EXTENDED PHASE 1 HABITAT SURVEY AND BAT REPORT REPORT
at
Land at Watt Street/Whalley Road
Clitheroe
BB7 9ED

Client:
Skipton Properties

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JCA Ref:
13611e/DB

Version:
Planning Application

Date of Report:
12/04/2018

JCA Limited
Arboricultural & Ecological Consultants

Quality Assurance

Version	Desktop Survey Completed:		Site Surveyed:		Report Completed:		Checked:	
	Date	Name	Date	Name	Date	Name	Date	Name
13611c	19/09/2017	David Bodenham	21/09/2017	David Bodenham	22/09/2017	David Bodenham	22/09/2017	Josie Collier
13611e	19/09/2017	David Bodenham	27/09/2017	David Bodenham	20/12/2017	David Bodenham	20/12/2017	Toby Thwaites
13611e	19/09/2017	David Bodenham	22/02/2018	David Bodenham	14/03/2018	David Bodenham	14/03/2018	Toby Thwaites
13611e	19/09/2017	David Bodenham	22/02/2018	David Bodenham	12/04/2018	David Bodenham	12/04/2018	Toby Thwaites

Risk Assessment Completed	
Bio-security Procedure Completed	
Lone Worker Procedure Completed	

Summary

A report is required for the **Land at Watt Street/Whalley Road** to assess the ecological value of the site by documenting the habitat types present and the site's potential for supporting rare and protected species. The development proposed on this site is the demolition of the existing mill structure and the construction of residential properties.

After conducting a thorough site investigation and a detailed Desktop Study, we considered the **Land at Watt Street/Whalley Road** to contain habitats of moderate ecological value (please see **Section 3.2**).

The site is not situated within influencing distance of any nature conservation sites of either statutory or non-statutory designation.

Himalayan Balsam (*Impatiens glandulifera*) is found along the banks of the Brook, and has most likely spread along the watercourse naturally.

Based on the findings outlined in this report the following recommendations are made:

- **Amphibians**: The pond has potential as breeding habitat for great crested newts. Initially, all ponds within 500m of the site were assessed for suitability for great crested newts. Only one pond, the pond found on site, has potential for breeding great crested newts. This will undergo absence/presence surveys that should be carried out to establish the absence/presence of GCN in ponds within 500m of the **Land at Watt Street/Whalley Road**. Ponds are visited on four separate occasions, between the months of mid-March and mid-June, with at least two of these visits being undertaken between mid-April and mid-May. Four different survey methods can be used during the each of the site visits including bottle trapping, egg searching, a torch survey and netting. After four surveys, if the presence of GCN is confirmed in ponds, then 2 further surveys per confirmed pond are undertaken to collect sufficient data to estimate the GCN population. This information is required to form a well-informed mitigation plan. Two of these surveys have been carried out so far and the results can be found in report 13611i.

- **Birds**: If any trees on site are to be removed during the nesting bird season (March-September), a nesting bird survey will need to be conducted. Once concluded, if no nesting birds are found, all surveyed vegetation must be removed within 24 hours of the survey. Outside this period, trees can be removed without the need for a survey. Enhancement for birds should be included in a Biodiversity Enhancement Plan

- **Bats**: As the site had been considered to have a high potential of supporting bat roosting sites, we recommended that dawn/dusk emergence surveys should be carried out to establish the absence/presence of roosting bats. These were completed on the 27/09/2017 and found 5 separate roosting locations. A winter hibernation surveys were carried out between 14/12/2017 – 22/02/2018 to explore weather bats are using the site

to hibernate over the winter period. Manual searching with the aid of an endoscope, nor acoustic surveys found any bat activity during this period. It is therefore concluded that bats do not use the structures to hibernate over the winter period. A Bat Mitigation Licence should be applied for from Natural England (See **Section 6**).

- **Otter and water vole**: As Sabden Brook had potential for otter and water vole. Initial otter and water vole surveys were carried out between 27/10/2017 – 22/02/2018. The site has been considered to have a low potential for supporting water vole as no evidence of their presence was found, therefore no further works are needed. The site has been considered to have a moderate potential for supporting otter as two spraints were discovered on one of the three surveys conducted in and around Victoria Mill. These were only discovered in late February 2018, and no other evidence of otters have been discovered along Sabden Brook or the mill pond from October 2017 to February 2018. This suggests the site is only occasionally used by otters, possibly on the edge of their territory as suggested by a record of an otter dating from 2011, 1700m downstream of the site. An Otter Mitigation Licence should be applied for from Natural England. See JCA report 13611f/g for the results.

- **White-clawed crayfish**: As the Sabden Brook had potential for white-clawed crayfish, initial crayfish surveys were carried out 27/10/2017 – 28/10/2017. The site has been considered to have a low potential for supporting white clawed crayfish as no evidence of their presence was found. No further works are needed. See JCA report 13611f/g for the results.

- **Himalayan Balsam**: As Himalayan Balsam was found growing along the bank of Sabden Brook it is a legal obligation to remove it from the site. JCA can provide a method statement on how to proceed safely and legally.

JCA Ltd. can provide these and other ecological surveys if required, please do not hesitate to contact us for further information.

Acknowledgements

Thank you to Jenny Butler and Amanda Beck for assisting during surveys.

Contents

1 Introduction and Terms of Reference

1.1 Purpose of the Report

1.1.1 A report is required for **Land at Watt Street/Whalley Road** to assess the ecological value of the site by documenting the habitat types present and the site's potential for supporting rare and protected species.

1.2 Terms of Reference

1.2.1 I am instructed by **Skipton Properties** to visit the site and prepare my findings in a report.

1.2.2 For this purpose I have been supplied with a site map and brief details of the proposal.

1.3 Scope of the Report

1.3.1 This survey was carried out in accordance with the Joint Nature Conservation Committee's (JNCC's) *Handbook for Phase 1 habitat survey - A technique for environmental audit* (2010).

1.4 Details of Proposed Development

1.4.1 The development proposed on this site is the demolition of the existing mill structure and the construction of residential properties.

1.5 Site Description

1.5.1 **Land at Watt Street/Whalley Road** is situated approximately 8km northwest of Burnley town centre, at grid reference: SD 77579 37276.

1.5.2 The site itself is a former mill which has fallen into disrepair over the past 15 years. Immediately surrounding it, is a strip of riparian woodland, Sabden Brook, which flows beneath the mill structure and a mill pond at the southwest of the site.

1.5.3 The site is surrounded predominantly by the village of Sabden to the east and pastoral land and woodland strips to the west. A strip of riparian habitat extends west away from the mill, following Sabden Brook. A map of the site, in relation to the surrounding habitats can be seen in **Appendix 4.**

2.1 Bats in the UK

2.1.1 In the UK there are thought to be 18 native species of bat (17 known to be breeding), and may account for more than a quarter of mammal species present in the UK. Nearly all UK bat species have experienced serious declines over the last century and all species are protected under UK and European Law.

2.2 Bat Ecology

2.2.1 All species of bat in the UK are insectivorous and have evolved to hunt a different set of insects, present in different habitat types. Preferred bat habitats include woodland, grassland, agricultural land, wetland and rivers.

2.2.2 Bats typically roost close to foraging sites, and use linear features such as hedgerows, tree lines and rivers to navigate. Removal of these linear features is thought to have a significant negative impact on their movement, which could be contributing to their decline.

2.2.3 Bats will roost in a wide range of different sites including built structures, underground sites and mature trees. Due to bats ecology different roost sites will be used at different times of the year. Known roost types include:

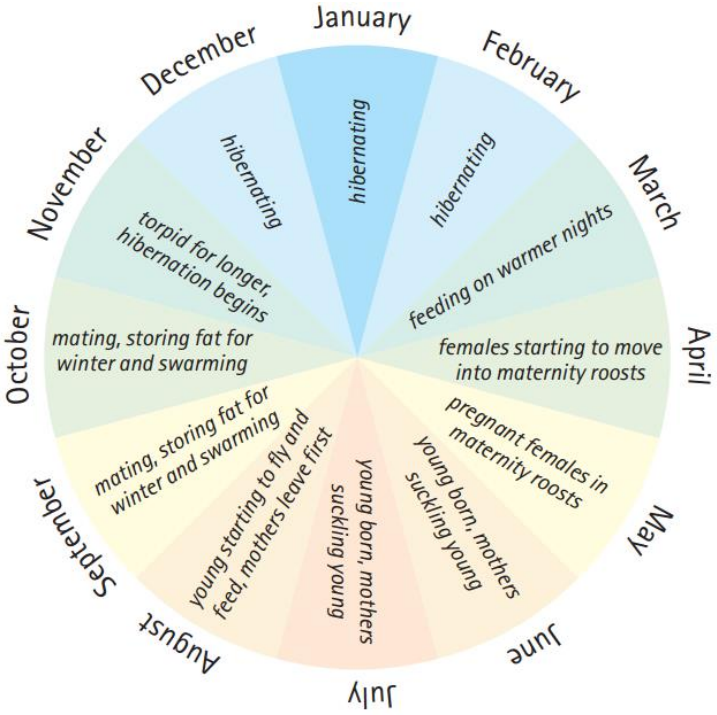
- Night Roosts: A place where individual bats, or sometimes the colony, rest or shelter in the night, but are rarely found in the day. Can be used throughout the year.
- Day Roosts: A place where individual bats, or small groups of males, rest or shelter during the day but are rarely found by night in the summer months.
- Feeding Roosts: A place where individual or a few individuals rest or feed during the night, but are rarely found in the day during the summer months.
- Transitional/Occasional Roosts: Used by a few individuals or occasionally by small groups for short periods of time on waking from hibernation, or in the period prior to hibernation. Usually found during February-April or during September to November.
- Swarming Sites: Where large numbers of males and females gather during late summer to autumn. Appear to be important mating sites. September – November.
- Mating Sites: Where mating takes place from late summer and can continue through the winter. August – March.
- Maternity Roosts: Where female bats give birth and raise their young to independence. May-September.
- Hibernation Roosts: Where bats may be found individually or together during the winter. They have a constant cool temperature and high humidity. December-February.

- Satellite Roosts: An alternative roost found in close proximity to the main nursery colony used by a few individual breeding females to small groups of breeding females throughout the breeding season. May-September.

2.2.4 The three main roosts to be considered, with respect to buildings and development, are maternity roosts, satellite and hibernation roosts. Disturbance of these roosts can have significant negative impacts on local bat populations.

2.2.5 **Figure 1** below provides a visual representation of the life cycle of a bat; showing the life cycle on a month by month basis.

Figure 1: Diagram of a bat's life-cycle (*taken from the BCT: Bat surveys for professional Ecologists, Good Practice Guidelines; 3rd Edition).*



2.3 UK Bat Species

2.3.1 Within the UK there are 17 species of bat known to be breeding, with a further one species listed as a resident, non-breeding species within the UK. **Table 1** below details the roosting preferences of the non-breeding species of bats currently listed as being found within the UK.

Table 1: Roosting preferences of the known UK breeding resident bat species *(taken from the BCT: Bat surveys for professional Ecologists, Good Practice Guidelines; 3rd Edition).*

Species Common Name	Species Scientific Name	Species Roosting Preferences
Greater Horseshoe Bat	*Rhinolophus ferrumequinum*	During the summer females use large, old, undisturbed buildings including coach houses, stable blocks and barns. This species prefers to fly directly into the roost and to their roosting position and bats hang freely Maternity sites are often found in large spaces at least 3–4m high, providing a sufficiently large flight area. This species generally uses night roosts to rest whilst foraging, which are found in a variety of structures, for example outbuildings, garages, stables, milking sheds, porches and trees. In winter, both male and female bats choose underground sites for hibernation, including tunnels, mines, caves or cold building basements.
Lesser Horseshoe Bat	*Rhinolophus hipposideros*	Roost sites include attics, chimneys and boiler rooms of buildings, rural houses and outbuildings in the summer, and cellars, tunnels, disused mines and caves for hibernation. Also found in industrial buildings. This species prefers to fly directly into roost sites and into their roosting position. Maternity sites are often found in large roof spaces at least 3–4m high providing a large flight area. A range of conditions is required throughout the year but this may be found in one building with, for example, an attic for the summer and a cellar for the winter. Summer and winter roost sites are generally no more than 5–10km apart. The lesser horseshoe bat also uses alternative roost sites during the night and day.
Daubenton's Bat	*Myotis daubentonii*	Roosts are found in hollow trees, bridges or sometimes buildings and generally close to water. Nursery roosts are not exclusively female – males may make up 25% or more of the colony and large male-only colonies have also been recorded. This species selected oaks over beech trees and preferred roosts on the edges of woodlands in a study in the Netherlands. Hibernation sites are usually underground including caves, mines and suitable tunnels where bats are found both in crevices and on open walls. They may also hibernate in tree cavities.
Bandt's Bat, Whiskered Bat and Alcathoe's Bat	*Myotis Brandtii, Myotis mystacinus, Myotis alcathoe*	These species can roost in trees and a wide range of buildings in the summer. These species hibernate in caves or other underground sites, where they can be found in the open or in cracks and crevices.
Natterer's Bat	*Myotis nattereri*	Roost sites include tree holes and different types of buildings but has also been is found in bridges. Usually roost in attics between late May and mid-July and often roosts have enough space for internal flight (Swift, 1997). This species also breeds in bat boxes. Timber-framed barns built between the 12th and 19th centuries may be particularly important to this species, with roosts found in mortise joints in both the summer and winter. Hibernates in cracks and crevices in caves and mines. Other hibernation sites recorded are canal and railway tunnels, ice houses and tree cavities.

Bechstein's Bat	*Myotis bechsteinii*	Maternity roosts are found in tree holes in the canopy, generally in old trees with dead branches. May be found in woodpecker holes in old oaks. Recorded switching roosts frequently. One study recorded roosts in rot holes, woodpecker holes and in a gap behind thick ivy. A study of ten colonies across the Isle of Wight found 90% of maternity roosts in woodpecker holes in ash trees. Another study found a maternity roost in a woodpecker hole in an oak tree on a golf course. Hibernates in trees and sometimes caves or other underground sites. Chilmark Quarry is an example of Bechstein's bats using an abandoned mine for hibernation.
Noctule	*Nyctalus noctula*	Roosts almost exclusively in tree holes, but sometimes found in bat boxes or buildings. One Netherlands study found that woodpecker holes are preferred, in trees close to woodland edge. Hibernates in trees but sometimes found in buildings.
Leisler's Bat	*Nyctalus leisleri*	Roosts in trees, bat boxes and buildings such as houses; for example, around the gable end of lofts, under tiles, under soffit boards and in disused chimneys. Often uses a variety of sites in the summer. Hibernates in tree holes, buildings and sometimes underground sites.
Common Pipistrelle and Soprano Pipistrelle	*Pipistrellus pipistrellus, Pipistrellus pygmaeus*	Maternity colonies are found mainly in buildings, usually roosting out of sight in crevices. Colonies may use a number of sites through the summer but are often loyal to the same sites for many years. Maternity colonies are extremely variable in terms of numbers, from 20 to over 1,000 bats. Soprano pipistrelle colonies tended to be larger than those of the common pipistrelle. Common pipistrelle shift roosts between pregnancy and lactation. Roost selection is based on temperature for common pipistrelle and on surrounding habitats (woodland and water) for both species. Males roost singly or in small groups in the summer, in buildings or trees. Bat boxes are used by both males and females but generally only males use them during the summer. These species do not use underground sites for hibernation but are sometimes found in the cracks and crevices of buildings in the winter.
Nathusius' Pipistrelle	*Pipistrellus nathusii*	The very few known British nursery roosts are in buildings, with hibernation roosts in hollow trees and crevices in cliffs, walls and caves. One study recorded males roosting under lead flashing and roof tiles.
Serotine	*Eptesicus serotinus*	Roosts in buildings in small cavities or crevices with high access points such as gables but occasionally also found in trees. Recorded hibernation sites include cavity walls, disused chimneys and occasionally caves.

Barbastelle	*Barbastella barbastellus*	In summer, breeding females move regularly between large numbers of different tree roosts. One study found that they preferred dead trees surrounded by holly under-storey and another found them in tree crevices and cavities, between overlapping limbs and behind ivy, on average 6.9m above ground level. Tree roosts are in relatively undisturbed places and frequently in thick cover, although cracks much higher up in trees were used at the time of birth. Bat boxes are also used. Almost all roosts found in two studies were behind loose bark and in mixed locations not always surrounded by under-storey. Winter roosts include deep, hollow trees (usually dead and among holly under-storey) and sometimes buildings or underground sites. Other winter roosts recorded are flaking bark and splits less than 2m above the ground and disused railway tunnels, barns, outbuildings, church porches and lime kilns. Chilmark Quarry is an example of barbastelle bats using an abandoned mine for hibernation. 24 Spring and autumn roosts have been recorded behind loose bark, in dead tree stumps and in splits in limbs mainly less than 2m above ground level.
Brown Long-Eared Bat	*Plecotus auritus*	Maternity roosts found in trees, in the voids of large, old buildings and bat boxes in woodland. Usually roosts against wooden beams at the roof apex in attics or farm buildings. Bats often cluster at the highest part of the roof and require enough space for unobstructed, internal flight. Shows high roost fidelity. Commonly uses feeding perches and night roosts in porches or outbuildings separate from the main roost. Hibernate in underground sites, tree holes and buildings.
Grey Long-Eared Bat	*Plecotus austriacus*	Frequently roosts on ridge beam in spaces between rafters. Maternity colonies show high roost fidelity. Number of males in maternity colony increases through summer. Many males are, however, solitary.

2.3.2 Greater Mouse-eared bats *(Myotis myotis)* are extremely rare in Britain and little is known about where they roost in the summer or winter, they are listed as a resident, non-breeding species within the UK within this species currently found at one site in Sussex.

2.4 Bats and the Law

2.4.1 All bat species and their roosts in the UK are protected under European and UK law. The main piece of legislation protecting UK bats is the Conservation of Habitats and Species Regulations 2017.

2.4.2 In addition to this, bats and their roosts are also protected in England and Wales under the Wildlife and Countryside Act 1981 and The Countryside and Rights of Way Act 2000.

2.4.3 Under these legislations, it is an offense to:

- Deliberately capture, injure or kill a bat.

- Deliberately disturb a bat in a way that would affect its ability to survive, breed or rear young (or hibernate or migrate in England, Wales and Northern Ireland) or (significantly in England, Wales and Scotland) affect the local distribution or abundance of the species.
- Damage or destroy a roost (this is an 'absolute' offence).
- Possess, control, transport, sell, exchange or offer for sale/exchange any live or dead bat or any part of a bat.
- Intentionally or recklessly disturb a bat at a roost.
- Intentionally or recklessly obstruct access to a roost.

If it is discovered that development may impact upon bat roosts (thus leading to an offence being committed) a **Mitigation Plan** should be devised and a **Bat Mitigation Licence** applied for from the relevant government department (i.e. Natural England). Gaining a licence will depend on many variables, such as the bat species present, roost type, roost size and its local/regional/national importance.

2 Methodology

2.1 Desktop Study Methodology

2.1.1 A desktop study was undertaken on 19/09/2017 in order to obtain any relevant ecological records that may be present within a 2km radius of the site. This includes protected and notable species records, as well as nature conservation designations. For this information, Lancashire Environment Record Network was contacted.

2.1.2 The Multi-Agency Geographic Information for the Countryside (MAGIC) website was used to locate any designated sites, both statutory and non-statutory, such as Local Nature Reserves (LNRs), Ramsar Sites, Special Areas of Conservation (SACs), Special Protection Areas (SPAs) or Sites of Special Scientific Interest (SSSIs) that may be present within 2km of the survey site.

2.2 Site Assessment Methodology

2.2.1 A thorough site assessment was undertaken on 24/08/2017 by David Bodenham *BSc Ind (Hons) MSc*, following the guidelines set out in the JNCC's *Handbook for Phase 1 habitat surveys*.

2.2.2 The entire site was walked over by an experienced consultant who mapped and described each habitat type that was present. The dominant floral species of each habitat were noted as well as any faunal species that were encountered.

2.2.3 Whilst conducting the site walk-over, any features that may be of value to or have the potential to support protected species were noted and photographic evidence taken (please refer to **Appendix 2**). Such protected species include, but are not limited to, Badgers, Bats, Dormice, Great Crested Newts, Nesting Birds, Otters, Reptiles, Water Voles, White-Clawed Crayfish (please see **Appendix 6**).

2.2.4 Limitations: The survey was conducted at the optimal time of year when most plant species were in flower, although a small number of species may have been present that flower in early spring or late summer. These species may not have been visible at the time of the survey; however, this constraint will not affect the overall conclusion of the report, as habitat types can still be classified and the potential for protected species can still be accurately assessed.

2.5 Bat Scoping Survey Methodology

2.5.1 The site was surveyed for foraging, commuting and roosting potential. A detailed search of habitat, structures and trees was conducted during daylight hours in order to identify potential bat roosting sites and look for evidence of bat activity. Potential roost

sites and features deemed to be of value to bats were documented on the site map (please refer to **Appendix 1**) and photographic evidence was taken (please refer to **Appendix 2**).

2.5.2 All surveys are conducted by experienced surveyors using the following equipment to ensure an accurate assessment; a printed site map, camera, 1 million candlelight torch, binoculars, ladders and a duet heterodyne bat detector.

2.5.3 Signs that bats have previously or are currently using a potential roost site include:

- Scratch marks, urine and oil stains around holes in buildings or trees.
- Droppings, carcasses and/or food remains found around the site.
- Bats observed flying in/out of a hole in a building or tree.
- Bats heard 'chattering' within a potential roost site, especially on warm summer days.

2.5.4 Limitations: It must be highlighted that the absence of any of these signs is not proof that the site is not being used by bats. Weathering and other factors will often remove any signs of bat activity, especially when present on the exterior of a building or a tree. As previously explained, many bat species will have several roost sites which they regularly move between and therefore an absence during a survey visit does not exclude their presence at a later date.

2.6 Bat Emergence/re-entry Survey Methodology

2.6.1 Emergence re-entry surveys are conducted either 15 minutes before sunset and up to two hours after or up to 2 hours before sunrise and 15 minutes after. Due to the lifecycle of bats emergence surveys are conducted between the months of May through to August, and can occasionally run into September. All surveyors used by JCA have experience in conducting bat emergence surveys and an appropriate level of knowledge in bat ecology.

2.6.2 It was previously recommended at least three surveys were required to establish the presence/absence of bats roosting in the buildings. These surveys should be conducted at dusk and dawn at each survey location. Because of the size and orientation of the building, it was recommended that ten surveyors were required to survey the building.

2.6.3 All surveyors present are equipped with the following items during each survey; a heterodyne bat detector, Walkie Talkie, clock, printed site map, note pad and pen.

2.6.4 An initial Scoping survey of the site will highlight all areas of the site that are likely to support bat roost sites. This information will then be used to influence the number of surveyors used and their positions around the site.

2.6.5 Limitations: Detecting bats using bat detectors can be limited. Bat species that produce calls at both a high amplitude (loud) and a low frequency, such as noctules are easier to detect than bats with low amplitude (quiet) and high frequency calls such as the brown long-eared bat and greater horseshoe bats respectively.

2.7 Winter Hibernation Survey Methodology

2.7.1 As there was a potential for bats roosting and hibernating in the building over winter, a winter hibernation survey was required. This involves a thorough inspection of all cracks and crevices for hibernating bats. Two visits were chosen to insect the entire site.

2.7.2 All surveyors are equipped with a torch, mirrors, endoscopes, heterodyne bat detector, Walkie Talkie, clock, printed site map, note pad and pen.

2.7.3 Periodically, bats will awake from hibernation to drink, or even feed in mild weather. As a result it is useful to leave a static detector to record any echolocation activity. An Anabat express detector is left near a known roost entrance for at least 2 weeks over the moths of December, January and February. This records any bat echolocation calls, as well as environmental variables. A table showing the location and time periods when detectors were left can be seen below:

Table 1: Locations and time increments of Anabat bat detectors (Building locations can be seen in **Appendix 1**).

Dates	Detector position
14/12/2017 - 28/12/2017	Building 1
14/12/2017 - 28/12/2017	Building 3
08/01/2018 - 22/01/2018	Building 1
08/01/2018 - 22/01/2018	Building 3
08/02/2018 - 22/02/2018	Building 1
08/02/2018 - 22/02/2018	Building 3

2.7.4 Limitations: Hibernating bats are difficult to detect as many species can find their way deep into walls and crevices. Evidence of bats such as droppings and staining can also give clues to their presence. Identification of bats can be difficult, as handling bats during hibernation is not recommended. Additional techniques such as DNA testing of bat droppings can be employed. At this particular site, it was not safe to use an endoscope in confirmed roosts, as they were both three storeys up. However, an Anabat express was left near the entrance to record any activity during warmer periods.

3 Results

3.1 Desktop Study Results

3.1.1 Local Data Centre Records: The Lancashire Environment Record Network has been commissioned to provide the records held for protected and notable species within a 2km radius of the survey site. The results have been summarised below. It should be noted that the absence of records should not be taken as confirmation that a species is absent from the search area. Please see **Appendix 3** for full desktop study results.

Legally Protected Species

3.1.2 Legally protected species are those protected under EU and UK legislation such as the Wildlife and Countryside Act (1981), Countryside and Rights of Way Act (2000), Protection of Badgers Act 1992 and the EU's Habitats Directive.

3.1.3 Bats: Four species of bat; Daubenton's bat (*Myotis daubentonii*), noctule (*Nyctalus noctula*), common pipistrelle (*Pipistrellus pipistrellus*) and brown long-eared bat (*Plecotus auritus*) have been recorded within 5km of the proposed development site. No bats have been recorded within 2km of the proposed development site. A possible common pipistrelle roost was recorded near Sabden Brook in 2010, 4km west of the site.

3.1.4 Otters: There is one record of an otter (*Lutra lutra*) along Sabden Brook, approximately 1700m downstream of Victoria Mill. This record dates from 2011.

Nature Conservation Designations

3.1.5 Nature designations are split into two types; those that confer some form of statutory protection, and other designations. These designated sites are summarised in the table below:

Table 1: Non-statutory designated sites with 2km of the site.

Site Name	Designation	Level	Proximity	Description
Non-statutory Designated Sites				
Read Heights Pasture	Biological Heritage Site	Local	1495m SW	A large species-rich, semi-natural, neutral grassland field, with a flattish plateau on the north side extending down to Back Lane.
Lower Barn Wood	Biological Heritage Site	Local	665m SW	Woodland and Scrub (Wd1).
The Rough	Biological Heritage Site	Local	989m NW	The site comprises dry dwarf shrub heath, acid grassland and mire communities.

Nick of Pendle Quarry	Biological Heritage Site	Local	1288m NW	Lichens (Li1a).
Black Hill	Biological Heritage Site	Local	645m SE	The site comprises a mosaic of dry dwarf shrub heath and marshy grassland situated 0.75 km south of Sabden.
Huntroyde Demesne	Biological Heritage Site	Local	1259m SE	The site comprises an estate with a high proportion of broad-leaved woodland.
Pendle Hill	Biological Heritage Site	Local	977m N	The site comprises an extensive and prominent upland area rising to 557m, situated between the Bowland Fells and the Pennines.

3.2 Site Assessment Results

3.2.1 The site was surveyed on 24/08/2017 by David Bodenham *BSc Ind (Hons) MSc*. Survey conditions are summarised in **Table 3**.

Table 2: Survey times and weather conditions.

Survey date	Lead surveyor	Temp	Humidity	Wind speed/Direction		Cloud Cover	Precipitation
24/08/2017	David Bodenham	15°C	78%	BF0	N/A	30%	None

3.2.2 The site comprises a former mill which has fallen into disrepair over the past 15 years. Immediately surrounding it is a strip of riparian woodland, Sabden Brook which flows beneath the mill structure and a mill pond at the southwest of the site.

Habitats Present

3.2.3 The following habitat types are present at Land at Watt Street/Whalley Road (in alphabetical order):

- Bare ground
- Buildings
- Dense scrub
- Running water
- Semi-natural broadleaf woodland
- Standing water
- Tall ruderal

3.2.4 Bare ground: There are two open courtyard areas on site, one to the east of the site and one at the northwest of the site (**Appendix 2, Photos 1 and 2**). At the northwest of the site, some land has been cleared, leaving areas of bare ground with minimal recolonization by plants. It appears that this has been cleared within this year. At the east of the site, in a courtyard, the entire area consists of bare ground where former loading facilities and access routes into the site were found. This has been cleared in late 2017.

3.2.5 Buildings: The majority of the site is covered by the mill buildings themselves. These are covered in detail in **Section 3.3**.

3.2.6 Running water: Sabden Brook flows along the northern perimeter and beneath the mill structure to the west of the site (**Appendix 2, Photos 5 and 6**). Following the edge of the brook, at the east of the site, are a number of young to mature trees including Norway Maple (*Acer platanoides*). The brook then descends underneath the mill structure under a tunnel and emerges at the west of the mill within a patch of woodland. The water appears to be dystrophic, with the water likely to have a low pH, having run-off in nearby moorland habitats.

3.2.7 Semi-natural broadleaf woodland: West of the mill structure is an area of semi-natural broadleaf woodland, which surrounds a mill pond which is found on site (**Appendix 2, Photos 6 and 7**). The woodland consists of a number of different tree species varying in age. Species include Wych Elm (*Ulmus glabra*), Common Ash (*Fraxinus excelsior*), Sycamore (*Acer pseudoplatanus*) and Norway Maple (*Acer platanoides*). Herbaceous species include common species such as Herb-Robert (*Geranium robertianum*) and Hart's-tongue Fern (*Asplenium scolopendrium*). This woodland continues off site along Sabden Brook for at least 200m.

3.2.8 Standing water: At the southwest of the site is a mill pond which would have been a water storage area when the mill was active (**Appendix 2, Photo 7**). Surrounded by the woodland on all sides, the pond has remained reasonably deep and the water appears to be oligotrophic.

3.2.9 Tall ruderal: At the west of the site in the courtyard, there are a few patches of tall ruderal vegetation which have resulted from natural colonisation of the former loading yard. Common species such as Rosebay Willowherb (*Epilobium angustifolium*) and Ragwort (*Jacobaea vulgaris*) have colonized these areas.

Target Notes

3.2.10 Target Note 1: There is a stand of Himalayan Balsam (*Impatiens glandulifera*) found in the woodland near the Pond.

3.2.11 Target Note 2: The mill pond has potential for breeding amphibians such as great crested newts (*Triturus cristatus*) (**Appendix 2, Photo 7**)

3.2.12 Target Note 3: The mill structure itself has high potential for roosting bats. See **Section 3.3** for more details.

Invasive Plant Species

3.2.13 The following invasive plant species were present at the survey site:

- Himalayan Balsam (see Target Note 1).

3.3 Bat Scoping Survey Results

3.3.1 The site was surveyed on the 24/08/2017 by David Bodenham *BSc Ind (Hons) MSc*, NE Level 2 Class Licence – 2016-26848-CLS-CLS. Survey conditions are summarised in **Table 3**.

Table 3: Survey times and weather conditions.

Survey date	Lead surveyor	Temp	Humidity	Wind speed/Direction		Cloud Cover	Precipitation
24/08/2017	David Bodenham	15°C	78%	BF0	N/A	30%	None

3.3.2 Habitats and Features Present

The mill structure falls along Sabden Brook. The Brook follows the northern edge of the site and then descends under the mill, forming a tunnel with running water underneath the mill. Trees line the edge of the brook, forming a screen along the Brook past the mill to the west. This riparian habitat continues west along Sabden Brook, forming a network of habitats along the valley. Immediately west of the mill is the mill pond, which is surrounded by semi-natural woodland.

3.3.3 Building Assessment/ Built Structure Assessment

The mill itself divides into five separate structures of varying ages and construction:

Building 1: A two storey stone built structure, this building was formally used as offices (**Appendix 2, Photos 8-16**). It appears to date from the Victorian era, and is constructed from large sandstone blocks. External condition is poor, with a number of gaps between stones and large cracks in the structure (**Appendix 2, Photos 8, 9, 11 and 12**). Some of the windows are broken, allowing access into the structure (**Appendix 2, Photo 10 and 13**). The north of the building faces Sabden Brook, and the structure's foundations reach the Brook. Internally, the structure has been partially stripped. The roof space is open with a small void between wooden panelling and the tiles. The roof is also covered in slate tiles which are generally in good condition, considering the age of the building. However, there are some gaps, as seen internally (**Appendix 2, Photos 15 and 16**). No evidence of bats were found on inspection of this structure.

Building 2: This is a large single storey warehouse structure at the centre of the site. The largest structure on site, it was most likely built after the construction of the original mill. The majority of the structure is constructed from breeze block internally (**Appendix 2, Photo 19**). This supports a steel structure which supports a wooden and plastic roof. This roof is in disrepair with many large gaps and areas where the roof has caved in (**Appendix 2, Photo 21**). Pigeons are prevalent in this area of the mill. Where building 2 adjoins older buildings, such as building 3, older stone walls have been covered in plaster, which is now falling away, revealing crevices and gaps beneath (**Appendix 2, Photo 20**). External wall on the east and west of this building are lined

with stone and have a number of gaps and crevices between stone blocks. No evidence of bats were found on inspection of this structure.

Building 3: This is a large two-storey stone-built structure, similar in construction to building 1. Again, there are a number of gaps in-between stone blocks (**Appendix 2, Photos 22-25**). A number of windows are broken, allowing access into the structure. On internal inspection, the roof is constructed from steel and glass, and this is broken in several areas (**Appendix 2, Photo 28**). Internal walls are in poor condition with a number of cracks and crevices (**Appendix 2, Photo 29**). The lower floor of this building has few windows and is permanently dark and humid. Sabden Brook flows underneath this building and building 2 at the north side of the mill (**Appendix 2, Photo 27**). There are a number of broken windows near the Brook into building 3. At the west of the building there is also a large open chimney allowing access inside. No evidence of bats were found on inspection of this structure.

Building 4: This is a single-storey warehouse with a pitched roof. Constructed from brick and stone, this is another later addition to the mill (**Appendix 2, Photos 30-32**). The roof is constructed from asbestos and glass, and has a number of gaps. The main door is also open, allowing access inside. No evidence of bats were found on inspection of this structure.

Building 5: The final structure is found at the west of the site (**Appendix 2, Photos 33-36**). This is a composite building, made of stone and brick built sections. Externally there is a large gap into the north side of the building. Internal inspection revealed several rooms, all of which are plastered internally. No evidence of bats were found on inspection of this structure.

3.3.4 Tree Assessment

All trees on site were assessed. No trees on site have bat roosting potential.

3.4 Bat Emergence Survey Results

3.4.1 The site was surveyed from the 21/08/2017 to the 27/09/2017 by lead surveyor David Bodenham *BSc Ind (Hons) MSc*, NE Level 2 Class Licence – 2016-26848-CLS-CLS Other surveyors included Jonathan Cocking, Josie Collier, Lorraine Spink, Emily Wilde, Jenny Butler and Mick Ethrington Survey conditions are summarised in **Table 4**. Surveys were divided between the east west of the building in groups of five surveyors.

Table 4: Survey times and weather conditions.

Survey date	Lead surveyor	Start/Finish		Temp Start/Finish		Humidity	Wind speed/Direction		Cloud Cover	Precipitation
21/08/2017	David Bodenham	21:05	22:05	18.2°C	15.4°C	75%	BF0	N/A	100%	Light Rain
22/08/2017	David Bodenham	04:00	06:15	15°C	16.4°C	79%	BF0	N/A	100%	None
05/09/2017	David Bodenham	19:35	21:50	16.7°C	14.1°C	51%	BF0	N/A	75%	Drizzle
06/09/2017	David Bodenham	05:00	06:45	13°C	14.5°C	61%	BF0	N/A	75%	None
26/09/2017	David Bodenham	18:35	20:45	15.7°C	15.2°C	77%	BF0	N/A	40%	None
27/09/2017	David Bodenham	05:30	07:20	12.5°C	14.5°C	65%	BF0	N/A	60%	None

3.4.2 Emergence Survey 1 results (east of site) – 21/08/2017

Bat Emergence – No bats were seen emerging from the building.

Bat Activity - There was a moderate level of activity from 20:20 to 20:35, near the stream tunnel that descends near the weir at the east side of the mill. Species consisted of an unknown *Myotis sp* and *Pipistrellus pipistrellus*. The *Myotis sp*. flew from the tunnel at 20:20 and foraged briefly around the entrance. The *Pipistrellus pipistrellus* foraged around the treeline north of the mill along Whalley Road. From 20:29 to 20:35. In the eastern courtyard, common pipistrelle were seen foraging over the vegetation in the courtyard from 20:24 to 21:38. Only one bat could be seen at any one time.

3.4.3 Re-entry Survey 1 results (west of site) – 22/08/2017

Bat Re-entry – No bats were seen entering any part of the building.

Bat Activity - There was a low level of activity at 04:47, near the stream tunnel at the west side of the mill. This was identified as a single *Pipistrellus pipistrellus*. Along the northern side of the mill, there was a moderate level of activity from 04:55 to 05:48. This consisted of at least three *Pipistrellus pipistrellus* foraging in the northern courtyard and passing over the mill roof. Along the western side of the mill, *Pipistrellus pipistrellus* were seen foraging over the mill.

3.4.4 Emergence Survey 2 results (west of site) – 05/09/2017

Bat Emergence – Three *Pipistrellus pipistrellus* were seen emerging from the southwest corner of building 3, below a ridge stone at 19:50.

Bat Activity - There was no activity from near the brook during the survey. Along the north of the mill, similar to the previous survey, *Pipistrellus pipistrellus* were seen

foraging over the northern courtyard from 20:00 to 20:54 Along the west of the building, *Pipsitrellus pipistrellus* were again seen foraging over and along the western side of the building from 19:59 to 21:05.

3.4.5 Re-entry Survey 2 results (east of site) – 06/09/2017

Bat Re-entry – No bats were seen entering the building at the east of the site.

Bat Activity - There was a very low level of activity from 05:43 to 06:13, near the eastern courtyard. This consisted of at least two *Pipistrellus pipistrellus* foraging over the courtyard, similar to the survey of the 21/08/2017. No bats were seen foraging around the stream tunnel or the north of the mill.

3.4.6 Emergence Survey 3 results (east of site) – 26/09/2017

Bat Emergence – Six *Pipipstrellus pipistrellus* were seen emerging from below a drainpipe on the south side of building 1 at 19:18-19:21. Three *Pipisrellus pipistrellus/Pipistrellus pygmaeus* were seen emerging from a broken window at the southeast corner of building 1 at approximately 19:00.

Bat Activity - There was a low level of activity from 19:13 to 20:11 along the north side of building 1. This consisted of *Pipisrellus pipistrellus/Pipistrellus pygmaeus* foraging along the river. In the eastern courtyard, both *Pipisrellus pipistrellus/Pipistrellus pygmaeus* were seen foraging over the courtyard from 19:05 to 20:14, including those bats that emerged from building 1. Up to 4 individuals were seen at any one time.

3.4.7 Re-entry Survey 3 results (west of site) – 27/09/2017

Bat Re-entry – Twelve *Pipistrellus pygmaeus* entered building 3 at the same location as emergence on 05/09/2017, at 06:17. Eleven *Pipistrellus pygmaeus* were seen entering near the chimney breast of building 3 between 06:19 and 06:24. *Pipisrellus pipistrellus* were seen entering the opposite side of building 3 at 06:20 and 06:29.

Bat Activity - There was a high level of activity along the northern side of the mill. *Pipisrellus pipistrellus* and *Pipistrellus pygmaeus* were seen foraging around the north side of the mill between 05:49 to 06:34. A potential *Plecotus auritus* was seen near the chimney of building 3 at 06:09. At 06:23, a *Myotis sp.* was heard close to the chimney of building 3.

2.8 Winter Hibernation Survey Results

2.8.1 The site was surveyed between the 14/12/17 – 22/02/18 by lead surveyor David Bodenham *BSc Ind (Hons), MSc*, NE Level 2 Class Licence – 2016-26848-CLS-CLS. Survey conditions are summarised in **Table 5**.

Table 5: Survey times and weather conditions.

Survey date	Lead surveyor	Time	Temp	Humidity	Wind speed/Direction		Cloud Cover	Precipitation
14/12/2017	David Bodenham	11:00	5.4°C	62%	BF0	N/A	20%	None
22/01/2018	David Bodenham	11:00	-2.5°C	71%	BF0	N/A	100%	None
22/02/2018	David Bodenham	11:00	7.8°C	63%	BF0	N/A	10%	None

2.8.2 All crevices and cracks were searched thoroughly throughout all the buildings on the 14/12/17 – 22/02/18, however, no hibernating bats, no evidence of bats could be found internally. The exterior confirmed roosts could not be explored further as they are all high above the ground and inaccessible. The Anabat express was left over three, two-week periods in December, January and February near the confirmed roosts in both buildings (see **Appendix 1**). No bat activity over the winter months was picked up.

4 Discussion and Analysis of Results

4.1 Nature Conservation Designations

4.1.1 No designated nature conservation sites are located within the boundary of the site.

4.1.2 There are seven non-statutorily designated sites within 2km of the site. The closest is Black Hill, located 645m southeast of the proposed development site. All these designated sites are outside the radius of influence of proposed works at the site and the proposed development will not have an effect on these sites.

4.2 On-site Habitat

4.2.1 Overall the site contains habitats of moderate to high ecological value. The most valuable habitats on the site include the mill building itself, and the pond and woodland to the west of the site. The mill building contains a myriad of potential roosting opportunities for a number of bat species, during the summer and winter months. See **Section 4.5** for more detail.

4.2.2 Although the woodland west of the mill structure contains no trees with bat roosting potential, the woodland itself contains semi-mature trees. This woodland also follows the path of Sabden Brook, forming an important riparian corridor that follows the Brook west. The woodland also surrounds a mill pond and it is likely that amphibians will be found in the area, with such suitable aquatic and terrestrial habitat.

4.2.3 The Brook itself is a dystrophic stream, stained with tannins from the nearby moorland. This again forms part of an important riparian corridor into Sabden and down the valley, and is likely home to a number of riparian mammal species.

4.2.4 The east of the site is less ecologically important consisting of a courtyard which is partially hard standing and tall ruderal and scrub vegetation which has naturally colonized over the years.

4.3 Potential for Protected Species

4.3.1 Amphibians: No records of protected amphibians have been recorded within 2km of the proposed development site. However, the mill pond found on site offers potential breeding habitat for protected species such as great crested newts. The surrounding terrestrial habitat is also suitable for foraging and hibernating amphibians.

4.3.2 Badgers: No evidence of badgers (*Meles meles*) were found on site, nor were any records of badger found within 2km of the site. The woodland at the west of the mill could provide suitable cover for badgers, but as it stands, no badgers appear to occupy the site.

4.3.3 Barn Owls: The urban setting, coupled with the lack of suitable habitat make it unlikely barn owls will hunt or roost on site. No records of barn owl were found within 2km of the site.

4.3.4 Bats: There was a high potential for bats within the mill structure. Their presence was confirmed during emergence/re-entry surveys. However, not bats were found hibernation within any of the structures. See more discussion of their presence in **Section 4.5 and 4.6**.

4.3.5 Dormouse: The site is unlikely to support dormice due to the lack of suitable habitat, nor were any records of dormice found within 2km of the proposed development site.

4.3.6 Nesting Birds: The trees on site are likely habitats for nesting birds, especially to the west of the site.

4.3.7 Otter: There is one record of an otter (*Lutra lutra*) along Sabden Brook, approximately 1700m downstream of Victoria Mill. This record dates from 2011. Sabden Brook runs directly along the northern perimeter of the site, as well as underneath the mill structure. It is likely that otter may be present in the Brook next to the mill.

4.3.8 Reptiles: The site is unlikely to support reptiles due to unsuitable habitat. Also there are no records of reptiles within 2km of the proposed development site.

4.3.9 Water Voles: Sabden Brook does offer some suitable habitat for water vole and although there are no records of water vole in the area, there is potential for them to be present.

4.3.10 White Clawed Crayfish: Sabden Brook does offer some suitable habitat for white clawed crayfish and although there are no records of white clawed crayfish in the area, there is potential for them to be present within the Brook.

*The absence of any signs of or features considered valuable for supporting protected species, can **not** be considered evidence that these species are absent from a site, or that these species will not occupy the site in the future. It must therefore always be recommended that work be conducted with care and vigilance. Should any protected species be encountered during work (please see **Appendix 6**), work should stop immediately and JCA or Natural England contacted.*

4.4 Invasive Species

4.4.1 Himalayan Balsam was found growing along the bank of Sabden Brook. This has most likely spread naturally via the Brook and seed dispersal. Invasive plant species are those plants listed under Schedule 9, Part II of the Wildlife and Countryside Act 1981 (as amended) or described on the Non-Native Species Secretariat (NNSS) website. Under the Wildlife and Countryside Act 1981 (as amended) it is an offence to plant or cause

the spread of Invasive Plant Species in the wild and therefore it is a legal obligation to remove them.

4.5 Bat Scoping Survey

4.5.1 The bat scoping survey found that the site offered a variety of potential opportunities for roosting bats. There are many external cracks and crevices in stonework found on all five buildings, allowing access for crevice dwelling species such as *Pipistrellus sp*. There is also plentiful access into the structures through broken windows and gaps in the roofs in all buildings, allowing access for larger species such as brown long-eared bat.

4.5.2 The lower floor of building 3 remains permanently dark and humid and it is reasonable to assume the temperature will remain relatively stable throughout the summer months, and possibly the winter months. The structure may be both an important site in summer, and be used by hibernating bats over the winter period.

4.5.3 The structure is also built over the top of Sabden Brook which flows through a tunnel under buildings 2 and 3. This flows along a wooded riparian corridor which is well connected to the surrounding habitat, allowing suitable commuting and foraging routes for a number of bat species. The mill is well connected to surrounding habitat and is likely used by roosting bats.

4.6 Bat Emergence Surveys

4.6.1 Several roost sites were identified during the emergence/re-entry surveys. At the east of the site, building 1 has two confirmed roost locations (see **Appendix 2, Photo 8**). The first is below a drainpipe and the second, just inside a broken window. During all three surveys, bats were only seen emerging from these two points once. The drainpipe roost consists of 6 *Pipipstrellus pipistrellus* and the window roost consists of 3 *Pipisrellus pipistrellus/Pipistrellus pygmaeus.* These may be satellite roosts, as they were only seen to be used once during surveys, and other larger roosts are found nearby in building 3.

4.6.2 Building 3 has three confirmed roosts at the western apex of the building (see **Appendix 2, Photo 25**). The first roost found on the southeast corner of building 3 below a topping stone consists of up to 12 *Pipistrellus pygmaeus* which were seen emerging on the 05/09/2017 and entering on the 27/09/2017. The second roost, found near the chimney on the apex of building 3 consists of up to 11 *Pipistrellus pygmaeus* which entered on the 27/09/2017. Three *Pipisrellus pipistrellus* were also seen entering the opposite side of building 3 on the morning of the 27/09/2017.

4.7 Winter Hibernation Surveys

4.7.1 Winter hibernation surveys found no hibernating bats roosting in the buildings, through either methods of manual searches or acoustic surveys. Acoustic surveys didn't pick up any bat activity over this period.

5 Conclusions and Recommendations

5.1 After conducting a thorough site investigation and a detailed Desktop Study, we considered the **Land at Watt Street/Whalley Road** to contain habitats of moderate ecological value (please see **Section 3.2**).

5.2 The site is not situated within influencing distance of any nature conservation sites of either statutory or non-statutory designation.

5.3 Himalayan Balsam (*Impatiens glandulifera*) is found along the banks of the Brook, and has most likely spread along the watercourse naturally.

5.4 Based on the findings outlined in this report the following recommendations are made:

- **Amphibians**: The pond has potential as breeding habitat for great crested newts. Initially, all ponds within 500m of the site were assessed for suitability for great crested newts. Only one pond, the pond found on site, has potential for breeding great crested newts. This will undergo absence/presence surveys that should be carried out to establish the absence/presence of GCN in ponds within 500m of the **Land at Watt Street/Whalley Road**. Ponds are visited on four separate occasions, between the months of mid-March and mid-June, with at least two of these visits being undertaken between mid-April and mid-May. Four different survey methods can be used during the each of the site visits including bottle trapping, egg searching, a torch survey and netting. After four surveys, if the presence of GCN is confirmed in ponds, then 2 further surveys per confirmed pond are undertaken to collect sufficient data to estimate the GCN population. This information is required to form a well-informed mitigation plan. Two of these surveys have been carried out so far and the results can be found in report 13611i.

- **Birds**: If any trees on site are to be removed during the nesting bird season (March-September), a nesting bird survey will need to be conducted. Once concluded, if no nesting birds are found, all surveyed vegetation must be removed within 24 hours of the survey. Outside this period, trees can be removed without the need for a survey. Enhancement for birds should be included in a Biodiversity Enhancement Plan

- **Bats**: As the site had been considered to have a high potential of supporting bat roosting sites, we recommended that dawn/dusk emergence surveys should be carried out to establish the absence/presence of roosting bats. These were completed on the 27/09/2017 and found 5 separate roosting locations. A winter hibernation surveys were carried out between 14/12/2017 – 22/02/2018 to explore weather bats are using the site to hibernate over the winter period. Manual searching with the aid of an endoscope, nor acoustic surveys found any bat activity during this period. It is therefore concluded that bats do not use the structures to hibernate over the winter period. A Bat Mitigation Licence should be applied for from Natural England (See **Section 6**).

- **Otter and water vole**: As Sabden Brook had potential for otter and water vole. Initial otter and water vole surveys were carried out between 27/10/2017 – 22/02/2018. The site has been considered to have a low potential for supporting water vole as no evidence of their presence was found, therefore no further works are needed. The site has been considered to have a moderate potential for supporting otter as two spraints were discovered on one of the three surveys conducted in and around Victoria Mill. These were only discovered in late February 2018, and no other evidence of otters have been discovered along Sabden Brook or the mill pond from October 2017 to February 2018. This suggests the site is only occasionally used by otters, possibly on the edge of their territory as suggested by a record of an otter dating from 2011, 1700m downstream of the site. An Otter Mitigation Licence should be applied for from Natural England. See JCA report 13611f/g for the results.

- **White-clawed crayfish**: As the Sabden Brook had potential for white-clawed crayfish, initial crayfish surveys were carried out 27/10/2017 – 28/10/2017. The site has been considered to have a low potential for supporting white clawed crayfish as no evidence of their presence was found. No further works are needed. See JCA report 13611f/g for the results.

- **Himalayan Balsam**: As Himalayan Balsam was found growing along the bank of Sabden Brook it is a legal obligation to remove it from the site. JCA can provide a method statement on how to proceed safely and legally.

6 Bat Mitigation Outline

6.1 After conducting a thorough Bat Roost Potential survey, Bat Emergence Surveys, Winter Hibernation Surveys and a detailed Desktop Study, we can confirm that **Victoria Mill** contains several confirmed common pipistrelle (*Pipistrellus pipistrellus*) and soprano pipistrelle (*Pipistrellus pygmaeus*) summer roosts.

6.2 The number of common pipistrelle and soprano pipistrelle using the mill at the time of the survey (August – September) are likely small (approximately 25 individuals).

6.3 Winter hibernation surveys confirmed it is unlikely these species or any other species of bat are hibernating in any of the buildings over the winter period.

6.4 As bats have been confirmed to be roosting at **Victoria Mill**, a Bat Mitigation Licence should be applied for from Natural England, and a mitigation plan devised so development causes as little impact on local bat populations as possible.

6.5 Roost conditions could not be fully assessed as they are located in high and inaccessible locations across the buildings. However, due to the number of bats confirmed (25 individuals), and the nature of the roosts (small crevices and cracks in between bricks), these roosts are most likely summer roosts and are of a lower conservation value. Based on these conclusions, a suitably designed **Mitigation Plan** should include the following:

- Where possible, existing roosts should be maintained. However, this is not possible under the proposed development plans. A soft demolition of buildings 1 and 3 should take place over the winter period when bats are not present, under the supervision of a suitably qualified ecologist, Buildings 2, 4 and 5 are unlikely to contain roosting bats and can be demolished at any time of the year.
- Interim bat boxes should be installed on site over winter, on poles located away from any works. These will mimic the conditions of the bat roosts which will be lost. These will be opened before spring 2019 to allow bats to roost.
- Integrated bat boxes should be built into the structures which replace buildings 1 and 3. These should mimic the previous roosts as closely as possible, including orientation and height.
- Integrated bat boxes should also be introduced into other proposed houses on site, as a form of enhancement. A bat tower will also be integrated into the plans, which will mimic the former chimney, and allow roosting opportunities for a number of bat species found on and near the site, and during different times of the year. The plans for this can be seen in **Appendix** .
- Lighting is a concern on site. Lighting should be designed to face away from known roost locations and new integrated boxes, to minimise spill of light into the existing roosts. Low wattage, low UV component or lights which are timed to include periods of darkness will be selected to avoid disturbing foraging bats along the edge of the site, in particular along the river.

7 References

Guidelines for surveys and report writing:

British Standards Institute (BSI), (2013) *BS 42020:2013, Biodiversity - Code of practice for planning and development*. London.

Chartered Institute of Ecology and Environmental Management (CIEEM), (2015) *Guidelines for Ecological Report Writing*. Winchester.

Joint Nature Conservation Committee (JNCC), (2010) *Handbook for Phase 1 habitat survey: A technique for environmental audit*.

Websites:

Advice on protected species is consolidated at:
Environmental management: Wildlife and habitat conservation - GOV.UK (2016) *Gov.uk*. Available at: https://www.gov.uk/topic/environmental-management/wildlife-habitat-conservation (Accessed: 21 September 2016).

Magic Map Application (2016) *Magic.defra.gov.uk*. Available at: http://magic.defra.gov.uk/MagicMap.aspx (Accessed: 21 September 2016).

The RSPB (2016). Available at: http://www.rspb.org.uk/ (Accessed: 21 September 2016).

Surveys and mitigation plans: protected species - Detailed guidance (2015) *Gov.uk*. Available at: https://www.gov.uk/guidance/surveys-and-mitigation-plans-protected-species (Accessed: 21 September 2016).

Within this detailed guidance on surveys and mitigation information is available on the following protected species:

- Bats
- Natterjack toads
- Otters
- Reptiles
- Water voles
- White-clawed crayfish
- Wild birds
- Hazel dormice
- Great crested newts
- Badgers

Wildlife licences: when you need to apply - Detailed guidance (2014) *Gov.uk*. Available at: https://www.gov.uk/guidance/wildlife-licences (Accessed: 21 September 2016).

Within this detailed guidance on licensing information is available on licences for the following protected species:

- Bats
- Natterjack toads
- Otters
- Reptiles
- Water voles
- White-clawed crayfish
- Wild birds
- Hazel dormice
- Great crested newts
- Badgers

As well as:

- Non-native Bumblebee species
- Deer
- Freshwater fish
- Invertebrates
- Mink, coypu, muskrat and grey squirrel
- Plants

Species specific information:

Badgers:

Natural England, (2007) *Badgers and Development: A Guide to Best Practice and Licensing*.

Bats:

Bat Conservation Trust, (2007) *Bats, Development & Planning in England*. London.

Mitchell-Jones, A. and McLeish, A. (ed.). (2004) *Bat Workers' Manual*. 3rd ed. JNCC.

Dormice:

Bright, P., Morris, P. and Mitchell-Jones, A. (1996) *The dormouse conservation handbook*. Peterborough: English Nature.

Great crested newts:

Langton, T., Beckett, C. and Foster, J. (2001) *Great Crested Newt Conservation Handbook*. Halesworth: Froglife.

Otters:

Natural England, (2007) *Species Information Note SIN006, Otter: European protected species.*

Reptiles and Amphibians:

Baker, J., Beebee, T., Buckley, J., Gent, T. and Orchard, D. (2011) *Amphibian Habitat Management Handbook*. 1st ed. Bournemouth: Amphibian and Reptile Conservation.

Edgar, P., Foster, J. and Baker, J. (2010) *Reptile Habitat Management Handbook*. 1st ed. Bournemouth: Amphibian and Reptile Conservation.

English Nature, (2004). *Reptiles: guidelines for developers.* Peterborough.

Gent, T. and Gibson, S. (ed.) (2003) *Herpetofauna Workers Manual*. Bournemouth: JNCC.

Water voles:

Natural England, (2008) *Water voles - the law in practice. Guidance for planners and developers*.

White-clawed crayfish:

Peay, S. (2002) *Guidance on Habitat for White-clawed Crayfish and its Restoration.* Kendal: English Nature

Relevant Legislation:

Wildlife and Countryside Act 1981, (c. 69) (as amended). Available at: http://www.legislation.gov.uk/ukpga/1981/69 (Accessed: 21 September 2016)

Countryside and Rights of Way Act 2000 (c.37). Available at: http://www.legislation.gov.uk/ukpga/2000/37/contents (Accessed: 21 September 2016)

The Conservation of Habitats and Species Regulations 2010 (No. 490). Available at: http://www.legislation.gov.uk/uksi/2010/490/contents/made (Accessed: 21 September 2016)

Conservation of natural habitats and of wild fauna and flora Council Directive (92/43/EEC) (The Habitats Directive) (as amended) Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31992L0043 (Accessed: 21 September 2016)

Protection of Badgers Act 1992 (c. 51). Available at: http://www.legislation.gov.uk/ukpga/1992/51/contents (Accessed: 21 September 2016)

The Hedgerow Regulations 1997 (No. 1160). Available at: http://www.legislation.gov.uk/uksi/1997/1160/contents/made (Accessed: 21 September 2016)

Appendices

N
W E
S

Building 1
Building 3
Building 4
Building 5
Building 2

0 1 5 10 15 20 30 40 50 metres

Appendix 1: Phase 1 Habitat Map

Victoria Mill, Sabden, Lancashire, BB7 9ED.
JCA REF: 13611e/DB

SCALE : 1:500	PAPER SIZE : A2

KEY

- Bare ground
- Broad-leaved woodland (Semi-natural)
- Buildings
- D — Dystrophic
- H — Hard standing
- O — Oligotrophic
- Scattered broad-leaved trees
- Tall ruderal
- Target note
- Bat roosting potential - gap in stonework
- Open window
- Gap in roof
- Confirmed bat roost
- Anabat detector position

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Arboricultural & Forestry Consultants

Appendix 2: Photographic Evidence

Photo 1: Bare ground and scrub in the courtyard at the east of the site.

Photo 2: Bare cleared ground at the west of the site.

Photo 3: Scrub in the courtyard at the east of the site.

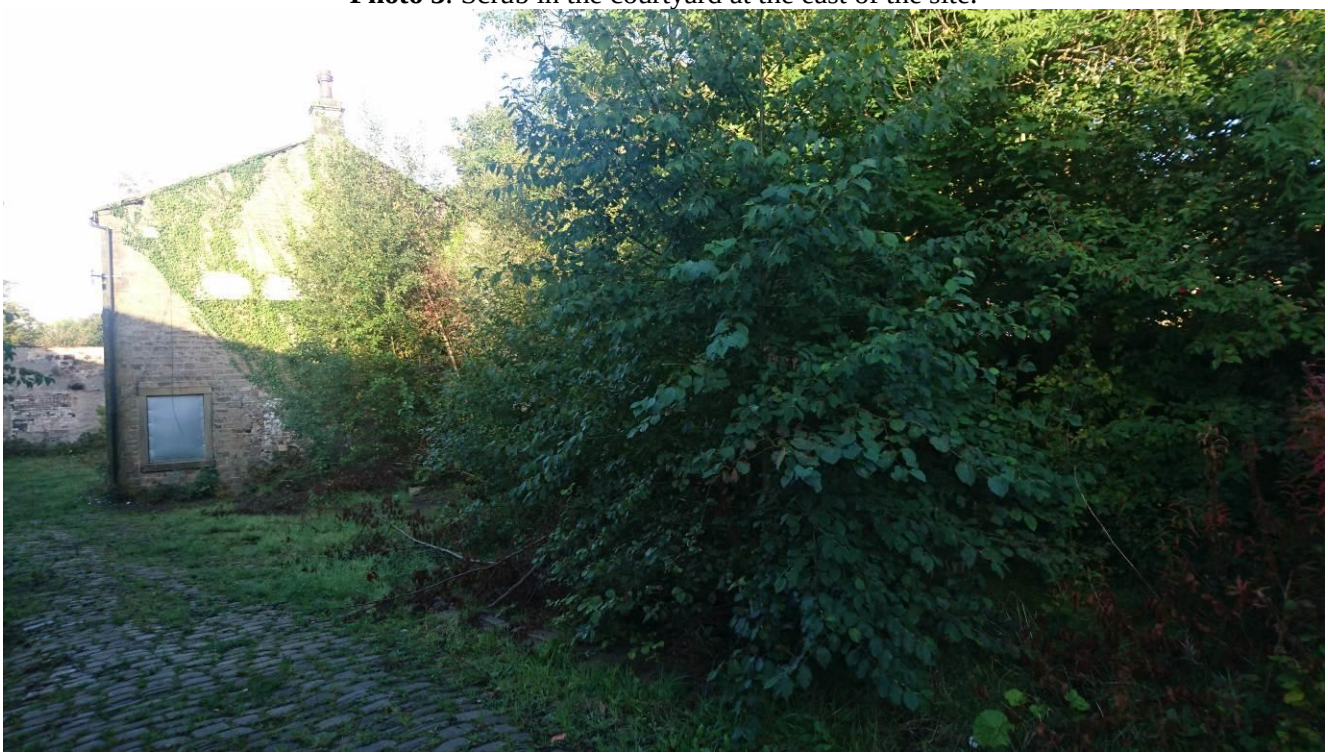


Photo 4: Scrub in the courtyard at the east of the site. The chimney can be seen behind.

Photo 5: Sabden Brook as it descends underneath the mill.

Photo 6: Sabden Brook at the west of the site.

Photo 7: The mill pond and surrounding broadleaf woodland.

Photo 8: Building 1 viewed from the south. Gaps in stonework circled red. Confirmed roost circled green.

Photo 9: Close-up of gaps in stonework.

Photo 10: Broken windows.

Photo 11: Building 1 viewed from the southeast. Gaps in stonework circled.

Photo 12: Gaps in stonework.

Photo 13: Building 1 viewed from the north. Gaps in stonework and windows circled.

Photo 14: Internal view of building 1.

Photo 15: Gaps in roof.

Photo 16: Gaps in internal stonework.

Photo 17: Building 2 viewed from the east. Gaps in stonework circled.

Photo 18: Building 2 viewed from the east. The Brook exists under this building.

Photo 19: Internal view of building 2.

Photo 20: Gaps in internal stonework.

Photo 21: Collapsed roof.

Photo 22: Building 3 viewed from the northeast.

Photo 23: Building 3 viewed from the northwest. Gaps in the stonework circled.

Photo 24: Gaps in the stonework.

Photo 25: Building 3 viewed from the west. Confirmed roost circled green.

Photo 26: Internal view of building 3 (lower floor).

Photo 27: Sabden Brook where it descends under buildings 2 and 3.

Photo 28: Internal view of building 3 (Upper floor).

Photo 29: Gaps in internal stonework.

Photo 30: Building 4 viewed from the north.

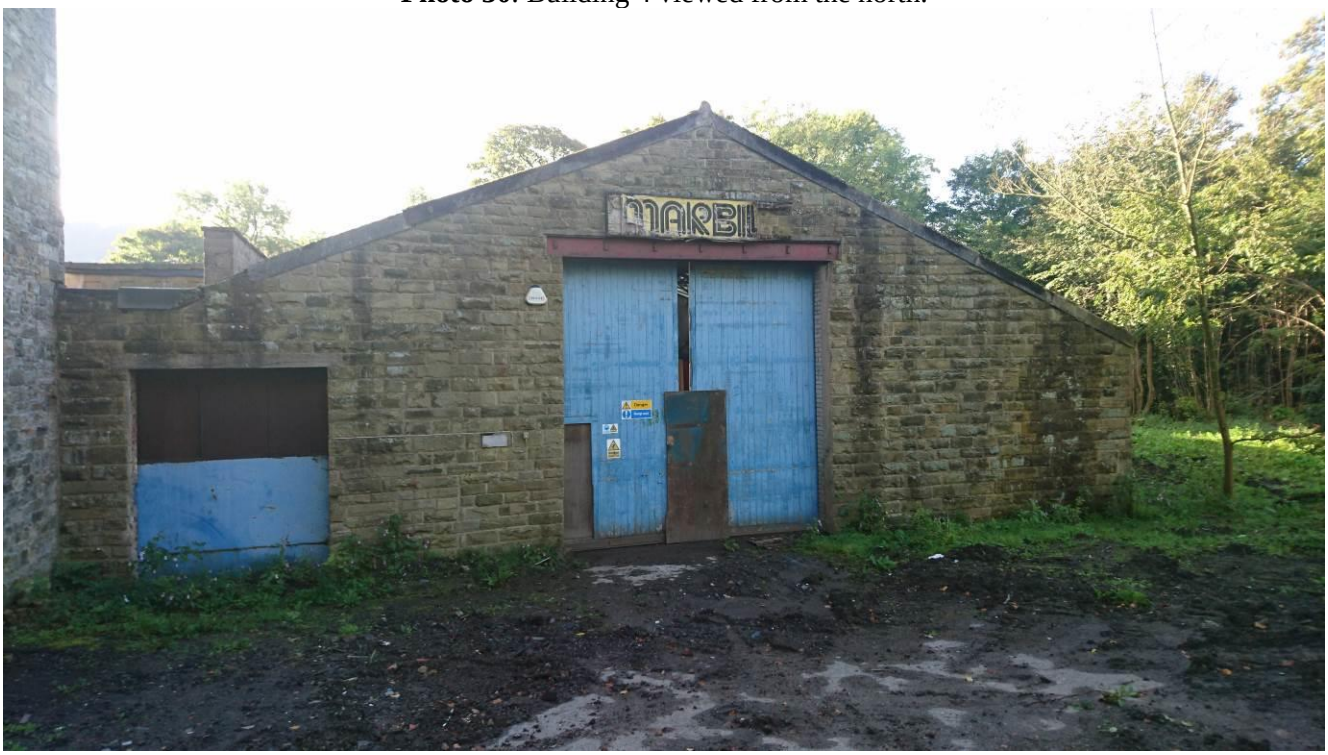


Photo 31: Building 4 viewed from the west.

Photo 32: Internal view of building 4.

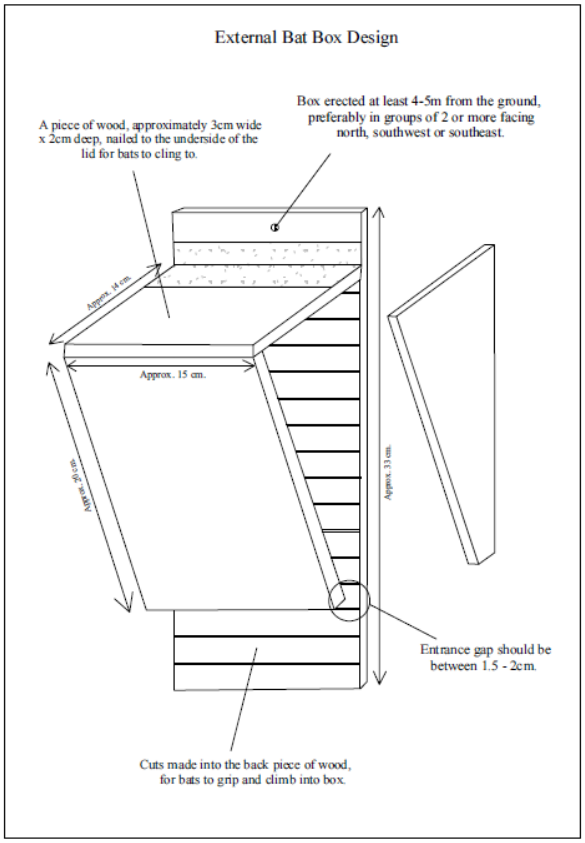
Photo 33: Building 5 viewed from the north.

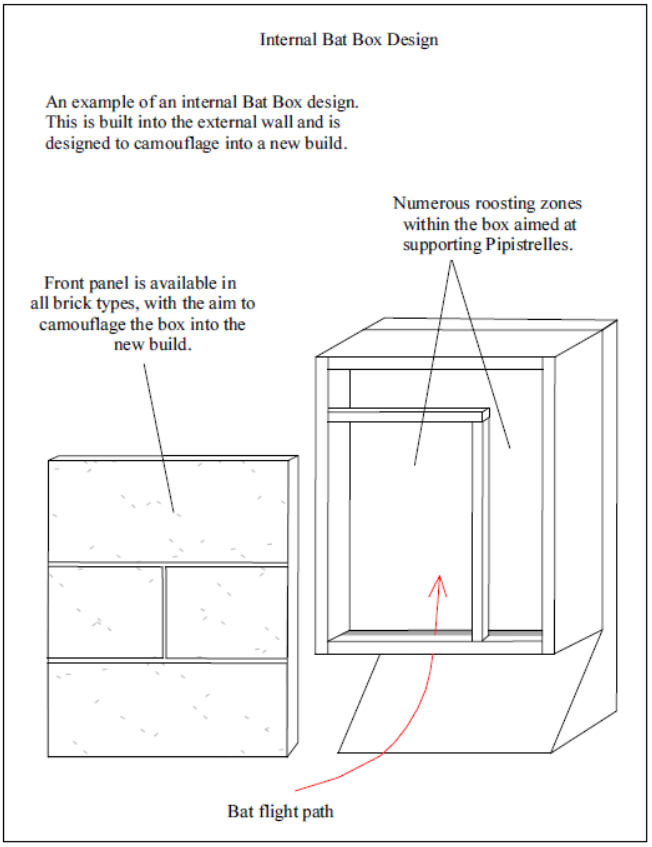
Photo 34: Gaps in the roof of building 5.

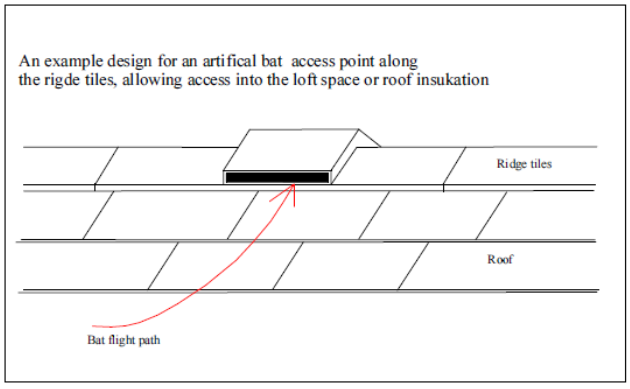
Photo 35: Internal view of building 5.

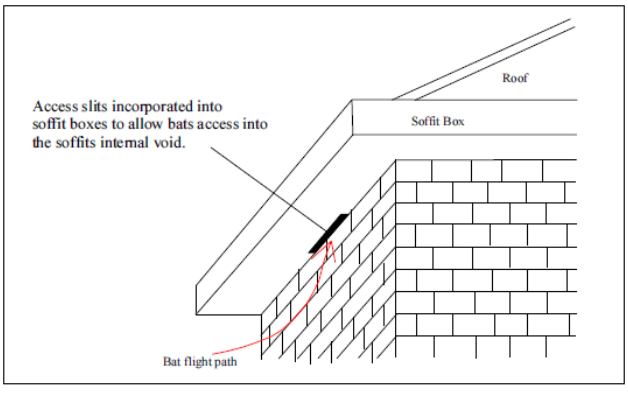
Photo 36: Internal view of building 5.

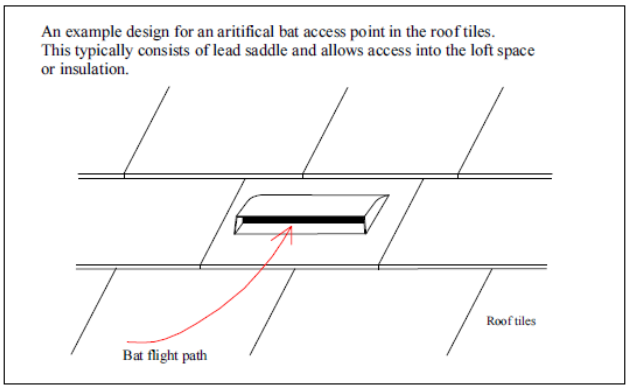
Appendix 3: Examples Artificial Bat Box Designs

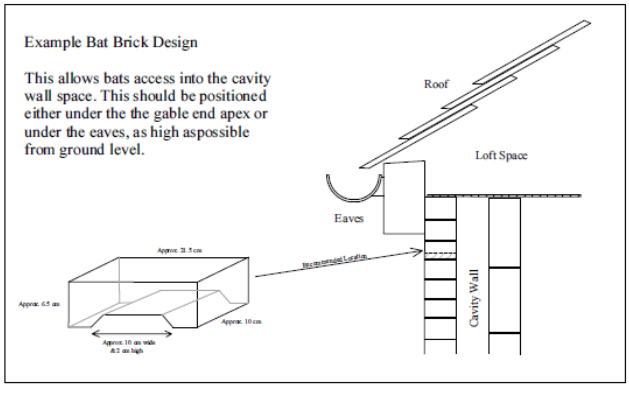






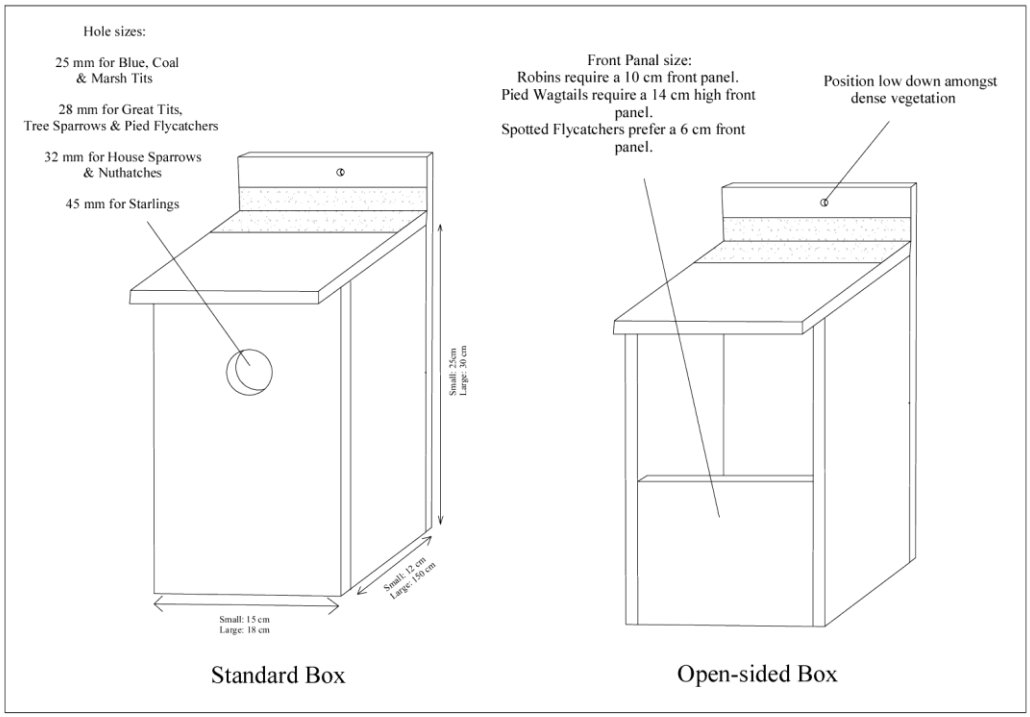




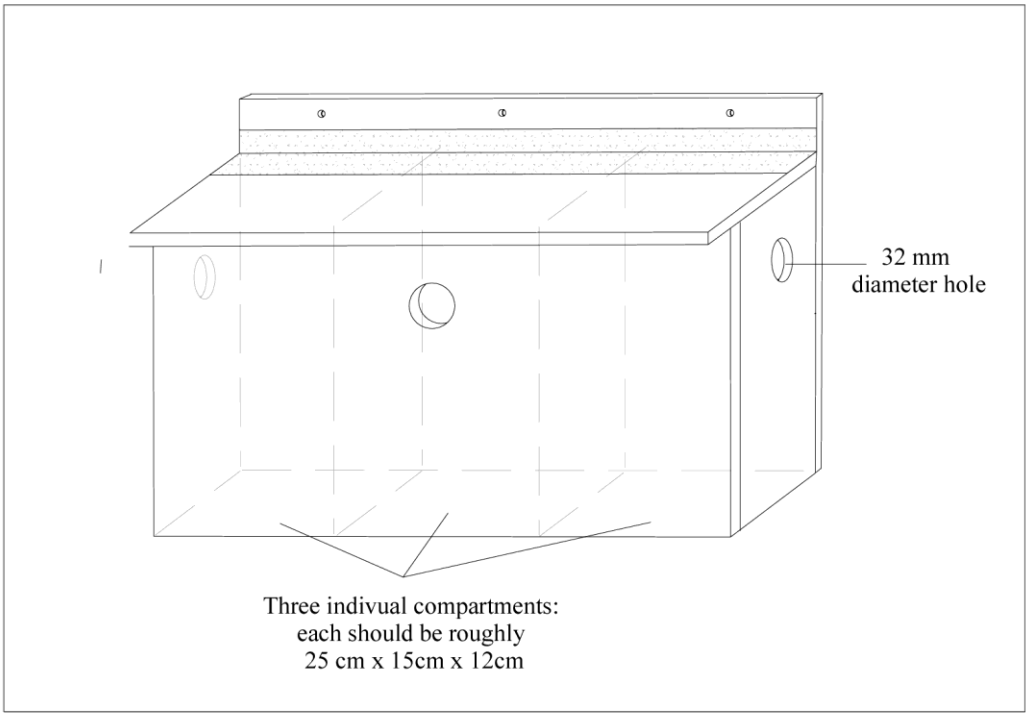


Appendix 4: Examples Artificial Bird Box Designs

An example of two different bird box designs

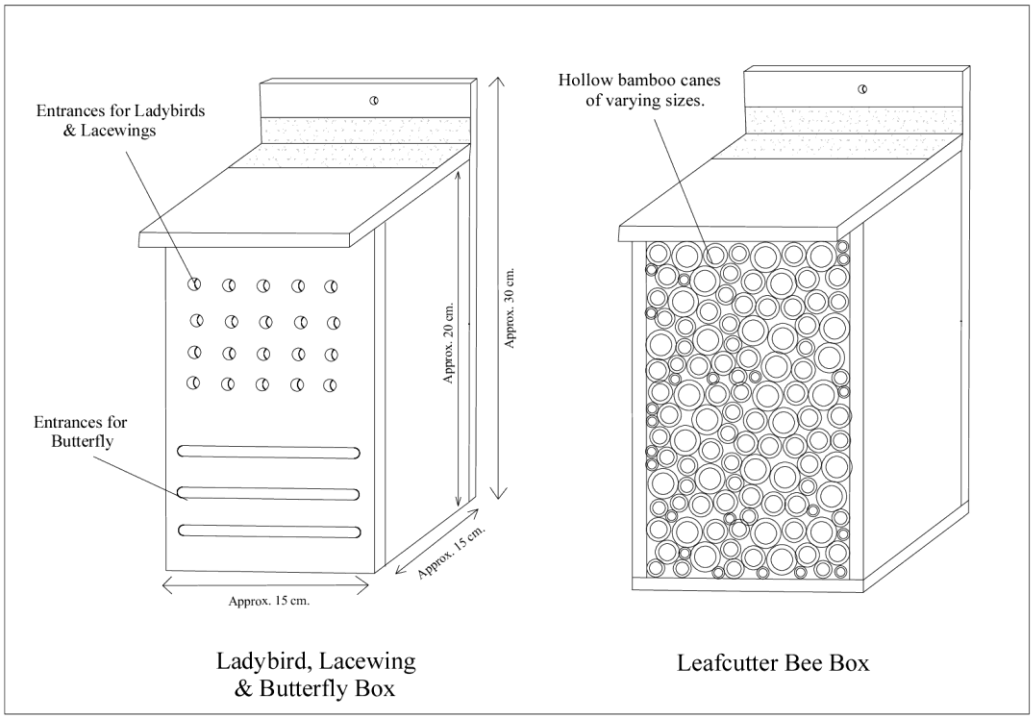


An example of a House sparrow box design

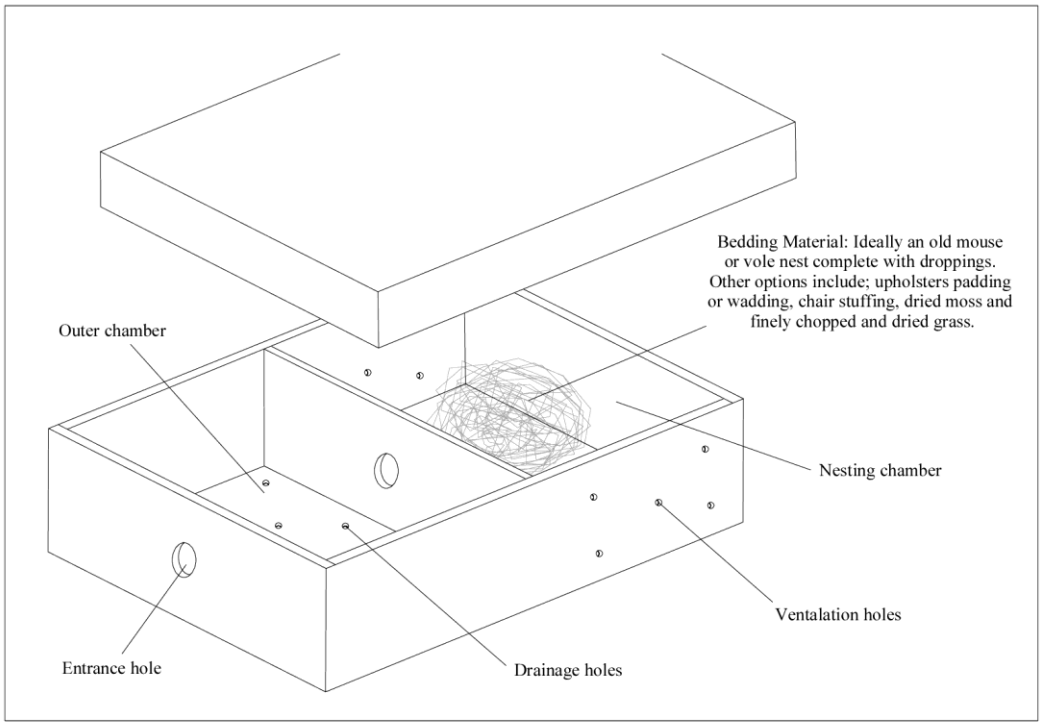


Appendix 6: Examples of Insect Shelter Designs

An example of two different insect box designs



An example of a Bumblebee box design



Faunal Boxes

★	Bat brick
★	Bird box

Appendix 7: Data Search

Table 4: The Lancashire Environment Record Network's records of protected and notable species within a 2km radius of the site.

Taxon Group	Common Name	Scientific Name	Number of Records	Latest Record
Amphibian	Common Toad	*Bufo bufo*	4	2011
	Common Frog	*Rana temporaria*	2	2011
Bird	Skylark	*Alauda arvensis*	3	1999
	Kingfisher	*Alcedo atthis*	1	1999
	Meadow Pipit	*Anthus pratensis*	4	2015
	Tree Pipit	*Anthus trivialis*	1	1999
	Swift	*Apus apus*	3	1999
	Raven	*Corvus corax*	1	2008
	Reed Bunting	*Emberiza schoeniclus*	2	1999
	Kestrel	*Falco tinnunculus*	4	2008
	Snipe	*Gallinago gallinago*	3	2008
	Linnet	*Linaria cannabina*	2	1999
	Grey Wagtail	*Motacilla cinerea*	1	1999
	Spotted Flycatcher	*Muscicapa striata*	2	1999
	Curlew	*Numenius arquata*	4	2015
	House Sparrow	*Passer domesticus*	4	2015
	Grey Partridge	*Perdix perdix*	3	1999
	Wood Warbler	*Phylloscopus sibilatrix*	7	1999
	Dunnock	*Prunella modularis*	3	1999
	Bullfinch	*Pyrrhula pyrrhula*	2	1999
	Woodcock	*Scolopax rusticola*	3	1999
	Starling	*Sturnus vulgaris*	4	2015
	Song Thrush	*Turdus philomelos*	2	1999
	Mistle Thrush	*Turdus viscivorus*	3	1999
	Lapwing	*Vanellus vanellus*	2	1999
Bony Fish (Actinopterygii)	European Eel	*Anguilla anguilla*	1	2011
	Bullhead	*Cottus gobio*	2	2011
	Atlantic Salmon	*Salmo salar*	2	2011
	Brown/Sea Trout	*Salmo trutta*	2	2011
Conifer	Scots Pine	*Pinus sylvestris*	18	2016
Flowering Plant	Italian Alder	*Alnus cordata*	1	2009
	Bog Pimpernel	*Anagallis tenella*	1	1965
	Butterfly-bush	*Buddleja davidii*	2	2015
	Box	*Buxus sempervirens*	1	2015
	Dioecious Sedge	*Carex dioica*	2	2008
	Tawny Sedge	*Carex hostiana*	1	1965
	Melancholy Thistle	*Cirsium heterophyllum*	4	1915
	New Zealand Pigmyweed	*Crassula helmsii*	1	1997
	Marsh Helleborine	*Epipactis palustris*	1	1995
	Japanese Knotweed	*Fallopia japonica*	2	2011
	Green-leaved Hawkweed	*Hieracium acuminatum*	1	1997

	Bluebell	*Hyacinthoides non-scripta*	15	2016
	Tutsan	*Hypericum androsaemum*	1	2015
	Indian Balsam	*Impatiens glandulifera*	17	2016
	Yellow Archangel	*Lamiastrum galeobdolon subsp. argentatum*	2	2015
	American Skunk-cabbage	*Lysichiton americanus*	1	2009
	Water-purslane	*Lythrum portula*	1	2004
	Welsh Poppy	*Meconopsis cambrica*	7	2015
	Monkeyflower	*Mimulus*	2	1999
	Grass-of-Parnassus	*Parnassia palustris*	2	1899
	Masterwort	*Peucedanum ostruthium*	1	1915
	Reflexed Saltmarsh-Grass	*Puccinellia distans*	2	2009
	Rhododendron	*Rhododendron ponticum*	10	2016
	Mountain Currant	*Ribes alpinum*	2	2004
	Corn Spurrey	*Spergula arvensis*	1	2004
	Field Woundwort	*Stachys arvensis*	1	2004
	Spreading Hedge-parsley	*Torilis arvensis*	1	1899
	Cowberry	*Vaccinium vitis-idaea*	2	1960
Insect - Moth	Knot Grass	*Acronicta rumicis*	1	2006
	Flounced Chestnut	*Agrochola helvola*	1	2005
	Ear Moth	*Amphipoea oculea*	1	2006
	Mouse Moth	*Amphipyra tragopoginis*	1	2007
	Gold Spangle	*Autographa bractea*	1	2006
	Dark Brocade	*Blepharita adusta*	2	2007
	Dark Marbled Carpet	*Chloroclysta citrata*	1	2005
	Small Square-spot	*Diarsia rubi*	4	2007
	Autumnal Rustic	*Eugnorisma glareosa*	3	2007
	Ghost Moth	*Hepialus humuli*	2	2007
	Broom Moth	*Melanchra pisi*	2	2007
	Brown Rustic	*Rusina ferruginea*	1	2006
	White Ermine	*Spilosoma lubricipeda*	1	2006
	Buff Ermine	*Spilosoma luteum*	1	2006
Lichen	Lecidea promixta	*Lecidea promixta*	1	1992
Liverwort	Atlantic Pawwort	*Barbilophozia atlantica*	2	2003
	Scarce Notchwort	*Leiocolea badensis*	1	2003
Moss	Common Aloe-moss	*Aloina aloides*	1	2003
	Campylium stellatum var. protensum	*Campylium stellatum var. protensum*	1	2002
	Sickle-leaved Hook-moss	*Sanionia uncinata*	1	2003
	Ringless Hook-moss	*Warnstorfia exannulata*	1	2002
Terrestrial Mammal	European Otter	*Lutra lutra*	1	2011
	Daubenton's Bat	*Myotis daubentonii*	2	2007
	Noctule Bat	*Nyctalus noctula*	3	2007
	Common Pipistrelle	*Pipistrellus pipistrellus*	16	2013
	Brown Long-eared Bat	*Plecotus auritus*	3	2011

Appendix 8: Site Map

Figure 1: Google Maps image of **Land at Watt Street/Whalley Road** showing the survey site in relation to the surrounding landscape and habitats.

Appendix 9: Floral Species List

Table 5: Complete list of floral species encountered during survey.

Common Name	Scientific Name
Field Maple	*Acer campestre*
Norway Maple	*Acer platanoides*
Sycamore	*Acer pseudoplatanus*
Horse Chestnut	*Aesculus hippocastanum*
Alder	*Alnus glutinosa*
Cow Parsley	*Anthriscus sylvestris*
Mugwort	*Artemisia vulgaris*
Hart's-tongue Fern	*Asplenium scolopendrium*
Silver Birch	*Betula pendula*
Buddleia	*Buddleja sp.*
Creeping Thistle	*Cirsium arvense*
Spear Thistle	*Cirsium vulgare*
Dogwood	*Cornus sanguinea*
Hawthorn	*Crataegus monogyna*
Foxglove	*Digitalis purpurea*
Rosebay Willowherb	*Epilobium angustifolium*
Great Willowherb	*Epilobium hirsutum*
Beech	*Fagus sylvatica*
Red Fescue	*Festuca rubra*
Common Ash	*Fraxinus excelsior*
Cleavers	*Galium aparine*
Herb-Robert	*Geranium robertianum*
Ground Ivy	*Glechoma hederacea*
Ivy	*Hedera helix*
Common Hogweed	*Heracleum sphondilium*
Holly	*Ilex aquifolium*
Himalayan Balsam	*Impatiens glandulifera*
Flag Iris	*Iris pseudacorus*
Ragwort	*Jacobaea vulgaris*
Soft Rush	*Juncus effusus*
White Dead Nettle	*Lamium album*
Privet	*Ligustrum sp.*
Perennial Ryegrass	*Lolium perenne*
Pineapple Weed	*Matricaria discoidea*
Dog's Mercury	*Mercurialis perennis*
Ribwort Plantain	*Plantago lanceolata*
Common Cinquefoil	*Potentilla simplex*

Prunus	*Prunus sp.*
Blackthorn	*Prunus spinosa*
Dog Rose	*Rosa canina*
Bramble	*Rubus fruticosus agg.*
Broadleaf Dock	*Rumex obtusifolius*
Goat Willow	*Salix caprea*
Crack Willow	*Salix fragilis*
Elder	*Sambucus nigra*
Whitebeam	*Sorbus aria*
Dandelion	*Taraxacum sp.*
Lime	*Tilia x europaea*
Red Clover	*Trifolium pretense*
White Clover	*Trifolium repens*
Wych Elm	*Ulmus glabra*
Nettle	*Urtica dioica*
Germander Speedwell	*Veronica chamaedrys*

Appendix 10: Protected Species Information

The following species are protected under EU law, such as the Conservation (Natural Habitats, &c.) Regulations (2010):

- All UK bat species
- Dormouse
- Great Crested Newt and Natterjack Toad
- Large Blue Butterfly
- Otter
- Pine Marten
- Polecat
- Scottish Wild Cat
- Smooth Snake and Sand Lizard
- Various aquatic and plant species

These species are afforded the highest protection in the UK. Under this protection it is an offence to; deliberately capture, injure or kill any wild animal of a European protected species; deliberately disturb wild animal of any such species; deliberately take or destroy the eggs of such an animal, or damage or destroy a breeding site or resting place of such an animal.
In addition to this it is an offence to be in possession of, or to control, transport, sell or exchange, or to offer for sale or exchange, a European Protected species.

The following species are protected under UK law, such as the Wildlife and Countryside Act 1981:

- Badger
- Nesting birds
- Red Squirrel
- Reptiles (Adder, Common lizard, Grass snake, Slow worm)
- Water Vole
- White Clawed Crayfish
- Various bird species i.e. Barn Owl
- Various plant species

Therefore under this protection it is an offence to; kill, injure or take any of the above species.

Nesting birds are only protected during the breeding season whilst on their nest. In addition to the adults being protected, the eggs, young and nest itself whilst in use are protected.

The Wildlife and Countryside Act 1981 also contains measures to prevent the establishment of non-native species which may be detrimental to native wildlife, prohibiting the release of animals and planting of plants listed in Schedule 9 in England and Wales (e.g. Japanese Knotweed and Himalayan Balsam).

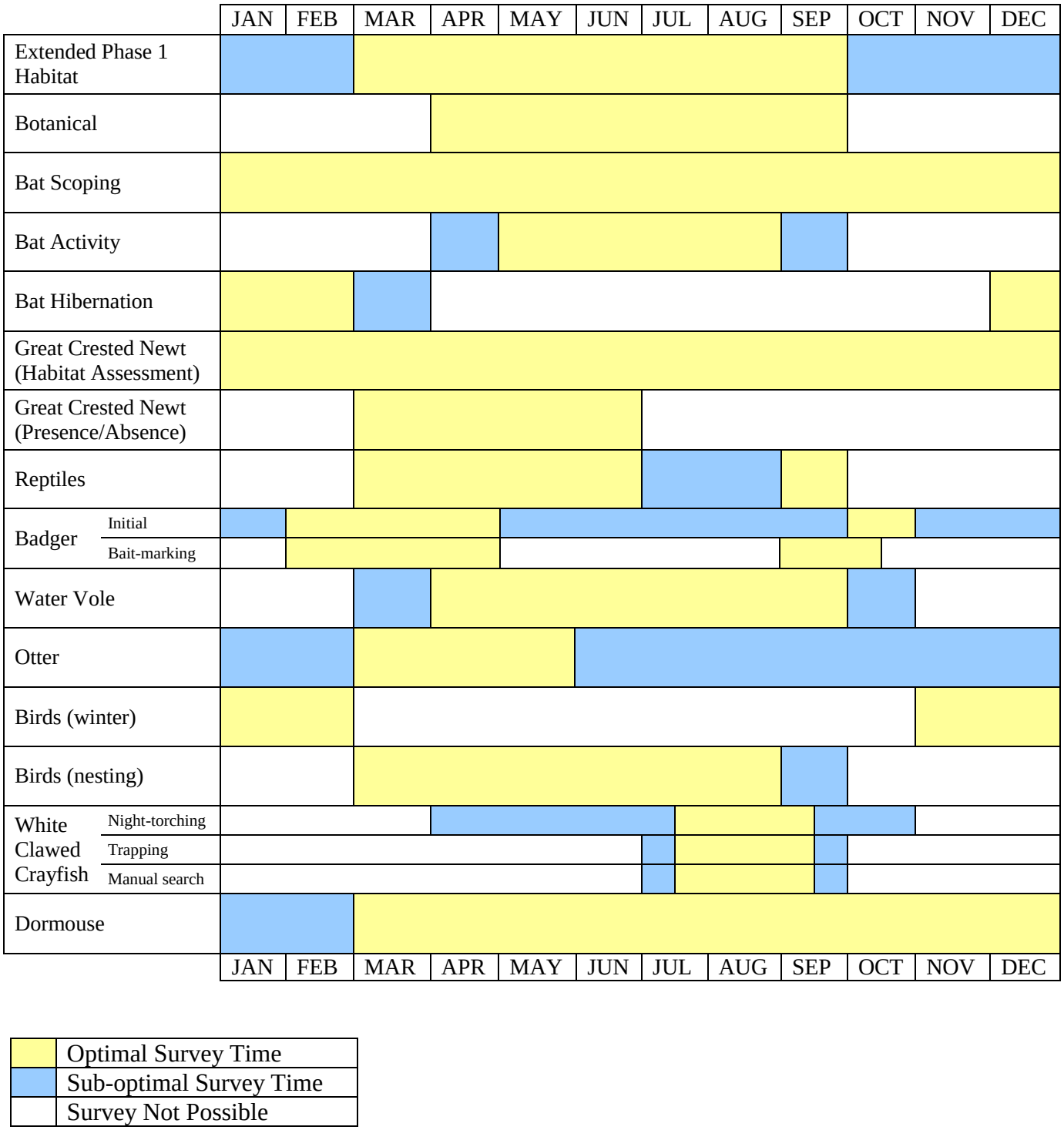
Badgers are protected under The Protection of Badgers Act 1992. Under this legislation it is an offence to; take, injure, kill, or cruelly ill-treat a badger; interfere with a badger sett; sell or possess a live badger; or mark or ring a badger.

The following habitat types are protected under UK Law:

- Habitats that are used by protected species
- Habitats that fall within designated sites
- Hedgerows
- Individual trees/woods can be protected under Tree Preservation Orders

Appendix 11: Survey Calendar

Figure 2: Survey calendar for protected species and habitat surveys.



	Optimal Survey Time
	Sub-optimal Survey Time
	Survey Not Possible

Appendix 12: Author Qualifications

Principal Consultant and Managing Director

Jonathan Cocking *F.R.E.S., Tech. Cert. (Arbor.A), PDipArb (RFS) FArborA CBiol MSB. MICFor.* Jonathan is a Registered Consultant and Fellow of the Arboricultural Association and sits on its Professional Committee. He has 31 years experience in the Arboricultural profession and served for eight years as Senior Arboriculturist with a large local authority before establishing JCA in 1997. Jonathan has since developed JCA's portfolio of services and its extensive client base. He is a Chartered Biologist, a Chartered Arboriculturalist and an Expert Witness with much experience of litigation work.

Technical Coordinator

Toby Thwaites *BSc (Hons), HND (Arboriculture).* Toby joined JCA in 1998 after graduating in Ecology at the University of Huddersfield and has since graduated in Arboriculture at the University of Central Lancashire. A former JCA team leader and Consulting Arboriculturist, Toby is now Technical Coordinator and oversees all office and on-site activities at JCA and is on hand to offer technical support and advice.

Consulting Staff: Arboriculture

Toby Parsons *Cert. Arb. (RFS), Tech. Cert. (Arbor.A).* Toby joined JCA after spending 6 years working as a senior climber for various Arboricultural contractors in the East Midlands and the South-West. He has gained the Level 2 Certificate in Arboriculture (RFS) and an Arboricultural Technicians Certificate. Toby is LANTRA certified in Professional Tree Inspection.

Scott Reid ***ND*** *(Arboriculture and Forestry).* Scott joined JCA after working with other consultancy companies in the south of England. He specialises in trees in relation to development and holds a National Diploma, various NPTC qualifications and is currently studying for his Level 4 Diploma in Arboriculture.

Andrew Bussey. Andrew joined JCA having spent 12 years working as a tree surgeon for various private companies and a Local Authority. He has various NPTC qualifications, is QTRA qualified and is currently studying for his Arboricultural Technicians Certificate.

Phil Humeniuk *FdSc (Arboriculture).* Phil joined JCA having spent 3 years working for various tree surgery companies and as a Tree Officer for a Local Authority. He also has several years experience working as a consultant both for JCA and for another consultancy. Phil obtained his foundation degree in Arboriculture at the University of Central Lancashire and has various NPTC's and is LANTRA certified in Professional Tree Inspection.

Emily Wilde *FdSc (Arboriculture).* Emily joined JCA having previously worked for various private tree surgery and consultancy companies over the past 8 years. She initially obtained a ND in Forestry & Arboriculture, followed by a FdSc in Arboriculture at Askham Bryan College, York. Emily has various NPTC certificates and is QTRA qualified.

Mick Eltringham *ND (Forestry).* Mick joined JCA after spending 12 years working in the industry for various private companies in the north and south of England. He has also spent the last five years working as a consultant for two canopy research projects in the Amazon Rainforest, working with Oxford University and the University of Arizona. He has various NPTC Qualifications.

Charles Cocking. Charles joined JCA in January 2014 as an Apprentice having previously worked for the company on a part time basis during 2013. In between his roles at JCA, Charles will be studying at Askham Bryan College, York, undertaking a two year course in order to obtain a Foundation Degree in Arboriculture (FdSc Arboriculture).

Consulting Staff: Ecology

David Bodenham *BSc Ind (Hons) Zoology, MSc Biodiversity and Conservation.* An advocate of evidence based conservation, he studied Zoology (Ind) at University and moved onto an MSc in Biodiversity and Conservation where he gained the myriad of skills needed as an ecologist. With over 7 years of experience, David specialises in bat and amphibian ecology.

Jenny Butler *Bsc (Hons) Environmental Science.* Jenny joined JCA's ecology department in 2017, bringing with her a bachelor degree in Environmental Science from Bangor University. Jenny has previously worked as an Environmental Consultant for an Agri-Environment company and as a freelance ecological consultant. Jenny specialises in great crested newt and bat ecology.

Administrative Staff

Sue Guest Administrative Team Leader.
Simeon Haigh *BSc (Hons).* IT Officer.
Lorraine Spink Administrative Assistant.
Yasmin Shahzad Administrative Assistant.
Catherine Cocking Accounts Manager.

We confirm that the opinions expressed are our true and bona fide opinions.

Signed

.....

David Bodenham *BSc Ind (Hons), MSc*

12/04/201

Proofread by

.....

Toby Thwaites *BSc (Hons), HND (Arboriculture)*

12/04/2018

For and on behalf of ***JCA Ltd***

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- Expert Witness, Planning Inquiries and Appeals

Veteran Tree Management

- Ancient Woodland Management
- Veteran Tree Management

Tree Health and Pest and Disease Management

- Pest and Disease Surveys
- Tree Health Checks
- Disease Mitigation and Control

ECOLOGICAL SERVICES

Ecological Pre-Planning Services

- Phase 1 Habitat Surveys
- Great Crested Newt eDNA Sampling
- Protected Species: Bat, Wintering and Nesting Bird, Badger, Amphibian, Otter, Water Vole, White-Clawed Crayfish, Dormice and Reptile Surveys.
- Preparation for Environmental Impact Assessment (EIA)
- Invasive Species Surveys
- Code for Sustainable Homes

Ecological Post-Planning Services

- Biodiversity Enhancement Plans
- Protected Species Mitigation
- Ecological Management (Bat and Bird box installation and inspection)

HEAD QUARTERS:

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