



Bat & Bird Activity Survey Report



Adderley Mill,
Brookhouse Rd.
Cheadle, Staffordshire.
ST10 2NJ

June 2019

Notice to readers

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Client / Architect Details:
Mr. & Mrs. D. Craven
Application area:
Adderley Mill, Brookhouse Rd. Cheadle Staffordshire ST10 2NJ
Postcode/ OS Grid Ref:
ST10 2NJ / SJ991439
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Author:
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Surveyor capability

Ecological assessment and report preparation has been conducted by a qualified ecologist and member of the Chartered Institute of Ecology and Environmental Management (MCIEEM), and an associate member of the Society of Biology (AMRSB). The ecologist holds a First-Class Honours degree in Conservation Biology, and a Vice Chancellors award for academic excellence. He has undertaken protected species surveys for over five years, and is actively involved in scoping, presence/absence surveys, and Natural England licence applications with regard to planning and the law. The actions of the surveyor on site and during the production of written reports are undertaken in accordance with the Code of Professional Conduct for the Chartered Institute of Ecology and Environmental Management (CIEEM).



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NON-TECHNICAL SUMMARY

○ *Report rationale*

- 1) Following on from additional survey recommendations made in the existing Preliminary Ecological Appraisal (PEA) report (Charnia Ecology, 2019), Phase 2 bat and bird activity surveys were conducted on behalf of Mr. and Mrs. D. Craven in relation to a proposed planning application at the former Adderley Mill, Brookhouse Road, Cheadle, Staffordshire, ST10 2NJ (NGR: SJ991439).

○ *Aims & objectives*

- 2) The objective of this report and to outline recommendations on how to proceed with the works in a legal and ecologically sensitive manner should bats and birds be present. Activity surveys (1 x dusk / 2 x dawn) were carried out under optimal conditions during May and June 2019 by a Natural England class 2 licensed bat ecologist and member of the Chartered Institute of Ecology and Environmental Management (CIEEM). No constraints were encountered during the survey periods.

○ *Proposed works*

- 3) The proposed planning application will entail demolition of all existing buildings onsite and erection of seven open market residential dwellings, comprising of four semi-detached and three detached buildings with a combined footprint area of 480m². The development will also entail removal of selected vegetation and tree removal.

○ *Site description*

- 4) The site that is located in greenbelt off Brookhouse Road ca. 1.8km west of Cheadle in the Staffordshire Moorlands, and comprises of former industrial/mill buildings with associated hard-standing. A narrow, running watercourse sits immediately adjacent to the western boundary of the site. The surrounding habitats provide a number of valuable resources for both bats and birds, with good connectivity to the wider landscape considered. Minor evidence of bats by-way-of droppings were recorded in the roof of Building B1 during the initial building inspection.

○ *Survey results*

- 5) A small, loosely aggregated colony of common pipistrelle was confirmed as roosting in Building 4 and 2. A total of six bats were seen re-entering at least four different locations under roof and brick convergences on the south gable and west facing elevation of Building 4, whilst a further two individuals were seen utilizing two locations along the ridge tiles on Building 2.
- 6) Moderate low levels of sustained foraging by individual transient bats was recorded along the watercourse, whilst also foraging around linear building features onsite, with occasional fly-throughs inside building B4 noted.

○ *Impact assessment*

- 7) Considered as being of low moderate conservation concern at site level, building 1 and Building 4 were found to be utilized as a summer day roost for a small aggregated colony of Common pipistrelle.
- 8) No TPO's are present onsite with all trees considered as having negligible potential for roosting bats and high potential for nesting birds. No impact is predicted for Barn owl and no further recommendations are considered.

○ *Designated sites*

- 9) Based on a small-scale development, NO impact to any designated sites in the surrounding landscape is predicted under the proposed scheme.

○ *Mitigation licence*

- 10) In the absence of mitigation, it is highly likely that the proposed application will result in an offence under Regulation 41 or 4, whereby destruction of a bat roosting place is predicted. In accordance to current legislation, a mitigation licence will need to be obtained from Natural England before any development works can take place.

- 11) In-order to maintain the Favourable Conservation Status (FCS) of bat species onsite, a preliminary mitigation strategy has been outlined in this report to support a pending licence application.
 - Timing of works
 - Site induction
 - Soft demolition
 - Roost compensation
 - Modern breathable roofing membrane:
 - Receptor site
 - Lighting
- 12) Additional recommendations are also given to nesting birds and overall biodiversity enhancement onsite, which should also be made a condition of any planning consent approved by the Local Planning Authority.

1. INTRODUCTION

1. Following on from additional survey recommendations made in the existing Preliminary Ecological Appraisal (PEA) report (Charnia Ecology, 2019), Phase 2 bat and bird activity surveys were conducted on behalf of Mr. and Mrs. D. Craven in relation to a proposed planning application at the former Adderley Mill, Brookhouse Road, Cheadle, Staffordshire, ST10 2NJ (NGR: SJ991439).
2. The objective of this report and to outline recommendations on how to proceed with the works in a legal and ecologically sensitive manner should bats and birds be present. Activity surveys (2 x dusk / 1 x dawn) were carried out during May and June 2019 by a Natural England class 2 licensed bat ecologist and member of the Chartered Institute of Ecology and Environmental Management (CIEEM).

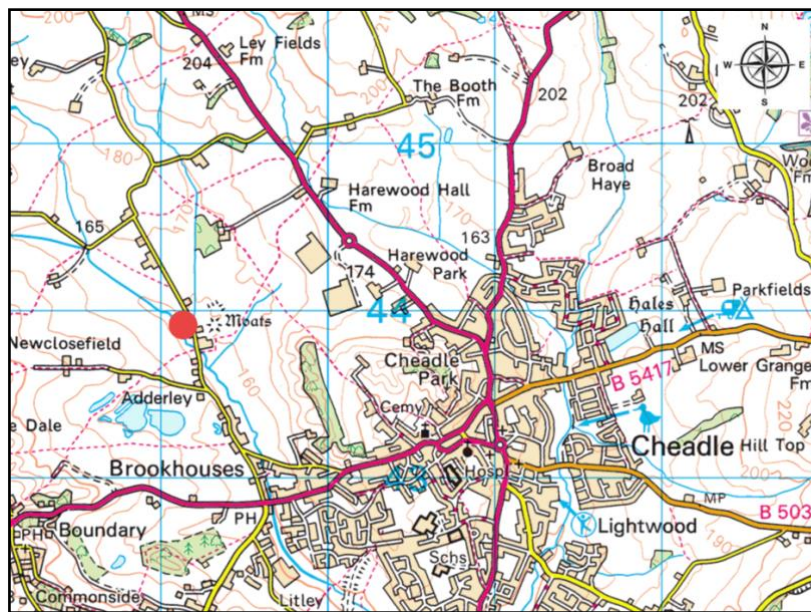


Figure 1. Location of proposed development area (arrow) in context to the wider landscape (source:OS Maps).

○ Site description

3. The site that is located in greenbelt off Brookhouse Road ca. 1.8km west of Cheadle in the Staffordshire Moorlands, and comprises of former industrial/mill buildings with associated hard-standing equating to a total foot print area of 1226m². The site is currently vacant, and last used for light industrial business. There is limited planning history relating to the site and the only application on record refers to proposed storage that was approved in 1979.
4. The site sits immediately adjacent to Brookhouse Industrial estate to the north and east, with New Haden Industrial Estate and Draycott Old Road to the west. The site fringes onto a semi-rural landscape with woodland blocks, pasture land and a number of large water bodies located north and south. A narrow, running watercourse sits immediately adjacent to the western boundary of the site, being fed by the River Tean and Mobberly Brook ca. 2km SE. The surrounding habitats provide a number of valuable resources for both bats and birds, with good connectivity to the wider landscape considered.

○ *Proposed works*

5. The proposed planning application will entail demolition of all existing buildings onsite and erection of seven open market residential dwellings, comprising of four semi-detached and three detached buildings with a combined footprint area of 480m². The development will also entail removal of a road side building to improve highway visibility and modification of existing vehicular access road (500m wide with 600m radius pavement kerbs at highway junction). Additional post-development tree, shrub and hedge planting is also intended.

2. SURVEY METHODOLOGY

○ *Aims of survey*

6. Stage 2 bat and bird activity surveys serve to provide initial advice at the pre-acquisition stage, with regards to any potential ecological impacts through development regarding protected bat and bird species under the Wildlife and Countryside Act 1981 (as amended) and/or the Conservation (Natural Habitats, &c.) Regulations 1994 (2); including species listed in the UK and local Biodiversity Action Plans (BAPs).
7. The aims of the survey are as follows:
 - Probability of bats and their roost sites being present at the proposed development site i.e. buildings and trees;
 - To assess the roost status should bats be present;
 - To assess potential commuting and foraging habit that may be subject to impact from the proposed development
 - To provide an overall impact assessment in the absence of mitigation
8. The scope of this appraisal has been determined in line with the proportional approach to ecological survey, assessment and subsequent recommendations for avoidance and mitigation of impacts, which is encouraged in the emerging 'BS 42020: Biodiversity – Code of practice for planning and development'.
9. This report has been prepared with due consideration for various best practice guidance and methodologies including those of the Chartered Institute of Ecology and Environmental Management (CIEEM (2012)¹, the emerging BS 42020 and BCT Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn) 2016.
10. Unless the client indicates to the contrary, information about the species found to be present on the site will be passed to the county biological records centre to update records held for the area. As defined in Planning Policy Statement 9 (ODPM, 2005) (now superseded by the National Planning Policy Framework - NPPF 2012), Biodiversity and Geological Conservation sites of biodiversity conservation value and protected species are material considerations in the planning process.

○ *Surveyor information*

- Ecological assessment on-site was conducted by: Mark Weston BSc (Hons) - Natural England licensed bat Ecologist (CLS00836 – Level 2) and member of the Chartered Institute of Ecology and Environmental Management (CIEEM). Assistant ecologist(s): Ian Myatt (CLS 37098 – Level 1 / Barn owl Licence registration number CL29/00424), Louise Cox BSc (Hons) and Robert Stokes BSc (Hons).

○ **Legislation and policy guidance** (see also Appendix)

11. All species of bat are listed in Schedule 5 of The Wildlife and Countryside Act (1981) and as such receive protection under Section 9 of this Act. It is a criminal offence to:
 - Deliberately capture, injure or kill a bat;
 - Intentionally or recklessly disturb a bat in its roost or deliberately disturb a group of bats;
 - Damage or destroy a bat roosting place (even if bats are not occupying the roost at the time);
 - Possess or advertise/sell/exchange a bat (dead or alive) or any part of a bat;
 - Intentionally or recklessly obstruct access to a bat roost.
12. A bat roost is interpreted as ‘any structure or place, which any wild bat uses for shelter or protection’ (i.e. buildings, trees, bridges, tunnels etc.). Bats tend to show a high fidelity to roosts; subsequently, legal opinion regards a roost to be protected whether or not the bats are present at the time. There are many types of roost used by temperate bats during their annual cycle. Any structures found having evidence of bats will be further evaluated to assess which of the following roost categories may be present onsite (if any):

Roost category	Description
Summer Maternity / nursery roost	Used by breeding bats, where pups are born and raised to independence (Anecdotal evidence may support this prospect despite sub optimal survey period).
Hibernation site	Where bats may be found during over-wintering.
Daytime Summer roost	Used by males and/or non-reproductive females (seasonal limitations can prevent robust assessment of this roost status).
Night roost	Where bats rest between feeding bouts during the night but are rarely present during the day.
Feeding roost	Where bats temporarily utilize feeding perches and stations to eat an item of prey.
Transitional (or swarming) site	Where bats may be present during the spring or autumn

Table 1. Bat roost status definitions.

13. Assessment also considers potential effects on Valued Ecological Receptors (VERs) and Zones of Influence (Zol) during pre and post development, both onsite and off- site. The term Zone of Influence is used to describe the geographic extent of potential impacts of a proposed development.
- **Birds**
14. The survey protocol also considers all common wild birds that are protected under the Wildlife and Countryside Act 1981 (and as amended). This protection extends to bird nests during the breeding season, which makes it an offence to damage or destroy nests or eggs.
 - Establish if birds are using the site;
 - Locate nest sites, if present;
 - Assess what types of activities were shown with the proposed application area;
 - Assess suitable food resources and habitat requirements;
 - Provide an impact assessment in the absence of mitigation.
 15. Certain rare breeding birds such as Barn Owl *Tyto alba*, are listed on Schedule One of The Wildlife and Countryside Act 1981 (and as amended). Under this legislation they are afforded the same protection as common wild birds and are also protected against disturbance whilst building a nest or on or near a nest containing eggs and unfledged young. Survey protocol considers the following:

- Establish presence onsite;
 - Establish potential nest sites (PNS);
 - Locate any active roost sites (ARS);
 - Locate any temporary roost sites (TRS);
 - Assess potential feeding and dispersal habitats (PFH);
 - Provide an impact assessment in the absence of mitigation.
16. In accordance with BCT 3rd edition (2016) guidelines, the following survey protocol is considered appropriate to provide a full ecological evaluation of the site in order to determine the following:
- **Pre-survey data search**
17. Pre-survey data search provided historical records of any protected bat and bird species found within a 2km radius of the application area. Additional ecological data has been sourced to understand any constraints that the proposed planning application may have on species and habitat in the wider landscape. The National (UK) and local (Staffordshire) Biodiversity Action Plans (BAPs) were also scrutinized for protected habitats and species relevant to the application area.
18. A number of electronic sources sites were also consulted including; www.magic.gov.uk; www.naturalengland.org.uk; Google Earth and www.ordnancesurvey.co.uk.
- **Walkover survey**
19. A walkover survey, including visual inspection of building and any trees, was undertaken to determine the availability of required resources for the protected species in the immediate area. The building was inspected both externally and internally for:
- Presence or absence of bats onsite (i.e. hibernating bats)
 - Evidence and/or potential of bat roosts onsite (i.e. summer roosts)
 - Whether additional surveys are required.
- **Field surveys**
20. Phase 2 bat and bird activity surveys were conducted during an optimal survey period when bats are known to be in summer maternity or bachelor roosts (see Table below). Surveys incorporated the use of both heterodyne and real time bat detectors, night-vision binoculars, torch, endoscope and ladders when necessary.

Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Inspection of Hibernation roosts- semi optimal survey			Limited activity-sub optimal	Summer roost emergence & re-entry surveys -Optimal survey period					Limited activity -sub optimal	Hibernation roosts - semi optimal survey	
Internal roost surveys are possible / Troos are best surveyed during Winter											

Table 2. Annual survey optimality for bats.

21. Bat ultrasound data was gathered using a number of heterodyne units (Batbox Duet and SSF Bat2) and real-time recording devices (EcoObs Batcorder). Real time recordings were subsequently analyzed using BatSound v4.03 and statistical algorithm analysis was carried out using EcoObs BcAdmin, BatIdent and BcAnalyze software to provide an unbiased discrimination of species onsite.

- ***Weather conditions and timing***

- 22. All surveys were carried out during optimal conditions (Dry / >8°C), with a minimum interval of two weeks between each survey to allow for stochastic events over space and time.

- ***Habitat survey***

- 23. The survey assessed habitat onsite in context to the wider landscape with regard to any important bat roosts, commuting / foraging areas that may be affected by the proposed development.

- ***Roost survey***

- 24. All potential roost structures (i.e. buildings) onsite or within the Zone of Influence of the proposed development were assessed, based on standard methodologies set out by Natural England, the Bat Conservation Trust (BCT) and the Joint Nature Conservation Committee (JNCC). The use of binoculars, torch, endoscope and ladders are used where necessary to inspect the building

- ***External inspection of structure***

- 25. A visual assessment during daylight hours is initially undertaken to locate potential ingress points that bats and birds (including Barn owl) could use to gain access into the structure to roost and/or nest, and assessed using the following criteria:

- Type and age of building;
- Type of construction;
- Condition of roof i.e. missing or raised roof tiles;
- Condition of windows and doors i.e. broken panes;
- Potential ingress points around ridges and apex of the buildings;
- Evidence of bats (i.e. presence of live or dead bats, droppings, grease marks, urine stains, characteristic smell of bats);
- Any evidence of birds i.e. nest material, droppings.

- ***Internal inspection of structure***

- 26. An internal inspection of the structure considers areas which provide appropriate features and environmental conditions for bats and birds, and considers the following criteria:

- To look for warm dark areas, joints, crevices, beams and cavities for possible bat roost sites and nests.
- To locate roost/nest sites.
- To listen for bats and birds.
- To examine floors, walls and structural elements for physical evidence of bats and birds;
- To record any anecdotal evidence (i.e. presence of live or dead bats, droppings, grease marks, urine stains, feeding remains and characteristic odour of bats).

- ***Building rating***

- 27. In the absence of any evidence, trees and structures were assigned a rating of suitability from negligible to high potential for supporting bats. The rating is based on the number and type of features suitable for use by bats (such as rot holes, cavities and raised bark), location of the structure in the surrounding landscape and surveyor's experience (See also Appendix).

28. Should a likely significance of negative impacts to bats be identified during the survey period, then a European Protected Species (EPS) development license issued by Natural England (NE) may be required prior to any works taking place, in-order to maintain the Favourable Conservation Status of species onsite.
29. The purpose of this report will only provide a preliminary outline of a bat mitigation strategy. A detailed method statement will need to be determined through consultation with an appropriately qualified and experienced bat ecologist thereafter, to fully support the aforementioned license application.

3. RESULTS

○ *Designated sites*

30. The proposed application is situated in a semi-rural green belt, and falls under the Regional (Joint) Character Area of 64 Potteries and Churnet Valley, comprising of 'Ancient Slope and Valley farmlands' landscape character types. There are no international (i.e. SAC, SPA, or Ramsar Site), national (i.e. SSSI, or NNR) or local (i.e. Local Nature Reserve (LNR)) statutory designated nature conservation sites recorded within 2km of the application site.
31. There are four non-statutory designated nature conservation sites within 2km of the proposed application site that include three Sites of Biological Importance (SBI) and one Biodiversity Alert Site (BAS).

Huntley Wood & Quarry SBI (SJ988416)	Non- statutory designated site of importance for nature conservation. Oak-Birch ancient and semi-natural woodland. Huntley Quarry and Wood contain a number of protected, UKBAP and SBAP species including badgers, bats and solitary bees and wasps. It also contains a population of the proposed UKBAP species, the dingy skipper butterfly. Important at County level. Huntley Wood is also listed on the Ancient Woodland Inventory (AWI) as Ancient and Semi-Natural Woodland (ASNW). There is also a site of regionally important geology known as Huntley Railway within 1km of the survey site. The quarry itself is designated as RIGS (regionally important geological sites), for the exposure of the Hawksmoor Formation and its close proximity to older coal measure rocks. (http://www.sbap.org.uk/sgap/pdf/SGAP.pdf).
Draycott Common Wood BAS (SJ996412)	Non- statutory designated site of potential importance for nature conservation. Important at County level.
Freehay Wood SBI (SK018416: 1.2km NE)	
Commonside Quarry SBI (SJ989421).	

Table 3. Designated sites in a 2km radius.

32. Subsequently the application area is within a SSSI Impact Risk Zone [assesses planning applications for likely impacts on SSSIs/SACs/SPAs & Ramsar sites (England)].
- #### ○ *Protected bat species*
33. Pre-survey data finds seven British bat species are currently given UK BAP (2007) Priority Species Status. National Biodiversity Network and Staffordshire Wildlife Trust (SWT) records show that 11 of the 17 resident UK bat species occur in the county with one UK BAP species being recorded within 2km of the proposed application area (highlighted in orange):

UKBAP	Common name	Species	Recorded within 2km
	BROWN LONG-EARED BAT	<i>Plecotus auritus</i>	
	BARBASTELLE BAT	<i>Barbastella barbastellus</i>	
	BECHSTEIN'S BAT	<i>Myotis bechsteini</i>	
	NOCTULE	<i>Nyctalus noctula</i>	
	GREATER HORSESHOE BAT	<i>Rhinolophus ferrumequinum</i>	
	LESSER HORSESHOE BAT	<i>Rhinolophus hipposideros</i>	
	SOPRANO PIPISTRELLE	<i>Pipistrellus pygmaeus</i>	

Table 4. UKBAP Bat species recorded within Staffordshire.

34. A further four/five bat species that are not currently given UK BAP consideration are also recorded within the county. SER data show one species recorded within a 1km radius of the site (highlighted in orange):

UKBAP	Common name	Species	Recorded in County
	NATTERER'S BAT	<i>Myotis Nattereri</i>	
	DAUBENTON'S BAT	<i>Myotis daubentonii</i>	
	WHISKERED / BRANDT'S	<i>Myotis mystacinus/brandtii</i>	
	COMMON PIPISTRELLE	<i>Pipistrellus pipistrellus</i>	

Table 5. Non UKBAP Bat species recorded in Staffordshire.

35. Pre-survey data show no records of any bat roosts within the application area itself.. The nearest known roost is that of a small colony of common pipistrelle ca.520m SW of the site near Blakehall Fisheries (2002).

○ **Birds**

36. SER data show 37 different bird species are recorded within a 1km radius of the application area, all of which are classified according to their status on Red, Amber and Green listed Birds of Conservation Concern (BoCC) in the UK.

<i>Turdus iliacus</i>	Redwing		<i>Larus canus</i>	Common Gull	
<i>Turdus pilaris</i>	Fieldfare		<i>Larus fuscus</i>	L. Black-backed Gull	
<i>Passer domesticus</i>	House Sparrow		<i>Columba oenas</i>	Stock Dove	
<i>Passer montanus</i>	Tree Sparrow		<i>Prunella modularis</i>	Dunnoek	
<i>Turdus viscivorus</i>	Mistle Thrush		<i>Sterna hirundo</i>	Common Tern	
<i>Sturnus vulgaris</i>	Common Starling		<i>Loxia curvirostra</i>	Common Crossbill	
<i>Motacilla flava</i>	Yellow Wagtail		<i>Falco peregrinus</i>	Peregrine Falcon	
<i>Motacilla cinerea</i>	Grey Wagtail		<i>Pyrrhula pyrrhula</i>	Kingfisher	
<i>Anas platyrhynchos</i>	Mallard		<i>Fringilla montifringilla</i>	Brambling	
<i>Anas querquedula</i>	Garganey		<i>Buteo buteo</i>	Buzzard	
<i>Anser anser</i>	Greylag Goose				

Table 6. Birds of Conservation Concern (BoCC) recorded in 1km radius.

○ **Habitat**

37. The majority of the site is composed of former industrial buildings and associated hard standing. There were a number of well-defined linear features were recorded by-way-of a running water brook along the western boundary with scattered trees and hedgerows around east and west elevations.
38. In context to the wider landscape, the site is surrounded by agricultural farmland, with a number of woodland blocks and water-bodies present in a 1km radius. A number of operable and defunct sand and gravel quarries are also present in the wider landscape. Overall the landscape is considered as providing a number of valuable resources for local bat and bird populations with good connectivity.

○ **Building assessment**



Figure 3. Aerial view of Adderley Mill buildings + associated hard-standing areas and boundaries.

Building B1:



Fig. 4. NE elevation.



Fig. 5. Internal roof void area.



Fig. 6. Bat droppings by loft hatch.

39. Building B1 is a low elevation section with a pitched and tiled roof located adjacent to the Brookhouse Road on the eastern boundary. A moderate number of external egress points were recorded by-way-of broken/lifted ridge tiles, with cracks and crevices around structural walls present. An internal roof void was inspected and gained via a loft hatch above a former kitchen area.
40. This internal roof void was found to be ca.2.2m high at apex with A-frame timber purlins and underfelt present, Light ingress was recorded around open hatch regions and roof verges. A small number of scattered, bat droppings (ca. 14) were recorded around the loft hatch area and considered to be more than 1/2 seasons old.

Building B2



Fig. 8. Ingress points on B2.



Fig. 9. First-floor region in main section of B2.

41. Building B2 is attached onto B1 at a 90-degree angle. It is constructed of red brick with a pitched and tiled roof present on the south facing elevation with a number of broken/lifted ridge tiles and cracks and crevices recorded around structural walls. An open first-floor portal window is present on the west gable elevation providing excellent ingress potential for both bats and birds. Internally this section was found to be open to roof height with exposed timber truss work providing excellent roosting potential for Barn owl although no evidence was recorded. The underside of the roof was found to be also boarded over with ceiling panels flush to timber purlins, providing potential for roosting bats between intermediate layers of the underside of the roof.
42. The main building section of B2 was found to have less potential, having corrugated asbestos sheet roofing. Internally, the first-floor area was found to open to roof height with exposed metal A-frames. The area was found to be illuminated by sky-lights and broken windows. No roof voids or intermediate layers were noted in this region. A small brick kiln was investigated on the lower floor levels which merges into a large prefabricated hanger unit of building B3. No evidence of bats or birds was recorded in this section.

Building B3



Fig 10. South elevation of B3.



Fig. 11. Ground-floor hanger unit of B3.

43. Building B3 is a large prefabricated hanger unit and deemed as having the least potential for roosting bats out of all structures onsite, albeit a number of external ingress points for both bats and birds were noted. Internally, the area was open to roof height being illuminated by a number of sky-lights, with negligible internal features present to support roosting bats. No evidence of bats or birds was recorded in this building unit.

Building B4

**Fig 12.** West elevation of B4.**Fig. 13.** Internal first-floor region of B4 .

44. Similar in design to that of the main section of B2, building B4 was constructed of red brick and found to have numerous ingress points around elevations, with open doors and broken windows present. The roof was constructed of corrugated asbestos sheets. Internally, the first-floor area was found to be open to roof height with an exposed metal A-frame. No roof voids or intermediate layers were noted across the undersides of roof sections. No evidence of bats or birds was recorded in this section.

45. All building sections with prefabricated asbestos sheet roofing are subject to abiotic temperature fluctuations on a daily basis, and provide less than stable microclimates and roosting features conducive for the thermoregulation requirements of torpid male bats (in-order to conserve energy), and/or female bats (during parturition of their young in maternity roost).
46. All other low elevation structures onsite were considered as having negligible to low potential for roosting bats overall, being either of a prefabricated build with corrugated sheet roofing and/or flat roof or external felted pitched roof providing negligible ingress potential.
47. All trees were found to have Negligible to low potential for roosting bats. No evidence of nesting birds (including Barn owl) was recorded during the building inspections, although nesting birds are considered around hedge and tree boundaries.

○ **Activity survey results**

48. Based on structure rating and proposed demolition of the building, 1 x dusk emergence activity survey (15min start before sunset to 2hrs after) and 2 x dawn re-entry activity surveys (1.5hrs before sunrise and min start before sunset and 15mins after) were carried out under optimal weather conditions to fully determine the absence/presence of roosting bats.

Survey 1 - Dusk emergence (1)				DATE: 03/05/2019	
SUNSET:	20:39hrs	TEMP START	12.5°C	CLOUD COVER START	10%
START TIME	20:30hrs	TEMP FINISH	11 °C	CLOUD COVER FINISH	10%
FINISH TIME	22:35hrs	WIND SPEED	<1	PRECIPITATION	NIL
Survey 2- Dawn re-entry (1)				DATE: 31/05/2019	
SUNRISE:	04:48hrs	TEMP START	14.5°C	CLOUD COVER START	30%
START TIME	03:30hrs	TEMP FINISH	15.8 °C	CLOUD COVER FINISH	10%
FINISH TIME	05:10hrs	WIND SPEED	<1	PRECIPITATION	NIL
Survey 2- Dawn re-entry (2)				DATE: 29/06/2019	
SUNRISE:	04:45hrs	TEMP START	15.5°C	CLOUD COVER START	30%
START TIME	03:30hrs	TEMP FINISH	16.5°C	CLOUD COVER FINISH	30%
FINISH TIME	05:05hrs	WIND SPEED	<1	PRECIPITATION	NIL

Table 7. Activity survey timing and conditions.

49. A small, loosely aggregated colony of common pipistrelle was confirmed as roosting in Building 4 and 2. A total of six bats were seen re-entering at least four different locations under roof and brick convergences on the south gable and west facing elevation of Building 4, whilst a further two individuals were seen utilizing two locations along the ridge tiles on Building 2, albeit it only once during the first dawn re-entry survey.



Figure 14. Common pipistrelle roost locations onsite.

50. Roost locations would appear to be adopting individual cavities along the top brick-line (below roof verges), of Building 4. The lack of any internal roof void or underfelt to the underside of the corrugated asbestos supports this inference, whereas intermittent use of select conventional raised ridge tiles on Building 2 were also adopted.

○ **Foraging and commuting**

51. Moderate low levels of sustained foraging by individual transient bats was recorded along the watercourse, whilst also foraging around linear building features onsite, with occasional fly-throughs inside building B4 noted. Species discriminating in rank order as: common pipistrelle (passes N72 / 100%); soprano pipistrelle (passes N3 / 100%); Myotis spp. (whiskered/ Brandt's bat passes N2 / 63% - Daubenton's bat N3 66%); brown long-eared bat (passes N2 / 100%). Common noctule (passes N4 / 100%)
52. No TPO's are present onsite with all trees considered as having negligible potential for roosting bats and high potential for nesting birds.
53. No evidence of Barn Owl was recorded onsite during the survey period.

4. IMPACT ASSESSMENT

○ **Survey constraints**

54. No access or survey constraints were encountered during each of the survey period(s).

○ **Bat roosts**

55. Considered as being of low moderate conservation concern at site level, building 1 and Building 4 were found to be utilized as a summer day roost for a small aggregated colony of Common pipistrelle. Given the number of crevice-dwelling roost features onsite, coupled with the ability of common pipistrelle to switch between roosts and exploit a greater spectrum of regimes (see below); there is moderate to high potential that all structures within the buildings complex (excluding B3) have some transient roost potential over space and time.

BATS		
Short-term: Disturbance	Long-term: Roost modification	*Long-term: Roost loss
HIGH	HIGH	LOW MODERATE
(*The impact of loss of roosts on bat populations is poorly understood and difficult to study. There is variation in the impacts depending on the particular species of bat with some being more sensitive to disturbance than others. Synanthropic species such as Pipistrelle bats for example are crevice roosters, and are known to move between roost sites (such as maternity roosts). These bats may find it easier to locate suitable new roosts as their requirements are not as specific as other species).		
BIRDS		
HIGH (for individual passerine species during ground-works)	LOW	LOW
BARN OWL		
LOW	LOW	LOW

○ **Roosting ecology of species onsite**

56. Common pipistrelle *P. pipistrellus* is considered common and widespread across local, county and regional levels (Population Estimate: UK 2,430,000, Battersby *et al.* 2005). This species tends to have less roost fidelity overall and are known to switch between roost sites. Common pipistrelle is a generalist in behaviour and capable of enduring a greater spectrum of temperature regimes, compared to other crevice-dwelling species. Common pipistrelle is generally sedentary in its nature and summer maternity colonies generally number 25-50 individuals (although colonies of as many as 200 have been recorded).

○ **Designated sites**

57. Based on a small-scale development, NO impact to any designated sites in the surrounding landscape is predicted under the proposed scheme.

5. RECOMMENDATIONS

○ **Further survey**

58. Assessment onsite was undertaken during an optimal survey period and considered to be robust and representative of protected species currently onsite during the summer period. No further surveys for bats are considered necessary at this juncture.
59. NO further survey recommendations are considered for protected bird species (including Barn owl), on the proviso that care and vigilance is carried out during works (see section 6).

○ **Mitigation licence**

60. In the UK, all species are listed on Schedule 5 of the the Wildlife and Countryside Act 1981 (as amended), and are therefore subject to the provisions of Section 9, which make it an offence to:
- Deliberately capture, injure or kill a bat;
 - Intentionally or recklessly disturb a bat in its roost or deliberately disturb a group of bats;
 - Damage or destroy a bat roosting place (even if bats are not occupying the roost at the time);
 - Possess or advertise/sell/exchange a bat (dead or alive) or any part of a bat;
 - Intentionally or recklessly obstruct access to a bat roost.
61. In the absence of mitigation, it is highly likely that the proposed application will result in an offence under Regulation 41 or 4, whereby destruction of a small (N8) male summer roost for common pipistrelle is predicted. In accordance to current legislation, a mitigation licence will need to be obtained from Natural England before any development works can take place.
62. In-order to maintain the Favourable Conservation Status (FCS) of existing species onsite, mitigation should be proportionate, justifiable and avoid or minimize any harm to species found during works, whilst also increasing net gains for biodiversity overall.
- Type and scale of works and predicted impacts on bats
 - Size, nature and complexity of the development site
 - Likelihood of bats being present or affected
 - Species and numbers of individuals concerned
 - Type of roost and/or habitat affected.
63. A separate method statement to support an EPSL from Natural England will be required, which should detail the necessary compensation measures to maintain the FCS of species onsite. The following preliminary mitigation outline strategy considers the roosting ecology of crevice dwelling bats:

PRELIMINARY BAT MITIGATION OUTLINE

○ **Timing of works**

64. To reduce potential impacts to roosting bats, any works affecting existing roof sections should be carried out under the supervision of a suitably qualified. during autumn/winter (late Sept to Oct) to early spring (Jan to March) during dry weather periods, and when temperatures have not dropped below 8°C, over four consecutive days and nights.

○ **Site induction**

65. Before ANY work commences, ALL building contractors should be made aware of the presence of roosting bats onsite, their legal protection and of working practices to avoid harming bats. A copy of the Method Statement and licensing conditions with summary sheet of works time table should be made permanently accessible onsite for reference.

○ **Soft demolition**

66. Soft demolition of the existing roof sections should be adopted. Any internal crevices should also be inspected using a flexible endoscope where necessary, prior to any removal around cavity sections and intermediate layers between roof and brick lines.

○ **Roost compensation**

67. Based on a new build, Integrated Bat tubes / bricks (Suitable as crevice roosts for Common pipistrelle) should be installed into the upper apex gable end elevations, as near to existing roost locations and existing flight-paths as possible.

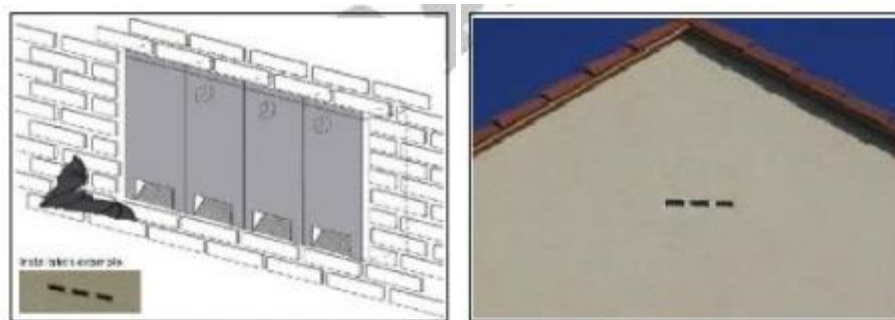


Fig. 15 & 16. Illustrations showing integrated bat tubes/bricks.

68. Alternatively, access slits in newly created soffits can also be considered for Common pipistrelle. Where possible access tiles should be incorporated into north and south facing sections, in-order to provide a range of alternative microclimates for bats to select from.
69. Alternatively, modified ridge bat access tiles, using modified Hog's-back or Half-round ridge ventilator tiles can be considered suitable for common pipistrelle, following the removal of internal mesh or plastic moldings. No apertures should be made in any of the underlying underlay to prevent ingress of bats into any internal roof voids.

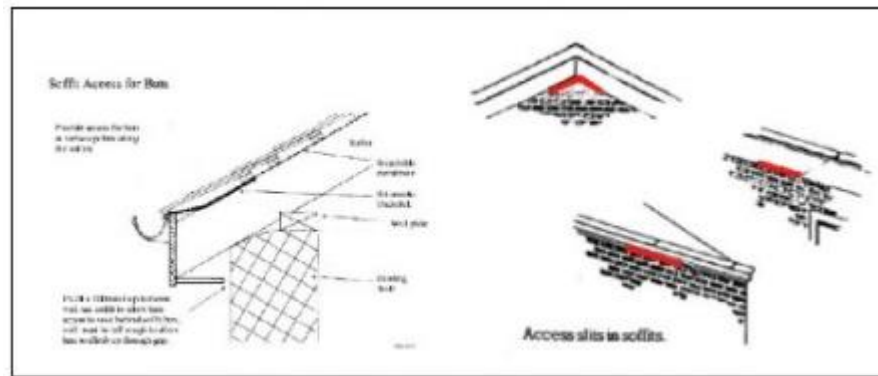


Figure 17. Illustrations showing access slits in soffit areas.

70. Bat mitigation features should be instated well in advance of the optimal period of May to mid-August, when bats are once again established back in summer roost.
- **Modern breathable roofing membrane:**
71. Modern breathable roofing membrane (BRM) is known to be detrimental to bats, due to fraying of fibres over time and subsequent entanglement and ensnarement of bats (Waring, 2014). It is therefore imperative that bats DO NOT come into contact with this substrate. Subsequently, should modified bat access tiles be incorporated into any new roof sections, then a 1m² section of traditional dark, Bitumastic F1 under-felt must will be overlain on top of BRM with timber batons around convergence edges to prevent bats coming into contact with this substrate.
- **Receptor site**
72. As a site safeguard measure, it is recommended that a hibernation receptor bat box (Schwegler 1FW) is fitted on site, in the unlikely event that individual bats are unexpectedly discovered during works. The use of standard capture and exclusion methods may be necessary, and should be undertaken by a licensed bat ecologist in-order to transfer any such individuals to the aforementioned receptor box for safe-guarding.
- **Lighting**
73. To minimize and impact on current roost locations and foraging and commuting habitat for bats, mitigation should follow the protocols outlined in the Institute for Lighting Engineers document "Guidance for the Reduction of Obtrusive Lighting" (2005) and Bat Conservation Trust's "Artificial Lighting and Wildlife Interim Guidance Recommendations to Help Minimise the Impact of Artificial Lighting" (2014).
 74. Only the use of low energy LED lighting to minimize light spill around the building(s) should be incorporated. Alternatively, Low-pressure sodium lamps (SOX) are recommended, which should be fitted with hoods to direct the light below the horizontal plane to minimize light-spill / upward sky-glow.
 75. Where necessary any security lighting will be less than 200 lumens (150 watts) and placed on a timer setting and faced down to reduce sky glow. Height of any columns around the development should not exceed eight metres.

- **BIRDS**

- 76. It is understood that ground works will involve selected tree removal and vegetation clearance around site. Consideration should therefore be given to any nesting birds which are protected under the Wildlife and Countryside Act 1981 (as amended) during the development.
- 77. Tree removal / pruning should be undertaken outside the bird breeding season (March to August inclusive). Where this is not possible, then a check for nesting birds should be undertaken by an ecologist prior to works. Should any active bird nests be found, then these should be left undisturbed until offspring have fully fledged. It may be necessary to enforce an exclusion work zone of 5m to reduce disturbance and minimize potential displacement of nesting birds.
- 78. No evidence of Barn owl was recorded and NO further recommendations are considered with regard to this species.

- ***Biodiversity enhancement***

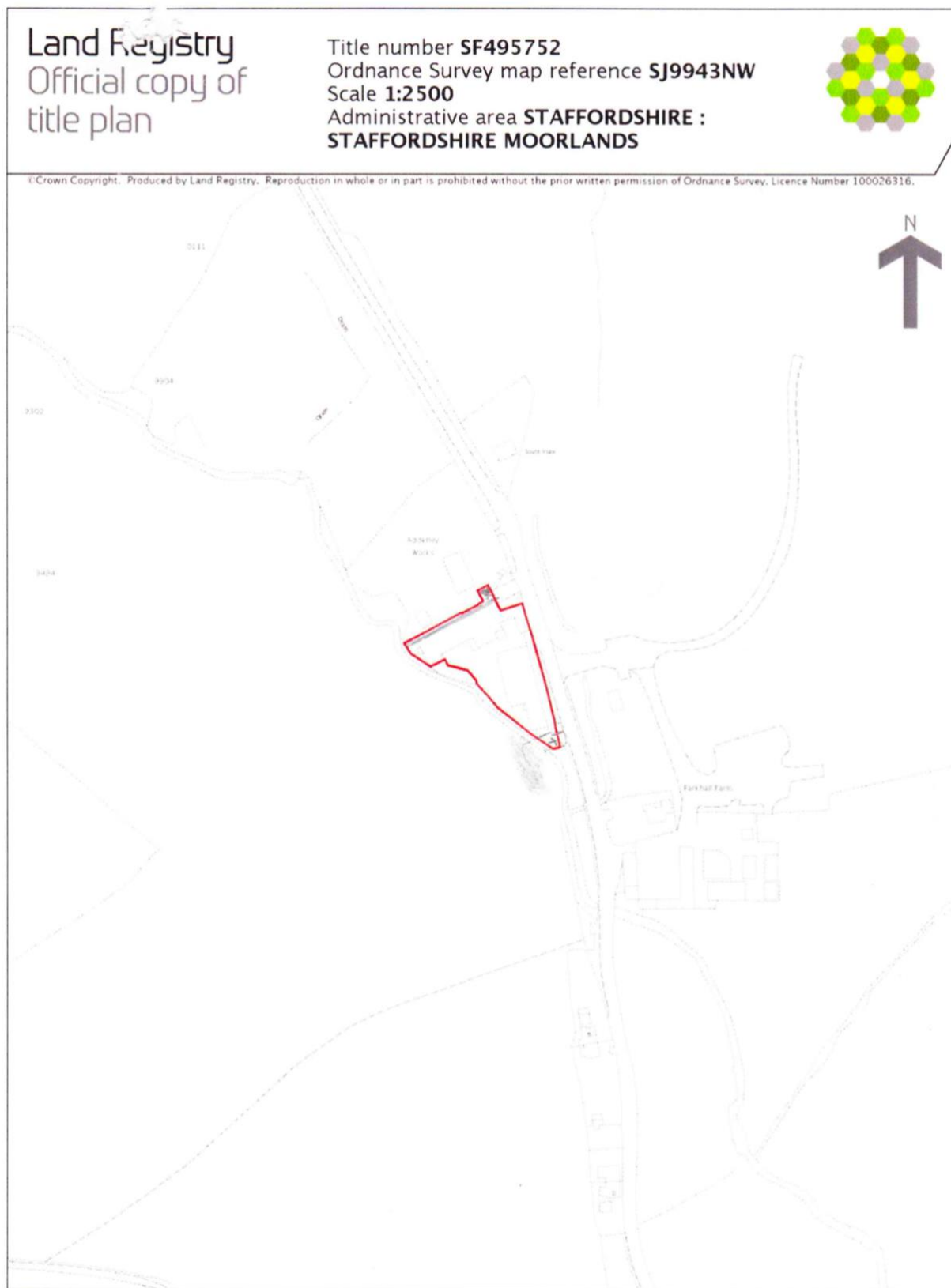
- 79. In accordance with the Natural Environment and Rural Communities (NERC) Act 2006, development proposals should seek, where possible, to enhance opportunities for local biodiversity. It is recommended that a minimum of eight additional bird boxes are also erected onsite to increase overall prospects for local bird populations.
- 80. Should any landscaping be considered at a later date, then it is recommended that only native tree and shrub species are planted. Nectar and berry rich native shrubs providing a variety of habitats for invertebrates should be selected to benefit foraging birds and bats whilst providing structural diversity for wildlife around site. This may include appropriate climbing species such as cotoneaster, ivy, climbing roses and honeysuckles to create green walls that will further enhance the site and gardens for wildlife. Species selected must be appropriate to the shade or moisture conditions on site.
- 81. No plant species listed on Schedule 9 of the Wildlife and Countryside Act 1981 should be planted during any landscaping around the conversions. For further details of Schedule 9 plants visit the Defra website: www.defra.gov.uk/wildlife-pets/non-native.

6. REFERENCES

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- The Conservation of Habitats and Species Regulations 2010. SI 2010/490. SI 2007/1843, London: HMSO.
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7. APPENDIX

○ *Maps & forms*



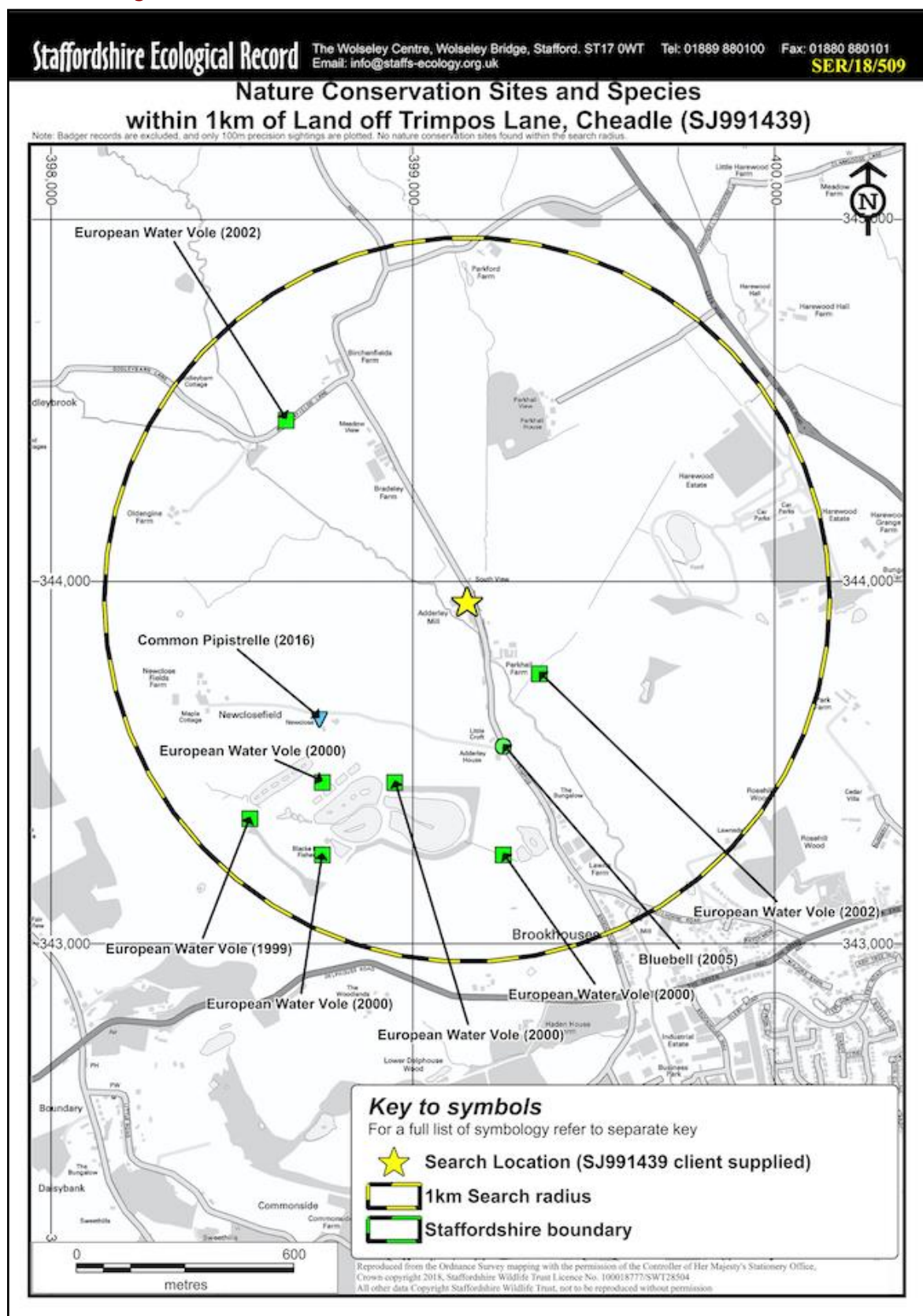
- *Proposed architectural drawings.*



○ *Extended Phase 1 habitat map*



○ **SER biological data records 1km**



○ **Roost habitat assessment criteria (BCT, 2016).**

Suitability	Description Roosting habitats	Commuting and foraging habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions ^a and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation ^b). A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential. ^c	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions ^a and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions ^a and surrounding habitat.	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.

For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.
Evidence from the Netherlands shows mass swarming events of common pipistrelle bats in the autumn followed by mass hibernation in a diverse range of building types in urban environments (Korsten *et al.*, 2015). This phenomenon requires some research in the UK but ecologists should be aware of the potential for larger numbers of this species to be present during the autumn and winter in large buildings in highly urbanised environments.
This system of categorisation aligns with BS 8596:2015 Surveying for bats in trees and woodland (BSI, 2015).

Tree category and description	Further action required
Known or confirmed roost	
Evidence of bat roost is already confirmed	Consider retention of tree in first instance. Should the tree be considered dangerous or diseased, then sufficient effort to establish population data and number of bat species should be obtained before any remedial works or felling is undertaken. Should disturbance and modification to a known bat roost be likely, then a European Protected Species licence is required.
High Roost Potential	
Trees with features such as: - Cavities incl. Rot holes, woodpecker holes, natural crevices - Cracks/splits in major limbs - Dense epicormic growth - Dense epiphyte coverage - Loose bark - Bat and Bird boxes - Staining/droppings	Any remedial works or removal of trees assessed as having HRP will necessitate further surveying to prove absence of bat roost. This will include activity surveys and a climbing endoscope survey prior to works. Should evidence of bats be found, then a European Protected Species licence will be required, and the roost status of the tree should be upgraded.
Moderate Roost potential	
Tree may exhibit once or more of the features described for HRP.	Any remedial works or removal of trees assessed as having MRP will necessitate further surveying effort to prove absence of bat roost. This should include emergence and re-entry surveys during an optimal surveying period (May to September), and if necessary, a climbing endoscope survey prior to works. Should evidence of bats be found, then a European Protected Species licence will be required, and the roost status of the tree should be upgraded.
Low Roost Potential	
Tree may exhibit less notable features as described in MRP, but are considered less suitable for bat utilization	Any remedial works or removal of trees assessed as having LRP should be taken outside the bat and bird breeding season. Should features be discovered that may be beneficial to bats and birds, then all care must be taken to retain such features if possible.
Negligible Roost Potential	
Trees exhibits no notable features for bat utilization	No further surveying effort is recommended. Any remedial works or felling should ideally be undertaken outside the bird breeding season (March to September)

○ *Policy guidelines*

PAS 2010	The published 'PAS 2010' 'Planning to halt the loss of biodiversity' which is the government's new policy aimed at all authorities and developers involved in the planning process in the UK to halt biodiversity decline by 2010 and deliver net biodiversity gains as part of the green infrastructure provisions.
National Planning Policy Framework, Section 11:	The recently published framework in 2012, replaces the previous Planning Policy Statement 9. Section 11: Conserving and enhancing the natural environment, reaffirms the Government's commitment to maintaining protections and preventing urban sprawl, retains the protection of designated sites and preserves wildlife, aims to improve the quality of the natural environment, and halt declines in species and habitats, protects and enhances biodiversity and promotes wildlife corridors.
Article 10 of the EC Habitats Directive:	The published Article requires government to develop features such as 'stepping stones' on the landscape, such as clusters of ponds, tracts of rough grassland or scrubland and vegetated railway line embankments.
Wildlife and Countryside Act 1981:	All species of bat are fully protected under the Wildlife and Countryside Act 1981, the European Conservation (Natural Habitats etc.) Regulations 1994, and the Countryside and Rights of Way Act 2000. This legislation makes it illegal to possess or control any live or dead specimens, to damage, destroy or obstruct access to any structure or place used for shelter, protection or breeding, and to intentionally disturb a bat while it is occupying a structure or place which it uses for that purpose.
Conservation of Habitats and Species Regulations (2010)	The Conservation of Habitats and Species Regulations 2010 consolidate all the various amendments made to the Conservation (Natural Habitats, &c.) Regulations 1994, in respect of England and Wales. It is an offence to possess, sell or offer, or transport for sale any European species of bat or any part derived from such a species. These Regulations also remove the 'incidental result defence'. In other words, it is no longer a defence to show that the killing, capture or disturbance of a species covered by the Regulations or the destruction or damage of their breeding sites or resting places was the incidental and unavoidable result of a lawful activity. Natural England can grant European Protected Species (EPS) licences in respect of development to permit activities that would otherwise be unlawful.
Natural Environment and Rural Communities Act (2006)	Under Section 40 of the Natural Environment and Rural Communities Act (2006), public bodies, including Local and Regional Planning Authorities, have a duty to 'have regard' to the conservation of biodiversity in England when carrying out their normal functions, which includes consideration of planning applications. In compliance with Section 41 of the Act, the Secretary of State has published a list of species considered to be of principal importance for conserving biodiversity in England. This is known as The England Biodiversity List, all of which make up the UK BAP Priority Species. Regional Planning Bodies and Local Planning Authorities will use it to identify the species that should be afforded priority to maintain, restore and enhance species and habitats.
Bird legislation	Most resident nesting birds are protected under the Wildlife and Countryside Act 1981, which protects birds, nests, eggs and nestlings. Some rarer species, such as barn owls, are afforded extra protection.

Table A. Policy guidelines.

Annual life cycle of a temperate bat

January	February	March
		
Jan: Bats spend most of the winter hibernating, a state of inactivity characterised by lower body temperature, slower breathing, and lower metabolic rate. Feb: Bats are still hibernating. They have little fat left to live off of now. They may leave the roost on warmer nights to find food and a drink of water. March: Bats may begin to emerge and signs of limited activity can be seen. There are small numbers feeding as it gets warmer. In bad weather, they may become torpid.		
April	May	June
		
April: Bats have mainly come out of hibernation and are hungry and active, feeding on most nights. They may be moving between several roost sites. They may become torpid (cool and inactive) again when cold. May: Bats are fully active and feeding. Females start forming maternity colonies and looking for suitable nursery sites, such as buildings or trees. Males will roost on their own or in small groups. June: Female bats usually give birth to a single pup, which they feed on their milk. Young bats are very small (less than an inch) with thin, slightly grey fur. Adult bats will catch thousands of insects each in a night.		
July	August	September
		
July: Mothers continue to suckle young. Some young are growing fast and almost full-size; others are still very small. At around three weeks old, young bats are sometimes found on the ground as they learn to fly. Aug: At six weeks old, the young bats begin to catch insects for themselves and no longer need their mothers' milk. The summer maternity colonies begin to disperse and bats may move to mating roosts. Sept: Mating season begins, with males of most species using special mating calls to attract females, which can include purrs, clicks, and buzzing. Bats are also concentrating on building up fat stores for the coming months.		
October	November	December
		
Oct: More mating is taking place, and building up fat reserves is becoming crucial to survive the winter season. Bats are seeking suitable hibernation sites, and beginning periods of torpor. Nov: Periods of torpor are lasting longer. Some begin hibernation, to save energy over the colder months, when insects are harder to find. They are using stored fat as fuel. Dec: Bats are hibernating. They may roost on their own or in small groups, often in cool, quiet places like disused buildings, old trees or eaves, where they hopefully won't be disturbed. (Source: Bat Conservation Trust).		

○ **Conditions & Disclaimers**



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