Teewood Farm, Slaidburn Road, Waddington BB7 3JJ

ECOLOGICAL SURVEY AND ASSESSMENT
Including a Licensed Bat and Bird Survey and Assessment

April 2019

[ERAP (Consultant Ecologists) Ltd ref: 2018-105c]

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Document Control

Survey Type:	Surveyors[1]	Survey Date(s)
Daylight licensed bat and bird survey	Victoria Burrows B.Sc. (Hons) M.Sc. CEnv MCIEEM Principal Ecologist	10th July 2018
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	Danielle Rowlands, Amy Sharples, Carol Flaxman, Aidan Pickering and Marie Pickering	28th August 2018
Reporting	**Personnel**	**Date**
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[1] *Licence reference numbers*

Bats

Victoria Burrows Natural England Class Survey Licence (bats, Level 2) Registration Number 2015-10390-CLS-CLS

Barn owl

Victoria Burrows Natural England Class Survey Licence Registration Number CL29/00061

SUMMARY

Introduction and Scope

i. This ecological survey and assessment has been prepared for the buildings and curtilage at Teewood Farm off Slaidburn Road, Waddington. The assessment was requested in connection with proposals to convert the two barns to a dwelling (main house and annex).

ii. The report presents the results of a desktop study and data search, an extended Phase 1 Habitat Survey and a licensed bat and barn owl survey and assessment carried out in July and August 2018.

iii. The site comprises two stone barns (detached barn and attached barn), a nissen hut and a concrete block shippon bordered by hard-standing and garden habitats. A stone farmhouse lies to the west of the attached barn; the house will not be directly affected by the proposals.

Results of Survey and Assessment

iv. Adverse direct and indirect impacts on statutory and non-statutory designated sites for nature conservation will be avoided by the proposals.

v. None of the habitats within the site are semi-natural habitat or are Priority Habitat. The site contains only common and widespread plant species. All mature trees surrounding the farm will be retained by the proposals and protected during construction.

vi. Indian Balsam, an invasive plant species listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended) was detected. Guidance in relation to the eradication of the plant and avoidance of spread is provided at **Section 5.3**.

vii. The two barns are assessed to be of moderate suitability for use by roosting bats and both support roosting bats. Two common pipistrelle day roosts (one bat at each barn) were detected (Roosts 1 to 2). In the absence of mitigation the conversion will result in the disturbance and possible loss of the recorded roosts and the possible disturbance of bats in the hibernation season.

viii. A bat mitigation strategy to describe how the proposals can be achieved whilst protecting roosting bats, ensuring there is no net loss of roosting opportunity at the site in the long-term and to detail how any post-development interference impacts will be avoided is outlined at **Section 5.1**. Works may only be carried out under a Natural England European Protected Species Mitigation (EPSM) licence issued under Regulation 55 of *The Conservation of Habitats and Species Regulations 2017.*

ix. The shippon is of low suitability for use by roosting bats; no bat roosts were detected during the daylight and the bat activity surveys. Precautionary measures to be applied during the demolition of the shippon are described in **Section 5.1**. The nissen hut has negligible suitability; no further actions are necessary.

x. The shippon is used by roosting barn owl (listed under Schedule 1 of the *Wildlife and Countryside Act 1981* (as amended)) and evidence of an old nest is present. Mitigation measures comprising the completion of pre-work surveys to determine the barn owl status at the site will be necessary; further information is presented at **Section 5.2**. The buildings are used by nesting swallow; guidance is provided at **Section 5.2**.

xi. Appropriate survey effort and assessment has been carried out to discount the presence of other relevant protected species (including badger, great crested newt and reptiles). No further surveys for other species are necessary to inform the design of the proposals and a planning application.

Recommendations and Conclusion

xii. The recommendations in **Section 5.0** identify all the mandatory measures and ecological recommendations to be applied to ensure compliance with relevant wildlife legislation, the National Planning Policy Framework (NPPF) and best practice.

xiii. Provided the identified measures for the protection of and mitigation for roosting bats and nesting birds are implemented as part of the proposed development, the conversion proposals at Teewood Farm can be

achieved in accordance with Natural England guidance, wildlife legislation, relevant planning policy and best practice.

xiv. Measures to achieve a net gain for biodiversity to achieve compliance with the NPPF are feasible and outlined in **Section 5.0**.

1.0 INTRODUCTION

1.1 Background and Rationale

1.1.1 ERAP (Consultant Ecologists) Ltd was commissioned to carry out a licensed bat and bird survey and assessment of the buildings at Teewood Farm off Slaidburn Road, Waddington, hereafter referred to as the 'site'. The Ordnance Survey (OS) grid reference at the centre of the site is SD 72221 45477. An aerial image of the site and its surrounding habitats is appended at **Figure 9.1** (Source image: Google Earth).

1.1.2 The survey and assessment was requested in connection with an assessment of the feasibility of proposals to convert the two stone barns to a residential property.

1.2 Scope of Works

1.2.1 The scope of ecological works comprised:

a. A desktop study and data search for known ecological information at the site and the local area;

b. An Extended Phase 1 Habitat Survey and assessment of the farm buildings and curtilage;

c. Survey and assessment of all habitats for relevant statutory protected species and other wildlife including badger (*Meles meles*), great crested newt (*Triturus cristatus*), bird species and reptiles;

d. A licensed bat and barn owl survey and assessment of the buildings;

e. Identification of any potential ecological constraints on the proposals and the specification of the scope of mitigation and ecological enhancement required in accordance with wildlife legislation, planning policy guidance and other relevant guidance; and

f. The identification of any further surveys or precautionary actions that may be required prior to the commencement of construction activities.

2.0 METHOD OF SURVEY

2.1 Desktop Study and Data Search

2.1.1 The following sources of information and ecological records were consulted:

a. MAGiC: A web-based interactive map which brings together geographic information on key environmental schemes and designations, including details of statutory nature conservation sites;

b. Lancashire Environment Record Network (LERN); and

c. Lancashire Biodiversity Action Plan (BAP).

2.2 Vegetation and Habitats

2.2.1 An Extended Phase 1 Habitat Survey of the site was carried out by Victoria Burrows on 10th July 2018. The weather was dry, overcast with sunny intervals, a light breeze (Beaufort scale 2) and an air temperature of 19°C at 12 noon. The conditions and time of year were suitable for the scope of ecological survey carried out.

2.2.2 A Phase 1 habitat and vegetation map was prepared for the site and the immediate surrounding area (refer to **Figure 9.2**). The mapping is based on the Joint Nature Conservation Committee Phase 1 Habitat

Survey methodology (JNCC, 2010) with minor adjustments to illustrate and examine the habitats with greater precision.

2.2.3 The plant species within the site boundary were determined with estimates of the distribution, ground cover, abundance and constancy of individual species. The estimation of abundance was based on the DAFOR system, where D = Dominant, A = Abundant, F = Frequent, O = Occasional and R = Rare, this being a widely used and accepted system employed by ecological surveyors. The terms L = Locally and V = Very were additionally used to describe the plant species distributions with greater precision.

2.2.4 Stands of vegetation and habitats were described and evaluated using the National Vegetation Classification (NVC). The NVC provides a systematic and comprehensive analysis of British vegetation and is a reliable framework for nature conservation and land-use planning.

2.2.5 Searches were made for uncommon, rare and statutorily protected plant species, those species listed as protected in the *Wildlife and Countryside Act 1981* (as amended) and species which are indicators of important and uncommon plant communities. Plant nomenclature follows *New Flora of the British Isles 3rd Edition* (Stace, 2010).

2.2.6 Searches were carried out for the presence of invasive species, including those listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended), including Japanese Knotweed (*Fallopia japonica*), Indian Balsam (*Impatiens glandulifera*) and Giant Hogweed (*Heracleum mantegazzianum*).

2.3 Animal Life

Badger

2.3.1 A search for badger activity was carried out. The survey area covered the site (as annotated on **Figure 9.1**) and extended to accessible land within a radius of 30 metres from the building curtilages.

2.3.2 The survey was conducted in accordance with guidance presented within *Badgers and Development* (Natural England, 2007) and *Badgers: surveys and mitigation for development projects* (Natural England, 2015).

2.3.3 The following signs of badger activity were searched for:

a. Sett entrances, e.g. entrances that are normally 25 to 35cm in diameter and shaped like a 'D' on its side;
b. Large spoil heaps outside sett entrances;
c. Bedding outside sett entrances;
d. Badger footprints;
e. Badger paths;
f. Latrines;
g. Badger hairs on fences or bushes;
h. Scratching posts; and
i. Signs of digging for food.

2.3.4 Habitats within and surrounding the site were assessed in terms of their suitability for use by foraging and sheltering badger in accordance with their known habitat preferences as detailed in current guidance and *Badger* (Roper, 2010).

Bat Species

Habitat Assessment for Commuting / Foraging Bats

2.3.5 Habitats within and adjacent to the site were assessed for their value and suitability for commuting and foraging bats in accordance with Table 4.1 of *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn),* (Collins, J. (ed), 2016). Reference was made to the following categories and descriptions / examples, presented below.

Table 2.1: Consideration of Suitability of Foraging and Commuting Habitat for Bats

Suitability	Commuting Habitat	Foraging Habitat
Negligible	Negligible habitat features on site likely to be used by commuting bats.	Negligible habitat features on site likely to be used by foraging bats.
Low	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 or patch of scrub.
Moderate	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 linked to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	Continuous, high-quality habitat that is well connected to the wider landscape and is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. Habitats close to and connected to known roosts.	High-quality habitat that is well-connected to the wider landscape and is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Habitats close to and connected to known roosts.

Daylight Survey

Survey Personnel and Guidance

2.3.6 The daylight licensed bat survey was carried out by Victoria Burrows (Natural England Class Survey Licence WML CL18 (Bat Survey Level 2), Registration Number 2015-10390-CLS-CLS). The surveyor's qualifications and experience meet the criteria as defined in the *Technical Guidance Series Competencies for Species Survey: Bats* (CIEEM, 2013).

2.3.7 The survey was carried out in accordance with standard methodology described in the *Bat Mitigation Guidelines* (Mitchell-Jones, 2004), the *Bat Workers' Manual* 3rd Edition (Mitchell-Jones & Mcleish, 2004) and *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn) (Collins, J. (ed), 2016).

Survey

2.3.8 An inspection of the external surfaces, walls and roof of the buildings was carried out to find potential bat roosting habitat or accesses into internal areas where roosts may be present. Searches for bats and evidence of bat presence in the form of droppings, urine stains, feeding signs, grease marks and other evidence were also carried out.

2.3.9 The suitability of the buildings has been assessed in accordance with Table 4.1 of *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn),* (Collins, J. (ed), 2016), taking into account the presence (or absence) of features suitable for use by roosting bats within the buildings (including crevice dwelling and species which can roost in the open in roof voids), and the suitability of the surrounding habitats for use by foraging and commuting bats.

Equipment

2.3.10 A list of equipment used is detailed below:

Table 2.2: Survey Equipment Used / Available for Use During Daylight Bat Survey

Ladders
LED Lenser P14 torch
Canon Ixus digital camera
8x20 binoculars
Ridgid Micro Inspection Camera Endoscope CA-300

Bat Activity Surveys

2.3.11 Two dawn re-entry surveys were carried out with the objectives of determining the presence of roosting bats (or otherwise) at the buildings and characterising any detected roosts.

2.3.12 Five surveyors, experienced in conducting bat surveys, were positioned at suitable locations to maximise the coverage of the relevant buildings (including the interior) to determine any entry into or exit from the buildings by roosting bats.

2.3.13 Heterodyne detectors were used to determine any bat detected to species or group (*Myotis* species often cannot be reliably separated to species via their echolocation calls, for example). Recording bat detectors units[1] were also used to record and analyse echolocation calls after the survey using AnalookW call analysis software. Surveyor / detector locations are annotated on **Figure 9.2**, appended.

2.3.14 The dawn re-entry survey commenced approximately 2 hours before sunrise and ended just after sunrise, provided all bat activity had ceased by this point. Bat emergence or re-entry activity was recorded. All surveys were conducted under suitable conditions. The dates of the surveys, surveyors and equipment used and weather conditions present are presented below.

[1] i.e. Anabat Express and Anabat SD2

Table 2.3: Dawn Re-entry Survey Dates, Weather Conditions and Surveyors

Date	26th July 2018	28th August 2018
Sunrise	05:11	06:10
Start time	03:25	04:20
End time	05:15	06:10
Wind	Beaufort 2 (light breeze)	Beaufort 0 (calm)
Precipitation	Dry	Dry, overcast
Air temperatures	14°C	13°C
Surveyor Position	**Surveyor and Detector**	**Surveyor and Detector**
1	Danielle Rowlands Peersonic RPA3 and Anabat Express	Danielle Rowlands Peersonic RPA3 and Anabat SD2
2	Victoria Burrows Batbox Duet, Anabat SD2 and Anabat Express	Amy Sharples Batbox III and Anabat Express
3	Carol Flaxman Batbox III and Anabat Express	Carol Flaxman Batbox III and Anabat Express
4	Chris Walsh Anabat Walkabout and Anabat Express	Aidan Pickering Batbox Duet and Anabat Express
5	Chris Wilkinson Batbox Duet and Anabat Express	-
6	-	Marie Pickering Batbox III and Anabat SD2

2.3.15 Based on the bat survey activity recorded during the two dawn re-entry surveys it is considered that appropriate and proportionate survey effort has been carried out to inform the feasibility of the conversion proposals and to characterise the roosts present. As identified in **Section 5.1** below, further updated surveys may be necessary to inform a Natural England licence application once planning consent has been granted.

Bird Species

2.3.16 Bird species observed and heard during the survey were recorded.

2.3.17 Habitats throughout the site and in the immediate surrounding area were assessed for their value to roosting, feeding and nesting birds, as indicated by the amount of shelter, feeding value, woody vegetation structure and species diversity of tree and shrub species in the site.

Barn Owl

2.3.18 The buildings were searched for owls, pellets, faecal splashes and feathers which may indicate use by roosting or nesting barn owl. Guidance in *The Barn Owl Conservation Handbook* (Barn Owl Trust, 2012) and *Barn Owl Tyto alba Survey Methodology and Techniques for use in Ecological Assessment. Developing Best Practice in Survey and Reporting* (Shawyer, 2011) was referred to.

Great Crested Newt

Ponds

2.3.19 In accordance with current Natural England guidance (Natural England, 2015) all ponds within an unobstructed 500 metres of a site should be considered for their suitability to support breeding great crested newts. The potential of the proposed development to impact upon any great crested newt population(s) whose breeding ponds are within 500 metres must be considered.

2.3.20 There are no ponds within the site or within an unobstructed 500 metre radius. The presence of great crested newt is reasonably discounted and no further survey effort is required to inform the proposals.

Reptile Species

2.3.21 The site and its surroundings were assessed in terms of their suitability for use by reptile species using the important characteristics for reptiles outlined in the draft document '*Reptile Mitigation Guidelines*' (Natural England, 2011), and the *Reptile Habitat Management Handbook* (Edgar, et al., 2010). These habitat characteristics are outlined below.

Table 2.4: Important Habitat Characteristics for Reptiles

1. Location (in relation to species range)	7. Connectivity to nearby good quality habitat
2. Vegetation Structure	8. Prey abundance
3. Insolation	9. Refuge opportunity
4. Aspect	10. Hibernation habitat potential
5. Topography	11. Disturbance regime
6. Surface geology	12. Egg-laying site potential

2.4 Survey and Reporting Limitations

2.4.1 Owing to the presence of rotten timbers at the first floor at the detached barn this surface was viewed from the access ladder only (various positioned used to enable a view of the entire floor). This access limitation has been addressed by the completion of the bat activity surveys.

2.4.2 All other areas of the site were accessed. No other survey limitations were experienced.

2.4.3 All measurements within this report are approximate only, and have been either estimated whilst on site or calculated using mapping software (QGIS) or internet-based mapping services such as MAGiC and Google Earth.

2.5 Evaluation Methods

2.5.1 The habitats, vegetation and animal life were evaluated with reference to standard nature conservation criteria as described in *A Nature Conservation Review* (Ratcliffe, 1977). These are size (extent), diversity, naturalness, rarity, fragility, typicality, recorded history, position in an ecological or geographical unit, potential value and intrinsic appeal.

2.5.2 Habitats have been assessed to determine whether they meet those described in *UK Biodiversity Action Plan: Priority Habitat Descriptions* (Maddock, A (ed), 2008); these lists are used to help draw up the statutory lists of Priority Habitats, as required under Section 41 of the *Natural Environment and Rural Communities* (NERC) *Act 2006*. Where suitable, the ecological value of the habitats present have been assessed using the terms outlined in *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* (CIEEM, September 2018).

2.5.3 Government advice on wildlife, as set out in the *National Planning Policy Framework* (Ministry of Housing, Communities and Local Government, February 2019) and associated government circulars has been taken into consideration. Legislation relating to protected species, such as those listed under Schedules 1, 5, 6 and 8 of the *Wildlife and Countryside Act 1981* (as amended) and *The Conservation of Habitats and Species Regulations 2017*, is referenced where applicable, and any impacts to protected species are evaluated in accordance with current guidance.

2.5.4 The presence of any Priority Species, as listed under Section 41 of the *Natural Environment and Rural Communities (NERC) Act 2006* is noted, and habitats are assessed in terms of their suitability and value for these species. The presence of species listed by the Lancashire BAP Provisional Long List has been taken into account in the evaluation of the site.

3.0 SURVEY RESULTS

3.1 Desktop Study

Designated Sites for Nature Conservation: Statutory Sites

3.1.1 There are no statutory designated sites for nature conservation within the site or immediately adjacent to the site boundary. There are no statutory designated sites for nature conservation within a radius of at least 3 kilometres from the site.

3.1.2 The site is within a Natural England Site of Special Scientific Interest (SSSI) Impact Risk Zone which requires the Local Planning Authority to consult with Natural England on likely risks from the following development categories (Ordnance Survey, 2019):

Infrastructure: Airports, helipads and other aviation proposals.

Air Pollution: Livestock & poultry units with floorspace greater than 500m², slurry lagoons greater than 4000m².

Combustion: General combustion processes greater than 50MW energy input. Including energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis / gasification, anaerobic digestion, sewage treatment works, other incineration / combustion.

3.1.3 The proposals do not involve any of these development categories.

Designated Sites for Nature Conservation: Non-statutory Sites

3.1.4 The site has no non-statutory designation for nature conservation.

3.1.5 Five Biological Heritage Sites (BHS) are located within 2 kilometres of the site, as listed below:

Table 3.1: Biological Heritage Sites (BHS) within a 2 Kilometre Radius of the Site.

Site Name and OS Grid Reference	Distance from Site	Reasons for Designation
Feazer Wood (BHS) SD 725452	255 metres	A semi-natural clough woodland, most of which is included in the Lancashire Inventory of Ancient Woodland (Provisional).
Waddington Fell and Browsholme Moor (BHS) SD 707474	1180 Metres	The moorland site is designated a BHS based on the range of plant communities present. The site is comprised of upland heath, blanket bog, upland flushes, fens and swamps which are all listed as Priority Habitats in the UK Biodiversity Action Plan. Cowberry, a species included in the Provisional Lancashire Red Data List of Vascular Plants, occurs occasionally on Waddington Fell. Common lizard occurs on the site.

Site Name and OS Grid Reference	Distance from Site	Reasons for Designation
Hospital Wood (BHS) SD 727 441	465 metres	A semi-natural clough woodland which is listed in the Lancashire Inventory of Ancient Woodland (Provisional).
Drakehouse Wood (BHS) SD 738450	1460 metres	Ancient, semi-natural woodland on the steep valley sides of Drakehouse and Brocklehurst Brooks. The wood is listed in the Lancashire Inventory of Ancient Woodland (Provisional).
Braddup Wood North (BHS) SD 700443	1820 metres	A large, semi-natural woodland occupying the steep sides of Bashall Brook. The site is included in the Lancashire Inventory of Ancient Woodland (Provisional). Wild daffodil, a species included in the Provisional Lancashire Red Data List of Vascular Plants, is present.

Protected and Notable Species

3.1.6 LERN holds no records of protected and notable species for the site. Records of protected and notable species for a 2 kilometre radius of the site are presented below.

Table 3.2: Records of Protected Species Within a 2 Kilometre Radius of the Site

Taxon Group	Species Name and Designation [1]	Notes (all measurements are approximate)
Terrestrial Mammals	Common pipistrelle (*Pipistrellus pipistrellus*) EPS, WCAs5 & LBAP	199 records, dated between 2004 and 2016, the closest of which is 1965 metres from the site.
	Brown hare (*Lepus europaeus*) S41 & LBAP	11 records, dated between 2013 and 2015, the closest of which is 810 metres from the site.
	West European hedgehog (*Erinaceus europaeus*) S41 & LBAP	6 records, dated between 2012 and 2014, the closest of which is 190 metres from the site.
Birds	*WCAs1* Kingfisher (*Alcedo atthis*). *S41 & LBAP* Cuckoo (*Cuculus canorus*), curlew (*Numenius arquata*), grasshopper warbler (*Locustella naevia*), grey partridge (*Perdix perdix*), house sparrow (*Passer domesticus*), lapwing (*Vanellus vanellus*), spotted flycatcher (*Muscicapa striata*), tree sparrow (*Passer montanus*), skylark (*Alauda arvensis*), bullfinch (*Pyrrhula pyrrhula*), dunnock (*Prunella modularis*), lesser spotted woodpecker (*Dendrocopos minor*), song thrush (*Turdus philomelos*) & starling (*Sturnus vulgaris*). *S41* Lesser redpoll (*Acanthis cabaret*). *LBAP* Grey heron (*Ardea cinerea*), kestrel (*Falco tinnunculus*), meadow pipit (*Anthus pratensis*), oystercatcher (*Haematopus ostralegus*), swift (*Apus apus*), willow tit (*Poecile montana*) & willow warbler (*Phylloscopus trochilus*).	
Bony fish	*S41 & LBAP* Atlantic salmon (*Salmo salar*), brown/sea trout (*Salmo trutta*) & European eel (*Anguilla anguilla*). *LBAP* Bullhead (*Cottus gobio*) & brown trout (*Salmo trutta subsp. fario*).	
Invertebrates	*S41 & LBAP* Small heath (*Coenonympha pamphilus*).	

Flowering Plants	*LBAP* Northern dock (*Rumex longifolius*) & American Skunk-cabbage (*Lysichiton americanus*).

[1]Key to designation codes
EPS = European Protected Species under the *Conservation of Habitats and Species Regulations 2017* (as amended)
WCAs1 = Listed on Schedule 1 of the *Wildlife and Countryside Act 1981* (as amended)
WCAs5 = Listed on Schedule 5 of the *Wildlife and Countryside Act 1981* (as amended)
WCAs8 = Listed on Schedule 8 of the *Wildlife and Countryside Act 1981* (as amended)
S41 = Priority Species listed under Section 41 of the *NERC Act* (2006)
LBAP = Lancashire Biodiversity Action Plan

3.2 Vegetation and Habitats

General Description

3.2.1 Refer to **Figures 9.1** and **9.2**. The cluster of buildings at Teewood Farm are is located to the west of Slaidburn Road approximately 1.6 kilometres to the north of Waddington.

3.2.2 Immediately west of the buildings (and attached to the attached barn) is an occupied farmhouse with associated garden. North of the farm buildings is sheep grazed semi-improved grassland. South of the site is a linear wooded copse with mature Beech trees.

3.2.3 A Phase 1 Habitat Survey map is appended at **Figure 9.2**. Photographs are appended at **Table 8.4**.

Vegetation Around the Curtilage of the Buildings

3.2.4 Refer to **Photo 1**. The hard-standing and compacted ground around the curtilage of the buildings is colonised by sparse ruderal herbs characterised by frequent and constant American Willowherb (*Epilobium ciliatum*) with frequent Yorkshire-fog (*Holcus lanatus*), locally frequent Annual Meadow-grass (*Poa annua*), Cock's-foot (*Dactylis glomerata*) and Perennial Rye-grass (*Lolium perenne*).

3.2.5 The vegetation is not characteristic of a specific NVC community. A plant species list for the vegetation is appended at **Table 8.1**.

Trees and Shrubs

3.2.6 Mature Beech (*Fagus sylvatica*) trees lie to the south of the farm buildings and a cluster of young Ash, Sycamore and Beech is present to the north of the shippon, as annotated on **Figure 9.2**.

Invasive Plant Species

3.2.7 Indian Balsam, an invasive species listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended), is locally very abundant between the eastern elevation of shippon and Slaidburn Road, refer to **Figure 9.2**.

3.3 Animal Life

Badger

3.3.1 No evidence of badger activity was found and no known records of badger were reported in the data search. The presence of badger is reasonably discounted.

Bat Species

Habitat Assessment for Commuting and Foraging Bats

3.3.2 The site is surrounded by favourable habitats for the attraction of foraging bats such as semi-improved grassland and the tree lined stream valley at Feazer Wood and Hospital Wood (300 metres to the east). The site and surrounds are assessed to be of moderate to high suitability for the attraction of foraging bats, in accordance with Table 4.1 of the *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)* (Collins, J. (ed), 2016).

Daylight Survey

Nissen Hut

3.3.3 Refer to **Photos 2** and **3**. Located to the north-west of the main cluster of farm buildings is a dilapidated nissen hut. The hut has a concrete slab base with curved corrugated sheeting walls. The southern and northern elevation walls comprise a single leaf of brick.

3.3.4 The interior of the hut is light owing to the presence of a window aperture and open doorway at the northern elevation.

3.3.5 No bats or evidence of previous use of the hut by roosting bats was detected. No crevices or potential roost features were found. The nissen hut is assessed to have negligible suitability for use by roosting bats. No further survey has been necessary at the hut.

Detached Barn

3.3.6 Refer to **Photos 4** to **12**. Immediately adjacent to Slaidburn Road is a two storey detached stone barn with a pitched slate covered roof. The stone barn is 9.5 metres long and 5.5 metres wide. The ridge is set at 6.5 metres above ground level and has a north / south alignment.

3.3.7 Internally the walls are cement pointed and painted with white wash. Examination of the first floor confirmed the absence of sarking or undertile felt; the underside of the slates are visible.

3.3.8 No bats or evidence of previous use of the detached barn by roosting bats was detected. Potential roost features observed at the detached barn comprise:

a. Frequent gaps in the stone elevation walls, particularly externally;

b. Gaps between the slates and beneath the ridge copings, particularly where sections of bedding mortar are absent, refer to **Photo 10**;

c. Gaps at the roof verge, between the wall tops and the slates, particularly at the northern elevation gable, refer to **Figure 9.2**;

d. At a gaps between the stone lintels and frames at the doorways and window apertures, particularly on the western elevation, refer to **Photo 11**; and

e. Within a large crack in the stone wall from ground level to the eaves on the southern elevation gable (south-western corner), refer to **Photo 12**.

3.3.9 Gaps around the exterior and the interior of the barn were inspected with the endoscope; no bats or droppings were detected however not all the cracks and crevices were accessible or viewable.

3.3.10 In consideration of the frequency of potential roost features and the moderate suitability of the surrounding habitats for the attraction of bats, the detached barn is assessed to be of moderate suitability for use by roosting bats, particularly crevice roosting species.

Attached Barn

3.3.11 Refer to **Photos 13** to **18**. Attached to the eastern elevation of the farmhouse is a stone barn with a pitched stone tile covered roof. Attached to the northern elevation is a single storey stone and concrete block annex with a monopitch corrugated sheet covered roof. A fascia at the eastern elevation provides gaps suitable for bat access to the crevice between the fascia and the stone wall, refer to **Photo 15**.

3.3.12 Internally the barn has cement pointed and / or white washed stone walls. A timber hayloft is present in the central area. The presence of windows and frequent skylights creates a light internal area. No undertile felt is present beneath the roof tiles.

3.3.13 No bats were found inside the barn. A single bat dropping was found on the floor of the hay loft; the dropping may have been left by a bat flying inside the barn.

3.3.14 Potential roost features observed at the attached barn comprise:

a. Frequent gaps in the external side of the stone elevation walls;

b. Gaps between the roof tiles and beneath the ridge copings, particularly where sections of bedding mortar are absent;

c. Gaps at the roof verge, between the wall tops and the stone tiles; and

d. At a crack in the stone wall beneath canopy at the barn door on the southern elevation.

3.3.15 The attached barn is assessed to be of moderate suitability for use by roosting bats, particularly crevice roosting species.

Shippon

3.3.16 Attached to the northern elevation of the attached barn is a concrete block and concrete rendered single storey shippon with hipped and pitched corrugated sheet covered roofs.

3.3.17 The shippon has metal framed windows; the majority of the glass panes are absent.

3.3.18 The internal side of the walls are painted and smooth and a timber plank at the wall plate covers any gaps or accesses to any voids at the hollow concrete block walls; no opportunities for roosting bats were found inside the shippon.

3.3.19 No bats or evidence of previous use of the detached barn by roosting bats was detected. Potential features for use by roosting bats are limited to the possible presence of gaps beneath the cement ridge copings. The shippon is assessed to be of low suitability for use by roosting bats.

Dawn Re-entry Activity Surveys

3.3.20 The raw data recorded by the surveyors and the analysis of the Anabat recordings are appended at **Tables 8.2** and **8.3**.

3.3.21 Two roosts were detected and are summarised below and annotated on **Figure 9.2**.

Table 3.3: Summary of Roosts Detected at Teewood Farm in 2018

Roost Number	Species	26th July 2018: Max. Number of Bats Detected	28th August 2018: Max. Number of Bats Detected	Roost Type[2]	Notes
1	Common pipistrelle	1	1	Day	Gap between the stone roof tiles at the west facing roof verge on the attached barn.
2	Common pipistrelle	-	1	Day	Gap at the wall top on the northern elevation gable of the detached barn.

3.3.22 At least five bat species were recorded during the surveys. The most frequent passes were common pipistrelle and soprano pipistrelle.

3.3.23 At least three noctule passes were recorded on the 28th August 2018 (at 05:26, 05:36 and 05:47).

3.3.24 Occasional brown long-eared bat and *Myotis* species passes were detected.

3.3.25 No other bat species were detected or recorded by the Anabat detectors.

Bird Species

3.3.26 Old swallow nests were found inside the detached barn and the shippon. Swallow were audible inside the shippon during the dawn bat survey on the 26th July 2018.

3.3.27 Evidence (old nests) of use of internal areas of the attached barn (south-eastern corner) and the detached barn (south-western corner) by nesting birds (possibly blackbird) were detected.

Barn Owl

3.3.28 Evidence of previous use of the north-western section of the shippon barn by roosting barn owl was confirmed by the presence of pellets and faecal splashes, refer to **Figure 9.2**.

3.3.29 Evidence of a possible, old barn owl nest (trampled pellets, faecal splashes and very old downy nestling feathers) was located at the base of a plywood hopper at the north-western section of the shippon. Closer inspection of the area at the base of the hopper was not possible; however no evidence of recent use of the nest is present.

3.3.30 No barn owl were present during the daylight survey in July 2018. No barn owl were observed using the buildings at the site during the dawn re-entry surveys.

Reptiles

3.3.31 The hard-standing and garden habitats in the curtilage surrounding the farm buildings are sub-optimal habitats for use by reptile species. There is no direct habitat connectivity between the known records of common lizard at Waddington Fell and Browsholme Moor BHS at the site. No other known records of reptile species were reported by the data search; the presence of reptile species is reasonably discounted.

[2] In accordance with Natural England's terminology / definitions available at https://www.gov.uk/government/publications/bats-apply-for-a-mitigation-licence and based on all field signs and evidence

4.0 EVALUATION AND ASSESSMENT

4.1 Description of Proposals

4.1.1 The proposals comprise the conversion of the two barns at Teewood Farm to a dwelling (main house and annex). The proposals are illustrated on John Coward Architects drawings 18103 01B (John Coward Architects, February 2019) and comprise:

a. Conversion of the attached barn to a dwelling;

b. Demolition of the nissen hut, shippon and single storey annex to the north of the attached barn;

c. Conversion of the detached barn to ancillary accommodation; and

d. Creation of an access off Slaidburn Road to the north of the buildings and landscaping works at the building curtilages to create garden habitats.

4.1.2 It is understood that no mature trees will be removed to facilitate the proposals.

4.1.3 The ecological baseline data, as evaluated below, have been used to inform the feasibility and scope of the conversion proposals and to also advise on the scope of mitigation required to comply with relevant wildlife legislation, Natural England licensing requirements, best practice guidance and relevant planning policy.

4.2 Designated Sites for Nature Conservation

4.2.1 Owing to the small scale nature of the proposals, the distance between the site and any statutory and non-statutory designated sites for nature conservation and the absence of any direct habitat or hydrological connectivity, direct and indirect adverse effects on designated sites for nature conservation as a result of the proposal are reasonably discounted.

4.3 Vegetation and Habitats

4.3.1 None of the habitats surrounding the farm buildings are representative of semi-natural habitat.

4.3.2 The site contains only common and widespread plant species and habitats that are typical of the conditions. No Priority Habitat is present at the site.

4.3.3 The mature Beech trees to the south of the barns are established and provide habitat structural diversity and opportunities for wildlife; it is understood that no mature trees will be affected by the proposals.

4.3.4 The presence of an invasive plant species (Indian Balsam) is a consideration and guidance is provided at **Section 5.3**.

4.4 Protected Species and Other Wildlife

Bats

4.4.1 Use of the barns as a maternity roost and / or a major hibernation roost of high conservation significance is reasonably discounted owing to the absence of suitable potential roost features and structure of the barns.

4.4.2 It is recognised that common and soprano pipistrelle are occasionally found individually or in low numbers in locations not typically associated with other species of hibernating bats, and may be found hibernating at features otherwise considered unsuitable. As such, the likelihood of use of the two stone barns as a minor hibernation roost has been taken into account when recommending appropriate precautionary actions during the proposed works at the site, refer to **Section 5.1**.

4.4.3 The detection of two roost positions (day roosts) used by one bat species and the possible use of the barns by bats in the hibernation season as a minor hibernation roost is a significant consideration in connection with the conversion proposals.

4.4.4 In the absence of mitigation, the conversion of the barns to residential dwellings will result in the, disturbance and possible loss of the day roosts and the possible disturbance of bats in the hibernation season. In accordance with Natural England's standing advice[3] this is a low scale of impact.

4.4.5 A bat mitigation strategy will be necessary to describe how the proposals can be achieved whilst protecting roosting bats, ensuring there is no net loss of roost opportunity at the site in the long-term and to detail how any post-development interference impacts will be avoided, refer to **Section 5.1**.

4.4.6 The works may then only be carried out under a Natural England European Protected Species Mitigation (EPSM) licence issued under Regulation 55 of *The Conservation of Habitats and Species Regulations 2017.*

Nesting Birds

4.4.7 No evidence of the recent use of the buildings at the site by nesting barn owl (listed under Schedule 1 of the *Wildlife and Countryside Act 1981* (as amended)) was detected.

4.4.8 It is advised that the use of the buildings by barn owl is monitored prior to the commencement of works. If barn owl begin to use the shippon for nesting again it is concluded that mitigation and compensatory measures in accordance with wildlife legislation and recognised conservation handbooks (namely the *Barn Owl Conservation Handbook* (Barn Owl Trust, 2012)) are feasible.

4.4.9 Use of the buildings by other nesting birds, namely swallow, is a consideration and further guidance to ensure compliance with relevant wildlife legislation and best practice is provided at **Section 5.2**.

Other Protected Species

4.4.10 Appropriate survey effort and / or assessment in accordance with standard guidance has been carried out to discount adverse effects on other relevant protected species namely badger, great crested newt and reptile species. No further survey is necessary to inform the preparation of a design / specification and a planning decision.

4.5 Consideration of Wildlife Legislation and Relevant Planning Policy

4.5.1 The proposals must adhere to wildlife legislation relating to the protected species found at the site, and to relevant planning policy.

4.5.2 All recommendations outlined at **Section 5.0** below are appropriate and proportionate to the ecological baseline, the proposed development, the geographical area, the habitats in the wider area and the wildlife detected at the site, present in the local area and likely to use the site post-construction.

[3] Available at https://www.gov.uk/guidance/bats-surveys-and-mitigation-for-development-projects#assess-the-impacts

4.5.3 In addition, opportunities to enhance the ecological interest and seek biodiversity gain have been identified, as required by the NPPF and other relevant planning documents.

5.0 MITIGATION STRATEGY, RECOMMENDATIONS AND ECOLOGICAL ENHANCEMENT

5.1 Roosting Bats

Natural England Licensing Requirements

Route of Licence Application

5.1.1 Owing to the presence of roosting bats and the protection afforded to bats and their roosts, the works at the barns that will affected the identified roosts must only be carried out under an appropriate Natural England licence granted under Regulation 55 of *The Conservation of Habitats and Species Regulations 2017* (as amended). The licence permits the disturbance of bats and the destruction bat roosts which would otherwise be an offence.

5.1.2 Based on the roosts detected, and subject to the appropriate timing of works (i.e. avoidance of the bat hibernation season), the barns are eligible to be registered under the Bat Mitigation Class Licence (BMCL). The BMCL has been issued by Natural England and permits the disturbance and capture of bats and / or damage / destruction of roost(s) of no more than three low conservation significance roosts affecting no more than three species of bats, which are present in small numbers

Three Tests

5.1.3 To achieve the licence the applicant must be able to demonstrate to Natural England that the following three tests of Regulation 55 of *The Conservation of Habitats and Species Regulations 2017* will be satisfied.

Test 1: *That the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range* [Regulation 55 (9)(b)];

Test 2: *Demonstration that the proposals for which a licence is sought are for the purposes of 'preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment'* [Regulation 55(2)(e)]; and

Test 3: *Consideration of 'There is no satisfactory alternative' including the implications of the 'do-nothing' option* [Regulation 55(9)(a)]

5.1.4 The outlined mitigation strategy below aims to demonstrate that compliance with Test 1 is achievable. Input from a planning consultant will be required in consideration of Tests 2 and 3.

Further Survey

5.1.5 An application for a Natural England licence can only be carried out once planning permission has been obtained and all wildlife-related conditions have been discharged. In addition, an application must typically be based on data from the most recent survey season; prior to a Natural England licence application it will be necessary to supplement the 2018 survey with updated survey data.

Mitigation Strategy: Bat Roosts

Introduction

5.1.6 This outline mitigation strategy draws on the following available information:

a. Natural England guidance;

b. Information presented in the *BCT Mitigation Conference Proceedings* (BCT, January 2017) and the *Mitigation Case Studies Forum* (BCT, January 2017);

c. Implemented and monitored activities / specifications carried out by ERAP (Consultant Ecologists) Ltd at other sites / properties; and

d. Information presented on the 'Roost' website provided by the Bat Conservation Trust.

5.1.7 The main consideration at this stage is related to how the bats and their roosts can be accommodated at the barns in the presence of the conversion proposals. The paragraphs below outline the minimum requirements (in accordance with Natural England guidance as specified in the *Bat Mitigation Guidelines* (Mitchell-Jones, 2004)) to be accommodated at the barns to appropriately mitigate any impacts on bats and their roosts.

Toolbox Talk

5.1.8 Prior to the commencement of works the licensed ecologist will inform all contractors of the following:

a. The wildlife legislation and protection afforded to bats and their roosts;

b. The presence of the licence and the associated method statement and the need to abide by the content;

c. The licensable actions;

d. Good working practices;

e. The presence of the any provisions for roosting bats installed in advance of the works and the need for them to remain undisturbed;

f. The protocol to be followed if a bat is discovered when the licensed ecologist is not on site; and

g. An outline of the proposals and timescales.

Provisions for Roosting Bats Throughout Works

5.1.9 Prior to the commencement of works and to ensure a suitable feature is present at the site to receive any bats found during the works, two bat boxes will be installed on the Beech trees to the south of the farm, refer to **Insert 1**.

Insert 1: Example of commercially available bat box: Greenwood's Ecohabitats two crevice box (available from http://www.greenwoodsecohabitats.co.uk/shop)

Timing of Works

5.1.10 Due to the absence of a maternity roost at the barns and the suitability of the building for use by hibernating bats (minor roost), it is considered that the commencement of works that may affect features used by bats in the hibernation season should be scheduled to avoid the hibernation season (i.e. no works that could affect a feature used by hibernating bats to be commenced between November and March inclusive, unless otherwise agreed by the licensed ecologist and the local planning authority).

5.1.11 This statement / condition may permit some works, such as creation of the access track, demolition of the shippon and nissen hut and construction of the extensions to be carried out in the winter months.

Roosts 1 and 2: Capture and Exclusion

5.1.12 The conversion works are likely to involve the loss of Roosts 1 and 2 during works to re-roof / point the stonework.

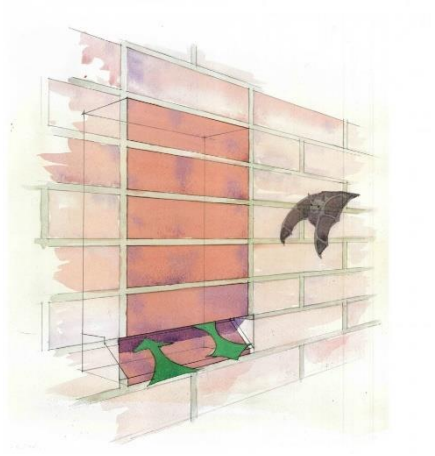
5.1.13 The licensed ecologist must be present during the careful removal / soft strip of the roof coverings in the vicinity of Roosts 1 and 2 and all other features with suitability for use by roosting bats. Roof tiles / slates and ridge copings must be lifted (rather than slid) and the underside of the roof covering will be checked for bats prior to discard / stacking.

5.1.14 If a bat is present or found the Registered Consultant will carefully collect the bat (using a hand held static net or by direct handling), place the bat in an appropriate container and transfer the bat(s) to the bat box.

Roost Re-creation

5.1.15 As the stone tiles and slates will be replaced at the converted barns it is concluded that opportunities for bat access between the roof tiles /slates will be reinstated. To avoid any risk of bat entanglement it is mandatory that the roof voids at the converted barns are lined with hessian backed bitumastic undertile felt (Type 1F); breathable roofing membranes will not be approved by Natural England.

5.1.16 Alternatively bat boxes or bat access panels could be installed beneath the eaves at the elevations of the converted barns. Suitable products comprise the externally mounted box shown at **Insert 1** or an integral box should as that shown below.



Insert 2: Example of an integral bat box. The outer leaf can be clad to match the stone elevations (available from http://www.habibat.co.uk)

Demolition of the Shippon

5.1.17 The demolition of the shippon can be carried out at any time of year (subject to the absence of nesting swallow). It is recommended that the ridge copings are lifted carefully by hand.

Plans and Works Schedule

5.1.18 Once the final proposals plans have been prepared and agreed a Bat Mitigation Strategy Plan will be prepared. The Plan will be accompanied by a Work Schedule to demonstrate the feasibility of the Strategy.

Mechanism for Ensuring Implementation / Success

5.1.19 If the licensed ecologist has any concerns regarding the quality of workmanship or there is non-compliance with the Natural England licence, the Mitigation Strategy and / or guidance provided by the licensed ecologist then this will result in additional site visits to make inspections.

5.1.20 It is always the intention to ensure all parties are aware of the importance of the Natural England licence and compliance with the Mitigation Strategy and this is achieved through good communication. However in extreme / significant cases of non-compliance the licensed bat surveyor will report the issue to Natural England and further action may be taken.

Post-development Interference Impacts and Mitigation

5.1.21 Post-development interference impacts may occur as a result from the disturbance of the bat roosts (and bird nests) by residents at the converted property. The risk of impacts will be minimised by providing guidance to the new residents at the property in relation to the presence of bats and birds, the protection afforded to bats and their roosts and nesting birds.

Artificial Lighting Impacts and Mitigation

5.1.22 Paragraph 180, bullet point 'c' in Chapter 15 (conserving and enhancing the natural environment) of the National Planning Policy Framework (NPPF) states that development should:

'limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.'

5.1.23 Any lighting scheme to be implemented at the converted barns must involve the use of appropriate products and screening, where necessary, to ensure no excessive artificial lighting shines over the roosting provisions, provisions for barn owl (if relevant) and any landscape planting, as lighting overspill may deter use by wildlife such as foraging bats.

5.1.24 The lighting scheme will be designed with reference to current guidance, namely:

a. Guidance Note 08/18. *Bats and Artificial Lighting in the UK*. Bats and Built Environment series.(Bat Conservation Trust and Institution of Lighting Professionals, 2018); and

b. Bats and lighting: Overview of current evidence and mitigation guidance (Stone, 2014).

Monitoring

5.1.25 There is no post-construction monitoring requirement under a BMCL.

5.2 Mitigation and Enhancement Strategy: Nesting Birds

Legal Protections

5.2.1 All wild birds are protected under the *Wildlife and Countryside Act 1981* (as amended) while they are breeding. It is an offence to kill, injure or take any wild bird, take damage or destroy the nest for any wild bird whilst the nest is in use or being built and take or destroy the egg or any wild bird.

5.2.2 Barn owl is listed on Schedule 1 of the *Wildlife and Countryside Act 1981* (as amended) and therefore they are also protected against disturbance whilst nesting. It is an offence to intentionally or recklessly disturb any wild bird included on Schedule 1 while it is building a nest or is in, on or near a nest containing eggs or young and disturb dependent young of such a bird.

Mitigation Strategy: Barn Owl

Monitoring

5.2.3 There is no evidence of recent use of the site by nesting barn owl; use by roosting barn owl is confirmed.

5.2.4 It is advised that the use of the buildings by barn owl is monitored prior to the commencement of works. If barn owl begin to use the shippon for nesting again it is concluded that mitigation and compensatory measures in accordance with wildlife legislation and recognised conservation handbooks (namely the *Barn Owl Conservation Handbook* (Barn Owl Trust, 2012)) are feasible and may comprise installation of a barn owl box within the curtilage of the site.

Mitigation Strategy: Swallow

5.2.5 Conversion of the buildings will result in the loss of opportunities for use by nesting swallow.

5.2.6 To avoid delays to the commencement of demolition, particularly at the shippon, provided the barn owl surveys have confirmed continued absence, it is feasible to board the apertures to exclude swallow access to the shippon. The exclusion must only be carried out between October and March inclusive, unless it is demonstrated that swallow are absent at other times of year.

5.2.7 It may be feasible to accommodate provisions for nesting swallow at a timber outbuilding / shed at the developed site (i.e. positioned to the north with open access to the wider countryside). Provisions may comprise the installation of swallow nest cups (available from www.NHBS.com) beneath a canopy or by

hammering large flat headed nails that are proud of the timber ridge board to provide swallow with an anchor point to build their nests.

5.3 Invasive Plant Species

5.3.1 It is an offence under the *Wildlife and Countryside Act 1981 (as amended)* to spread or to cause the spread of Indian Balsam in the wild.

5.3.2 To ensure all contractors are appropriately advised of the protocol and biosecurity measures to be applied in relation to an invasive plant species it is recommended that an Invasive Plant Species Management Plan is prepared. At this site, owing to the restricted distribution of the plants the following measures are advised:

a. To prevent further seed production the Indian Balsam plants must be cut down at ground level in the growing season (i.e. from May and definitely *before* the plants flower). The individual plants can be hand pulled whereas a larger areas can be cut with the use of hand tools. Hand pulled or cut plants must be physically destroyed and plant material may be piled within the site and allowed to wilt and die;

b. Hand pulling / cutting over a period of two – three growing seasons is typically sufficient to eradicate or effectively manage the plants. If this is not appropriate then treatment with an approved herbicide (e.g. 2,4-D Amine or Glyphosate) prepared to the correct formulation and in accordance with the suppliers instructions can be applied before the plants flower.

5.4 Protection of Existing Trees and Landscape Planting

Protection of Trees

5.4.1 During the construction phase, temporary protective demarcation fencing will be used to protect the trees and shrubs to be retained. The fencing must extend outside the canopy of the retained trees and must remain in position until all areas have been developed to ensure protection is provided throughout the construction phase.

5.4.2 The fencing will be in accordance with BS5837:2012 Trees in Relation to Design, Demolition and Construction: Recommendations (BSI, 2012).

Landscape Planting

5.4.3 Any landscape planting associated with the conversion provides an opportunity to enhance the value of the site for feeding bats, birds and invertebrates with the use of native species and species known to be of value for the attraction of wildlife. Suitable tree and shrub species are presented at **Table 5.1** and suitable plant species for the attraction of wildlife within a garden habitat are detailed at **Table 5.2**.

Table 5.1: Suitable Native Species for Tree and Shrub Planting

Scientific Name	Common Name	Scientific Name	Common Name
Acer campestre	Field Maple	*Prunus spinosa*	Blackthorn
Corylus avellana	Hazel	*Rosa arvensis*	Field Rose
Crataegus monogyna	Hawthorn	*Rosa canina*	Dog-rose
Ilex aquifolium	Holly	*Sambucus nigra*	Elder
Malus sylvestris	Crab Apple	*Sorbus aucuparia*	Rowan
Prunus avium	Wild Cherry	*Ulmus glabra*	Wych Elm
Prunus padus	Bird Cherry	*Viburnum opulus*	Guelder Rose

Table 5.2: Recommended Plants For Use in Gardens to Attract Bats[4]

Flowers for Borders		Herbs
Aubretia (spring to early summer)	Mexican aster (summer to autumn)	Angelica
Candytuft (summer to autumn)	Michaelmas daisy	Bergamot (summer to early autumn)
Cherry pie (summer to autumn)	Night-scented stock (summer)	Borage (spring to early autumn)
Corncockle	Ox-eye daisy (summer)	Coriander (summer)
Cornflower	Phacelia (summer to autumn)	English marigolds
Corn marigold	Poached egg plant (summer)	Fennel (summer to early autumn)
Corn poppy	Primrose (spring)	Feverfew (summer to autumn)
Echinacea	Red campion (spring)	Hyssop (summer to early autumn)
English Bluebell (spring)	Red valerian	Lavenders
Evening primrose	Scabious (summer)	Lemon balm
Field poppies (summer)	St John's wort (spring)	Marjoram (summer)
Honesty (spring)	Sweet William (summer)	Rosemary (spring)
Ice plant 'Pink lady' (early autumn)	Tobacco plant	Sweet Cicely
Knapweed (summer to autumn)	Verbena (summer to autumn)	Thyme (summer)
Mallow (summer to autumn)	Wallflowers	

6.0 CONCLUSION

6.1 The conversion proposals at Teewood Farm must take into consideration the requirement to accommodate crevice roosting bat species and nesting birds.

6.2 As described in this report, appropriate and proportionate measures for the protection of and mitigation / compensation for roosting bats (including licensing requirements) and nesting birds can be implemented as part of the proposals. The conversion proposals at Teewood Farm can be achieved in accordance with Natural England guidance, wildlife legislation, relevant planning policy and best practice.

6.3 Measures to achieve a net gain for biodiversity to achieve compliance with the NPPF are feasible and outlined in **Section 5.0**.

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[4] Extracted from *Encouraging bats, A guide for bat-friendly gardening and living* (Bat Conservation Trust, August 2015)

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8.0 APPENDIX 1: TABLES

Table 8.1: Plant Species List for the Vegetation Around the Curtilage of the Buildings

Scientific Name	Common Name	DAFOR[1]	% Cover
Woody Species			
Acer pseudoplatanus	Sycamore	O	<1%
Fagus sylvatica	Beech	LF	2%
Fraxinus excelsior	Ash	R	<1%
Herb Species			
Alliaria petiolata	Garlic Mustard	VLA	<1%
Arrhenatherum elatius	False Oat-grass	VLA	1%
Cerastium fontanum	Common Mouse-ear	O	<1%
Dactylis glomerata	Cock's-foot	LF	1%
Epilobium ciliatum	American Willowherb	F*	1%
Geranium robertianum	Herb Robert	VLF	<1%
Hedera helix	Ivy	VLA	<!%
Heracleum sphondylium	Common Hogweed	O	<1%
Holcus lanatus	Yorkshire-fog	F	1%
Impatiens glandulifera	Indian Balsam	VLF	<1%
Lolium perenne	Perennial Rye-grass	LF	1%
Myosotis sp.	Forget-me-not species	VLF	<1%
Plantago major	Greater Plantain	R	<1%
Poa annua	Annual Meadow-grass	VL	<1%
Poa trivialis	Rough Meadow-grass	LF	<1%
Ranunculus repens	Creeping Buttercup	VLF	<1%
Rumex conglomeratus	Clustered Dock	O	<1%
Sonchus oleraceus	Smooth Sow-thistle	R	<1%
Tanacetum parthenium	Feverfew	R	<1%
Taraxacum officinale agg.	Dandelion	O	<1%
Trifolium repens	White Clover	VLF	<1%
Urtica dioica	Common Nettle	VLF	<1%

[1]**Key to DAFOR:** D=Dominant, A=Abundant, F=Frequent, O=Occasional, R=Rare, V=Very, L=Local and *denotes a constant species

Table 8.2: Activity Survey 1, Date: 26th July 2018, Sunrise time: 05:11 Start time: 03:25

Note: All bats are individuals (i.e. one bat) unless otherwise stated. Only observed bat activity has been listed in the notes

Surveyor Position 1: Danielle Rowlands

Time	Species	Notes
03:51	Common pipistrelle	Brief pass
03:53	Soprano pipistrelle	Brief pass
03:59	*Myotis* species	Pass
04:03	Common pipistrelle	Heard not seen
04:06	Bat	Heard not seen
04:10	Common pipistrelle	Pass
04:11	Common pipistrelle	Pass
04:20	Common pipistrelle	Pass
04:24	Common pipistrelle	Pass
04:25	Common pipistrelle	Pass
04:26	Common pipistrelle	Pass
04:34	Common pipistrelle	Pass
04:36	Common pipistrelle	Pass
04:48	Common pipistrelle	Pass
05:15 (end)	-	**No bat emergence or re-entry activity**
The Anabat Express recorded: 1 *Myotis* pass at 04:00; 3 common pipistrelle passes at 04:03, 04:20 and 04:25; and 11 soprano pipistrelle passes between 03:36 and 04:26.		

Surveyor Position 2: Victoria Burrows

Time	Species	Notes
03:50	Common pipistrelle	Pass
03:52	Soprano pipistrelle	Brief pass
03:57	*Myotis* species	Pass
04:10	Common pipistrelle	Pass
04:11	*Myotis* species	Two bats flying over yard
04:32	Soprano pipistrelle	**Entry into gap at roof verge on west elevation of barn [Roost 1]**
04:48	Common pipistrelle	Two bats commuting over site, left site and headed north along Slaidburn Road
05:15 (end)	-	
The Anabat Express recorded: 1 *Myotis* passes at 03:57 and 04:11. 12 common pipistrelle passes between 03:45 and 04:48; and 19 soprano pipistrelle passes between 03:36 and 04:37. The Anabat SD2 recorded: 1 *Myotis* pass at 04:07; 17 common pipistrelle passes between 03:35 and 04:49; and 21 soprano pipistrelle passes between 03:36 and 04:38.		

Surveyor Position 3: Carol Flaxman

Time	Species	Notes
04:09	Common pipistrelle	Entered building from above timber doorway on southern elevation and flew around inside then left via gap at the top of the timber door on the southern elevation.
05:15 (end)	-	**No bat re-entry activity**
The Anabat Express recorded: 1 common pipistrelle pass (in clutter) at 04:09 and 04:10.		

Surveyor Position 4: Chris Walsh

Time	Species	Notes
03:50	Common pipistrelle	Heard not seen
03:55	Common pipistrelle	Heard not seen
04:03	Common pipistrelle	Heard not seen
04:07	Common pipistrelle	Heard not seen
04:11	Common pipistrelle	Heard not seen
04:13	Common pipistrelle	Flew northwards along Slaidburn Road
04:16	Common pipistrelle	Flew across yard
04:19	Common pipistrelle	Heard not seen
04:24	Common pipistrelle	Flew northwards along Slaidburn Road
04:31	Common pipistrelle	Heard not seen
04:34	Common pipistrelle	Heard not seen
04:48	Common pipistrelle	Flew northwards along Slaidburn Road
05:15 (end)	-	**No bat emergence or re-entry activity**
The Anabat Express recorded: 1 *Myotis* pass at 03:38; 13 common pipistrelle passes between 03:35 and 04:48; and 11 soprano pipistrelle passes between 03:35 and 04:17.		

Surveyor Position 5: Chris Wilkinson

Time	Species	Notes
03:44	N/k	Brief pass
03:57	Common pipistrelle	Pass
04:17	Common pipistrelle	Pass
04:18	Soprano pipistrelle	Pass over yard
04:20	Common pipistrelle	Pass over yard
05:15 (end)	-	
The Anabat Express recorded: 2 brown long-eared passes at 03:45 and 03:56; 1 *Myotis* pass at 03:38; 4 common pipistrelle passes between 03:44 and 04:20; and 8 soprano pipistrelle passes between 03:35 and 04:40.		

Table 8.3: Activity Survey 2, Date: 28th August 2018, Sunrise time: 06:10 Start time: 04:20

Surveyor Position 1: Danielle Rowlands

Time	Species	Notes
04:29	Common pipistrelle	Brief pass
04:33	Common pipistrelle	Heard not seen
04:35	Soprano pipistrelle	Pass
04:39	Soprano pipistrelle	Pass
04:46	Soprano pipistrelle	Pass
04:48	Soprano pipistrelle	Pass
04:52	Soprano pipistrelle	Pass
04:53	Soprano pipistrelle	Pass
05:05	Common pipistrelle	Heard not seen
05:07	Common pipistrelle	Heard not seen
05:18	Soprano pipistrelle	Pass
05:21	U/k	Heard not seen
05:22	Common pipistrelle	Brief pass
05:23	Common pipistrelle	Brief pass
05:25	Common pipistrelle	Brief pass
05:28	Common pipistrelle	Brief pass
05:31	Common pipistrelle	Pass
05:33	Common pipistrelle	Pass
05:35	Common pipistrelle	Brief pass
05:37	Common pipistrelle	Two bats
05:41	Common pipistrelle	Two bats circling over detached barn
05:44	Common pipistrelle	Two bats circling over detached barn before flying out of site (toward the north-west)
05:30	Common pipistrelle	Brief pass
06:10 (end)		**No bat emergence or re-entry activity**
The Anabat SD2 recorded: 1 *Myotis* pass at 04:49; 1 noctule pass at 05:26; 16 common pipistrelle passes between 04:20 and 05:42; and 35 soprano pipistrelle passes between 04:25 and 05:49.		

Surveyor Position 2: Amy Sharples

Time	Species	Notes
04:33	Pipistrelle	Social calls
04:36	Pipistrelle	Social calls
04:39	Pipistrelle	Social calls
04:47	Pipistrelle	Social calls
04:49	Pipistrelle	Social calls
04:53	Common pipistrelle	Pass
05:17	Common pipistrelle	Brief pass
05:21	Common pipistrelle	Brief pass
05:26	Noctule	Pass
05:27	Common pipistrelle	Flying over yard until 05:30
05:30	Common pipistrelle	**Entered Roost 1**
05:35	Common pipistrelle	Flying over farmhouse
05:42	Common pipistrelle	Flew over detached barn and left site
05:53	Common pipistrelle	Heard not seen
05:47	Common pipistrelle	Pass
05:48 to 05:20	Common pipistrelle	Feeding around trees to the south
06:10 (end)		
The Anabat Express recorded: 2 noctule passes at 05:26 and 05:47; 9 common pipistrelle pass at 05:22 and 05:42; and 26 soprano pipistrelle passes at 04:24 and 05:49.		

Surveyor Position 3: Carol Flaxman

Time	Species	Notes
05:02	Common pipistrelle	Flying inside building; observed leaving over top of timber doorway.
06:10 (end)	-	**No bat re-entry activity**
The Anabat Express recorded: 1 common pipistrelle pass (in clutter) at 05:02.		

Surveyor Position 4: Aidan Pickering

Time	Species	Notes
04:39	Soprano pipistrelle	Brief pass
05:07	Common pipistrelle	Heard not seen
05:16	U/K	Pass
05:26	Noctule	Pass
05:27	Common pipistrelle	Pass
05:41	Common pipistrelle	Pass
06:10 (end)	-	**No bat emergence or re-entry activity**
The Anabat Express recorded: 4 brown long-eared passes at 03:35 and 04:50; 1 *Myotis* pass at 04:51; 2 noctule passes at 05:26 and 05:47; 3 common pipistrelle passes at 04:34, 05:28 and 05:42; and 4 soprano pipistrelle passes between 04:39 and 05:37.		

Surveyor Position 5: Marie Pickering

Time	Species	Notes
04:20	Common pipistrelle	Heard not seen
04:33	Soprano pipistrelle	Pass
04:35	Soprano pipistrelle	Pass
04:46	Soprano pipistrelle	Pass
04:49	Soprano pipistrelle	Pass
04:52	Soprano pipistrelle	Pass
05:06	Soprano pipistrelle	Pass
05:17	Soprano pipistrelle	Pass
05:21	Common pipistrelle	Pass
05:23	Common pipistrelle	**One bat entered gap at wall top at the northern elevation gable of the detached barn [Roost 2]**
05:26	Noctule	Pass
06:10 (end)	-	
The Anabat SD2 recorded: 3 *Myotis* passes at 04:22, 04:52 and 05:07; 2 noctule passes at 05:26 and 05:36; 16 common pipistrelle passes between 04:23 and 05:42; and 42 soprano pipistrelle passes between 04:25 and 05:49.		

Table 8.4: Table of Photographs

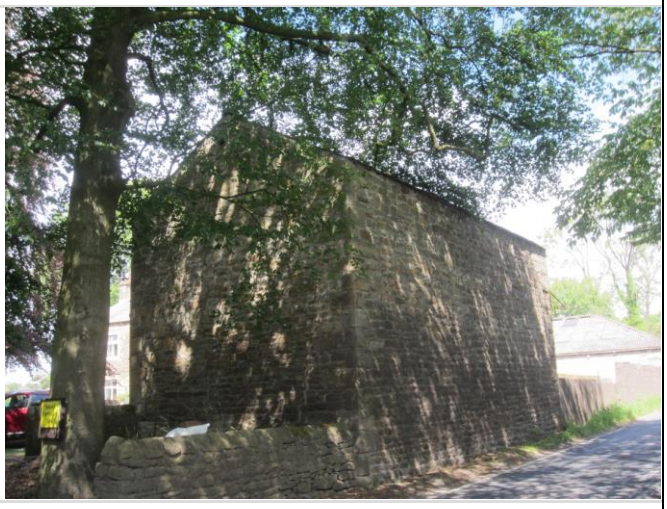
	
Photo 1: Young trees and ruderal herbs to the north of the shippon	**Photo 2:** Northern elevation of the nissen hut
	
Photo 3: Interior of the nissen hut	**Photo 4:** West elevation of the detached barn
	
Photo 5: Northern and western elevations of the detached barn	**Photo 6:** Southern and eastern elevations of the detached barn, adjacent mature Beech tree and Slaidburn Road

Photo 7: Interior of first floor of detached barn showing light internal area owing to the presence of skylights

Photo 8: Well pointed internal walls at the first floor of the detached barn

Photo 9: White washed walls at ground level at the detached barn

Photo 10: Gaps beneath the ridge copings and between the slates at the detached barn

Photo 11: Gaps around the stone window frames at the detached barn

Photo 12: Large crack in the stonework at the southern elevation of the detached barn

Photo 13: Southern elevation of the attached barn

Photo 14: Southern and eastern elevations of the attached barn

Photo 15: Cement sheet fascia at the eastern elevation of the monopitch / lean-to at the northern elevation of the attached barn

Photo 16: Interior of the attached barn showing the light internal area owing to the presence of skylights (the newer bricks are part of the farmhouse).

Photo 17: Interior of the attached barn

Photo 18: Surface of the hayloft at the attached barn

Photo 19: Eastern and northern elevations of the shippon (detached and attached barns in the background)

Photo 20: Northern and western elevations of the shippon

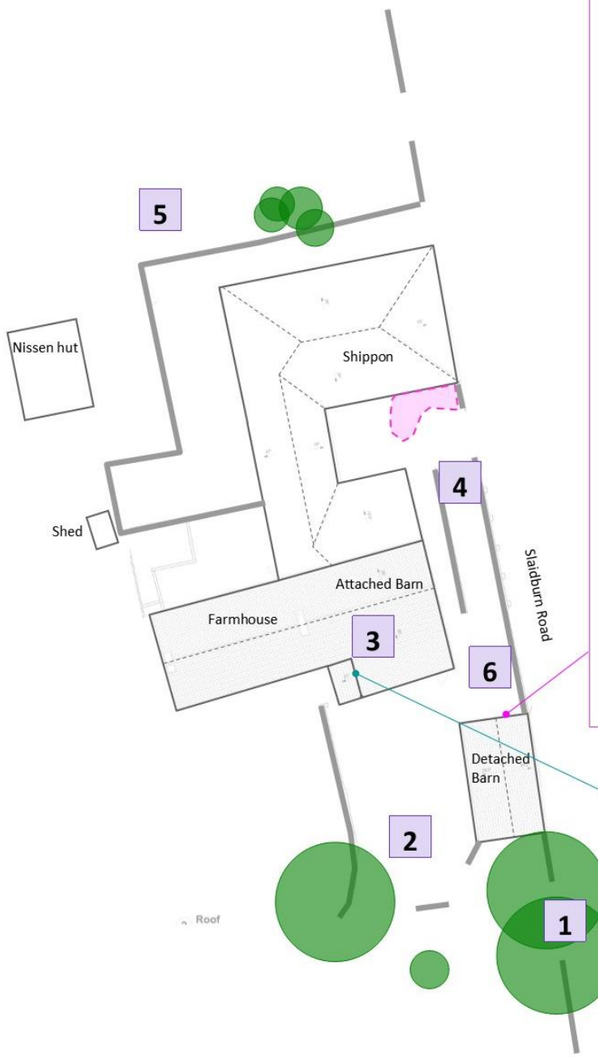
Photo 21: Interior of the shippon

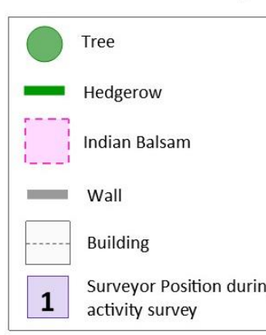
Photo 22: Interior of the shippon showing the timber plank at the wall top

9.0 APPENDIX 2: FIGURES

Figure 9.1: **Google Earth Image to Show Site and Surrounds**

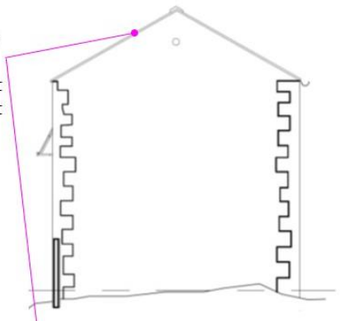
Figure 9.2: Plan to Show Results of Licensed Bat and Bird Survey 2018





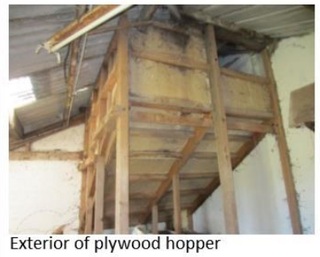
ROOST 2: NORTHERN ELEVATION OF DETACHED BARN

Roost 2: Common pipistrelle day roost (1 bat) entered gap at the wall top at the northern elevation.

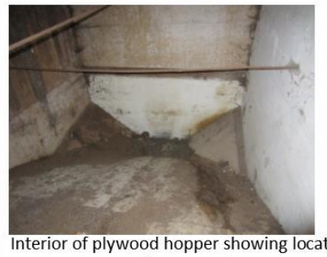


INTERIOR OF ATTACHED BARN AND SHIPPON AND BIRD SURVEY RESULTS

Old Barn Owl Nest (likely) inside the disused plywood hopper at the north-western corner of the shippon

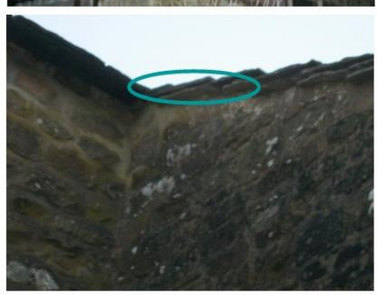


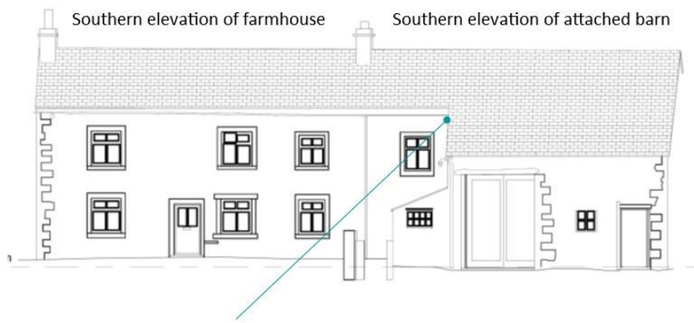
Exterior of plywood hopper



Interior of plywood hopper showing location of possible old nest (pellets and faecal splashes)

ROOST 1: ATTACHED BARN





Roost 1: Common pipistrelle day roost (max. 1 bat) entered gap at roof verge between the roof tiles at the western elevation .

Elevation drawings extracted from Drawing D2R-TWF-RT-03 prepared by d2r survey

Project Name: Teewood Farm, Slaidburn Road, Waddington BB7 3JJ		
Title: Plan to Show Results of Licensed Bat and Bird Survey 2018		
Scale: See scale bars	**Drawing No.** Figure 9.2	**Date:** April 2019
Central Grid Ref: SD 72218 45467	**Reference No.** ERAP Ltd 2018-105c	
Version: 1 (VB) 27.04.19		

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