



TREKENNICK BARN, ALTARNUN, CORNWALL

PRELIMINARY ECOLOGICAL ASSESSMENT & PRELIMINARY BUILDING (ROOST) ASSESSMENT

BATS, BARN OWLS AND NESTING BIRDS



Northwest gable and northeast face.

Report reference: HEA504a2021

Date: February 2021

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Grid reference: - *SX 2174 8154*

Surveyors: - *Jessica Hutchinson*

Natural England Licence numbers: - *2015-15065-cls-cls (Bats & Dormice)
CL29-00122 (Barn Owls)*

Date of Survey(s): - *12th January 2021*

Document Control		
Action	Personnel	Date
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Revision details					
Revision	Date	Comments	Prepared by	Reviewed by	Approved by
Final	24/02/2021		Jessica Hutchinson	Tamar Horn	Jessica Hutchinson

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EXECUTIVE SUMMARY

<u>Brief Survey Summary</u>	
Habitats present:	<p>Semi-improved grassland (B2.2) Hedgerow and trees; species-poor (J2.3.2) Fence (J2.4) Building (J3.6)</p> <p>Hedgerows are UK and Cornwall BAP priority habitats which will require further assessment against the Hedgerow Regulations if being removed.</p>
Designated sites:	No designated sites of importance to nature conservation within a 1km radius of the Site.
Flora:	No protected floral species were recorded during the survey.
Nesting birds:	The hedgerow and building habitats provide good value habitat for nesting and breeding birds. It is therefore recommended as good practice that where possible works on these features be undertaken outside of the nesting season (October - February). If an active nest is encountered then works must cease and further advice sought from a suitably qualified ecologist who will determine how to proceed. There is insufficient access into the barn for larger avian species such as barn owls.
Amphibians:	The lee of the hedgerow and rough areas of pasture provide suitable habitat for common and widespread species during the terrestrial stage of their life cycle however will not be impacted upon.
Badger:	Absent at the time of survey, no evidence of this species recorded.
Bats:	No evidence of roosting bats was recorded within the barn present at the Site and the trees present are of low value as roosts and will be retained. Commuting and foraging across the Site will be present however will not be significantly impacted upon as lighting will be constrained.
Dormice:	The hedgerow habitat is suitable for this species however no evidence during the survey or records were obtained. This habitat feature will also be retained.
Otter:	The Site lacks suitable habitat for this species which are concluded absent.
Water vole:	The Site lacks suitable habitat for this species which are concluded absent.
Hedgehog:	Hedgehogs are likely present; the habitat is highly suitable however will not be significantly impacted upon.
Reptiles:	The lee of the hedge and the rough areas of pasture provide suitable habitat for these species however will not be significantly impacted upon.
Fish:	The Site lacks suitable habitat for this species which are concluded absent.
Invertebrates:	No notable invertebrate of importance to nature conservation was recorded during the survey and the most valuable habitat, the pasture and hedgerow are of low value and will be retained.
Further work:	<p>Currently no further survey effort is determined necessary as long as the mitigation and recommendations detailed in the below sections can be implemented. In brief these include:</p> <ul style="list-style-type: none"> • Use of existing access and tracks therefore no removal of hedgerow or pasture; • Where possible, general avoidance of the active nesting / breeding bird season;

- Restricted lighting to permit the continued use of the site by nocturnal species, namely bats commuting and foraging;
- Inclusion of biodiversity net gain features, namely bird and bat boxes; and,
- Consultation with the ecologist with any ecological concern or issue and a cease of works if likely evidence of any protected species identified.

Regarding all protected species, vigilance when works are undertaken, and timing of works are of great importance and should any evidence of a protected species be identified at any time then further advice should be sought from the ecologist, whom may need to apply for the appropriate license from Natural England, before works recommence.

If works do not commence within a year of this survey an updated survey will be required.

If the Site becomes unmanaged then the necessity for further survey effort to assess impacts may be required.

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TREKENNICK BARN

PRELIMINARY ECOLOGICAL APPRAISAL & CHIROPTERAN (BAT), BARN OWL AND NESTING BIRD BUILDING SURVEY,

1. Introduction

Hutchinson Ecological Associates¹ was contracted to undertake a Preliminary Ecological Appraisal (PEA) of Trekennick Barn and some surrounding land near Altarnun, Cornwall².

The Site is located in the hamlet of Trekennick, north east of the villages of Altarnun and Five Lanes, north of the main A30 trunk road in north Cornwall. It is sited within the wider habitat of agricultural land, predominantly grazed pasture, and lies close to Bodmin Moor; mosaic of grazed heathlands interlinked by wooded valleys. The town of Launceston is located to the northeast and the of Bodmin to the southwest.

Trekennick barn comprises of a barn surrounded by pasture and hedgerow adjacent to an unclassified county road and south of the main residence of Trekennick House. Currently the habitat management is light grazing with horses and the barn is used as storage.

Our understanding is that the Site is to be proposed to the Local Planning Authority (LPA) for the construction of ancillary accommodation to the main Trekennick house. The proposed scheme layout has been viewed.

An aerial view of the Site is outlined within Figure 1 with photos enclosed in Figure 2.

¹ hereafter referred to as HEA

² hereafter referred to as the Site

2. Aims and Objectives

The overall aim is to establish the extent of ecological constraint upon the proposed development, with reference to the species noted within the below objectives, and to propose appropriate mitigation to minimise ecological impacts. Specific objectives include: -

- Extended Phase 1 Habitat Survey:
 - Determine the locations of nearby habitats and sites of importance to Nature Conservation;
 - Determine the broad habitat categories present on Site;
 - Establish any significant deviation from the 2013 - 2015 baseline; and,
 - Assess the likelihood of protected species at the Site and cross reference with local biodiversity record information.

- Bats:
 - Determine if bats are roosting at the site
 - If present, establish what bat species are on Site
 - Make recommendations upon further surveying, mitigation and licensing with Natural England.

- Barn Owls:
 - Determine presence or absence of this species from the Site
 - Make recommendations for mitigation and enhancement

- Nesting Birds;
 - Determine presence or absence of these species from the Site
 - Make recommendations for mitigation and enhancement

A further aim was to refer to other species of importance to local nature conservation that although may not be protected or notable, may be impacted upon by the proposed scheme and advise upon limitations to impacts.

3. Legal Status

3.1 Habitats and Extended Phase 1 / Preliminary Ecological Appraisal

Within the UK there are specific areas that have been designated as being of conservational importance. These habitats are afforded greater protection due to the ecological impact their loss would have on a wide diversity of species. Such sites include:

- [Sites of Special Scientific Interest \(SSSI\)](#) protected under the Wildlife and Countryside Act (as amended) 1981 for a variety of animals, plants and habitats;
- [Special Areas of Conservation \(SAC\)](#) protected under the European Union's Habitats Directive (Conservation (Natural habitats &c) Regulations 1994) for a variety of animals, plants and habitats;
- [Special Protection Areas \(SPA\)](#) protected under the Birds Directive (Directive 2009/147/EC) 2009 for rare, vulnerable birds or regularly occurring migratory species; and,
- [Ramsar Sites](#) designated under the Ramsar Convention and afforded protection under the Wildlife and Countryside Act (as amended) 1981.

Other sites include:

- [National Nature Reserves \(NNR\)](#);
- [Local Nature Reserves \(LNR\)](#) ;
- [Marine Protected Areas \(MPA\)](#);
- [National Parks](#) ; and,
- [Areas of Outstanding Natural Beauty \(AONB\)](#).

Other non-statutory sites exist but are not afforded the same level of protection and include sites such as County Wildlife Sites (CWS).

3.2 Protected Flora and Fauna

The legal status of the protected species recorded on the Site, along with any species that may be affected by the proposed development can be found in Appendix 1.

3.3 Chiroptera (bats)

Many bat species populations have declined significantly in recent years and thus have been afforded legal protection (protected species). All bats, and their roosts, are protected by The Wildlife & Countryside Act 1981 (amended in the Countryside and Rights of Way Act (CRoW Act) 2000) and European Law (The Bern & Bon Conventions & Habitats and Species Directive 92) albeit if a bat is in a roost, or not. Thus, it is an offence to kill, injure, capture or disturb a bat, or obstruct, damage or destroy a bat roost.

The CRoW Act 2000 affords greater protection to wildlife by including “reckless” damage to, or, destruction of a roost, or disturbance of bats whilst in a roost. Therefore, there are implications with planning where bat species may be involved.

The 2007 amendments to the Conservation Regulations 1994, under 39 (1) (b), states that an offence is committed if there is deliberate disturbance of a species listed in Annex IV of the habitats directive, which include all British bat species, if the action has a significant effect on; (i) the ability of any significant groups of animals of that species to survive, breed, or rear or nurture their young, or, (ii) the local distribution or abundance of that species.

If it is relatively likely that bats are going to be encountered in a building and be significantly disturbed, then it is an offence to knowingly enter the roost and a Natural England licensed bat worker is required to conduct an inspection. Intervention that causes disturbance to a roost may have significant effects on local bat populations even when the bats may not be present.

3.4 Barn Owls

Barn owls are protected under The Wildlife & Countryside Act 1981 (amended in the CRoW Act 2000).

Barn owls, their eggs and young, are protected from being killed, theft and disturbance at their nesting location. Any visit to a site containing these birds during the breeding season requires a worker with the appropriate licence issued by Natural England.

3.5 Nesting Birds

All birds, including pest species, are afforded protection whilst nesting under the Wildlife and Countryside Act (WCA) 1981 (as amended) and the CRoW Act 2000. This protection is active from the first moment when a bird starts to construct their nest to when all young have fledged, albeit one or more broods. Under this legislation it is illegal to kill, injure or take any wild bird; take damage or destroy the nest of any wild bird whilst it is being built or is in use; and take or destroy the eggs of any wild bird. Generally, this season extends from the 1st April to 1st November (see Appendix 1 for DEFRA guidance on timing) however it can be influenced by climatic conditions.

Some species are afforded greater protection under Schedule 1 of the WCA 1981 (as amended) whereby they are protected against reckless, or intentional, disturbance whilst nest building, near a nest containing eggs or young and the young are protected (see section above regarding Barn Owls).

Additional lists prepared by governmental bodies, have assessed UK bird populations and classified species into Red (globally threatened with rapidly declining ranges and no sign of recovery), Amber (unfavourable European conservational status with a moderate decline in ranges) and Green (low) lists of conservational concern.

4. Survey Methodology

4.1 Data Search

An ecological desk survey was completed for the Site, Devon Biological Records Centre (DBRC), the local records centres, were contacted to provide relevant data. Data pertained included details on statutory and non-statutory designations of conservation interest and, protected and/or species of concern within the local area; 2km radius. Bat records were requested for a 4 km radius.

Historical and online data resources were reviewed within a minimum of a 2 km radius of the site and included the National Biodiversity Network³, Natural England⁴ and MAGIC⁵.

The search for international and European designated sites extended for 10km and for UK statutory designation for 5km.

4.2 Phase 1 Habitat Survey / Preliminary Ecological Appraisal (PEA)

The Extended Phase 1 Survey / PEA was undertaken in accordance with the standard methodology developed by the Nature Conservancy Council and published in the 'Handbook for Phase 1 Habitat Survey', whereby systematic habitat search and species search was undertaken (JNCC, 2016). The Site survey effort was cross referenced with the data search information obtained.

4.3 Chiroptera (bats)

The surveys were carried out by, or with, a Natural England (formerly English Nature) licensed bat worker and was completed with guidance from Bat Conservation Trust (2007) and English Nature (2004). The buildings were inspected internally and externally for signs of bats. Indicators used to determine bat use and activity were visual bat identification, droppings and associated volume, feeding signs (moth wings or insect carapace), and urine staining and associated smell. Where appropriate, the survey was aided by binoculars, endoscopes, mirrors, torch light and ladders.

The surveys initially assigned criteria for the potential to support roosting bats, depending upon the criteria assigned (refer to Appendix 2 for criteria) the need for extended survey effort was determined. Where further survey effort identified the presence of bats the roosting species and use of the Site was classified, refer to Appendix 3 for classification of roost types. An assessment of the impacts upon the bat roost and species will assessed in the absence and presence of mitigation with consideration to residual and cumulative effects.

4.3.1 Internal Inspection

A systematic building survey strategy was adopted, and all work was assisted with a powerful torch, light and ladders. The floor space and then walls of the structure were surveyed for bat signs. Further inspection of cracks and crevices with bat roost

³ here after referred to as the NBN

⁴ here after referred to as NE

⁵ www.magic.gov.uk

potential were made i.e., cracks in walls, doorways, windows, associated framework and lintels. Finally, the roof space, including rafters, beams, purlins, eaves and ridge boards were surveyed. Potential bat roost emergence and entrance points were recorded.

4.3.2 External Inspection

The ground immediately surrounding the structure, or beneath any projections of the structure, were surveyed. Walls, fascia's, soffits, cracks and crevices where bats may live were surveyed with a powerful torch, mirrors and endoscopes. Loose slates and ridge lines were surveyed using binoculars and torch light with further inspection, if required, using a ladder. All items attached to the building that may provide a potential bat roost, emergence or roost entrance, were inspected and recorded.

4.3.3 Thermal Inspection

All features suitable for bat roosting were further viewed with a Helion Pulsar 38QF thermal scope with magnification in order to seek any abnormal heat sources which could indicate a roosting bat.

4.3 Barn Owls (Tyto alba)

An initial floor inspection, looking for owl pellets, was followed by looking for lime marks on walls and beams. Any ridges, beams or suitable nesting areas were inspected by use of ladders, torch light and where necessary using endoscopes. Nesting birds were surveyed for whilst conducting this stage of the survey.

4.4 Nesting Birds

All ledges and roof timber of the internal structure of a building were surveyed by eye and binoculars, where necessary, for signs of nesting birds. All nests viewed were recorded and active nests counted.

5. Results: Background, Historical Records and Survey

Consideration to constraints must be applied when interpreting the results from all the completed surveys.

5.1 Background and Historical Data

Data was obtained from the local records centres, Cornish Biodiversity Network (CBN). Further online resources were utilised and included the National Biodiversity Network (NBN), www.magic.gov.uk and Natural England.

The full data, except for sensitive information, obtained from the local records centre is enclosed within Appendix 4.

Where species specific surveys have been completed these have been evaluated individually below.

5.1.1 Habitats

Within a 1km radius of the Site there are no records of any site designated as being of statutory importance to Nature conservation, refer to Figure 3 Magic Map

Within a 1km radius of the Site there is a single County Wildlife Site (CWS) approx. 1 km to the northwest, North Bodmin Moor (CBN, 2020).

5.1.2 Other notable protected flora and species recorded on the data search (CBN, 2020)

No species of importance to nature conservation or Schedule 9 alien species have been recorded within or bordering the Site.

A total of 129 species noted as being of importance to nature conservation were recorded within the data search radius including species of international, national and county importance.

The closest recorded species of importance is the Scott's pine which has been recorded approx. 180m to the north. There are records of small passerine birds within 200m which may pass through the Site but unlikely reside.

No Schedule 9 species, alien species, have been recorded within significant proximity to impact upon the Site, the nearest being Himalayan Cotoneaster to the southeast approx. 300m. The Grey Squirrel has also been recorded within a 1 km radius.

5.1.3 Notable protected flora and species recorded on NBN (2021)

No species were recorded within the Site or in significant proximity to be impacted upon. The nearest record to the Site is approx. 400m to the west where a good diversity of cartilaginous fish have been recorded.

5.1.4 Chiropteran (Bats)

5.1.5 Barn Owls

A single record of this species was recorded within 1km radius, within a 2 km 3 records, 40 records within 5km and 196 records within a 10 km radius (NBN, 2020).

5.1.6 Avian

A good diversity of avian species has been recorded within a 1km radius of the Site and include 50 species, within 2km 69 species, within 5km 131 species recorded and within a 10km radius 251 species (NBN, 2020).

5.2 Site Description

The Site comprises of a barn set within an area of managed grassland and pasture with a mature tree hedgerow to the east and south. The track to the site runs through a pasture field and uses an access gate to the southeast and borders an unclassified county road. Currently the Site is well maintained and managed being grazed by horses.

To the immediate north is Trekenick house beyond which is a stock farm which grazes the pasture land that surrounds the wider-site. Mature hedgerows with trees link to off-site meta-populations within wooded valleys through which streams and tributaries from the nearby Bodmin Moor drain.

Overall, the Site forms approx. 5,000m², 1.3 acres, 0.5 hectares.

5.3 Survey Constraints

There were no significant constraints to the survey undertaken other than the surveys did not span for a full year and that there were items in storage within the barn that hindered an exhaustive search. As with any survey it is impossible to see into every feature that can be accessed by a species or may be concealed from view.

5.4 Survey Conditions

All the 2021 surveys were completed during a time of year and within suitable parameters for the surveys. The survey conditions are listed in Table 1.

5.5 Results; Phase 1 Habitat Survey, Preliminary Ecological Appraisal and Preliminary Roost Assessment (bats, barn owls and breeding / nesting birds)

The results must be interpreted with consideration for the constraints to the survey. See the below sections for further detailed information.

5.5.1 Habitat categories present

Within the Site four habitat categories were identified. Table 2 provides details of the habitats present and a description, Figure 4 maps the location of these at the Site.

Hedgerow is a UK and Cornwall BAP habitat which will require further assessment under the Hedgerows Regulations, 1997 should any need to be removed.

Table 1 - Survey Conditions

Survey	Date	Weather	Cloud Cover (%)	Wind	Precipitation	Temperature (°C)
Preliminary Ecological Assessment & Preliminary Roost Assessment (bats, barn owls, nesting birds)	12/01/2021	Overcast	100	Moderate	Rain	8 - 9

Table 2 – Habitat (JNCC, 2016); description and area

Code	Habitat	Area	Categorisation	Description	Notes
B2.2	Semi-improved grassland; neutral	4,750 m ²	Interim grassland having been modified with the inclusion of organic or inorganic fertilisers whilst still demonstrating a moderate species diversity.	Form the majority of the Site forming grazing paddocks	Tussock grassland is not heavily grazed including cox-foot Yorkshire-fog, false oatgrass, fescue with the inclusion of species such as ribwort plantain, thistle, birds-foot trefoil and dock. This habitat is currently grazed by horses
J2.3.2	Hedgerows and trees; species-poor	150 m	Intact, more-or-less stock proof, with mature trees but lacking in species diversity.	Southern and western boundaries.	Borders unclassified county road and has mature trees lacking ecological features for fauna.
J2.4	Fence	180 m	Man-made stock proof barrier, often of little importance to nature conservation.	Constructed from wood and forming part of the northern and eastern boundaries.	Fence subdividing pasture paddocks.
J3.6	Building	50 m ²	Built up area comprising of a structure and including residential, agricultural and commercial buildings.	Wood constructed barn	Currently in use as a workshop and store.

5.5.2 Plants and Fungi

Site Survey

No protected or notable floral species were recorded on the Site at the time of survey.

Data Search and Desk Study

130 notable floral species recorded within the search area, those of particular interest include;

- Bogbean and Bird's-nest Orchid CITES protected from trade;
- Wall Cotoneaster, Himalayan Cotoneaster, Montbretia, Shallon, Himalayan Balsam, Yellow Archangel, Japanese Knotweed and Rhododendron which under Schedule 9 it is an offence to plant or cause to grow in the wild;
- Bluebell is a Schedule 8 species protected from picking;
- Hazel Gloves, Com Buttercup, Shepherd's needle, Glandular Eyebright and Chamomile are UK BAP species;
- *Opegrapha rupestris* is nationally scarce IUCN;
- Cornish Bladderseed is nationally rare;
- Scots Pine, Bears-foot, Welsh Poppy, Medlar and Cornish Moneywort are nationally scarce; and,
- 15 further species notable Red List 2001 IUCN species.

Overall, 817 species and 174 plants have been recorded within the 1km study radius; respectively CBN (2021) and NBN (2021).

Further Works

No further survey effort necessary, presence of protected or notable species unlikely. Of the recorded identified within the 1km radius search, none are determined to be likely present on Site and no evidence was recorded at the time of survey.

5.5.3 Avian

Site

No evidence of nesting birds was recorded within the building present or the hedgerows however these habitats do provide moderate grade nesting habitat.

No evidence of barn owls was recorded within the building habitat present. Although the pasture has potential to be foraged by barn owls, the building present on Site is not determined to be suitable nesting habitat as lacks suitable access for a bird of this size.

A diversity of common and widespread avian species was observed within the Site, mainly those associated with residential and urban habitats and low-grade farmland.

Data Search and Desk Study

Notable avian species recorded within the search area include:

- Hoopoe, Wood Lark, Redwing and Fieldfare legally protected under Schedule 1;
- Lesser Spotted Woodpecker, Hedge Accentor, Willow Tit, Yellow Hammer, Common Bullfinch, House Sparrow and Common Starling are additional UK BAP species;
- Eurasian Woodcock, Grey Wagtail, Pied Flycatcher and Willow Tit, further red listed IUCN;

- Common Swift, Meadow Pipit, Dipper, Common Redstart and Willow Warbler, further Amber listed IUCN;
- Green Spotted Woodpecker, Green Woodpecker, Barn Swallow, Winter Wren, Goldcrest, European Robin, European Nuthatch and European Goldfinch are further Bern Convention Annex II protected; and,
- 10 further notable species of conservation concern or management.

The majority of the species recorded are associated with either farmland or the nearby moorland habitats located on the valley fringes leading into the Bodmin Moor North SSSI to the west.

Overall, 37 and 62 avian species have been recorded within the 1km study radius; respectively CBN (2021) and NBN (2021).

Further Works

The habitats present on Site have the potential to support breeding and nesting common and widespread species, inclusive of some BAP species. Predominantly the hedgerow with their associated trees and the building are the most valuable habitat and will be maintained however disturbed by the proposed works. Should significant areas of these habitats then a breeding birds survey may be required, completed between March – June/ July. It is not determined that the Site has any value for wintering birds, no further survey effort necessary.

Regardless, works on the hedgerows, trees and building it is advisable as good practice to be undertaken outside of the active nesting season, approx. October – February (breeding bird season approx. March / April – August / September). If nesting is likely then a suitably qualified ecologist must attend and undertake a watching brief to determine presence or absence of active nests. Should an active nest be identified then all works within that area will cease until all young have fledged. Refer to Appendix 5 for a timing guide for nesting.

Although barn owls are absent, they may forage over the pasture habitat however this habitat will be retained and mitigation put in place to retain the suitability for this nocturnal activity.

5.5.4 Amphibian

Site

No breeding habitat is present for amphibians within the Site however, suitable terrestrial habitat is present for common and widespread species in the lee of the hedge and the pasture.

Data Search and Desk Study

Three common and widespread amphibian species, afforded partial protection, have been recorded within the search area and include the common toad, common frog and the palmate newt.

The common toad is also a UK BAP priority species.

No further amphibian species were within the 1km study radius (NBN, 2021).

Further Work

No further survey effort deemed necessary as the habitats of greatest value will be retained with no impacts. Should these habitats have to be removed then further assessment may be required.

5.5.5 Badgers *Meles meles*

Site

No evidence of badgers', legally protected under their own act, was recorded within the Site at the time of survey. The habitats present offer this species potential foraging habitat.

Data Search and Desk Study

Badgers have been recorded within the search area (CBN, 2021) and within the study area (NBN, 2021).

Further Work

No further survey effort determined necessary due to the current absence of this species from the Site.

Vigilance is recommended, badgers can quickly establish protected sett structures which would pose a constraint.

5.5.6 Chiropteran (Bats)

Site

No evidence of bat roosting was recorded within the building present which provides low grade habitat. The mature trees within the hedgerows also lack suitable roosting features.

The pasture and hedgerow habitats provide suitable habitat for foraging and commuting.

Data Search and Desk Study

Three bat species were recorded within the 1km search areas and include Lesser Horseshoe, Common Pipistrelle and Brown Long-eared (CBN, 2021).

The NBN atlas was searched for records of bats recorded within a wider radius of 1, 2, 5 and 10 kms (NBN, 2021). The results of the data search are located within Table 3.

Further Works

No further survey effort is determined necessary as current evidence suggests the likely absence of bat roosting within the building and mature trees and, that lighting is constrained to mitigate and retain nocturnal commuting and foraging. Should it not be possible to constrain lighting then further survey effort may be required.

Table 3 - NBN Atlas, 2017, Bat Species Records

Species	2km radius	5km radius	10km radius
Common Pipistrelle <i>Pipistrellus pipistrellus</i>	x	<u>1</u>	<u>15</u>
Soprano Pipistrelle <i>P. pygmaeus</i>	x	1	<u>1</u>
Pipistrelle ⁶ <i>Pipistrellus</i>	3	<u>10</u>	<u>25</u>
Brown Long-eared <i>Plecotus auritus</i>	<u>2</u>	<u>11</u>	<u>24</u>
Greater Horseshoe <i>Rhinolophus ferrumequinum</i>	x	<u>11</u>	<u>14</u>
Lesser Horseshoe <i>R. hipposideros</i>	x	<u>70</u>	<u>115</u>
Daubenton's <i>M. daubentoni</i>	x	x	<u>35</u>
Natterer's <i>M. nattereri</i>	x	<u>2</u>	<u>4</u>
Whiskered / Brandt's <i>M. mystacinus / brandtii</i>	x	<u>1</u>	<u>3</u>
Noctule <i>N. noctula</i>	x	1	<u>4</u>
Barbastelle <i>Barbastellus barbastellus</i>	x	<u>1</u>	<u>1</u>

5.5.7 Dormice *Muscardinus avellanarius*

Site

No evidence of dormice were recorded at the time of survey. The most valuable habitat is the hedgerow which lacks structural complexity and floral diversity to be considered of value.

Data Search and Desk Study

No recorded of dormice were recorded within the km data search (CBN, 2021), or within an extended 2km radius search areas (NBN, 2021).

Further Work

No further survey effort determined necessary. Dormice are highly likely absent and the hedgerow habitat will be retained.

5.5.8 Otter *Lutra lutra*

Site

None of the habitats present at the Site are suitable to support otters'

Data Search and Desk Study

Records of this species, a Cornwall BAP⁷, is recorded by CBN (2021) or NBN (2021).

⁶ Pre-1992 the Common and Soprano Pipistrelle were considered to be the same species.

⁷ Biodiversity Action Plan

Further Works

No further survey effort necessary, the Site lacks suitable habitat for this species.

5.5.9 Water Vole *Arvicola amphibius*

Site

None of the habitats present at the Site are suitable to support water voles.

Data Search and Desk Study

No records of this species were recorded by CBN (2021) or NBN (2021).

Further Works

No further survey effort necessary, the Site lacks suitable habitat for this species

5.5.10 Hedgehog

Site

The habitats present on the Site are suitable for the hedgehog, a BAP species, although no evidence was recorded at the time of survey.

Data Search and Desk Study

Hedgehogs' have been recorded within the search area (CBN, 2020) but not the study areas (NNB, 2021).

Further Work

No further survey effort deemed necessary other than vigilance; the suitable habitat of the pasture and hedgerow will be retained.

5.5.11 Reptiles

Site

The lee of the hedgerow and the pasture habitats are suitable for these species to shelter and forage.

Data Search and Desk Study

Adder, Common Lizard, and Slowworm have been recorded within the search areas (CBN, 2021) but not the study area (NBN, 2021). All three species are BAP.

Further Work

No further survey effort deemed necessary as the habitats of greatest value will be retained with no impacts. Should these habitats have to be removed then further assessment may be required.

5.5.14 Fish

Site

None of the habitats present are suitable to support bony or cartilaginous fish.

Data Search and Desk Study

No records of these species were recorded within the search area (CBN, 2021) however six species were recorded within the study areas and include the European Eel, Bullhead, Brook Lamprey, Atlantic Salmon, Sea Trout and Brown Trout (NBN, 2021).

Further Works

No further survey effort necessary. It is not possible for these species to utilise the Site.

5.5.15 Invertebrates

Site

No notable invertebrates were observed at the time of survey however the pasture and hedgerows are suitable to support a moderate diversity of invertebrate species.

Data Search and Desk Study

Notable invertebrate species recorded within the search areas include:

- Marsh Fritillary which is protected under Schedule 5,;
- Small Pearl-bordered Fritillary, Small Heath, Wall Butterfly and Mullein Wave Moth are all BAP species and IUCN red listed; and,
- *Aphodius sus*, red data book species.

Overall, a total of 160 invertebrate species have been recorded within the search area (CBN, 2021) and ten within the study areas (NBN, 2021).

6. Mitigation, Recommendation and Enhancements

Mitigation is to be implemented to ensure that there are no impacts. If the below mitigation can be implemented then there will be no need for further survey effort. General mitigation includes the constraint of light to avoid impacts upon nocturnal species.

Recommendations are made as to good working practices in order to avoid impacts becoming significant. Timing of works will generally negate or reduce impacts to insignificant.

Enhancements are proposed to provide a net gain to biodiversity at a Site level and are recommended to be included within the design as good practice as beneficial to nature conservation.

6.1 Bats

Mitigation

Lighting will need to be constrained at the Site in order to ensure there are no impacts to commuting and foraging bats. Implementation of mitigation includes:

- Limiting lighting to only that and a lux required essential to health and safety;
- Restriction of PIR to being no greater than 30seconds;
- Use of hoods and cowls to direct light across the required area and not refracted up into the night sky;
- Where possible set lighting fixtures back and away from doors and windows to prevent overspill; and,
- Externally no use of metal halide bulbs, bulbs to be wave lengths above 500nm and greater than 2700 Kelvin.

These mitigation measures will also be beneficial to other nocturnal species that may pass through the Site.

Recommendations

Vigilance is recommended at all times and should a bat, or evidence of, be identified then works must stop with further advice obtained from the ecologist whom will determine the best means to progression.

Enhancements

If wanting to enhance the Site for bat roosting then the inclusion of bat boxes within the conversion of the barn or mounted on nearby trees would suffice. Suitable designs are included within Appendix 6.

6.3 Nesting Birds

Mitigation

No mitigation required due to the current absence from the Site. However, should an active nest be identified then works must cease around the feature and further advice sought from the ecologist who will determine how best to proceed in order for works to recommence.

Recommendation

Vigilance is recommended at all times; once a bird commences nesting the nest site is protected for the duration of the nurturing and rearing of young. As best practice and to avoid potential delays to works, it is best to avoid the active nesting bird season, approx. March / April – August / September. Should an active nest be identified then works must cease around the feature and further advice sought from the ecologist who will determine how best to proceed in order for works to recommence.

Enhancement

If wanting to enhance the Site for nesting birds then the inclusion of bird boxes within the conversion of the barn or mounted on nearby trees would suffice. Suitable designs are included within Appendix 7.

6.3 Barn Owls

Mitigation

No mitigation required due to the current absence of this species from the Site. However, should evidence of this species become apparent then works must cease and further advice sought from the ecologist who will determine how best to proceed.

Recommendations

No recommendations due to the current absence of this species other than general vigilance. Should evidence of this species become apparent then works must cease and further advice sought from the ecologist who will determine how best to proceed.

Enhance

If wanting to enhance the Site for barn owls then the inclusion of a nest box, internal or external within the conversion of the site would suffice. Suitable designs are included within Appendix 8.

7. Conclusions

The Site comprises predominantly of habitats of local value with the exception of the hedgerow which is a BAP priority habitat, UK and Cornwall.

Any development will have an impact upon nature conservation despite this, the inclusion of mitigation and enhancement features can achieve an overall net gain to biodiversity with negligible overall impacts. This does not necessarily need to be targeted at the species impacted upon most significantly but attain an overall improvement in habitat quality. Regardless of the scale of a development, any development will have some ecological impact.

No further surveys are recommended for the Site, no evidence of protected species has been recorded; namely bats, nesting birds and barn owls. However, vigilance is recommended at all times and should evidence of a protected species be identified then the works must cease and the ecologist consulted in order to determine how the Site can legally progress and recommence.

Recommendations of restricted lighting to preserve nocturnal activity. Enhancements are proposed to identify where a net gain to biodiversity can be achieved.

During works should any species be identified as being potentially of significance to nature conservation then then a suitably qualified ecologist must be consulted whom will act as Ecological Clerk of Works (ECoW) and determine how to progress and if a derogation license needs to be granted from Natural England.

If works do not commence within twelve months of this survey, an updated survey will be required to ensure that the status of the Site, with regard to these species, has not significantly altered. Post 2-3 years a full Site re-survey will be required in accordance with Natural England guidelines.

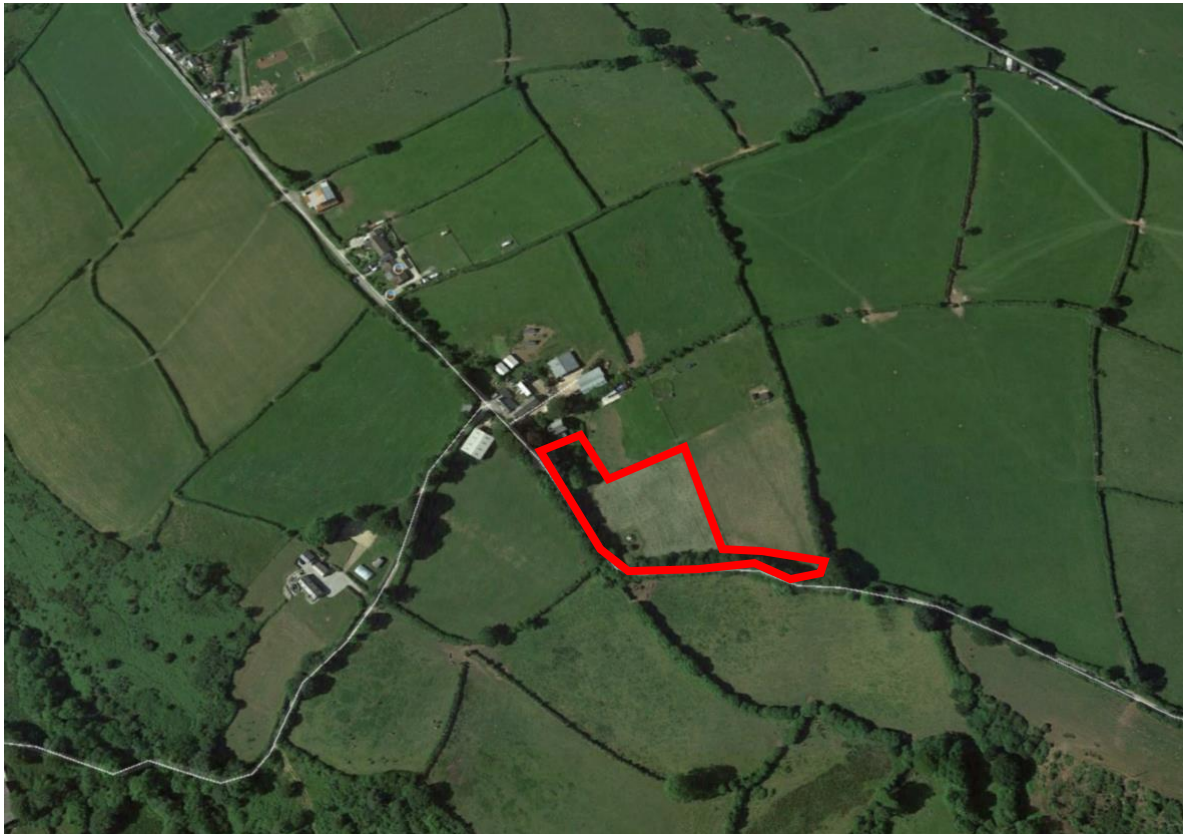
If the Site is allowed to become unmanaged then further survey effort may be necessary with regard to protected species as the Site becomes more suitable.

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- Wildlife and Countryside Act 1981 (as amended);
- Countryside and Rights of Way Act 2000;
- Natural Environment and Rural communities (NERC) Act 2006;
- Hedgerows Regulations 1997;

- Protection of Badgers Act 1992;
- National Planning Policy Frameworks (NPPF);
- Cornwall Biodiversity Action Plan; and,
- The UK Biodiversity Action Plan (UKBAP).

Figure 1 –Site location



a. Google image of the Site, as outlined in red.



b. The Site, outlined in red.

Figure 2 – Photos of the Site



a. Part of north west gable end and southwest face of the building.



b. Track leading to the Site through semi-improved grassland (pasture), fenced along the western hedgerow.



c. Wooden fence, semi-improved grassland and barn in the rear of view.



d. Access gate and track in southeast corner of the Site.

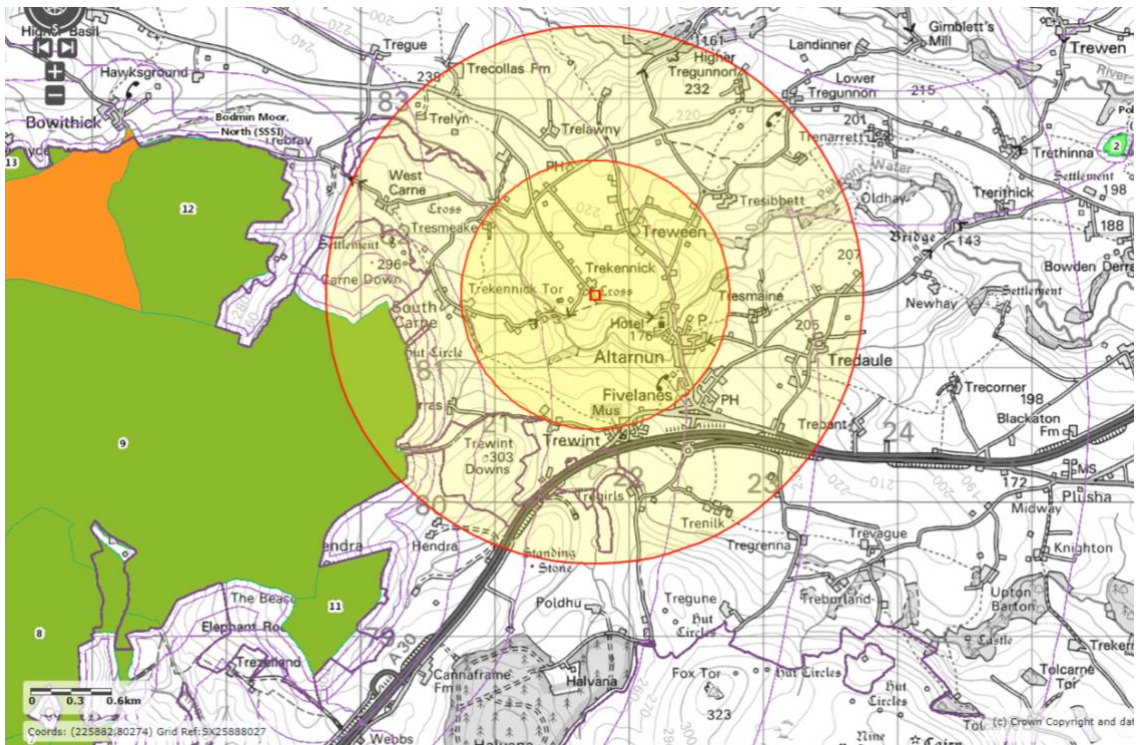


e. Semi-improved pasture forming the majority of the Site.



f. Interior of the barn where items were in storage.

Figure 3 – Magic Map; Statutory designated sites within a 1 and 2 km radius



Buffer zones of 1 and 2km radii of the Site illustrating sites of importance to nature conservation. The green and orange area to the left of view, west on map, is the Bodmin Moore North SSSI.

Figure 4 – Phase 1 Plan of the Site Habitats



HEA 504 / 2021

Tre kennick Barn

Phase 1 Habitat map

Legend

-  Hedgerow
 -  Fence
 -  Building
 -  Site Boundary
 -  SI SemiImprovedGrassland
- 2020.08-01P Location Plan

P1	05/06/20	ADW	Prelim. issue
ISSUE	DATE	DRAWN	REVISION

Architects

C Templeton

Scale 1:1250

Altarnun

Date June 2020

Dwg No. 2020/08-01P1

APPENDICES

Appendix 1 – Legislation for Flora and Fauna

Hedgerows

Hedgerows are protected under The Hedgerow Regulations 1997 (made under section 97 of the Environment Act 1995), which makes it an offence to remove most hedgerows without having submitted a hedge row removal notice to the Local Planning Authority (LPA) who can insist on retention of “important” hedgerows.

Plants

Many invasive plant species are included in Section 9 of the Wildlife and Countryside Act (WCA) 1981 (as amended), which covers, “plants which may not be planted or otherwise caused to grow in the wild”. This includes, Japanese knotweed, Himalayan balsam, montbretia and giant hogweed.

The Conservation of Habitats and Species Regulations 2010; and the Wildlife and Countryside Act 1981 (as amended) protects 186 flora species in the UK under a Schedule 8 under which it is an offence to: pick, uproot, destroy, sell or offer for sale, possess or transport with the intention of selling. Nine of these species are further protected with additional offences including cut and collect.

A further 250 floral species are protected through Planning Policy and Natural Environment and Rural Communities (NERC) Act 2006.

Nesting Birds

All birds, including pest species, are afforded protection whilst nesting under the Wildlife and Countryside Act (WCA) 1981 (as amended) and the CRoW Act 2000. This protection is active from the first moment when a bird starts to construct their nest to when all young have fledged, albeit one or more broods. Under this legislation it is illegal to kill, injure or take any wild bird; take damage or destroy the nest of any wild bird whilst it is being built or is in use; and take or destroy the eggs of any wild bird. Generally, this season extends from the 1st April to 1st November however it can be influenced by climatic conditions.

Some species are afforded greater protection under Schedule 1 of the WCA 1981 (as amended) whereby they are protected against reckless, or intentional, disturbance whilst nest building, near a nest containing eggs or young and the young are protected (see section above regarding Barn Owls).

Additional lists prepared by governmental bodies, have assessed UK bird populations and classified species into Red (globally threatened with rapidly declining ranges and no sign of recovery), Amber (unfavourable European conservational status with a moderate decline in ranges) and Green (low) lists of conservational concern.

Amphibians

Great crested newts (GCN"s) are protected under the Wildlife and Countryside Act (as amended) 1981 Section 9(4) (b) & (c) and (5) against intentional / reckless disturbance at a structure / place used for shelter or protection, and, sale (including offering / advertising/transporting for sale) inclusive of parts or derivatives. Further protection is

afforded under the Conservation (Natural Habitats &c) Regulations 1994 against deliberate killing, deliberate taking / destruction of eggs, keeping, damage to / destruction of breeding site / resting place, deliberate disturbance, and, sale / exchange, offering exchange (includes parts or derivatives and transport)

Badgers

Badgers and their setts are legally protected under the Protection of Badgers Act 1992, and the Wildlife and Countryside Act 1981 and subsequent amendment 1985. As such it is an offence to wilfully take, kill, injure, or ill-treat a badger. Under the Protection of Badgers Act 1992 their setts are also protected against obstruction, destruction, or damage in any part, and the animals within a sett cannot be disturbed.

If necessary, it is possible to move badgers from a sett, but the difficulty/success of such actions depends upon the importance of the sett to that group of badgers and whether a suitable alternative sett exists within their territory. For setts in current use by badgers, a licence must be issued (by Natural England) before the badgers can be moved and /or the sett destroyed. In general, the smaller the sett, the less important it is likely to be to the continued survival of a group of badgers, and the more successfully the badgers can be excluded from it.

Chiroptera (bats)

Many bat species populations have declined significantly in recent years and thus have been afforded legal protection (protected species). All bats, and their roosts, are protected by The Wildlife & Countryside Act 1981 (amended in the Countryside and Rights of Way Act (CRoW Act) 2000) and European Law (The Bern & Bon Conventions & Habitats and Species Directive 92) albeit if a bat is in a roost, or not. Thus, it is an offence to kill, injure, capture, or disturb a bat, or obstruct, damage or destroy a bat roost.

The CRoW Act 2000 affords greater protection to wildlife by including “reckless” damage to, or, destruction of a roost, or disturbance of bats whilst in a roost. Therefore, there are implications with planning where bat species may be involved.

The 2007 amendments to the Conservation Regulations 1994, under 39 (1) (b), states that an offence is committed if there is deliberate disturbance of a species listed in Annex IV of the habitats directive, which include all British bat species, if the action has a significant effect on; (i) the ability of any significant groups of animals of that species to survive, breed, or rear or nurture their young, or, (ii) the local distribution or abundance of that species.

If it is relatively likely that bats are going to be encountered in a building and be significantly disturbed, then it is an offence to knowingly enter the roost and a Natural England licensed bat worker is required to conduct an inspection. Intervention that causes disturbance to a roost may have significant effects on local bat populations even when the bats may not be present.

Dormice

The Common dormouse is afforded protection under UK legislation, Wildlife and Countryside Act 1981 (as amended) and CROW Act 2000, as well as European, Conservation (Natural habitats &c) Regulations 1994. Under this legislation, and regulations, it is an offence to; intentionally or deliberately take, kill or injure a dormouse; damage, destroy or obstruct access to any structure or place of shelter or area of protection; and, disturb a dormouse whilst occupying a place of shelter or protections.

Otter

The otter is protected under both the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2010.

Under the above legislation, otters and their resting places are fully protected. It is an offence to deliberately, capture, injure or kill them or to damage, destroy or obstruct their breeding or resting places. It is also an offence to disturb otters in their breeding or resting places.

There is however provision within the legislation to carry out, under licence, activities which would otherwise be unlawful. Such licenses are issued by Natural England in certain defined circumstances, for specified purposes, if the issue cannot be satisfactorily resolved by any other satisfactory alternative means.

Water Vole

Water vole are protected under the Wildlife and Countryside Act (WCA) 1981 (as amended) It is an offence to kill, capture or own a water vole, damage, destroy or obstruct shelter and, sell or advertise for sale.

Reptiles

All six reptile species native to Britain are protected under the Wildlife and Countryside Act 1981, and subsequent Amendment 1985, which makes it an offence to intentionally kill or injure a reptile. This legislation includes four “widespread” species; adder⁸, grass snake⁹, common lizard¹⁰ and slow worm¹¹. The sand lizard¹² and smooth snake¹³ receive additional protection under further sections of the WCA 1981, CROW 2000 and European legislation, which protects their habitat.

Although the widespread habitat of the reptile is not directly protected, disturbing or destroying habitat whilst these animals are present may lead to an offence being committed. Under the CROW Act 2000, which strengthens the WCA, 1981, the definition of “intentional” is taken to include “reckless” where there is a likelihood of a protected species being present. Therefore, there is a legal obligation to undertake a “reasonable

⁸ *Vipera berus*

⁹ *Natrix natrix*

¹⁰ *Zootoca vivipara*

¹¹ *Anguis fragilis*

¹² *Lacerta agilis*

¹³ *Coronella austriaca*

effort” to mitigate harm to reptiles present on a site by removing them from the habitat to be lost or protecting any retained habitat.

Invertebrates

The Conservation of Habitats and Species Regulations 2010; and the Wildlife and Countryside Act 1981 (as amended) protects large blue butterflies, Fisher’s estuarine moth and the little whirlpool ramshorn snail species in the UK making it an offence to Intentionally or recklessly: damage or destroy a breeding or resting place, obstruct access to a place of resting or shelter and, possess, sell, control or transport live or dead individual specimens, or parts of.

A further 400 species of principle importance are protected under the Wildlife and Countryside Act 1981 (as amended) and the Natural Environment and Rural Communities (NERC) Act 2006.

Appendix 2 – Criteria for Buildings Potential to Support Roosting Bats

Roosting Potential	Criteria
Negligible	Lacking habitat features suitable to be used by roosting bats.
Low	Low numbers of features, one or more, that could be used by individual bats or low numbers to roost. However, these potential roost features do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by large numbers of bats (i.e., unlikely to be suitable for maternity or hibernation).
Moderate	Either an increased number of features that could be used by bats, or greater numbers of, to roost. Often of greater size, or afford shelter, protection, conditions and surrounding habitat that is of a higher value. Often unlikely to support roosts of a high conservation status (with respect to roost type only and not species, species are assessed later if confirmed present).
High	Either an increased number of features, or features of significant size which afford suitable / high value shelter, protection, conditions and surrounding habitat. Roost features have obvious suitability for use by larger numbers of bats on a regular basis, potentially for longer periods of time due size, shelter, protection, conditions and surrounding habitat. Potential to be used for activities such as Maternity or hibernation.
Confirmed	Evidence of bats confirmed through observation of bats or evidence of.

Appendix 3 – Bat Roost Definitions, Impact Evaluation Indices and Effect Calculator

1. **Definitions of roost types to be included in the application (further detail can also be found in the Bat Mitigation Guidelines and the BCT’s “Bat Surveys Good Practice Guidelines”):**
 - a. *Day roost*: a place where individual bats, or small groups of males, rest or shelter in the day but are rarely found by night in the summer.
 - b. *Night roost*: a place where bats rest or shelter in the night but are rarely found in the day. May be used by a single individual on occasions or it could be used regularly by the whole colony.
 - c. *Feeding roost*: a place where individual bats or a few individuals rest or feed during the night but are rarely present by day.
 - d. *Transitional / occasional roost*: used by a few individuals or occasionally small groups for generally short periods of time on waking from hibernation or in the period prior to hibernation.
 - e. *Swarming site*: where large numbers of males and females gather during late summer to autumn. Appear to be important mating sites
 - f. *Mating sites*: sites where mating takes place from later summer and can continue through winter.
 - g. *Maternity roost*: where female bats give birth and raise their young to independence.
 - h. *Hibernation roost*: where bats may be found individually or together during winter. They have a constant cool temperature and high humidity.
 - i. *Satellite roost*: an alternative roost found in close proximity to the main nursery colony used by a few individual breeding females to small groups of breeding females throughout the breeding season.
 - j. *Other* – please explain what the roost type is if not one of the above (we recognise that roost types are interchangeable and not always easy to classify according to the nuances of certain species).

These are valued, for the purpose of impact assessment, geographically with regard to the species status. The following table is open to some interpretation as there are regional and national variations in species distribution and abundance, for example Horseshoe species are rare and more abundant in the South-West but are rare and less abundant the further east you go so a Horseshoe identified in the east would be extremely rare by comparison to it being rare in the west. This is based upon work by Wray *et al*, 2010.

2. Categorisation of bats species by National Rarity

Rarity range	within	England	Wales	Scotland	Northern Island
Common population over 100,00		Common pipistrelle Soprano pipistrelle Brown long-eared	Common pipistrelle Soprano pipistrelle	Common pipistrelle Soprano pipistrelle	Common pipistrelle Soprano pipistrelle
Rarer population, 10,000-100,00		Lesser horseshoe Whiskered Brandt's Daubenton's Natterer's Leisler's Noctule Nathusius pipistrelle Serotine	Lesser horseshoe Daubenton's Natterer's Brown long-eared	Daubenton's Natterer's Brown long-eared	Daubenton's Natterer's Leisler's Noctule Nathusius pipistrelle Brown long-eared
Rarest population under 10,000		Greater horseshoe Bechstein's Alcathoe Greater mouse-eared Barbastelle Grey long-eared	Greater horseshoe Whiskered Brandt's Bechstein's Alcathoe Noctule Nathusius pipistrelle Serotine Barbastelle	Whiskered Brandt's Alcathoe Noctule Nathusius pipistrelle Leisler's	Whiskered

3. Bat Roost Impact Evaluation Assessment criteria table

Geographical Frame of Reference	Roost Type
District, Local, or, Parish	Feeding Perches (<i>common species</i>) Individual bats (<i>common species</i>) Small numbers of non-breeding bats (<i>common species</i>) Mating sites (<i>common species</i>)
County	Maternity sites (<i>common species</i>) Small numbers of hibernating bats (<i>common and rarer species</i>) Feeding perches (<i>rarer/rarest species</i>) Individual bats (<i>rarer/rarest species</i>) Small numbers of non-breeding bats (<i>rarer/rarest species</i>)
Regional	Mating sites (<i>rarer/rarest species</i>) including well-used swarming sites Maternity sites (<i>rarer/rarest species</i>) Hibernation sites (<i>rarer/rarest species</i>) Significant hibernation sites
National/UK	Mating sites (<i>rarer/rarest species</i>) Sites meeting SSSI guidelines with bats roosting or noted within the citation.
International	SAC sites with bats roosting or noted within the citations and definitions.

4. **Duration of impacts allow for the assessment of effects when cross referenced with the magnitude of the Impact. The definition of the durations is categorised within the below table.**

Description of Duration of impact	
Duration	Criteria
Temporary	Effects resultant of grounds work preparation and constructional phases of the development
Short term	Effects 1-2 years post development completion
Mid term	Effects 2-5 years post development completion
Long term	Effects 5-15 years post development completion
Permanent	Effects 15 years or beyond

5. **Magnitude of impact is cross referenced with the impact duration to establish the effect of the proposed scheme**

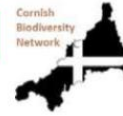
Description of magnitude of effect	
Impact Description	Criteria
Major Adverse	The change is likely to cause a permanent adverse effect on the integrity of an ecological receptor.
Minor Adverse	The change adversely affects the valued ecological receptor, but there will probably be no permanent effects on its integrity.
Negligible	No effect
Minor Beneficial	The change is likely to benefit the receptor in terms of its conservation status, but not so far as to achieve favourable conservation status.
Major Beneficial	The change is likely to restore an ecological receptor to favourable conservation status, or to create a feature of recognisable.

6. **Matrix of Residual effect is applicable to the duration of the impact for the purposes of assessment**

Basic matrix used to determine significance of effects						
Impact Evaluation	International	National	Regional	County / Metropolitan	District / Borough	Parish / Neighbourhood
Magnitude						
Major Adverse	Critical	Critical	Critical to moderate	Large to moderate	Moderate to minor	Minor to moderate
Minor Adverse	Large to minor	Large to minor	Large to minor	Moderate to minor	Moderate to minor	Minor
Negligible	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
Minor Beneficial	Large to minor	Large to minor	Large to minor	Moderate to minor	Moderate to minor	Minor
Major Beneficial	Critical	Critical	Critical to moderate	Large to moderate	Moderate to minor	Minor to moderate

Appendix 4 – Data Search Results

CORNISH BIODIVERSITY NETWORK – SUPPORTING WILDLIFE RECORDING

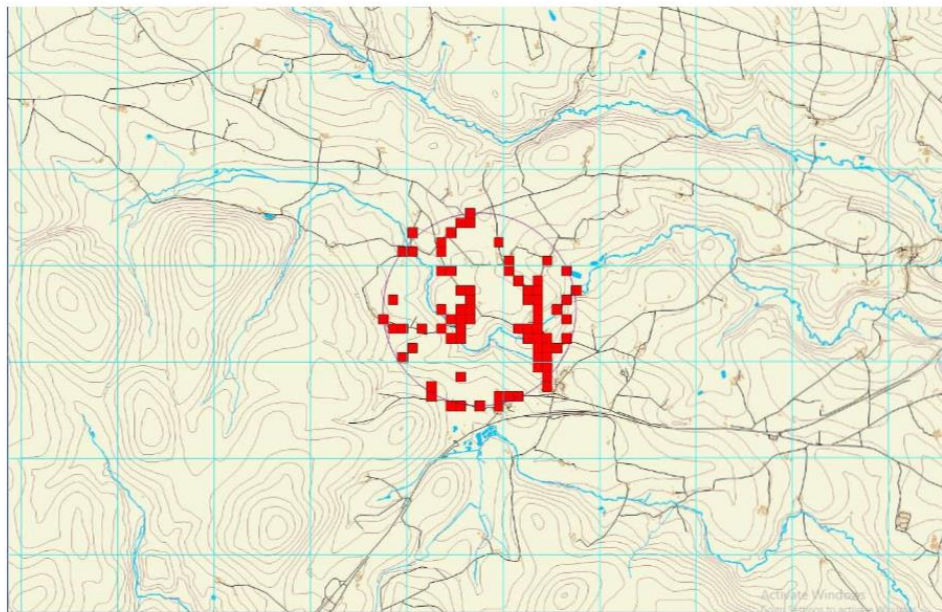


Site name: Trekennick Barn

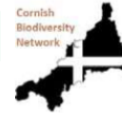
Grid ref.: SX217815

The following report has been compiled by the Cornish Biodiversity Network (CBN) on behalf of Ecological Surveys Ltd as part of a desktop ecological assessment of land at Trekennick Barn. Based on our standard data search service it includes information on a) any statutory or non-statutory designated sites (i.e. sites of international, national or regional/local importance), b) all protected species, c) all rare/notable species and d) all Priority Species as identified in the UK Biodiversity Action falling within a one kilometre radius search area centred on the Ordnance Survey grid reference SX217815. The report is completed by three spreadsheets containing records of rare and threatened species in the search area and a total species list and two HTML files which show the position of the rare and threatened species, and schedule 9 species, on a satellite backdrop.

Figure 1: Location map showing the search area and hectares with records.



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The species report spreadsheets are:

Rarities.xls: The records of rare and threatened species.

SpeciesList.xls: Total species list for the 1km radius of the site, sorted taxonomically.

Schedule9.xls: The records of Schedule 9 alien species.

The two accompanying HTML files:

Rarities.htm

Schedule9.htm

These show the distribution of rare and threatened species and Schedule 9 alien species on a Google satellite background. Hovering the mouse over the dots reveals the grid reference and species species that were recorded at that grid reference. Note that the dots are smaller than a hectare in size so for records with a 6 figure grid reference (denoting a hectare) the dots give an approximate position.



Table 1: Species that are rare and/or threatened showing the threat categories.

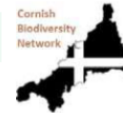
Species name	Common name	First Year	Last Year	Uk Protection	International Protection	Status
<i>Alopecurus myosuroides</i>	Black-grass	2018	2018			RPR2
<i>Anguis fragilis</i>	Slow Worm	2001	2001	England_NE RC_S.41 WACA- Sch5_sect9.1 WACA- Sch5_sect9.5 a	Bern-A3	BAP-2007
<i>Anthemis arvensis</i>	Corn Chamomile	1909	1909			CRDB2 RPR1 RDB2014-EN RDB>2001- EN
<i>Anthus pratensis</i>	Meadow Pipit	2011	2011		Bern-A2	Bird-Amber
<i>Aphodius sus</i>		1906	1906			RDB<94-EN
<i>Apus apus</i>	Common Swift	2011	2011			Bird-Amber
<i>Asplenium obovatum</i> subsp. <i>billotii</i>	Lanceolate Spleenwort	1909	1909			CRDB2 RPR4 RDB2014-NT NS
<i>Atriplex littoralis</i>	Grass-leaved Orache	2018	2018			RPR1
<i>Bionectria ralfsii</i>		2014	2014			CRDB2 NS
<i>Boloria selene</i>	Small Pearl-bordered Fritillary	1982	1982	England_NERC_S.41		RDB>2001-NT BAP-2007
<i>Bufo bufo</i>	Toad	1994	2014	England_NE RC_S.41 WACA- Sch5_sect9.5 a	Bern-A3	BAP-2007
<i>Buteo buteo</i>	Common Buzzard	2011	2015		CMS_A2 ECCITES-A	
<i>Calluna vulgaris</i>	Ling	1922	2013			RDB2014-NT RDB>2001-NT
<i>Carduelis carduelis</i>	European Goldfinch	2011	2016		Bern-A2	
<i>Carex echinata</i>	Star Sedge	1993	2015			RDB2014-NT RDB>2001-NT
<i>Chamaemelum nobile</i>	Chamomile	2011	2011	England_NERC_S.41		CRDB2 RPR4 RDB2014-VU NS RDB>2001- VU BAP-2007
<i>Cichorium intybus</i>	Chicory	1909	1909			RDB2014-VU RDB>2001- VU
<i>Cinclus cinclus</i>	Dipper	2018	2018		Bern-A2	Bird-Amber
<i>Cladonia portentosa</i>		1998	1998		HabDir-A5	
<i>Coenonympha pamphilus</i>	Small Heath	2013	2013	England_NERC_S.41		RDB>2001-NT BAP-2007
<i>Columba palumbus</i>	Common Woodpigeon	2014	2014		BirdsDir-A2.1	
<i>Corvus corone</i>	Carrion Crow	2011	2011		BirdsDir-A2.2	
<i>Corvus frugilegus</i>	Rook	1996	2012		BirdsDir-A2.2	
<i>Corvus monedula</i>	Eurasian Jackdaw	2016	2016		BirdsDir-A2.2	
<i>Dendrocopos major</i>	Great Spotted Woodpecker	2011	2011		Bern-A2	
<i>Dendrocopos minor</i>	Lesser Spotted Woodpecker	1968	1968		Bern-A2	CRDB2 Bird- Red
<i>Dichomitus efibulatus</i>		2011	2014			CRDB2 NS

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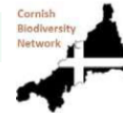
<i>Didymodon nicholsonii</i>	Nicholson's Beard-moss	2005	2005			CRDB2
<i>Dryopteris affinis</i> subsp. <i>cambrensis</i>	Narrow Male-fern	2011	2011			RPR1
<i>Emberiza citrinella</i>	Yellow Hammer	2011	2011	England_NE RC_S.41	Bern-A2	Bird-Red BAP-2007
<i>Erica cinerea</i>	Bell Heather	1924	2011			RDB2014-NT RDB>2001-NT
<i>Erica tetralix</i>	Cross-leaved Heath	1924	2011			RDB2014-NT RDB>2001-NT
<i>Erinaceus europaeus</i>	Hedgehog	2003	2003	England_NE RC_S.41	Bern-A3	CRDB2 BAP-2007
<i>Eriophorum angustifolium</i>	Common Cottongrass	1993	1993			RDB2014-VU RDB>2001-VU
<i>Erithacus rubecula</i>	European Robin	2016	2016		Bern-A2	
<i>Euphrasia nemorosa</i>	Common Eyebright	2011	2018			RDB2014-NT RDB>2001-NT
<i>Euphrasia officinalis</i> subsp. <i>anglica</i>	Glandular Eyebright	1993	1993	England_NERC_S.41		CRDB2 RPR3 RDB2014-EN RDB>2001-EN BAP-2007
<i>Euphydryas aurinia</i>	Marsh Fritillary	1965	1965	England_NE RC_S.41 WACA-Sch5_sect9.1 ,WACA-Sch5_sect9.2 ,WACA-Sch5_sect9.4 a,WACA-Sch5_sect9.4 b,WACA-Sch5_sect9.5 a,WACA-Sch5_Sect9.4c	Bern-A2 HabDir-A2*	CRDB2 NS RDB>2001-VU BAP-2007
<i>Ficedula hypoleuca</i>	Pied Flycatcher	1990	1990		CMS_A2	CRDB2 Bird-Red
<i>Fragaria vesca</i>	Wild Strawberry	1989	2015			RDB2014-NT RDB>2001-NT
<i>Garrulus glandarius</i>	Eurasian Jay	2018	2018		BirdsDir-A2.2	
<i>Glebionis segetum</i>	Corn Marigold	1909	1909			CRDB2 RPR4 RDB2014-VU RDB>2001-VU
<i>Helleborus foetidus</i>	Bears-foot	2016	2016			NS NS-excludes
<i>Heterodermia leucomela</i>	Ciliate Strap-lichen	1906	1906	England_NERC_S.41 WACA-Sch8		CRDB2 RDB>2001-EN NRIUCN BAP-2007
<i>Hirundo rustica</i>	Barn Swallow	2011	2015		Bern-A2	
<i>Hyacinthoides non-scripta</i>	Bluebell	1989	2018	WACA-Sch8		
<i>Hydrocotyle vulgaris</i>	Marsh Pennywort	1993	1993			RDB2014-NT RDB>2001-NT
<i>Hylotelephium telephium</i> subsp. <i>fabaria</i>		1909	1909			RPR3
<i>Hyoscyamus niger</i>	Henbane	1909	1909			CRDB2 RPR2 RDB2014-VU RDB>2001-VU
<i>Hypericum elodes</i>	Marsh St John's-wort	1993	2011			RDB2014-NT RDB>2001-NT
<i>Hypocrepis rhododendri</i>	Hazel Gloves	2018	2018	England_NERC_S.41		CRDB2 BAP-

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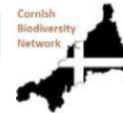
						2007
<i>Jacobaea aquatica</i>	Marsh Ragwort	1993	2015			RDB2014-NT RDB>2001-NT
<i>Jasione montana</i>	Sheep's-bit	1989	2019			RDB2014-VU RDB>2001-VU
<i>Lasiommata megera</i>	Wall Butterfly	2011	2018	England_NERC_S.41		RDB>2001-NT BAP-2007
<i>Lathyrus linifolius</i> var. <i>montanus</i>	Common Bitter-vetch	1909	2018			RDB2014-NT RDB>2001-NT
<i>Lissotriton helveticus</i>	Palmate Newt	2001	2001	WACA-Sch5_sect9.5 a	Bern-A3	
<i>Lullula arborea</i>	Wood Lark	1966	1966	England_NERC_S.41 WACA-Sch1_part1	BirdsDir-A1	CRDB2 BAP-2007
<i>Lutra lutra</i>	Otter	1994	2003	England_NERC_S.41 WACA-Sch5_sect9.4 b, WACA-Sch5_sect9.5 a, WACA-Sch5Sect9.4c HabReg-Sch2	Bern-A2 HabDir-A2*, HabDir-A4 ECCITES-A GRDB-NT	CRDB2 BAP-2007
<i>Lysimachia minima</i>	Chaffweed	2011	2018			CRDB2 RPR4 RDB2014-EN RDB>2001-NT
<i>Marasmius hudsonii</i>	Holly Parachute	2018	2018			CRDB2 NS
<i>Meles meles</i>	Badger	1995	2015		Bern-A3	CRDB2
<i>Menyanthes trifoliata</i>	Bogbean	1993	1993			ECCITES-D
<i>Mespilus germanica</i>	Medlar	2016	2016			RPR2 NS-excludes
<i>Motacilla cinerea</i>	Grey Wagtail	2016	2016		Bern-A2	Bird-Red
<i>Mustela erminea</i>	Stoat	1998	1998		Bern-A3	
<i>Nardus stricta</i>	Mat-grass	1990	2018			RDB2014-NT RDB>2001-NT
<i>Neottia nidus-avis</i>	Bird's-nest Orchid	1909	1909		ECCITES-B	CRDB2 RPR2 RDB2014-VU RDB>2001-VU
<i>Opegrapha rupestris</i>	a lichenicolous fungi	1994	1994			NSIUCN
<i>Oxalis acetosella</i>	Wood-sorrel	1989	2016			RDB2014-NT RDB>2001-NT
<i>Papaver cambricum</i>	Welsh Poppy	1909	2019			CRDB2 RPR4 NS NS-excludes
<i>Papaver lecoqii</i>	Yellow-juiced Poppy	1901	1901			RPR1
<i>Parentucellia viscosa</i>	Yellow Bartsia	1993	1993			RPR4
<i>Passer domesticus</i>	House Sparrow	2011	2016	England_NERC_S.41		Bird-Red BAP-2007
<i>Pedicularis sylvatica</i>	Lousewort	1993	2013			RDB2014-VU RDB>2001-VU
<i>Pedicularis sylvatica</i> subsp. <i>sylvatica</i>		1998	1998			RDB2014-VU RDB>2001-VU
<i>Phasianus colchicus</i>	Common Pheasant	2016	2016		BirdsDir-A2.1	

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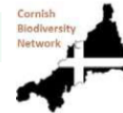


<i>Phoenicurus phoenicurus</i>	Common Redstart	1967	1989		Bern-A2	Bird-Amber
<i>Phylloscopus trochilus</i>	Willow Warbler	2014	2014			Bird-Amber
<i>Physospermum comubiense</i>	Cornish Bladderseed	1909	1909			CRDB2 RPR4 NR-excludes
<i>Pica pica</i>	Magpie	2014	2016			BirdsDir-A2.2
<i>Picus viridis</i>	Green Woodpecker	2011	2012		Bern-A2	
<i>Pipistrellus pipistrellus</i>	Common Pipistrelle	1985	1985	WACA-Sch5_sect9.4 b,WACA-Sch5_sect9.5 a,WACA-Sch5Sect9.4c HabReg-Sch2	Bern-A2,Bern-A3 CMS_A2,CM S_EUROBAT S-A1 HabDir-A4	CRDB2
<i>Platanthera chlorantha</i>	Greater Butterfly-orchid	1982	1982			CRDB2 RPR4 RDB>2001-NT
<i>Platyhypnidium lusitanicum</i>	Portuguese Feather-moss	2012	2012			CRDB2 NS
<i>Plecotus auritus</i>	Brown Long-Eared Bat	1994	1994	England_NE RC_S.41 WACA-Sch5_sect9.4 b,WACA-Sch5_sect9.5 a,WACA-Sch5Sect9.4c HabReg-Sch2	Bern-A2 CMS_A2,CM S_EUROBAT S-A1 HabDir-A4	CRDB2 BAP-2007
<i>Poecile montanus</i>	Willow Tit	1990	1990		Bern-A2	CRDB2 Bird-Red
<i>Polygala serpyllifolia</i>	Heath Milkwort	1998	2013			RDB2014-NT RDB>2001-NT
<i>Potentilla erecta</i>	Common Tormentil	1989	2018			RDB2014-NT RDB>2001-NT
<i>Prunella modularis</i>	Hedge Accentor	2013	2014		Bern-A2	Bird-Amber
<i>Pyrrhula pyrrhula</i>	Common Bullfinch	2012	2012			Bird-Amber
<i>Rana temporaria</i>	Common Frog	1994	2014	WACA-Sch5_sect9.5 a	Bern-A3 HabDir-A5	
<i>Ranunculus arvensis</i>	Corn Buttercup	1909	1909	England_NERC_S.41		RPR0 RDB2014-EN RDB>2001-EN BAP-2007
<i>Ranunculus flammula</i> subsp. <i>flammula</i>	Lesser Spearwort	1989	2015			RDB2014-VU RDB>2001-VU
<i>Regulus regulus</i>	Goldcrest	2016	2016		Bern-A2	
<i>Rhinolophus hipposideros</i>	Lesser Horseshoe Bat	1901	1901	England_NE RC_S.41 WACA-Sch5_sect9.4 b,WACA-Sch5_sect9.5 a,WACA-Sch5Sect9.4c HabReg-Sch2	Bern-A2 CMS_A2,CM S_EUROBAT S-A1 HabDir-A2*,HabDir-A4	CRDB2 BAP-2007
<i>Sagina nodosa</i>	Knotted Pearlwort	1909	1909			RPR2 RDB2014-VU RDB>2001-VU
<i>Sagina subulata</i>	Heath Pearlwort	1909	1993			RDB2014-NT RDB>2001-NT

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<i>Scandix pecten-veneris</i>	Shepherd's-needle	1909	1909	England_NERC_S.41		CRDB2 RPR1 RDB2014-EN NS RDB>2001- EN BAP-2007
<i>Scolopax rusticola</i>	Eurasian Woodcock	1990	1990		BirdsDir-A2.1 CMS_A2,CM S_AEWA-A2	Bird-Red
<i>Scopula marginepunctata</i>	Mullein Wave Moth	1906	1906	England_NERC_S.41		BAP-2007
<i>Sibthorpia europaea</i>	Cornish Moneywort	1999	1999			CRDB2 RPR4 NS NS- excludes RDB2014-NT RDB>2001-NT
<i>Silene flos-cuculi</i>	Ragged-Robin	1993	2015			
<i>Sitta europaea</i>	European Nuthatch	1984	2016		Bern-A2	
<i>Sorex araneus</i>	Common Shrew	2018	2018		Bern-A3	CRDB2
<i>Spergula arvensis</i>	Corn Spurrey	2011	2011			CRDB2 RPR4 RDB2014-VU RDB>2001- VU
<i>Stachys arvensis</i>	Field Woundwort	2012	2018			CRDB2 RPR4 RDB2014-NT RDB>2001-NT
<i>Streptopelia decaocto</i>	Eurasian Collared Dove	2011	2011		BirdsDir-A2.2	
<i>Sturnus vulgaris</i> subsp. <i>vulgaris</i>	Common Starling	2016	2016	England_NERC_S.41		BAP-2007
<i>Succisa pratensis</i>	Devil's-bit Scabious	1993	2018			RDB2014-NT RDB>2001-NT
<i>Teesdalia nudicaulis</i>	Shepherd's Cress	1903	1903			CRDB2 RPR3 RDB2014-NT RDB>2001-NT
<i>Terana caerulea</i>	Cobalt Crust	2011	2014			CRDB2 NS
<i>Torilis nodosa</i>	Knotted Hedge-parsley	1909	1909			RPR3
<i>Troglodytes troglodytes</i>	Winter Wren	2013	2014		Bern-A2	
<i>Turdus iliacus</i>	Redwing	2016	2016	WACA- Sch1_part1	BirdsDir-A2.2	Bird-Red
<i>Turdus merula</i>	Common Blackbird	1867	2014		BirdsDir-A2.2	
<i>Turdus pilaris</i>	Fieldfare	2016	2016	WACA- Sch1_part1	BirdsDir-A2.2	Bird-Red
<i>Upupa epops</i>	Hoopoe	1989	1989	WACA- Sch1_part1	Bern-A2	
<i>Usnea articulata</i>		1989	2014	England_NERC_S.41		RDB>2001-NT BAP-2007
<i>Utricularia minor</i>	Lesser Bladderwort	1993	1993			RPR2 RDB2014-VU RDB>2001- VU
<i>Valeriana officinalis</i>	Common Valerian	1965	2016			RDB2014-NT RDB>2001- NT_WL
<i>Valerianella dentata</i>	Narrow-fruited Comsalad	1909	1909			CRDB2 RPR2 RDB2014-EN RDB>2001- EN
<i>Veronica officinalis</i>	Heath Speedwell	1993	2016			RDB2014-NT RDB>2001-NT
<i>Veronica scutellata</i>	Marsh Speedwell	1993	1993			RDB2014-NT RDB>2001-NT
<i>Viola palustris</i> subsp. <i>juressi</i>	Marsh Violet	1993	1998			RPR4
<i>Vipera berus</i>	Adder	1993	1993	England_NE RC_S.41	Bern-A3	BAP-2007



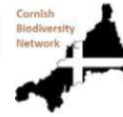
				WACA-Sch5_sect9.1 ,WACA-Sch5_sect9.5 a		
<i>Wahlenbergia hederacea</i>	Ivy-leaved Bellflower	1993	2018			CRDB2 RPR4 RDB2014-NT RDB>2001-NT
<i>Zootoca vivipara</i>	Common Lizard	1974	2018	England_NE RC_S.41 WACA-Sch5_sect9.1 ,WACA-Sch5_sect9.5 a	Bern-A3	BAP-2007

Key to threat categories:

- NERC 41** **NERC Act (2006) Section 41:** Species listed under Section 41 of the Natural Environment and Rural Communities Act (2006). These are the species found in England which have been identified as requiring action under the UK BAP. All local authorities and other public authorities in England and Wales have a duty to promote and enhance biodiversity in all of their functions.
- WACA 5** **Wildlife and Countryside Act (1981) Schedule 5:** species protected against killing, injury, disturbance and handling.
- WACA 5 (S)** **Wildlife and Countryside Act (1981) Schedule 5: (sale):** species protected against sale only.
- WACA 5 (KIS)** **Wildlife and Countryside Act (1981) Schedule 5:(killing & injury):** species protected against killing, injury and sale only.
- WACA 6** **Wildlife and Countryside Act (1981) Schedule 6:** animals (other than birds) which may not be killed or taken by certain methods.
- BA** **Protection of Badgers Act 1992:** badgers may not be deliberately killed, persecuted or trapped except under licence. Badger setts may not be damaged, destroyed or obstructed.
- Bern II** **Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) Appendix II:** Special protection for listed animal species and their habitats.
- Bern III** **Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) Appendix III:** Exploitation of listed animal species to be subject to regulation.
- ECIIa, IIb** **EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats & Species Directive) Annex IIa and IIb:** Designation of protected areas for animal and plant species listed.



ECIIIa, IIIb	EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats & Species Directive) Annex IIIa and IIb: Species used as criteria for designating Special Areas of Conservation (SACs).
ECIVa, IVb	EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats & Species Directive) Annex IVa: Exploitation of listed animals and plants to be subject to management if necessary.
ECVa, Vb	EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats & Species Directive) Annex Va and Vb: Exploitation of listed animals and plants to be subject to management if necessary.
Bonn II	Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) Appendix II: Range states encouraged to conclude international agreements to benefit species listed.
CMS	Convention on Migratory Species (Appendices 1 and 2, AEWA, ASCOBANS, EUROBATS).
BirdsDir	Birds Directive (Annexes 1, 2.1 and 2.2).
Bird-Amber	Birds of Conservation Concern (Red/Amber list and not based on IUCN criteria).
UKBAP(P)	UK Priority Species (Short and Middle Lists - UK Biodiversity steering Group Report 1995) i.e. species that are globally threatened and rapidly declining in the UK (by more than 50% in the last 25 years). Has a Species Action Plan.
RDB>2001	Red Data Book based on 2001 IUCN guidelines.
RDB2014	Red Data Book: Stroh, P.A., Leach, S.J., August, T.A., Walker, K.J., Pearman, D.A., Rumsey, F.J., Harrower, C.A., Fay, M.F., Martin, J.P., Pankhurst, T., Preston, C.D. & Taylor, I. 2014. A Vascular Plant Red List for England. Botanical Society of Britain and Ireland, Bristol.
NS	Nationally Scarce: Occurring 16-100 10kmsquares in Britain.
NR	Nationally rare. Taxa occurring in 15 or fewer 10km squares in Britain.
Notable	Taxa thought to occur within the range of 16 to 100 10km squares or, for less-well recorded groups less than twentyvice-counties.
Notable-A	Taxa estimated to occur within 16-30 10-kilometre squares in Britain.
Notable-B	Taxa estimated to occur within 31-100 10 kilometre squares in Britain.
CRDB2:	Cornish Red Data Book: Species in the second edition of the Cornish Red Data Book. Bennallick, I., <i>et al.</i> 2009. <i>Red Data Book for Cornwall and the Isles of Scilly</i> . 2nd Edition. Croceago Press. Praze-an-Beeble.

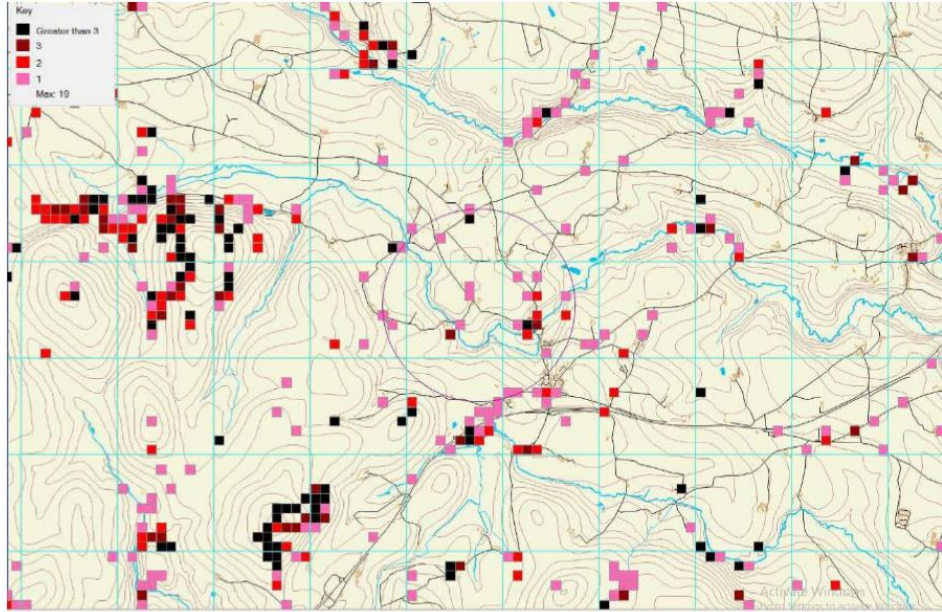


- RPR0** **Cornish Rare Plant Register:**Species not seen recently (or presumed extinct).
- RPR1** **Cornish Rare Plant Register:**Cornwall Rare (in 1-3 tetrads).
- RPR2** **Cornish Rare Plant Register:** Cornwall Scarce (in 4-10 tetrads).
- RPR3** **Cornish Rare Plant Register:** Cornwall Local (in 11-20 tetrads).
- RPR4** **Cornish Rare Plant Register:**More than 20 Tetrads.

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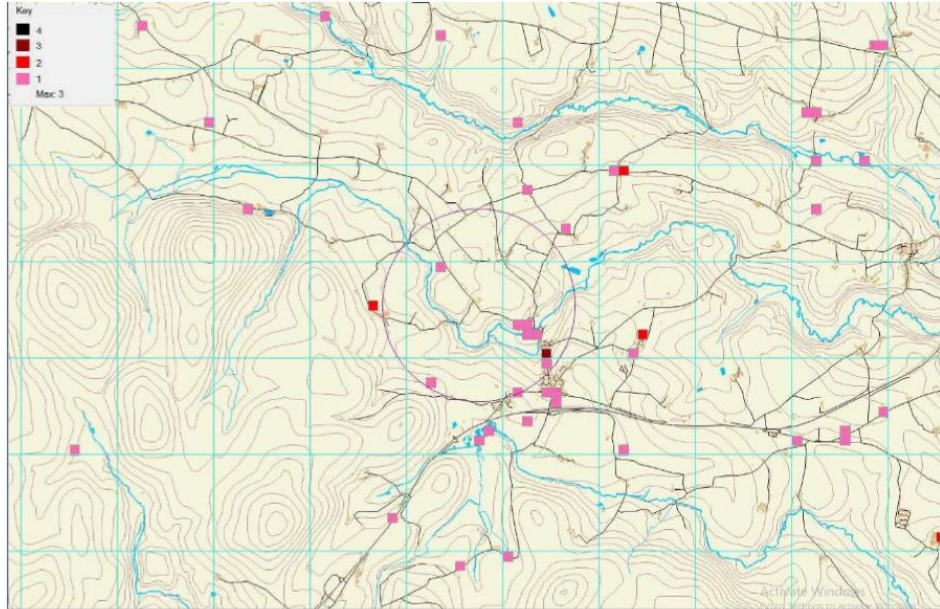
Figure 2: Hotspot map showing the location of rare or threatened species.



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Figure 3: Hotspot map showing the location of Schedule 9 alien species.



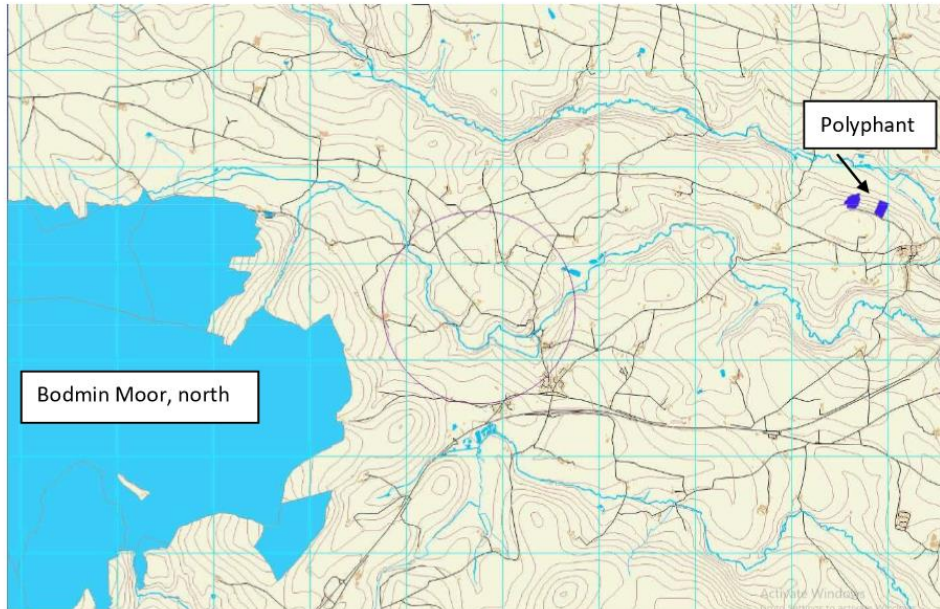
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Table 2: Schedule 9 alien species.

Species name	Common name	Family name	First Year	Last Year
<i>Cotoneaster horizontalis</i>	Wall Cotoneaster	Rosaceae	2016	2016
<i>Cotoneaster simonsii</i>	Himalayan Cotoneaster	Rosaceae	2016	2016
<i>Crocsmia x crocosmiiflora</i>	Montbretia	Iridaceae	2007	2016
<i>Gaultheria shallon</i>	Shallon	Ericaceae	2016	2016
<i>Impatiens glandulifera</i>	Himalayan Balsam	Balsaminaceae	1989	2012
<i>Lamiasrum galeobdolon</i> subsp. <i>argentatum</i>	Variegated Yellow Archangel	Lamiaceae	1991	2018
<i>Reynoutria japonica</i> var. <i>japonica</i>	Japanese Knotweed	Polygonaceae	1990	2016
<i>Rhododendron ponticum</i>	Rhododendron	Ericaceae	1997	2016
<i>Sciurus carolinensis</i>	Grey Squirrel	Sciuridae	1996	2003



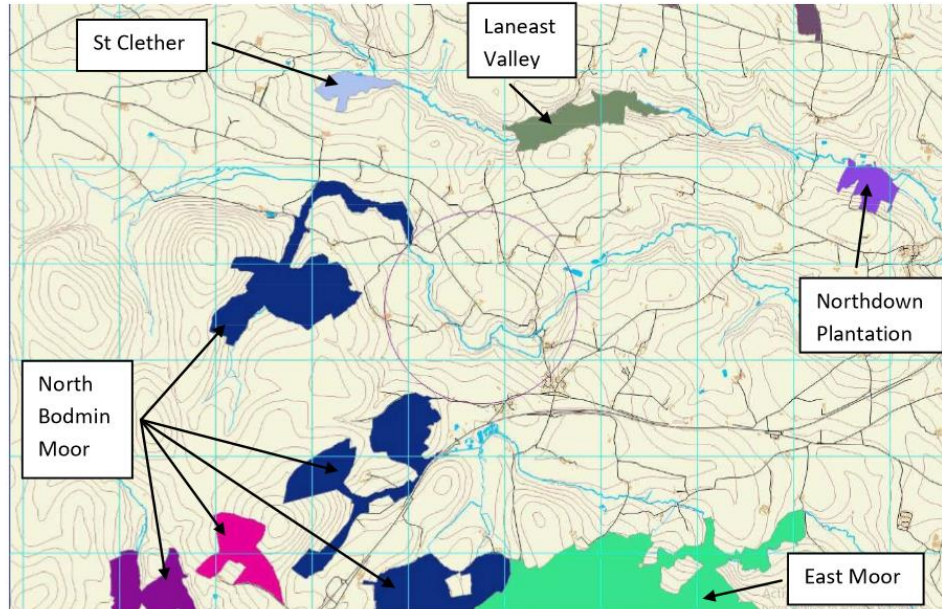
Figure 4: Map showing the location of Sites of Special Scientific Interest.



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Figure 5: Map showing the location of Cornwall Wildlife Sites.



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County Wildlife Sites (CWS):

- provide a comprehensive suite of sites that complements other site networks;
- provide wildlife refuges for most of the UK's fauna and flora;
- have a significant role to play in meeting overall national biodiversity targets;
- represent local character and distinctiveness;
- contribute to the quality of life and the well-being of the community, with many sites providing opportunities for research and education.

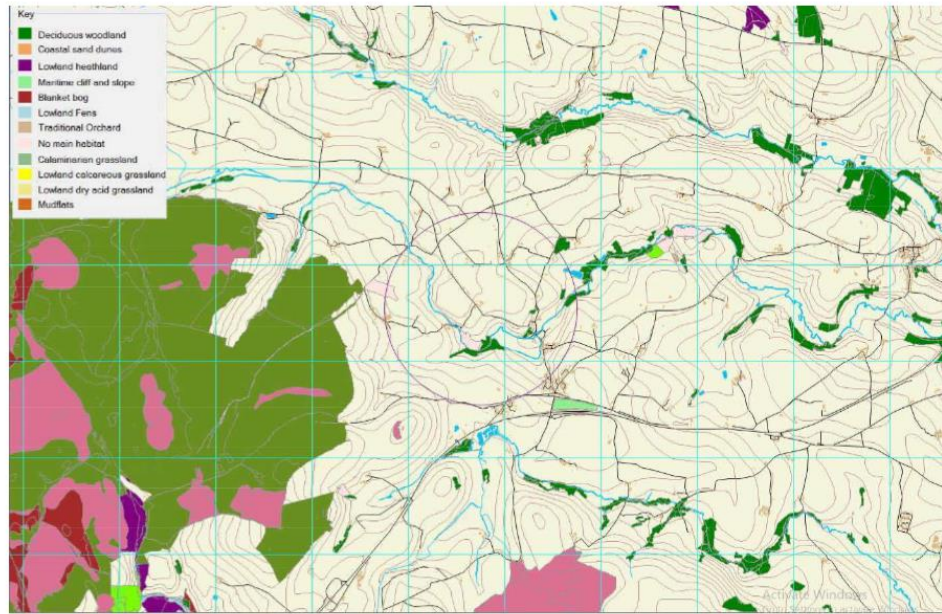
It is important to note that the presence of a County Wildlife Site does not necessarily imply there is public access to the site.

The CWS are on the Cornwall Council interactive map, see:

<https://map.cornwall.gov.uk/website/ccmap/?zoomlevel=4&xcoord=202687&ycoord=69221&wsName=ccmap&layerName=County%20Wildlife%20Sites%20-%20no%20implied%20public%20access>



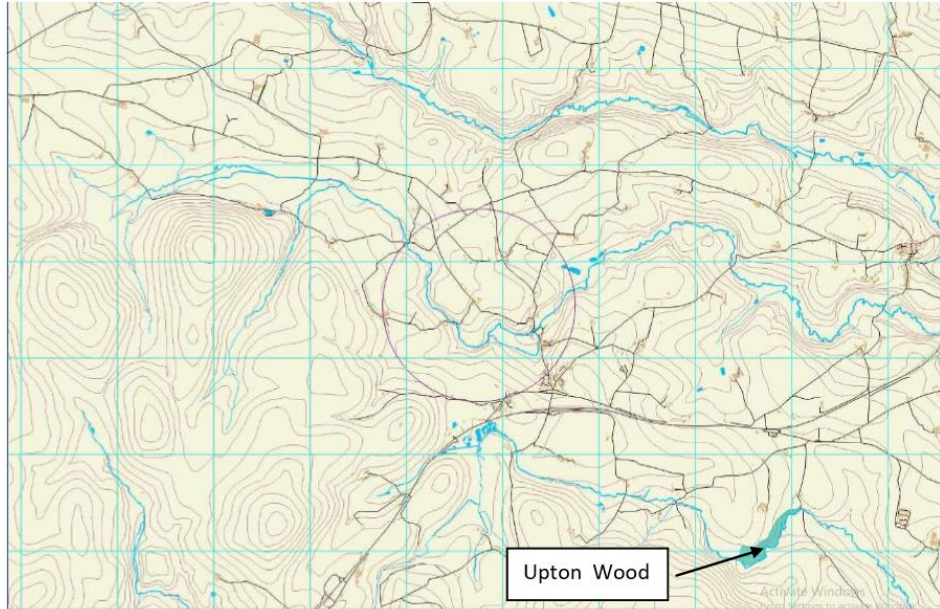
Figure 6: Map showing the location of BAP Priority Habitat Inventory habitats.



Contains OS data © Crown copyright and database (2021)



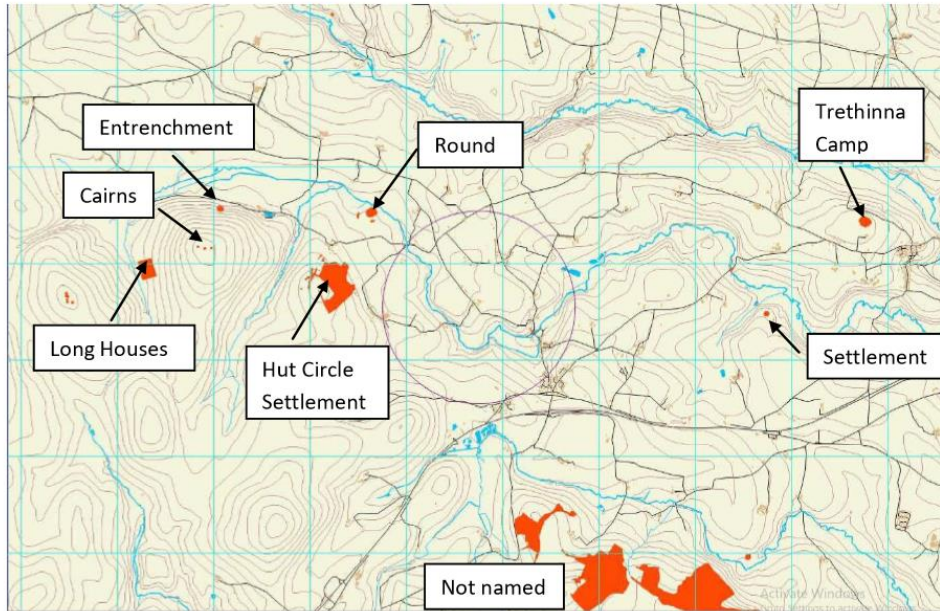
Figure 7: Map showing the location of Ancient Woodland.



Contains OS data © Crown copyright and database (2021)



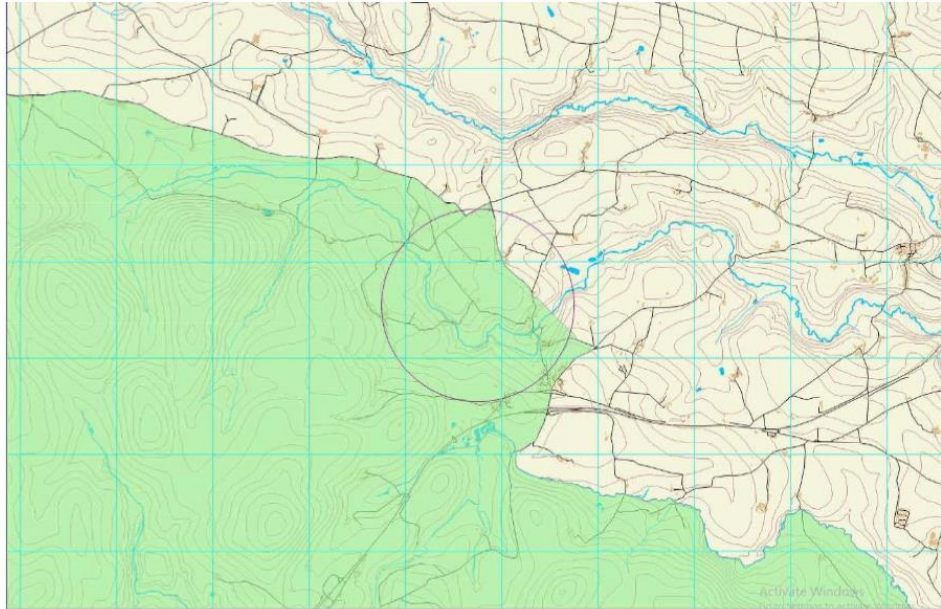
Figure 8: Map showing the location of the Scheduled Ancient Monuments.



Contains OS data © Crown copyright and database (2021)



Figure 9: Map showing the location of the AONB.



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There are no World Heritage Sites, LNRs, NNRs or SAC close to the study area.

Appendix 5 – Bat and Bird Timing Chart

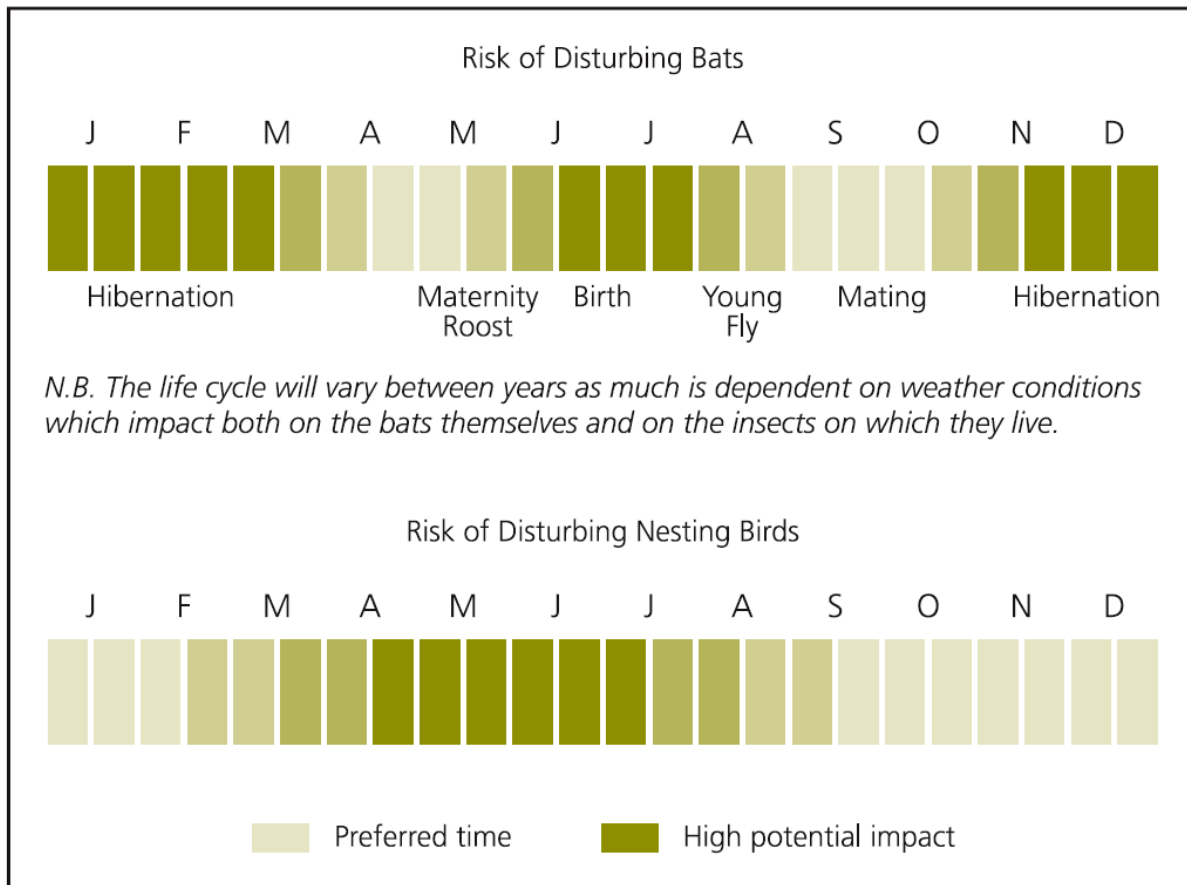


Chart reproduced from DEFRA publication PB10367 Bats, Buildings & Barn Owls. Crown copyright.

Appendix 6 – Suitable bat box designs

The following images show a range of potential bat box designs to be incorporated either on or within the structure;



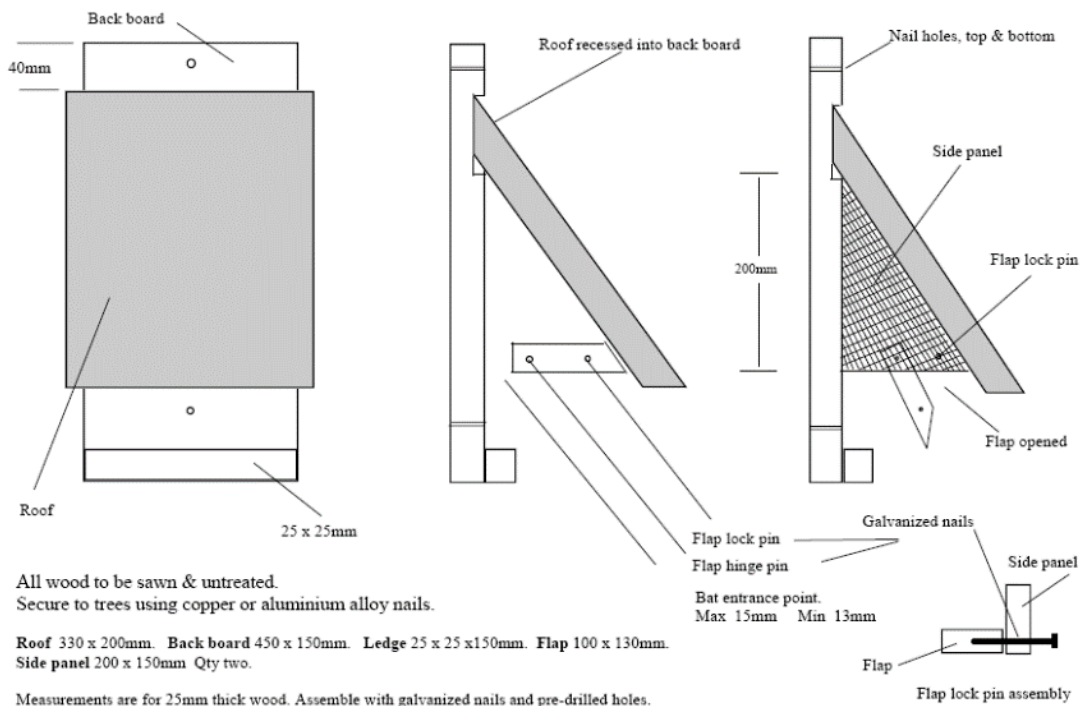
Produced and Copyright Wildcare. No rights reserved.

Bat Access Unit



Produced and Copyright Wildcare. No rights reserved.

Bat Box 67



Wooden bat boxes that can be erected on nearby trees.



Produced and Copyright Alana Ecology. No rights reserved.

Habitat Bat box

Appendix 7 – Suitable bird box designs

A selection of Swift, house sparrow and general bird boxes as well as Swallow cups.



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Swallow cup



Produced and Copyright Wildcare. No rights reserved.

Swift nest box



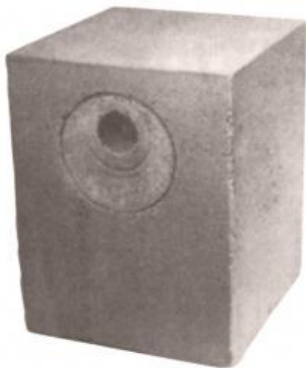
Produced and Copyright Wildcare. No rights reserved.

Generic nest box



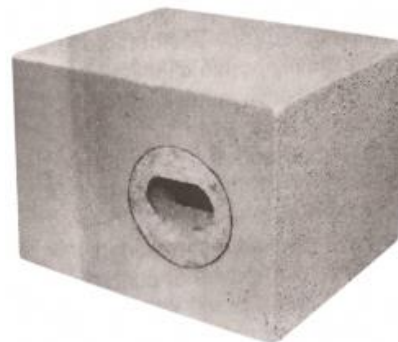
Produced and Copyright Wildcare. No rights reserved.

House Sparrow nest box



Produced and Copyright Alana Ecology. No rights reserved.

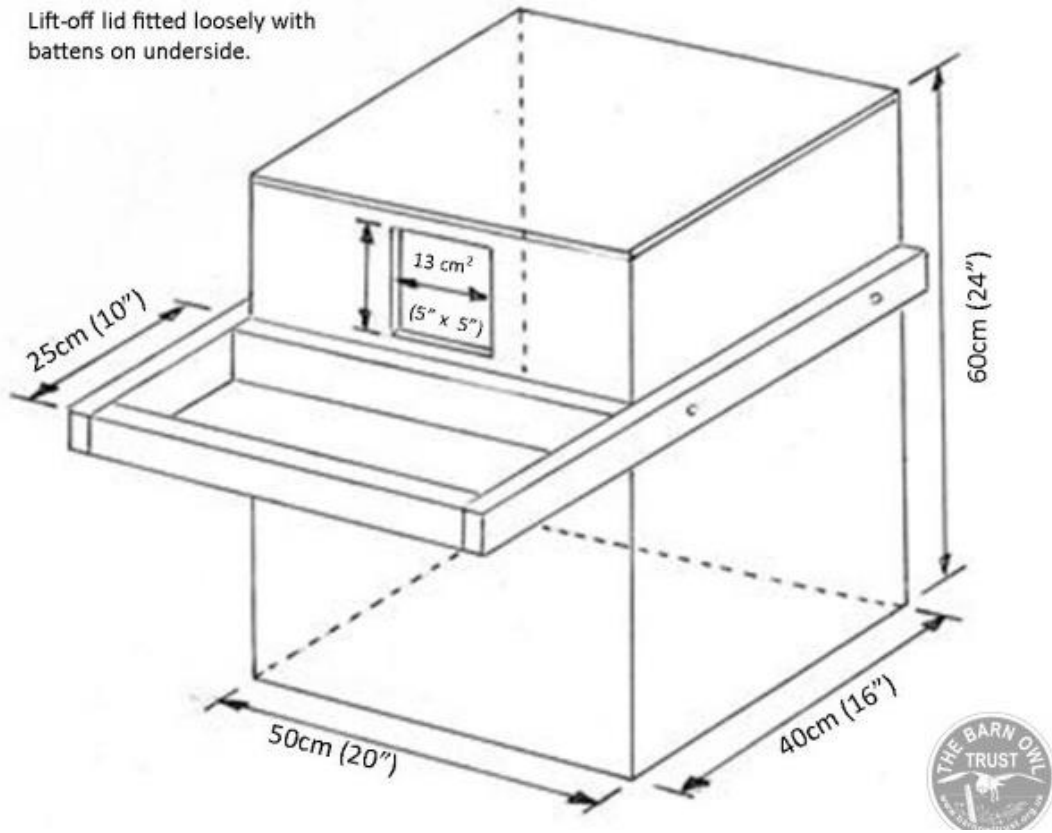
Schwegler No24 Brick box



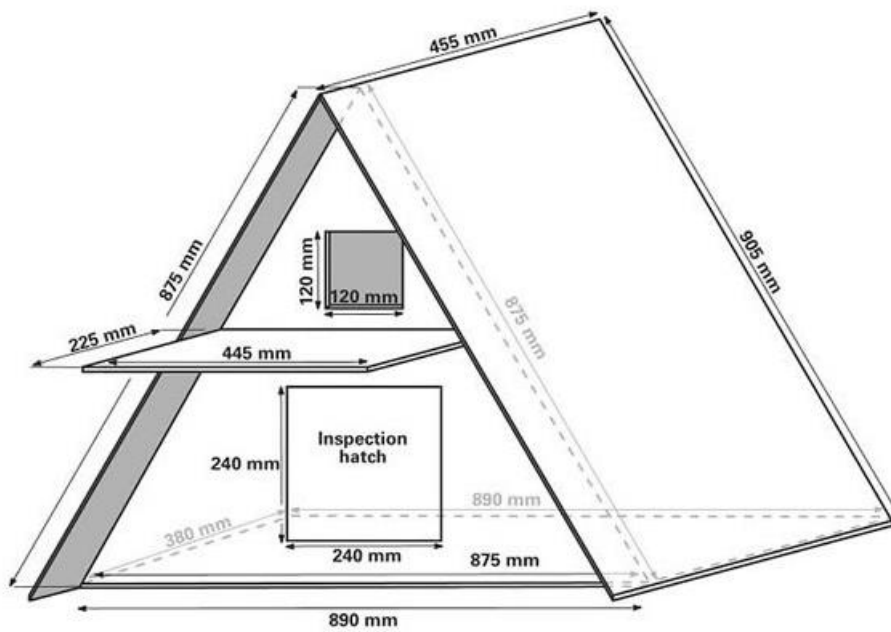
Produced and Copyright Alana Ecology. No rights reserved.

Schwegler No25 Brick box

Appendix 8 – Suitable barn owl box designs



a. Internal design



b. External design