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PARKER DANN

LAND AT CHURCH LANE, CLIMPING, WEST SUSSEX

BAT AND BADGER SURVEY REPORT

JUNE 2016

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NON-TECHNICAL SUMMARY

Phlorum was commissioned to carry out a series of bat and badger surveys across land at Church Lane in Climping, West Sussex. Potentially suitable habitat to support these species groups was identified during the Preliminary Ecological Appraisal and further assessments are required in order to ascertain whether these species groups could pose a constraint to the works. It is understood that current proposals are for a residential development for up to 300 dwellings with amenity facilities and the provision of green space. It is understood that the woodland within the southern and western site extents will be retained and enhanced and a series of ponds will be created as part of the proposed landscaping design.

The main findings of the surveys are as follows:

- A series of bat surveys were undertaken at the site to include an activity survey in September 2015 and June 2016 and tree assessment in respect to bats in November 2015.
- The tree assessment identified a total of 62 trees that were considered to have moderate or high value to roosting bats. The majority of these were located within the woodland boundaries around the southern and western site extents.
- No bat roosts were identified within any of the trees during the activity survey. Overall there was a moderate level of foraging activity at the site and at the peak of activity, at least three species were recorded. Species included soprano pipistrelle (*Pipistrellus pygmaeus*) common pipistrelle (*Pipistrellus pipistrellus)* and noctule (*Nyctalus noctula*).
- Activity was concentrated along the southern and western site boundaries within the woodland areas with considerably less activity recorded throughout the remainder of the site.
- Although no roosts were identified in any of the on-site trees during the activity survey, suitable features on the trees continue to have potential for use as bat roosts at different times of the year.
- Overall, features identified on the trees may be used by small numbers of bats as temporary overnight roosts during the active period, or by individual males during the mating season. Larger cavities may also provide more stable conditions for groups of hibernating bats.
- Based on the current design proposals no trees identified as having bat roost potential will require removal to facilitate the development. If design proposals change further surveys I respect to trees may be required.

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- If any trees identified as having potential to support a bat roost subsequently require removal or associated tree works, these should be subject to a climbed inspection.
- If bats are subsequently found to be roosting within the trees and where felling is unavoidable, it may be necessary to obtain a European Protected Species Mitigation (EPSM) Licence before the works can proceed and to complete any necessary mitigation.
- Due to the level of bat foraging activity at the site as a whole, measures to mitigate the impact on lighting in respect to the development should be devised and a lighting scheme that is sympathetic to bats should be incorporated into the final design. This will serve to limit disturbance to bat foraging patterns post works and ensure the on-going suitability of potential roosts within the retained boundary trees post works.
- A badger survey was also undertaken and covered all land within the survey boundary and all land accessible within a 30m buffer of the site. No setts or secondary signs of badger were identified within the site or surrounding 30m at the time of the survey.
- Based on the results of the survey, badgers do not pose a constraint to works. However due to the potential presence of badgers in the wider landscape, a series of mitigation measures are recommended in order to safeguard individuals passing through the site during the proposed works.
- Details of mitigation and enhancement measures for the site are provided in the recommendations section of the report.

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1. INTRODUCTION

Background

1.1 Phlorum Limited was commissioned by Parker Dann to undertake a series of bat and badger surveys to inform the potential ecological constraints of the proposed future development of land at Church Lane, Climping, West Sussex (hereafter referred to as "the site"). The surveys follow on from a Preliminary Ecological Appraisal (Phlorum 2015a) which identified potentially suitable habitat for these species groups.

1.2 The report provides an assessment of the status of bats and badgers within the site, providing information on their presence and distribution. Potential impacts of the proposed development are identified and measures to mitigate the effects on these species are discussed in outline.

1.3 It is understood that current proposals are for a residential development to include amenity facilities and the provision of green space. It is understood the woodland within the southern and western site extents will be retained and a series of ponds will be created as part of the proposed landscaping design.

Site Description

1.4 The site at Church Lane is within a relatively rural location within the centre of Climping in West Sussex. The site is bounded to the north by residential housing and Horsemere Green Lane and to the east by Church Lane. Yapton Road bounds the site to the west and Crookthorn Lane is directly south.

1.5 In the wider surrounds, agricultural land dominates the landscape to the south, east and west with residential properties and commercial buildings to the north. Littlehampton is located approximately 1.5km to the east and the coastline is approximately 1.3km to the south.

1.6 The National Grid Reference for the centre of the site is TQ000 020 and the site measured approximately 21 hectares (ha).

2. METHODOLOGY

Data Search

2.1 Records for bats within 2km of the site were obtained from Sussex Biodiversity Records Centre as part of the initial preliminary ecological appraisal. This data has been included in this report. Badger records were not returned by the data search due to the sensitive nature of this species.

Bat Activity Survey

Personnel

2.2 The first bat activity survey was led by Carly Teague, a Senior Environmental Consultant with over seven years commercial survey experience as an ecologist. Carly has led on numerous emergence/activity surveys. Assistance during the survey was provided by environmental consultant Leonard Gouzin.

2.3 The second activity survey was led by Jack Kellett, an Environmental consultant with over five years' experience and bat class licence holder (20402). Jack has carried out numerous similar surveys. Assistance during the survey was provided by Chloe Jackson

2.4 Dusk transect surveys was carried out by two surveyors on the 15th September 2015 and 1st June 2016.

2.5 During the surveys, both surveyors walked set transect routes around the site to record general foraging activity throughout and adjacent to the proposed development area. Surveyors walked separate transects covering the margins of the site with five stopping points each. The surveyor remained at the stopping point for 10 minutes on each occasion recording any bat activity.

2.6 The surveyed area to include the transect routes are illustrated on the Bat Survey Map in Appendix A.

2.7 The surveyors were equipped with Bat Box Duet frequency division detectors and recordings were made using Roland R-05 digital recorders. Two Anabat SD2 Detectors were also used and carried with each surveyor. The recordings were analysed post survey to confirm species identification using appropriate software i.e. BatSound and AnaLookW.

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2.8 The activity survey commenced 20 minutes before sunset and continued for up to two hours after sunset. Prior to sunset bat detectors were tuned to below 30 kHz to listen for any pre-emergence social calls in proximity to any trees and at sunset they were tuned to 45 kHz.

2.9 The time of any bat pass, the species, and information regarding the behaviour and flight direction, were recorded. The survey followed standard protocols and accepted standards (Mitchell-Jones and McLeish, 2004; Hundt, 2012).

Tree Assessment for Bats

2.10 A tree assessment was carried out across the site on the 6th November 2015 (Refer to the survey map in Appendix A). All trees were assessed using currently accepted criteria (Hundt 2012 & Cowan, 2006), following the Cowan scale (Cowan, 2006) which is used to assign a value of 0-4 according to the presence or otherwise of features suitable for roosting bats. The Cowan Scale is summarised in the table below.

Table 2.1: Tree Assessment Criteria

Cowan Scale	Features
0: No Value	No visible features of use to bats.
1: Low Value	One or two minor features, possibly associated with feeding or night roosts, easily replaced; sparse ivy (*Hedera helix*), minor branch splits, small areas of loose bark, features less than 10 years old.
2: Moderate Value	Features which may provide a more secure site for small groups and individuals, fairly common features; dense ivy, significant branch splits, small cavities, present for between 10-30 years.
3: High Value	Features of particular significance, suitable for high priority roosts and large numbers of bats, conditions rare or uncommon in local area; large cavities, extensive branch splits, multiple opportunities in same tree, features may have been available for >30 years.
4: Confirmed roost	Evidence of use by bats e.g. bats, bat droppings.

2.11 Any features that could potentially support roosting bats were viewed remotely from the ground using binoculars to assess suitability and identify signs of use.

2.12 Due to the large number of trees within the survey area, only trees identified as having moderate potential or higher for roosting bats are detailed in this report. These were individually numbered for the assessment and their locations marked on the survey map in Appendix A. Due to the large number of trees on site, a different numbering system was used to that used in the previous Arboricultural Assessment (Phlorum 2015b). To enable cross referencing between reports corresponding tree numbers have been provided in the summary in Table 3.1.

Badger Survey

2.13 A survey was undertaken on the 27th October 2015 by a suitably qualified ecologist to determine the use of the site by badgers. This evaluation was based on methodology developed for the National Survey for Badgers (Cresswell et al. 1990). This included a systematic search for badger field signs in the form of:

- Setts: comprising either single isolated holes or a series of holes likely to be interconnected underground;
- latrines: badgers usually deposit faeces in characteristically excavated pits called latrines;
- paths: between setts or leading to feeding areas;
- foraging areas indicated by the presence of a series of 'snuffle holes' in the ground;.
- hair: often found among spoil and bedding outside entrances to setts, or caught on fences and other objects along well used runs; and
- footprints.

2.14 Where access permitted, areas within 30m of the site boundary were also searched for evidence of badger activity. Where dense scrub restricted a thorough search of an area, the perimeter of these areas was examined for evidence of runs of pathways into the scrub which may indicate the presence of a sett.

2.15 All holes potentially created by badgers were examined closely to determine if they were, or ever had been, used as badger setts. Where holes used by badgers were found, an intensive search within the area was undertaken to determine the number of entrances and levels of use. The sett was then classified according to the criteria shown in Table 2.2 below.

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Table 2.2: Badger Sett Classification

Sett Type	Definition
Main	Several holes with large spoil heaps and obvious paths emanating from and between sett entrances.
Annexe	Normally less than 150m from main sett, comprising several holes. May not be in use all the time, even if main sett is very active.
Subsidiary	Usually at least 50m from main sett with no obvious paths connecting to other setts. May only be used intermittently.
Outlier	Little spoil outside holes. No obvious paths connecting to other setts and only used sporadically. May be used by foxes and rabbits.

Caveat

Data Search

2.16 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.

Bats- Tree Assessment

2.17 Dense ivy (*Hedera helix)* may obscure potential roosting features such as rot holes and broken branches. However, the ground based tree assessment, followed good practice guidelines, and is considered suitably rigorous for the site. Greater accuracy could be obtained by carrying out an aerial tree assessment for bats, particularly areas covered by ivy.

Bats- Activity Survey

2.18 Bats are highly mobile animals and individuals can move roost sites throughout the year and it is possible that a survey undertaken during September may not identify the presence of roosts which are utilised earlier or later in the year. The first survey was undertaken at the end of the survey period however due to the on-going mild weather around this time, the survey is considered to provide a good representation of bat activity levels at the site for this time of year.

Badger Surveys

2.19 It was not possible to access residential gardens to the north of the site or parcels of agricultural land to the west, south and east. These areas were viewed remotely however signs of badger activity in these areas may have been missed.

2.20 Areas of dense nettle (*Urtica dioica*) and bramble (*Rubus fruticosus* agg.) scrub had developed within the southern and western site extents and obscured a significant amount of the ground within areas. This may have resulted in field signs including foraging areas, footprints and latrines being missed during the survey however the perimeter of these areas were thoroughly searched for pathways extending into the dense vegetation which would have indicated signs of mammal activity.

3. RESULTS

Data Search

3.1 The data search returned records for five different species of bat within 2km of the site, including common pipistrelle (*Pipistrellus pipistrellus*), brown long-eared (*Plecotus auritus*), serotine (*Eptesicus serotinus*), noctule (*Nyctalus noctula*) and whiskered/Brandt's bat (*Myotis mystacinus/brandtii*).

Bat Activity Survey

Survey Overview

3.2 Due to the extent of the site together with the large number of trees present, transect surveys were undertaken to ensure sufficient coverage during the survey. No bat roosts were identified within any trees along the route of the transect however foraging activity commenced soon after sunset indicating that the bats are likely to be roosting in nearby habitat.

3.3 Overall there was a moderate level of foraging activity at the site by a minimum of three species with activity concentrated along the southern and western site sections along the woodland boundary.

3.4 The results of the surveys are illustrated in the Bat Survey Map in Appendix A. Full survey data is included in Appendix C.

Activity Surveys

3.5 The first activity survey commenced on 15th September 2015 at 18:55hrs and ceased at 21:15hrs. Sunset was at 19:19hrs. The temperature was 13°C at the start of the survey and it was dry for the duration. No bats were seen to emerge from any of the trees along the transect route. The first bats were heard at 19:38hrs which were three soprano pipistrelle's foraging along the northern boundary. Bats were then recorded throughout the survey with concentrations along the southern and western wooded sections. The last bat was heard at 20:38hrs.

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3.6 Small numbers of common pipistrelles and soprano pipistrelles (*Pipistrellus pygmaeus*) were recorded foraging along the southern and western tree lines within the southern site extent intermittently between 20:04hrs and 20:34hrs. A single pass of a noctule was recorded at 20:02 within the south east corner of the site.

3.7 The second activity survey commenced on 1st June 2016 at 20:45hrs and ceased at 22:35hrs. Sunset was at 21:05hrs. The temperature was 17°C at the start of the survey and it was dry for the duration. No bats were seen to emerge from any of the trees along the transect route. The first bat was heard at 21:17hrs which was a common pipistrelle foraging within the northern section of the western site woodland. Bats were then recorded throughout the survey with concentrations along the southern and western wooded sections. The last bat was heard at 22:30hrs.

3.8 Small numbers of common pipistrelles and soprano pipistrelles (*Pipistrellus pygmaeus*) were recorded foraging along the southern and western tree lines intermittently between 21:40hrs and 22:25hrs..

3.9 The activity surveys recorded three bat species using the site for foraging. Overall there was a moderate level of foraging activity at the site which was concentrated along woodland boundaries within the southern and western site extents. The species recorded in the highest numbers were soprano and common pipistrelle. Full survey results including weather conditions and timings are included in Appendix C: Full Survey Data.

Tree Assessment for Bats

3.10 In total 62 trees were considered to support features of moderate to high value to roosting bats with 36 having moderate potential and 26 having high potential. No confirmed roosts were identified during the assessment.

3.11 All trees assessed as having roosting potential were predominantly found within the woodland habitats to the south and west of the site with concentrations along the boundaries adjacent to the arable field dominating the site. For the purposes of this assessment, trees assigned as having a moderate or high value have been numbered and are illustrated on the survey map in Appendix A. Approximately 30% of the trees within the survey boundary were considered to provide low potential for roosts based on the degree of ivy cladding on the trunks. The remainder of the trees were considered to provide negligible potential for roosting bats.

3.12 Under current design proposals all trees noted as having potential to support roosting bats are to be retained.

3.13 The results of the tree assessment are provided in the summary table below (Table 3.1). High value trees are highlighted in red and moderate value trees are in blue and the locations of these trees are marked on the map in Appendix A. The corresponding tree numbers/areas assigned during the arboricultural assessment have also been provided in the table and on the map for cross referencing purposes.

3.14 Due to the large number of on-site trees, those considered to be of low or negligible potential have been omitted from the summary table below however areas of trees with low potential are described later in the results section.

Table 3.1: Tree Assessment Summary

Tree Number	Tree Species	Cowan Score	Potential	Proposed Works	Arboricultural Reference Number
T1	Goat willow	2	Moderate	Retain	T44
T2	Ash	3	High	Retain	W13
T3	Ash	2	Moderate	Retain	W13
T4	Ash	3	High	Retain	W13
T5	Ash	2	Moderate	Retain	W13
T6	Pedunculate oak	2	Moderate	Retain	W13
T7	Pedunculate oak	2	Moderate	Retain	W13
T8	Ash	2	Moderate	Retain	W13
T9	Ash	3	High	Retain	W13
T10	Ash	2	Moderate	Retain	W22
T11	Ash	2	Moderate	Retain	W22
T12	Beech	2	Moderate	Retain	W22
T13	Beech	2	Moderate	Retain	W22
T14	Sycamore	2	Moderate	Retain	W22
T15	Beech	3	High	Retain	W22
T16	Beech	2	Moderate	Retain	W22
T17	Beech	3	High	Retain	W22
T18	Beech	3	High	Retain	W22
T19	Beech	2	Moderate	Retain	W22

Tree Number	Tree Species	Cowan Score	Potential	Proposed Works	Arboricultural Reference Number
T20	Beech	2	Moderate	Retain	W22
T21	Beech	3	High	Retain	W22
T22	Ash	3	High	Retain	W22
T23	Beech	2	Moderate	Retain	W22
T24	Ash	3	High	Retain	W22
T25	Poplar sp.	3	High	Retain	W22
T26	Beech	3	High	Retain	W22
T27	Ash	2	Moderate	Retain	G23
T28	Ash	3	High	Retain	G23
T29	Ash	3	High	Retain	G23
T30	Ash	3	High	Retain	G23
T31	Ash	2	Moderate	Retain	G23
T32	Ash	2	Moderate	Retain	W22
T33	Ash	2	Moderate	Retain	T24
T34	Sycamore	2	Moderate	Retain	W22
T35	Sycamore	3	High	Retain	W22
T36	Pedunculate Oak	3	High	Retain	W22
T37	Beech	2	Moderate	Retain	W22
T38	Pedunculate oak	3	High	Retain	W25
T39	Ash	3	High	Retain	W25
T40	Ash	2	Moderate	Retain	W25
T41	Ash	2	Moderate	Retain	W25
T42	Ash	2	Moderate	Retain	W25
T43	Beech	3	High	Retain	W27
T44	Beech	2	Moderate	Retain	W27
T45	Ash	3	Moderate	Retain	W27
T46	Beech	3	High	Retain	W27
T47	Ash	3	High	Retain	W28
T48	Ash	3	High	Retain	W28
T49	Beech	2	Moderate	Retain	W28
T50	Beech	3	High	Retain	W28
T51	Beech	3	High	Retain	W28
T52	Ash	2	Moderate	Retain	W28
T53	Ash	2	Moderate	Retain	W28
T54	Beech	2	Moderate	Retain	W28

Tree Number	Tree Species	Cowan Score	Potential	Proposed Works	Arboricultural Reference Number
T55	Ash	2	Moderate	Retain	W29
T56	Ash	3	High	Retain	W29
T57	Ash	2	Moderate	Retain	W29
T58	Ash	2	Moderate	Retain	W29
T59	Ash	2	Moderate	Retain	W29
T60	Ash	2	Moderate	Retain	W29
T61	Ash	2	Moderate	Retain	W29
T62	Ash	2	Moderate	Retain	W29

High Value: Category 3

3.15 A total of 26 trees assigned a high value for roosting bats were identified within the site. Large trunk cavities and multiple woodpecker holes, knot/rot holes and branch splits were present together with varying amounts of ivy cladding. Several trees had at least three or more features. Concentrations of woodpecker holes were on marginal trees on the northern extent of the woodland strip located within the south of the site. Dominant species included ash (*Fraxinus excelsior*), beech (*Fagus sylvatica*) and pedunculate oak (*Quercus robur*). Specific tree numbers and associated areas (provided in the arboricultural survey report) of Category 3 trees are listed below:

- T2, T4 and T9 (in W13);
- T15, T17, T18, T21, T22 and T24-T26, T35 and T36 (in W22);
- T28-T30 (in G23);
- T38 and T39 (in W25);
- T43, T45 and T46 (in W27);

  T47, T48, T50 and T51 (in W28); and T56 (in W29).

Moderate Value: Category 2

3.16 In total 36 trees were recorded throughout the site. Dominant features included knot/rot holes, woodpecker holes and branch splits and some were clad with ivy. Dominant species included ash, beech, pedunculate oak and sycamore (*Acer pseudoplatanus*). Most of these trees were within the woodland areas in the southern and western site extents, with the exception of one: T1, located on the northern boundary. Specific tree numbers and associated areas (provided in the arboricultural survey report) of Category 2 trees are listed below:

- T1;
- T3, T5, T6, T7 and T8 (in W13);
- T10-T14, T16, T19, T20, T23, T32, T33, T34 and T37 (in W22);
- T27 and T31 (in G23);
- T40-T42 (in W25);
- T44 (in W27);
- T49, T52-T54 (in W28); and
- T55, T57-T62 (in W29).

Low Value: Category 1

3.17 Approximately 30% of trees at the site were noted to have some degree of ivy cladding and/or flaking bark. Dominant species included ash and beech. Category 1 trees were located within five discrete areas of the woodland within the southern and western site extents. Due to the large number of low value trees, these were not individually numbered; instead these were grouped into areas for the purposes of this assessment. These areas (based on the area reference provided in the arboricultural survey report) are listed below and marked on the bat survey map in Appendix A:

- W13;
- W22;
- G23; and
- W29.

No Value: Category 0

3.18 All remaining trees around the site to include the majority of the trees along the northern boundary (with the exception of T1 included above) and all trees along the eastern site boundary were considered to be relatively young and small with no potential to support roosting bats.

Badger Survey

3.19 No setts or secondary signs of badger were found within the site or the surrounding 30m where access permitted.

3.20 Although access throughout discrete areas within the site was restricted due to dense vegetation, no pathways were observed leading into these areas therefore it is considered unlikely that any secondary signs would have been missed at the site during the survey.

3.21 The site provides extensive areas of suitable foraging habitat for badgers. The nature of the arable fields and the associated field margins are likely to provide a high invertebrate density including earthworms, providing a food source for badgers. In addition, the woodland edge habitat provides cover and topography likely to support sett construction.

3.22 Surrounding residential gardens and agricultural land provides an additional range of food sources for badgers in the form of vegetable patches, planted beds and extensive areas of grassland, all of which may support earthworms, their preferred prey item, as well as other prey including caterpillars and other insect larvae. Berry yielding trees and shrubs both within the site and throughout the wider landscape also provide a food source for badgers for some of the year.

3.23 The survey area is illustrated in the map in Appendix A.

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4. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

4.1 The land at Church Lane is located within a predominantly rural area within Climping in West Sussex. The site measured approximately 21ha and comprised extensive areas of arable land, woodland blocks, scattered trees, scrub, ruderal vegetation and a hedgerow. Design proposals include the re-development of the site for residential and amenity use.

4.2 The tree assessment identified a total of 62 trees that were considered to have features of high or moderate value to roosting bats, most of which were located within woodland in the southern and western site extents, with the exception of T1 which was located along the northern site boundary.

4.3 Approximately 30% of the remaining trees were considered to provide low potential for roosting bats and these were all contained within the southern and western boundary woodland. All trees along the northern and eastern site boundaries, with the exception of T1 were assessed as having no potential to support roosting bats. It is anticipated, based on the current design proposals, that none of the trees identified as having any potential for roosting bats will require removal to facilitate development.

4.4 No bat roosts were identified during the activity survey however foraging activity by common and soprano pipistrelle species commenced soon after sunset, indicating that individuals may be roosting nearby. Overall there was a moderate level of foraging activity during the surveys at the site and at the peak of activity, at least three species were recorded. Activity was concentrated within the southern and western site boundaries along the woodland edge, with considerably less activity recorded within the remainder of the site to the north and east. The northern site extent received light spill from the adjacent residential properties and the eastern boundary received light spill from the adjacent Church Lane. This may explain why foraging and commuting activity was reduced within these locations.

4.5 Although no roosts were identified during the activity survey, a large number of trees continue to have potential for use by roosting bats at different times throughout the year. Features on some of these trees may be used by small numbers of bats as temporary overnight roosts during the active period, or by individual males during the mating season. Larger cavities may also provide more stable conditions for groups of hibernating bats.

4.6 In addition, any trees identified within this report as having potential to support a roost that subsequently require removal or tree works should also be subject to further assessment which may include a climbed inspection.

4.7 If bats are subsequently found to be roosting within the trees and where felling is unavoidable, it will be necessary to obtain a European Protected Species Mitigation (EPSM) Licence before the works can proceed and to complete any necessary mitigation.

4.8 Due to the level of bat foraging activity at the site as a whole, measures to mitigate the impact on lighting in respect to the development should be devised and a lighting scheme that is sympathetic to bats should be incorporated into the final design. This will serve to limit disturbance to bat foraging patterns post works and ensure the on-going suitability of potential roosts within the retained boundary trees post works.

4.9 No setts were found on site at the time of the survey. No secondary signs including foraging areas or latrines were found within the site during the survey.

4.10 Based on the results of the survey, badgers do not pose a significant constraint to works. However due to the potential presence of badgers in the wider surrounds and suitability of the on-site habitats for foraging, there remains potential for badgers to pass through the site and therefore a series best practice measures are recommended in order to safeguard this species during the proposed works.

4.11 More information is provided in the recommendations section below together with post development enhancement options.

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Recommendations

Badger

4.12 Badgers may use the site for commuting. No setts were found within the site or adjacent to it therefore no further survey is required at this stage. Badgers are faithful to their foraging and commuting routes and therefore the presence of badgers must be taken into account during and post development. Badgers receive protection under The Protection of Badgers Act 1992.

4.13 Boundary habitat must be maintained during works and incorporated into the landscaping design. Where possible, boundary features must measure at least 5m in width. This will enable badgers to continue to pass through the site to habitats in the wider landscape in the long-term.

4.14 During the construction phase of the development activities may result in disturbance to badgers. This should be mitigated for by undertaking the following:

- All on-site contractors must be made aware of the presence of badgers in the locality- a tool box talk should be given by a qualified ecologist to immediately prior to the start of construction works to discuss the potential for badgers to pass through the site and to provide information on legislation and the ecology of this species;
- all materials must be stored safely and lids securely fitted;
- trenches must be covered at the end of each day or if this is not possible, ramps must be installed into the trenches to enable badgers to escape should they enter the excavations;
- adjacent water sources should be protected from contamination and damage; and
- Felled trees must not block access routes i.e. between buildings or through cleared vegetation.

4.15 Compensatory planting should be incorporated into the post development landscaping. This should include native fruit/berry bearing trees and shrubs which could be incorporated around the site to include the retained boundary features. This would serve to increase the amount of food sources currently available and would serve to improve the overall biodiversity of the site post development in accordance with local and national planning policy.

4.16 Additional planting would also serve to further enhance habitat connectivity between the site and the wider surrounds.

Bat

Follow Up Climbed Tree Inspections

4.17 At the time of compiling this report no trees identified as having potential to support roosting bats will require removal to facilitate the works. However if any trees identified within this report as having bat roosting potential subsequently require removal further assessment and mitigation may be required which may include the need for a climbed inspection to inspect the roosting features if any trees require tree works or felling.

4.18 A climbed tree inspection by a suitably licensed surveyor should be undertaken for immediately prior to works to inspect any features in order to identify if bats are roosting within the tree(s).

4.19 If bats are subsequently found to be roosting within the tree(s) and where felling is unavoidable, it will be necessary to obtain a European Protected Species Mitigation (EPSM) Licence before the works can proceed and to complete any necessary mitigation.

4.20 Such a licence would need to be obtained from Natural England and can only be obtained once full planning permission is in place. The application will require the drafting of a detailed mitigation strategy including timing and construction methods in addition to the mitigation measures proposed. Natural England currently require 30 working days to determine a licence application.

Bats and Lighting

4.21 This section provides outline advice regarding lighting provision and the lighting scheme should be discussed with the project ecologist to ensure it is devised in a sympathetic way for bats.

4.22 Different species of bat have been found to react differently to night-time lighting however research indicates that generally, all species of bats are sensitive to artificial lighting and that excessive lighting can delay bats from emerging, thus shortening the time available for foraging, as well as causing individuals to move away from suitable foraging grounds or roost sites, to alternative dark areas (Jones, 2000). Bats can also become isolated from their foraging grounds if the linear features they use for commuting are suddenly illuminated, creating a light barrier (Fure, 2006).

4.23 Currently the proposed development area within the southern and western site extent is not lit at night and therefore the area provides foraging opportunities for bats. Any new lighting should therefore seek to minimise impacts on bats at night. This should be achieved by incorporating the following best practice measures (Institute of Ecology and Environmental Management 2006, Institute of Lighting Engineers 2009):

- The level of artificial lighting will be kept to a minimum, and light spill onto the site boundaries should be limited and where unavoidable, this should be directed at a low level and downwards to minimise disturbance to bat foraging areas;

- Recent LED technology should be utilised where possible. LED lights do not emit UV radiation, towards which insects are attracted, drawing them away from bat foraging areas in the surrounding landscape. Alternatively, low pressure sodium lights could be used. These can be a more cost effective option compared to LED lights and are the preferred option to high pressure sodium or mercury lamps. All lights should be directed at a low angle with minimal light spillage wherever possible; and

- Boundary habitats, particularly to the south and west of the development area should be kept dark.

<u>Bat Boxes and Bricks</u>

4.24 Additional bat roosting provision could be incorporated into new design proposals. Recommendations are made below.

4.25 Bat boxes could be installed either on the new buildings or to mature trees around the site. Long lasting Schwegler woodcrete boxes are preferred but there are also good quality beech or pressure treated soft wood boxes on the market. Bat boxes should be oriented south-west to south-east and located at least 3m above ground level on trees and ideally directly below the eaves if located on a building.

4.26 In addition, the new buildings could include specially designed roosting features within the structures, for example integral bat boxes or 'bat bricks' (e.g. Schwegler 2FR tubes). These will provide warm and favourable conditions for crevice roosting species such as pipistrelles which have been recorded at the site.

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Appendix A
Survey Maps

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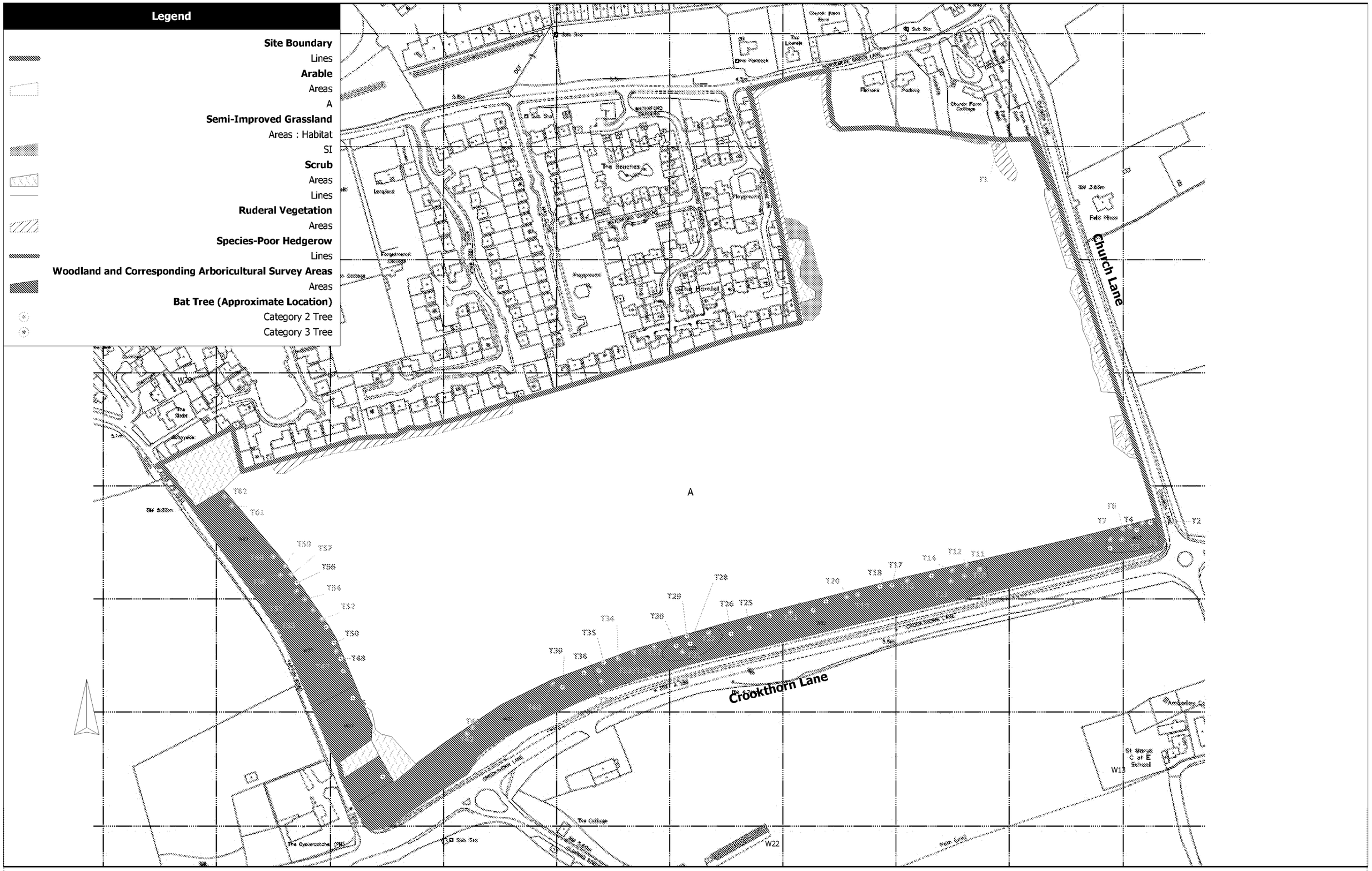


Figure 1a: Land at Church Lane Bat Tree Assessment Map

Drawn by: JWK
On the: 22/12/2015
Not to Scale
Ref: 5989

Phlorum Limited, 12 Hunns Mere Way,
Woodingdean, Brighton, East Sussex,
BN2 6AH

Tel: +44(0)1273 307167 Fax: 01273 7044 99
Web: www.phlorum.com Email: info@phlorum.com

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Legend

- **Site Boundary**
- Lines
- **Arable**
- Areas
- **Semi-Improved Grassland**
- Areas : Habitat
- SI
- **Broad-Leaved Semi-Natural Woodland**
- Areas
- **Scrub**
- Areas
- **Ruderal Vegetation**
- Areas
- **Tree (Approximate Location)**
- Areas
- Points
- **Transect**
- Transect 1
- Transect 2
- **Dominant Flight Lines**
- Common Pipistrelle
- Soprano Pipistrelle

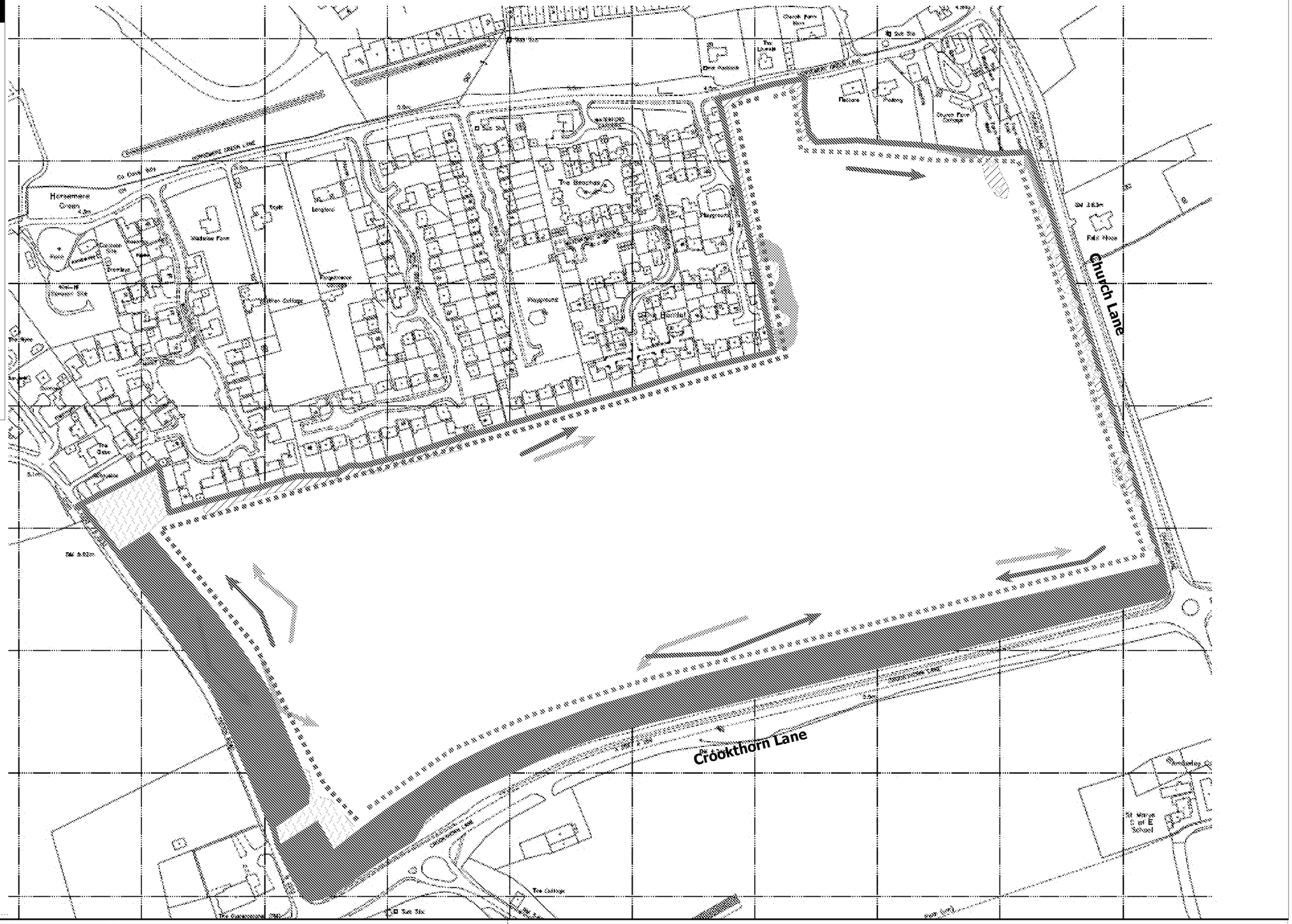


Figure 1b: Land at Church Lane Bat Survey Map

Drawn by: JWK
On the: 22/12/2015
Not to Scale
Ref: 5989

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Figure 1c: Land at Church Lane Badger Survey Area Map

Drawn by: JWK
On the: 19-Dec-16
Not to Scale
Ref: 5989

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Appendix B
Legislation

LEGISLATIVE FRAMEWORK

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 Directive[1] 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
- Wild Mammals (Protection) Act 1996

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

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
- 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
Full Survey Data

ARUN DISTRICT COUNCIL CM/1/17/OUT

Date	Surveyor	Site	Sunset	Temperature at start	Temperature at end	Sky	Wind	Rain
15/09/2015	Leonard Gouzin	Climping	19:19	13.1	15	5	1	None

Comments	Location	Time of Pass	Activity	Species						
				Common pip	Soprano pip	Myotis sp	Long eared sp	Noctule	Serotine	Unidentified
	Central northern boundary	19:51 - 56	Foraging	✓	✓					
	Along western tree line	20:04	Foraging		✓					
	South west corner of site	20:10 - 12	Foraging	✓	✓					
	South west corner of site	20:14 - 19	Foraging	✓	✓					
	Western tree line	20:21 - 34	Commuting	✓	✓					

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Date	Surveyor	Site	Sunset	Temperature at start	Temperature at end	Sky	Wind	Rain
15/09/2015	Richard Schofield	Climping	19:19	13.1	15	5	1	None

Comments	Location	Time of Pass	Activity	Species						
				Common pip	Soprano pip	Myotis sp	Long eared sp	Noctule	Serotine	Unidentified
	Along northern boundary	19:38 - 40	Foraging		✓ x3					
	Along east boundary tree line	19:45	Foraging	✓	✓					
Not seen		19:48	Foraging	✓						
	South east corner of the site	19:51 - 3	Foraging	✓	✓					
Not seen		20:02 - 4	Foraging	✓	✓			✓		
	Central southern tree line	20:12	Foraging	✓	✓					
Not seen		20:20 - 24	Foraging	✓						
Not seen		20:32	Foraging	✓						
Not seen		20:36 - 38	Foraging	✓	✓					