data search returned recent (post-2008) records for at least 6 different species of bat within 2km of the site, including from the genera pipistrelle (*Pipistrellus*), long-eared (*Plecotus*), myotis (*Myotis*), horseshoe (*Rhinolophus*), serotine (*Eptesicus*) and noctule/Leisler's (*Nyctalus*).

Designated Sites

3.2 None of the SACs within 15km of the site are designated for bats.

Dusk Activity Transect Survey Results

Overview of Results

Northern Site Area (Tess Square)

3.3 Across the three activity transect surveys undertaken, which each lasted for approximately 2 and a half hours after sunset, a total of 26 records of bats were made. Some of these records included bats that continuously foraged within one area, and therefore passed the surveyor multiple times. As such, the total number of bat passes is higher than 26. Whilst there was some variability between seasons, it was overall assessed that the site typically had a low level of bat activity.

3.4 The survey season with the highest levels of bat activity was Summer 2023. At least four different species of bat were recorded during the Summer 2023 survey. The survey season with the lowest level of bat activity was Spring 2023, with a total of only four records of bats and three different species.

3.5 The locations/habitats within the site where the highest levels of bat activity were typically recorded were:

- The developed land, cereal crop, ruderal vegetation and hedgerow in the southeast corner of the field;
- the strip of ruderal vegetation and scattered trees to the southwest of the pharmacy;
- the fen marsh and swamp, scattered trees, and ruderal vegetation in the northeast of the site; and
- the cereal crop in the northwest of the site.

3.6 The species of bat recorded during the surveys were:

- **Common pipistrelle:** This was overall the dominant species during the surveys, accounting for between 25% and 50% of all bat records for each survey. Common pipistrelles were frequently recorded foraging in one area for continuous periods and were recorded across the whole transect route.
- **Serotine:** This was the second most common species recorded during all surveys, accounting for between 25% and 38% of all bat records for each survey. This species was recorded in a variety of locations across the site, however most of the records were from the southeast corner of the site in the areas of developed land, cereal crop, ruderal vegetation, and hedgerow. Serotines were frequently recorded foraging in one area for continuous periods.
- **Noctule:** Noctules were recorded during all of the surveys, but were always recorded at a low density, with only one or two recordings per survey. This species was recorded in a variety of locations across the site.
- **Soprano pipistrelle:** Soprano pipistrelles were recorded during only the summer and autumn surveys in low densities, with only one or two recordings per survey. This species was recorded only in the ruderal vegetation, scattered trees and fen marsh and swamp at the northeast corner of the site.

3.7 Locations of highest bat activity are shown on the Survey Map in Appendix A. Full survey data from the activity transect surveys are provided in Appendix C. A summary of the findings from each seasonal survey are provided below.

First Survey: 17th May 2023 (Spring)

- Sunset was at 20:55hrs and the temperature at the start of the survey was 16°C, falling to 12°C at the end of the survey. It was clear and still, with no rain.
- There were four records of bats made in total. Some of these included multiple passes, which were likely the same bat. The highest level of activity was recorded between approximately 21:37hrs and 21:59hrs. No bat activity was recorded between 22:00hrs and 23:25hrs.
- A total of three species were recorded. These were common pipistrelle, noctule, and serotine.
- The majority of the records were common pipistrelle (50%). Serotine made up 25% of the records, and noctule made up 25%. Serotine and common pipistrelle were the only species recorded making multiple passes.
- The areas of highest activity were the areas of cereal crop, ruderal vegetation, and scattered trees to the south and west of the pharmacy.

Second Survey: 27th July 2023 (Summer)

- Sunset was at 21:03hrs and the temperature at the start of the survey was 19°C, falling to 17°C at the end of the survey. It was overcast and still, with no rain.
- There were 14 records of bats made in total. Some of these included multiple passes, with periods of continuous activity for several minutes, which were likely the same bat. Bats were recorded throughout the survey, however the highest level of activity was recorded between approximately 21:30hrs and 21:51hrs.
- A total of at least four species were recorded. These were common pipistrelle, soprano pipistrelle, noctule, and serotine.
- The majority of the records were common pipistrelle (43%) and serotine (29%). Common pipistrelles and unidentified bats were heard for continuous periods of time and made multiple passes. Soprano pipistrelle was only heard once and noctule was only heard twice during the survey. One bat was unidentified, being seen but not heard.
- The area of highest activity was the southeast corner of the field, which was comprised of developed land, cereal crop, ruderal vegetation, and hedgerow.

Third Survey: 12th September 2023 (Autumn)

- Sunset was at 19:31hrs and the temperature at the start of the survey was 18°C, falling to 16°C at the end of the survey. It was clear with a gentle breeze and no rain.
- There were eight records of bats made in total. Some of these included multiple passes, with periods of continuous activity for several minutes, which were likely the same bat. The highest level of activity was recorded between approximately 19:58hrs and 20:05hrs. No bats were recorded between 19:16hrs and 19:58hrs.
- A total of at least four species were recorded. These were common pipistrelle, soprano pipistrelle, serotine, and noctule.
- The majority of the records were serotine (38%), noctule (25%), and common pipistrelle (25%). Serotine was the only species to make multiple passes and to be heard for continuous periods of time. Noctule was only recorded once.
- The area of highest activity was the southeast corner of the field, which was comprised of developed land, cereal crop, ruderal vegetation, and hedgerow.

Southern Site Area (Butts Close)

3.8 Across the three activity transect surveys undertaken, which each lasted for approximately 2 and a half hours after sunset, a total of 41 records of bats were made. Some of these records included bats that continuously foraged within one area, and therefore passed the surveyor multiple times. As such, the total number of bat passes is higher than 41. Whilst there was some variability between seasons, it was overall assessed that the site typically had a low level of bat activity.

3.9 The survey season with the highest levels of bat activity was Summer 2023, with a total of 21 bat records. At least four different species of bat were recorded during the Summer 2023 survey. The survey season with the lowest level of bat activity was Spring 2023, with a total of only four records of bats and three different species.

3.10 The locations/habitats within the site where the highest levels of bat activity were consistently recorded were:

- The cereal crop and hedgerow along the eastern site boundary;
- the ruderal vegetation and bramble scrub along the northern site boundary;
- the cereal crop, ruderal vegetation, and hedgerow in the northwest corner of the site; and
- the cereal crop and along the hedgerow at the southwest of the site.

3.11 The species of bat recorded during the surveys were:

- **Common pipistrelle:** This was the dominant species during all surveys, accounting for between 50% and 76% of all bat records for each survey. Common pipistrelles were frequently recorded foraging in one area for continuous periods and were recorded across the whole transect route.
- **Noctule:** Noctules were recorded during all of the surveys, accounting for between 14% and 25% of all bat records for each survey. This species was recorded in a variety of locations across the site, but most of the records came from the ruderal vegetation, bramble scrub, cereal crop, and hedgerow at the north of the site.
- **Serotine:** Serotines were recorded during only the spring and summer surveys, and were always recorded at a low density, with only one recording per survey. This species was recorded foraging on both occasions: along the hedgerow at the eastern site boundary, and within the cereal crop at the northwest corner of the field.
- **Leisler's bat:** Leisler's bats were only recorded during the summer and autumn surveys, and were always recorded at a low density, with just one recording per survey. This species was recorded at the northwest and the southwest of the site, in areas of cereal crop and hedgerow.

- **Myotis species:** Due to the difficulty differentiating between the calls of myotis species, these bats were identified to genus level only. Myotis species were recorded only once in the autumn survey. This record was from the area of bramble scrub, ruderal vegetation and cereal crop in the north of the site.

3.12 Locations of highest bat activity are shown on the Survey Map in Appendix A. Full survey data from the activity transect surveys are provided in Appendix C. A summary of the findings from each seasonal survey are provided below.

First Survey: 17th May 2023 (Spring)

3.13 Sunset was at 20:55hrs and the temperature at the start of the survey was 16°C, falling to 12°C at the end of the survey. It was overcast and still, with no rain.

3.14 There were four records of bats made in total. Some of these included multiple passes, with periods of continuous activity for several minutes, which were likely the same bat. Bats were recorded throughout the survey, however the highest level of activity was recorded between approximately 21:42hrs and 21:58hrs.

3.15 A total of at least three species were recorded. These were common pipistrelle, serotine, and noctule.

3.16 The majority of the records were common pipistrelle (50%). This was also the only species that made multiple passes and was heard for continuous periods of time. Serotine made up 25% of the records, and noctule 25%.

3.17 The areas of highest activity were along the eastern boundary and the southeast corner of the field, both of which were comprised of cereal crop and hedgerow.

Second Survey: 27th July 2023 (Summer)

3.18 Sunset was at 21:03hrs and the temperature at the start of the survey was 19°C, falling to 17°C at the end of the survey. It was overcast and still, with no wind or rain.

3.19 There were 21 records of bats made in total. Some of these included multiple passes, with periods of continuous activity for several minutes, which were likely the same bat. Bats were recorded throughout the survey, however the highest level of activity was recorded between approximately 21:47hrs and 21:59hrs.

3.20 A total of at least four species were recorded. These were common pipistrelle, serotine, noctule, and Leisler's bat.

3.21 The majority of the records were common pipistrelle (76%). Common pipistrelle and serotine were heard for continuous periods of time and made multiple passes. Noctule made up 14% of the records, and serotine and Leisler's bat were each recorded once during the survey.

3.22 The areas of highest activity were the ruderal vegetation, bramble scrub, and cereal crop along the northern boundary, and the cereal crop and hedgerow along the eastern boundary.

Third Survey: 12th September 2023 (Autumn)

3.23 Sunset was at 19:31hrs and the temperature at the start of the survey was 18°C, falling to 16°C at the end of the survey. It was clear with a gentle breeze and no rain.

3.24 There were 16 records of bats made in total. Some of these included multiple passes, with periods of continuous activity for several minutes, which were likely the same bat. Bats were recorded throughout the duration of the survey, however the highest level of activity was recorded between approximately 20:34hrs and 20:53hrs.

3.25 A total of at least four species were recorded. These were common pipistrelle, myotis species, Leisler's bat, and noctule.

3.26 The majority of the records were common pipistrelle (63%), which was also the only species to make multiple passes and to be heard for continuous periods of time. Noctule made up 25% of the records, and Leisler's bat and myotis species were each only recorded once.

3.27 The areas of highest activity were the ruderal vegetation, bramble scrub, and cereal crop along the northern boundary, and the cereal crop and hedgerow along the eastern boundary and in the southeast corner of the field.

Static Detector Survey Results

Overview of Results

Northern Site Area (Tess Square)

3.28 A total of 6,421 bat passes have been recorded and identified from the static detector surveys, which involved one static detector within the northern site area recording bat activity for five consecutive nights per season including spring, summer, and autumn.

3.29 There was significant variation in the number of bat passes recorded by each static detector each season. This is likely reflective of both the habitat/location in which the detectors were deployed, as well as the time of year and weather conditions. For example, the detector recorded very few bat passes in spring, consistent with the activity transect results for that month and possibly reflective of the cold and wet weather conditions that dominated Spring 2023.

3.30 The highest number of bat passes, at 3,968, were recorded by the detector deployed in the copse near the western site boundary in Summer 2023. The second highest number of bat passes, at 2,358, were recorded by the detector deployed in the hedgerow at the northwest of the site in Autumn 2023.

3.31 The lowest number of bat passes was recorded in Spring 2023. 95 passes were recorded by the detector deployed in a tree near the marshy grassland (fen marsh and swamp) at the northeast of the site.

3.32 A total of at least seven species of bat were recorded across the static detector surveys. These were soprano pipistrelle, common pipistrelle, myotis species, brown long-eared bat, serotine, Leisler's bat, and noctule.

3.33 Common pipistrelle was the dominant species recorded by all static detectors, making up over 80% of all bat passes.

3.34 Noctules were generally the second most recorded species group and were recorded at every detector location at variable densities. Noctules made up between 2% and 15% of all bat passes for each detector.

3.35 Soprano pipistrelles were recorded by all of the detectors, making up around 6% of the total bat passes. They were recorded at variable densities, making up 0.9% to 10% of all bat passes for each detector. The lowest density was recorded by the detector deployed in the hedgerow at the northwest of the site.

3.36 Myotis species were recorded by all of the detectors, making up around 3% of the total bat passes. They were less frequently recorded by the detector deployed in the hedgerow at the northwest of the site. Due to the difficulty differentiating between the calls of myotis species, these bats were identified to genus level only.

3.37 Leisler's bats were recorded by two of the detectors, always at low densities. They appear to be quite uncommon across the site, making up around 0.4% of the total bat passes.

3.38 Serotines were recorded only by the detector deployed in a tree at the west of the site. They made up just 0.5% of the bat passes for this detector.

3.39 Brown long-eared bats were recorded only by the detector deployed in a tree at the west of the site. They made up just 0.1% of the bat passes for this detector.

3.40 Full survey results are provided below.

First Survey: 17th – 21st May 2023 (Spring)

3.41 The static detector was deployed in the hedgerow at the northeast of the site, near the marshy grassland (grid reference ST 78036 19069) for five nights from the 17th until the 21st May 2023.

3.42 A total of 95 bat passes were recorded during this period. 80% of the passes were common pipistrelle, 9.5% were noctule, 7.4% were soprano pipistrelle, and 3.2% were myotis species. Results are provided in Table 3.1 below.

Table 3.1: Bat passes recorded by the static detector in Spring 2023.

Static Detector Location: In hedgerow at the northeast of the site		
Species	**% of Total Passes**	**Number of Passes**
Common pipistrelle	80%	76
Myotis sp.	3.2%	3
Noctule	9.5%	9

Soprano pipistrelle	7.4%	7
	Total bat passes:	**95**

Second Survey: 27th – 31st July 2023 (Summer)

3.43 The static detector was deployed in the copse near the western site boundary (grid reference ST 77954 18876) for five nights from the 27th until the 31st of July 2023.

3.44 A total of 3,968 bat passes were recorded during this period. 83.3% of the passes were common pipistrelle, 10% were soprano pipistrelle, 3.9% were myotis species, and 2.1% were noctule. Three other species were recorded in low numbers. Results are provided in Table 3.2 below.

Table 3.2: Bat passes recorded by the static detector in Summer 2023.

Static Detector Location: In the copse near the western site boundary		
Species	**% of Total Passes**	**Number of Passes**
Brown long-eared bat	0.1%	5
Common pipistrelle	83.3%	3,306
Leisler's bat	0.1%	3
Myotis sp.	3.9%	155
Noctule	2.1%	82
Serotine	0.5%	19
Soprano pipistrelle	10%	398
	Total bat passes:	**3,968**

Third Survey: 12th – 16th September 2023 (Autumn)

3.45 The static detector was deployed in the hedgerow at the northwest of the site (grid reference ST 77927 19007) for five nights from the 12th until the 16th September 2023.

3.46 A total of 2,358 bat passes were recorded during this period. 82.8% of the passes were common pipistrelle, and 14.8% were noctule. Three other species were recorded in very low numbers. Results are provided in Table 3.3 below.

Table 3.3: Bat passes recorded by the static detector in Autumn 2023.

Static Detector Location: In hedgerow at the northwest of the site		
Species	**% of Total Passes**	**Number of Passes**
Common pipistrelle	82.8%	1,953
Leisler's bat	1%	23
Myotis sp.	0.4%	10

Noctule	14.8%	350
Soprano pipistrelle	0.9%	22
	Total bat passes:	**2,358**

Southern Site Area (Butts Close)

3.47 A total of 6,836 bat passes have been recorded and identified from the static detector surveys, which involved one static detector within the southern site area recording bat activity for five consecutive nights per season including spring, summer, and autumn.

3.48 There was significant variation in the number of bat passes recorded by each static detector each season. This is likely reflective of both the habitat/location in which the detectors were deployed, as well as the time of year and weather conditions. For example, the detector recorded very few bat passes in spring, consistent with the activity transect results for that month and possibly reflective of the cold and wet weather conditions that dominated Spring 2023.

3.49 The highest number of bat passes, by a considerable margin at 6,631, were recorded by the detector deployed in the hedgerow along the eastern site boundary in Summer 2023. The second highest number of bat passes, at 153, were recorded by the detector deployed in the tree along the northern site boundary, near the area of bramble scrub in Autumn 2023.

3.50 The lowest number of bat passes were recorded in Spring 2023. 52 passes were recorded by the detector deployed in a tree along the southern site boundary.

3.51 A total of at least six species of bat were recorded across the static detector surveys. These were soprano pipistrelle, common pipistrelle, myotis species, serotine, Leisler's bat, and noctule.

3.52 Common pipistrelles were the dominant species recorded by all static detectors, collectively making up over 80% of all bat passes.

3.53 Noctules were generally the second most recorded species group and were recorded at every detector location at variable densities. Noctules made up between 1.9% and 25% of all bat passes for each detector.

3.54 Soprano pipistrelles were not recorded by the detector deployed in the tree at the southwest of the site. They were always recorded at fairly low densities, making up less than 5% of the total bat passes.

3.55 Myotis species were not recorded by the detector deployed in the tree at the southwest of the site. They were more frequently recorded by the detector deployed in the tree at the north of the site. Due to the difficulty differentiating between the calls of myotis species, these bats were identified to genus level only.

3.56 Serotines were not recorded by the detector deployed in the tree at the southwest of the site. They were always recorded at fairly low densities.

3.57 Leisler's bats appear to be quite uncommon across the site and were only recorded by the detector deployed in the hedgerow along the eastern boundary. They were recorded at a low density, making up 0.2% of the bat passes for this detector.

3.58 Full survey results are provided below.

First Survey: 17th – 21st May 2023 (Spring)

3.59 The static detector was deployed in a tree along the southern site boundary (grid reference ST 77915 18369) for five nights from the 17th until the 21st May 2023.

3.60 A total of 52 bat passes were recorded during this period. 75% of the passes were common pipistrelle, and 25% were noctule. Results are provided in Table 3.4 below.

Table 3.4: Bat passes recorded by the static detector in Spring 2023.

Static Detector Location: In a tree along the southern site boundary		
Species	**% of Total Passes**	**Number of Passes**
Common pipistrelle	75%	39
Noctule	25%	13
	Total bat passes:	**52**

Second Survey: 27th – 31st July 2023 (Summer)

3.61 The static detector was deployed in the hedgerow along the eastern site boundary, to the east of the large sycamore tree (grid reference ST 78165 18466) for five nights from the 27th until the 31st July 2023.

3.62 A total of 6,631 bat passes were recorded during this period. 89.1% of the passes were common pipistrelle, 8.1% were soprano pipistrelle, and 1.9% were noctule. Three other species were recorded in low numbers. Results are provided in Table 3.5 below.

Table 3.5: Bat passes recorded by the static detector Summer 2023.

Static Detector Location: In the hedgerow along the eastern site boundary		
Species	**% of Total Passes**	**Number of Passes**
Common pipistrelle	89.1%	5,907
Leisler's bat	0.02%	1
Myotis sp.	0.6%	41
Noctule	1.9%	129
Serotine	0.2%	16
Soprano pipistrelle	8.1%	537
	Total bat passes:	**6,631**

Third Survey: 12th – 16th September 2023 (Autumn)

3.63 The static detector was deployed in a tree along the northern site boundary, near the area of bramble scrub (grid reference ST 77997 18599) for five nights from the 12th until the 16th September 2023.

3.64 A total of 153 bat passes were recorded during this period. 77.7% of the passes were common pipistrelle, and 10.5% were myotis species. Three other species were recorded in low numbers. Results are provided in Table 3.6 below.

Table 3.6: Bat passes recorded by the static detector in Autumn 2023.

Static Detector Location: In a tree along the northern site boundary		
Species	**% of Total Passes**	**Number of Passes**
Common pipistrelle	77.7%	119
Myotis	10.5%	16
Noctule	5.2%	8
Serotine	1.3%	2
Soprano pipistrelle	5.2%	8
	Total bat passes:	**153**

4. Discussion and Recommendations

Discussion

4.1 The survey site is located at land off Church Hill and Butts Close, Marnhull, Sturminster Newton. The site is mostly surrounded by agricultural land and residential properties.

4.2 Current proposals are for a commercial centre at land off Church Hill, to be known as Tess Square, and a residential development at land off Butts Close, to be known as Butts Close.

4.3 The Preliminary Ecological Appraisal undertaken in July 2023 noted that the site contained habitat of low value for foraging and commuting bats. It was therefore recommended that a series of seasonal bat activity transect and static detector surveys be undertaken through the main active season for bats.

Northern Site Area (Tess Square):

4.4 The levels of bat activity recorded on the site varied considerably between each survey, however there was overall a low level of bat activity recorded. The highest levels of activity were recorded in the summer survey in July 2023.

4.5 During the walked activity transect surveys, a total of at least four different species were recorded. During the static detector surveys, a total of at least seven different species were recorded. Since myotis species have been identified to genus level only, it is likely that the actual number of species is slightly higher than this. Species confirmed as present at the site were soprano pipistrelle, common pipistrelle, myotis species, brown long-eared bat, serotine, Leisler's bat, and noctule.

4.6 Common pipistrelles dominated the bat activity across all surveys and in all locations on the site, typically making up over 70% of the recorded bat passes collectively. This species is common and they are habitat generalists, so this is not an unexpected result.

4.7 Myotis species, soprano pipistrelle, brown long-eared bat, serotine, Leisler's bat, and noctule were regularly recorded during the surveys but at low densities only. These species were found across a range of locations and habitat types at the site.

4.8 The walked activity transect surveys identified locations on the site where consistently high bat activity was recorded. These were:

- The developed land, cereal crop, ruderal vegetation and hedgerow in the southeast corner of the field;
- the strip of ruderal vegetation and scattered trees to the southwest of the pharmacy;
- the fen marsh and swamp, scattered trees, and ruderal vegetation in the northeast of the site; and

- the cereal crop in the northwest of the site.

Southern Site Area (Butts Close):

4.9 The levels of bat activity recorded on the site varied considerably between each survey, however there was overall a low level of bat activity recorded. The highest levels of activity were recorded in the summer survey in July 2023.

4.10 During the walked activity transect surveys, a total of at least five different species were recorded. During the static detector surveys, a total of at least six different species were recorded. Since myotis species have been identified to genus level only, it is likely that the actual number of species is slightly higher than this. Species confirmed as present at the site were soprano pipistrelle, common pipistrelle, myotis species, serotine, Leisler's bat, and noctule.

4.11 Common pipistrelles dominated the bat activity across all surveys and in all locations on the site, typically making up over 70% of the recorded bat passes collectively. These species are common and are habitat generalists, so this is not an unexpected result.

4.12 Myotis species, soprano pipistrelle, serotine, Leisler's bat, and noctule were regularly recorded during the surveys but at low densities only. These species were found across a range of locations and habitat types at the site.

4.13 No Annex II bat species were confirmed to be present on the site.

4.14 The walked activity transect surveys identified locations on the site where consistently high bat activity was recorded. These were:

- The cereal crop and hedgerow along the eastern site boundary;
- the ruderal vegetation and bramble scrub along the northern site boundary;
- the cereal crop, ruderal vegetation, and hedgerow in the northwest corner of the site; and
- the cereal crop and along the hedgerow at the southwest of the site.

4.15 The locations of high bat activity are also shown on the Survey Maps in Appendix A. Development works within and/or the introduction of artificial lighting to these areas could have a more significant impact on foraging and commuting bats. It is noted that these areas mostly fall outside of the main development footprint, which is focused on the northeast of the northern site (Tess Square), and the centre of the southern site (Butts Close).

Recommendations

Lighting

4.16 Artificial lighting can alter bat behaviour, with many species avoiding light and some species unable to cross lit areas even with low light levels. Lighting can also create a 'vacuum effect' whereby insect prey are drawn from surrounding habitats to artificial light sources, reducing the foraging opportunities for bats. Species including brown long-eared bats, barbastelles, and myotis species are particularly known to avoid lights. Some of these species have been recorded at the site, albeit rarely. The site is currently unlit. Therefore, careful lighting design is required to prevent impacting on the abundance of foraging and commuting bats at the site.

4.17 As far as possible, the areas highlighted for high bat activity (see Figures 3 and 4 in Appendix A) should be kept dark to maintain their value for foraging and commuting bats. It is recommended that dark corridors, with dark buffer zones, are maintained along all hedgerow and tree lines at the site.

4.18 During the construction period, works outside of daylight hours which would require use of flood lighting should be avoided wherever possible.

4.19 Where lighting is required for the proposed development, the following general recommendations are provided:

- The level of any artificial lighting including flood lighting should be kept to a minimum;
- unlit open spaces should be included in the lighting design;
- LED lights are a preferred option to low pressure sodium lights or high pressure sodium or mercury lamps. LED lights do not emit UV radiation, towards which some insects are attracted, drawing them away from bat foraging areas in the surrounding landscape;
- all lights should be directed at a low angle with minimal light spillage wherever possible;
- artificial lighting should not directly illuminate any potential bat commuting areas such as hedgerows or tree lines. Similarly, any newly planted linear features or buffer areas around important habitat features should not be directly lit;
- if security lights are required, then they will be set on a Passive Infrared (PIR) sensor and timer so that the light is only emitted for the short time period required; and
- accessories such as hoods and baffles should be considered to reduce light spill and direct light where needed, but only as a last resort.

Habitat Enhancement

4.20 It is understood that a range of habitat creation and enhancements have been proposed. These will serve to mitigate for the loss of a small amount of vegetated habitat that may be used by bats and improve the quality of the retained habitat for foraging and commuting bats.

4.21 New hedgerows are to be planted, providing improved connectivity across the site. It is recommended that a diversity of tree and hedgerow species are included to create opportunities for a range of invertebrate prey. Oak could be included due to its high value for a range of invertebrates. Hedgerow management should ensure the hedges remain thick with tussocks. A wide margin at the base of the hedgerow for succession between grassland hedgerow should be maintained.

4.22 A high number of new trees are proposed for the site. It is recommended that these are planted as soon as is possible to compensate for the loss of existing trees.

4.23 The creation of an ecology buffer with scrub has been proposed for the southern site area (Butts Close), as well as wildflower grassland and new tree and hedgerow planting in the northern site area (Tess Square). If carried out effectively, these enhancements should significantly improve the site's value for foraging and commuting bats. A Landscape and Ecological Management Plan (LEMP) will be produced to ensure the enhancements and habitat creation are delivered effectively.

4.24 It is recommended that log piles are installed on the site. Log piles can support saprophytic insects which can provide a food source for foraging bats.

5. Conclusions

Conclusions

5.1 A series of three dusk bat activity transect and static detector surveys were carried out between May and September 2023, during the main active season for bats, at land off Church Hill and Butts Close, Marnhull.

5.2 Whilst activity levels varied between seasons, an overall low level of bat activity was typically recorded across both site areas.

Northern Site Area (Tess Square)

5.3 At least seven different species were confirmed as present. These were soprano pipistrelle, common pipistrelle, myotis species, brown long-eared bat, serotine, Leisler's bat, and noctule. Common pipistrelle dominated the bat activity, with the other species generally recorded at low densities.

5.4 Consistently high levels of bat activity were recorded in the areas of developed land, cereal crop, ruderal vegetation and hedgerow in the southeast corner of the field; the strip of ruderal vegetation and scattered trees to the southwest of the pharmacy; the fen marsh and swamp, scattered trees, and ruderal vegetation in the northeast of the site; and the cereal crop in the northwest of the site. Development works within and/or the introduction of artificial lighting to these areas could have a more significant impact on foraging and commuting bats.

Southern Site Area (Butts Close)

5.5 At least six different species were confirmed as present. These were soprano pipistrelle, common pipistrelle, myotis species, serotine, Leisler's bat, and noctule. Common pipistrelle dominated the bat activity, with the other species generally recorded at low densities.

5.6 Consistently high levels of bat activity were recorded in the areas of cereal crop and hedgerow along the eastern site boundary; the ruderal vegetation and bramble scrub along the northern site boundary; the cereal crop, ruderal vegetation, and hedgerow in the northwest corner of the site; and the cereal crop and along the hedgerow at the southwest of the site. Development works within and/or the introduction of artificial lighting to these areas could have a more significant impact on foraging and commuting bats.

5.7 Given the main development footprint is focused around the northeast of the northern site (Tess Square) and the centre of the southern site (Butts Close), there is not expected to be significant areas of habitat loss for foraging and commuting bats. The areas of high bat activity mostly fall outside of the development footprint.

5.8 It has been recommended that a bat-sensitive lighting strategy is devised, which should keep overall light levels to a minimum and retain dark corridors with dark buffer zones around important habitat features, such as hedgerows and trees.

5.9 It has also been recommended habitat creation and enhancements are delivered effectively, as set out in a Landscape and Ecological Management Plan (LEMP) or similar, to maximise the site's value for foraging and commuting bats.

6. References

- Bat Conservation Trust (2014). *Interim Guidance: Artificial lighting and* wildlife *- Recommendations to help minimise the impact of artificial lighting* [on line]. Available from http://www.bats.org.uk/publications_download.php/1330/BCT_Interim_Guidance_Artificial_Lighting_June_2014.pdf
- Collins, J. (ed.) (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn). The Bat Conservation Trust, London. [on-line]. Available from http://www.bats.org.uk/pages/batsurveyguide.html
- Collins, J. (ed.) (2023). *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (4th edn). The Bat Conservation Trust, London. [on-line]. Available from http://www.bats.org.uk/pages/batsurveyguide.html
- DERC (2023). *5km Ecological Data Search for Marnhull Hybrid Scheme.* Unpublished data from Dorset Environmental Records Centre.
- Dietz, C. and Kiefer, S. (2014). *Bats of Britain and Europe*. Bloomsbury.
- Entwistle, A.C., Racey, P.A. and Speakman, J.R., 1996. Habitat exploitation by a gleaning bat, Plecotus auritus. *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences*, *351*(1342), pp.921-931.
- Fure, A. (2006) *Bats and lighting*. The London Naturalist, No. 85.
- IEEM - Institute of Ecology and Environmental Management (2006). *Bats and Lighting*. Winchester: IEEM.
- ILP - Institute of Lighting Professionals (2018). *Bats and artificial lighting in the UK.* ILP and the Bat Conservation Trust Guidance Note 08/18.
- Jones, J. (2000). *Impact of Lighting on Bats.* Bat Conservation Trust. [on-line]. Available from http://www.bats.org.uk/downloads/Helpline/lighting.pdf [Accessed on 20/10/2023].
- Mitchell-Jones, T. & McLeish, A.P (2004). *The Bat Workers' Manual* (3rd Ed). Joint Nature Conservation Committee, Peterborough, UK.
- Natural England (2015). Standing advice for local planning authorities to assess impacts of development on bats: Survey and Mitigation for development projects. [on line]. Available from https://www.gov.uk/guidance/bats-surveys-and-mitigation-for-development-projects
- Phlorum (2023). *Preliminary Ecological Appraisal: Tess Square and Butts Close Hybrid Scheme, Marnhull*. Unpublished report by Phlorum Ltd.

Appendix A
Bat Survey Maps

Legend

- Site Boundary
- Transect Walking Route
- Stop Points
- Trees and Hedgerows
- Location of Automated Static Detectors
- Spring 2023
- Summer 2023
- Autumn 2023

Figure 1: Marnhull Northern Site Area (Tess Square) Bat Transect Map

Drawn by: BC
On the: 19/10/2023
Not to Scale
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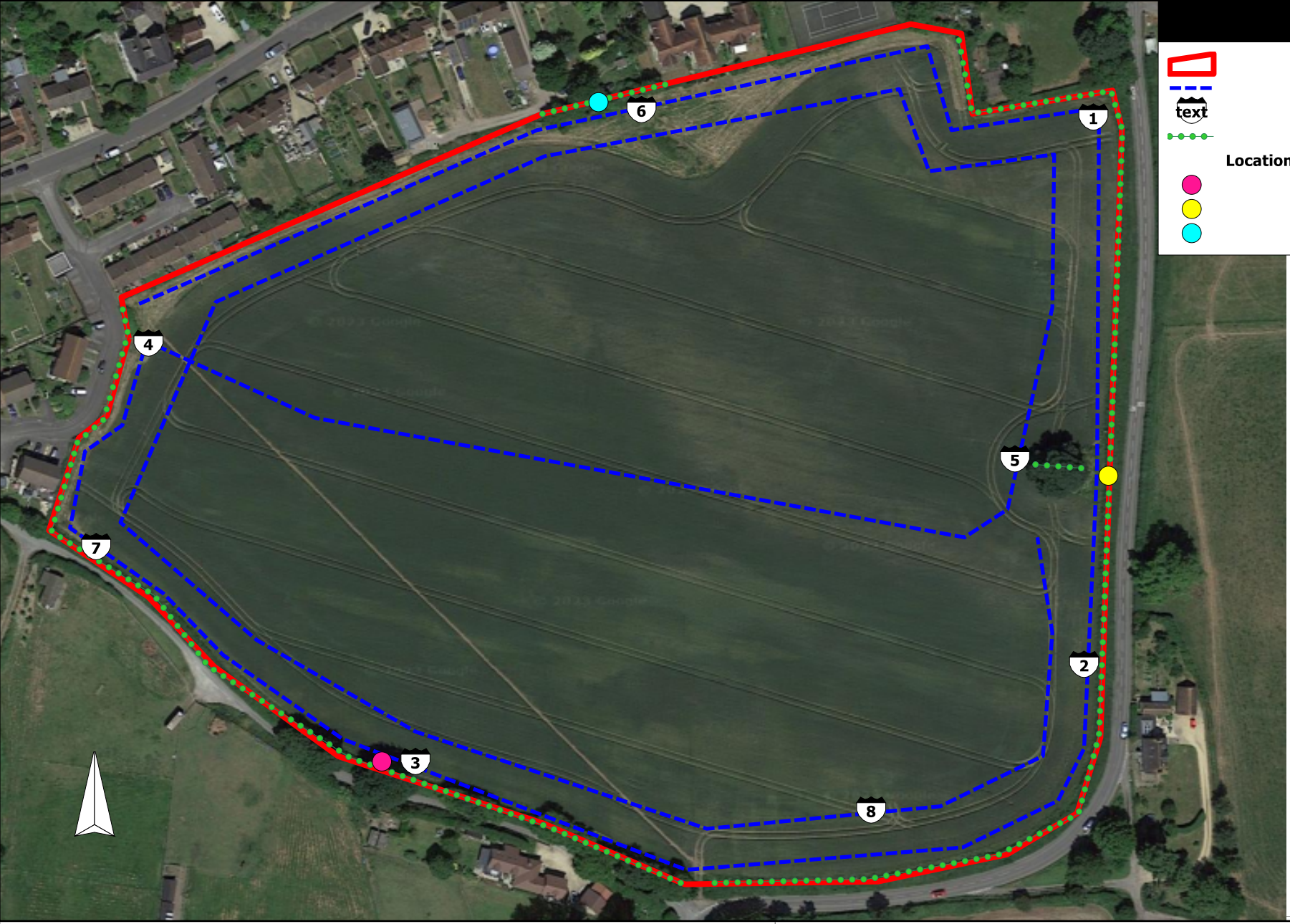

Figure 2: Marnhull Southern Site Area (Butts Close) Bat Transect Map

Drawn by: BC
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Legend

Site Boundary
Highest Bat Activity

Figure 3: Marnhull Northern Site Area (Tess Square), Highest Activity

Drawn by: BC
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Figure 4: Marnhull Southern Site Area (Butts Close), Highest Activity

Drawn by: BC
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Appendix B
Legislation

Legislation

This section contains information pertaining to the legislation and planning policy applicable in Britain. This information is not applicable to Northern Ireland, the Republic of Ireland the Isle of Man or the Channel Islands. Information contained in the following appendix is provided for guidance only.

Species

The objective of the EC Habitats Directive1 is to conserve plants and animals which are considered to be rare across Europe. The Directive is transposed into UK law by The Conservation of Habitats and Species Regulations 2010 (as amended) (formerly The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) and The Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 (as amended).

The Wildlife and Countryside Act 1981 (as amended) implements the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and also implements the obligations set out for species protection from the Council Directive 2009/147/EC (formerly 79/409/EEC) on the Conservation of Wild Birds (EC Birds Directive) in Great Britain.

Various amendments have been made since the Wildlife & Countryside Act came into force in 1981. Further details pertaining to alterations of the Act can be found on the following website: www.opsi.gov.uk. Key amendments have been made through the Countryside and Rights of Way (CRoW) Act (2000) and Nature Conservation (Scotland) Act 2004.

There are a number of other legislative Acts affording protection to species and habitats. These include:

- Countryside and Rights of Way (CRoW) Act 2000;
- Deer Act 1991;
- Natural Environment & Rural Communities (NERC) Act 2006;
- Protection of Badgers Act 1992; and
- Wild Mammals (Protection) Act 1996.

Bats

Bats are protected under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended). This act protects individuals from:

- intentional or reckless disturbance (at any level);
- intentional or reckless obstruction of access to any place of shelter or protection; and

[1] Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora.

- selling, offering or exposing for sale, possession or transporting for purpose of sale

In addition, all species of bat are fully protected under The Conservation of Habitats and Species Regulations 2010 (as amended) through their inclusion on Schedule 2. Regulation 41 prohibits:

- deliberate killing, injuring or capturing of Schedule 2 species (all bats);
- deliberate disturbance of bat species as to impair their ability:

  (i) to survive, breed, or reproduce, or to rear or nurture young; and

  (ii) to hibernate or migrate.
- deliberate disturbance of bat species as to affect significantly the local distribution or abundance of the species;
- damage or destruction of a breeding site or resting place; and
- keeping, transporting, selling, exchanging or offering for sale whether live or dead or of any part thereof.

A European Protected Species Mitigation (EPSM) Licence issued by Natural England will be required for works liable to affect a bat roost or for operations likely to result in a level of disturbance which might impair their ability to undertake activities listed above. A licence is required to allow derogation from the relevant legislation but also to enable appropriate mitigation measures to be put in place and monitored.

Appendix C
Bat Activity Transect Survey Data

Bat Survey Data

First Activity Transect Survey on the 17th May 2023

Number of Surveyors	Site and Job no:	Start/Sunset Time	Finish Time	Temperature (°C) at start	Temperature (°C) at end	Cloud Cover (Oktas 1-8)	Windspeed (Beauforts 1-12)	Rain
2	Marnhull Hybrid Scheme 11424	20:55	23:25	16	12	2	1	None

Surveyor 1: Land off Butts Close
Start Location: By entrance to southern field (listening point 4)

Time	Location	Activity observed	Number of passes	Species and Comments/Notes
21:05	Listening point 5 (to west of large sycamore tree)	Commuting	1	Noctule flying high along eastern boundary
21:42-21:58	Along eastern boundary	Foraging	Multiple	Multiple common pipistrelles and a single common serotine foraging along hedgerow
23:03	Southeast corner of field (between listening points 2 and 8)	Foraging	1	Common pipistrelle

Surveyor 2: Land off Church Hill Start Location: Listening point 7, in southwest corner of field				
Time	**Location**	**Activity observed**	**Number of passes**	**Species and Comments/Notes**
21:11	Listening point 8 (to west of pharmacy)	Heard but not seen	1	Noctule
21:37	To south of pharmacy (between listening points 1 and 8)	Heard but not seen	Multiple	Common serotine and common pipistrelle
21:59	To south of listening point 5, on other side of hedgerow	Heard but not seen	Multiple	Common pipistrelle

Second Activity Transect Survey on the 27th July 2023

Number of Surveyors	Site and Job no:	Start Time	Finish Time	Temperature (°C) at start	Temperature (°C) at end	Cloud Cover (Oktas 1-8)	Windspeed (Beauforts 1-12)	Rain
2	**Marnhull Hybrid Scheme 11424**	**20:48**	**23:03**	**19**	**17**	**7**	**2**	**None**

Surveyor 1: Land off Butts Close Start Location: In the southwest of field, near listening point 3				
Time	**Location**	**Activity observed**	**Number of passes**	**Species and Comments/Notes**
21:00	Northwest of field, near listening point 4	Heard but not seen	1	Common pipistrelle
21:12-21:18	Along northern boundary	Heard but not seen	Multiple	Common pipistrelle
21:19-21:22	Northeast corner of field, to south of listening point 1	Heard but not seen	3	Common pipistrelle
21:22	Along eastern boundary	Commuting	1	Common pipistrelle
21:23	At far-east of field from north to south	Commuting	1	Common pipistrelle

21:26	Listening point 2 (in the southeast of the field)	Heard but not seen	1	Common pipistrelle
21:26-21:29	Listening point 2 (in the southeast of the field)	Heard but not seen	4	Common pipistrelle
21:39	Listening point 3 (along the southern boundary)	Heard but not seen	1	Common pipistrelle
21:45	Listening point 4 (near the entrance at the northwest corner of the field)	Heard but not seen	1	Noctule
21:47	Listening point 4 (near the entrance at the northwest corner of the field)	Foraging	3	Common serotine
21:48	Listening point 4 (near the entrance at the northwest corner of the field)	Heard but not seen	1	Leisler's noctule
21:50	Listening point 4 (near the entrance at the northwest corner of the field)	Heard but not seen	1	Noctule and common pipistrelle
21:55	Listening point 5 (to the west of the large sycamore tree)	Heard but not seen	1	Common pipistrelle
21:58	Listening point 5 (to the west of the large sycamore tree)	Heard but not seen	1	Common pipistrelle
21:59	Listening point 5 (to the west of the large sycamore tree)	Commuting	1	Common pipistrelle flying over hedge along eastern boundary
22:03	Listening point 6 (by the bramble scrub at the centre of the northern boundary)	Heard but not seen	1	Common pipistrelle
22:06	Listening point 6 (by the bramble scrub at the centre of the northern boundary)	Heard but not seen	1	Noctule
22:13-22:22	Listening point 7 (at the southwest corner of the field, by the houses)	Heard but not seen	Multiple	Common pipistrelle
22:42	Listening point 8 (at the east of the southern boundary)	Heard but not seen	2	Common pipistrelle
22:51-23:01	Listening point 8 (at the east of the southern boundary)	Heard but not seen	Multiple	Common pipistrelle

Surveyor 2: Land off Church Hill
Start Location: Listening point 3, in the centre of the western site boundary

Time	Location	Activity observed	Number of passes	Species and Comments/Notes
21:07	Listening point 8, to the west of Marnhull pharmacy	Heard but not seen	1	Common pipistrelle

21:30	In the southeast of the field, to the west of listening point 7	Heard but not seen	1	Common serotine
21:33	In the southeast of the field, to the west of listening point 7	Heard but not seen	1	Common serotine
21:35	Listening point 7, in the southeast of the field	Foraging	1	Common serotine
21:35	Listening point 7, in the southeast of the field	Heard but not seen	1	Common pipistrelle
21:41	In the southeast corner of the field, to the south of listening point 7	Foraging	2	Unidentified
21:42	In the southeast corner of the field, to the south of listening point 7	Heard but not seen	1	Common pipistrelle
21:51	In the south of the field, north of the barns and between listening points 6 and 2	Heard but not seen	1	Noctule
22:03	Listening point 3, in the centre of the western site boundary	Heard but not seen	1	Noctule
22:14	To the south of listening point 5, on the other side of the hedgerow	Heard but not seen	1	Common pipistrelle
22:22	To the south of listening point 5, on the other side of the hedgerow	Heard but not seen	3	Common pipistrelle
22:46	To the north of listening point 8, on the other side of the hedgerow	Heard but not seen	1	Common pipistrelle
22:49	To the southeast of listening point 4, within the fen marsh and swamp at the northeast of the site	Heard but not seen	1	Common serotine
22:54	Listening point 4, within the fen marsh and swamp at the northeast of the site	Heard but not seen	1	Soprano pipistrelle

Third Activity Transect Survey on the 12th September 2023

Number of Surveyors	Site and Job no:	Start Time	Finish Time	Temperature (°C) at start	Temperature (°C) at end	Cloud Cover (Oktas 1-8)	Windspeed (Beauforts 1-12)	Rain
2	Marnhull Hybrid Scheme 11424	19:16	21:31	18	16	3	2	None

Surveyor 1: Land off Butts Close
Start Location: Entrance to southern site area (Butts Close), at the northwest of the field

Time	Location	Activity observed	Number of passes	Species and Comments/Notes
19:28	Listening point 1 (northeastern corner of field)	Heard but not seen	1	Noctule
19:54	Listening point 2 (at the south of the eastern side of the field)	Heard but not seen	1	Noctule
20:27	Listening point 4 (northwest of the field near the entrance)	Heard but not seen	1	Noctule
20:31	In the cereal crop in the centre of the field (between listening points 4 and 5)	Heard but not seen	1	Noctule
20:33	To the southwest of the large sycamore tree near listening point 5	Heard but not seen	1	Common pipistrelle
20:34-20:35	Listening point 5 (To the west of the large sycamore tree)	Heard but not seen	2	Common pipistrelle
20:38-20:43	Listening point 5 (To the west of the large sycamore tree)	Heard but not seen	Multiple	Common pipistrelle
20:44-20:47	Multiple locations along north of eastern boundary and east of northern boundary (between listening points 5 and 6)	Heard but not seen	4	Common pipistrelle
20:47	Listening point 6 (by the bramble scrub at the centre of the northern boundary)	Heard but not seen	1	Myotis
20:49-20:53	Listening point 6 (by the bramble scrub at the centre of the northern boundary)	Heard but not seen	3	Common pipistrelle
20:54	At the west of the northern boundary (between listening points 6 and 4)	Heard but not seen	1	Common pipistrelle

20:58	Listening point 7 (southwest corner of the field, near the houses)	Heard but not seen	1	Common pipistrelle
21:00	Listening point 7 (southwest corner of the field, near the houses)	Heard but not seen	1	Common pipistrelle
21:05	Listening point 7 (southwest corner of the field, near the houses)	Heard but not seen	1	Common pipistrelle
21:06	Listening point 7 (southwest corner of the field, near the houses)	Heard but not seen	1	Leisler's noctule
21:13-21:15	Multiple locations along the west of the southern boundary (between listening points 7 and 3)	Heard but not seen	Multiple	Common pipistrelle

Surveyor 2: Land off Church Hill
Start Location: Entrance to northern field, to the west of the pharmacy

Time	Location	Activity observed	Number of passes	Species and Comments/Notes
19:58	Listening point 7 (at the southeast of the field)	Commuting	1	Noctule
20:00	Listening point 7 (at the southeast of the field)	Commuting	1	Common serotine
20:01	Listening point 7 (at the southeast of the field)	Foraging	2	Common serotine
20:03	Listening point 7 (at the southeast of the field)	Commuting	1	Soprano pipistrelle
20:05	To the south of listening point 5, on the other side of the hedgerow	Heard but not seen	1	Common serotine
20:56	To the northeast of listening point 5, along the hedgerow	Heard but not seen	1	Common pipistrelle
21:08	Within the fen marsh and swamp (to the southeast of listening point 4)	Heard but not seen	1	Common pipistrelle
21:15	Within the ruderal vegetation (to the southwest of listening point 4)	Heard but not seen	1	Soprano pipistrelle

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