

Betty Barn, Slaidburn Road, Waddington BB7 3JQ

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

April 2019

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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	10 th July 2018
Dawn activity surveys	Aidan Pickering and Marie Pickering	26 th July 2018
	Aidan Pickering and Marie Pickering	26 th August 2018
Reporting	Personnel	Date
Author	Victoria Burrows B.Sc. (Hons) M.Sc. CEnv MCIEEM Principal Ecologist	27 th April 2019
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Revised and issued by	Victoria Burrows	29 th April 2019
Report issued to	G and M Fisher c/o Mr Charlie Yorke / Steven Abbott Associates	
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SUMMARY

Introduction and Scope

- i. This ecological survey and assessment has been prepared for Betty Barn and curtilage off Slaidburn Road, Waddington. The assessment was requested in connection with proposals to convert the barn to a dwelling involving the construction of a new access track from Slaidburn Road.
- 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 a stone barn with a stone tile covered roof. The barn is bordered by stone walls and sheep and cattle grazed semi-improved and improved grassland.

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 surrounding the barn or along the route of the proposed access track are semi-natural habitat or are Priority Habitat. The site contains only common and widespread plant species. All trees surrounding the barn 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 barn is assessed to be of moderate to high suitability for use by roosting bats and is a confirmed roost. Three common pipistrelle day roosts (one bat at each roost) were detected (Roosts 1 to 3). It is also considered that the barn may be used as a minor hibernation roost during the hibernation season. In the absence of mitigation the conversion will result in the disturbance and 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 barn is used by nesting and roosting barn owl (listed under Schedule 1 of the *Wildlife and Countryside Act 1981* (as amended)). Mitigation and compensatory measures will be necessary as part of any proposal to convert the barn. Further information is presented at **Section 5.2**.
- x. 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

- xi. 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.
- xii. 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 Betty Barn can be achieved in accordance with Natural England guidance, wildlife legislation, relevant planning policy and best practice.
- xiii. 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 Betty Barn off Slaidburn Road, Waddington, hereafter referred to as the 'site'. The Ordnance Survey (OS) grid reference at the centre of the site is SD 72377 44382. 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 barn to a residential property.

1.2 Scope of Works

- 1.2.1 The scope of ecological works comprised:
- A desktop study and data search for known ecological information at the site and the local area;
 - An Extended Phase 1 Habitat Survey and assessment of the barn and its curtilage;
 - 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;
 - A licensed bat and barn owl survey and assessment of the barn;
 - 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
 - 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:
- MAGiC: A web-based interactive map which brings together geographic information on key environmental schemes and designations, including details of statutory nature conservation sites;
 - Lancashire Environment Record Network (LERN); and
 - 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 17°C at 08:30. 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 site boundary.
- 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 barn 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 barn 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 barn (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 barn and characterising any detected roosts.

2.3.12 Two surveyors, experienced in conducting bat surveys, were positioned at suitable locations to maximise the coverage of the barn (including the interior) to determine any entry into or exit from the barn 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 units¹ 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	26 th July 2018	26 th August 2018
Sunrise	05:11	06:06
Start time	03:25	04:10
End time	05:15	06:08
Wind	Beaufort 2 (light breeze)	Beaufort 0 (calm)
Precipitation	Dry	Dry
Air temperatures	14°C	10°C
Surveyor Position	Surveyor and Detector	Surveyor and Detector
1	Aidan Pickering Batbox Duet and Anabat SD2	Aidan Pickering Batbox Duet and Anabat Express
2	Marie Pickering Anabat Walkabout and Anabat Express	Marie Pickering Anabat Walkabout and Anabat Express

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 barn was searched for 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 All areas of the site were accessed. No survey limitations were experienced.
- 2.4.2 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 2.2 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
Hospital Wood (BHS) SD 727 441	285 metres	A semi-natural clough woodland which is listed in the Lancashire Inventory of Ancient Woodland (Provisional).
Feazer Wood (BHS) SD 725 452	775 metres	A semi-natural clough woodland, most of which is included in the Lancashire Inventory of Ancient Woodland (Provisional).
Waddington Brickworks Old Workings (BHS) SD 738 439	1425 metres	The site was designated a BHS based on the quality of artificial habitats present. The site is comprised of old workings colonised by species-rich, semi-natural neutral grassland and used as pasture.
Drakehouse Wood (BHS) SD 738 450	1540 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).

Site Name and OS Grid Reference	Distance from Site	Reasons for Designation
Cross Lane Roadside Verges (BHS) SD 704 441	1750 metres	Species-rich roadside verges with an associated ditch along Cross Lane. The site is notable for the presence of Green Figwort which is listed as Sensitive in the Provisional Lancashire Red Data List of Vascular Plants.

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 km 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	Daubenton's bat (<i>Myotis daubentonii</i>) EPS, WCAs5 & LBAP	1 roost record, dated 2009 located 1185 metres from the site.
	Common pipistrelle (<i>Pipistrellus pipistrellus</i>) EPS, WCAs5 & LBAP	199 records, dated between 2004 and 2016, the closest of which is 970 metres from the site.
	Brown hare (<i>Lepus europaeus</i>) S41 & LBAP	11 records, dated between 2013 and 2015, the closest of which is 405 metres from the site.
	West European hedgehog (<i>Erinaceus europaeus</i>) S41 & LBAP	6 records, dated between 2012 and 2014, the closest of which is 900 metres from the site.
Birds	<p>WCAs1 Kingfisher (<i>Alcedo atthis</i>).</p> <p>S41 & LBAP Cuckoo (<i>Cuculus canorus</i>), curlew (<i>Numenius arquata</i>), grasshopper warbler (<i>Locustella naevia</i>), grey partridge (<i>Perdix perdix</i>), house sparrow (<i>Passer domesticus</i>), lapwing (<i>Vanellus vanellus</i>), spotted flycatcher (<i>Muscicapa striata</i>), tree sparrow (<i>Passer montanus</i>), skylark (<i>Alauda arvensis</i>), bullfinch (<i>Pyrrhula pyrrhula</i>), dunnock (<i>Prunella modularis</i>), lesser spotted woodpecker (<i>Dendrocopos minor</i>), song thrush (<i>Turdus philomelos</i>) & starling (<i>Sturnus vulgaris</i>).</p> <p>S41 Lesser redpoll (<i>Acanthis cabaret</i>).</p> <p>LBAP Grey heron (<i>Ardea cinerea</i>), kestrel (<i>Falco tinnunculus</i>), meadow pipit (<i>Anthus pratensis</i>), oystercatcher (<i>Haematopus ostralegus</i>), swift (<i>Apus apus</i>), willow tit (<i>Poecile montana</i>) & willow warbler (<i>Phylloscopus trochilus</i>).</p>	

Taxon Group	Species Name and Designation ¹	Notes (all measurements are approximate)
Bony fish	<i>S41 & LBAP</i> Atlantic salmon (<i>Salmo salar</i>), brown/sea trout (<i>Salmo trutta</i>) & european eel (<i>Anguilla anguilla</i>). <i>LBAP</i> Bullhead (<i>Cottus gobio</i>) & brown trout (<i>Salmo trutta subsp. fario</i>).	
Invertebrates	<i>S41 & LBAP</i> Small heath (<i>Coenonympha pamphilus</i>).	
Flowering Plants	<i>LBAP</i> Northern dock (<i>Rumex longifolius</i>) & American Skunk-cabbage (<i>Lysichiton americanus</i>).	
¹ Key to designation codes EPS = European Protected Species under the <i>Conservation of Habitats and Species Regulations 2017</i> (as amended) WCAs1 = Listed on Schedule 1 of the <i>Wildlife and Countryside Act 1981</i> (as amended) WCAs5 = Listed on Schedule 5 of the <i>Wildlife and Countryside Act 1981</i> (as amended) WCAs8 = Listed on Schedule 8 of the <i>Wildlife and Countryside Act 1981</i> (as amended) S41 = Priority Species listed under Section 41 of the <i>NERC Act (2006)</i> LBAP = Lancashire Biodiversity Action Plan		

3.2 Vegetation and Habitats

General Description

- 3.2.1 Refer to **Figures 9.1** and **9.2**. The barn is located to the west of Slaidburn Road approximately 700 metres to the north of Waddington. Betty Barn is a traditionally constructed stone built agricultural barn with a sandstone slab roof.
- 3.2.2 Land surrounding the barn comprises sheep grazed semi-improved grassland. Immediately east of the barn within a stone / concrete block wall enclosure is an area of unmanaged tall-herb vegetation with self-seeded tree saplings. A dry stone wall and timber fence lined track lies immediately north of the barn. Where the access track meets Slaidburn Road are mature Sycamore (*Acer pseudoplatanus*) trees and a Hawthorn (*Crataegus monogyna*) hedgerow.
- 3.2.3 A Phase 1 Habitat Survey map is appended at **Figure 9.2**. Photographs are appended at **Table 8.5**.

Barn

- 3.2.4 The barn is described in relation to its suitability for use by roosting bats at **Section 3.3** below.

Unmanaged Tall-herb Vegetation

- 3.2.5 Refer to **Photo 6**. The area of unmanaged tall-herb to the east of the barn is characterised by abundant and constant Great Willowherb (*Epilobium hirsutum*), False Oat-grass (*Arrhenatherum elatius*), Cocks'-foot (*Dactylis glomerata*) and Yorkshire-fog (*Holcus lanatus*) with locally abundant Creeping Buttercup (*Ranunculus repens*) and Common Nettle (*Urtica dioica*). Self-seeded Ash (*Fraxinus excelsior*) saplings are present.
- 3.2.6 The tall-herb vegetation is characteristic of a mosaic of the OV26 *Epilobium hirsutum*, OV24 *Urtica dioica*-*Galium aparine* and the MG1 *Arrhenatherum elatius* communities of the NVC. A plant species list for this area is appended at **Table 8.1**.

Semi-improved grassland

- 3.2.7 Refer to **Photos 3** and **4**. The sheep and cattle grazed semi-improved grassland surrounding the barn to the east, west and south is characterised by abundant and constant Perennial Rye-grass (*Lolium perenne*), Rough Meadow-grass (*Poa trivialis*) and Yorkshire-fog with frequent Crested Dog's-tail (*Cynosurus cristatus*), Sweet Vernal-grass (*Anthoxanthum inodorum*), Meadow Foxtail (*Alopecurus pratensis*) and Creeping Thistle (*Cirsium arvense*).
- 3.2.8 The grassland is characteristic of the MG6 *Lolium perenne* - *Cynosurus cristatus* community of the NVC.
- 3.2.9 A plant species list for the site is appended at **Table 8.2**.

Trees and Shrubs

- 3.2.10 A mature Ash tree lies approximately 15 metres to the west of the barn.

Invasive Plant Species

- 3.2.11 Indian Balsam, an invasive species listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended), is locally very abundant in the enclosure to the immediate east of the barn.

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 tree lined stream and river valley at Hollins Clough (280 metres to the west) 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: Barn

- 3.3.3 Refer to **Photos 1** to **18**. The stone barn is 11 metres long and 8.5 metres wide. The ridge is set at 6 metres above ground level and has an east / west alignment. The pitched roof is covered with stone tiles. The barn is used for the storage of straw and other agricultural items.
- 3.3.4 A large barn door aperture with a keystone arch is present at the north elevation (the timber doors are propped open). Various open and boarded timber framed doorway and window apertures are present on the other elevations.
- 3.3.5 The barn is single storey at the western end with no undertile felt or sarking beneath the roof tiles. At the eastern end a timber ceiling is present to create a 7 metres wide by 3 metres long hayloft. The underside of the roof tiles above this section is lined with degraded bitumen undertile felt.

-
- 3.3.6 The internal side of the walls comprise the exposed stone with local areas of white wash, particularly at the ground floor beneath the hayloft.
- 3.3.7 The open barn doorway and skylights in the roof and create a light internal area. No bats or bat droppings were detected inside the barn.
- 3.3.8 Potential roost features observed at the barn comprise:
- a. Gaps between the stone roof tiles and the wall tops, refer to **Photo 7**;
 - b. Frequent gaps in the stone elevation walls, both internally and externally, refer to **Photos 8 to 10**;
 - c. Gaps between the stone roof tiles and between the roof tiles and the timber rafters;
 - d. Gaps at the internal dividing wall, particularly at the underarch, refer to **Photo 13**;
 - e. Gaps between the timber lintel above the doorway at the eastern elevation, refer to **Photo 12**;
 - f. Gaps at the mortise joints at the roof timbers, refer to **Photo 16**;
 - g. Gaps either side of the keystone at the northern elevation; and
 - h. Gaps beneath the ridge copings.
- 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 to high suitability of the surrounding habitats for the attraction of bats, the barn is assessed to be of moderate to high suitability for use by roosting bats (all roost types, including use in the hibernation season (minor roost only)).

Dawn Re-entry Activity Surveys

- 3.3.11 The raw data recorded by the surveyors and the analysis of the Anabat recordings are appended at **Tables 8.3 and 8.4**.
- 3.3.12 Three roost locations are summarised below and annotated on **Figure 9.2**.

Table 3.3: Summary of Roosts Detected at Betty Barn in 2018

Roost Number	Species	26 th July 2018: Max. Number of Bats Detected	26 th August 2018: Max. Number of Bats Detected	Roost Type ²	Notes
1	Common pipistrelle	1	-	Day	Gap between the stone roof tiles at the south-facing pitch.
2	Common pipistrelle	1 (briefly)	1	Night / Day	Gap in the stone work at the western elevation. On the 26 th July 2018 the bat was only present in roost for 3 minutes before leaving and entering Roost 3.
3	Common pipistrelle	1	-	Day	Gap in the stone work at the southern elevation beneath the cornerstone at the south-eastern corner.

3.3.13 At least five bat species were recorded during the surveys. The most frequent passes were common pipistrelle and soprano pipistrelle. At least one noctule pass, two brown long-eared bat and four *Myotis* species were also recorded flying over the site.

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

Bird Species

3.3.15 No birds were recorded using the barn on the survey dates. Birds audible in the wider area comprised chaffinch, great tit and jackdaw.

3.3.16 Two old swallow nests were found at the timber rafters but no evidence of current use was recorded in Summer 2018.

Barn Owl

3.3.17 Evidence of previous (recent) use of the barn by roosting and nesting barn owl was confirmed by the presence of a nest with fresh downy nestling feathers at the north-eastern corner of the hayloft and frequent pellets and faecal splashes throughout all areas of the barn, refer to **Figure 9.2**.

3.3.18 No barn owl were present during the daylight survey in July 2018. No barn owl were observed using the barn during the dawn re-entry surveys; a barn owl did fly over the barn at 04:18 on the 26th July 2018.

Reptiles

3.3.19 The close grazed grassland surrounding the barn are sub-optimal habitats for use by reptile species. No 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 Betty Barn to a dwelling. The proposals are illustrated on John Coward Architects drawings 18102 02B (John Coward Architects, February 2019) and 03A (John Coward Architects, February 2019) and comprise:

- a. Conversion of the entire stone barn including the installation of a ground floor ceiling to create a first floor;
- b. Inclusion of a 3.5 metre wide by 6.5 metre long and c. 3 metre high roof void at the western end;
- c. Removal of the stone / concrete block wall enclosure at the eastern side;
- d. Installation of a single storey store at the western elevation;
- e. Removal of the stone wall extending from the north-eastern and north-western corners of the barn and planting of a native hedgerow to the north (to create a patio area); and
- f. Creation of a new vehicular access through the stone wall off Slaidburn Road (to the south of the barn) to extend through the field of semi-improved grassland to meet the existing track to the west of the barn followed by the blocking of the existing track access with a new stone wall.

4.1.2 It is understood that no 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 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 barn, along the access track or within the semi-improved grassland to be traversed by the new access track 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 and agricultural management currently applied. No Priority Habitat is present at the site.

4.3.3 The mature Ash tree to the west of the barn and the mature Sycamore trees at the roadside will not 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**.

4.3.5 As illustrated on the *Concept Scheme Design Site Plan* (John Coward Architects, February 2019) the proposals provide an opportunity to enhance the structural habitat diversity in the site and improve habitat connectivity by the planting of a new native hedgerow and a woody copse to the site. Further details are provided at **Section 5.4**.

4.4 Protected Species and Other Wildlife

Bats

4.4.1 Use of the barn as a maternity roost 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 barn. 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 barn 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**.

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

4.4.3 In the absence of mitigation, the conversion of the building to a residential dwelling will result in the, disturbance and possible loss of day roosts (definite loss of Roost 2 owing to location of store annex and loss of Roost 1 owing to the re-roofing works), the possible disturbance of bats in the hibernation season and the possible loss of minor hibernation roost opportunities. In accordance with Natural England's standing advice³ this is a low scale of impact (and possibly a high scale in the event of the loss of minor hibernation roost opportunities *and* in the absence of mitigation).

4.4.4 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**.

4.4.5 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

4.4.6 The use of the barn by nesting barn owl (listed under Schedule 1 of the *Wildlife and Countryside Act 1981* (as amended)) is a significant consideration. Mitigation and compensatory measures in accordance with wildlife legislation and recognised conservation handbooks (namely the *Barn Owl Conservation Handbook* (Barn Owl Trust, 2012)) are necessary, and is described further at **Section 5.2**.

4.4.7 Use of the barn by other nesting birds is also a consideration and further guidance to ensure compliance with relevant wildlife legislation is provided at **Section 5.2**.

Other Protected Species

4.4.8 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

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

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.
- 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 barn 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 of 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 barn is 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 barn 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 barn 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 a bat box will be installed on the Ash tree to the west of Betty Barn, refer to **Insert 1**.



Box Specifications in CM:
Height x Width x Depth
 External: 44 x 21.5 x 9
 Each Crevice: 37 x 17.5 x 2
 Attic Void: 5 x 17.5 x 5
 Internal Volume: 3.02 litres

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 barn 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 March⁴ 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 and construction of the new stone wall to be carried out in the winter months.

Roost Conservation: Roost 3 (Common Pipistrelle Day Roost)

- 5.1.12 It is recommended that as many of the gaps and crevices in the elevation stonework are retained as possible.
- 5.1.13 It is considered feasible that the common pipistrelle day roost at the south elevation (Roost 3) can be retained in the long-term.
- 5.1.14 If there is a risk, during the construction period that the roost will be obstructed by scaffold, for example, then it is recommended that the roost is temporarily excluded, under the licence and prior to the commencement of works with the use of a one-way exclusion device.

Roost Exclusion and Re-creation: Roosts 1 and 2

- 5.1.15 The conversion works are likely to involve the loss of Roosts 1 and 2 by the re-roofing and the construction of the store annex.

Roost 1

- 5.1.16 The licensed ecologist must be present during the careful removal / soft strip of the roof covering and destruction of Roost 1. Roof tiles and copings must be lifted (rather than slid) and the underside of the roof covering will be checked for bats prior to discard / stacking.
- 5.1.17 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.

⁴ Consideration of any conflict with the appropriate timing in relation to consideration of nesting barn owl is provided at **Section 5.2.**

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

Roost 2

- 5.1.19 To ensure no bats are entombed during the installation of the store annex it is recommended that a one-way exclusion device is fitted to the section of wall and all crevices to be affected. The device will permit bats to leave but not re-enter the roost (Roost 3 and the tree mounted bat box will be available as an alternative).
- 5.1.20 To compensate for the loss of Roost 2 it is recommended that a bat box (such as the product illustrated at **Insert 1**) is installed on the south or west elevation of the barn.

Plans and Works Schedule

- 5.1.21 Once the final proposals plans have been prepared and agreed a Bat and Barn Owl 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

- 5.1.22 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.
- 5.1.23 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

- 5.1.24 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

- 5.1.25 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.'

- 5.1.26 Any lighting scheme to be implemented at the converted barn 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.
- 5.1.27 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

5.1.28 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

- 5.2.3 The presence of nesting barn owl does not preclude the conversion proposals provided an appropriate Barn Owl Mitigation Strategy, as outlined below, is applied. The outlined strategy is in accordance with relevant wildlife legislation, the NPPF and the guidance in the *Barn Owl Conservation Handbook* (Barn Owl Trust, 2012) and *Barn Owls and Rural Planning Applications "What needs to happen" - A Guide for Planners* (Ramsden, 2009) and best practice.

Alternative Provision for Use by Roosting / Nesting Barn Owl

- 5.2.4 Prior to the conversion works an alternative provision suitable for use by nesting barn owl must be provided within proximity to the site. This may involve:
 - a. **Option 1 (preferred)**: Installation of a barn owl box within a suitable outbuilding at Hollins Farm (located approximately 200 metres to the west of Betty Barn and understood to be within the same ownership), refer to **Appendix 3**;
 - or,
 - b. **Option 2**: Installation of a barn owl box on a tree within the same land ownership, refer to **Appendix 3**.

Access for Monitoring

- 5.2.5 Regardless of the mitigation / compensation measure provided, access for monitoring and removal of debris will need to be provided.

Timing of Commencement of Works / Exclusion of Barn Owl

- 5.2.6 The conversion works at the barn must be preceded by a pre-work inspection for nesting barn owl. In accordance with best practice it is advised that works are not scheduled to commence between March and August inclusive. Unless:
- a. It is suitably demonstrated by an appropriately licensed ecologist that no evidence of nesting barn owl (or other bird species) is present;
- Or, (importantly to enable the timing constraints in relation to bats to be accommodated);
- b. Once the pre-work inspection has confirmed an absence of barn owl *and* the alternative provision for use by barn owl is installed, the barn is boarded up and excluded to barn owl access.

Ownership

- 5.2.7 The occupier of the property must be made aware of the protected afforded to barn owl and the nest provisions provided.

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

Table 5.2: Recommended Plants For Use in Gardens to Attract Bats⁵

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 Betty Barn must take into consideration the requirement to accommodate crevice roosting bat species, nesting barn owl and nesting birds.
- 6.2 As described in this report, appropriate and proportionate measures for the protection of and mitigation / compensation for roosting bats and nesting birds (including licensing requirements) can be implemented as part of the proposals. The conversion proposals at Betty Barn can be achieved in accordance with Natural England guidance, wildlife legislation, relevant planning policy and best practice.

⁵ Extracted from *Encouraging bats, A guide for bat-friendly gardening and living* (Bat Conservation Trust, August 2015)

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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8.0 APPENDIX 1: TABLES

Table 8.1: Plant Species List for the Tall-herb Vegetation to the East of the Barn

Scientific Name	Common Name	DAFOR ¹	% Cover
Woody Species			
<i>Fraxinus excelsior</i>	Ash (sapling)	O	<1%
Herb Species			
<i>Agrostis capillaris</i>	Common Bent	O	<1%
<i>Anthriscus sylvestris</i>	Cow Parsley	R	<1%
<i>Arrhenatherum elatius</i>	False Oat-grass	A*	20%
<i>Cirsium arvensis</i>	Creeping Thistle	LA	5%
<i>Cirsium vulgare</i>	Spear Thistle	O	<1%
<i>Dactylis glomerata</i>	Cock's-foot	A*	10%
<i>Dryopteris filix-mas</i>	Male-fern	O	<1%
<i>Elytrigia repens</i>	Common Couch	VLF	<1%
<i>Epilobium hirsutum</i>	Great Willowherb	A*	20%
<i>Festuca rubra</i>	Creeping Fescue	LA	<1%
<i>Galium aparine</i>	Cleavers	VLF	<1%
<i>Heracleum sphondylium</i>	Common Hogweed	O	<1%
<i>Holcus lanatus</i>	Yorkshire-fog	A*	20%
<i>Impatiens glandulifera</i>	Indian Balsam	LVA	5%
<i>Lolium perenne</i>	Perennial Rye-grass	LF	1%
<i>Phleum pratense</i>	Timothy	VLF	<1%
<i>Poa trivialis</i>	Rough Meadow-grass	F	5%
<i>Ranunculus repens</i>	Creeping Buttercup	LA*	5%
<i>Rumex obtusifolius</i>	Broad-leaved Dock	O	<1%
<i>Stachys sylvatica</i>	Hedge Woundwort	VLF	<1%
<i>Urtica dioica</i>	Common Nettle	LA	5%

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: Plant Species List for the Semi-improved Grassland

Scientific Name	Common Name	DAFOR ¹	% Cover
Woody Species			
<i>Fraxinus excelsior</i>	Ash	R	<1%
Herb Species			
<i>Alopecurus pratensis</i>	Meadow Foxtail	F	5%
<i>Anthoxanthum inodorum</i>	Sweet Vernal-grass	F	10%
<i>Cirsium vulgare</i>	Spear Thistle	R	<1%
<i>Cynosurus cristatus</i>	Crested Dog's-tail	F	20%
<i>Holcus lanatus</i>	Yorkshire-fog	A*	20%
<i>Lolium perenne</i>	Perennial Rye-grass	A*	40%
<i>Poa trivialis</i>	Rough Meadow-grass	A*	20%
<i>Trifolium repens</i>	White Clover	VLA	<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 8.3: Activity Survey 1, Date: 26th July 2018, Sunrise time: 05:11 Start time: 03:15

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: Aidan Pickering

Time	Species	Notes
03:42	Common pipistrelle	Pass
03:56	Common pipistrelle	Pass
03:57	Soprano pipistrelle	Pass
04:10 to 04:30	Common pipistrelle	Two bats observed
04:18	Barn owl	Flew by barn (south to north)
04:30	Common pipistrelle	One bat entered barn at gap between the stone roof tiles (6 tiles from the south-western corner of the barn) [Roost 1]
04:46	Common pipistrelle	One bat entered gap in the stone work on the western elevation [Roost 2]
04:49	Common pipistrelle	One bat left gap at Roost 2 and entered a gap in the stone work beneath the cornerstone at the south-eastern corner of the barn [Roost 3]
05:15 (end)	-	Last bat activity / passes recorded at 22 minutes before sunrise.
The Anabat SD2 recorded: 4 Myotis passes between 03:35, 03:49 (x2) and 04:07; 90 common pipistrelle passes between 03:33 and 04:49; and 14 soprano pipistrelle passes between 03:28 and 04:45.		

Surveyor Position 2 : Marie Pickering

Time	Species	Notes
03:44/5	Noctule	Pass
03:50	Common pipistrelle	Pass
04:07	Common pipistrelle	Pass
04:10	Common pipistrelle	Two bat observed
04:18	Barn owl	Flew over barn (south to north)
04:28	Common pipistrelle	Pass
05:15 (end)	-	No bat emergence or re-entry activity
The Anabat Express recorded: 1 noctule pass at 03:45; 6 common pipistrelle passes between 03:42 and 04:29; and 3 soprano pipistrelle passes at 03:31, 03:43 and 03:55.		

Table 8.4: Activity Survey 2, Date: 26th August 2018, Sunrise time: 06:06 Start time: 04:10

Surveyor Position 1: Aidan Pickering

Time	Species	Notes
04:45	Common pipistrelle	Heard not seen (brief pass)
06:08 (end)		No bat emergence or re-entry activity
The Anabat Express recorded: 1 brown long-eared bat pass at 05:09; and 1 soprano pipistrelle pass at 04:10.		

Surveyor Position 2 : Marie Pickering

Time	Species	Notes
04:48	Common pipistrelle	Pass
05:09	U/k	Pass (corresponds with the time of a brown long-eared call recorded on the Anabat Express)
05:10	Soprano pipistrelle	Pass
05:19	Soprano pipistrelle	Pass
05:56	U/k / no echolocation	One bat entered crack in stone wall at Roost 2
06:08 (end)		
The Anabat Express recorded: 1 brown long-eared bat pass at 05:09; 1 common pipistrelle pass at 04:48; and 5 soprano pipistrelle passes at 05:09 and 05:20.		

Table 8.5: Table of Photographs



Photo 1: Track to the barn from Slaidburn Road (facing west)



Photo 2: Eastern and northern elevations of Betty Barn



Photo 3: Western and southern elevations of Betty Barn and adjacent mature Ash tree



Photo 4: Southern and eastern elevations of barn



Photo 5: Northern elevation of barn



Photo 6: Unmanaged vegetation and self-seeded Ash saplings to the east of the barn



Photo 7: Gaps and PRF between the roof tiles and at the wall tops



Photo 8: Gaps and PRF at the stone and rubble filled elevation walls (all elevations)



Photo 9: Gaps and PRF at the stone and rubble filled elevation walls (all elevations)



Photo 10: Gaps and PRF at the stone and rubble filled elevation walls (all elevations)



Photo 11: Interior of the eastern section (beneath the hayloft) showing white washed walls



Photo 12: Gaps at timber lintel over doorway on the eastern elevation



Photo 13: Gaps at timber lintel over doorway at internal dividing wall



Photo 14: White washed internal walls



Photo 15: Roof and timbers above single storey / western section of barn



Photo 16: Gaps at mortise joints; no bat present on survey dates



Photo 17: Degraded undertile felt beneath stone tiles at eastern section of the barn (and skylight to create light internal areas)



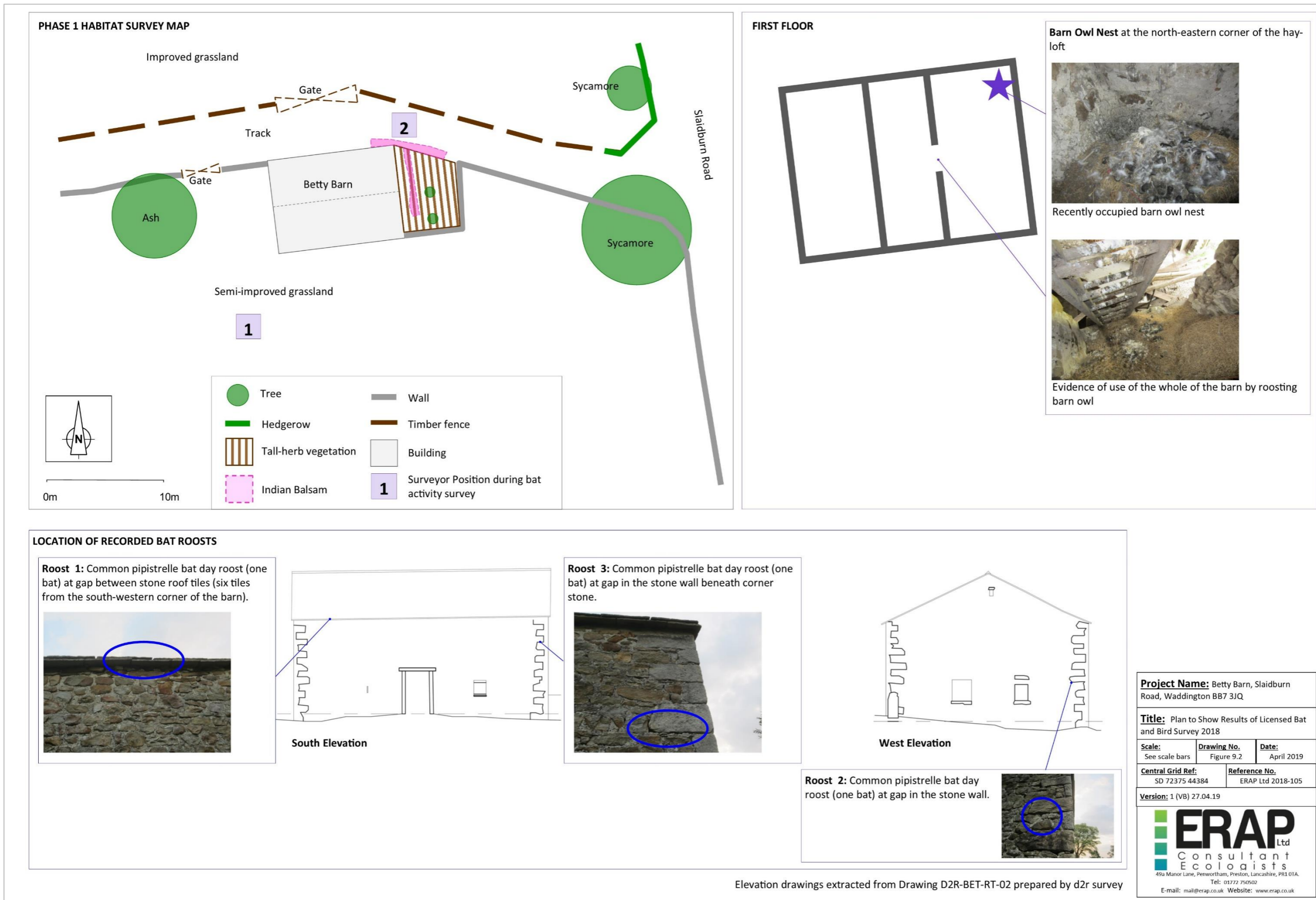
Photo 18: Degraded undertile felt beneath stone tiles at eastern section of the barn (and skylight to create light internal areas)

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



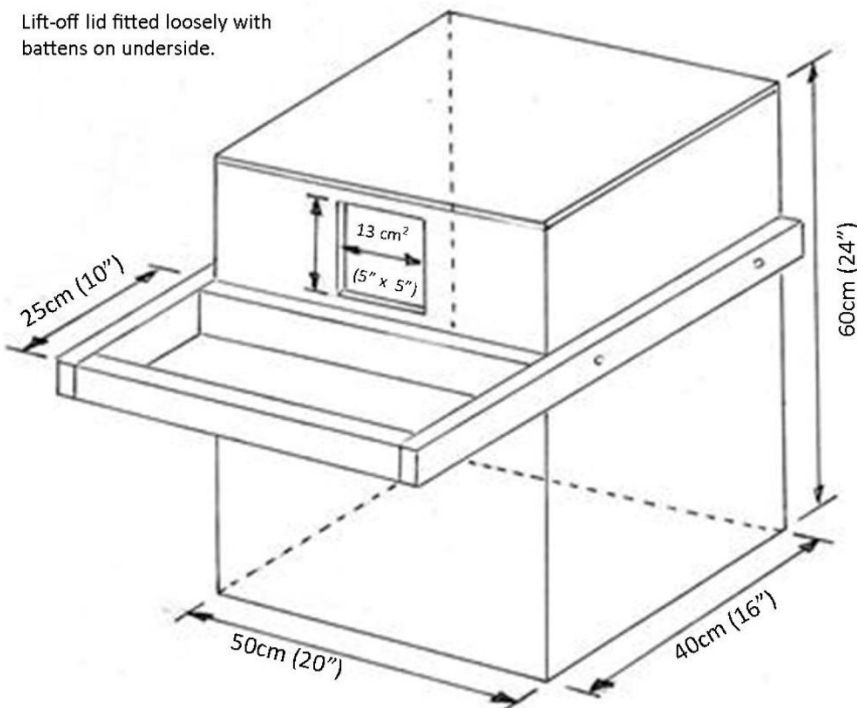
10.0 APPENDIX 3: PROVISIONS FOR BARN OWL WITHIN OFF-SITE BARN

10.1 Installation of a Barn Owl Box Inside an Outbuilding at Hollins Farm (Option 1: Preferred)



Insert 10.1: Plywood Barn Owl box installed in a hay barn

Lift-off lid fitted loosely with battens on underside.



Insert 10.2: Dimensions of box. Further information is available at <https://www.barnowltrust.org.uk/>

10.2 Installation of a Barn Owl Box at the Ash Tree (Option 2)



Insert 10.3: Boxes available at www.NHBS.com