Bradley Hall Farm, Bradley

Ecological Impact Assessment

15th July 2024

Prepared by:

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Purpose and Description	Originated	Checked	Reviewed	Date
For Planning	G Slack MCIEEM	R Bell MCIEEM	P Middleton MCIEEM	15th July 2024

Contents

Site Name Bradley Hall Farm	
Local Authority Kirklees Council	**Grid Reference** SE 17043 21211
Surveyor Greg Slack MCIEEM	**Date of Survey** 26/01/2024
Soilscape Slowly permeable seasonally wet acid loamy and clayey soils	**Designation of Site** None

UK Habitat Classification habitats on Site
Habitats: g3c – other neutral grassland, h3d – bramble scrub, u1b5 – buildings, u1b6 – other developed land, u1c – artificial unvegetated, unsealed surface, h2a5 – species rich native hedgerow. Secondary codes: 10 – scattered scrub, 32 – scattered trees, 33 – line of trees, 103 – horse grazed, 114 – dry stone wall, 203 – mature tree; 612 – fence, 800 – road, 825 – ruined building, 833 - barn. The non-native invasive species Himalayan balsam was also recorded.
HPIs and SPIs under NERC Act 2006 Bat species and various bird species.

1. Summary

1.1.1 This Ecological Impact Assessment for Bradley Hall Farm was commissioned by Paul Briggs of Northern Design Partnership. The survey was commissioned to inform a planning application for the renovation of Bradley Hall (a house and barn) and construction of a new shed / workshop. The red line boundary was approximately 1 ha in size. The site was located on the northern edge of the Bradley district of Huddersfield, West Yorkshire.

1.1.2 The site comprised a grassland field with scattered scrub and three mature trees present. An area of bramble scrub was present in the eastern corner, Bradley Hall and a smaller outbuilding were present near the centre. Dry stone walls were present along the southwest boundary and an old access into Bradley Hall from the southwest. The site was enclosed and divided by fencing.

1.1.3 The populations of bats, birds, and potentially invertebrates which used the site were considered to be of up to Local importance. All other habitats and species present were considered to be of no greater than site level importance.

1.1.4 The likely unmitigated impacts of the development were considered to comprise:

- The net loss of 0.04 ha of other neutral grassland, and one mature tree;
- The loss of a brown long-eared bat roost;
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- The construction of a new shed / workshop, access, stone walls, and parking;
- The creation of 0.03 ha of amenity grassland / lawns around the building;
- Increased lighting affecting nocturnal species; and
- Biosecurity risks as a result of bringing in plants, seeds and soil for landscaping, and the potential spread of Himalayan balsam.

1.1.5 The following further mitigation requirements are considered necessary:

- 36 new small trees will be planted;
- The grassland will be managed to bring it into moderate condition and the Himalayan balsam removed;
- Hedgerows should be created along the northwest, and southwest boundaries, and the hedgerow on the southeast boundary ‘gapped up’.
- The bramble scrub will develop into mixed scrub in moderate condition.
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  three bat boxes installed on a mature tree.
- A licence must be obtained from Natural England to allow the renovation work. The mitigation will include supervision and a toolbox talk to contractors.
- Lighting restrictions will apply to protect nocturnal species.

1.1.6 With the proposed mitigation measures, the development is projected to result in a net gain of 1.41 Habitat Units (a 23 % gain) and 1.79 Hedgerow Units (a 388 % gain).

1.1.7 The results of this survey and report are considered to be valid for a period of 24 months. After this time Middleton Bell Ecology should be contacted to determine the need for update survey.

2. Introduction

2.1.1 This Ecological Impact Assessment for Bradley Hall Farm was commissioned by Paul Briggs of Northern Design Partnership on 17th January 2024. The survey was commissioned to inform a planning application for the renovation of Bradley Hall (a house and barn) and construction of a new shed / workshop. The proposed layout is shown in Appendix 1.

2.1.2 The red line boundary was approximately 1 ha in size. The site was located on the northern edge of the Bradley district of Huddersfield, West Yorkshire (Figure 1).

Figure 1. The site location is indicated by red line boundary shown

2.1.3 The purpose of this report is to present the findings of a desk-based study, UK Habitat Classification survey, and assessment of the site's suitability to support protected or notable species. The report includes consideration of the value, likely impacts and effects of the proposed development to protected and notable species and habitats. Detail on suitable mitigation and compensation measures necessary to avoid or reduce these impacts are included within the report.

2.1.4 Key legislation relating to designated sites, protected species, and habitats is detailed in Appendix 2. The implications of legislation are detailed in the body of the report where applicable.

3. Site Description

3.1.1 The site consisted of a pasture field with scattered trees and scrub surrounding Bradley Hall and a small derelict outbuilding. The land to the west of the site comprised a landfill site in a former quarry with associated woodland. The other surrounding habitat comprised farmland including arable and pasture. A rail line was present to the northeast, as was the River Calder.

3.1.2 Fences formed the northeastern and northwestern boundaries, a hedgerow formed the southeast boundary and a tree line formed the southwest boundary.

3.1.3 The site falls within National Character Area 37: The Yorkshire Southern Pennine Fringe National Character Area (NCA) is a transitional landscape from the upland areas of the Southern Pennines NCA in the west through to the low-lying land of the Nottinghamshire, Derbyshire and Yorkshire Coalfield NCA to the east. The most striking aspect of the landscape is the mingling of predominantly 'gritstone' industrial towns and villages with the strong valley forms and pastoral agriculture of the Pennine foothills.

3.1.4 The Soilscapes resource[1] shows soils in the area to be slowly permeable seasonally wet acid loamy and clayey soils.

4. Methodology

4.1 Data Consultation

4.1.1 West Yorkshire Ecology Service (WYES) and West Yorkshire Bat Group (WYBG) were contacted in February 2024 to request the following information for locations within a 2 km radius of the site:

- Protected and notable species records.
- The boundaries of non-statutory designated sites of nature conservation interest.

4.1.2 A search of the Multi-Agency Geographical Information for the Countryside (MAGIC) website was undertaken to determine the following for locations within a 2 km radius of the site:

- The boundaries of statutory designated sites of nature conservation interest.
- The locations of historic European Protected Species (EPS) licences granted by Natural England.

4.2 Field Survey

UK Habitat Classification Survey

4.2.1 The site was surveyed on 26th January 2024, with an update survey of habitats completed on 14th May 2024. The survey was undertaken using UK Habitat Classification habitat survey methodology (UKHab Ltd, 2023) by Greg Slack MCIEEM. Greg is a competent ecologist with more than 15 years' experience and holds a Natural England bat survey licence (WML-A34-Level 4, 2017-28068-CLS-CLS) and Natural England great crested newt *Triturus cristatus* survey licence (CL08-Level 1, 2015-18073-CLS-CLS).

4.2.2 The surveyor methodically covered the site, searching for notable, rare or scarce plant species and evidence of protected species including bats and species of nature conservation importance (including a search of suitable features for signs of bats). Features of interest are presented on the UK Habitat Classification plan, using Secondary Codes and Target Notes.

[1] http://www.landis.org.uk/soilscapes/ [accessed 5th March 2024]

4.2.3 Aerial photographs (Google Earth, Bing Mapping, and ESRI imagery) and Ordnance Survey mapping were studied to consider the wider context and to look for ecological features that would not be evident on the ground during the walkover survey. This is particularly useful for identifying wildlife corridors and ponds.

4.2.4 Habitats of Principal Importance (HPIs) and Species of Principal Importance (SPIs) included on Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 were recorded. Any priority species and habitats included on the Local Biodiversity Action Plan (LBAP) were also noted if present.

Nocturnal bat survey

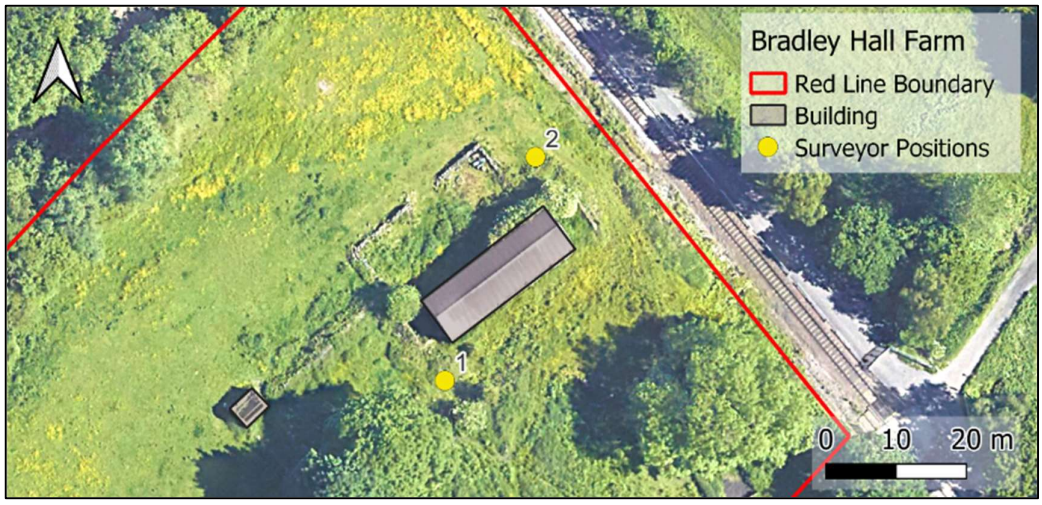
4.2.5 The nocturnal bat surveys comprised two dusk emergence surveys completed on 14th May 2024, and 1st July 2024 respectively. The surveys were both conducted by Greg Slack and Carl Dixon.

4.2.6 Two surveyor positions were covered during the survey. The surveyors were equipped with a Wildlife Acoustics EM Touch bat detectors and tablet recorders. Additional night vision aids were used to record bat activity during the survey. Units used comprised a Guide TK612 Gen2 Thermal Imaging Monocular, and two Canon XA10 cameras and additional infrared lights. The surveyor positions are shown in Figure 2.

4.2.7 The nocturnal survey was carried out in compliance with relevant Bat Survey Guidelines (Collins, 2023). The survey continued from 15 minutes before sunset until 1.5 hours after sunset.

4.2.8 The camera and monocular footage were reviewed as required to check and confirm the observations made by the surveyor.

Figure 2. Site layout and surveyor position



Camera trap survey

4.2.9 A Spypoint Force Dark Camera Trap was deployed on the northwest site boundary from 26th May 2024 to 26th June 2024 to monitor the activity around a nearby mammal track. Upon retrieval of the camera the video footage was reviewed to check for protected or notable species.

4.3 Method of Assessment

4.3.1 In line with CIEEM guidelines (CIEEM, 2017) the survey results were used to identify any ecological constraints to the proposed development, any further surveys, and any mitigation measures likely to be required. Opportunities for ecological enhancement measures were also included where possible.

4.3.2 The value and sensitivity of ecological features present on site were determined based on the guidance provided within 'Guidelines on Ecological Impact Assessment in the UK and Ireland' (CIEEM, 2018). Individual ecological receptors (habitats and species that could be affected by the development) were assigned a geographic level of importance for nature conservation. The highest level is international, decreasing through national, regional, county, local and lastly site importance.

4.4 Biodiversity Calculation

4.4.1 The Statutory Biodiversity Metric (Defra, 2023) was used to calculate the ecological impact of this scheme within the context of the blue line boundary site. This metric uses habitat as a proxy for wider biodiversity with different habitat types scored according to their relative biodiversity value. This value is then adjusted depending on the condition and location of the habitat, to calculate 'biodiversity units'. The Statutory Biodiversity Metric incorporates similar but separate calculations for habitats that require a different method of measurement such as hedgerows, lines of trees, rivers, streams and street trees. Calculations are undertaken in a purpose designed spreadsheet, which provides the main output of the process.

4.5 Survey Limitations

4.5.1 Part of the grassland within the site had been cleared to create an access track and storage area. Aerial photographs showed that this had been undertaken after July 2022, and prior to commissioning of the ecological impact assessment. For the purpose of calculating the site's value using the Statutory Biodiversity Metric, Google Earth images were used to determine the extent of the grassland habitat that had been present. Its condition was assumed to match the other grassland within the site. The requirement for this approach is stipulated in Schedule 14 of the Environment Act (2021).

5. Ecological Baseline

5.1 Summary

5.2 Designated Sites

5.2.1 No statutory designated sites were present within the desk study search area. However, three local wildlife sites (LWS) were present within the 2 km search area. The sites are summarised in Table 1 below and their locations are shown in Appendix 3.

5.2.2 The closest site was Bradley Park Woods LWS located approximately 200 m southwest of the proposed red line boundary.

Table 1. Designated sites present within 1 km of the site

Designation	Site	Ecological features	Distance, and Direction
Local Wildlife Site	Bradley Park Woods	An area of semi natural woodland. English bluebells *Hyacinthoides non-scripta* and dog's mercury *Mercurialis perennis* are both present, as well as fallen dead wood	200 m southwest
Local Wildlife Site	Sir John Ramsden Canal	Qualifies as a local wildlife site for its standing open water and its nature appreciation value.	790 m southeast
Local Wildlife Site	Clifton Lagoon	Qualifies as a local wildlife site for its species rich neutral grassland, its diverse habitats, and its nature appreciation value.	800 m northwest

5.2.3 Although the site itself was not located within the Kirklees Wildlife Habitat Network, the adjacent railway line to the northeast was. For the purposes of the Biodiversity Net Gain Calculation the site has been identified as ecologically desirable but not in a local strategy area.

5.3 Habitats

Summary

5.3.1 The site comprised a neutral grassland field (g3c – other neutral grassland) with

scattered scrub and three mature trees present. An area of bramble scrub was present in the eastern corner of the site, Bradley Hall and a smaller outbuilding were present near the centre. The site sloped down from a tree line on the southwest boundary to a rail line just beyond the northeast boundary. A woodland was present to the northeast and access roads were located to the southeast and southwest. Dry stone walls were present along the southwest boundary and along an old access into Bradley Hall from the southwest. The site was enclosed by fencing some of which was new.

5.3.2 The arrangement of site habitats is shown on the UK Habitat plan in Appendix 4, whilst a full list of plant species recorded is provided in Appendix 5.

5.3.3 A detailed description of the site and the site's potential to support protected and notable species is provided below. The importance of each habitat type and species or species group is included in Table 4 at the end of Section 5.3.

g3c – other neutral grassland

5.3.4 Other neutral grassland covered the majority of the site (Plate 1). Evidence of previous horse grazing was present, but no livestock were on site at the time of survey.

Plate 1. The other neutral grassland looking east from the western end of the site

5.3.5 Grass species present comprised frequently occurring Yorkshire fog *Holcus lanatus*, red fescue *Festuca rubra,* cocksfoot *Dactylis glomerata*, and false oat grass *Arrhenatherum elatius*. Occasionally recorded grass species comprised meadow foxtail *Alopecurus pratensis*, annual meadowgrass *Poa annua*, and rough meadowgrass *Poa trivialis*. Smooth meadowgrass *Poa pratensis* was also present as a rarely recorded grass species.

5.3.6 Herbs comprised frequent common nettle *Urtica dioica* and creeping buttercup *Ranunculus repens*, occasionally occurring yarrow *Achillea millefolium*, cow parsley *Anthriscus sylvestris*, ladies bedstraw *Galium verum*, bramble *Rubus fruticosus*, herb Robert *Geranium robertianum*, meadow buttercup *Ranunculus acris*, common sorrel *Rumex acetosa*, at least one additional dock species *Rumex* spp., ribwort plantain *Plantago lanceolata*, red clover *Trifolium pratense*, and white clover *Trifolium repens*. Rarely occurring herbs comprised bush vetch *Vicia sepium*, lesser burdock *Arctium minus*, creeping thistle *Cirsium arvense*, ragwort *Senecio jacobaea*, common mouse-ear *Cerastium fontanum*, and in the wetter areas at the northeastern end of the site

soft rush *Juncus effusus*. Springy turf moss *Rhytidiadelphus squarrosus* was locally abundant in the southern quarter of the site.

5.3.7 An area of locally dominant Himalayan balsam *Impatiens glandulifera* was present at the western corner of the site (Plate 2). Himalayan balsam is a 'non-native, invasive species' listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended)[2].

Plate 2. Area of Himalayan balsam, photographed in May 2024

5.3.8 Some scattered scrub (Secondary code 10) was present comprising willow *Salix* spp. and blackthorn *Prunus spinosa* saplings and young trees.

Plate 3. Typical area of sward within the site in January 2024

5.3.9 The other neutral grassland was considered to be in poor condition (Defra, 2023), principally because it had fewer than eight species per m^2, meaning that it did not meet the definition of a good example of this habitat type. In January a species count was made in four locations with an average count of 3.25 species per m^2 (Plate 3). In May this increased to an average of 5.5 species per m^2 following an assessment of the

[2] This makes it an offence to plant or allow the species to spread in the wild (see Appendix 1).

number of species present in eight separate locations (Plate 4).

Plate 4. area of sward photographed in May 2024

Secondary Code 203 - mature tree

5.3.10 A mature sycamore *Acer pseudoplatanus* tree (T1) and a mature ash *Fraxinus excelsior* tree (T2) were located along a disused track which led from Lower Quarry Road to Bradley Hall (Plate 5). A third mature tree (an ash tree – T3) was also present in the eastern corner of the site (Plate 6). The diameter of the trees at a height of 1.5 m was approximately: T1 – two stems[3] on average of 65 cm in diameter; T2 – 81 cm; T3 – 110 cm. For the purposes of biodiversity net gain assessment this means T1 and T2 were 'Large' and T3 was 'Very Large' (Defra, 2023)

5.3.11 All three trees were considered to be in good condition (Defra, 2023) T1 and T2 passed all of the condition criteria and T3 failed only Condition Criterion E (presence of natural ecological niches).

[3] For the purposes of the biodiversity net gain calculation the largest stem is used to determine the trees size class. In this instance the larger stem was approximately

Plate 5. Trees T1 and T2 photographed in January 2024

Plate 6. Tree T3

Secondary Code 33 – Line of trees

5.3.12 A line of relatively young trees was present along Lower Quarry Road on the southwestern site boundary. The trees were predominantly ash (dominant species) with rarely occurring sessile oak and willow *Salix* sp.. Ground flora comprised frequent false oat grass, occasional bramble and broad buckler fern *Dryopteris dilatate* and rarely occurring hart's-tongue fern *Asplenium scolopendrium*. The trees were approximately 6 m tall and 2 m wide (Plate 7).

Plate 7. The tree line along the southwest site boundary

5.3.13 The treeline was considered to be in poor condition (Defra, 2023). The only condition criterion passed was A – at least 70 % of trees are a native species.

h2a5 – species rich native hedgerow

5.3.14 A hedgerow along the southeastern site boundary (H1) was identified as a species rich native hedgerow. The dominant species was hawthorn but rarely occurring ash, sessile oak *Quercus petraea*, blackthorn *Prunus spinosa*, and dog rose *Rosa canina* were also present. The hedgerow was approximately 5 m tall and 3 m wide with lots of gaps present at the base indicative of a lack of recent management (Plate 8).

5.3.15 The hedge was considered to be in poor condition as it failed Condition Criteria B1 (gap between the ground and the base of the canopy <0.5 m for >90 % of the length) and B2 (gaps make up <10% of total length and no canopy gaps > 5 m).

Plate 8. Hedgerow H1 on the southeastern site boundary

h3d – bramble scrub

5.3.16 An area of bramble scrub was present in the eastern corner of the site (Plate 9). Aside

from the bramble, which dominated the ground cover, frequent common nettle and rarely recorded hawthorn *Crataegus monogyna* were also present. The mature ash tree (T3) was located on the western edge of this habitat.

Plate 9. Bramble scrub in the eastern corner of the site

5.3.17 No condition assessment is applicable for this habitat type.

u1b5 – buildings

5.3.18 Two buildings were present within the site, Bradley Hall (B1) and a small outbuilding (B2).

Building description – Bradley Hall (B1)

5.3.19 Bradley Hall comprised a now derelict rectangular stone building which had been a dwelling at the southwestern end, a barn in the centre, with a redbrick extension to the barn on the northeastern end (Plate 10). The pitched roof was covered with profiled metal sheets with metal capping present on the verges. The windows and doors had wooden frames. The building was in a relatively poor state of repair, part of the rear wall had collapsed (Plate 11).

5.3.20 The Historic England website identifies the Grade 2 listed building as probably constructed in the 17th Century with the house body having been rebuilt in the 19th Century.

Plate 10. Bradley Hall Façade and southwestern gable

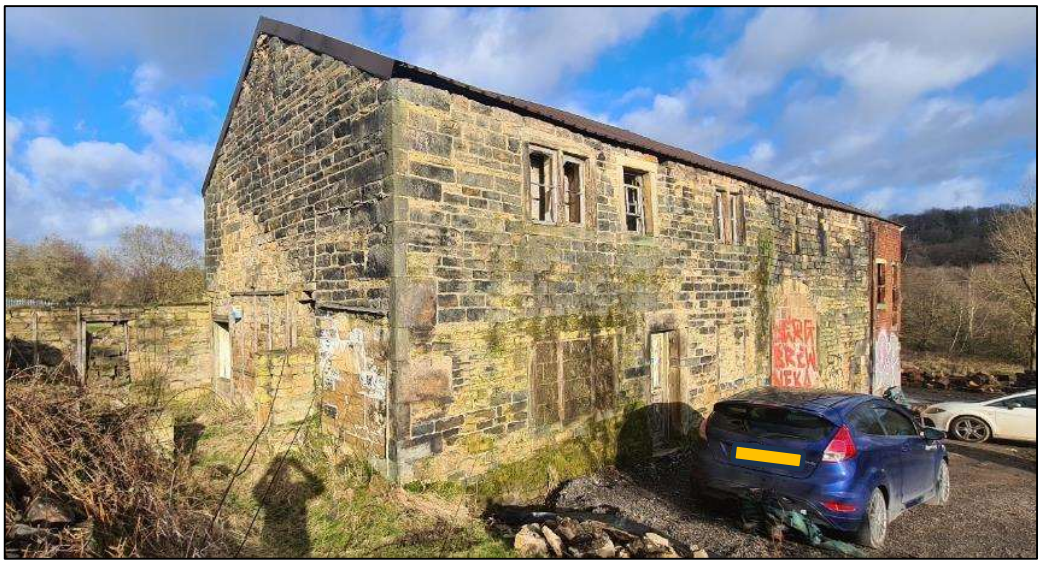


Plate 11. Rear of Bradley Hall

Building description – outbuilding (B2)

5.3.21 The small outbuilding was a small rectangular stone building with a pitched roof. The roof covering had been removed and no door or window coverings were present (Plate 12).

Plate 12. The small stone outbuilding

u1b6 – other developed land

5.3.22 The entrance to the site comprised compacted gravel and hard standing (Plate 6).

5.3.23 No condition assessment is applicable for this habitat type.

u1c – artificial unvegetated unsealed surface

5.3.24 An access track leading to Bradley Hall and storage area to the north had been created with aggregate put down to allow vehicle movement. Aerial images of the site (Google Earth) indicate that the unvegetated area had been created since July 2022. The area to the northeast between the hall and the adjacent rail line was being used to store logs and sleepers (Target Note 1, Appendix 4) (Plate 13). The area to the northwest was being used to store stone, pallets and aggregate.

Plate 13. Stored logs at the northeastern end of the site

5.3.25 No condition assessment is applicable for this habitat type.

5.4 Species and Species Groups

Hedgehog

5.4.5 The desk study returned four hedgehog *Erinaceus europaeus* records. The closest record was located 1450 m east of the site.

5.4.6 No signs of hedgehog use of the site were recorded, including on the camera trap.

5.4.7 The grassland within the site was suitable for use by foraging hedgehogs but, it was assumed that the site was not used by this species.

Bats

5.4.8 A total of 127 bat records were returned by the record centre (WYES). The records

comprised seven species, namely: common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, brown long-eared bat *Plecotus auritus*, Daubenton's bat *Myotis daubentonii*, whiskered bat *Myotis mystacinus*, noctule *Nyctalus noctula*, and Leisler's bat *Nyctalus leisleri*. Additional records of unidentified *Pipistrellus*, *Myotis* and *Nyctalus* species were also received along with records of unidentified bat species. The closest was a record of a common pipistrelle roost used by a single bat, and a record of a foraging noctule, both located approximately 380 m south of the red line boundary and dating from 2022.

5.4.9 A total of 20 records were provided by West Yorkshire Bat Group. No additional species were included in the WYBG dataset. The closest WYBG record was of an unidentified species of bat in a building approximately 410 m south of the red line boundary.

5.4.10 One European Protected Species Licence application for bats was identified within the two-kilometre search area. The details of the licence are given in Table 2 below.

Table 2. Bat EPS mitigation licences within 2 km

Species listed on the licence	Licence start date	Licence end date	What does the licence cover?	Approximate distance (m)	Direction
Common pipistrelle	26/01/2016	26/01/2021	Destruction of a breeding site and resting place	970	Southwest

5.4.11 The building inspection identified potential roost features (PRF) on both of the two buildings. B1 was identified as having moderate suitability to support roosting bats and B2 was identified as having low suitability. The PRFs on B2 could be thoroughly checked with a torch and endoscope during the inspection but the PRFs on B1 required nocturnal survey.

5.4.12 The nocturnal surveys identified the presence of a single brown long-eared bat day roost within the interior of the building. Foraging and commuting common pipistrelle a *Myotis* bat species, and noctule were also recorded on site. The level of foraging activity was relatively high later on during both surveys with a reasonably good diversity of species present.

5.4.13 The full building inspection and nocturnal survey results are given in Appendix 6.

Other mammals

5.4.14 The other mammals recorded within the site comprised roe deer *Capreolus capreolus*, red fox *Vulpes vulpes*, rabbit *Oryctolagus cuniculus*, and grey squirrel *Sciurus carolinensis* (Plates 15, 16 and 19). Grey squirrels are listed on Schedule 9 of the wildlife and countryside act which makes it illegal to release or allow this species to escape into the wild (Appendix 1).

Plate 15. Roe deer recorded on the camera trap on the northwest site boundary

Plate 16. fox recorded on the camera trap on the northwest site boundary

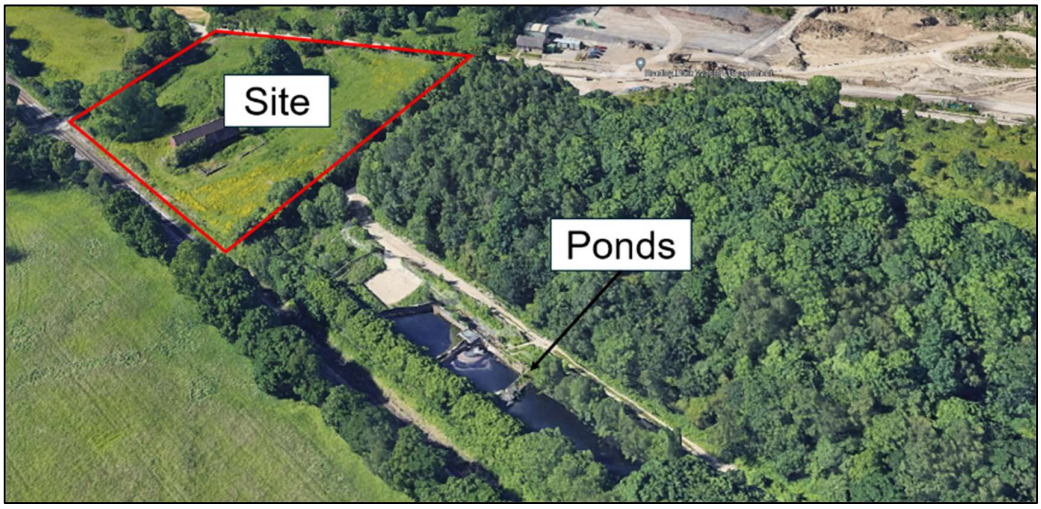
Reptiles

5.4.20 No reptile records were returned by the local biological records centre for the search area. Although the south facing grassland slope and scattered scrub/trees within the site would be suitable to support reptiles if they were present in the local area, based on the lack of records or observations during the surveys it was assumed that they were not present within the site.

Amphibians

5.4.21 Three ponds were identified within 500 m of the site. The ponds were located within the landfill site to the northwest of the red line boundary and unfortunately couldn't be accessed. Aerial images show the ponds to be steep sided manmade water storage containers (Plate 18). This matches a planning permission (Planning Application Number: 92/62/00082/BO) for the creation of a storm water storage lagoon and collection drain in the area which was granted in 1992.

Plate 18. Ponds within the landfill site adjacent to the red line boundary



5.4.22 The lack of amphibian access/egress, and lack of vegetation was considered to make them unsuitable for use by breeding amphibians. No other ponds were identified within 500 m of the site.

5.4.23 No great crested newt *Triturus cristatus* records were included in the local records centre data or on the MAGIC datasets. In combination with the lack of potential breeding ponds within the surrounding 500 m, it is considered unlikely that great crested newts are likely to be present within the site.

5.4.24 The record search identified four common frog *Rana temporaria* records, four common toad *Bufo bufo* records, three smooth newt *Lissotriton vulgaris* records, and a record of a palmate newt *Lissotriton helvetica*. None of the records were located within the site, the closest records were of a common frog, common toad, and smooth newt all approximately 826 m northwest of the site, apparently associated with a pond on the north side of the River Calder.

5.4.25 The habitats present within the site were suitable to support amphibians during their terrestrial phase but the lack of a nearby pond suitable for breeding made it unlikely that they would be present within the site.

Invertebrates

5.4.26 The record search returned a total of 19 invertebrate records covering 10 species. One record related to a crustation, namely white-clawed crayfish *Austropotamobius pallipes*, 14 related to butterflies and moths, and four related to beetles. None of the records related to the site itself, the closest records comprised two moth species, a cinnabar moth *Tyria jacobaeae*, and a ghost moth *Hepialus humuli* located approximately 550 m northwest of the site in an area of woodland in Bradley Park.

5.4.27 The white-clawed crayfish was recorded in 2011 approximately 1625 m west of the site in Bradley Park golf course. No suitable white clawed crayfish habitat was present within the site.

5.4.28 It is considered that the habitats present were likely to support an average diversity of invertebrate species. It was considered unlikely that particularly rare or diverse species assemblage was present due to the lack of species rich grassland or other mature or rarely occurring habitats.

Invasive species

5.4.29 A total of 60 invasive species records were present within the desk study results. These included 42 plant records comprising giant hogweed *Heracleum mantegazzianum*, Himalayan balsam *Impatiens glandulifera*, Japanese knotweed *Reynoutria japonica*, variegated yellow archangel *Lamiastrum galeobdolon argentatum*, Montbretia *Crocosmia crocosmiiflora*, and *Rhododendron ponticum*. The records were predominantly associated with the river and canals in the area. None of the records were located within the site.

5.4.30 Himalayan balsam was identified within the site during the May survey. The plant was concentrated at the western corner of the site (Plate 2), with individual specimens dotted around the site. No evidence of the presence of other invasive plant species was identified during the survey. The only other invasive species (listed on Schedule 9 of the Wildlife and Countryside act) found on site was the grey squirrel recorded on the camera trap on 25th May 2024 (Plate 19).

Plate 19. grey squirrel recorded on site on 25th May

Value of habitats and species

5.4.31 No records or signs of other protected or notable species / species groups were identified for the site or surrounding area. It is therefore considered unlikely that additional protected or notable species use the site. The ecological value of the habitats and species present, or potentially present is given in geographic terms (from

site to international value) in Table 3 below.

Table 3. Ecological importance of each habitat, species or species group using the site

Habitat, Species or Species Group	Ecological value
G3c – other neutral grassland	Site
H2a5 – species rich native hedgerow	Local
H3d – bramble scrub	Site
U1b5 – buildings	Site
U1b6 – other developed land	Negligible
U1c – artificial unvegetated, unsealed surface	Negligible
33 – line of trees	Site
203 – mature tree	Local
Badger	Unlikely to be present
Hedgehog	Unlikely to be present
Bats	Up to Local
Other mammals	Site
Birds	Local
Reptiles	Unlikely to be present
Amphibians	Unlikely to be present
Invertebrates	Up to Local
Invasive species	N/A

5.5 Biodiversity Calculation

5.5.1 It was assessed that the pre-clearance site's value as calculated by the Statutory Biodiversity Metric was 6.1 Habitat Units, and 0.46 Hedgerow Units (Appendix 7).

6. Assessment

6.1 Proposals

6.1.1 The assessment of impacts is based upon a consideration of the proposed renovation of Bradley Hall (a house and barn) and construction of a new shed / workshop. The proposed plan is shown in Appendix 1.

6.2 Assessment of Impacts

6.2.1 The likely potential impacts of the development were considered to comprise:

- The net loss of approximately 0.04 ha of other neutral grassland[4].
- The loss of one mature tree (T2).
- The loss of a brown long-eared bat roost.
-
- The construction of a new shed / workshop, access, and parking.
- The creation of approximately 0.03 ha of amenity grassland / lawns around the building
- The construction of new stone walls (including a retaining wall) around the new building.
- A small reduction in foraging habitat for bats, birds, and invertebrates.
- Increased lighting affecting nocturnal species such as bats, other mammals. and nocturnal invertebrates.
- Biosecurity risks as a result of bringing in plants, seeds and soil for landscaping.

6.2.2 Mitigation measures have been proposed with the aim of increasing the intrinsic value of the retained habitats within the site, and their value to the protected and notable species present and potentially present. Additional measures have been included to ensure the safety of protected and notable species during the proposed work.

6.3 Further Survey, Mitigation, and Enhancement Measures

6.3.1 No further survey is considered necessary.

Habitat enhancement and creation

New trees

6.3.2 A total of 36 new small trees will be planted within the proposed site. The trees will be

[4] This figure includes the area of artificial unvegetated, unsealed surface (the access track and storage area) which was installed at some point after July 2022. Guidance on accounting for sites where some habitat has been lost or degraded is given in the Environment Act (2021). In Schedule 14, Part 1, Paragraph 6, it states: if "*as a result of the activities undertaken [on or after 30 January 2020] the biodiversity value of the site… is lower on the relevant date than it would otherwise have been, the pre-development biodiversity value of the onsite habitat is to be taken to be its biodiversity value"*

planted alongside the new driveway to form an avenue, and near to the site boundaries. The species selected will mirror the species present in the local area as well as including fruit trees. The trees are expected to obtain moderate condition as per the Statutory Metric (Defra, 2023). The trees would be likely to pass condition criteria B (continuous canopy), D (no evidence of adverse impact on tree health by human activities), and F (more than 20 % of the canopy oversailing vegetation below).

Other neutral grassland

6.3.4 The remaining area of other neutral grassland will be managed to increase its plant species diversity. Aside from pathways and the verges of the driveway which will be maintained as a short sward, the grass in this area will be cut three or four times a year, avoiding a cut between May and July inclusive. The arisings should be collected during or after the cuts and composted in a specific set location, and no fertiliser used.

6.3.5 The semi-parasitic[5] plant yellow rattle *Rhinanthus minor* will be added to the grassland in order to reduce the vigour of course grasses such as cocksfoot and Yorkshire fog. This will help to promote an increase in the average number of plant species present. The plant will be introduced by planting 50 plugs in ten groups of five.

6.3.6 If undesirable species (such as docks and ragwort) are recorded in the area of long grass they can be spot treated (although hand pulling would be preferable) but otherwise no herbicide, insecticide, or fertiliser should be used across the site. The management of the grassland in this way is envisaged to allow it to achieve moderate condition. It is foreseen that all condition criteria will be able to be met (Defra, 2023).

Modified grassland

6.3.7 Areas of grass lawn will also be created around the buildings in the centre of the site. This area will be sown with a grass and flower mix that will thrive in short grass[6]. It can be mown to create a short sward. The arisings should be removed and composted in a specific area, and no fertiliser used. In time it will prevent the establishment of course grasses. The advice on how to take care of a flower rich lawn given on the Plant Life website[7] will then be followed.

Hedgerows

6.3.8 The tree line and existing hedgerow (H1) should be gapped up with at least five native species used. These should include the species recorded within the site (hawthorn, blackthorn, sessile oak, sycamore, and dog rose) as well as other locally occurring

[5] Semi-parasitic plants are partially parasitic. Yellow rattle is able to draw some of the nutrients it needs from the root systems of coarse grass species, such as Yorkshire fog which will allow other species such as herbs and fine grasses to increase.
[6] An example of a flower rich short sward seed mix is available from: https://www.wildflowerlawnsandmeadows.com/product/wild-flower-lawn-seed-mix/
[7] Information on how to mow a lawn to maximise the presence of wildflowers can be found at https://nomowmay.plantlife.org.uk/what-is-no-mow-may/wild-flower-lawn/

native species such as dogwood *Cornus sanguinea*, hazel *Corylus avellana*, and holly *Ilex aquifolium*. Consideration should be given to laying or trimming the hawthorn hedge (H1) to allow the newly planted hedgerow plants to establish.

6.3.9 When hedgerow planting along the tree line to create a second hedgerow with trees along the southwestern boundary, a standard tree should be included every 20 m. If any ash trees within the tree line are disease free, they should be retained as standard trees. If this is not possible sessile oak or sycamore should be selected and planted to form the regularly occurring standard trees within the hedgerow.

6.3.10 A third hedgerow should be planted along the northwestern site boundary. The new hedgerow will comprise a double row of at least five native hedgerow plant species.

6.3.11 The hedgerows should be cut in late winter (January or February). The late cut will ensure the fruit and berries are available for overwintering birds. The cut should be made slightly further back each year, allowing the hedges to gradually expand to just over 1.5 m in width.

6.3.12 The proposed management should be sufficient to allow the hedgerows to achieve at least moderate condition. With the exception of Criterion E1 (the presence of at least one veteran of ancient tree present per 20 – 50 m) it is considered that all condition criteria can be achieved.

Mixed scrub

6.3.13 The area of bramble scrub will be selectively cut back to remove approximately half of the bramble. The gaps will be planted with a mixture of blackthorn, hawthorn, and dog rose. The area of scrub will be expanded slightly at the northwestern edge (increasing the scrub cover by a total of approximately 65 m^2. The new scrub planting will be sparser to create a natural transition to the grassland habitat.

6.3.14 Pruning will be undertaken in the winter to prevent any one species from becoming dominant. After the initial establishment of the hawthorn, blackthorn, and dog rose it is not envisaged that any gap planting would be required as self set plants are likely to be sufficiently vigorous, with small gaps within the scrub during regeneration acceptable.

6.3.15 The management is suitable to ensure the scrub achieves at least moderate condition. It is envisaged that the scrub could pass all of the required condition criteria and end up in good condition, although the relatively small size means that the presence of gaps rides and glades may be difficult to maintain (Defra, 2023).

Himalayan balsam removal

6.3.16 The Himalayan balsam present, particularly in the western corner of the site should be removed by hand pulling, strimming or mowing, or spraying with herbicide prior to the plants flowering, or as soon as the plants have flowered but prior to seeding. This must be undertaken twice a year until all plants have been removed[8]. The seeds can persist in the soil for two years so a minimum of three years of treatment is likely to be required.

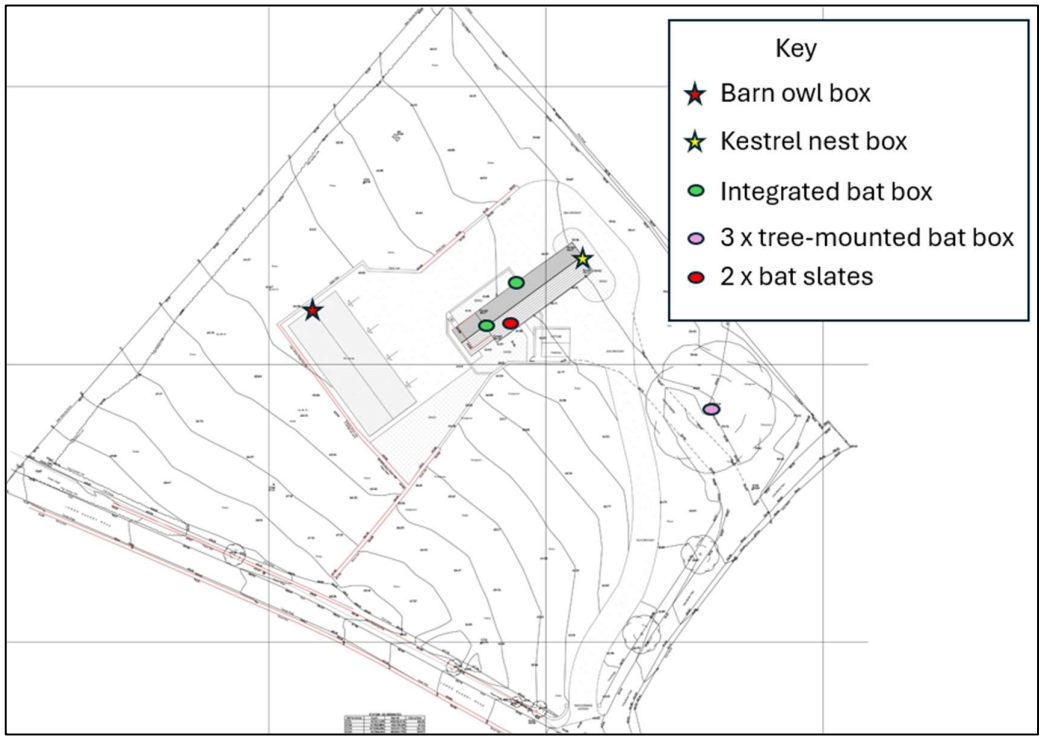
[8] The check and removal should be done on two occasions in each year as its likely that some plants will be missed during the initial management.

Bat and barn owl boxes

6.3.18 The locations of the proposed boxes is shown in Figure 3.

6.3.19 Two integrated bat boxes will be installed into the rebuilt section of Bradley Hall, with an additional three small hollow boxes installed on retained mature trees within the site.

Figure 3. Location of barn owl box and hedgehog hole



[9] https://www.barnowltrust.org.uk/barn-owl-nestbox/owl-boxes-for-trees/ [accessed 15th July 2024]

Protection of bats

6.3.22 As a result of a bat roost being present within the interior of the barn a mitigation licence must be obtained from Natural England in order to proceed with the renovation. A licence application can only be submitted once planning permission has been granted and once any pertinent planning conditions relating to wildlife have been signed off (where feasible to do so).

6.3.23 The building does have some limited suitability for use by low numbers of hibernating bats. Therefore, as a precaution, it is recommended that the demolition work occurs outside the core bat hibernation period, taken to be December to February inclusive.

6.3.24 To ensure bats are not killed or injured during the work, a toolbox talk must be provided to all construction staff by an experienced bat ecologist at the start of works. The toolbox talk should identify the presence of the known bat roost to building contractors. The toolbox talk should also highlight:

- bat protection legislation,
- the bat roost location,
- identification of signs of bats,
- the presence and location of the other potential bat roost features identified within the building (and any that may be created during the work),
- how to remove or open up suitable bat roost features where work is required, and

- what to do in the event a bat is discovered.

6.3.25 The removal of the roof will be undertaken under the supervision of the licensed ecologist.

6.3.26 The loss of the brown long-eared bat roost in the barn should be mitigated for by the inclusion of two integrated bat boxes and two lead bat slates[10] within the barn as shown in Figure 3 and Plate 21 and 22 below. It is recommended that an additional three small hollow boxes are also installed on one of the retained mature trees within the site. The tree mounted boxes will allow any bats found during the demolition to be safely released and ensure continuous roost provision is available on site during the construction works.

Plate 21. Build in bat box being installed in a stone building

6.3.27 The use of bat safe roofing felt must be used, with Type 1F bitumen coated felt the best option for known bat roosts or areas with bat mitigation. Standard breathable roofing felts are not safe for use in bat roosts. Further information on this issue is included in Appendix 7.

[10] The bat slates will allow bats to access the space between the roof slates and the roof membrane.

Plate 21. A bat slate installed in a stone slate roof

External lighting

6.3.28 The design of outside lighting should be carefully considered in line with guidance from the Institute of Lighting Professionals and the Bat Conservation Trust Guidance (IILP, 2023).

6.3.29 To prevent excessive light spill and disturbance to nocturnal species lighting restrictions will apply. Lighting should be avoided on the north, south and west aspects of the new shed/workshop and should avoid lighting up the bat and bird boxes.

6.3.30 Lighting must be low level (less than 4 m) and downwards facing. Lights must be a warm white colour (<2700 Kelvin) in line with good practice guidance (ILP, 2023). To prevent lighting at times when it is not required almost all lighting should be activated only by PIR sensors so that for the majority of the time the site remains unlit.

6.4 Biodiversity Calculations

6.4.1 The Headline Results output of The Statutory Biodiversity Metric is presented in Appendix 8, based on the proposed site habitats shown in the proposed UK Habitats Map included as Appendix 9. The development is projected to result in a net gain of 1.41 Habitat Units (a 23 % gain) and a 1.79 hedgerow unit gain (a 388 % net gain).

6.5 Conclusion

6.5.2 The results of this survey and report are considered to be valid for a period of 24 months. After this time Middleton Bell Ecology should be contacted to determine the need for update survey.

7. References

CIEEM (2017) *Guidelines for Preliminary Ecological Appraisal, 2nd edition.* Chartered Institute of Ecology and Environmental Management, Winchester.

CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal and Marine.* Chartered Institute of Ecology and Environmental Management, Winchester.

ILP (2023) Guidance Note 08/23 Bats and Artificial Lighting At Night. Bat Conservation Trust and Institute of Lighting Professionals.

DEFRA (2023) The Statutory Biodiversity Metric User Guide (draft). DEFRA.

Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., & I Win (2021) *The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain.* British Birds 114: 723-747. Available online at: www.britishbirds.co.uk/content/status-our-bird-populations

UKHab Ltd (2023) UK Habitat Classification Version 2.0 (at https://www.ukhab.org)

Appendix 1. Proposed Plan

The proposed site plan is shown below.

Appendix 2. Relevant Legislation and Planning Policy

Wildlife legislation relating to statutory designated sites and species is summarised in Table A2.1 and A2.2 below. This legal information is intended for summary only, and the original legal documents should be consulted if a detailed understanding is required.

Table A2.1. Legislation relating to designated sites and habitats

Designated Site	Legal Status
Local Nature Reserves (LNR)	LNRs are of local, but not necessarily national, importance. An LNR can also be an SSSI (Site of Special Scientific Interest), but often is not, or may have other designations. Except where the site is an SSSI, there is no legal necessity to manage an LNR to any set standard and there is no national legal protection specifically for LNRs. An LWS has certain protection against development on and around it. This protection is usually given via the local plan, (produced by the Local Planning Authority (LPA), and often supplemented by local by-laws.
Local Wildlife Site (LWS)	While they have no direct legal status, Local Wildlife Sites are considered important enough to receive recognition within the planning system. National planning policy requires local authorities to identify Local Wildlife Sites and provide for their protection through local policy.
Hedgerows	Hedgerows that meet certain criteria are protected by The Hedgerows Regulations 1997, under which it is an offence to remove or destroy such hedgerows without permission from the Local Planning Authority.

Table A2.2. Legislation relating to species

Species	Legal Status
European protection	
European Protected Species (EPS) (including bats	These animal species and their breeding sites or resting places are protected under Schedule 2 of The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, which makes it illegal to: • Intentionally or deliberately capture, injure or kill any such animal or to deliberately take or destroy their eggs. • Deliberately disturb such an animal. • Damage or destroy a breeding site or resting place of such an animal. European Protected Species (EPS) licences can be granted by Natural England in respect of development to permit activities that would otherwise be unlawful under the Conservation Regulations, providing that the following 3 tests (set out in the EC Habitats Directive) are passed: • The development is for reasons of overriding public interest.

Species	Legal Status
	• There is no satisfactory alternative; and • The favourable conservation status of the species concerned will be maintained and/or enhanced. Under Regulation 9(5) of The Conservation Regulations, Planning Authorities have a legal duty to 'have regard to the requirements of the EC Habitats Directive in the exercise of their functions'. This means that they must consider the above 3 tests when determining whether Planning Permission should be granted for developments likely to cause an offence under the Conservation Regulations. As a consequence, Planning Applications for such developments must demonstrate that the 3 tests will be passed.
National protection	
European Protected Species and other species including adder, grass snake, common lizard, and water vole	These animals receive full protection under the Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000), which makes it illegal (subject to exceptions) to: • Intentionally kill, injure or take any such animal. • Intentionally or recklessly damage, destroy or obstruct any place used for shelter or protection by any such animal; and • Intentionally or recklessly disturb such animals while they occupy a place used for shelter or protection.
Schedule 1 birds (including barn owl)	Special penalties relate to offences concerning birds listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). In addition to the offences detailed above relating to all wild birds, it is illegal to intentionally or recklessly disturb any Schedule 1 bird or their dependent young while nesting.
All bird species	All wild birds are protected under the Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000), which makes it illegal (subject to exceptions) to: • Intentionally kill, injure or take any wild bird. • Take, damage or destroy the nest (whilst being built or in use) or eggs of any wild bird.
Invasive species	The Wildlife and Countryside Act 1981 (as amended) contains measures for preventing the establishment of non-native species which may be detrimental to native wildlife, prohibiting the release of animals and planting of plants listed in Schedule 9 of the Act. In relation to Schedule 9 plants, it is an offence to plant or otherwise cause these plant species to grow in the wild.

Species and Habitats of Principal Importance

Planning authorities have a duty under Section 40 of the NERC Act 2006 to have regard to priority species and habitats in exercising their functions including development control and planning. In compliance with Section 41 of the NERC Act, the Secretary of State has published a list of species and habitats considered to be of principal importance for conserving biodiversity in England under the UK Post-2010 Biodiversity Framework. This is known as the list of Habitats and Species of Principal Importance (HPI/SPI). The HPI/SPI list is used to guide planning authorities in implementing their duty under the NERC Act.

National Planning Policy Framework

The National Planning Policy Framework for England was revised in 2023. This document states that plans should 'promote the conservation, restoration and re-creation of priority

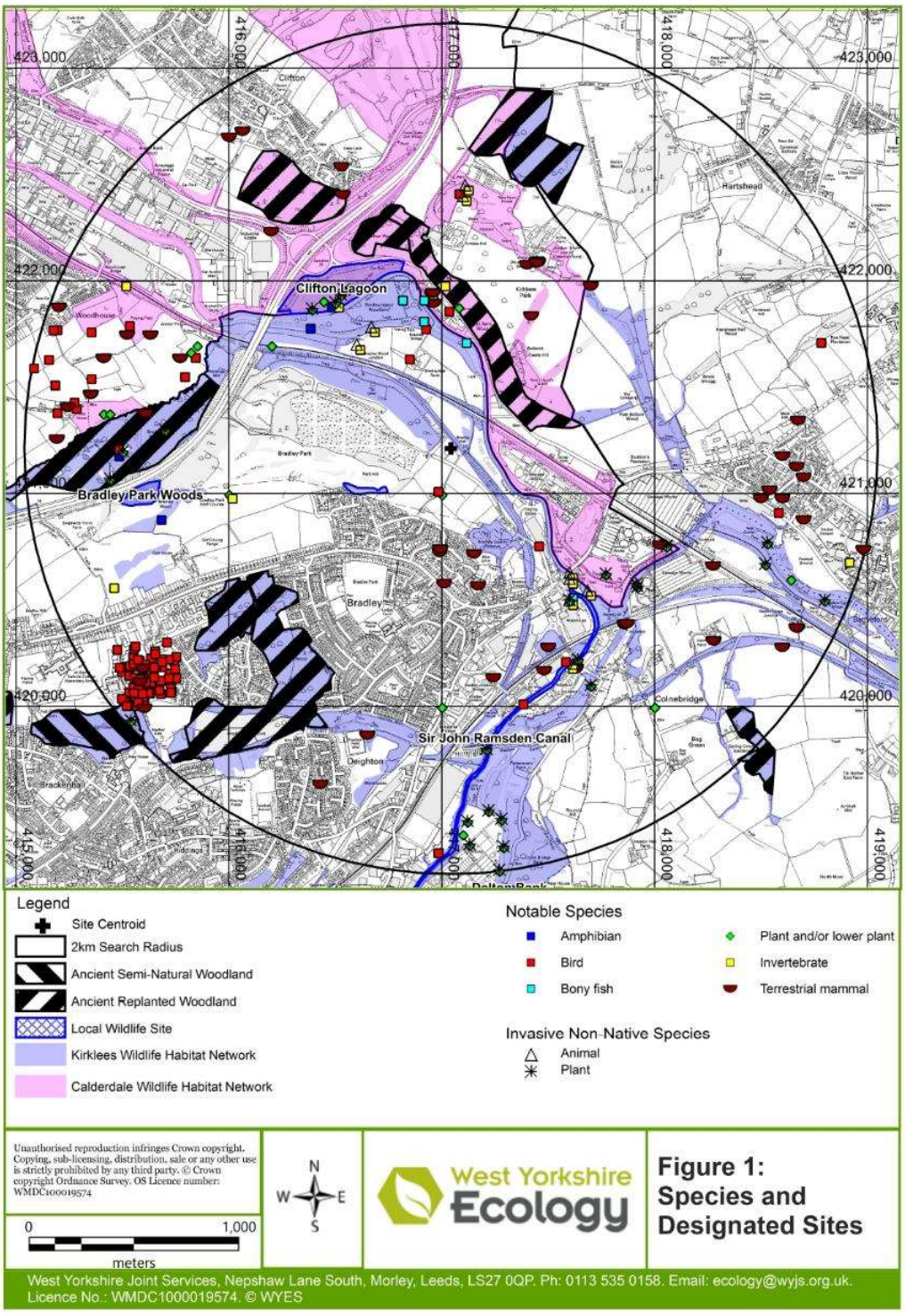
habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity'. It also puts an emphasis on refusing development which would result in the 'loss or deterioration of irreplaceable habitats (such as ancient woodland)' unless there are 'wholly exceptional reasons and a suitable mitigation strategy exists'.

Local Biodiversity Action Plans

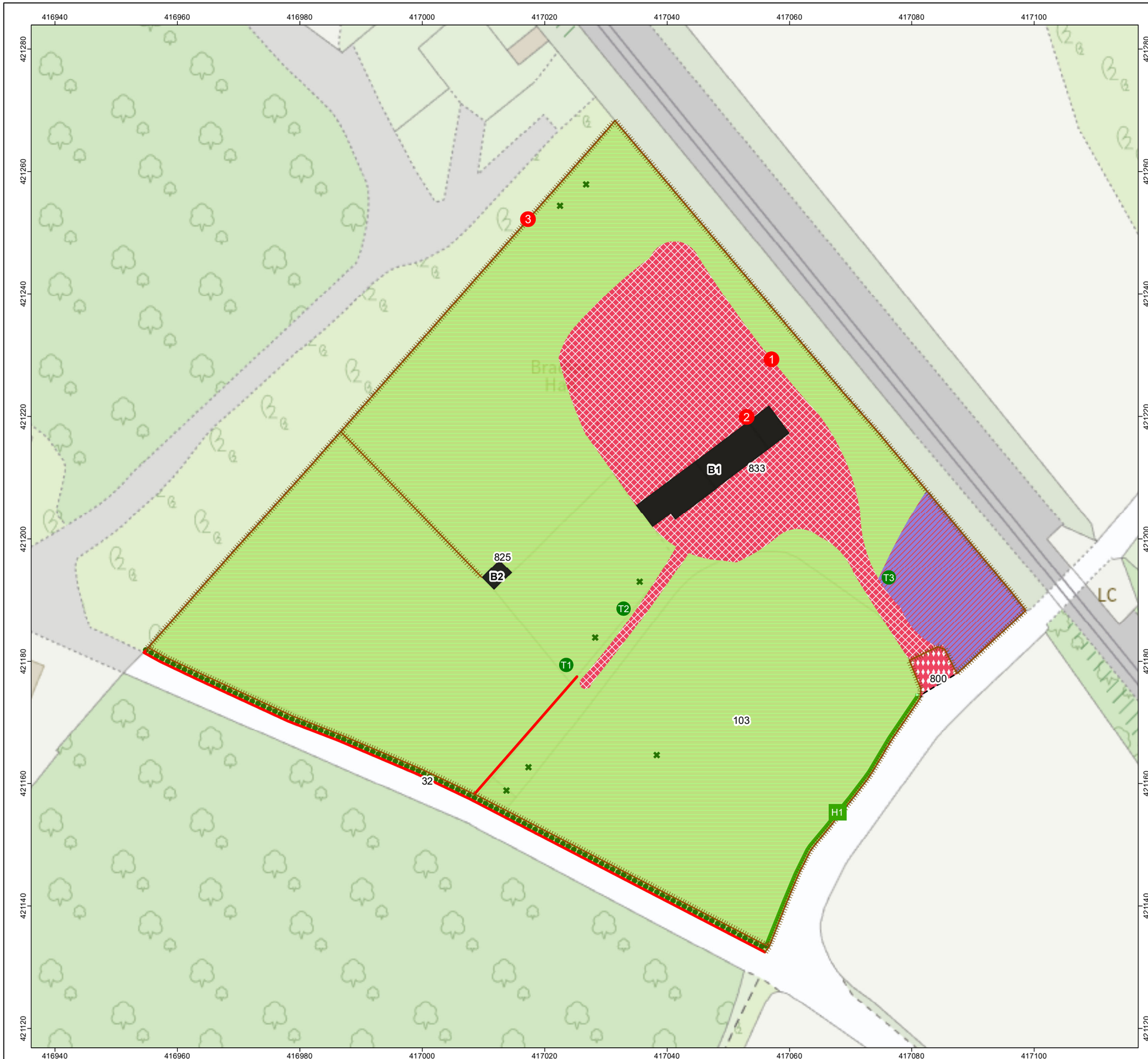
The HPI/SPI list included on Section 41 of the NERC Act 2006 is supported by a series of Local Biodiversity Action Plans (LBAPs), usually set up on a local authority local authority administrative boundary basis. Each LBAP identifies those habitats and species considered to be most important in that area (usually referred to as priority habitats and species). Commonly, an LBAP will identify a number of habitats and species for which "action plans" have been prepared.

Appendix 3. Distribution of Designated Sites Within the Search Area

Figure A3.1 The location of designated sites within the search area



Appendix 4. UK Habitat Classification Plan



Survey Information

- Site boundary (9,575.9m²)

UK Habitat Survey (Primary Habitats)

- g3c - Other neutral grassland (7,515.9m²)
- h3d - Bramble scrub (356.5m²)
- u1b5 - Buildings (161.9m²)
- u1b6 - Other developed land (35.0m²)
- u1c - Artificial unvegetated, unsealed surface (1,506.6m²)
- h2a5 - Species-rich native hedgerow (H2=48.3m)
- 33 - Line of trees (112.9m)
- 114 - Dry stone wall (138.7m)
- 612 - Fence (447.6m)
- 10 - Scattered scrub
- 203 - Mature tree
- Target note

Secondary codes:

32 – Scattered trees
103 - Horse grazed
800 – Road
825 – Ruined building
833 – Barn

Target notes:

1 – Stored cut logs and building supplies
2 – Barn owl pellets, feathers, and splashing
3 – Mammal track crossing adjacent fence

N

0 2.5 5 10
Metres

PROJECT TITLE

BRADLEY HALL FARM

DRAWING TITLE

Figure 1. UK Habitat Survey Plan

VER	DATE	REMARKS	Drawn	Checked
1.3	15/07/24	UKHab	MP	GS

DRAWING NUMBER:
MIDDLETONBELLECOLOGY/BradleyHallFarm/UKHab

SCALE	PLOT SIZE	DATUM	PROJECTION
1:600	A3	OSGB	BNG

Middleton Bell Ecology
33 Wilthorpe Road, Barnsley, South Yorkshire, S75 1JA
www.middletonbellecology.co.uk
T: 01226 286282

Appendix 5. Plant Species Recorded on Site

The plant species recorded in the various habitats present wihtin the site (g3c – other neutral grassland, 33 line of trees, h2a5 – species rich native hedgerow, and h3d – bramble scrub) and their relative abundance within the habitats present on site are shown in Table A5.1 below.

D = Dominant, **A** = Abundant, **F** = Frequent, **O** = Occasional, **R** = Rare, **L** = Locally

Table A5.1. Plant species recorded and their relative abundance

Common name	Latin name	g3c	33	h2a5	h3d
meadow foxtail	*Alopecurus pratensis*	O			
false oat grass	*Arrhenatherum elatius*	F	F		
cocksfoot	*Dactylis glomerata*	F			
red fescue	*Festuca rubra*	F			
Yorkshire fog	*Holcus lanatus*	F			
annual meadow grass	*Poa annua*	O			
smooth meadow grass	*Poa pratensis*	R			
rough meadow grass	*Poa trivialis*	O			
yarrow	*Achillea millefolium*	O			
cow parsley	*Anthriscus sylvestris*	O			
hart's tongue fern	*Asplenium scolopendrium*		R		
common mouse-ear	*Cerastium fontanum*	R			
creeping thistle	*Cirsium arvense*	R			
broad buckler fern	*Dryopteris dilatata*		O		
ladies bedstraw	*Galium verum*	O			
herb robert	*Geranium robertianum*	O			
Himalayan balsam	*Impatiens glandulifera*	LD			
soft rush	*Juncus effusus*	R			
ribwort plantain	*Plantago lanceolata*	O			
meadow buttercup	*Ranunculus acris*	O			
creeping buttercup	*Ranunculus repens*	F			
bramble	*Rubus fruticosus*	O	O		D
common sorrel	*Rumex acetosa*	O			
dock species	*Rumex spp.*	O			
ragwort	*Senecio jacobaea*	R			
red clover	*Trifolium pratense*	O			
white clover	*Trifolium repens*	O			
common nettle	*Urtica dioica*	F			F
bush vetch	*Vicia sepium*	R			
lesser burdock	*Arctium minus*	R			
springy turf moss	*Rhytidiadelphus squarrosus*	LA			

Common name	Latin name	g3c	33	h2a5	h3d
sycamore	*Acer pseudoplatanus*	R			
hawthorn	*Crataegus monogyna*			D	R
ash	*Fraxinus excelsior*	R	D	R	R
blackthorn	*Prunus spinosa*	R			R
sessile oak	*Quercus petraea*		R	R	
dog rose	*Rosa canina*			R	
willow species	*Salix spp.*	R	R		

Appendix 6. Detailed Bat Survey Results

External inspection B1 – Bradley Hall

7.1.1 The external inspection recorded a substantial number of gaps in the stone section of the Grade II listed barn. The dwelling section was in better condition with fewer gaps and more recent pointing, however, gaps were present around the stone lintels and jambs (Plate A6.1). In addition, the area of external wall which had collapsed allowed bats into the rubble filled wall cavity (Plate A6.3). Some missing bricks were present on the brick extension, particularly on the southeast corner of the building, but in general the brickwork and pointing was in relatively good condition in this section of B1 (Plate A6.2).

7.1.2 The collapsed wall, unglazed windows in the barn, and smashed windows on the house allowed bats easy access into the building. There was no substantial roost potential associated with the roof as it had been replaced with profiled metal sheeting.

Plate A6.1. Showing gaps around the door and window lintels and jambs on the dwelling section of B1 and a significant number of gaps in the masonry on the barn section

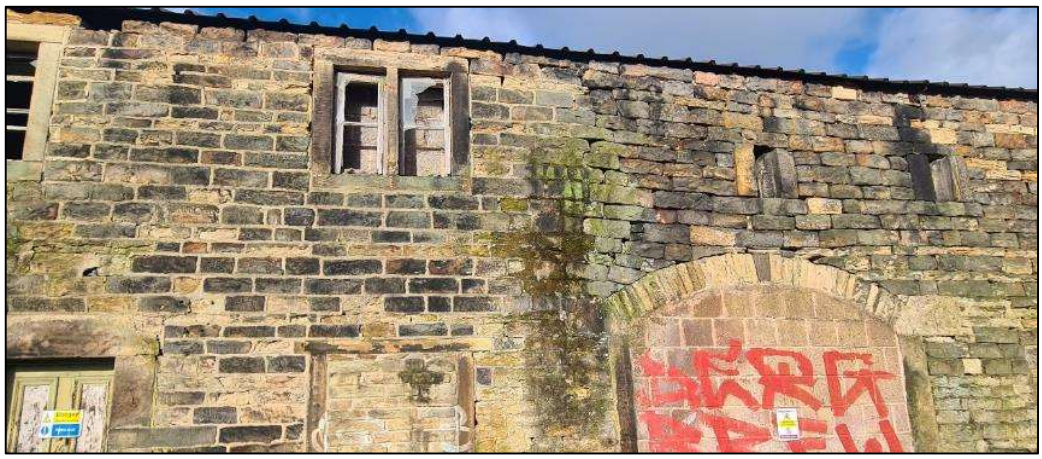


Plate A6.2. Showing the loose and missing bricks on the southeast corner of B1

Internal inspection B1 – Bradley Hall

7.1.3 The internal inspection of B1 identified large areas of loose masonry with a substantial number of gaps present (Plate A6.3). gaps were also present behind plaster in the dwelling area of the building, where it was coming away from the walls, and around beams (Plate A6.4). A small cellar was present, but relatively few potential roost features were present as the brickwork was sound and the walls were covered in thick white paint (Plate A6.5). Evidence of a fire within the dwelling area was present.

Plate A6.3. An example of a section of loose masonry on the first floor of B1

Plate A6.4. The ground floor of the dwelling area of B1

Plate A6.5. The cellar beneath the dwelling section of B1

7.1.4 The stone barn section in the centre of B1 was open to the unlined roof. The king post trusses supporting the purlins, and rafters could be seen from the ground floor (Plate A6.6).

Plate A6.6. The king post roof support and purlins within the stone barn section of B1

7.1.5 Large wooden lintels were present over doors and windows. Gaps were present between the internal and external wooden lintels. A large section of stonework had been replaced with brick, presumably as a repair. A large gap was present at the location where the brickwork should have tied into an internal stone wall (as seen on Plate A6.6 above). Additional gaps were present in the masonry as a result of missing mortar in a relatively large number of locations (Plate A6.7).

Plate A6.7. Missing mortar in the internal masonry wall

7.1.6 The roof of the redbrick extension was supported on purlins which rested on the internal and external wall (Plate A6.8). A first floor was present in this area, although the floorboards were missing in many locations. The brickwork was in reasonably good condition and few potential roost features were present internally in this section (A6.9).

Plate A6.8. The roof of the red brick extension

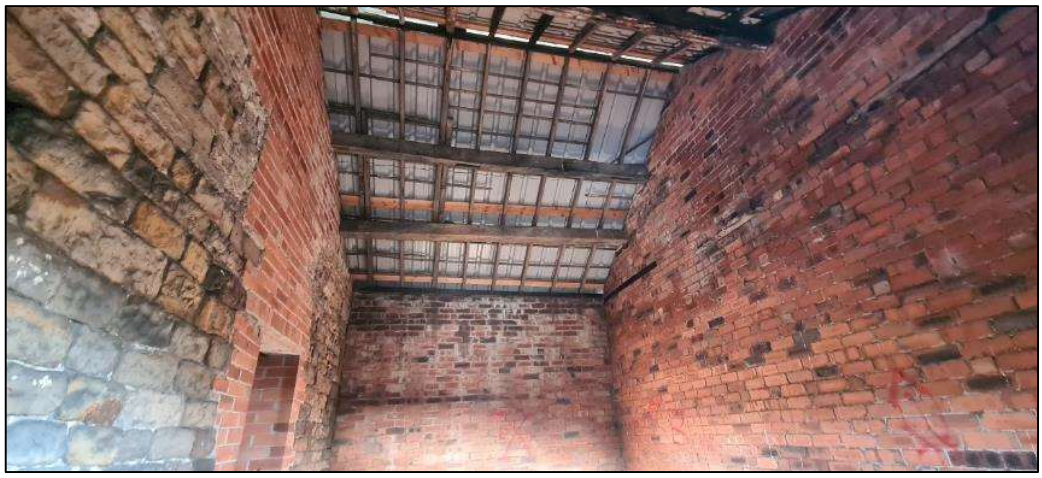


Plate A6.9. The floor and brickwork of the red brick extension

External inspection B2 – outbuilding

7.1.7 The small stone outbuilding had missing mortar resulting in gaps in the masonry on all aspects (Plate A6.10). No roof was present and aside from the gaps present in the stone walls no external potential roost features were present.

Plate A6.10. Examples of gaps between masonry in the small stone outbuilding

Internal inspection B2 - outbuilding

7.1.8 A gap was present between two timber lintels above the door on the northeast end of the building. The gap was thoroughly checked with the endoscope during the survey and no bats or signs of bats were present. The lintel above the bricked-up door on the southwest end of the building comprised a single piece of stone, similar to the window lintels (Plate A6.11). The crevices between stonework on the inside of the building were relatively shallow, damp and moss covered (Plate A6.11). Other than the gap in the door lintel the potential roost features present internally were considered to have negligible suitability to support roosting bats within the building.

Plate A6.11. Interior of B2

7.1.9 Overall B2 – the outbuilding was considered to have low suitability to support roosting bats.

Trees

7.1.10 The mature ash tree near the centre of the site (T2) had butt rot on the south-western side of the base of the stem and a tear out at present on the southern aspect at a

height of approximately 4 m. The tear out didn't appear to extend upwards when checked with a high-powered torch and was relatively shallow. The rot extended up into the stem of the tree approximately 25 cm. The cavity could be thoroughly checked during the site visit and no bats or signs of bats were recorded. Both potential roost features were relatively cluttered with twigs and small branches preventing clear access for bats entering or emerging. Neither of the features were suitable to support more than an individual bat, i.e. they would be classed as PRF-I as per the Bat Conservation Trust Survey Guidance (Collins, 2023).

7.1.11 No potential roost features were recorded on the other two trees within the site (T1 and T3) but T3 was of a sufficient size and age that it is expected that potential roost features would be present that couldn't be seen from a ground inspection.

Nocturnal Survey – 14th May 2024

7.1.12 The temperature at the beginning of monitoring was 14^0C, with a light air (Beaufort Scale 1), no rain, and two oktas cloud cover. The temperature dropped to 13^0C and the cloud increased to four oktas with the wind and rain remaining the same. The light levels in the area around the building were considered to be relatively low during the survey.

7.1.13 No bats were recorded emerging from the building during the nocturnal survey. The bat species recorded during the survey comprised common pipistrelle and noctule.

7.1.14 The first bat recorded was a noctule which was heard but not seen at 21:06 (five minutes after sunset). The next bat recorded was a common pipistrelle which flew past the southeast side of the building from the southwestern site boundary at 21:29 (28 minutes after sunset). After a brief period of six minutes with no bat activity, common pipistrelle passes were recorded fairly regulalrly, interspersed with occasional noctule passes for the remainder of the survey. At 21:45 a common pipistrelle flew into the building via an unglazed window at the northeastern end of the southwest elevation. The bat exited the building shortly afterwards. A video of the bat entering then exiting the building is available here: https://youtu.be/sEqml-jcUDM.

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7.1.15 The temperature at the beginning of monitoring was 14^0C, with a light air (Beaufort Scale 1), no rain, and full cloud cover (eight oktas). The temperature dropped to 13^0C and other weather conditions remained the same.

7.1.16 A single brown long-eared bat was recorded emerging from a window at the northeastern end of the southeast elevation (Plate A6.12). The bat emerged at 22:08 (29 minutes after sunset) and then proceeded fly to the southern end of the buidling going into and out of the ground floor door, presumably foraging. A video of the emerging brown long-eared bat is available here: https://youtu.be/gVAx0yT_Jug.

7.1.17 No other bats were recorded emerging from the building during the nocturnal survey. The other bat species recorded during the survey comprised common pipistrelle and a *Myotis* bat species.

Plate A6.12. Brown long-eared bat emergence location

7.1.18 The first bat recorded was a common pipistrelle which was heard but not seen at 21:59 (20 minutes after sunset). The second bat recorded on site was the emerging brown long-eared bat. The first *Myotis* bat species was recorded at 22:28 (49 minutes after sunset). Although very little bat activity was recorded until the brown long-eared bat emerged approximately half way through the survey, after that point the level of activity was high with multiple bats foraging and socailly interacting in front of the building.

Bat Records

7.1.19 In accordance with best practice and the requirements of bat licensing, bat records collected during surveys are supplied to the relevant biological record centres and bat groups. The records to be supplied in accordance with this survey are shown below.

Date	Species	Site Address	OS Grid Reference	Notes
14/05/2024	Noctule	Bradley Hall	SE 17043 21211	In flight record.
02/07/2024	Brown long-eared bat	Bradley Hall	SE 17043 21211	Single bat in day roost.
02/07/2024	Common pipistrelle	Bradley Hall	SE 17043 21211	In flight record.
02/07/2024	*Myotis* bat species	Bradley Hall	SE 17043 21211	In flight record.

Appendix 7. Roofing and Cladding Membranes

Standard roof membranes can cause the death of significant numbers of bats. Traditional bitumen coated roofing felt is recommended where roosting bats are expected to be present.

The problem

Non-bitumen coated membranes used below roof slates and tiles present a significant problem for bats. Over time, strands are pulled away from the surface of these materials as bats crawl over them. These fuzzy strands are very strong and can tangle and trap bats, sometimes causing the death of bats over multiple years[11].

One example we have encountered comprised a pipistrelle roost which formed in a building extension constructed in 2009. Over the course of just 13 years the roofing felt degraded to the extent that it trapped and killed more than 10 bats. Fortunately, the problem in this roost was identified and remedial work was undertaken to replace the roofing membrane in 2022.

Plate A2.1. Four dead pipistrelles tangled in breathable roofing membrane

Although a new roof might be considered to lack potential bat access points, that is often not the case. Roofs covered with stone slates almost always have gaps large enough to be accessed by bats, this is often also the case where imitation stone slates are used. On older buildings the uneven roof timbers and/or building design also often results in gaps on wall tops and between slates. Even on new builds it is often possible for bats to access potential roosts via features such as dry verge capping. Some bats can access a space no wider than a biro pen, therefore it is not surprising that they can find their way into most buildings.

Safe roofing membranes (and membranes behind cladding)

The best roofing membrane option for areas where bat roosts are expected is traditional Type 1F bitumen coated hessian backed roofing felt. Bitumen coated roofing felts have been widely and safely used as a secondary weather barrier since approximately the 1950s/1960s. Wooden sarking has also been used for many decades and if appropriately treated, is safe for use in bat roosts, or where bats could be, present. Most commercially available products come pretreated but if required, a list of suitable timber treatment products is available on the

[11] Wearing S. Essah E., Gunnel K. & Bonser R. (2013) Double jeopardy: the potential for problems when bats interact with breathable roofing membranes in the United Kingdom. Architecture and Environment

government website[12]. Wooden sarking also has the benefit of adding additional insulation and is usually breathable.

There are breathable membrane products which have passed a snagging propensity test. The test attempts to replicate the wear and tear which results from bats crawling over the membrane. At the time of writing (to our knowledge) two products have passed the test and are accepted for use in bat roosts by Natural England: TLX BatSafe[13,14] and SIGA Majcoat 200 SOB Diffusion. Although both have passed this test, it is unclear how they would fair over a long timeframe, and particularly within larger bat roosts. For this reason, we do not recommend that they are used for known bat roosts, and particularly for large (maternity roosts). However, they may provide a much needed option for roofs where future bat use cannot be ruled out, sarking boards are not an option, and a breathable solution is required.

Additional considerations

In recent years a fairly substantial proportion of the lofts we have surveyed which had existing breathable felt, were found to have been damaged by wasps (Plate A2.2). In these situations, the wasps appear to have chewed holes in the felt and formed nests in the holes. This doesn't appear to be a problem associated with the traditional bitumen coated roofing felt. Obviously, any holes within roofing felt would be likely to significantly reduce its functionality as a secondary weather barrier. Where bats or birds do come into contact with breathable roofing membranes, they can damage the membrane causing it to leak and they can also significantly reduce the breathability of the felt in that location.

Plate A2.2. Damage to a breathable roofing membrane adjacent to a wasp nest

Traditional bituminous Type 1F roofing felt is a non-breathable product and therefore ventilation is required. This can be achieved, even in buildings with vaulted ceilings, but requires some consideration during the design stage. Products to increase the ventilation within roofs where bituminous Type 1F felt has already been installed are also available but should not be considered as the primary ventilation option.

[12] Accessible at: https://www.gov.uk/government/publications/bat-roosts-insecticides-and-timber-treatments/timber-treatment-products-suitable-for-use-in-or-near-bat-roosts

[13] https://www.gov.uk/government/publications/bats-apply-for-a-mitigation-licence#full-publication-update-history:~:text=Use%20of%20safe%20roofing%20membranes

[14] TLX BatSafe requires all joints and cut edges to be taped in order to prevent the fraying of bare edges.

Appendix 8. Biodiversity Net Gain Headline Results

The Biodiversity Net Gain Final Results show a gain of 1.41 Habitat Units (a 23.11 % gain), and a gain of 1.79 Hedgerow Units (a 388.06 % gain).

FINAL RESULTS		
Total net unit change (Including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	1.41
	Hedgerow units	1.79
	Watercourse units	0.00
Total net % change (Including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	23.11%
	Hedgerow units	388.06%
	Watercourse units	0.00%
Trading rules satisfied?	Yes ✓	

Appendix 9. Proposed Plan Shown Using The UK Habitat Classification System

Survey Information	
	Site boundary (9,575.9m^2)
UK Habitat Survey (Primary Habitats)	
	g3c - Other neutral grassland (6,883.9m^2)
	g4 - Modified grassland (302.7m^2)
	h3h - Mixed scrub (422.6m^2)
	u1b5 - Buildings (396.9m^2)
	u1b6 - Other developed land (1,420.5m^2)
	h2a5 - Species-rich native hedgerow (44.2m)
	h2a5 - Species-rich native hedgerow, newly planted (116.2m)
	33 - Line of trees (109.3m)
	114 - Dry stone wall (264.6m)
	612 - Fence (391.3m)
	32 - Scattered tree, newly planted (36)
	203 - Mature tree (2)
X	Target note

Secondary codes:

10 - Scattered scrub

Target notes:

1 – Barn owl box

N

0 2.5 5 10
Metres

PROJECT TITLE

BRADLEY HALL FARM

DRAWING TITLE

Figure 2. Proposed Habitat Plan

VER	DATE	REMARKS	Drawn	Checked
1.1	15/07/24	Proposed	MP	GS

DRAWING NUMBER:
MIDDLETONBELLECOLOGY/BradleyHallFarm/Proposed

SCALE	PLOT SIZE	DATUM	PROJECTION
1:600	A3	OSGB	BNG

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