

Bat Survey Report

Ridgeway,
Main Rd,
Woolverstone,
Ipswich,
IP9 1AX

*Report
for
Ruth Wade
July 2023*



DCS **ECOLOGY**



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1	DRAFT	ET	31/07/23		
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The authors and surveyors used to undertake the work are appropriately qualified for the tasks undertaken. The work undertaken while preparing this report has been carried out with due care, skill, and diligence.

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1. Executive Summary

DCS Ecology was commissioned by Ruth Wade to conduct emergence bat surveys of Ridgeway, main Rd, Woolverstone, Ipswich, IP9 1AX (central grid reference TM18783837, hereby referred to as the Site) to inform a proposed extension for a Natural England (NE) European Protected Species (EPS) Mitigation Licence.

The site is approximately 0.2ha (1,700 square meters) consisting of a dwelling and associated garden, garage, and conservatory.

Two bat surveys (emergence) were carried out on 21st of June, and 13th of July 2023 by DCS Ecology, which recorded three emergences over both surveys from the building, resulting in the confirmed emergences of at least two common pipistrelles (*Pipistrellus pipistrellus*).

No works impacting the building or bats roosting within should be undertaken until a Bat Mitigation Class Licence (CL21 or 'Low Impact Licence') or Bat Mitigation Licence (A13 or 'Full Licence') has been granted by Natural England.

Bat Mitigation Class Licenses are only applicable if development involves the damage or destruction of no more than 3 low conservation status roosts and the work is completed within 6 months of commencement. If development works do not meet these conditions, a Full EPS Mitigation Class License will be required before the commencement of any works on site.

2. Introduction

2.1 Background

Bat (emergence) surveys of Ridgeway, main Rd, Woolverstone, Ipswich, IP9 1AX, were undertaken on behalf of Ruth Wade in June, and July 2023 by DCS Ecology Ltd. This is for the proposed demolition of a conservatory and an extension onto the existing dwelling.

Emergence surveys were required to inform a detailed mitigation strategy and whether a European Protected Species (EPS) Mitigation Licence for bats will be required from Natural England (NE) prior to the commencement of works.

The surveys were undertaken using infra-red and thermal imaging cameras on 21st June and 13th July 2023. Dusk surveys began 20 minutes before sunset and finished at least one hour and thirty minutes after sunset. Two surveyors undertook both surveys. The lead surveyor holds a Nature England level 2 bat licence. Buildings surveyed included the house. There was a focus on the second survey on the gable end where the proposed extension will be.

2.2 Legislative Context

All bat species and their roosts are protected under the Wildlife and Countryside Act 1981 (as amended) (WCA) and the Conservation of Habitats and Species Regulations 2010 (as amended). Under this legislation it is an offence to intentionally or recklessly:

- Capture, injure or kill a bat
- Disturb a bat
- Destroy or obstruct access to a bat roost.

The National Planning Policy Framework (NPPF) 2021 places responsibility on Local Planning Authorities (LPAs) to aim to conserve and enhance biodiversity in and around developments.

Section 40 of the Natural Environment and Rural Communities (NERC) Act requires every public body to 'have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity'. Biodiversity, as covered by the Section 40 duty, is not confined to habitats and species of principal importance but refers to all species and habitats. However, the expectation is that public bodies would refer to the Section 41 list (of species and habitats) through compliance with the Section 40 duty.

2.3 Survey Objectives

The objectives of this survey were:

- To determine the current bat roosting status of Columbine Hall barn.
- Identify species and numbers, and locations where possible, should roosting bats be recorded.
- To make recommendations for habitat enhancement, precautionary measures, and mitigation, if required.

2.4 Site description

The Site is a residential dwelling consisting of a modern masonry construction with a render finish over a brick plinth. The roofing consists of pan tiles with bitumen underfelt and fibreglass insulation between rafters. The Site is within the village of Woolverstone and 6.7km south of the town of Ipswich.

Beyond the dwelling is a garage that has a red brick construction and pan tile roof. A driveway and parking area consisting of hardstanding and amenity grassland with shrubs and plantings consistent with a residential garden.

The habitats adjacent to site are mainly areas of other residential properties. However, the wider countryside contains areas of woodland, the river Orwell, and arable fields.

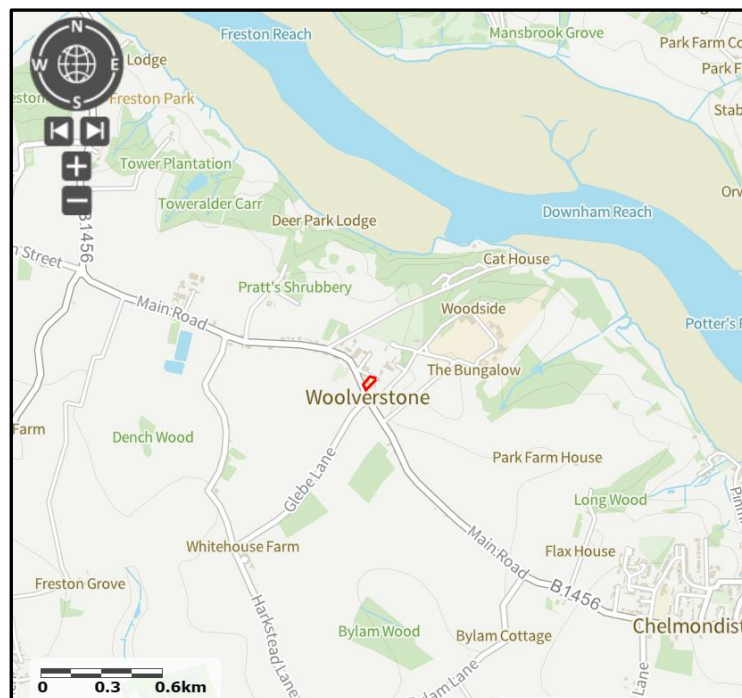


Figure 1: Site location (outlined in red) (1:25000) Based upon Ordnance Survey (c) Crown Copyright under licence 100064616.

2.5 Proposals and Potential Impacts

Development proposals include the demolition of a conservatory on the southeast of the property. This is for the construction of an extension onto the southeast elevation of the existing dwelling.

As the surveys found evidence of the use of the building by roosting bats, the proposals will result in the disturbance of bat roosts. Therefore, a Bat Mitigation Class Licence (CL21 or 'Low Impact' Licence) or Bat Mitigation Licence (A13 or 'Full Licence') will be required prior to the start of works and must be adhered to throughout and post development.

Initial assessments of site found the wider habitats such as tree lines, arable fields, and woodlands (good/moderate foraging habitats) present within 100m of site, and foraging bats were recorded during the survey, lighting recommendations have been detailed in Section 5 in order to minimize the risk of impacts to potential bat roosts in the surrounding habitats during or post construction. Bat surveys found that adjacent habitats supported foraging bats and emergence of multiple individuals from the building showed that it supported roosting bats.

2.6 Bat Ecology

There are 18 species of bat found in the UK, of which 17 are known to be breeding. 13 species have been recorded in Suffolk, five of these are subject to National Biodiversity Action Plans: these are lesser horseshoe (*Rhinolophus hipposideros*), barbastelle (*Barbastella barbastellus*), noctule (*Nyctalus noctula*), brown long-eared (*Plecotus auratus*), and soprano pipistrelles (*Pipistrellus pygmaeus*).

Bats are the only flying mammal, their wings have a similar structure to the hand and arm of a human, with skin stretched between long fingers and the body. In Britain, bats range in size from 4-7g (pipistrelles) to 40 g (noctules).

Bats are found around the world and many species eat fruit and nectar; however, all British bats are insectivorous. Bats utilise different methods to hunt (such as catching insects on the wing and gleaning), hunt a variety of prey species (including midges, beetles, and spiders), and use echolocation, passive hearing, and vision to find their prey at night (passive hearing is used by gleaning bats that capture non-flying insects on the ground or trees). Echolocation is a very sophisticated sonar system, whereby bats emit short, high frequency sounds and use the information/echoes returning to them to construct an image of their environment and locate their prey.

Roosts provide bats with shelter from predators and variable weather conditions. Bats will use different roost sites throughout the year, which are selected based on current physiological requirements. These roosts can be used for hibernation, reproduction, and as transient day roosts. Bats will utilise natural roost sites (including tree-holes, caves, and cavities in exposed rocks) and those provided by human construction (such as houses), which mimic natural roost sites. Opportunities are abundant within residential housing; bats can use roof spaces, cavity walls, window frames, weatherboarding, tiles, and many other crevices and cavities. Roost sites are often near to foraging habitat or commuting routes, most likely this is near woodland or water, however roost sites can, and have, been found in apparently isolated locations.

Foraging habitat consists of any habitat which attracts invertebrate prey, such as trees, hedgerows, woodland, scrub, rivers, and waterbodies and open areas such as grassland (particularly where this is grazed, as livestock attract some invertebrates). Linear features such as hedgerows, woodland edges and rides, tree lines and rivers are typically used for commuting between roosting locations

and foraging habitat, particularly by smaller bat species which seek cover from predators and shelter from weather. Such corridors are also used by migratory bat species, such as Nathusius' pipistrelle (*Pipistrellus nathusii*) and noctule when moving longer distances between maternity and hibernation areas. As such, the conservation of these habitat features, as well as their protected roost sites, is particularly important for bats, and these can be threatened particularly by larger scale development and infrastructure.

3. Methods

3.1 Desk Study

A data search using Magic maps was undertaken in July 2023 to review records of designated sites and protected / priority species and habitats within a defined search area from the centre of the site. The search radius was 1 km for statutory designated sites, non-statutory designated sites, and protected / priority species (excluding bats where the radius was extended to 2 km in accordance with best practice guidance) (Collins, 2016), and 500 m for priority habitats. The respective search radii were considered suitable for the scale and type of the proposed development. Information from an SBIS desk study undertaken in May 2023 by DCS Ecology Ltd was used to support these findings.

The designated sites included within this search were as follows:

- Special Areas of Conservation (SAC);
- Special Protection Areas (SPA);
- Ramsar Sites;
- Sites of Special Scientific Interest (SSSI);
- National Nature Reserves (NNR);
- Local Nature Reserves (LNR); and
- County Wildlife Sites (CWS).

The following data sources were used, contacted and/or reviewed:

- Suffolk Biological Information Service (SBIS);
- Multi Agency Geographic Information for the Countryside (MAGIC, 2023);
- Species and habitats of principal importance in England, Section 41 of the Natural Environment and Rural Communities Act 2006; and
- Suffolk BAP (SBAP).

3.2 Field Survey

The buildings were surveyed externally, and internally where possible, for their suitability to support roosting bats according to Bat Conservation Trust Good Practice Guidelines (Collins, 2016). The buildings were systematically searched for potential bat roost features (PRFs) and any evidence of roosting bats such as fur staining, urine splashes, droppings, smoothness at entry points and feeding remains. A torch, extendable mirror, binoculars, endoscope and thermal imaging camera was used to investigate accessible features where necessary.

The survey gives particular attention to the following Potential Bat Roost Features

(PBRFs):

- Gaps between ridge tiles and ridge and roof tiles, usually where the mortar has fallen out or the tiles are broken or lifted,
- The ridge area of the roof (particularly between the ridge beam and roofing material),
- Lifted lead flashing associated with roof valleys, ridges, and hips, or where lead flashing replaces tiles,
- Spaces between external weatherboarding/cladding and the timber frame or Walls,
- Gaps behind window frames, lintels and doorways including the main doors,
- Tenon and mortise joints between truss beams and braces and the principal support columns,
- Cracks and crevices in timbers,
- Gaps between stones or bricks (especially where purlins enter the wall and by the wall plate),
- Surfaces such as the ground, ledges, windows, sills or walls, machinery or stored material within the barns (which should be searched for bat droppings and/or urine spots or stains).

Following completion of the external surveys, each building/structure is classified in one of the following categories:

Confirmed bat roost: presence determined from evidence of bats.

High potential: a structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size shelter, protection, conditions, and surrounding habitat.

Moderate potential: A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions, and surrounding habitat but is unlikely to support a roost of high conservation status.

Low potential: A structure with one or more potential roost sites that could be used by individual bats opportunistically. These sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger number of bats (e.g., unlikely to be suitable for maternity or hibernation).

Negligible potential: No habitat features likely to be used by roosting bats.

3.3 Emergence / Return to Roost Surveys 2023

Two survey visits were undertaken by ecologists Duncan Sweeting LCG (Natural England bat class licence WML-CL18), and Elizabeth Thurston (undergraduate), 21st June and 13th July 2023. The survey was conducted following methods described by The Bat Conservation Trust (Collins, 2016) and interim guidance (BCT May 2022).

Surveyors watched potential roost features and entry/exit points on every aspect of the building from stationary positions and recorded bats emerging or returning to roost. Using bat detectors, the surveyors noted species, number of bats, roost locations, and access points where possible. Surveyor locations are shown in Appendix II; these locations were chosen based on the position of previously identified access points and ensuring full coverage of the buildings. Where possible,

bat activity surrounding the surveyed buildings (commuting, foraging etc.), including flight direction, and number of bats, was also recorded.

Dusk Surveys started at least 20 minutes before sunset and continued for 90 minutes after sunset (or until light levels became insufficient to accurately survey bat activity) in accordance with best practice guidelines (Collins, 2016) and interim guidance published by BCT in 2022.

The surveys were carried out within the optimal weather conditions for bat surveys; with temperatures at sunset above 10°C, no or little rain, and little/gentle breeze.

Equipment used on surveys included Wildlife Acoustics EMT Pro 2 (with tablet or Ipad), Batlogger M, Canon XA40 4K infra-red Camcorders, and Guide Track Pro 19 thermal imaging cameras. Recorded bat calls were analysed using Anabat insight/Kaleidoscope and video footage using i-catcher software.

4. Results

4.1 Desk Study Results

- The SBIS data search returned 63 records within 2km of the Site, comprising at least 9 of the 13 bat species known to Suffolk. These included natterers (*Myotis nattereri*), Common Pipistrelle (*Pipistrellus pipistrellus*), barbastelle (*barbastelle barbastellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), Daubenton's bat (*Myotis daubentonii*), Noctule Bat (*Nyctalus noctule*), Lesser Noctule (*Nyctalus leisleri*), Serotine (*Eptesicus serotinus*), brown long-eared (*Plecotus auritus*), and unidentified Pipistrellus and Chiroptera species. The closest record was a hibernation site and roost of at least brown long-eared bats in 2004 at Diary House, Woolverstone, IP9 1AY north of site.

Magic Map Data Search (01/08/23)

Table 1: MAGIC map system bat EPS licence applications within a 10km radius (see map in Appendix V)

Case reference of granted application	Species on the licence	Damage/ destruction of breeding site	Damage/ destruction of a resting place	Grid Ref	Nearest Location
2014-2484-EPS-MIT	BLE, C-PIP, NATT, S-PIP	N	Y	TM16282891	Bradfield
2014-2484-EPS-MIT-1	BLE, C-PIP, NATT, S-PIP	N	Y	TM16282891	Bradfield
2015-15173-EPS-MIT	BLE, C-PIP	N	Y	TM17493090	Warbness
EPSM2009-970	C-PIP; S-PIP; NOCT; BLE	N	Y	TM17603091	Warbness
EPSM2009-1529	C-PIP; BLE	N	Y	TM13903158	Bradfield
EPSM2012-4026	C-PIP; S-PIP; NATT; BLE	N	Y	TM14094490	Westbourne
2016-25859-EPS-MIT	BLE, C-PIP, NATT, S-PIP	N	Y	TM22393680	Shotley Common
EPSM2009-1359	C-PIP; BLE; NATT	N	Y	TM23993909	Levington
2014-3991-EPS-MIT	BLE	Y	Y	TM23183962	Levington
EPSM2013-6380	C-PIP; BLE	N	Y	TM20494290	Broke Hall
EPSM2013-6732	C-PIP; S-PIP; BLE	N	Y	TM24284161	Bucklesham

2017-29900-EPS-MIT	BARB, BLE, C-PIP	N	Y	TM09083721	Lattinford Hill
2016-25859-EPS-MIT-1	BLE, C-PIP, NATT, S-PIP	N	Y	TM22393680	Shotley Common
2018-33609-EPS-MIT	C-PIP	N	Y	TM17494240	Gainsborough
2018-33889-EPS-MIT	BARB, BLE, C-PIP, NATT, S-PIP	N	Y	TM17763872	Woolverstone
2018-34459-EPS-MIT	C-PIP	N	Y	TM15694390	Ipswich
2018-37839-EPS-MIT	C-PIP	N	Y	TM16384489	Ipswich
2019-39154-EPS-MIT	BLE, C-PIP	Y	Y	TM18793841	Woolverstone
2019-39515-EPS-MIT	BLE, C-PIP	Y	Y	TM23803681	Church End
2014-1038-EPS-MIT	BLE, C-PIP	N	Y	TM20494300	Broke Hall
2014-140-EPS-MIT	C-PIP, S-PIP	N	Y	TM17484339	Ipswich
EPSM2012-5184	C-PIP; BLE	N	Y	TM10794021	Mace Green
EPSM2013-6102	C-PIP; S-PIP; BLE	N	Y	TM20484431	Kesgrave
EPSM2013-6374	BLE	N	Y	TM09673470	East End
EPSM2013-5916	C-PIP; BLE	N	Y	TM20494279	Broke Hall

The MAGIC data search returned 25 records of past and current EPS licences within a 10km radius, including six bat species. These were Common Pipistrelle (*Pipistrellus pipistrellus*), Soprano Pipistrelle (*Pipistrellus pygmaeus*), Brown Long-eared (*Plecotus auratus*), Natterers (*Myotis nattereri*), Noctule (*Nyctalus noctule*) and Barbastelle (*Barbastella barbastellus*). The nearest record to site was an EPS licence record (2019-39154-EPS-MIT) in 2019 that was adjacent to site for the destruction of a resting and breeding site. Including brown long-eared and common pipistrelle.

For species abbreviation definitions, please see Appendix VIII.

Priority Habitats and Designated Sites

On the 29th of June 2023, DCS Ecology Ltd. conducted a data search of all designated sites and priority habitats and species. The data search showed that there were designated sites within 1km. These included Suffolk coast and heaths area of outstanding natural beauty, the Stour and Orwell estuaries Ramsar/SPA site and the Orwell Estuary SSSI. The site was within the impact zone of the Orwell Estuary SSSI. However, the development proposal is such that there will be no impact on the SSSI and therefore no actions need to be taken.

Priority habitats within 500km of site included deciduous woodland, broadleaved woodland, wood-pasture, and parkland. Mature and ancient trees, due to decay and biological damage from age, typically have more natural features (such as welds, trunk cavities, hollows, rot holes, bark crevices, cracks, fissures, and woodpecker holes) that could provide highly preferable roosting opportunities for bats. Habitats such as woodlands provide opportunities for foraging bats.

4.2 Field Survey Results

Table 2: Survey Timings Summary and Weather Conditions

Survey Date	Survey Type	Temperature start (°C)	Temperature end (°C)	Precipitation	Wind Speed (beaufort)	Cloud Cover (%)
21/05/23	Emergence	19.8	17.7	N/C	0	50
13/07/23	Emergence	18.2	16.7	N/C	3	50

Emergence / Return to Roost Surveys

Maps of surveyor locations, and emergence points can be found in Appendices II and III respectively.

21/06/2023 – Sunset 21:19 hrs

Prior to the survey commencing, a visual inspection was undertaken of the building including external features of interest. There were no signs of bat droppings around the building or on external walls however, there were some lifted tiles and lead flashing with gaps allowing potential ingress of bats.

During the first survey, identified species were confined to common pipistrelle (*Pipistrellus pipistrellus*), serotine (*Eptesicus serotinus*), and noctule (*Nyctalus noctule*) bats.

Common Pipistrelle were seen emerging from and flying around the building. The first recorded sighting of a bat was a common pipistrelle at 21:34 hrs, emerging from under the tiles on the south face of the gable extension (see appendix II). As no bats were observed entering the building or detected before that point, and the pipistrelle was seen emerging it can be concluded that the building is being used as a day roost. At 22:07 a common pipistrelle was seen emerging from the north face of the same gable extension.

Common pipistrelles dominated the activity recorded at the site, which were most frequently observed flying around the house and adjacent tree lines to the north and south of site. Activity was moderate and consistent from 21:34 to 22:25. The maximum number of pipistrelles observed at any one time was three.

Serotine and noctule were recorded within the survey, however no emergences were noted or seen. The noctule made two passes and was foraging in the tree line adjacent to the building beyond the north boundary of site.

13/07/2023- Sunset 21:11

During the second survey a common pipistrelle was recorded emerging at 21:54 and multiple individuals were recorded foraging within the area continually throughout the survey. Also recorded was a foraging/commuting noctule bat which made one pass at 22:31. Although the exact emergence of the common pipistrelle was not observed. It was seen flying away from the building and no bats had been seen or heard before this by any surveyors therefore it is highly likely the bat originated from the building.

Activity was greatest between 21:57 and 22:30, particularly around the building and neighbouring houses to the northwest where bats were recorded foraging. At least two common pipistrelles were observed foraging around the building and adjacent land.

4.3 Survey Limitations

No survey limitations were identified during the survey.

5. Conclusions and Recommendations

5.1 Conclusions

At least two common pipistrelles were confirmed to be roosting within the building between the 21st of June and 13th of July 2023. This is concluded to be a roosting site for a small number of bats due to the number of emergences recorded during the surveys.

Exact roosting locations of the common pipistrelle were not observed however exit points were observed under pantiles on the east and southeast of the building (see appendix III).

Pipistrelle species were recorded emerging from the building during the first survey (21/06/23) and the second survey (13/07/23). The total number of bats recorded emerging from the building was three over both surveys consisting of one species. There were two individuals that emerged on the first survey and one on the second.

The proposal is to demolish a conservatory and construct an extension onto the main building. This will result in the disturbance of bat roosts, and without appropriate mitigation could also result in the injuring and killing of bats. If the proposed works are likely to take longer than six months a Bat Mitigation Licence (A13 or 'Full Licence') by Natural England will be required prior to any works which may impact Ridgeway. **However, if works can be conducted within six months, then works can be conducted under a Bat Mitigation Class Licence (CL21 or 'Low Impact Licence')** as there is no planned destruction of a roost site.

This licence agreement is likely to include compensatory bat roosts and detailed precautionary working methods to minimize the risk of harm to any bats during the works such as an integral bat tube or tubes, ridge tile bat cavities, bat boxes, and a sensitive wildlife lighting plan.

5.2 Recommendations

- A Bat Mitigation Licence (A13 'Full Licence') by Natural England or Bat Mitigation Class Licence (CL21 or 'Low Impact Licence').
- A wildlife sensitive lighting plan needs to be written and implemented.
- Bat mitigation needs to be implemented as part of the licence, and a toolbox talk given to anyone working within the builds effected and recorded.

6. Validation

Table 3: Validity duration of the data.

Information Source	Date Undertaken	Valid Until	Comments
Bat Dusk Emergence/Dawn Re-entry Survey (For Planning)	July 2023	August 2025 (2 years)	Bats are known as a transient species and can move roost sites both within and between years.
Bat Dusk Emergence/Dawn Re-entry Survey (For Mitigation Licensing)	July 2023	August 2024 (1 year)	Natural England requires information from the most recent survey season to inform a licence application.

7. References

Literature

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Web references

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<http://www.natureonthemap.naturalengland.org.uk/MagicMap.aspx>

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<http://www.suffolkwildlifetrust.org>

<http://www.naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/habandspeciesimportance.aspx>

8. Appendices

Appendix I: Survey Images

Table 4: Survey Images taken on the 21st of June and 13th of July 2023

	
North elevation of the housing showing the conservatory that will be demolished for the extension	South elevation of the building and gateway of site
	
Internal loft space within the building	Photo of bat droppings within the loft space believed to be pipistrelle species
	
Potential ingress point within the lead flashing circled in red in the photo to the right.	Lead flashing sealed in most places but allowing access via a gap (circled in red) and sealed gable ends not allowing access points on the end of the building



Emergence from under the roof tile on southeast gable (21/06/23).



Infra-red camera view from the 21/06/23 of the south elevation and western extension and gable ends.



Circled is an egress point of a bat during the first survey (21/06/23).



A bat recorded flying away from/over the house during the second survey (13/07/23).



A bat recorded flying low over the ridge of the building during the first survey (21/06/23). This is a view of the north elevation.

Appendix II: Surveyor location maps

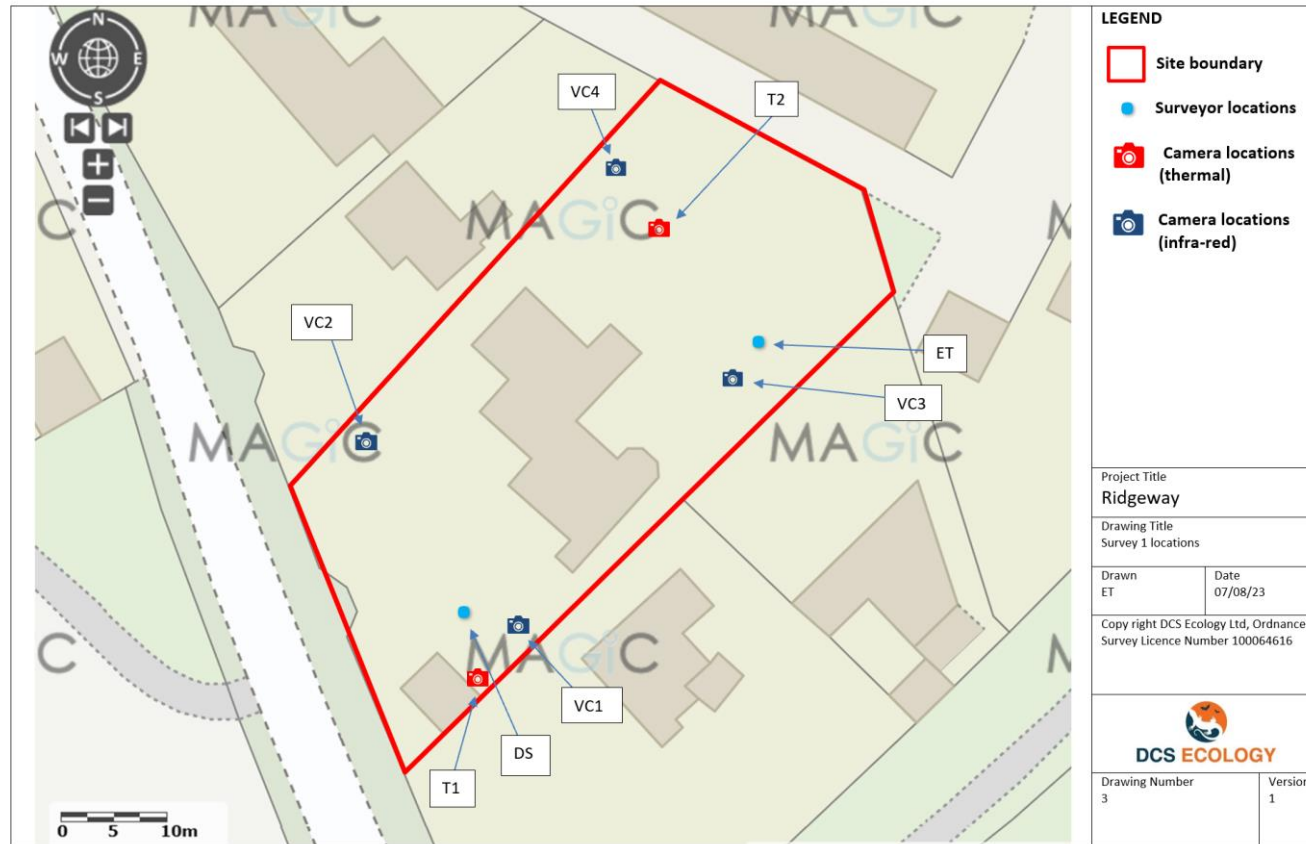


Figure 2: Surveyor location map (21/06/23) (c) Crown Copyright under licence 100064616

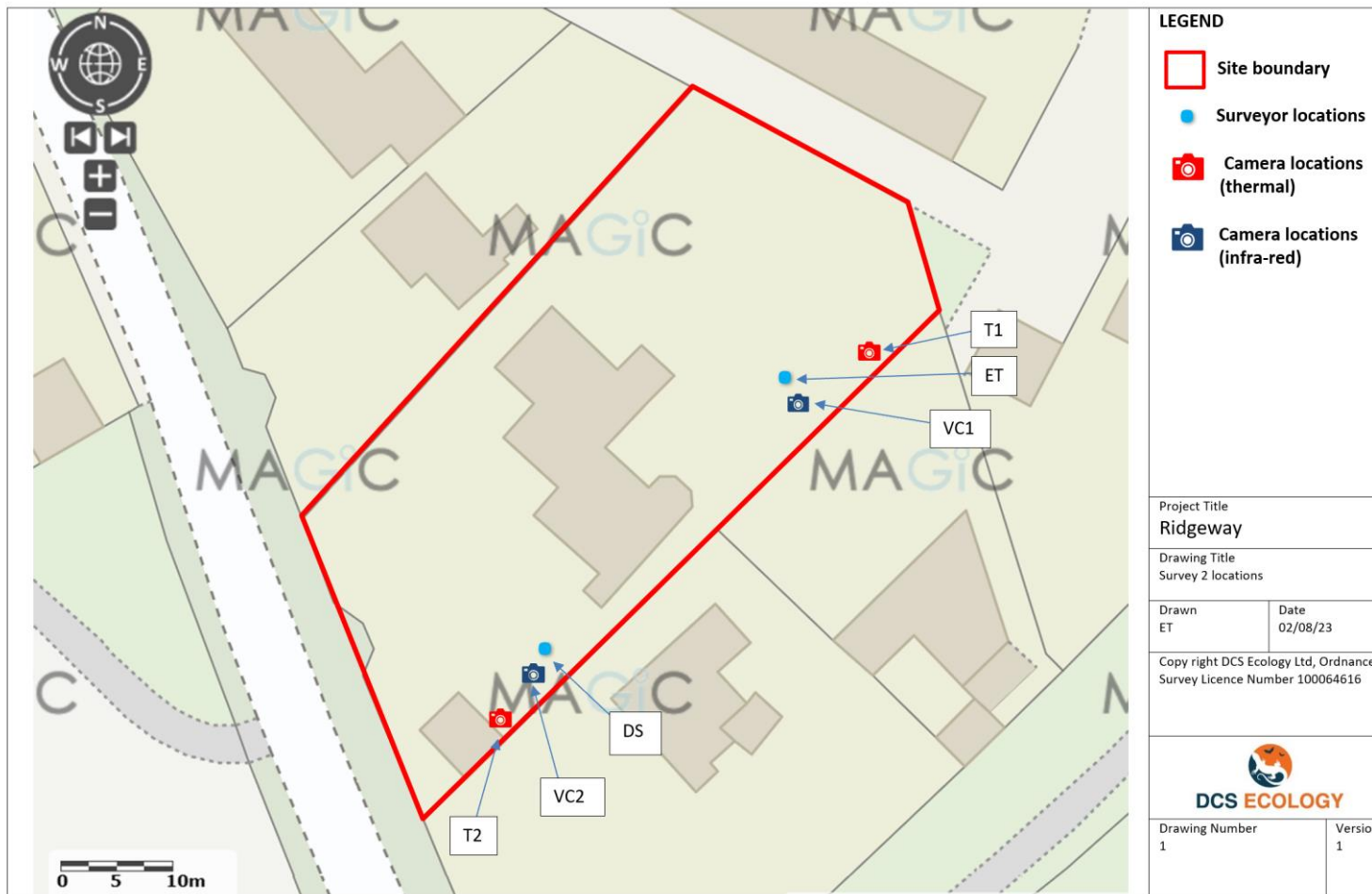


Figure 3: Surveyor location map (13/07/23) (c) Crown Copyright under licence 100064616

Appendix III: Bat Emergence Points and Activity Maps

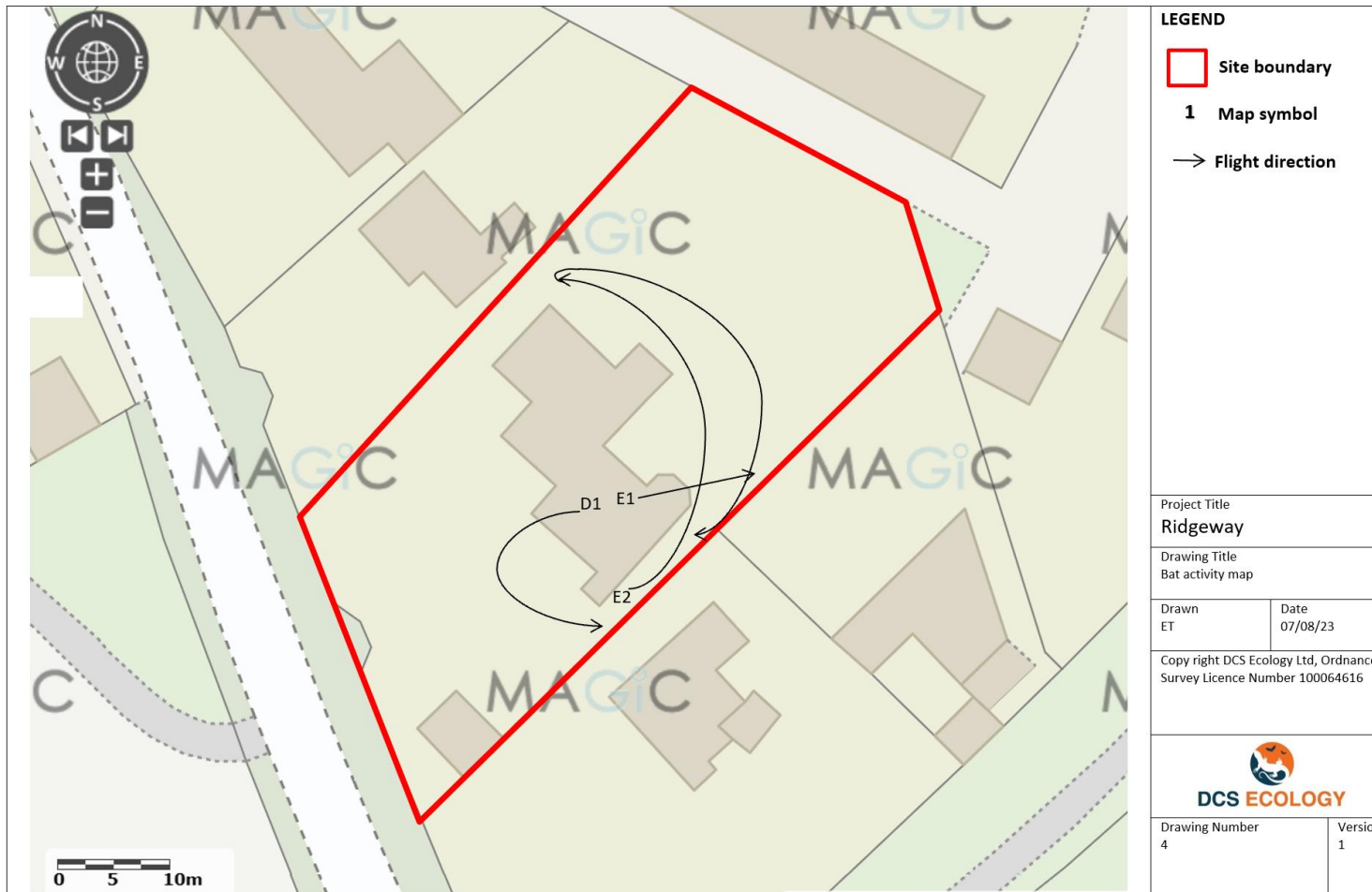


Figure 4: Bat activity map for 21/06/23 (c) Crown Copyright under licence 100064616



Figure 5: Bat activity map for 13/07/23 (c) Crown Copyright under licence 100064616

Appendix IV: Bat survey Results

Surveyor Results – 21/06/2023 (Sunset – 21:19)

Table 5:

Surveyor: DCS						
SURVEY START: 21:00				Equipment: Bat logger M BL1, infra-red video camera VC1 and VC2, Thermal imaging camera T1.		
Map symbol	Time	Species	# Bats	# Passes	Activity	Notes
D1	21:34	CPIP	1		Emergence	Roof tiles up valley
	21:44	Noctule	1	1	Foraging	Treeline to the north of site
	21:49	CPIP	1	1	Foraging	Trees to the south and southeast
	21:55	CPIP	1	continuous	Foraging	Trees to the south and southeast
	22:05	CPIP	3	multiple	Foraging	Chasing each other lasted approximately 3.5 minutes.
	22:18	Noctule	1	1	Foraging	To the north of site
	22:25	Serotine	1	1	Foraging	Road to the west (next door) towards the north of site
SURVEY END: 22:50						

Table 6:

Surveyor: ET						
SURVEY START: 21:00				Equipment: EMT 2 Pro DS4, Bat logger M BL2 and infra-red video camera VC3 and VC4 and Thermal imaging camera T2.		
Map symbol	Time	Species	# Bats	# Passes	Activity	Notes
	21:44	Noctule	1	1	Foraging	Seen flying at the treeline to the north by DS
	21:53	CPIP	1	6	Foraging	Previously emerged (seen by DS at 21:44) foraging around building
	22:02	CPIP	1	5	Foraging	

E1	22:07	CPIP	1	1	Emergence	North face of roof on eastern gable of house
E2	22:10	CPIP	3	13	Social activity	Social calls, chasing and looping around the house and back again
	22:14	CPIP	1	Continuous	Foraging	
	22:16	Noctule	1	1	Foraging	Heard not seen
	22:25	Serotine	1	1		Heard not seen
SURVEY END: 23:00						

Surveyor Results – 13/07/2023 (Sunset – 21:11)

Table 7:

Surveyor: DCS						
SURVEY START: 20:45				Equipment: EMT 2 Pro DS1 and infra-red video camera VC2		
Map symbol	Time	Species	# Bats	# Passes	Activity	Notes
	21:54	CPIP	1	Continual	Emergence/foraging	HNS
	22:03	CPIP	1	2	Foraging	
	22:05	CPIP	1	1	Foraging	Up to garage onsite.
	22:45	CPIP	1	Continual	Foraging	End gable to tree/house to the northwest
SURVEY END: 22:45						

Table 8:

Surveyor: ET						
SURVEY START: 20:45				Equipment: EMT 2 Pro DS4 and infra-red video camera VC1 and Thermal imaging camera T1		
Map symbol	Time	Species	# Bats	# Passes	Activity	Notes
E1/E2	21:57	CPIP	1	Continual	Foraging	
E3	22:02	CPIP	2	Continual	Foraging	
	22:31	Noctule	1	1	Commuting	
SURVEY END: 22:45						

Appendix V: Data search maps

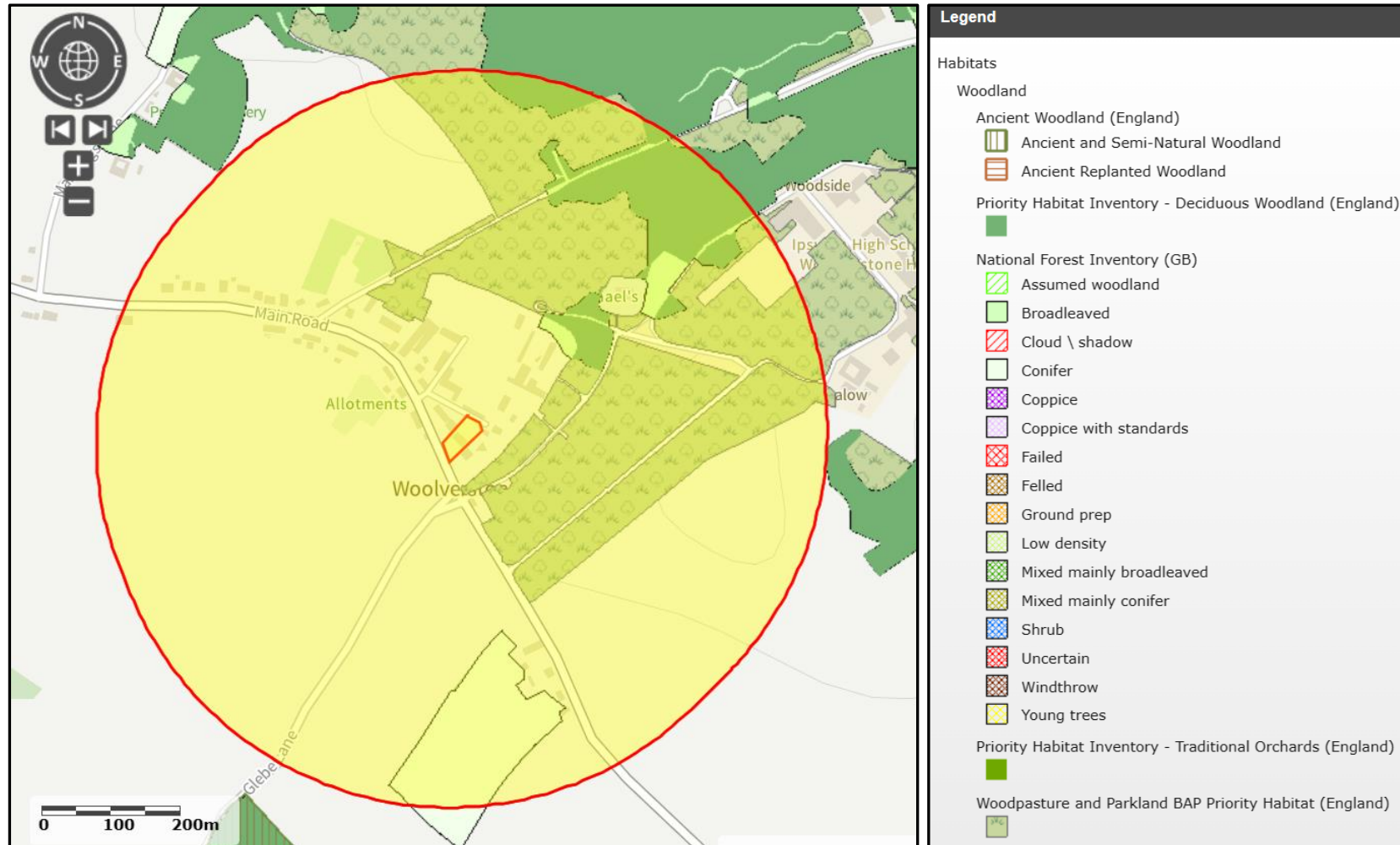


Figure 6: protected and priority habitats within 500m of the Site. Based upon Ordnance Survey (c) Crown Copyright under licence 100064616

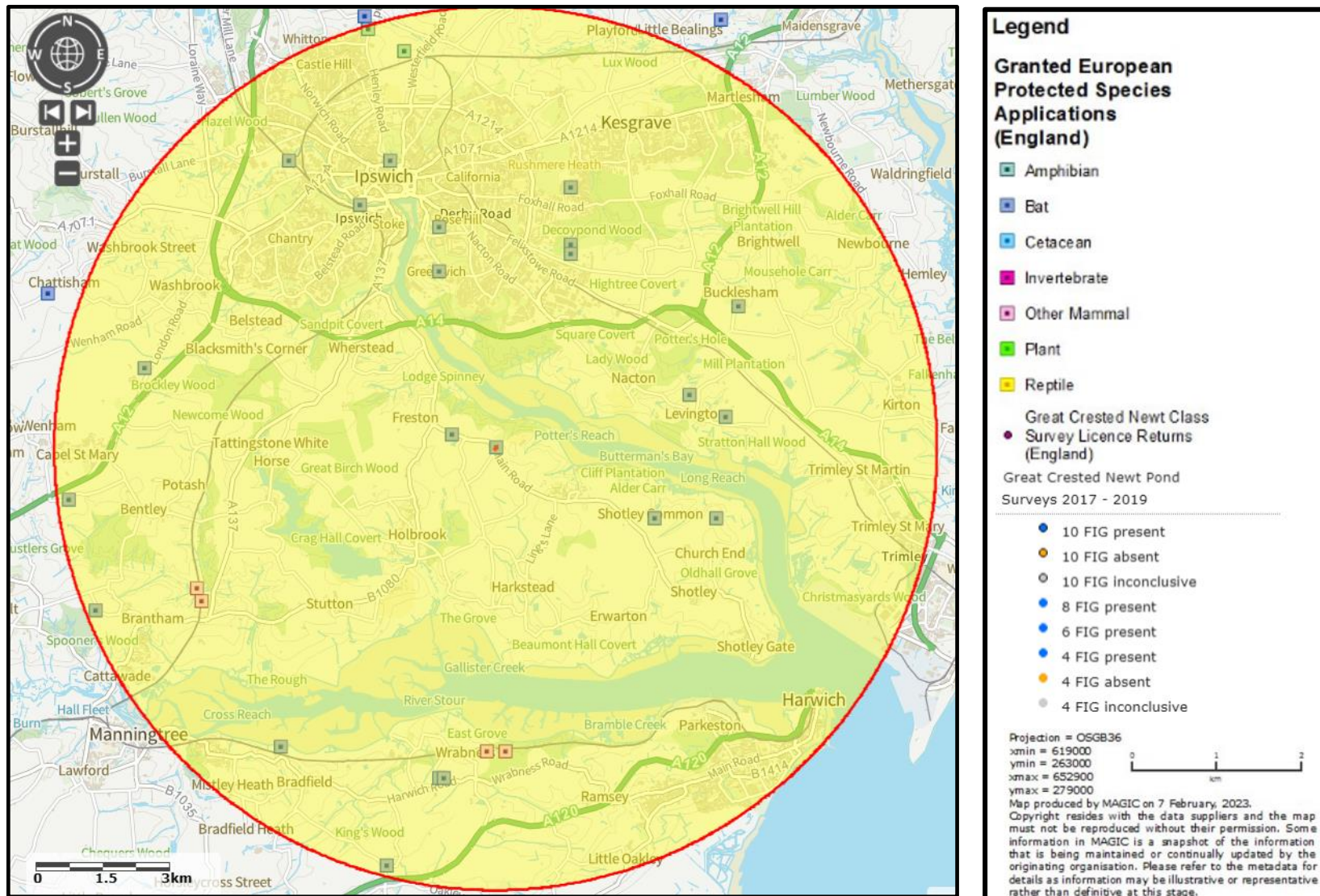


Figure 7: Protected bat species recorded on MAGIC within 10km of the Site. Based upon Ordnance Survey (c) Crown Copyright under licence 100064616

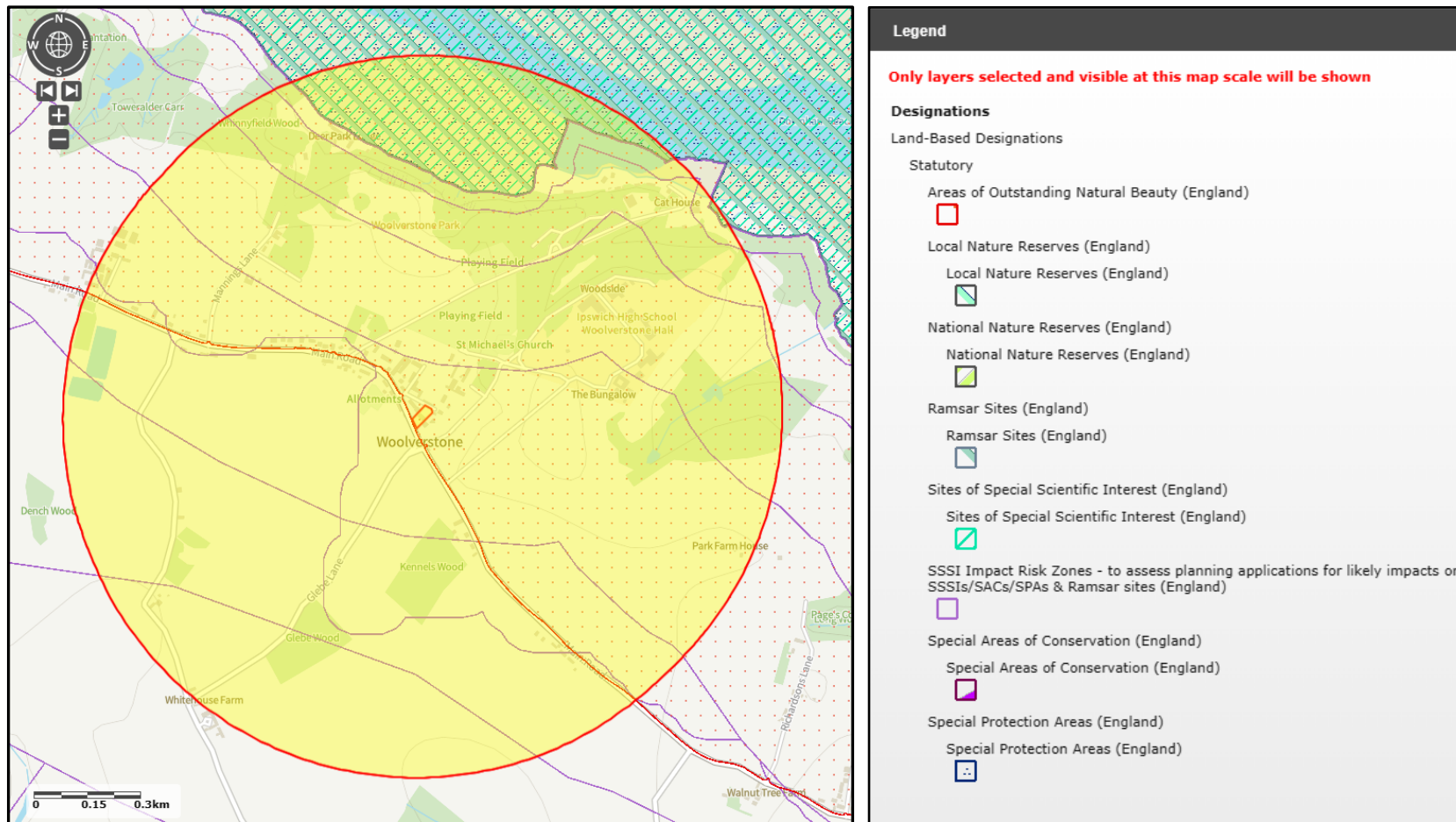


Figure 8: protected areas within 1km of the Site. Based upon Ordnance Survey (c) Crown Copyright under licence 100064616

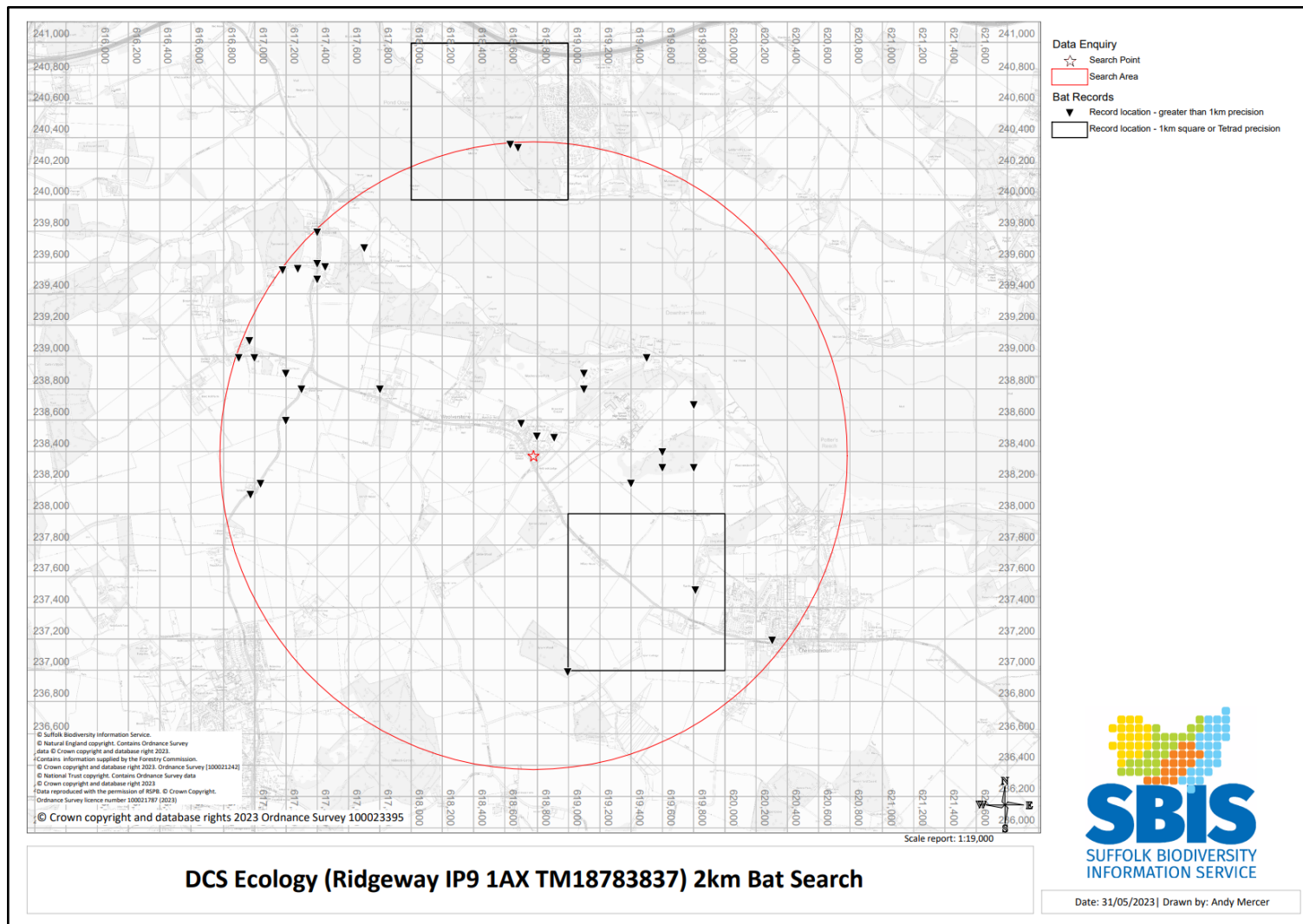


Figure 9: Single species (Bat) records, within 2km of the Site.

Appendix VI: Desk Study

Table 9: Bat records within 2km of the Site from SBIS data records 31/05/23.

<i>Species common name</i>	<i>Latin name</i>	<i>Grid reference</i>	<i>Year</i>	<i>Notes</i>
Noctule Bat	<i>Nyctalus noctula</i>	TM169390	2014	The Mammal Society
Pipistrelle	<i>Pipistrellus pipistrellus</i>	TM1696739109	2014	
Pipistrelle	<i>Pipistrellus pipistrellus</i>	TM1697438129	2014	
Pipistrelle	<i>Pipistrellus pipistrellus</i>	TM1703838199	2014	
Pipistrelle	<i>Pipistrellus pipistrellus</i>	TM170390	2014	The Mammal Society
Pipistrelle	<i>Pipistrellus pipistrellus</i>	TM1717939560	2014	
Pipistrelle	<i>Pipistrellus pipistrellus</i>	TM172386	2014	The Mammal Society
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	TM172389	2014	The Mammal Society
Pipistrelle	<i>Pipistrellus pipistrellus</i>	TM1727539568	2014	
Pipistrelle	<i>Pipistrellus pipistrellus</i>	TM173388	2014	The Mammal Society
Western Barbastelle	<i>Barbastella barbastellus</i>	TM174395	2019	Flying over - EMT2
Daubenton's Bat	<i>Myotis daubentonii</i>	TM174395	2019	one roosting individual
Pipistrelle	<i>Pipistrellus pipistrellus</i>	TM174395	2019	= 3 individuals. Non-breeding roost
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	TM174395	2019	= 3 individuals. Non-breeding roost
Brown Long-eared Bat	<i>Plecotus auritus</i>	TM174395	2019	= 3 individuals. Non-breeding roost
Pipistrelle	<i>Pipistrellus pipistrellus</i>	TM174396	2014	The Mammal Society
Pipistrelle	<i>Pipistrellus pipistrellus</i>	TM174398	2014	The Mammal Society

Pipistrelle Bat species	<i>Pipistrellus</i>	TM1745039580	2014	Owner sees them flying in garden.
Brown Long-eared Bat	<i>Plecotus auritus</i>	TM1745039580	2014	Feeding perch in outbuildings already granted permission for conversion
Pipistrelle	<i>Pipistrellus pipistrellus</i>	TM177397	2002	
Natterer's Bat	<i>Myotis nattereri</i>	TM178388	2017	In cavity in brick wall - torpid
Pipistrelle	<i>Pipistrellus pipistrellus</i>	TM178388	2017	
Brown Long-eared Bat	<i>Plecotus auritus</i>	TM178388	2017	In open mortise and tenon joint where vertical stud meets the wall plate.
Pipistrelle	<i>Pipistrellus pipistrellus</i>	TM1840	2014	The Mammal Society
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	TM1840	2014	The Mammal Society
Lesser Noctule	<i>Nyctalus leisleri</i>	TM18634036	2016	Bat detector record with Auto ID
Natterer's Bat	<i>Myotis nattereri</i>	TM18684034	2016	Bat detector record with Auto ID
Bat	<i>Chiroptera</i>	TM1869938581	2016	7 passes, bats did not echolocate
Serotine	<i>Eptesicus serotinus</i>	TM1869938581	2016	single pass
Myotis Bat species	<i>Myotis</i>	TM1869938581	2016	2 passes
Noctule Bat	<i>Nyctalus noctula</i>	TM1869938581	2016	1 pass
Pipistrelle Bat species	<i>Pipistrellus</i>	TM1869938581	2016	6 passes
Pipistrelle	<i>Pipistrellus pipistrellus</i>	TM1869938581	2016	bats emerged from cottage from the south gable end

				beneath the barge board
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	TM1869938581	2016	8 passes
Brown Long-eared Bat	<i>Plecotus auritus</i>	TM1869938581	2016	2 passes
Brown Long-eared Bat	<i>Plecotus auritus</i>	TM188385	2004	hibernation site & roost
Brown Long-eared Bat	<i>Plecotus auritus</i>	TM1890938492	2019	A maternity roost.
Pipistrelle	<i>Pipistrellus pipistrellus</i>	TM1899736998	2014	
Pipistrelle	<i>Pipistrellus pipistrellus</i>	TM191388	2016	Bat detector record
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	TM191389	2016	Bat detector record
Pipistrelle Bat species	<i>Pipistrellus</i>	TM1937	2022	
Western Barbastelle	<i>Barbastella barbastellus</i>	TM194382	2013	Bat detector
Pipistrelle	<i>Pipistrellus pipistrellus</i>	TM194382	2013	Bat detector
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	TM194382	2013	Bat detector
Brown Long-eared Bat	<i>Plecotus auritus</i>	TM194382	2013	Bat detector
Natterer's Bat	<i>Myotis nattereri</i>	TM195390	2007	Hibernating
Pipistrelle	<i>Pipistrellus pipistrellus</i>	TM195390	2007	Hibernating
Brown Long-eared Bat	<i>Plecotus auritus</i>	TM195390	2007	Hibernating
Western Barbastelle	<i>Barbastella barbastellus</i>	TM196383	2012	Bat detector
Serotine	<i>Eptesicus serotinus</i>	TM196383	2013	Bat detector
Pipistrelle	<i>Pipistrellus pipistrellus</i>	TM196383	2013	Bat detector
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	TM196383	2013	Bat detector
Western Barbastelle	<i>Barbastella barbastellus</i>	TM196384	2013	Bat detector
Pipistrelle	<i>Pipistrellus pipistrellus</i>	TM196384	2013	Bat detector

Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	TM196384	2013	Bat detector
Noctule Bat	<i>Nyctalus noctula</i>	TM19813752	2019	
Pipistrelle Bat species	<i>Pipistrellus</i>	TM19813752	2019	
Pipistrelle	<i>Pipistrellus pipistrellus</i>	TM198383	2013	Bat detector
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	TM198383	2013	Bat detector
Western Barbastelle	<i>Barbastella barbastellus</i>	TM198387	2013	Bat detector
Myotis Bat species	<i>Myotis</i>	TM198387	2013	Bat detector
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	TM198387	2013	Bat detector
Brown Long-eared Bat	<i>Plecotus auritus</i>	TM203372	2012	Injured bat in garden (died)

Appendix VII: Relevant Protected Species Legislation

International and national legislation, and policy context.

EC Habitats Directive

In 1992 the then European Community adopted Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, known as the Habitats Directive. The main aim of the Habitats Directive is to promote the maintenance of biodiversity by requiring member states to introduce protection for these habitats and species of European importance. The mechanism for protection is through the designation of Special Areas of Conservation (SACs), both for habitats and for certain species listed within Annex II. There are several species listed within Annex II of the Habitats Directive that are present within the UK; these include four lower plant species, nine higher plant species, six species of molluscs, six species of arthropods, eight species of fish, two species of amphibian, and nine species of mammal.

The Bern Convention

The Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention) came into force in 1982. The principal aims of the Convention are to ensure the conservation and protection of wild plant and animal species and their natural habitats (listed in Appendices I and II of the Convention), to increase cooperation between contracting parties, and to regulate the exploitation of those species (including migratory species) listed in Appendix 3. To this end the Convention imposes legal obligations on contracting parties, protecting over 500 wild plant species and more than 1000 wild animal species.

Bonn Convention

The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention or CMS) was adopted in Bonn, Germany in 1979 and came into force in 1985. Contracting Parties work

together to conserve migratory species and their habitats by providing strict protection for endangered migratory species (listed in Appendix 1 of the Convention), concluding multilateral agreements for the conservation and management of migratory species which require or would benefit from international cooperation (listed in Appendix 2 of the Convention), and by undertaking cooperative research activities.

Convention on Biological Diversity

The Convention on Biological Diversity (Biodiversity Convention or CBD) was adopted at the Earth Summit in Rio de Janeiro and entered into force in December 1993. It was the first treaty to provide a legal framework for biodiversity conservation. Contracting Parties are required to create and enforce national strategies and action plans to conserve, protect and enhance biological diversity.

Wildlife and Countryside Act 1981 (as amended)

The Wildlife and Countryside Act 1981 (as amended) is the principal mechanism for the legislative protection of wildlife in Great Britain. However, it does not extend to Northern Ireland, the Channel Islands, or the Isle of Man. This legislation is how the Convention on the Conservation of European Wildlife and Natural Habitats (the 'Bern Convention') and the European Union Directives on the Conservation of Wild Birds (79/409/EEC) and Natural Habitats and Wild Fauna and Flora (92/43/EEC) are implemented in Great Britain.

Conservation of Habitats and Species Regulations 2010 (as amended)

In the UK the Council Directive 92/43/EEC has been transposed into national laws by means of the Conservation (Natural Habitats, & c.) Regulations 1994 (as amended), and the Regulations (Northern Ireland) 1995 (as amended). The Regulations came into force on 30 October 1994 and have been amended several times. Subsequently the Conservation of Habitats and Species Regulations 2010 was created which consolidates all the various amendments made to the 1994 Regulations in respect of England and Wales and is commonly known as the 'the Habitats Regulations'. In Scotland the Habitats Directive is transposed through a combination of the Habitats Regulations 2010 (in relation to reserved matters) and the 1994 Regulations. The Conservation (Natural Habitats, &c) Regulations (Northern Ireland) 1995 (as amended) transpose the Habitats Directive in relation to Northern Ireland. The Regulations contain five Parts and four Schedules and provide for the designation and protection of 'European sites', the protection of 'European protected species', and the adaptation of planning and other controls for the protection of European Sites.

Table 10: Relevant Protected Species Legislation

Species	Legislation	Protection
Bats	<ul style="list-style-type: none"> ▪ Conservation of Habitats and Species Regulations (2010) (as amended) ▪ Wildlife and Countryside Act (WCA) (1981), Schedule 5 (as amended) ▪ Wild Mammals Act (1996) 	<p>It is an offence to:</p> <ul style="list-style-type: none"> ▪ Intentionally kill, injure, or take any bat. ▪ Intentionally or recklessly disturb a bat. ▪ Intentionally or recklessly damage, destroy or obstruct access to a bat roost.

Appendix VIII: Abbreviations

Table 11: List of abbreviations	
BAP	Biodiversity Action Plan
BCT	Bat Conservation Trust
BoCC	Birds of Conservation Concern
CHSR	Conservation of Habitats and Species Regulations 2017
CIEEM	Chartered Institute of Ecology and Environmental Management
CROW	The Countryside Rights of Way Act 2000
CWS	County Wildlife Site
ECoW	Ecological clerk of works
eDNA	Environmental DNA
EIA	Ecological Impact Assessment
EPS	European Protected Species
GCN	Great crested newt
HPI	Habitat of Principal Importance
HSI	Habitat Suitability Index
HRA	Habitat Regulations Assessment
JNCC	Joint Nature Conservation Committee
LNR	Local Nature Reserve
LPAs	Local Planning Authorities
MAGIC	Multi-Agency Geographic Information for the Countryside
NERC	Natural Environment and Rural Communities Act
NBIS	Norfolk Biodiversity Information Service
NE	Natural England
NERC	Natural Environment and Rural Communities Act 2006
NNR	National Nature Reserve
NPPF	The National Planning Policy Framework
PEA	Preliminary Ecological Appraisal
PRA	Preliminary Roost Assessment
PRF	Potential (bat) Roosting Feature
RAMs	Reasonable Avoidance Measures
SAC	Special Area of Conservation
SBAP	Suffolk Biodiversity Action Plan
SBIS	Suffolk Biodiversity Information Service
SPA	Special Protection Area
SSSI	Special Site of Scientific Interest
TAF	Temporary amphibian fencing
WCA	Wildlife and Countryside Act 1981 (as amended)
UKBAP	United Kingdom's Biodiversity Action Plan

Table 12: Abbreviations of bat species		
Abbreviations	Common name	Latin name
BARB	Barbastelle (bat)	<i>Barbastella barbastellus</i>
BLE	Brown long-eared (bat)	<i>Plecotus auritus</i>
CPIP	Common Pipistrelle bat	<i>Pipistrellus pipistrellus</i>
DAUB	Daubenton's bat	<i>Myotis daubentonii</i>
LEI	Lesser noctule / Leisler's bat	<i>Nyctalus leisleri</i>
NATT	Natterer's bat	<i>Myotis nattereri</i>
NOC	Common noctule	<i>Nyctalus noctule</i>
NPIP	Nathusius's pipistrelle	<i>Pipistrellus nathusii</i>
SERO	Serotine (bat)	<i>Eptesicus serotinus</i>
SPIP	Soprano pipistrelle (bat)	<i>Pipistrellus pygmaeus</i>