

CALDER COTTAGE ECOLOGICAL IMPACT ASSESSMENT

July 2023

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MCIEEM

Summary

Ecological Matters Environmental Consultancy was commissioned to undertake an Ecological Impact Assessment (EclA) at Calder Cottage, Spring Hill, Nailsworth, Stroud, GL6 0LX, to inform a planning application (reference number S22/2306/HHOLD Status Withdrawn). The aim of the EclA was to determine whether works associated with the proposal are likely to have an adverse impact on protected and/or priority species and habitats within and adjacent to the proposed development site.

The Preliminary Ecological Appraisal highlighted the potential of habitats within the site to support the following protected and/or notable species:

- bats,
- badgers,
- common reptiles,
- common amphibians,
- breeding birds,
- hedgehogs.

During the subsequent Phase 2 surveys the following protected and/or notable species were discovered on site:

- bats,
- badgers,
- slow worms
- common toads
- Japanese knotweed.

Bats

During the dusk emergence survey (05.05.23) a common pipistrelle bat was seen to emerge from beneath lead flashing associated with the dormer window on the south sloping roof pitch of the cottage.

In the absence of appropriate mitigation works on the roof of the property will result in the destruction of a bat roost. In addition, the proposed work has the potential to kill, injure, and disturb bats. Therefore, a mitigation license from Natural England (NE) will be required to ensure legislative compliance in relation to the proposed development.

The proposed works will affect small numbers of a commonly occurring bat species and will have a low impact on one low conservation status roost (a non-maternity day roost). Therefore, the work qualifies to be carried out under a bat low impact licence (WML-CL21 Class Licence).

In order for the development to be carried out under a low impact licence, the mitigation must be completed within six months. The proposed works can be undertaken at any time of the year, subject to approval during licencing.

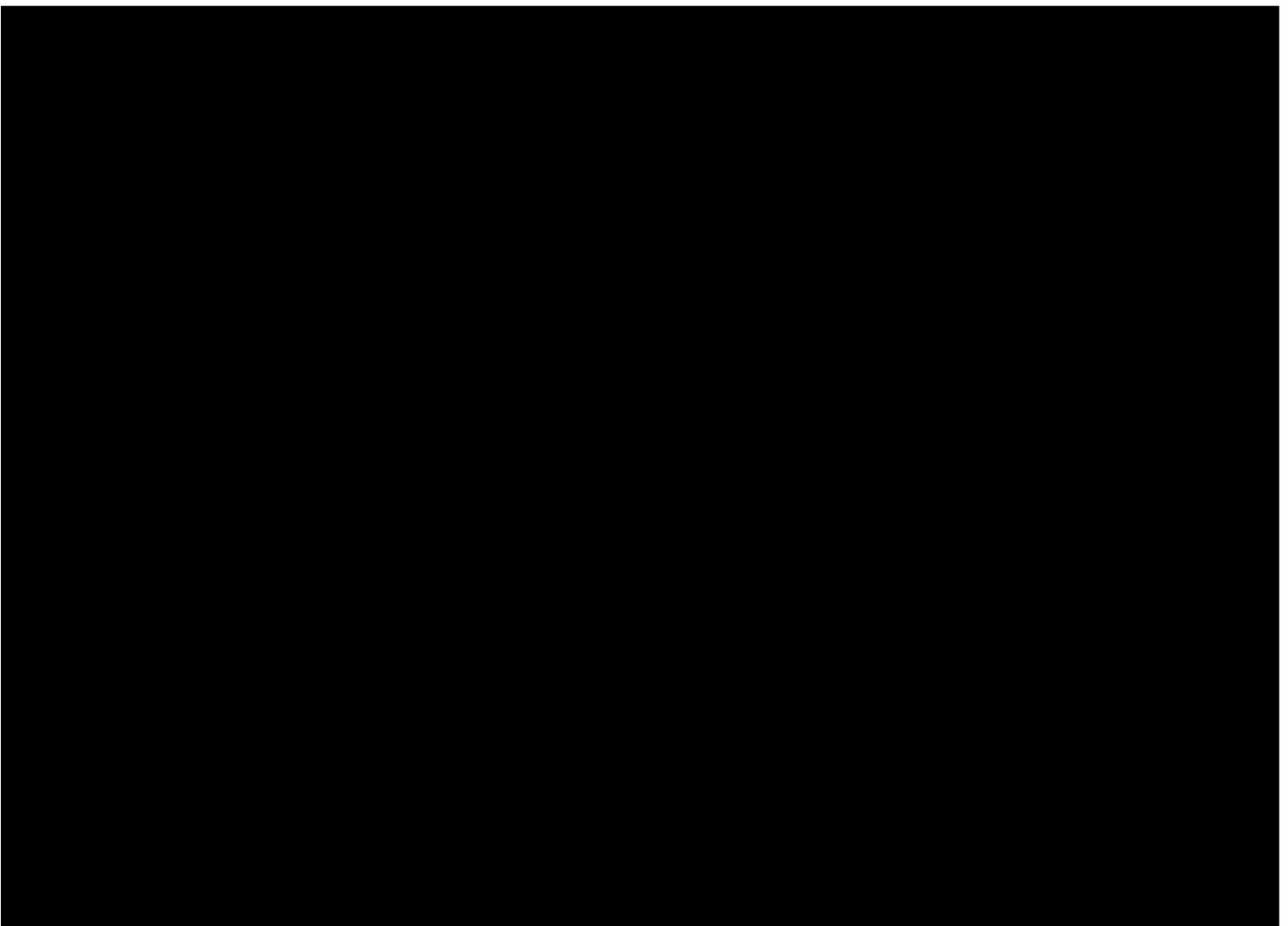
The mitigation measures have been designed to prevent individual bats from being harmed during the proposed works on the building and to provide bats with permanent roosting opportunities on site in the form of long-lasting bat boxes. The level of mitigation is based on NE's guidance.

To minimise the risk of killing or injuring bats during the proposed works recommendations outlined within this report must be adhered to, notably, removal of roofing materials in the vicinity of the existing roost will be undertaken as a soft strip, which will be carried out under the supervision of a licensed ecologist.

The licence application cannot be made:

- more than twelve weeks in advance of the proposed works starting date,
- less than three weeks before the start of licensable works.

If additional artificial lighting is proposed in association with the development proposal a bat sensitive lighting plan will be required.





Common Reptiles

A small population of slow worms was discovered on site during the reptile survey. In the absence of appropriate mitigation measures, the development proposal has the potential to result in death and/or injury of common reptiles. To protect slow worms from any harm during development works, they will be excluded from the development footprint prior to any site clearance occurring.

This will be achieved by the installation of a short stretch of reptile exclusion fence within the site and the translocation of slow worms into an in situ receptor area. The capture phase will extend over a period of eight consecutive days, followed by five days with no reptile capture. The reptile translocation will be undertaken in September and completed before mid- October, as slow worms will be entering a period of hibernation after this time.

The reptile mitigation strategy includes habitat manipulation within the donor site to facilitate the capture of slow worms and ultimately reduce its attractiveness to reptiles.

Habitat enhancement measures within the receptor area in relation to reptiles are outlined in this report and include the creation of a hibernaculum and a wildflower lawn.

Breeding Birds

Nesting opportunities are offered to breeding birds on site. If the development works are to be carried out during the bird breeding season (March-August inclusive), a check of potential breeding habitats must be carried out by a suitably qualified ecologist prior to the works commencing. If active nests are found, an appropriate buffer zone should remain in place until the young have fledged.

Common amphibians

No aquatic breeding habitat for amphibians is present on site; however, common toads were discovered within terrestrial habitat within the site. This species is a species of principle importance for the conservation of biodiversity therefore consideration must be given to its presence in relation to the development proposal. If common toads are encountered during development works, they will be carefully removed to the reception area.

Hedgehogs

Suitable habitat occurs on site for hedgehogs; however, due to the presence of badgers on site, hedgehogs are less likely to be present on site. The mitigation

measures to prevent the entrapment of badgers will also ensure hedgehogs are not trapped.

Japanese knotweed

Japanese knotweed is a non-native invasive plant species listed in Schedule 9 of the Countryside & Wildlife Act 1981. A recognised control programme for this species on site has been designed by an invasive weed control specialist, and implementation of the control measures has begun.

Designated Sites and Priority Habitats

No adverse impacts on designated sites or on Priority Habitats are anticipated in relation to the development proposal. This conclusion relates to the size and nature of the development proposal and the site's distance from designated sites and Priority Habitats.

Biodiversity Enhancements

Biodiversity enhancements suggested within this report include:

- creation of a wildflower lawn,
- construction of a wildlife pond,
- native hedge planting.

Providing the mitigation measures and recommendations outlined in this report are implemented, the proposed works should not result in adverse impacts on protected and/or priority species or habitats. The mitigation strategy and suggested biodiversity enhancements ensure the proposed development is in accordance with nature conservation legislation and planning policy.

This report will remain valid for eighteen months until the end of November 2024.

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Introduction

1. Ecological Matters Environmental Consultancy was commissioned by Souad Wrixen (hereafter referred to as the client) to undertake an Ecological Impact Assessment (EclA) at Calder Cottage, Spring Hill, Nailsworth, Stroud, Gloucestershire GL6 0LX (hereafter referred to as the site). The site is centred on Ordnance Survey grid reference ST 84907 99711.
2. The aim of the EclA was to determine whether works associated with the development proposal are likely to have an adverse impact on protected and/or priority species and habitats within and adjacent to the proposed development site.
3. Protected species and habitats are those that receive international and/or national legal protection.
4. Priority species and habitats are listed in Schedule 41 of the Natural Environment and Rural Communities (NERC) Act 2006 and are defined as those of principle importance for the conservation of biodiversity.
5. The EclA consisted of a desk study, a Preliminary Ecological Appraisal (PEA), a Preliminary Roost Assessment (PRA) for bats and birds, Phase 2 bat surveys, a reptile survey, and a badger survey.
6. The key objectives of the EclA were to:
 - identify potential ecological constraints associated with the development proposal,
 - identify any mitigation measures that may be needed to ensure compliance with nature conservation legislation and policy,
 - outline opportunities for ecological enhancement.
7. The surveys were carried out by [REDACTED] a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM), and holder of a Natural England survey licence for bats (registration number 2015-10661-CLS-CLS). Assistance during the Phase 2 bat surveys was provided by [REDACTED] also a bat-licenced ecologist (registration number 2015-11171-CLS-CLS) and full member of CIEEM. The ecological surveys were carried out in accordance with published good practice guidelines.
8. The planning application (S.22/2306 HHOLD. Status: Application Withdrawn) seeks to gain consent for the following: refurbishment of the existing dwelling, replacement of the timber outbuilding with a new timber framed building, renewal of the driveway, construction of a covered parking bay with provision

for vehicular turning on site, and landscaping of the garden to provide accessible level amenity space.

9. The site plan is presented below in figure 1 the red line delineates the site boundary.

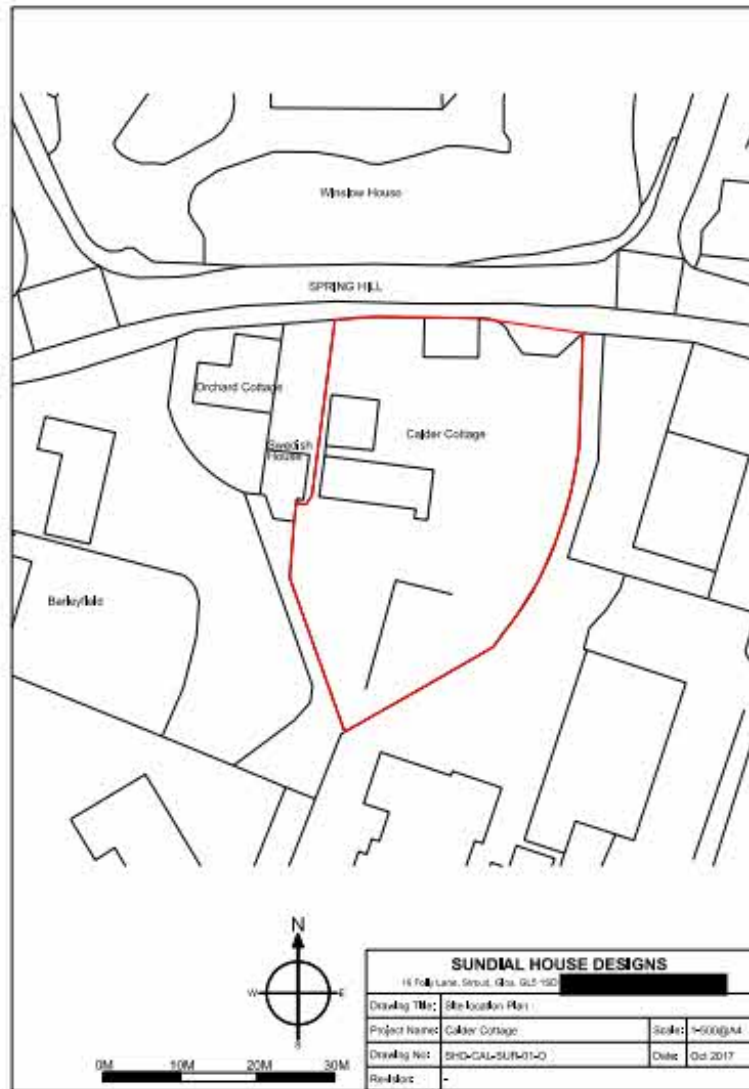


Figure 1 Site location plan © Sundial House Designs

Planning Policy

National Policy

10. The National Planning Policy Framework (NPPF) sets out the government's requirements for the planning system in England. A number of sections of the NPPF are relevant when taking into account development proposals and the environment.

11. The general impetus of the NPPF in relation to ecology and biodiversity is for development proposals to not only minimise the impacts on biodiversity but also to provide enhancement. Paragraph 109 states that the planning system should contribute to and enhance the natural environment by '*minimising impacts on biodiversity and providing net gains in biodiversity where possible..*'
12. Paragraph 1118 states '*when determining planning applications, local planning authorities should aim to conserve and enhance biodiversity*'. A number of principles are set out in Paragraph 118 including the principle that where harm cannot be adequately avoided then it should be mitigated for, or as a last resort, compensated for.
13. Where impacts occur on nationally designated sites , the benefit must clearly outweigh any adverse impact and incorporating biodiversity in and around developments should be encouraged. Protection of irreplaceable habitats, such as ancient woodlands and those sites proposed as Special Protected Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar Sites or acting as compensation for SPAs, SACs and Ramsar sites, should receive the same protection as European sites.
14. In addition to the NPPF, Circular 06/05 provides guidance on the application of the law relating to planning and nature conservation as it applies in England. Paragraph 98 states '*the presence of a protected species is a material consideration when a planning authority is considering a development proposal that, if carried out, would be likely to result in harm to the species or its habitat*', whilst paragraph 99 states '*it is essential that the presence or otherwise of a protected species, and the extent that they may be affected by the proposed development, is established before planning permission is granted*'.

Local Policy

15. A number of Biodiversity Action Plans (BAP) have been identified within Gloucestershire for the protection of habitats and species . This includes ancient woodlands and species rich hedgerows, arable farmland which includes farmland birds reliant on arable crops and unimproved grasslands.
16. Gloucestershire is also a stronghold for bats, of which there are now 18 species in the UK.

Methods

Desk Study

17. A desk study was carried out using Natural England's nature on the map web site www.magic.defra.gov.uk to search for internationally designated sites within 5km of the site, these included Special Protection Areas, Special Areas of Conservation and Ramsar sites. Nationally designated sites of Special Scientific Interest (SSSI) and National Nature Reserves (NNR), together with Local Nature Reserves (LNR) and Priority Habitats were searched for within 2km of the site.
18. The website was also consulted to determine whether European Protected Species (EPS) derogation licences had been granted within a 5km radius of the proposed development site. In addition, any sites within 10km designated specifically for their bat populations were noted.
19. These search buffers were considered appropriate when assessing the potential zone of influence in relation to the proposed development. The zone of influence refers to the area(s) over which ecological features may be affected by the biophysical changes caused by the proposed project and associated activities (CIEEM, 2018).
20. In addition, information pertaining to the ecological history of the site was requested from the client.
21. A Biological Records Centre (BRC) data search was not thought to be necessary as the proposed development will only impact on the site and data for other species would be irrelevant.

Field surveys

Preliminary Ecological Appraisal

22. A Preliminary Ecological Appraisal was undertaken on the 2nd December 2022 this consisted of a site walkover survey to assess the suitability of the habitats present on site to support protected and/or priority species. In addition, characteristic field signs which might indicate the presence of protected and/or priority species at a UK and European level were noted. The PEA followed guidance provided by CIEEM (CIEEM, 2017).

23. Habitats on site were identified in accordance with Phase 1 Habitat Survey methodology (JNCC, 2010) and digitally mapped in QGIS to produce a visual representation of the survey area with descriptive target notes.
24. The area covered during the site walkover survey is delineated by the red line in figure 1.
25. Non-native invasive species listed in Schedule 9 of the Wildlife & Countryside Act 1981 were recorded when encountered within the survey area.

Bats -Preliminary Roost Assessment

26. A Preliminary Roost Assessment was carried out on the onsite buildings on the 2nd December 2022. This involved an external and internal inspection survey of the structures, to look for evidence of bats, and to identify features of actual or potential suitability for roosting bats. Possible access points into the buildings for bats were also noted.
27. The search involved looking for: bats themselves, bat droppings, feeding remains, urine splashes, fur-oil staining and scratch marks around entry holes. As bats often omit detectable squeaks when hidden in a roost, and are known to give off a distinct odour, the surveyor was alert to audible and olfactory signs which could indicate their presence. In addition, the presence or absence of cobwebs was noted, as gaps occluded by dense cobwebbing were unlikely to have been accessed by bats, conversely, an absence of cobwebs could indicate usage of features by bats as their wings and bodies would most likely have brushed roof timbers and small cavities clean as they move about.
28. Following the PRA, the buildings were classified according to their suitability to support roosting bats based on the presence of suitable roost features and bat access points within the structure, and on the presence of suitable foraging and commuting habitats within the surrounding landscape. Classification followed guidance outlined in industry good practice guidelines (Collins, 2016).
29. The equipment used included a high-powered torch (SR 52 –UT), an endoscope (Explorer Premium), bat detectors (Anabat Walkabout and a Bat Box Duet), binoculars (Avian 8 x 42) and a telescopic inspection mirror.
30. Any bat droppings found during the inspection of the built structures were retained and either identified using a field guide or sent off to the laboratory for DNA analysis.
31. All aspects of the buildings were inspected and the survey lasted 2 hours.

Phase 2 Bat Surveys

32. The cottage was subject to three bat activity surveys; these consisted of two dusk emergence surveys and one dawn re-entry survey. The dusk surveys were undertaken on the 5th May and the 16th June and the dawn survey was carried out on the 19th May.

33. The objective of the bat activity surveys was to:

determine whether bats are roosting in the structure of the building,
characterise any bat roosts present,
design a mitigation strategy to protect bats and their roosts,
ascertain whether a Natural England European Protected Species
Licence is required in order to protect bats and ensure legislative
compliance.

34. Surveyors were equipped with bat detectors capable of recording bat echolocation calls; where it was not possible to identify bat species on site audio recordings were later analysed using bat sound software (Analook Insight) in order to confirm bat species identification.

35. Surveyors were positioned to ensure optimal visual coverage of the building (figure 2). The Phase 2 bat surveys were undertaken during suitable weather conditions, when the weather was warm, dry and with light or no wind. The dusk surveys began 15 minutes before sunset and lasted approximately 1.5 hours. The dawn re-entry survey began 1.5 hours before sunrise and continued for 15 minutes after sunrise.

36. No further bat surveys were required on the timber out-building.

37. The bat surveys was carried out in accordance with best practice guidelines (Collins, 2016).

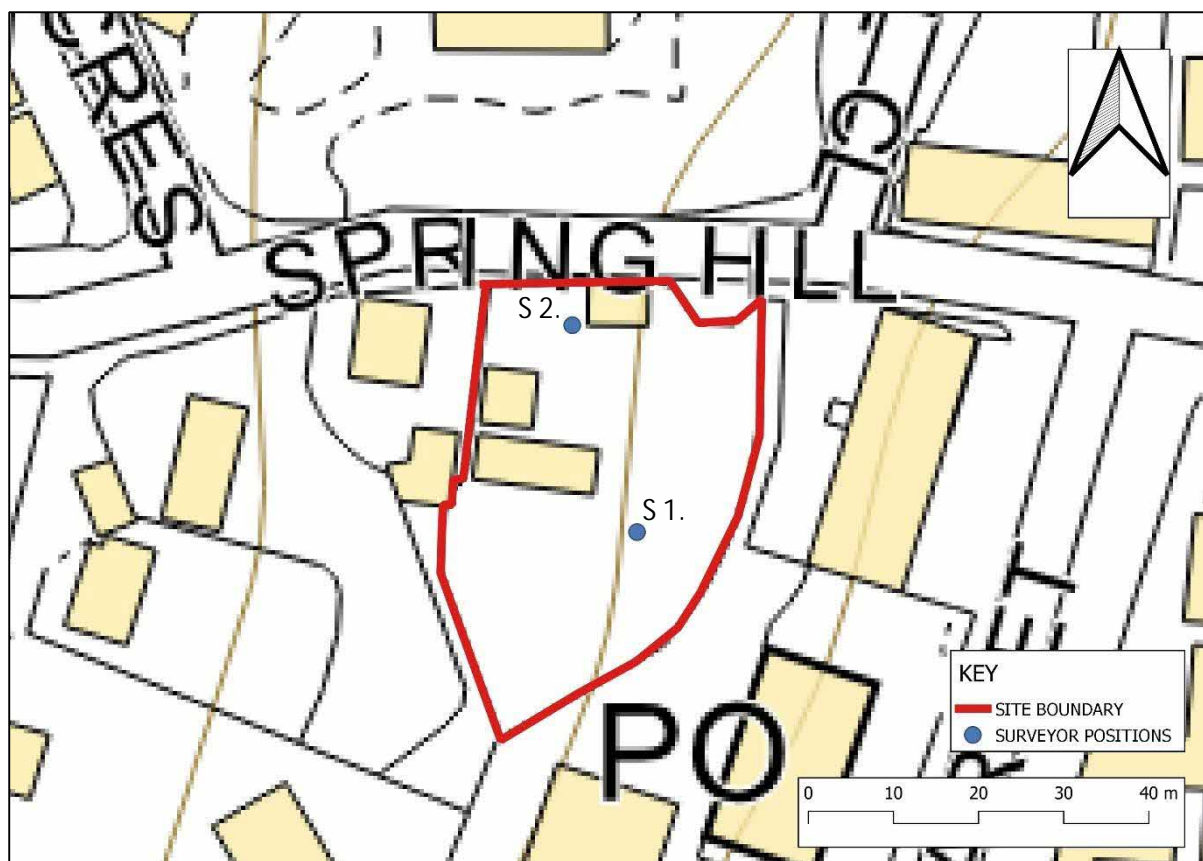


Figure 2 Surveyor positions during the bat activity surveys. Surveyor 1.(S1).Surveyor 2. (S2.)

Constraints

- 38. Due to the proximity of the cottage to the western boundary fence line the west gable ends of the building could not be viewed.

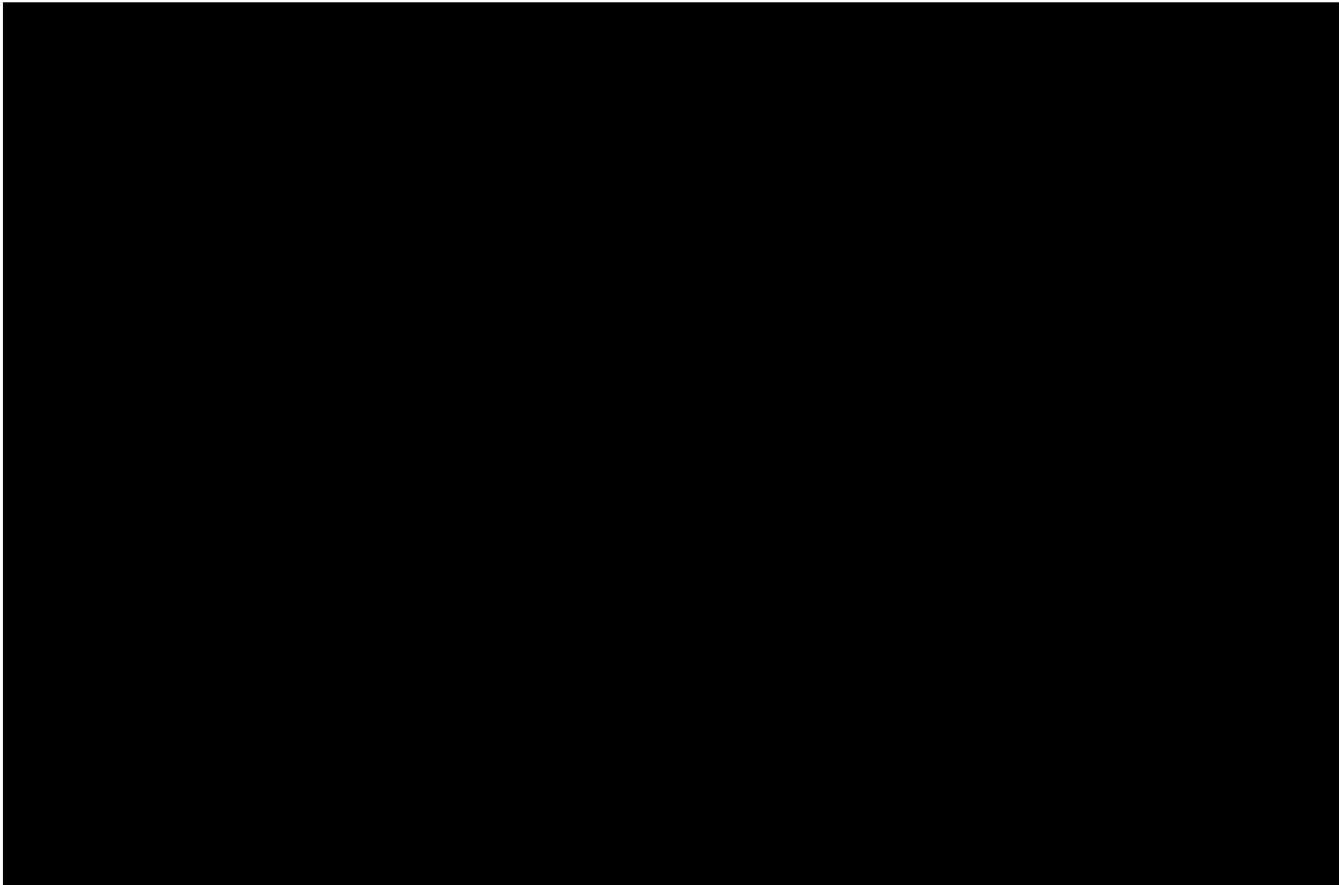
Breeding Bird Assessment

- 39. During the PRA, features on the buildings that could provide suitable nesting sites for breeding birds were noted, along with any avian faecal deposits and old nests.

Reptiles – Presence/ Absence Survey

- 40. A reptile survey was undertaken to determine the presence, or likely absence, of reptiles within the site. Artificial refugia (rectangles of roofing felt measuring approximately 0.5m x 0.5m) were positioned around the site in locations where habitat features were favourable for reptiles.
- 41. The refugia, which provide suitable basking habitat for reptiles, were inspected on the upper surface and then lifted and checked underneath for reptiles, before being carefully replaced.

42. Seven survey visits were undertaken. The survey was carried out in May, which is a key month for surveying for reptiles, and under optimum weather conditions (one survey visit was undertaken at the beginning of June). The following information was recorded during each reptile survey visit: species present, number of individuals present, approximate age (e.g. adult, immature or juvenile), sex, date, start and finish times, temperature and weather conditions. When reptiles were encountered a photo with a what3word location was taken.
43. A total of 35 refugia were deployed across the site on the 13rd April. The refugia were positioned approximately 2 weeks before the survey commenced, to allow them sufficient time to 'bed in'.
44. The survey was carried out by an experienced ecologist, in accordance with Natural England's Reptile Mitigation Guidelines (Natural England, 2011).



Site Description

45. The site, which is on a main road, is located in the centre of the market town of Nailsworth and is surrounded by residential properties with gardens and commercial buildings (figure 3).



Figure 3 Aerial image of the site (red dot) © Google Earth

46. When the PEA was undertaken on 2nd December 2022 there were two built structures on site, a dilapidated timber outbuilding and a detached stone cottage.

47. The cottage, which is a Grade II listed building, consists of the original structure built in the 17th century onto which a single-storey and a two-storey extension have been constructed resulting in a stepped down-hill dwelling with three ridge heights (figures 4 & 5).

48. The cottage is surrounded by an overgrown sloped garden containing tall grasses and ruderals, herbaceous flowering plants, scattered scrub, ornamental shrubs and a few small trees. The garden is bordered around its periphery by a large cherry laurel hedge on top of a steep soil bank, a timber fence, brick wall, box hedge, bramble scrub and an ivy covered stone wall.



Figure 4 Existing elevations (south elevation - top image, north elevation - bottom image) ©Sundial House Designs



Figure 5 Existing elevations (west elevation - top image, east elevation - bottom image showing timber outbuilding) ©Sundial House Designs

49. The wider landscape (figure 6) contains a mosaic of habitats which include deciduous woodland blocks, grassland commons, pasture and arable fields with hedgerows, and aquatic habitats which include the Nailsworth Stream, Ruskin Mill and Egypt Mill ponds, and Gatecombe Lake.

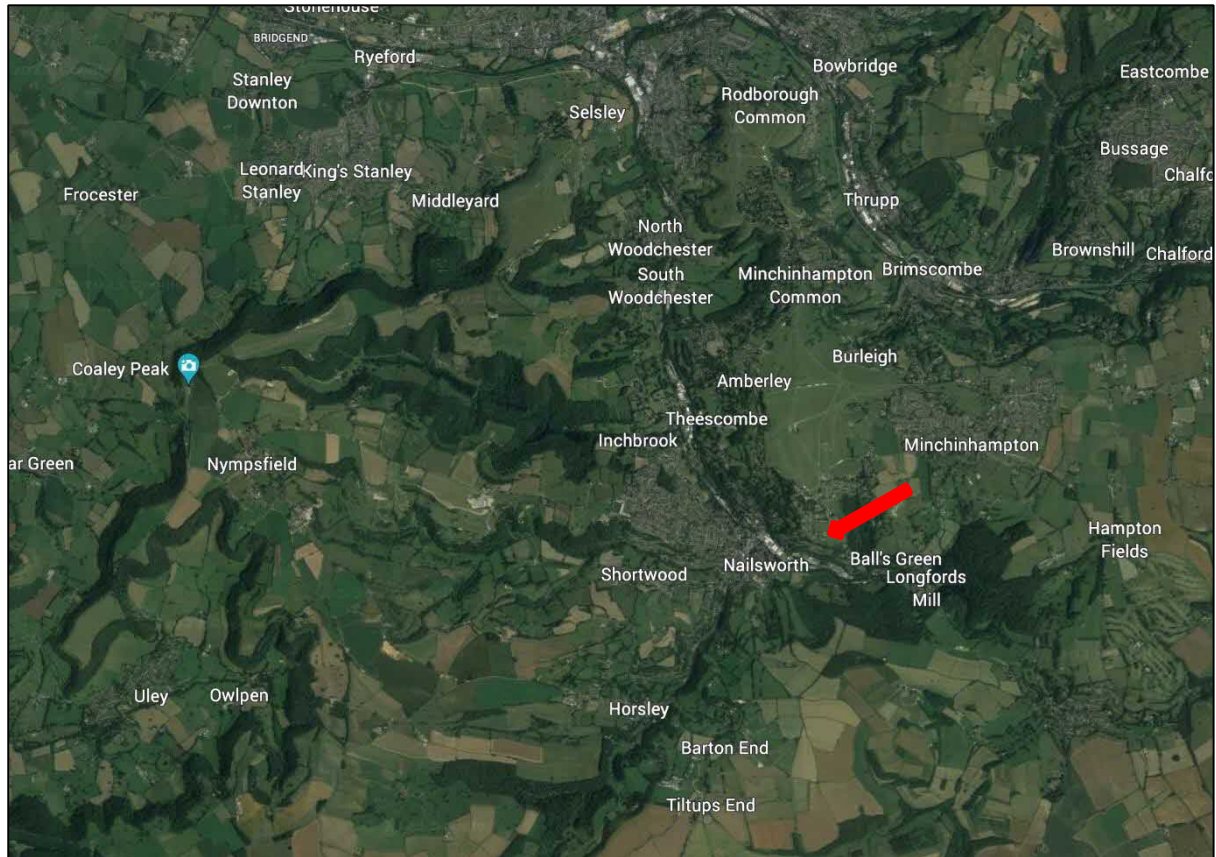


Figure 6 Aerial image showing wider landscape (the red arrow points to the site) © Google Earth

Proposed development

50. The development proposal is for the refurbishment of the existing dwelling, to make it habitable and improve access, replacement of the existing timber outbuilding with a new timber framed building, renewal of the vehicle access and provision of a parking/turning site and a garage (figures 7-9).



Figure 7 Proposed elevations (south elevation – top image, north elevation -bottom image)© Sundial House Designs

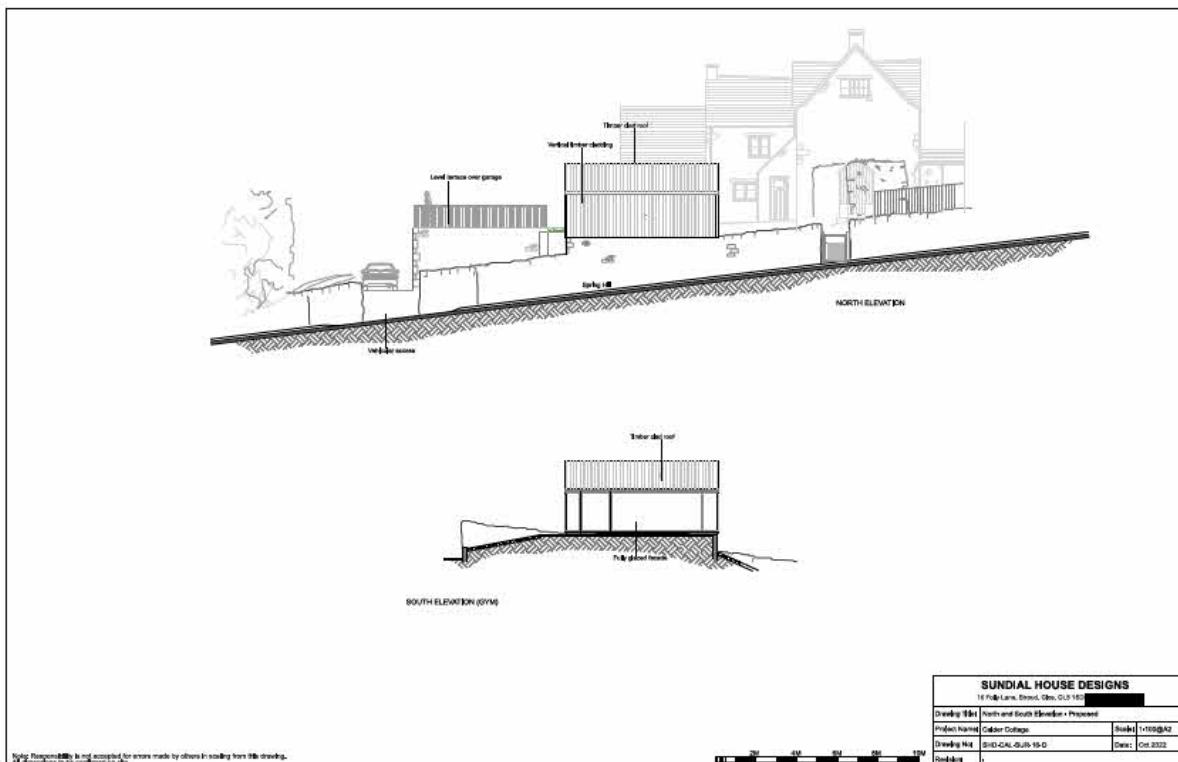


Figure 8 Proposed elevation – north showing new timber outbuilding © Sundial House Designs



Figure 9 Proposed elevations (west elevation- top image, east elevation -bottom image showing proposed garage) © Sundial House Designs

51. In addition, the garden will be terraced to provide an accessible, level amenity space. Landscaping works will involve considerable site clearance and the creation of areas of hardstanding, which will include a large paved area and an urban pool (figure 10).

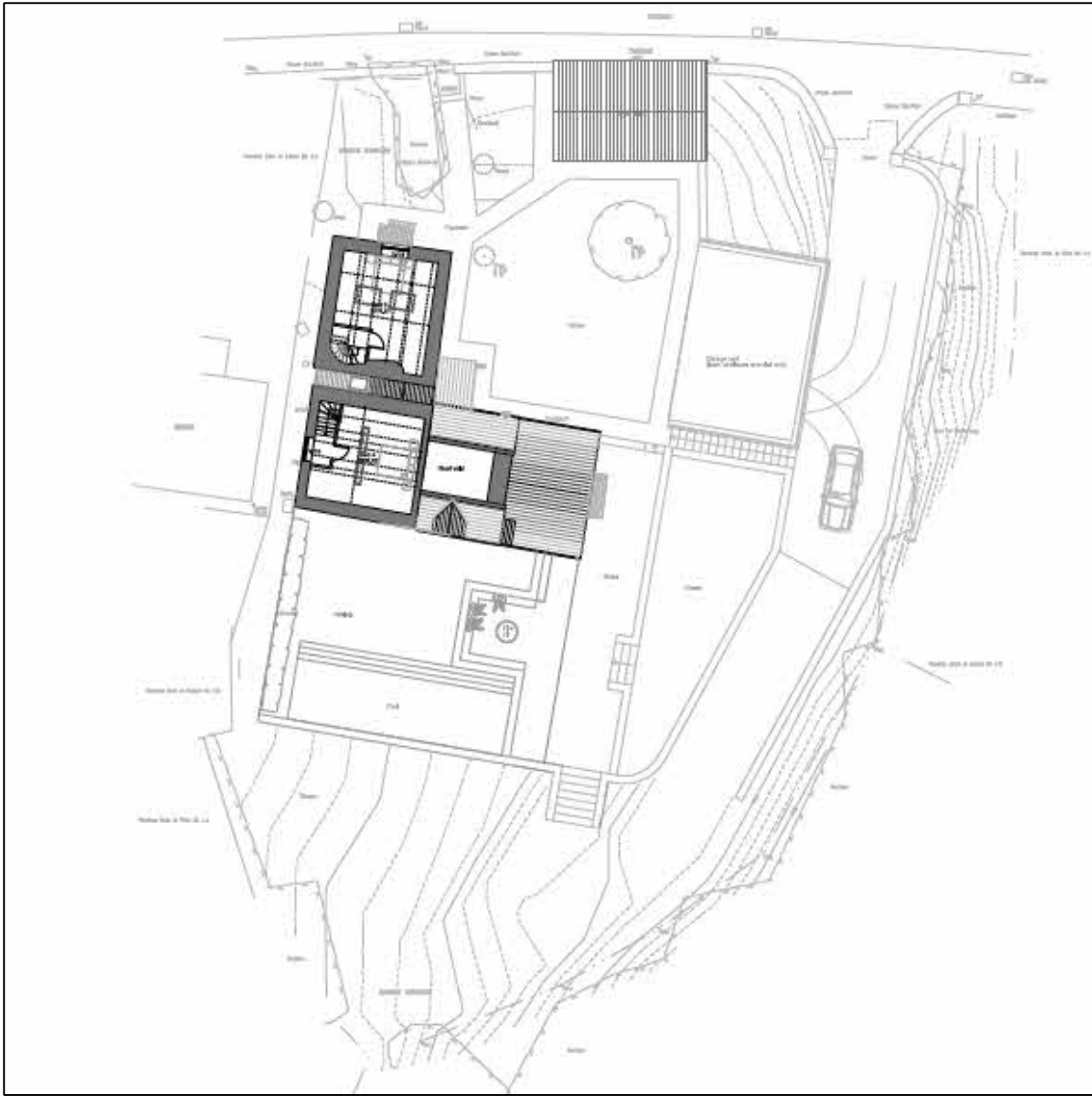


Figure 10 Proposed plan © Sundial House Designs

Results

Desk Study

Designated Sites

52. The site lies just outside (< 300m) the Cotswold Area of Outstanding Natural Beauty (AONB). Designated for its geological and ecological value; the Cotswolds are nationally important for their rare limestone grassland habitat and for their ancient beech woods and associated rich flora www.landscapesforlife.org.uk/about-aonbs/visit-aonbs/cotswolds-aonb (figure 11).

53. Rodborough Common (also a SSSI) Special Area of Conservation is the only internationally designated site within 5km of Calder Cottage. The common

which lies 2.7km north of the site and is designated for its Annex 1 Habitat: semi natural dry grasslands and scrubland facies on calcareous substrates (figure 11).

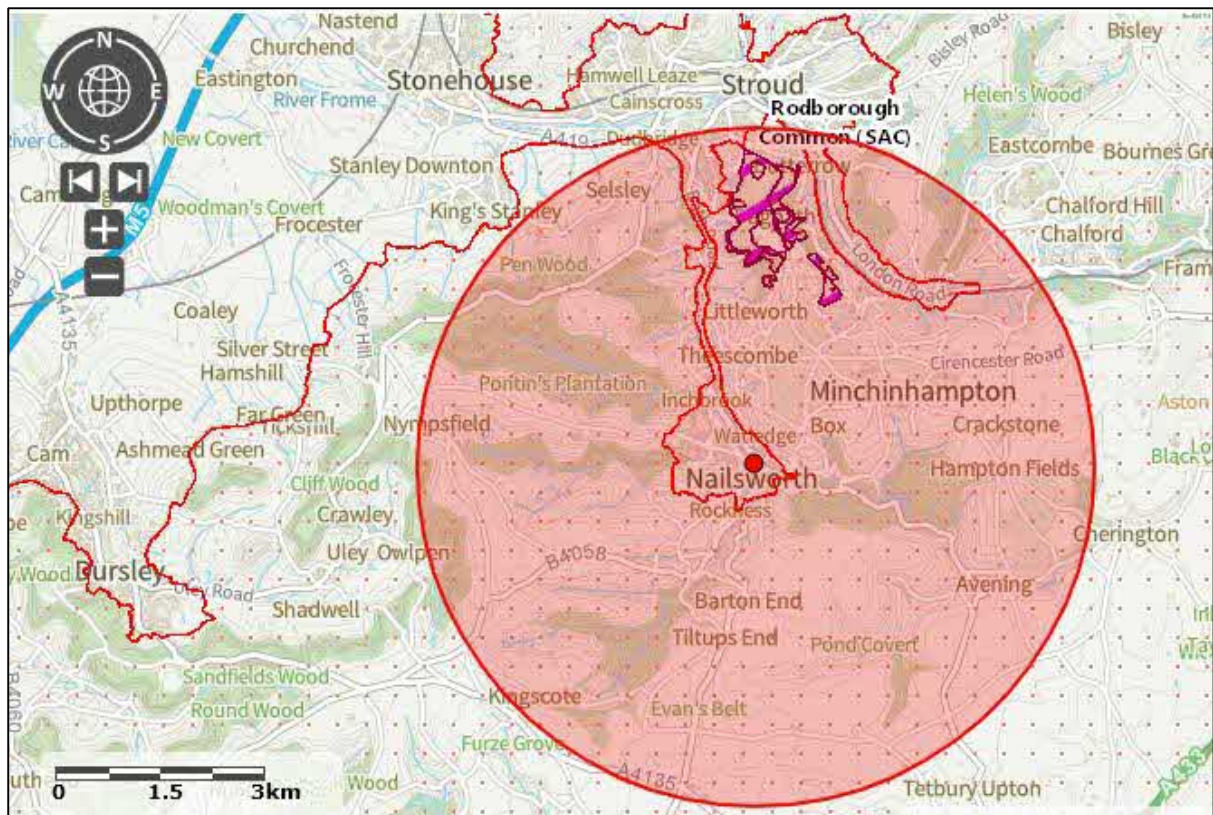


Figure 11 AONB and Rodborough Common SAC (red dot is the site)

54. There is three Sites of Special Scientific Interest within 2km of Calder Cottage (figure 12).
55. Minchinhampton Common SSSI (0.8 km north-east) is important for its unimproved, herb-rich limestone grassland in addition, the disused stone mines on the Nailsworth side of the common are used as winter roost sites by the greater horseshoe bat www.designatedsites.naturalengland.org.uk.
56. Box Farm Meadows SSSI (0.4km east) is a good example of species-rich limestone grassland and supports one outstanding national botanical rarity www.designatedsites.naturalengland.org.uk.
57. Woodchester Park's SSSI (1.6 km north-west) is within 10km of the site; its designation relates in part to the existence of a nationally important breeding colony of greater horseshoe bats (*Rhinolophus ferrumequinum*) centred on the Mansion near the western end of the site www.designatedsites.naturalengland.org.uk .
58. The mansion also supports a nationally important breeding colony of lesser horseshoe bats (*Rhinolophus hipposideros*). Both species of bat are listed as

endangered and are known to have been at Woodchester Mansion since at least the early 1950s.

59. The valley is known to support at least 12 and probably 14 of the UK's 18 species of bat.

60. There is one locally designated site, Dunkirk Mill Ponds, within the search buffers consulted. The 18th century mill ponds support over 40 species of wetland plants and breeding populations of little grebe, tufted duck, mallard, common toad, common frog and water shrew, together with a range of dragonflies and damselflies.

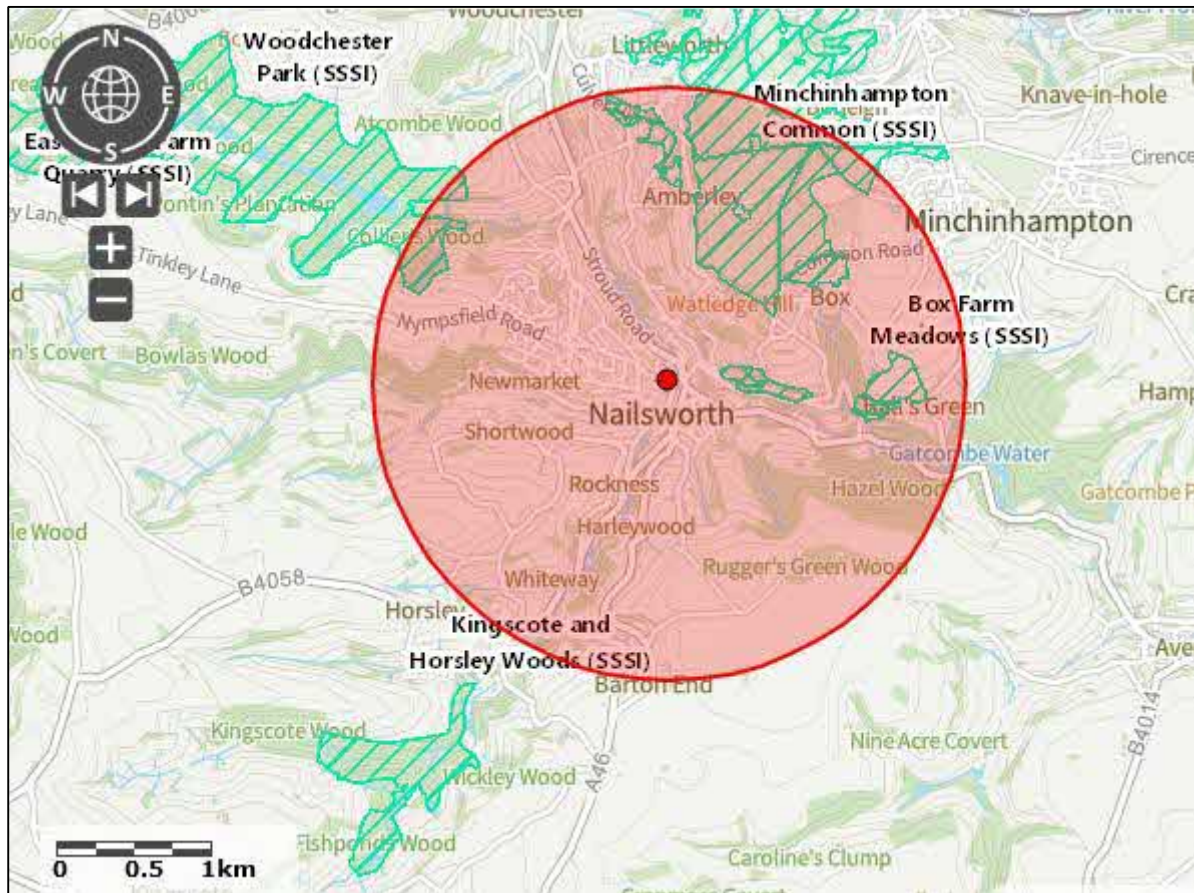


Figure 12 SSSIs within the consulted zone (red spot illustrates the site).

Priority Habitats

61. There are six Priority Habitats within 2km of the site, these include; lowland calcareous grassland, lowland meadow, ancient woodland/ancient replanted woodland, deciduous woodland, woodland pasture/parkland and traditional orchard (figure 13).

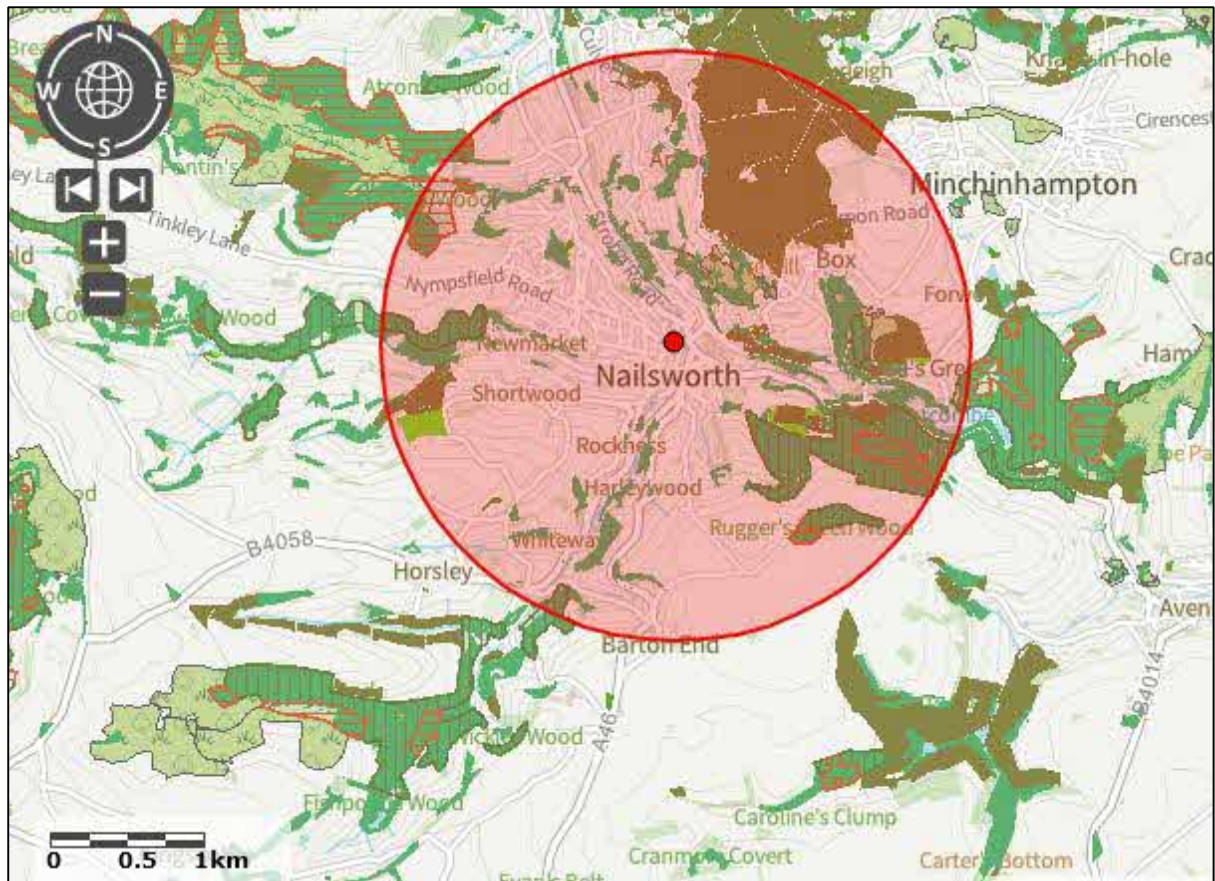


Figure 13 Priority Habitats within the search area (red spot illustrates the site).

Protected Species

62. Sixteen bat European Protected Species derogation licences (figure 14) have been granted by Natural England, and these relate to the following species:, brown long-eared bat *Plecotus auritus* , greater horseshoe bat, lesser horseshoe bat, common pipistrelle bat *Pipistrellus pipistrellus* and serotine *Eptesicus serotinus* bat. Four of the licences were issued in relation to bat breeding sites for brown long-eared bats, common pipistrelle bats, lesser and greater horseshoe bats and serotine bats.

63. One hazel dormouse *Muscardinus avellanarius* derogation licence has been granted by Natural England for a site 3km away from Calder Cottage.

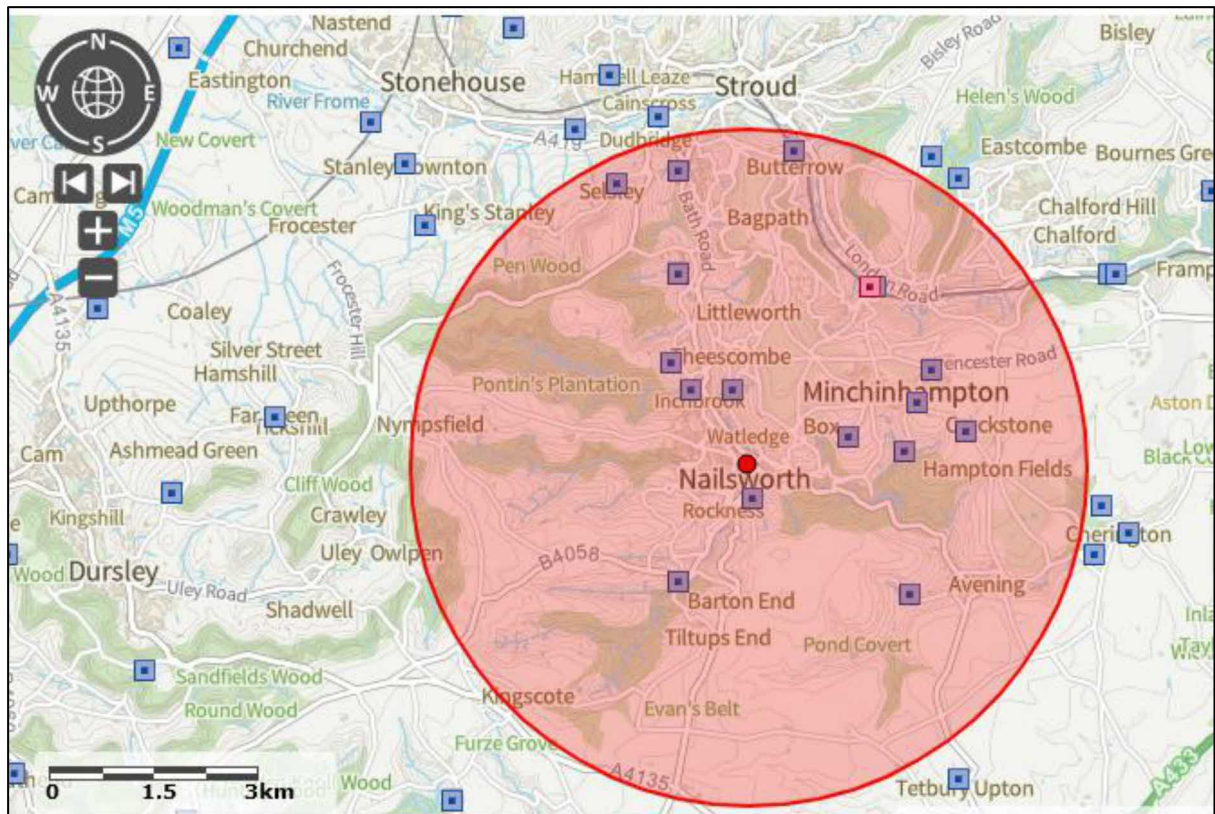


Figure 14 Granted EPS derogation licences within the search area (red spot illustrates the site)

Additional Ecological Information

64. Information obtained from the client (██████████ personal communication, May 2023) revealed two badger setts with associated latrines and paths (figure 15) were discovered on the site during a badger survey undertaken on 10th October 2015 by GE Pearce Badger Consultants. Sett 1 and sett 2 were identified as a main sett and a subsidiary sett respectively. The associated report stated that the badger setts were causing damage to land and property and would prevent the removal of Japanese knotweed and the implementation of proposed landscaping works.

65. Badgers were excluded from the setts and the setts were permanently closed in November 2015 under a Natural England sett interference licence (licence reference 2015-16541-SPM.WLM).

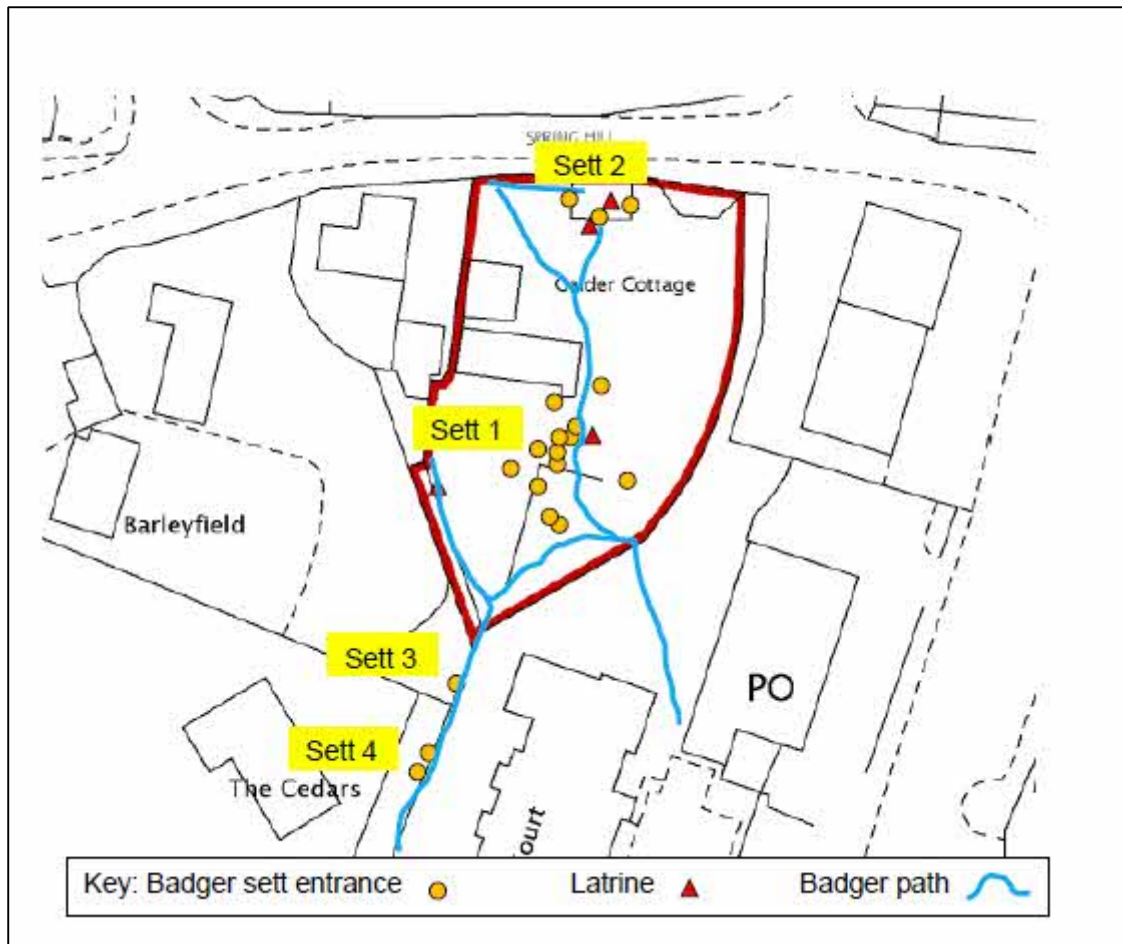


Figure 15 Results of the badger survey undertaken by GE Badger Consultants in October 2015.

66. The report produced by GE Badger Consultants also included proposals to manage the spread of Japanese knotweed that had been discovered on site. Suggested control was by containment and herbicide application.

Field Surveys

Site Walkover Survey

67. Habitats present within the site were classified according to Phase 1 Habitat survey methodology. A Phase 1 Habitat map with target notes (TN) is provide in figure 28 and table 1.

68. The survey site contains a detached derelict Cotswold stone cottage (figures 16-19) surrounded by a large overgrown garden (figure 20). At the time of the walkover survey the site also contained a dilapidated timber outbuilding (figure 21).



Figure 16 East elevations



Figure 17 South elevation

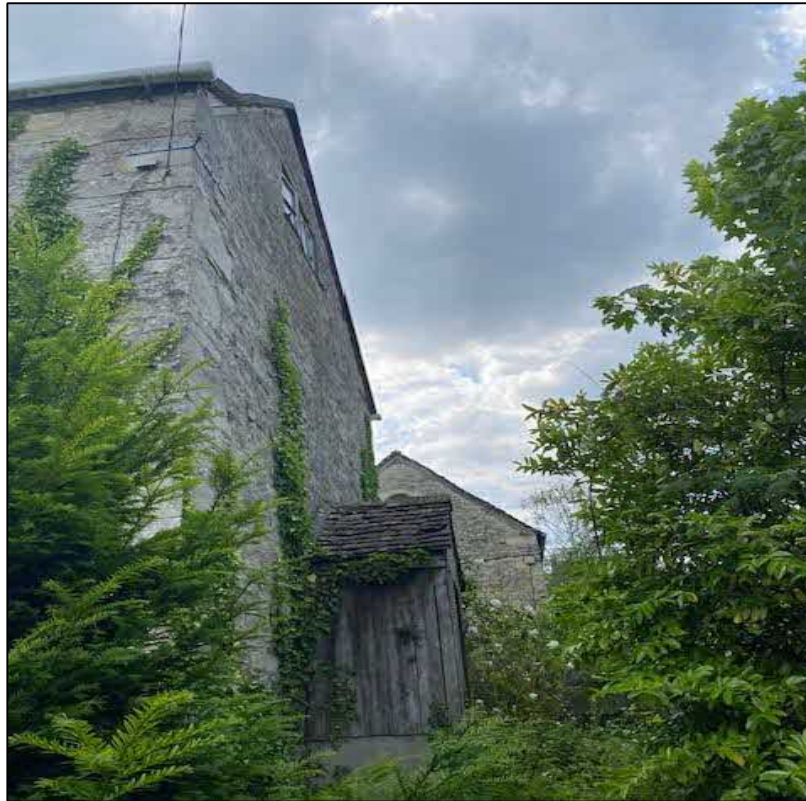


Figure 18 North elevation



Figure 19 West elevation



Figure 20 Overgrown garden



Figure 21 Dilapidated timber shed

69. The garden is gently sloped until it reaches the top of a steep bank, which extends through the site in a north-south direction; the bank drops steeply to meet the overgrown driveway. Beyond the flat driveway, the bank continues down to the hardstanding associated with the commercial buildings, which extend alongside the eastern boundary of the site.

70. The cottage is surrounded on three sides by an overgrown lawn (figure 22) containing scattered scrub. A small holly *Ilex aquifolium* tree, a small yew tree *Taxus baccata* and an immature sycamore *Acer pseudoplatanus* are present in the lawn. The scattered scrub includes bramble *Rubus fruticosus*, Buddleja *Buddleja davidii* and willow *Salix* sp. saplings. The lawn is dominated by tall grasses and tall ruderals. The dominant grass species are cock's foot *Dactylis glomerata*, false oat grass *Arrhenatherum elatius*, barren brome *Anisantha sterilis* and meadow foxtail *Alopecurus pratensis*. The dominant ruderal species include nettles *Urtica dioica*, creeping thistle *Cirsium arvense*, ground elder *Aegopodium podagraria* and rosebay willow herb *Chamenon angustifolium*.



Figure 22 Garden showing tall grass sward

71. In addition to the scrubby grassland and tall ruderals the garden contains a wide range of common herbaceous flowering species which includes a large stand of morning widow *Geranium phaeum* in front of the north gable of the cottage. In addition to the native botanical species the garden also contains a selection of ornamental shrubs, these include golden rod *Solidago* sp., and

Japanese rose *Kerria japonica*, A full botanical species list is given in Appendix II.

72. The northern boundary of the site is delineated by a high stone wall covered in ivy *Hedera helix* which runs parallel with the road (figure 23). The eastern boundary of the site is formed by soil bank (figure 24) and a large cherry laurel hedge *Prunus laurocerasus*, with some hazel *Corylus avellana*, wych elm *Ulmus glabra* and a mature ash tree *Fraxinus excelsior* (figure 25). The dense cherry laurel hedge becomes gappy as it extends along the southern boundary of the site. The western site boundary of the site is made up of an ornamental box *Buxus sempervirens* hedge with adjacent bramble and buddleia scrub. As the boundary extends towards the road the box is replaced by a red brick wall and a then wooden fence which is in close proximity to the west elevation of the cottage (figure 26).



Figure 23 North boundary



Figure 24 Soil bank and laurel hedge



Figure 25 East boundary with scrub and tall ruderals in the foreground



Figure 26 West boundary – the copper beech is in next doors garden

73. Evidence of Japanese knotweed *Reynoutria japonica* (figure 27) and wall spray *Cotoneaster horizontalis* both species are listed in Schedule 9 of the Wildlife & Countryside Act 1981, was seen during the site walkover survey in December. The cotoneaster is growing against the cottage's east elevation and the Japanese knotweed is scattered along the bank.



Figure 27 Japanese knotweed

74. Later on in the year it was evident that the Japanese knotweed was considerably more widespread, with a sizable stand being noted in the site's southeast corner.

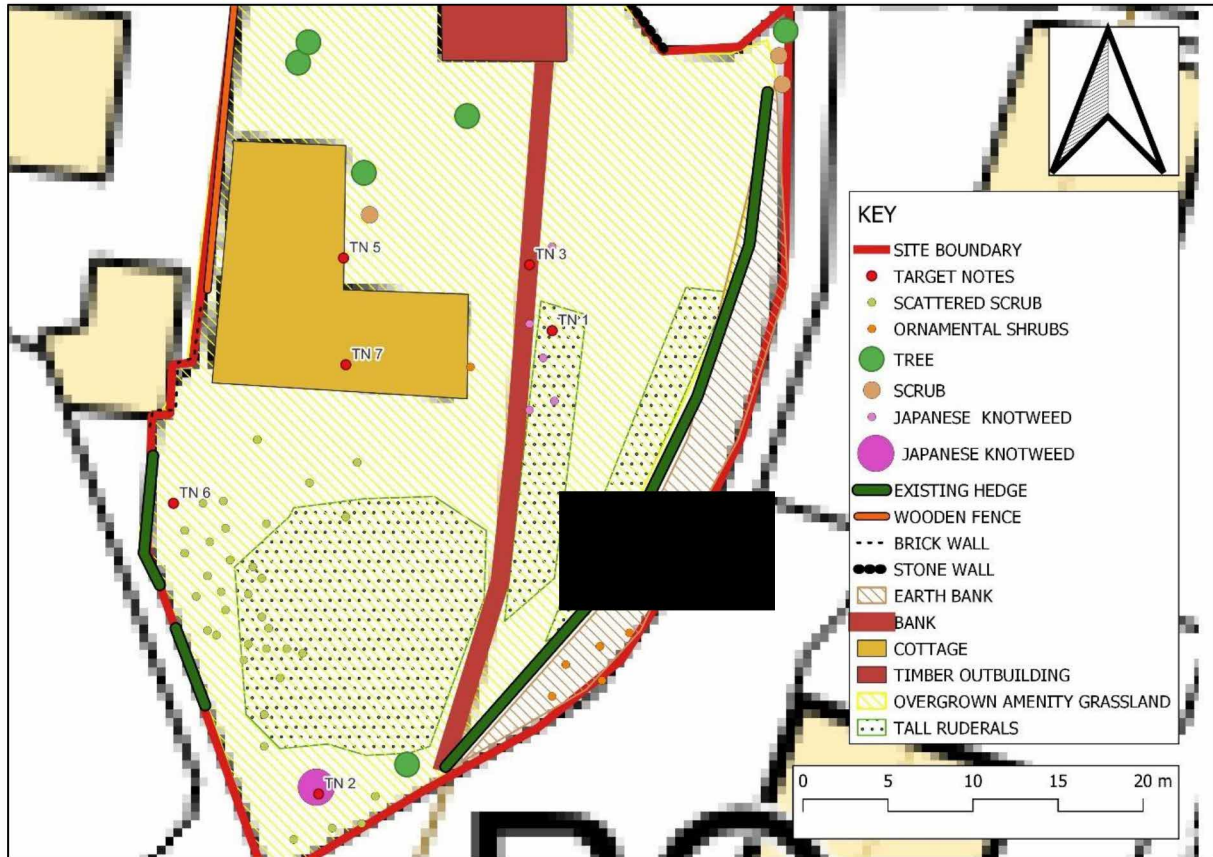


Figure 28 Phase 1 Habitat Map with Target Notes (TN)

Target Note (TN) number	Description
TN 1	Scattered Japanese knotweed Schedule 9 species
TN 2	Large stand Japanese knotweed Schedule 9 species
TN 3	Brush pile
[REDACTED]	[REDACTED]
TN 5	Cotoneaster horizontalis Schedule 9 species
TN 6	Tree stump and log pile
TN 7	Bat roost

Table 1 Target notes to accompany Phase 1 Habitat Map

75. Habitats with the potential to support the following protected and/or priority fauna species were identified during the site walkover survey .

Reptiles

76. The structurally diverse mosaic of habitats, which includes tall grasses with an associated deep herb layer, scattered scrub, a sunny bank, a brush pile, and a

stone wall within the overgrown garden, provides reptiles with optimum foraging, basking and refuging habitat. Common reptiles are highly likely to be present on the site.

Amphibians

77. There are no aquatic habitats within the site, consequently there is no breeding habitat for common amphibians available, however, the site does contain suitable terrestrial foraging and sheltering habitat and common amphibians are likely to be present.

Breeding Birds

78. The hedges and scrub associated with the garden provide suitable nesting opportunities for breeding birds. In addition, the cottage has the potential to offer breeding habitat to synanthropic avian species. Nesting birds are likely to be present on site during the bird breeding season (March – August inclusive).

Badgers

79. The site offers suitable foraging and commuting habitat to badgers and numerous snuffle holes were recorded in the long grass along with a well-worn badger path. In addition the soil bank which extends along the eastern site boundary offers optimum habitat to badgers for excavating their setts and a single outlying sett was observed in the bank. Badgers are present on site.

European Hedgehog

80. European hedgehogs can occur in a wide variety of habitats and the hedgerow, scrub, brash pile and tall grassland in the garden offer hedgehogs suitable foraging and sheltering habitat. However despite suitable onsite habitat for hedgehogs this species is less likely to be on site due to the presence of badgers. Although badgers mainly feed on soil invertebrates they do predate on hedgehogs; competition for the same food resource and predation reduce the likelihood of hedgehogs being present on site.

Bats Preliminary Roost Assessment

External Inspection

81. Limited foraging opportunities are offered to bats in the immediate vicinity of the site (<250m); however, the wider landscape (< 2km) contains optimum foraging habitats for bats, which include grassland commons, deciduous

woodland, mill ponds, and lakes. In addition, acoustic guidelines are offered to commuting bats in the form of linear landscape features, which include woodland edges, hedgerows, and streams. Numerous roosting opportunities are likely to present themselves within the nearby residential dwellings, many of which are large historic houses.

82. The cottage is a Grade II listed residential dwelling constructed in the 17th century which has been subsequently added to over the years. The building is constructed out of Cotswold stone rubble, the original Cotswold stone tile roof has been replaced with modern concrete tiles. A 20th century timber clad porch with stone roof tiles has been built onto the north gable end and a modern bay window has been added to the east gable end. The middle section of the cottage has a gabled dormer window in the south facing roof slope with timber 'cheek' walls. There are two gable chimneys constructed out of red brick.

83. Fenestration is irregular in design and includes timber and casement windows with stone chamfered surrounds or timber lintels.

84. There are no soffit, barge, or fascia boards associated with the cottage roof. However, lead flashing is extensively used, and it can be seen in these locations: where the extensions abut the cottage walls; where it lines the valleys between the roof pitches and encircles the bases of the chimney stacks; and where it meets the south-facing roof pitch at the dormer window intersection points (figures 29 & 30). In a number of locations the lead flashing is raised and the gaps beneath offer numerous potential roosting opportunities to crevice dwelling bats. Additional potential roosting habitat is offered to crevice dwelling bats beneath raised roof tiles particularly those associated with the roof verges and eaves and the tiles lining the porch roof, and within crevices associated with the timber lintels (figure 31).



Figure 29 Photo showing lead flashing



Figure 30 Lead flashing associated with dormer window



Figure 31 Timber window lintel

85. The walls of the cottage are constructed out of Cotswold stone and in number of locations the mortar between the stones has crumbled away resulting in crevices that are likely to provide suitable roosting features which could be exploited by crevice dwelling bats (figure 32).



Figure 32 Gaps between stones caused by missing mortar

86. The nearby grassland common provides known roosting habitat for horseshoe bats however horseshoe bats cannot crawl into crevices but hang up in void spaces which must have access large enough for them to fly through. With the exception of the porch, and no evidence in the form of droppings was encountered here, there is no suitable roosting habitat on site for horseshoe bats.

87. The annotated figures below illustrate the potential roost features for crevice dwelling bats discovered during the external inspection (figures 33 & 34).

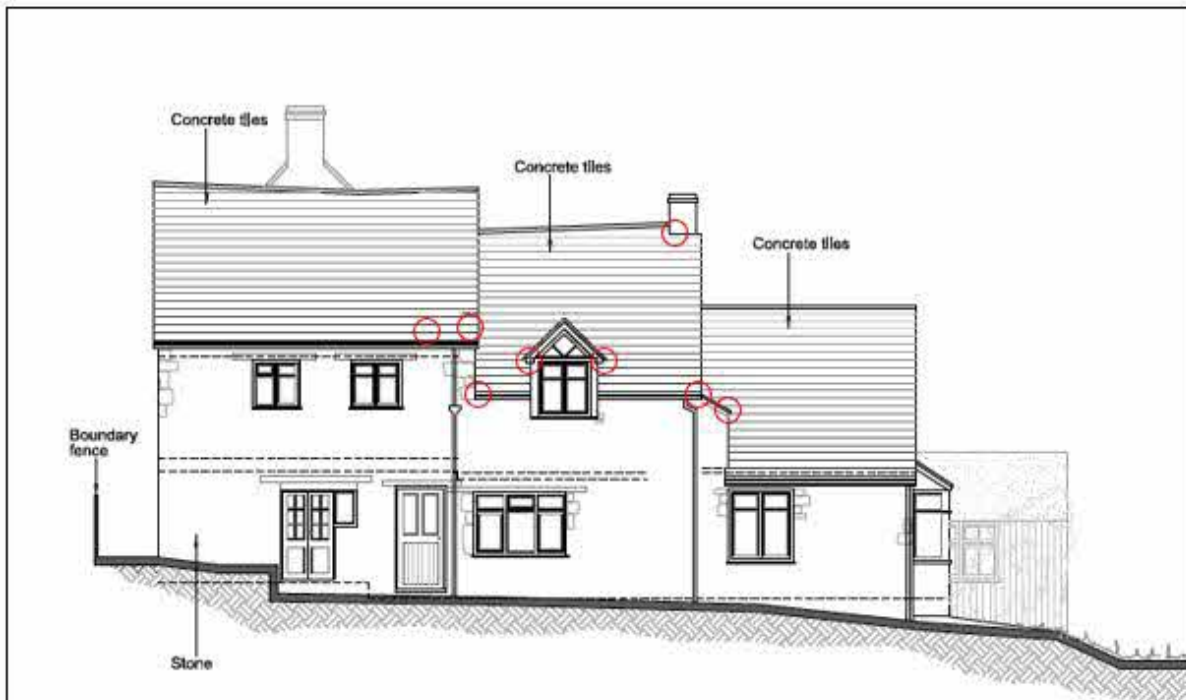


Figure 33 Potential roost features for crevice-dwelling bats. South elevation



Figure 34 Potential roost features for crevice-dwelling bats. East elevation

88. A derelict timber outbuilding, referred to on plans as the chapel, existed on site when the walkover survey was undertaken. The roof had completely collapsed, and although the walls remained upright, no potential roost features that could be exploited by crevice-dwelling bats were observed.

89. As a consequence of its dilapidated condition, it was not possible to undertake an internal survey of the outbuilding; however, the collapse of the roof meant that no bat roosting habitat was associated with it.
90. Due to its condition the outbuilding was assessed as having negligible suitability to support roosting bats and no further surveys were required.

Internal Survey

91. The cottage is currently derelict; however, internal restoration work on the building had already begun when the internal inspection was undertaken.
92. There are three roof voids (figure 35) associated with the cottage, two of which have always formed part of the residential space within the cottage and are fully open to the roof ridge; the third roof void is an enclosed attic space (figures 36-38).



Figure 35 Roof plan © Sundial House Designs

93. The roof pitches are supported by a timber purlin and rafter structure with collar beams. There is evidence that remedial roofing works have been undertaken in the past, but the majority of the roof timbers are original, and although no cracks within the old timbers were evident, crevices that could provide potential roosting habitat to bats are present where the purlins insert into the rafters.



Figure 36 Roof Void 1



Figure 37 Roof void 2



Figure 38 Roof void 3

94. The roof lining is traditional roofing felt which is in good condition except for two small tears seen in the roof void associated with the north facing elevation (roof void 3). Potentially these could provide crevice-dwelling bats with access into the interior of the building. Additional access points into the interior of the cottage which could be exploited by crevice-dwelling bats were observed around the frames of the windows.



Figure 39 Gaps around window frame

95. The open roof voids are naturally well-lit due to the presence of windows in the gable ends and consequently unlikely to offer day roosting opportunities to bats, however the internal walls of the cottage contain numerous crevices where the mortar between the stones has crumbled away, these features offer dark roosting habitat to crevice-dwelling bats and therefore could be exploited by bats at night or during the day (figure 40).



Figure 40 Internal crevices

96. The smallest loft void (roof void 1.) associated with the cottage is separated from the room below by a ceiling; the attic above is not residential space (figure 36). An open loft hatch offers access into the attic; however, this was not examined during the internal inspection due to the poor condition of the floor.

97. No bats or evidence of bats was discovered during the internal inspection of the cottage; however, due to their unsafe nature, some of the floors were not examined for bat droppings, consequently evidence of bats could have been missed.

98. The cottage possessed a number of internal and external potential bat roosting features and entrance points that could be exploited by crevice-dwelling bats to gain access into the interior of the building were present. The building was therefore assessed following the PRA as having moderate suitability to support roosting bats. Two bat activity surveys were recommended to be undertaken at the property; this is in accordance with best practice guidance relating to the number of activity surveys required to provide confidence that bats are absent from a structure.

99. To validate this assessment, the information collated during the internal and external inspection of the cottage was entered into the Bat Roost Trigger Index, an excel-based tool designed by Swift Ecology that helps evaluate the suitability of a structure to support summer roosting bats. The cottage received a score of 0.69. Structures that score between 0.6-0.7 are evaluated as having moderate potential to support summer roosting bats. A structure with a moderate potential to support roosting bats is unlikely to support a roost of high conservation status.

100. The timber outbuilding on site was in a derelict state and was therefore assessed as having negligible suitability to support roosting bats. No further bat surveys are required on buildings with negligible suitability for roosting bats. Following discussions between the client and the planning authority regarding health and safety concerns relating to the outbuilding, it was demolished in spring 2023.

Bat Activity Surveys

101. One dusk emergence survey and one dawn re-entry survey were undertaken on the cottage following its assessment as providing moderate suitability for roosting bats. Following the discovery of a bat roost in the building during the dusk emergence survey, an additional dusk emergence survey was undertaken. This level of survey effort followed best practice guidance. The weather conditions and timings recorded during the surveys are tabulated below (table 2). Surveyor positions are illustrated in figure 2.

Date of survey	Sunset/sunrise time	Start	Finish	Weather conditions
Dusk emergence survey 05.05.23	20:39	20:24	22:09	Temperature at start 15.4°C Temperature at end 12.1 °C Dry Cloud cover 100% Wind none
Dawn re-entry survey 19.05.23	05:12	03:42	05:27	Temperature at start 10.3°C Temperature at end 9.5 °C Dry Cloud cover 75% Wind none
Dusk emergence survey 16.06.23	21:29	21:14	22:59	Temperature at start 18.3°C Temperature at end 15.7 °C Dry Cloud cover 50% Wind none

Table 2 Summary of weather conditions and survey times

Dusk Emergence Survey 05.05.23

102. The first bat that was recorded was a common pipistrelle bat that emerged from beneath raised lead flashing associated with the dormer window on the south facing roof slope (figure 41). After emerging from its roost the bat flew off in a westly direction. Very little bat activity was recorded during the survey and, with the exception of one soprano pipistrelle bat, activity that was recorded was attributed entirely to commuting common pipistrelle bats.



Figure 41 Common pipistrelle bat roost red arrow indicates direction of flight

Dawn Re-entry Survey 19.05.23

103. The majority of the bat activity recorded during the dawn survey was attributed to foraging and commuting common pipistrelle bats. Both surveyors recorded a serotine bat at 03:52 and a commuting soprano pipistrelle *Pipistrellus pygmaeus* bat was observed at 03:59. No bats were observed entering into the building.

Dusk Emergence Survey 16.06.23

104. The bat activity recorded during the second emergence survey was attributed to common pipistrelle bats commuting across the site and foraging in the garden and to commuting noctule bats *Nyctalus noctula*. A common pipistrelle bat was observed emerging from the neighbouring house adjacent to the west elevation at 21:57

Reptile Survey

105. The site contains optimum reptile habitat and the reptile survey revealed it supports a small population of slow worms *Anguis fragilis*. The results of the reptile survey are tabulated below (table 3). Figure 42 illustrates recording of slow worms on site.



Figure 42 Reptiles on site

Visit number	Date	Start time End time	Weather conditions	Reptile Species encountered	Totals	What3word location	Other species
1.	02.05.23	10:07-10:23	Sunny Dry Cloudy Wind none Temperature 11°C	4 Juvenile slow worms 2 Adult female slow worms	6	decoded.ranges.argued congested.positions.disposal rewarded.vest.expensive uplifting.pining.flashback likening.publisher.berated month.fond apparatus	1 adult toad positions.voters.rate
2.	08.05.23	09:32-09:46	Sunny Dry Cloudy Wind none Temperature 11°C	1 Juvenile slow worm	1	hobbit.sauves.hears	
3.	10.05.23	09:36-09:52	Sunny Dry Cloud patchy Wind none Temperature 13°C	3 Juvenile slow worms 2 Immature female slow worms 3 Mature male slow worm	8	continued.boarding.luggage uplifting.pining.flashback convinced.panic.beats month.fond.apparatus	1 adult toad convinced.panic.beats
4.	17.05.23	10:18-10:41	Sunny Dry Clear Wind none Temperature 16°C	4 Juvenile slow worms 2 Mature female slow worms 2 Mature male slow worm	8	camper.checked.cakewalk returns.reading.sparrows scavenger.bouncing.attic adults.snuck.rotation congested.positions.disposal issues.eased.appetite moons.tidal.calms	
5.	22.05.23	10:05-10:22	Sunny Dry Cloudy Wind none Temperature 16°C	2 Adult male slow worms 2 Immature female slow worm 2 Adult female slow worms	6	deputy.funny.scratches nuance.limelight.powder bootleg.zone.activates returns.reading.sparrows flight.waking.flanks cooks.oil.divisible	
6.	23.05.23	09:47-10:09	Sunny Dry Clear Wind none Temperature 16.5°C	2 Juvenile slow worms 1 Immature female slow worm 2 Female slow worms 2 Adult male slow worm	7	returns.reading.sparrows scavenger.bouncing.attic month.fond.apparatus pods.tactical.anguished newsreel.swooned.goose	
7.	02.06.23	10:20-10:36	Sunny Dry Patchy cloud Light breeze Temperature 16°C	3 Juvenile slow worms 1 Immature Female slow worm 2 Adult male slow worms	6	interval.screen.reunion nuanced.limelight.powder scavenger.bouncing.attic uplifting.pining.flashback tall.quilting.plays	

Table2. Reptile presence/absence survey results

106. The slow worm population was heterogeneous in structure being composed of adults, immature individuals and juveniles. The reptiles were predominately recorded within the area of the garden where the long grass was dominant and were evenly spread throughout this area (figure 43). Reptiles were only infrequently recorded in areas within the site that contained dense scrub, tall ruderals or areas that were shaded by the tall peripheral vegetation.

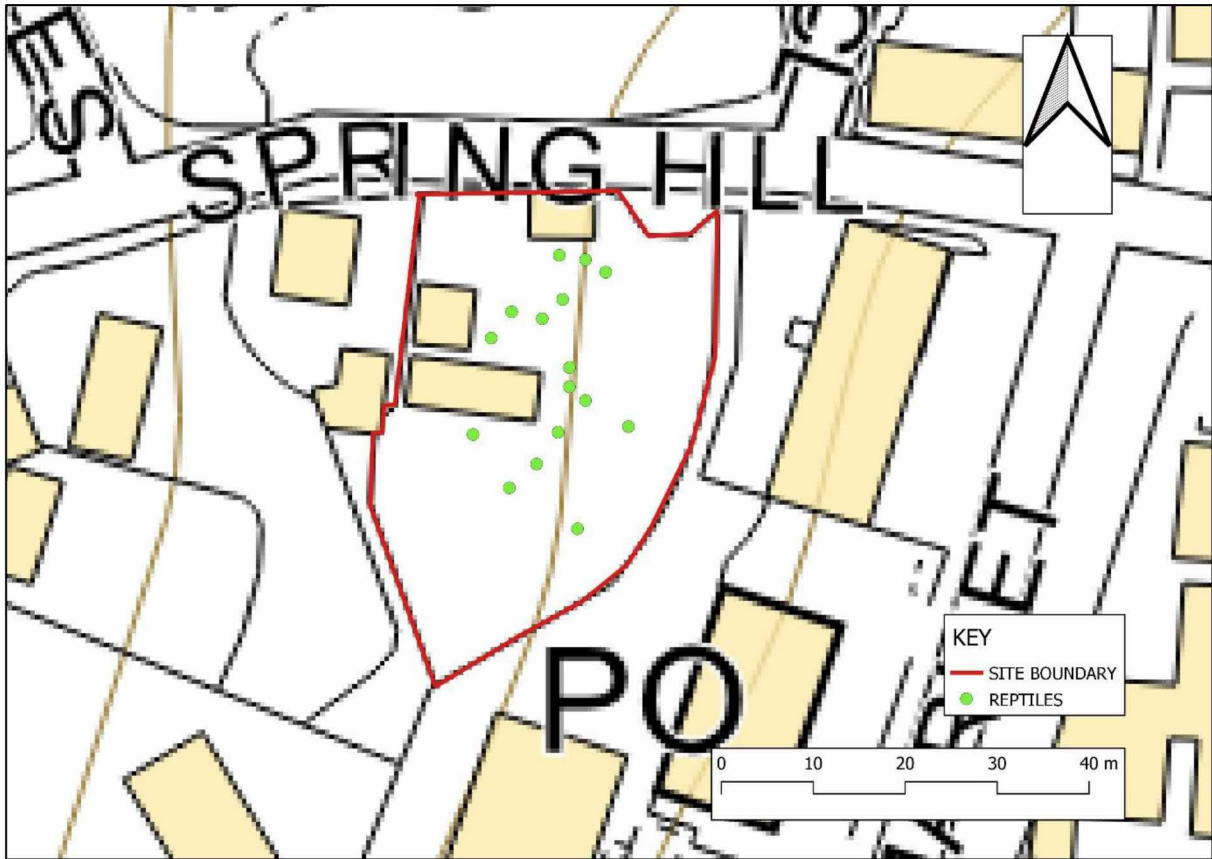
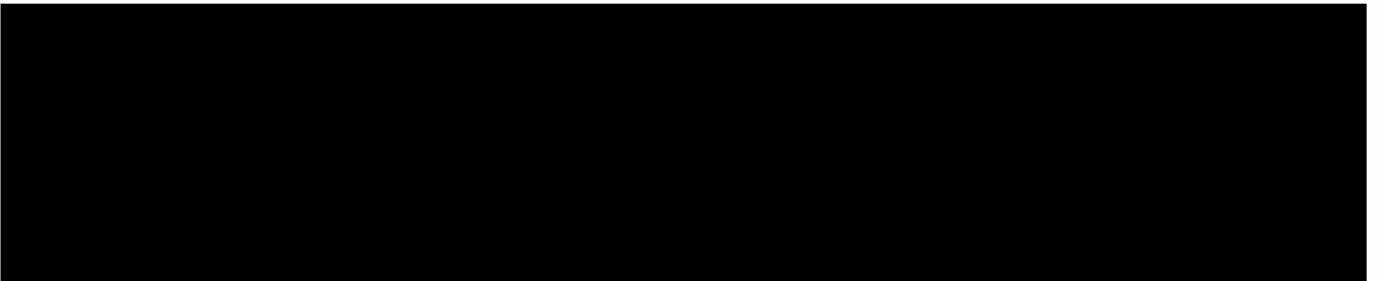
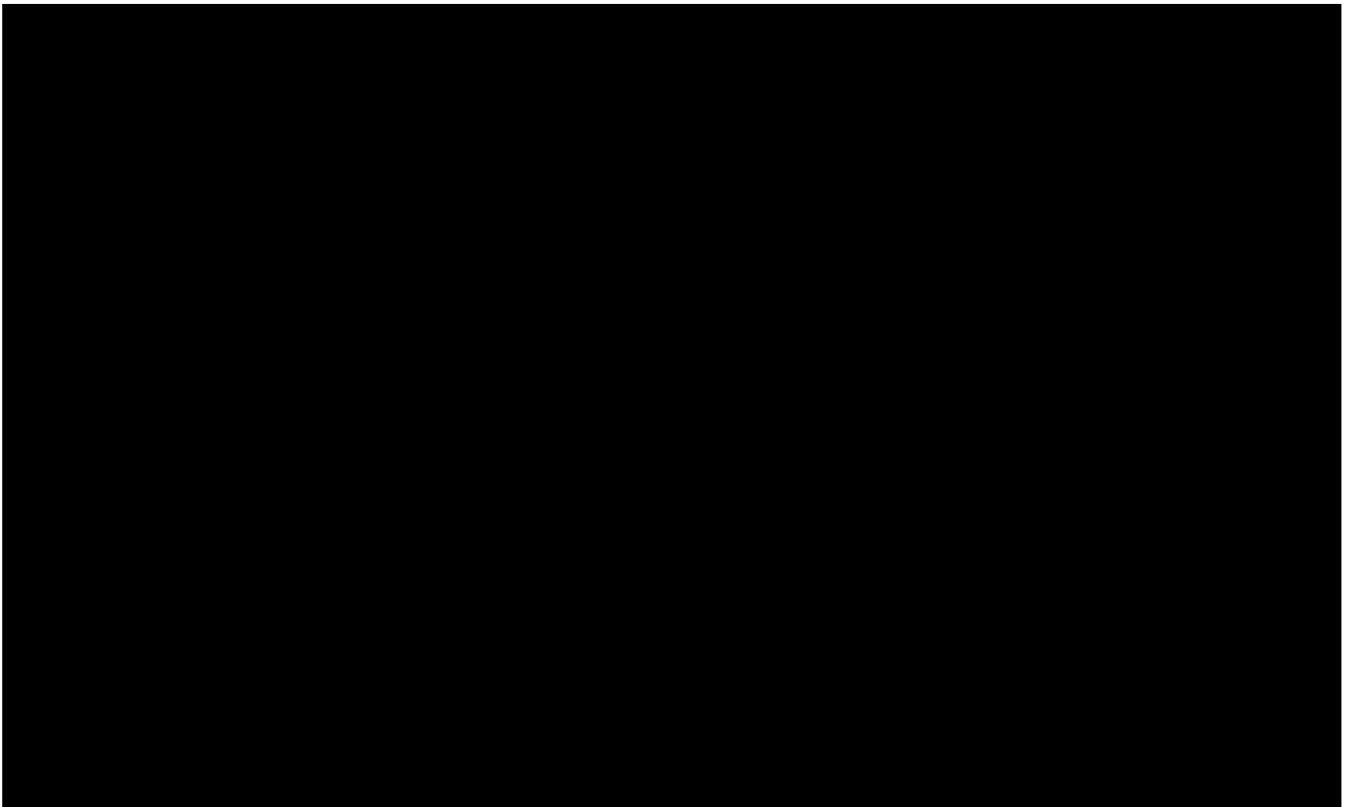


Figure 43 Slow worm locations







Hazel dormice

110. One record of Hazel dormouse was found during the desk study this was a considerable distance from the site and no suitable habitat for this species is present on site therefore this species will not be considered further.

111. The ecological surveys undertaken at Calder Cottage revealed that the site had the potential to support or supported the following protected and/notable species:

- bats,
- badgers,
- slow worms,
- breeding birds,
- hedgehogs,

- Common toads,
- Japanese knotweed.

Legislation

Bats

112. In Britain all bats are fully protected under the Wildlife & Countryside Act 1981. In addition, all bats are included in Schedule 2 of the Conservation (Natural Habitats, &c.) Regulations 1994 (Mitchell-Jones & M^cLeish, 2004).

113. Taken in combination the legislation makes it illegal *inter alia* to:

- intentionally or deliberately kill, injury or capture (or take) bats,
- deliberately disturb bats (whether in a roost or not),
- recklessly disturb bats or obstruct access to their roosts,
- damage or destroy bat roosts.

Breeding Birds

114. All wild birds are protected under the Wildlife & Countryside Act 1981. Under the provisions of this legislation it is an offense to:

- kill, injure or take any wild bird,
- take, damage or destroy the nest of any wild bird while that nest is in use or being built,
- take or destroy an egg of any wild bird.

Reptiles

115. Wide spread reptiles are offered protection under the Wildlife & Countryside Act 1981 (as amended).

116. Their inclusion in Schedule 5 gives them protection from intentional killing and injuring.

European Hedgehog

118. European hedgehog is listed as a species of principle importance for the conservation of biodiversity in Section 41 of the Natural Environment and Rural Communities Act 2006.

119. In addition, European hedgehog is listed in Schedule 6 of the Wildlife & Countryside Act which prohibits the taking or killing of these animals by certain methods.

Common Amphibians

120. Common toads are listed as a species of principle importance for the conservation of biodiversity in Section 41 of the Natural Environment and Rural Communities Act 2006.

Invasive Non-native Species

121. Japanese knotweed and Wall spray cotoneaster are invasive non-native weed listed in Schedule 9 of the Wildlife & Countryside Act 1981. Inclusion in Schedule 9 makes it an offense to allow Japanese knotweed to grow in/escape into the wild.

Assessment

Designated sites

122. The proposed works are of a small enough scale and sufficiently distanced from designated nature conservation sites for the works not to have an impact upon the features for which these sites are designated.

Habitats

123. There are no Priority Habitats on site and due to the scale and location of the proposed development no adverse impacts on Priority Habitats within 2km of the site are anticipated.

124. The development proposal, in addition to creating onsite vehicle access and parking facilities, involves a considerable amount of landscaping to enhance the usability of the garden. Plans include the creation of amenity grassland and the construction of a large paved area in place of the lawn at the front of the cottage (south elevation) with an urban pool (figure 10). This involves the loss of scrubby grassland with associated tall ruderals and herbaceous flowering grass species.

125. Although not of intrinsically high ecological value these habitats are providing foraging and/or sheltering habitat for bats, badgers, slow worms and toads and nesting habitat for breeding birds.

Protected and Priority Species

Bats

126. The scrubby grassland associated with the cottage and the neighbouring gardens offer foraging habitat to bats and during the bat activity surveys common pipistrelle bats were seen feeding over the overgrown lawn.

127. Optimal foraging opportunities are offered to bats within the wider landscape (<2km) in the form of deciduous woodland, calcareous grassland, hay meadows, wetlands, tree lines and hedgerows. In addition, potential roosting sites for bats are likely to be present in nearby residential buildings and within mature trees. This together with the EPS derogation license information obtained in the desk study suggests bats are a common feature of the landscape and that bat species richness is high.

128. The cottage was found to support a non-maternity day roost containing an individual common pipistrelle bat and is therefore classified as a low conservation status roost. In the absence of mitigation, the proposed work has the potential to disturb, injure and/or kill bats and will result in the destruction of a bat roost. The work will consequently trigger the legislation protecting bats and their roosts and will therefore require a derogation licence from Natural England to ensure legislative compliance.

129. The proposed work will affect small numbers of a commonly occurring bat species and will have an impact on a low conservation status roost. Therefore, the work qualifies to be carried out under a bat low-impact licence (WML-CL21 Class License). Works which impact upon a roost of low conservation status of a common species of bat incur no time restrictions on when the work can take place.

However, for the development to be carried out under a low-impact licence, the mitigation must be completed within six months.

130. The mitigation licence application can be submitted once planning permission has been obtained. An ecologist approved to use the WML-CL21 licence will register the site, and subject to Natural England approval, permission to carry out the works under a low-impact bat licence is normally granted within ten working days of the application forms being submitted.

131. The mitigation measures, proposed in association with the derogation licence, are outlined below and have been designed:

to prevent individual bats from being harmed during the proposed work,
to provide bat mitigation in long-lasting bat boxes erected on the site.

Mitigation measures

Installation of bat boxes

132. Prior to the works commencing, one Schwegler 1FF bat box (or similar) will be fitted onto the east gable end of the central element of the cottage (figure 46). This is in close proximity to where the bat roost was discovered and will be retained in perpetuity to provide a long-lasting replacement roost site for common pipistrelle bats.

133. An additional long-lasting bat box will be erected on the holly tree close the cottage's north elevation. This tree mounted box will be positioned approximately 3m high with its front facing east. A clear flight path to the box will be created by pruning any obstructing branches. If bats are encountered during the proposed works (see below), the rescued bats will be carefully placed in the bat box mounted on the holly tree by a Licenced Bat Worker (LBW). The bat box will be retained on site in the long term to provide bats with alternative roosting opportunities.



Figure 46 location of bat box

Toolbox talk

134. Once the site is registered under the bat low impact licencing scheme and work is due to begin on site, the LBW will deliver an induction talk to construction workers to explain the implications of the work in relation to roosting bats. The toolbox talk will include:

- legislation relating to bats,
- where bats are likely to be encountered,
- what to do if bats are found,
- details of best practice for removing roofing materials to reduce the risk of harm to bats.

Supervision of works

135. To minimise the risk of killing and injuring bats, the removal of high-risk areas of the roof for bats will be supervised by the LBW. This will include the removal of the lead flashing associated with the dormer window beneath which the common pipistrelle bat was seen to emerge during the activity survey and any other potential bat roost features identified during the PRA. Any bats encountered will be carefully transferred to the newly erected bat box mounted on the holly tree. The access slot of the bat box will be temporarily blocked with a cloth to ensure the bat does not exit immediately during daylight. The cloth will be removed by the ecologist, allowing the bat to emerge at nightfall.

136. In the event of bats being discovered when the LBW is not present, no attempt must be made to handle the bat; it should be covered either with a cloth, or carefully with the roofing material under which it was discovered, and the LBW contacted to rescue it. Work that affects the roof must cease in the vicinity of where the bat is discovered until the bat has been transferred to safety.

137. Removal of roof materials during the proposed works must be carried out during suitable weather conditions (dry with temperatures above 8°C) and should follow nights when the temperature exceeds 5°C, as bats are most likely to be torpid when overnight weather conditions are cold. Torpid bats are unresponsive and consequently vulnerable to harm as they are unable to escape, whereas active bats will be able to move to safer areas of the roof.

138. Care must be taken when erecting the scaffolding associated with the work to be undertaken on the building, to ensure that the poles do not block any bat access points identified during the bat surveys. In addition, any scaffolding coverings used must have an opening that is a minimum of 1m x 2 m wide and must be open at dusk and left open until dawn to facilitate bat access.

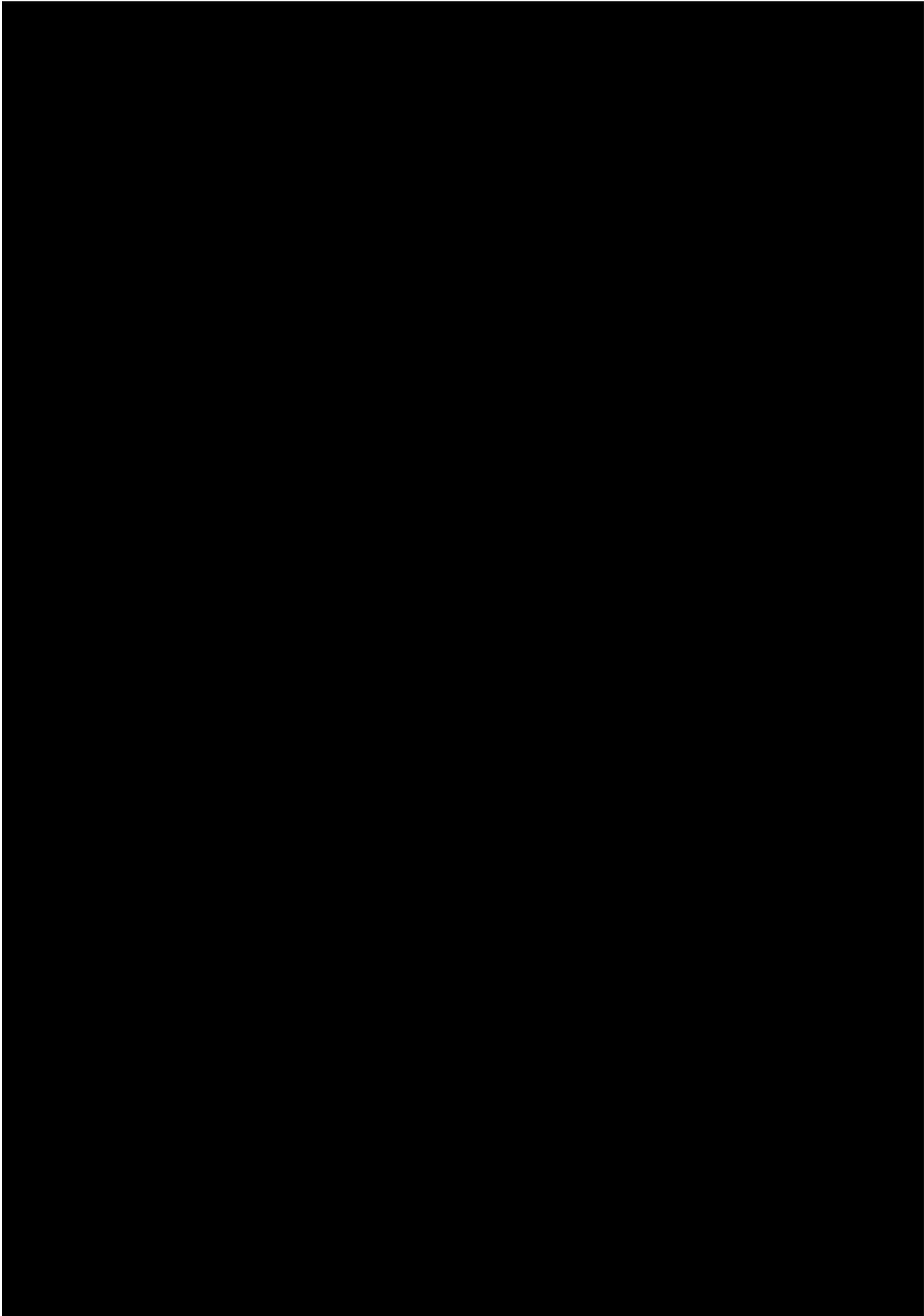
139. In order for the development to be undertaken under a low- impact bat licence, the mitigation must be completed within six months. Works can be undertaken at any time of year, subject to approval during licencing.

140. The licence application cannot be made:

- more than twelve weeks in advance of the proposed works starting date,
- less than three weeks before the start of the licensable works.

Other considerations

141. The planning proposal does not include the installation of artificial lighting. If changes are made to the development plans to include additional artificial lighting, a bat-sensitive lighting plan will be required.





Common Reptiles

150. In the absence of appropriate mitigation the development proposal has the potential to result in death and/or injury to common reptiles. To protect slow worms from any harm during development works they will be excluded from the development footprint prior to any site clearance occurring.
151. In order to ensure compliance with legislation relating to common reptiles, a short stretch of reptile exclusion fencing will be erected 10m from the south elevation of the cottage, this coincides with the edge of the proposed paved area (figure 10) and will extend from west to east across the garden and intercept the corresponding site boundaries. The route of the reptile exclusion fence is illustrated on the annotated plan below (figure 47).
152. Reptiles in habitat north of the exclusion fence, hereafter referred to as the donor site, will be captured using artificial refugia and released into habitat to the south of the exclusion fence, hereafter referred to as the receptor site.
153. The presence of Japanese knotweed does not present restrictions to the reptile mitigation proposal as the route of the fence will avoid it. To ensure compliance with legislation relating to preventing the spread of invasive non-native plant species installation of the reptile exclusion fence should be undertaken by a specialist in invasive weed control.

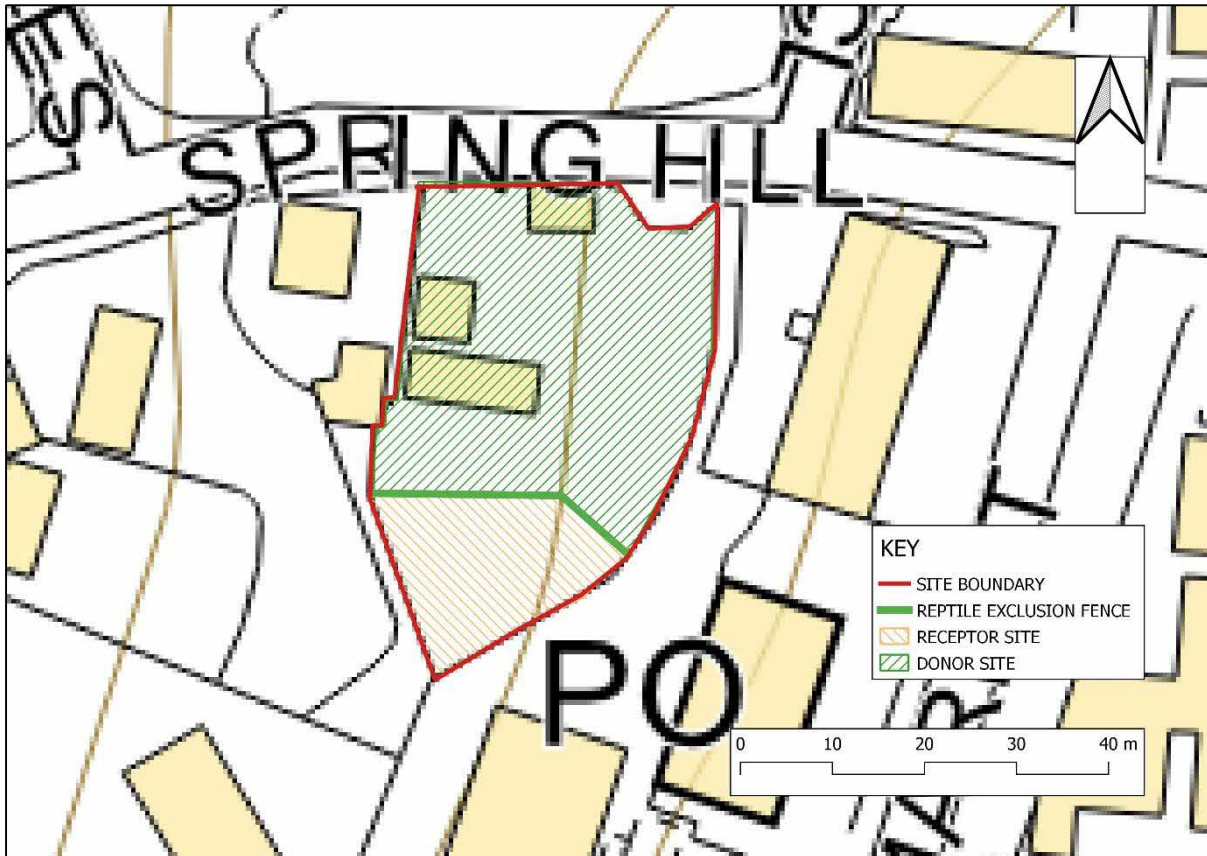


Figure 47 Route of reptile exclusion fence and donor and receptor sites

154. Following completion of the installation of the reptile exclusion fencing artificial refugia will be deployed within the donor site at a high density in locations within suitable reptile habitat. Reptiles taking refuge under the artificial refugia will be captured by hand by a fieldworker experienced in reptile translocation and released into the receptor site.

155. The capture phase will extend over a period of 8 consecutive days followed by five days with no reptile capture. This is in accordance with Natural England’s guidance (Natural England, 2011), and should ensure reasonable confidence in substantially depleting the reptile population on site.

156. The reptile translocation will be carried out under optimum conditions when reptiles are expected to be active. The capture period may need to be extended if adverse weather conditions reduce catchability, or if additional effort is required because of the complex vegetation structure within the proposed development area.

157. The reptile translocation will be undertaken in September; this coincides with a time when reptiles are still active. The translocation must be completed before mid-October as reptiles will be entering a period of hibernation after this time.

Reptiles should not be captured after they have sought refuge for hibernation as they are vulnerable to harm at this time of year.

158. Even after trapping has been completed there is still a likelihood of reptiles being present underneath brash/log piles within the donor site. It is recommended therefore, that these are dismantled by hand and removed under ecological supervision and relocated safely to the receptor site.
159. After completion of the reptile trapping phase, a check for slow worms within key reptile habitat features within the donor site will be carried out by an ecologist, and following this, the tall grass sward will be cut back under ecological supervision. The vegetation should initially be cut to a height of c.150mm to reduce the habitat suitability for reptiles, and to encourage any remaining individuals to take refuge underneath the artificial refugia, from which they can subsequently be captured. After 24 hours, the vegetation will be cut to ground level, further reducing the donor site's suitability for reptiles.
160. The vegetation will be cut using a hand held cutting tool to avoid harming reptiles during vegetation clearance.
161. Manipulation of the habitat alone as a mitigation strategy to ensure legislative compliance in relation to common reptiles, is not feasible due to time delays associated with the badger mitigation strategy.
162. The reptile translocation will be undertaken in September; this coincides with a time when reptiles are still active. The translocation must be completed before mid-October as reptiles will be entering a period of hibernation after this time. Reptiles should not be captured after they have sought refuge for hibernation as they are vulnerable to harm at this time of year.
163. The reptile exclusion fence should remain in position for the duration of the development works, after which it should be removed.
164. To prevent injuring or killing of reptiles no building materials, or materials associated with site clearance, should be placed in the receptor site, and construction vehicles must not traversing over it during the development works.
165. Prior to commencing work on site the contractors should be given a 'toolbox' talk which will include:

background legislation on reptiles,
where to expect to find reptiles,
what to do if reptiles are encountered

where to store construction materials on site avoid a risk of harm to reptiles

166. The donor site contains optimum reptile habitat in the form of a tall grass sward with an associated deep herbage layer. The habitat in the receptor site is dominated by dense patches of tall ruderals and is consequently less favourable to reptiles. This area will therefore be enhanced to create optimum reptile habitat to compensate for the loss of habitat relating to the landscaping proposals.

167. Habitat enhancement measures within the receptor site will include the following:

- construction of a hibernaculum created out of a log pile covered with soil (figure 48),
- removal of scattered scrub within the grass sward to reduce shade,
- removal of tall ruderals and creation of a wildflower lawn using native plant species of local provenance to enhance the area for foraging,
- reducing the height of cherry laurel extending along the east and southern boundaries of the site to increase insolation,
- creation of stone piles and brash heaps to provide refuge sites,
- excavation of small scrapes of exposed soil to create additional basking sites.

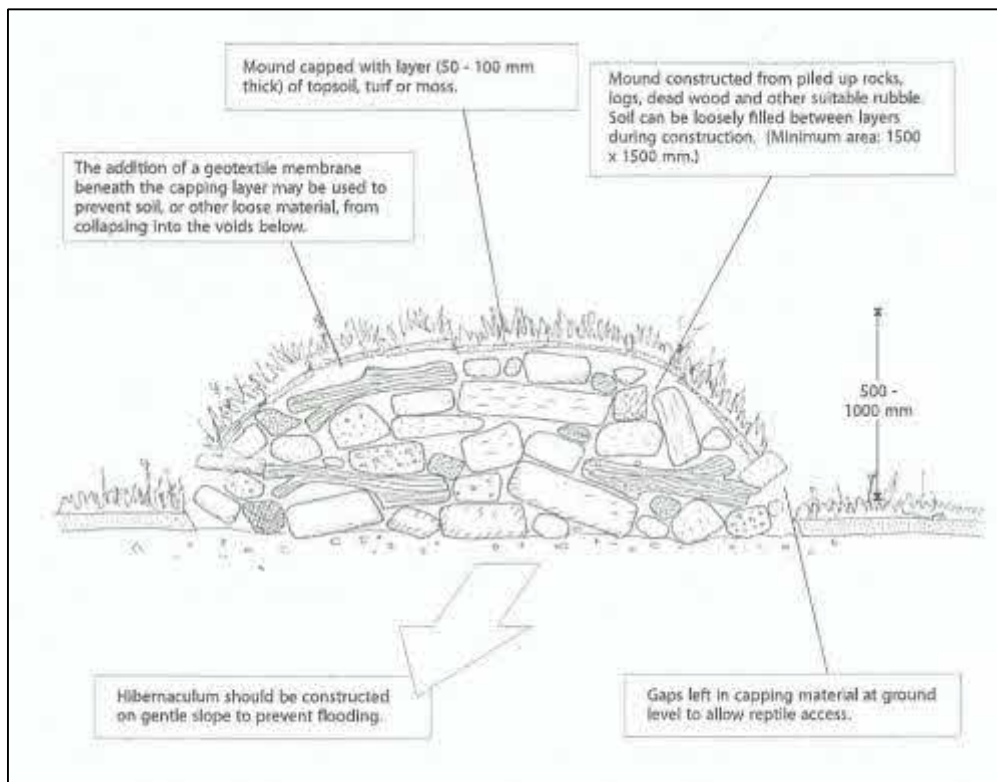


Figure 48 Reptile hibernaculum

168. A sensitive approach to the creation of a wildflower lawn will need to be adopted in order to ensure sufficient suitable habitat is continuously available to reptiles. In addition, appropriate timing will be adhered to prevent harm to reptiles during vulnerable stages of their life cycle.
169. The prescribed habitat enhancement measures (figure 49) are designed to ensure sufficient quality and quantity of reptile habitat is available to accommodate the reptile populations on site in the long term.
170. Habitat created within the receptor site will be appropriately managed to enhance its suitability for reptiles. Maintaining this area as favourable reptile habitat in perpetuity is crucial in ensuring there is no net loss of local reptile conservation status.

Management of Reptile Habitat

171. A management regime targeted at maintaining optimum habitat for reptiles within the receptor site will be implemented. This will involve, creation of a mosaic of tall and short areas of vegetation within the meadow lawn. Management of the grass sward will be designed so that it does not pose a risk to reptiles; the vegetation will be cut annually after October 31st using a hand-held strimmer to a minimum height of 150mm.

Nesting Birds

172. Calder Cottage provides nest sites for synanthropic avian species, and the onsite hedges and scrub offer natural breeding habitat to garden birds. No evidence of birds nesting within the fabric of the building or in the onsite habitats was observed during the ecological surveys. However, if the development works are to be carried out during the bird breeding season (March – August inclusive), a check of the building and hedges/scrub for breeding birds must be carried out by a suitably qualified ecologist prior to the works commencing. If active nests are found, an appropriate buffer zone should remain in place until the young have fledged.

Other Fauna Species

173. The habitats within the survey area have the potential to support the following priority species:

common amphibians
European hedgehog

174. Common toads *Bufo bufo* and European hedgehogs *Erinaceus europaeus* are listed in Section 41 of the NERC Act 2006 and therefore are species of principle importance for the conservation of biodiversity in England. Section 40 of the Act places a duty on local authorities to have due regard for Section 41 species to ensure the protection of biodiversity. If toads are encountered during the reptile translocation and during the proposed development works, they will be caught and carefully placed in the receptor site to prevent them from being harmed. Covering excavations and/or providing a mammal ladder will prevent the entrapment of hedgehogs.

Japanese knotweed

175. A recognised control programme targeting the Japanese knotweed on site has been designed and implementation of the control measures has begun. Control includes excavation, with removal from site followed by incineration, and herbicide application. Full details of the control management plan can be found in Conservation Land Services Japanese Knotweed Excavation Report (2023).

Wall spray cotoneaster

176. The proposed development is not anticipated to result in the spread of wall spray cotoneaster.

Recommendations

177. To ensure that the donor site does not become attractive to wildlife, it is recommended that the grass sward be kept short following completion of the reptile translocation and that any piles of vegetation, stones, or timbers that might attract wildlife are placed well away from the development footprint.

Biodiversity enhancements

178. Local Planning Authorities have a duty when exercising their functions to enhance biodiversity; therefore, it is recommended that in addition to creating a wildflower lawn, which will benefit other wildlife in addition to reptiles, a wildlife pond be created on site and a native hedge using species of local provenance be planted along the southern site boundary (figure 47). The hedge should be maintained at a height so as not to increase the level of shade within the receptor area.

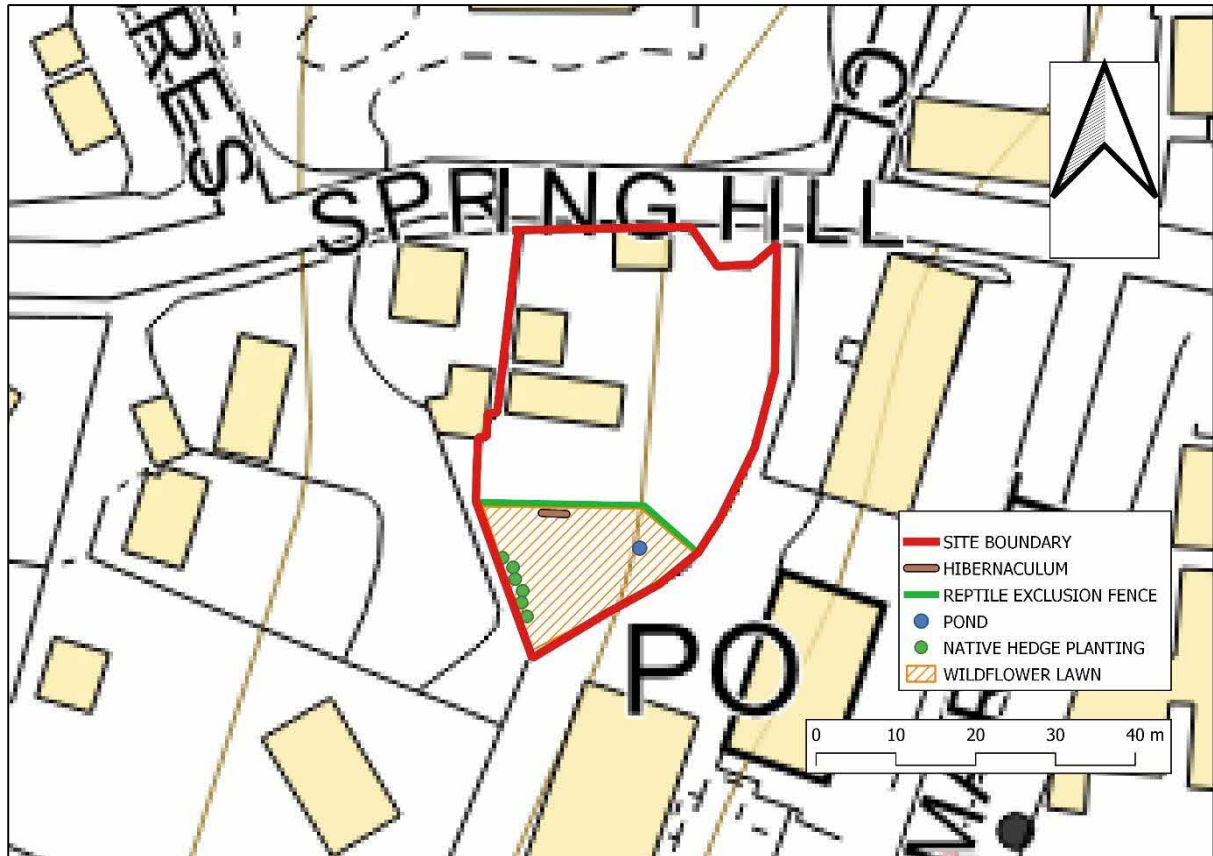


Figure 49 Biodiversity enhancements

Conclusion

179. Providing the mitigation measures and recommendations outlined in this report are implemented the proposed works should not result in adverse impacts on protected and/or priority species or habitats. The mitigation strategy and suggested biodiversity enhancements ensure that the proposed development is in accordance with nature conservation legislative requirements and planning policy.

180. This report will remain valid for eighteen months until the end of November 2024.

References

Chartered Institute of Ecology and Environmental Management 2017. Guidelines for Preliminary Ecological Appraisal.

Chartered Institute of Ecology and Environmental Management 2018. Guidelines for Ecological Impact assessment in the UK and Ireland.

JNCC 2010. Handbook for Phase 1 Habitat Survey.

Collins, 2016. Bat Surveys for Professional Ecologists Good Practice Guidelines 3rd Edition.

Conservation Land Services Ltd., 2023. Japanese knotweed Excavation Report Calder Cottage Spring Hill Nailsworth GL6 0LX.

Pearce, 2015. Badgers at Calder cottage, Spring Lane, Nailsworth, GL6 0LX.

Mitchell-Jones & McLeish, 2004. Bat Mitigation Guidelines.

Natural England Technical Information Note TIN102. Reptile Mitigation Guidelines.

www.swiftecology.co.uk

www.landscapesforlife.org.uk/about-aonbs/visit-aonbs/cotswolds-aonb

www.natureonthemap.co.uk

www.designatedsites.naturalengland.org.uk

Appendices

Appendix I Bat Activity Survey Results

Name: C. Billingsley	Location: CALDER COTTAGE	Date: 05.05.23
Surveyor number: 1	Survey type: Emergence	Number of survey: 1/3
Temperature Start: 15.5°C End: 12.1°C	Weather conditions Dry/Rain Wind: Strong/Medium/light/none Cloud Cover:	Sunset/sunrise: 20:39
Start: 20:24	End: 22:09	Equipment Anabat Walkabout
Time	Species	Comments: e.g. feeding, commuting, single bat pass, direction flight, emergence/re-entry
2048	Common pipistrelle reference 204742	Emerged from beneath lead flashing associated with

		dormer window on south roof slope
2107	Soprano pipistrelle	Heard not seen (HNS) brief call
2122	Soprano pipistrelle	HNS commuting
2156	Common pipistrelle	HNS commuting
2159	Common pipistrelle	HNS commuting

Name	Location	Date
J.Smith	CALDER COTTAGE	05.05.23
Surveyor number: 2	Survey type: Emergence	Survey number: 1/3
Temperature Start: 15.5°C End: 12.1°C	Weather conditions Dry/Rain Wind: Strong/Medium/light/none Cloud Cover: 100%	Sunset/sunrise: 20:39
Start: 20:24	End: 22:09	Equipment: EMT2
Time	Species	Comments: e.g. feeding, commuting, single bat pass, direction flight, emergence/re-entry
2044	Common pipistrelle	HNS
2045	Common pipistrelle	HNS
2114	Common pipistrelle	HNS
2125	Common pipistrelle	HNS
2159	Common pipistrelle	HNS
2200	Common pipistrelle	HNS
2202	Common pipistrelle	HNS

Name: C. Billingsley	Location: CALDER COTTAGE	Date: 19.05.23
Surveyor number: 1	Survey type: Re-entry	Number of survey: 2/3
Temperature Start: 10.3°C End: 9.5°C	Weather conditions Dry/Rain Wind: Strong/Medium/light/none Cloud Cover: 75%	Sunset/sunrise: 05:12
Start:	End:	Equipment
03:42	05:37	Anabat Walkabout

Time	Species	Comments: e.g. feeding, commuting, single bat pass, direction flight, emergence/re-entry
0336	Common pipistrelle	HNS
0340	Common pipistrelle	HNS
0341	Common pipistrelle	Foraging in the garden
0345	Common pipistrelle	HNS
0346	Common pipistrelle	HNS
0349	Common pipistrelle	Commuting
0352	Serotine	HNS
0354	Common pipistrelle	HNS
0358	Common pipistrelle	HNS
0359	Soprano pipistrelle	HNS
0402	Common pipistrelle	HNS
0403	Common pipistrelle	Foraging in the garden
0404	Common pipistrelle	Commuting
0408	Common pipistrelle	HNS
0411	Common pipistrelle	HNS
0418	Common pipistrelle	HNS
0422	Common pipistrelle	HNS
0425	Common pipistrelle	HNS
0430	Common pipistrelle	HNS
0439	Common pipistrelle	HNS
0446	Common pipistrelle	HNS
0447	Common pipistrelle	HNS

Name: J.Smith	Location: CALDER COTTAGE	Date: 19.05.23
Surveyor number: 2	Survey type: Re-entry	Number of survey: 2/3
Temperature Start: 10.3°C End: 9.5°C	Weather conditions Dry/Rain Wind: Strong/Medium/light/none Cloud Cover: 75%	Sunset/sunrise: 05:12
Start:	End:	Equipment
03:42	05:37	EMT2
Time	Species	Comments: e.g. feeding, commuting, single bat pass, direction flight, emergence/re-entry
0346	Common pipistrelle	HNS
0350	Common pipistrelle	HNS
0352	Serotine	HNS

0354	Common pipistrelle	HNS
0403	Common pipistrelle	HNS
0404	Common pipistrelle	HNS
0411	Serotine	HNS
0434	Common pipistrelle	HNS
0440	Common pipistrelle	HNS
0443	Soprano pipistrelle	HNS

Name: [REDACTED]	Location: CALDER COTTAGE	Date: 16.06.23
Surveyor number: 1	Survey type: Emergence	Number of survey: 3/3
Temperature Start: 18.3°C End: 15.7°C	Weather conditions Dry/Rain Wind: Strong/Medium/light/ none Cloud Cover: 50%	Sunset/sunrise: 21:29
Start: 21:14	End: 22:59	Equipment Anabat Walkabout
Time	Species	Comments: e.g. feeding, commuting, single bat pass, direction flight, emergence/re-entry
2222	Noctule	HNS
2223	Noctule	HNS
2225	Common pipistrelle	Foraging in the garden
2229	Common pipistrelle	HNS
2230	Common pipistrelle	Commuting
2234	Common pipistrelle	Commuting
2248	Noctule	HNS

Name: [REDACTED]	Location: CALDER COTTAGE	Date: 19.05.23
Surveyor number: 2	Survey type: Emergence	Number of survey: 3/3
Temperature Start: 18.3°C End: 15.7°C	Weather conditions Dry/Rain Wind: Strong/Medium/light/ none Cloud Cover: 50%	Sunset/sunrise: 21:29
Start: 21:14	End: 22:59	Equipment EMT2

Time	Species	Comments: e.g. feeding, commuting, single bat pass, direction flight, emergence/re-entry
2157	Common pipistrelle	Seen between house and neighbour emerged from next door
2213	Common pipistrelle	HNS
2219	Noctule	HNS
2222	Noctule	HNS
2234	Common pipistrelle	HNS
2240	Common pipistrelle	HNS
2248	Noctule	HNS
2249	Common pipistrelle	HNS

Appendix II Botanical list

Common Name	Scientific Name
Cock's foot	<i>Dactylis glomerata</i>
False oat grass	<i>Arrhenatherum elatius</i>
Meadow foxtail	<i>Alopecurus pratensis</i>
Barren brome	<i>Anisantha sterilis</i>
Rosebay willow herb	<i>Chamaenerion angustifolium</i>
Nettle	<i>Urtica dioica</i>
Creeping thistle	<i>Cirsium arvense</i>
Ragwort	<i>Senecio jacobaea</i>
St John's wort square stemmed	<i>Hypericum tetrapterum</i>
Field forget me not	<i>Mysotis arvensis</i>
Cow parsley	<i>Anthriscus sylvestris</i>
Ground elder	<i>Aegopodium podagraria</i>
Self-heal	<i>Prunella vulgaris</i>
Golden rod	<i>Solidago sp.</i>
Burdock	<i>Arctium minus</i>
Curled dock	<i>Rumex crispus</i>
Meadow buttercup	<i>Ranunculus acris</i>
Daisy	<i>Bellis perennis</i>
Dandelion	<i>Taraxacum</i>
Ribwort plantain	<i>Plantago lanceolata</i>
Black medic	<i>Medicago lupulina</i>
Herb Robert	<i>Geranium robertianum</i>
Wood avens	<i>Geum urbanum</i>
Fox & cubs	<i>Pilosella aurantiaca</i>
Cleavers	<i>Gallium aparine</i>
Pendulous sedge	<i>Carex pendula</i>
Cut-leaved cranesbill	<i>Geranium dissectum</i>
Ground ivy	<i>Glechoma hederacea</i>
Strawberry	<i>Fragaria vesca</i>
Red dead nettle	<i>Lamium purpureum</i>
Primrose	<i>Primula</i>
Cuckoo flower	<i>Arum maculatum</i>
White dead nettle	<i>Lamium album</i>
Shiny crane's bill	<i>Geranium lucidum</i>
Common knapweed	<i>Centaurea nigra</i>
Mint	<i>Mentha sp.</i>
Bluebell	<i>Hyacinthoides non-scripta</i>
Ladies' mantel	<i>Alchemilla mollis</i>
Aquilegia	<i>Aquilegia sp.</i>

Field poppy	Papaver rhoeas
Euphorbia	Euphorbia
Hawkweed	Hieracium sp.
Canterbury bells	Campanula medium
Hemp agrimony	Eupatorium cannabinum
Rockspray cotoneaster	Cotoneaster horizontalis
Peony	Paeonia sp.
Japanese rose	Kerria japonica
Japanese knotweed	Reynoutria japonica
Bramble	Rubus fruticososa
Ivy	Hedera helix
White bryony	Bryonia dioica
Bindweed	Convolvulus arvensis
Rose	Rosa sp.
Buddleja	Buddleja davidii
Cherry Laurel	Prunus laurocerasus
Lilac	Syringa sp.
Box	Buxus sempervirens
Privet	Ligustrum ovalifolium
Holly	Ilex aquifolium
Wych elm	Ulmus glabra
Silver birch	Betula pendula
Yew	Taxus baccata
Hornbeam	Carpinus betulus
Mexican orange	Choisya ternata