Lower Woodhouse

Fernhill

Preliminary Ecological Appraisal

August 2021

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REPORT CONTENTS

PLANS

APPENDICES

Document Verification Table

Lower Woodhouse, Fernhill Preliminary Ecological Appraisal				
Revision	Date	Prepared by	Checked by	Verified by
1.0	31 August 2021	Alice Wynne-Griffiths Assistant Ecologist	Luke Owen [redacted]	Paul Hudson MCIEEM Principal Ecologist [redacted]

Summary

Brief and Site Location	Acer Ecology Ltd. were commissioned by Benham Architects Ltd. to conduct a preliminary ecological appraisal and roost assessment of land at Lower Woodhouse, Fernhill, Almondsbury, BS32 4LX, within the boundary of South Gloucestershire Council (Ordnance Survey Grid Reference centred at: ST 6127 8536).
Development Proposals	The proposed development works comprise clearance of a small area of the site to facilitate the construction of a 5-bedroom house which will be known as Greystone cottage (Historical Planning Reference: PT08/1214/F). Ground and root protection areas and tree protection fences will be set up for the proposed development works.
Impacts to Key Receptors	Provided appropriate precautionary and mitigation measures detailed in Section 4 are implemented, the development is not anticipated to result in adverse impacts to any protected sites, habitats and species.
Recommendations	The following provisional recommendations have been developed based on the development proposals available at the time of writing: • Precautionary measures – timing of vegetation clearance for Birds, investigation of stonework of barns for Bats, precautionary non-licensed method statement on vegetation clearance for Dormice, pollution prevention measures for habitats and species including GCN, species-deterrence measures for Reptiles and Good Construction Practices; • Mitigation measures – bird nesting opportunities; and • Compensation and enhancement measures – grassland enhancement, installation of green roof, compensatory planting, SuDs Feature enhancement, pond enhancement.
Licensing Requirements	None required.
Conclusions	The site's ecological value is not considered to represent a fundamental in-principal constraint to the proposed development. If development works do not begin within eighteen months to two years of the date of this report of this report, an update survey is likely to be required in accordance with guidance from Natural England (CIEEM, 2019) and BS 42020:2013, to determine if conditions have changed since those described in this report.

1. Introduction

1.1. Brief

Acer Ecology Ltd. were commissioned by Benham Architects Ltd. to conduct a preliminary ecological appraisal of land at Lower Woodhouse, Fernhill, Almondsbury, BS32 4LX, within the boundary of South Gloucestershire Council (Ordnance Survey Grid Reference centred at: ST 6127 8536)[1]. The purpose of the assessment was to document the baseline ecological condition of the survey area, which comprises the red line boundary shown in Plan 1. This included identification of any designated sites or habitats that could be affected by the proposed works, and identification of or potential for, protected and/or otherwise notable species of conservation interest that could be affected. Potential ecological constraints were identified, and subsequent recommendations developed.

1.2. Site Description

The site proposed for development measures approximately 2.73ha, and mainly comprises grassland with areas of hardstanding, peripheral hedgerows and scrub. The site is situated approximately 0.3km to the west of the Woodhouse Park Activity Centre. There are a few well-maintained residential bungalows with associated driveways and a B road, Fernhill. To the north is a hedgerow and farmland beyond. To the east and west are scattered residential areas within well-maintained grasslands and lines of trees and hedgerows. The M4 is approximately 0.4km to the south-west and the A38 is 0.5km to the south-east of the site.

The landscape beyond the site proposed for development is predominantly rural with agricultural land bordered by hedgerows to the north and west. A large M4 and M5 conjunction lies approximately 1.7km to the south of the site. The site lies on broadly flat topography approximately 54m above sea level.

1.3. Proposed Works

The proposed development works comprise clearance of a small area of the site to facilitate the construction of a 5-bedroom house which will be known as Greystone cottage (Historical Planning Reference: PT08/1214/F)[2]. Ground and root protection areas and tree protection fences will be set up for the proposed development works.

The proposed development plan is provided in Appendix 1.

[1] Latitude and Longitude: 51.565866, -2.5600713/ what3words: genetics.probably.publisher
[2] https://developments.southglos.gov.uk/online-applications/applicationDetails.do?activeTab=summary&keyVal=ZZZTQAOKXT098

1.4. Scope of the Study

The study comprised the following:

- A desk study to identify existing information on statutory and non-statutory sites of nature conservation interest, and records of notable or protected habitats or species within the site and its environs;
- A Phase 1 Habitat Survey of the site, extended to search for evidence of, and potential for, protected fauna; and
- Identification of potential ecological constraints to the proposed works at the site and assessments of impacts including appropriate mitigation measures where necessary.

1.5. Review of Historic Site Data

A relevant historic report exists for the proposed development:

A daytime survey for bat roosts was conducted at the barns by Just Ecology in July 2008 followed by dusk/dawn activity surveys in July-September 2008 where two surveyors were present for each survey. No evidence was found for bat roosts, although the barn had potential for roosting as well as providing a large open area for bats to light sample or warm up within. Up to six bat species were recorded during the dusk/dawn activity surveys, including common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), long-eared sp. (*Plecotus sp.*), serotine (*Eptesicus serotinus*), noctule (*Nyctalus noctula*) and a *Myotis* species (*Myotis sp.*). The barn was re-inspected in December 2011 where no evidence of bats was found and the potential for roosting bats had reduced.

1.6. Reporting

This report aims to:

- Outline the methodology used during the survey;
- Present the results of the survey;
- Provide an ecological evaluation of on-site habitats, including an assessment of the potential for protected species;
- Provide an assessment of the potential impacts of the development proposals on ecological receptors identified through the desk and field study;
- Provide an assessment of the potential ecological constraints to the proposals; and
- Provide recommendations for further survey, avoidance, mitigation and enhancement where appropriate.

2. Methods

The survey was undertaken following standard methods as described in the Chartered Institute of Ecology and Environmental Management (CIEEM) Preliminary Ecological Appraisal 2016 guidelines, and the Phase 1 Habitat Survey methodology (Joint Nature Conservation Committee, 2010). The methodology utilised for the survey work comprised a desk study, habitat survey and a survey of protected and notable species.

2.1. Desk Study

2.1.1. Protected Sites, Habitats and Species

Information on designated sites and protected species was obtained from the sources detailed in Table 2. The legislation and policy relating to statutory and non-statutory designated sites and protected species can be found in Appendix 2 and 3. Plans 2 and 3 show the protected sites in relation to the proposed development site.

Table 1: Summary of Designated Sites and Other Abbreviations

Abbreviations	
Special Areas of Conservation	SAC
Special Protected Area	SPA
Site of Special Scientific Interest	SSSI
National Nature Reserve	NNR
Local Nature Reserve	LNR
Area of Outstanding Natural Beauty	AONB
Site of Nature Conservation Importance	SNCI
Ancient Semi-Natural Woodland	ASNW
Restored Ancient Woodland Site	RAWS
Plantation on Ancient Woodland Site	PAWS
Bristol Regional Environmental Records Centre	BRERC
Natural England	NE

Table 2: Sources of Data

Source	**Data**	**Radius of Search**
NE Geographical Information Systems (GIS) Layers	Statutory and non-statutory nature conservation designated sites ASNW, RAWS and PAWS	Ramsar/SACs/SPAs/SSSIs/NNRs/LNRs – 2km[3]. SACs (designated for bats) - 10km. 2km.
BRERC	Protected species records SNCIs	1km. 1km.
Multi-agency Geographic Information for the Countryside (Magic) website	European Protected Species Licences Permitted	1km.

[3] The citations of all the SSSIs and SACs within 2km of the site were consulted to determine if any of them had features or species which could be affected by the development proposals.

All available records of bat roosts were considered. For other species, only records collected within the last 10 years were considered relevant.

2.1.2. Landscape Context

The site and wider landscape were assessed and characterised using aerial images and Ordnance Survey maps. The presence of off-site features and habitats, which add to the ecological value within the wider area (for example, ponds within 0.5km of the site) were identified. Where appropriate, such features were scoped into the detailed assessment of impacts presented in Section 3.

2.1.3. Ancient Woodland

Although ancient woodland is not a designated site as such, it is often listed as a designated site due to its ecological significance and associated protection. Ancient woodland has therefore been included within the non-statutory designated site section of this report.

2.2. Field Study

2.2.1. Personnel

The field survey was undertaken in good weather on the 12th August 2021 by Luke Owen[4] and Alice Wynne-Griffiths[5].

2.2.2. Vegetation and Habitats

The vegetation and habitat types present within the survey area were categorised and mapped in accordance with the standard[6] Phase 1 Habitat assessment methodology (Joint Nature Conservation Committee, 2010), dominant and conspicuous plant species were recorded for each habitat. Target notes were used to record information on features of ecological interest, such as evidence of, or habitats with potential to support protected species. Following the completion of the survey, a colour-coded habitat plan was digitised using QGIS to show the extent and distribution of the different habitat types present within the site (see Plan 4).

Target notes (TN) were labelled on the plan where any features of interest too small to map were recorded.

Habitats on site were assessed to determine whether they qualified as Section 41 habitats (Natural Environment and Rural Communities (NERC) Act, 2006), Priority Habitats of the UK Biodiversity Action Plan (BAP) (Biodiversity Reporting & Information Group, 2007), habitats of local priority for conservation, for example in the relevant Local Biodiversity Action Plan (LBAP), or if they qualified for inclusion as non-statutory designated site inclusion (SNCI).

[4] Luke graduated with a degree in Zoology from the University of Bristol. Luke is currently in his second season of ecological survey, working as an Assistant Ecologist and receiving training from Acer Ecology. During his training Luke has undertaken preliminary ecological appraisals, under the direct supervision of Rory Jones.
[5] Alice graduated in Zoology with first class honours from the University of Bristol. She is currently receiving training from Acer Ecology, working as an Assistant Ecologist, gaining ecological surveying experience.
[6] Some additional categories were also used if applicable e.g. hard standing and Japanese knotweed.

Hedgerows within the site were not formally assessed against the definitions within the Hedgerow Regulations 1997 as this was beyond the scope of the assessment.

The presence of invasive plant species listed on Schedule 9[7] of the Wildlife and Countryside Act 1981 (as amended), such as Himalayan balsam (*Impatiens glandulifera*), giant hogweed (*Heracleum mantegazzianum*) and Japanese knotweed (*Fallopia japonica*) were also noted during the survey, if present.

2.2.3. Protected and Notable Species

During the survey, emphasis was placed on searching for evidence of, and habitats with, potential to support protected or notable species, especially species meeting any of the following criteria:

- Listed under the and the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species (Amendment) (EU Exit) ['CHSAEU'] Regulations 2019;
- Listed under The Natural Environment and Rural Communities (NERC) Act 2006 Section 41 Habitats or Species of Principle Importance for Conservation of Biological Diversity in England;
- Listed as a local priority for conservation, for example in the relevant Local Biodiversity Action Plan (LBAP);
- Red Listed using International Union for the Conservation of Nature (IUCN) criteria (e.g. in one of the UK Species Status Project[8] reviews, in the Species of Conservation Concern Red, Amber or Near Threatened List[9], or, where a more recent assessment of the taxonomic group has not yet been undertaken, listed in a Red Data Book);
- Listed as a Nationally Rare or Nationally Scarce species (e.g. in one of the Species Status Project reviews) or listed as a Nationally Notable species where a more recent assessment of the taxonomic group has not yet been undertaken; and/or
- Endemic to a country or geographic location (it is appropriate to recognise endemic sub-species, phenotypes, or cultural behaviours of a population that are unique to a particular place).

It should be noted that only those species with potential to be present on-site are mentioned within this report. The methodologies used were as follows:

Birds

Any birds observed during the field survey were recorded, in addition to features capable of supporting nesting birds (e.g. trees, hedgerows, buildings, bramble, ruderal vegetation and rough grassland etc.). The site was also assessed for its actual and potential suitability to support Wildlife and Countryside Act 1981 (as amended) Schedule 1 species.

[7] Schedule 9 species of plants and animals are ones that do not naturally occur in Great Britain but have become established in the wild and represent a threat to the natural fauna and flora.
[8] The Species Status project is the successor to the JNCC's Species Status Assessment project, providing up-to-date assessments of the threat status of various taxa using the internationally accepted Red List guidelines (http://jncc.defra.gov.uk/page-1773).
[9] Eaton *et al.* (2015) Birds of conservation concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. British Birds 108: 708-746.

A comprehensive bird survey, such as a breeding bird survey, was not undertaken as this was beyond the scope of the assessment.

Bats

Preliminary Ground-level Roost Assessment

A preliminary ground-level roost assessment of the trees within the survey area was undertaken, looking for features that bats could use for roosting (Potential Roost Features[10] (PRF) and evidence of bats (i.e. droppings in, around or below a PRF; odour emanating from a PRF; audible squeaking at dusk or during warm weather; or staining below the PRF). A systematic inspection was carried out around all accessible aspects of the tree, from both close to the trunk and further away. The location of the trees is shown on Plan 5.

The trees were assessed for their suitability to support roosting and hibernating bats in accordance with Table 4.1 of the Bat Conservation Trusts Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016) (see Appendix 7). A high-powered torch (Clulite), binoculars and a ladder were used as appropriate during the survey.

Buildings Assessment

Daytime Internal and External Building Inspection

A systematic search was made of the exterior and interior of the buildings and structures on site, looking for features that bats could use for entry/ exit and roosting[11] and to search for the presence of bats or evidence of bat use, such as droppings, feeding remains, urine staining, scratch marks and the remains of dead bats. The survey was undertaken by Luke Owen[12/13], acting as an accredited agent of Paul Hudson[14] MCIEEM (NE Licence Number: 2018-36707-CLS-CLS).

A high-powered torch (Clulite), binoculars and a ladder were used as appropriate during the survey.

Terrestrial Habitat Assessment

A preliminary assessment of the value of the site for bats (and any potential roost sites therein) was made in accordance with Table 4.1 of the Bat Surveys for Professional Ecologists (Collins, 2016) (see Appendix

[10] Potential Roost Features that bats may use identified by Andrews include: woodpecker-holes; squirrel-holes; knot-holes; pruning-cuts; tear-outs; wounds; cankers; compression-forks; butt-rots; lightning strikes; hazard-beams; subsidence-cracks; shearing cracks; transverse cracks; welds; lifting bark; frost-cracks; fluting and ivy.
[11] Bats may utilise gaps as small as 8mm by 20mm (Bat Conservation Trust, Cluster flies leaflet)
[12] Luke graduated with a degree in Zoology from the University of Bristol. Luke is currently in his second season of bat survey, working as an Assistant Ecologist and receiving training from Acer Ecology. During his training Luke has undertaken numerous preliminary roost assessments on a range of different structures, under the direct supervision of Rory Jones.
[13] This work was undertaken as Luke Owen acting as an assistant under the licence of Paul Hudson MCIEEM (NE Licence Number: 2018-36707-CLS-CLS)
[14] Paul graduated with a degree in Environmental Biology from Reading University and a Postgraduate Diploma in Conservation Management from the University of East Anglia. He has worked within ecological consultancy since 2000 and has been involved in bat work since 2001. He holds licences to disturb bats in both Wales (S088190/1 valid until June 2022) and England (2018-36707-CLS-CLS valid until 2028). Further details of his qualifications and experience can be found at http://linkd.in/19aGTf4.

6). The assessment was based on the relative abundance and quality of habitat features within the site, and surrounding landscape, suitable for roosting, foraging and commuting bats.

Dormice

The hedgerows and scrub habitats were assessed for their suitability to support dormice (*Muscardinus avellanarius*) with reference to guidance such as The Dormouse Conservation Handbook (Bright, Morris & Mitchell-Jones, 2006). The structure and composition of these habitats were assessed with respect to the presence of flower, fruit or nut-bearing food-plants such as hazel (*Corylus avellana*) (a favoured food-plant of dormice), oak (*Quercus* sp.), honeysuckle (*Lonicera periclymenum*), bramble (*Rubus fruticosus* agg.), sycamore (*Acer pseudoplatanus*), as well as other trees and shrubs listed in Bright, Morris & Mitchell-Jones (2006) as being of value to dormice. In addition, connectivity to other areas of suitable habitat in the wider landscape, such as hedgerows and woodland, was assessed.

Limited hazel was present on site and therefore it was not possible to undertake a search for hazelnut shells to determine if they had been opened by dormice. A full nest tube/box survey was not undertaken as this was beyond the scope of the assessment.

Great Crested Newts

The survey area was appraised for its suitability to support great crested newts (*Triturus cristatus*) (GCN). The assessment was based on guidance outlined in the Herpetofauna Workers' Manual (Joint Nature Conservation Committee, 2003) and the Great Crested Newt Conservation Handbook (Langton, Beckett & Foster, 2001).

Ordnance Survey maps and aerial images of the land surrounding the site were consulted to determine if any water bodies were present within the site or within 0.5km of it. Ten potentially suitable water bodies were identified within the study area (see Plan 6). The Habitat Suitability Index (HSI) (Oldham *et al.*, 2000) was applied to these water bodies (where access permitted).

Nine of the identified ponds were situated on private land and access had not been arranged at the time of the survey. The tenth pond was located in woodland outside of the survey area, but this had dried. Therefore, none of the ponds identified were assessed for their suitability. However, one additional pond was located on site, and this was assessed.

As part of the assessment, ponds are scored using 10 suitability indices[15]: Each of these features is awarded a score between 0 and 1, and a final score is calculated, also between 0 and 1 (a higher score representing more optimal conditions for GCN). This final score enables the pond to be ranked in terms of its suitability (poor, below average, average, good or excellent) and to estimate the likely presence of GCN within the water body.

[15] The 10 suitability indices are: location, pond area, pond drying, water quality, shade, waterfowl presence, fish presence, number of ponds in the local area, terrestrial habitat, and macrophyte cover.

The HSI assessment is not a substitute for undertaking GCN surveys but can be used to inform the assessed likelihood of presence or absence. It is not sufficiently precise to prove that a higher score confirms presence, or a lower score confirms absence.

A full GCN survey was not undertaken, as this was beyond the scope of this assessment.

Badgers

Earth embankments, wooded copses, hedgerows and dense bramble beds are habitat features that often contain evidence of badger (*Meles meles*). Where present on-site, these and other suitable habitat features were searched for such evidence. Where present, the location of badger signs such as setts, runs, dung pits or latrines, prints, hair and foraging snuffle holes were recorded.

A full badger survey was not undertaken as it was beyond the scope of this assessment.

Reptiles

An assessment of the suitability of on-site habitats to support reptiles was made. Reptiles require a diverse range of habitats to meet their needs such as hedgerows, scrub, rough grassland, woodpiles, rubble, banks and compost heaps. The potential of the site to provide hibernation opportunities and spring/ summer/autumn habitat was also assessed, with reference to guidance provided in the Herpetofauna Workers' Manual (Joint Nature Conservation Committee, 2003), the Reptile Management Handbook (Edgar, Foster & Baker, 2011) and the Reptile Mitigation Guidelines Technical Note TIN 102 (Natural England, 2013). The following factors were considered: vegetation type and structure; insolation (sun exposure); slope aspect; topography; surface geology; habitat connectivity; habitat size; prey abundance; refuge opportunity; hibernation opportunity; egg-laying potential for grass snake (*Natrix helvetica*); public pressure; percentage of shade; levels of disturbance and management regime.

A targeted presence/ likely absence reptile survey was not undertaken as it was beyond the scope of this assessment.

Other Species

General habitat suitability and incidental sightings of other animal species were also noted.

2.2.4. Assessment of Ecological Value

The value of the habitats and features of the site have been provisionally evaluated and graded in accordance with a geographical frame of reference as detailed in Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland (CIEEM, 2018). The level of value of specific ecological receptors is assigned using a geographic frame of reference, i.e. international value being most important, then national, regional, county, district, local and, lastly, within the immediate zone of influence of the site only. Brief descriptions of how Acer Ecology interprets these categories are set out in Appendix 5.

2.2.5. Constraints and Limitations

General Temporal Constraints

Any ecological survey can only identify what was present on-site at the time the survey was conducted and habitat usage by species can change over time.

Restricted Access to Water Bodies Within 0.5km of Site

Access to the water bodies within 0.5km of the site was not possible as some are situated on private land and access permissions had not been agreed at the time of the survey. Due to the assessment of the pond on the site as having 'below average' suitability for GCN and the low value of the adjacent terrestrial habitat that would connect to any of the off-site ponds, this is not considered a significant constraint.

Floor Covered with Detritus

In the stables, the majority floor in were covered with detritus, thus making the observation of bat droppings difficult.

3. Baseline Ecological Conditions, Evaluation and Development Impacts

The baseline conditions and evaluation of the *in-situ* habitats and the actual/ potential presence of protected species are discussed in this section. Potential impacts on protected sites, *in-situ* habitats and protected or notable species arising from the proposed development are identified, including both direct and indirect impacts, and those associated with construction and operational stages.

A summary of relevant legislation and planning policies relating to protected sites, habitats and species is provided in Appendices 2 and 3.

3.1. Statutory Nature Conservation Designated Sites

Statutory Sites (SACs or SSSIs) Designated for Bats within 10km of Site

No SACs or SSSIs specially designated for bats lie within 10km of the site.

RAMSARs, SPAs, SACs, SSSIs, NNRs, LNRs, National Parks and AONBs within 2km of Site

There are no statutory sites designated for their conservation value within 2km of the site.

3.2. Non-statutory Nature Conservation Designated Sites

SNCIs

The proposed development site lies within 2km of the following non-statutory sites:

Table 3: Non-Statutory Sites Designated Within 2km

Site Name	Designation	Description	Distance	Development Impacts
Whatleaze	SNCI	Species rich neutral grasslands and damp woodland.	0.05km	The proposed development site lies in close proximity to the Whatleaze SNCI. However the two sites are separated by a road on the southern boundary of the development site. In addition, no habitat higher than site value will be lost to the development, as a consequence the loss of these habitats is considered unlikely to cause any significant adverse impacts to the viability of the SNCI. Further to this, the small-scale of the development means increases in noise and light spill are likely to be negligible in the

				context of the SNCI, therefore no direct impacts to this site are envisaged as part of the development. However, indirect impacts could feasibly occur through any pollution incidents, therefore pollution prevention measures are outlined in Section 4.
Tockington Park Wood	SNCI	Ancient woodland and areas of diverse secondary woodland.	0.90km	No impacts due to the distance from the proposed development site.

Ancient Woodland

There are five areas of ASNW located within 2km of the proposed development site, the nearest of which lies 0.8km to the south of the site (Plan 2).

Considering the distances between these woodlands and the proposed development site, together with the small scale of the works, none of these woodlands are anticipated to be affected by proposals. They are therefore not mentioned further in this report.

3.3. Habitats and Vegetation

The results of the general survey of habitats and vegetation are shown on Plan 4. A botanical species list is provided in Appendix 4.

The site consists of twelve elements which are described in detail overleaf in the following table:

Table 4: Habitats Recorded on Site			
Habitat	**Description**	**Ecological Value**	**Development Impacts**
Broadleaved Woodland (A1.1.1), Dense Scrub (A2.1) and Bramble Scrub[16]	Areas of scrub woodland are present along the eastern and southern boundaries of the site. The scrub at the north-east forms part of the adjacent woodland to the east, supporting species such as plum (*Prunus domestica*), common hawthorn (*Crataegus monogyna*), elder (*Sambucus nigra*), ash (*Fraxinus excelsior*), buddleia (*Buddleja davidii*) and bramble. Dense bramble scrub, with occasional elder and hazel, forms the south-eastern boundary of the site.	Site value	The majority of these habitats are proposed for retention, however, a small number of trees within the area of scrub woodland to the north-east, adjacent to the barns, will be felled. Felling of these trees may result in direct adverse impacts to birds nesting within these habitats, including the loss of potential nesting sites. Recommendations to mitigate such impacts are presented in Section 4.
Scattered Broadleaved Trees (A3.1)	Several scattered broadleaved trees are present throughout the site including ash, holly (*Ilex aquifolium*) and walnut (*Juglans regia*), present to the south of the site, as well as a mature pedunculate oak (*Quercus robur*) located within the northern hedgerow.	Site value	While the scattered broadleaved trees are all proposed for retention, there is a risk that some of these trees could be inadvertently damaged during the construction phase of the development. Recommendations to avoid such impacts are detailed in Section 4.
Poor Semi-improved Grassland (B3.6)	The majority of the site comprises species-poor semi-improved grassland. The sward is short, uniform and dominated by Yorkshire fog (*Holcus lanatus*). Several other common grasses are present including perennial rye grass (*Lolium perenne*) creeping bent (*Agrostis stolonifera*), creeping soft-grass (*Holcus mollis*) and timothy grass (*Phleum pratense*). Herbaceous species include common nettle, creeping thistle (*Cirsium arvense*), creeping buttercup (*Ranunculus repens*), curled dock (*Rumex crispus*), white clover (*Trifolium repens*), greater plantain (*Plantago major*), cut-leaved cranesbill (*Geranium dissectum*), meadow vetchling (*Lathyrus pratensis*), common ragwort (*Senecio jacobaea*) and herb Robert (*Geranium robertianum*).	Site value	Clearance of the site to facilitate the new development will result in the permanent loss of relatively small areas of this habitat.
Tall Ruderal Vegetation (C3.1)	Tall ruderal vegetation grading into spoil is present towards the north-western corner of the site. Common	Site value	It is considered likely that this vegetation will be cleared to facilitate the new development.

[16] Habitat included within dense scrub (A2.1) or scattered scrub (A2.2) within the Phase 1 Handbook (JNCC 2010)

	nettle is dominant, with abundant bramble, willowherb (*Epilobium* sp.) and hedge bindweed (*Calystegia sepium*), and frequent common mallow (*Malva sylvestris*).		
Open Water (G.1)	A shallow pond (Pond 1) lies within the area of semi-improved grassland.	Site value	Pond 1 is not anticipated to be directly impacted by the development. However, the construction works may cause increased sedimentation and/or water inputs into the pond and consequently, adverse impacts to aquatic fauna. Recommendations to avoid such impacts are presented in Section 4.
Spoil (I2.2)	Various earth and rubble spoil piles are present to the north-west and north-east of the site, adjacent to the existing buildings.	Site value	The spoil piles will be permanently cleared.
Intact Species-Rich Hedgerow (J2.1.1)	An intact species-rich hedgerow forms the northern boundary and part of the eastern boundary of the site. The dominant species present within the structural component is common hawthorn. Other species present include English elm (*Ulmus procera*), plum, holly and hazel, as well as abundant ivy (*Hedera helix*) and hedge bindweed. The hedgerow also incorporates a mature pedunculate oak tree. The ground flora is dominated by bramble and common nettle, with frequent hogweed (*Heracleum sphondylium*).	Section 41 habitat Local value	Whilst the hedgerows on site are proposed to be retained, it is likely that the proposed development will result in a degree of increased anthropogenic disturbance during both construction and operational phases. There is also a risk that the hedgerows could be inadvertently damaged during the construction phase. Trees in the hedgerow may be subject to root damage as a result of heavy plant movement over the root protection area, or accidental damage during general construction activities. Recommendations to avoid and mitigate such impacts are presented in Section 4.
Wall (J2.5)	A stone wall runs along part of the eastern boundary of the site.	Site value	The wall may be subject to disturbance during construction works.
Buildings (J.3.6)	Several buildings are present on site including a portacabin (Building 1), stables (Building 2) and two derelict traditional barns (Buildings 3 & 4). Detailed descriptions of these buildings are provided in Section 3.4.3.	Site value	Buildings 1 and 2 will be permanently cleared. Current proposals suggest that buildings 3 and 4 will remain as permanent external features of the new development.
Bare Ground (J.4)	A patch of bare ground is situated at the north-eastern corner of the site.	Negligible value	The bare ground will be permanently lost to development.
Hard Standing[13]	Hardstanding forms the access track through the site and is present at the north-east, adjacent to the buildings, colonised by bristly ox-tongue (*Helminthotheca echioides*), dandelion (*Taraxacum officinale agg.*), creeping thistle and broad-leaved dock (*Rumex obtusifolius*).	Negligible value	The hard standing will be permanently lost to development.

Photo 1: Scrub woodland and adjacent bare ground

Photo 2: Scrub woodland

Photo 3: Scrub woodland

Photo 4: Bramble scrub

Photo 5: Scattered broadleaved trees - ash

Photo 6: Penduculate oak

Photo 7: Holly

Photo 8: Ash

Photo 9: Poor semi-improved grassland

Photo 10: Poor semi-improved grassland

Photo 11: Tall ruderal vegetation

Photo 12: Pond 1

Photo 13: Spoil adjacent to existing barns

Photo 14: Spoil

Photo 15: Intact species-rich hedgerow at north

Photo 16: Hardstanding

3.4. Protected and Notable Species

3.4.1. Notable Plant Species

Data Trawl Results

BRERC returned no records of protected plant species or species of principal importance listed under Section 41 list in England of the NERC Act (2006) from within 1km of the site.

Field Survey Results

No plant species, which individually are considered to be of either of national, regional or local significance were recorded on the site.

3.4.2. Birds

Desk Study Results

The following table shows nesting birds and wintering birds of note recorded within 1km of the site, that are also associated with the habitats present on-site and their conservation status:

Table 5: Records of Birds

Species		Schedule 1	NERC S41	UK BAP	17Red list[18]	Amber list[19]	Breeding Habitat[20]	Wintering Habitat
Bullfinch	*Pyrrhula pyrrhula*		Yes	Yes			Deciduous woodland, thickets, gorse and detached groups of trees, mostly in lowlands	As breeding habitat, plus greater use of farmland, scrub, orchards and large gardens
Coal tit	*Periparus ater*						Coniferous, sessile oak and northern birch woodland	As breeding habitat, plus scrub hedgerow and gardens
Cuckoo	*Cuculus canorus*		Yes	Yes	Yes		Woodland and scrub, parkland, hedgerows, wetlands with reedbeds, heaths, coastal dunes and marshes	Not applicable
Dunnock	*Prunella modularis*		Yes	Yes		Yes	Scrubland, woodland, field hedgerows, suburban parks and gardens	As breeding habitat
House sparrow	*Passer domesticus*		Yes	Yes	Yes		Agricultural land, grasslands, hedgerows, scrub, parks, gardens and farmyards	As breeding habitat
Song thrush	*Turdus philomelos*		Yes	Yes	Yes		Woodland, parkland, hedgerows, scrubby grassland and gardens	As breeding habitat except woodlands are mostly vacated
Starling	*Sturnus vulgaris*		Yes	Yes	Yes		Farmland, woodland and suburban habitats	As breeding habitat
Willow warbler	*Phylloscopus trochilus*					Yes	Young woodlands, scrub, woodland edges, rides and clearings and young conifer	N/A

[18] Bird species of high conservation concern, such as those whose population or range is rapidly declining, recently or historically, and those of global conservation concern.

[19] Bird species of medium conservation concern, such as those whose population is in moderate decline, rare breeders, internationally important and localised species and those of unfavourable conservation status in Europe.

[20] Breeding and wintering habitat descriptions from Key Habitat Attributes for Birds and Bird Assemblages in England Part 1 (ENRR359)

Field Survey Results

No birds were recorded during the survey.

However, a single defunct swift's nest was recorded within the stable (see Photo 20).

Assessment of Ecological Value of Site for Birds

The species-rich hedgerow, scattered broadleaved trees and scrub habitats provide nesting and foraging opportunities for a range of tree and scrub nesting bird species, including NERC S41, UK BAP and Red Listed species such as dunnock, song thrush and starling which have been recorded in the wider area. Furthermore, the buildings on site also provide opportunities for nesting and evidence of nesting was found within the stables during the internal building inspection.

Impact Assessment of Proposed Development on Birds

The following direct impacts to nesting birds may occur as a result of the development:

- Death or injury to adults or destruction of nests during vegetation clearance and building work. However, such impacts can be avoided either by timing works so that they occur outside of the nesting bird season (September to February inclusive), as detailed in Section 4; and
- Small-scale nesting habitat loss.

The following indirect impacts to nesting birds may occur as a result of the development:

- Disturbance to active nests at the time of vegetation clearance and construction; and
- Habitat degradation via accidental damage to retained habitats during the construction phase of works.

3.4.3. Bats

Desk Study Results

The data search returned a total of 18 records of bat roosts within 1km of the site. The roost records are summarised in the table below.

Table 6: Bat Roost Records

Species	Total Number of Records	Distance to Nearest Record	Most Recent Record	Maximum Count
Natterer's bat (*Myotis nattereri*)	1	Approx. 0.45km	16/09/2015	1
Common pipistrelle (*Pipistrellus pipistrellus*)	8	Approx. 0.45km	22/07/2016	21
Soprano pipistrelle (*Pipistrellus pygmaeus*)	2	Approx. 0.45km	22/07/2016	1
Brown long-eared (*Plecotus auritus*)	4	Approx. 0.45km	21/07/2016	2
Noctule	2	Approx. 0.45km	21/07/2016	2

(*Nyctalus noctula*)				
Leisler's bat (*Nyctalus leisleri*)	1	Approx. 0.45km	21/07/2016	NA

In addition to the roost records, BRERC returned 10 records of bats foraging or commuting within 1km of the site. These included: brown long-eared, common pipistrelle, Leisler's bat, noctule, and serotine.

The following European Protected Species Mitigation Licences (EPSMLs) were granted within a 2km radius of the site:

Table 7: Granted Bat EPSMLs within 2km of the Site

Case Reference of Granted Application	Approx. Distance from Site	Species Affected	Licence Start Date	Licence End Date	Impacts Allowed by Licence
2016-26634-EPS-MIT	0.7km	Common pipistrelle	18/11/2016	18/11/2016	Destruction of a resting place
2012-4634-EPS-MIT	0.7km	Common pipistrelle Soprano pipistrelle Brown long-eared bat	14/06/2013	31/08/2014	Destruction of a resting place

Field Survey Results

Trees

All of the trees within the survey area were assessed for their suitability to support roosting bats. The majority of the scattered trees, and the trees within hedgerows were young in age, with Diameters at Breast height (DBH)' ranging from 10cm to 30cm, with no PRFs. They were therefore assessed as having negligible bat roost potential and were scoped out of the assessment. They are therefore not mentioned further in this context in the report.

However, two trees on site (T23 and T24 marked on Plan 5) were semi-mature to mature and presented roosting features. These have been described in detail in the table below and are numbered on Plan 5, which should be read in conjunction with this section of the report.

Table 8: Trees Assessed for Bat Potential

No.	Description	Evidence of roosting bats	PRF	Potential for Roosting Bats
T23	Semi-mature walnut. Single trunk. Approximately 8m tall, DBH 50cm.	None.	Knot hole at terminal of limb at height of approx. 3.5m, facing south.	Low
T24	Mature ash. Single trunk. Approximately 12m tall, DBH 60cm.	None	Wound at base of crown stretching over a large section of a limb, leading into limb break at height of approx. 3.5m.	Low
DBH – Diameter at Breast Height DBH. This refers to the tree diameter measured at 4.5 feet above the ground.				

Photo 17: Defunct swift's nest

Photo 18: Walnut

Photo 19: Walnut PRF

Photo 20: Ash and PRF

Buildings and Other Structures

The buildings and structures on site were assessed externally and internally for their suitability to support roosting bats, as set out in the table below:

<u>Building 1 – Portacabin</u>

Building 1 is a derelict, single-storey temporary portacabin structure measuring approximately 15m by 12m with a timber construction detail (see Photo 21). The building is flat-roofed and lined with bitumen felt (see Photo 22). The building is in a poor state of repair. Several timber panels have fallen from the structure exposing the roof void to the elements (see Photo 12 and 23). Internally the building is light and extremely damp, large sections of the ceiling have collapsed and heaps of insulation and ceiling material can be seen (see Photo 24). Building 1 also appears to currently be in use for storage of building materials and waste (see Photo 25). The building presented no suitable external roosting features.

No evidence of bats was recorded. The building has negligible roosting suitability for use by crevice-dwelling bats (*Pipistrellus* species and smaller *Myotis* species such as Brandt's (*Myotis brandtii*) and whiskered bats (*Myotis mystacinus*)), and negligible suitability for use by roof-void dwelling bats (long-eared species and

large *Myotis* bats, such as Natterer's bat (*Myotis nattereri*) and serotine bats (*Eptesicus serotinus*)) due to a lack of suitable roosting locations. There is low potential for Building 1 to be used as an occasional night roost for direct-access species requiring a large access point and large roost space (lesser horseshoe (*Rhinolophus hipposideros*) and greater horseshoe (*Rhinolophus ferrumequinum*) bats)), due to the open nature of the building. However, the building is assessed as having limited potential to support these species due to:

- The lack of suitable day roosting opportunities;
- The unstable internal environment as the building is subject to large temperature fluctuations and exposure to the weather. In addition, water is able to enter at various locations due to the poor state of repair;
- Single skin walls and asbestos roof which would provide little in the way of thermal stability; and
- The interior of the single storey office appeared well illuminated, an environmental factor which is generally considered unsuitable for roosting bats.

When considering these factors, in addition to the lack of evidence in the form of droppings, urine staining or feeding remains, the systematic inspection of all suitable roosting areas and the lack of records returned from BRERC and the Magic database, it is considered highly unlikely that these species would make use of this structure.

Building 2 – Stables

Building 2, is a small, timber stable block measuring approximately 7m by 4m (Photo 26). The stables have fallen into disrepair. The roof of the stable block has been removed at some stage and currently only plastic sheeting covers the timber rafters, which has come loose in places. In addition to the open stable doors, the building is open at the eaves and at the gable apex's, which could be accessed directly by bats (Photo 27). The timber panelling on the outside of the stable block is generally well-fitted and tight to the building. There are some panels that have slightly pulled away from the building but none which present a gap sufficient to provide an external roosting feature.

No evidence of bats was recorded. The stable has negligible roosting suitability for use by crevice-dwelling bats and roof-void dwelling bats due to a lack of suitable roosting features. The building also has negligible suitability for use by direct-access species requiring a large access point and large roost space due to the draughts[21] and light ingress causing a lack of dark, stable microclimates of the kind which direct-access species normally require for daytime roosting. The open nature of the structure means it does have low potential to be used as a night roost, though no direct evidence of this was recorded within the internal parts of the stables. Though not conclusive of absence, the absence of bat droppings within the building provides a reasonably high level of confidence that the building has not been used for this purpose.

[21] Summer roosts, and particularly maternity roosts typically occur in buildings with relatively warm and dry conditions (Altringham 2003).

Building 3 and 4 – Traditional Barns

The barns on site are of a traditional stone construction and are no longer functional (see Photos 28 - 30). For the purposes of this report, Barn 1 is the larger barn which is located to the south of the smaller barn, Barn 2. The roofs have been removed as part of previous ecological work and the barns are fully open to the elements. The floors have been colonised by short perennial and ephemeral vegetation, with some bramble scrub beginning to colonise (see Photo 30). Parts of the walls have fallen or become unstable. There are many large cracks and crevices within the stonework, where mortar has slipped or weathered, that could feasibly be utilised by roosting bats.

No evidence of bats was recorded. The barns have negligible suitability for roof-void dwelling bats and negligible suitability for use by direct-access species due to a lack of suitable roosting features. Both barns have low potential for use by crevice-dwelling species due to a number of cracks and cervices in the stone masonry where the mortar has weathered and fallen which bats could utilise for roosting.

Photo 21: External of portacabin

Photo 22: Roof of portacabin

Photo 23: Where timber cladding has fallen

Photo 24: Internal or portacabin showing ceiling

Photo 25: Waste and building storage

Photo 26: External of stables

Photo 27: Stables open at the apex

Photo 28: Internal of Barn 1

Photo 29: Damaged external wall of Barn 2

Photo 30: Bramble scrub within Barn 2

Assessment of Ecological Value of Site for Bats

Potential Tree Roosts

T23 and T24 have been assessed as having low potential to support roosting bats due to single PRFs being recorded.

Potential Building Roosts

From the assessment made during the survey:

- Building 1 is assessed as having negligible potential for crevice-dwelling and roof void dwelling species and negligible potential for roosting by direct-access species. However, there is some limited potential for use as a night roost, although the building is assessed as being sub-optimal for this purpose, no evidence was recorded, and the building is considered unlikely to be used for this purpose;
- Building 2 is assessed as having negligible potential for crevice-dwelling and roof void dwelling species and negligible potential for roosting by direct-access species. However, there is some limited potential for use as a night roost, although no evidence of this was recorded during the survey. Though not conclusive of absence, the absence of bat droppings within the building provides a reasonably high level of confidence that the building has not been used for this purpose; and
- Buildings 3 and 4 are assessed as having negligible potential for roof void dwelling species and negligible potential for roosting by direct-access species. The building has low potential to be used opportunistically by crevice-dwelling species. However, current development proposals suggest no work is proposed to be undertaken on the barns and therefore no further survey is considered necessary. Plans indicate that the new dwelling will be adjoined to the Barn 2 on one wall. It is therefore recommended that prior to this work taking place, all cracks and crevices present on this wall will be systematically inspected with an endoscope (see Section 4).

Potential Foraging and Commuting Habitat

The vast majority of the site constitutes species poor semi-improved grassland that is managed, and although this is likely to support a viable insect population it is unlikely to be of high value to bats in itself. However, the site is surrounded on the northern, eastern and southern boundaries by a mixture of species rich and species poor hedgerows that contribute to linear features extending into the surrounding landscape that are likely to be used by foraging and commuting bats. In addition, there are small areas of woodland directly adjacent to the east of the site which are likely to be used by roosting bats. Therefore, the site is collectively considered to provide moderate quality foraging and commuting habitat for bats.

<u>Impact Assessment of Proposed Development on Bats</u>

The following direct impacts to bats may occur as a result of the development:

- The proposals will result in a small area of low-quality foraging habitat being lost, and these losses will be permanent in nature. These losses are considered to be negligible in the context of the development.

The following indirect impacts to bats may occur as a result of the development:

- T23 and T24 are proposed for retention. However, there is a risk that these trees may be subject to root damage as a result of heavy plant movement over the root protection area, or accidental damage during general construction activities. T23 and T24 have been assessed as having low bat roost potential. Protective barriers will therefore be installed prior to any site work, to ensure that no such inadvertent impacts occur (see Section 4). These will be established in line with the tree root protection zones detailed in the previous arboriculture report that has been produced for the site (see Plan 5); and
- Due to the change of use of the site, increases in artificial lighting levels may be significant, both during the construction phase and the operational phase of the development. If this lighting envelops the retained hedgerows and trees of the site, it could adversely affect foraging and commuting bats.

3.4.4. Dormice

Desk Study Results

BRERC returned no dormice records from within 1km of the site.

Field Survey Results

No signs or evidence of dormice was recorded on site. The species-rich hedgerow and scrub habitats are structurally suitable for dormice and together contain seven food-plants known to form part of the dormice diet (hazel, ash, elder, common hawthorn, pedunculate oak, holly and bramble). The poor semi-improved grassland, bare ground and hardstanding is considered to be unsuitable for use by dormice.

Assessment of Ecological Value of Site for Dormice

Though the central parts of the site are unsuitable for supporting dormice, the species-rich hedgerow and scrub woodland habitats have greater potential to support this species. The value of the dense scrub to the southeast is limited due to its species-poor, bramble dominant nature; however, the northern hedgerow and scrub woodland to the north-east has potential to support this species, providing ample opportunities for foraging and arboreal movement. These habitats are also well connected to other hedgerows in the wider landscape; however, connectivity to any areas of ancient woodland off-site is limited.

Impact Assessment of Proposed Development on Dormice

A small number of trees within the scrub woodland habitat to the north-east are proposed for removal. Felling of these trees will not result in increased fragmentation of habitat for dormice, as the remainder of the scrub woodland is well connected and will remain intact. However, there is some potential for direct adverse impacts to occur, including the death or injury of dormice if present at the time of vegetation clearance. Indirect impacts associated with noise, vibrations and artificial lighting may also occur.

Considering the very small scale of habitat to potentially be cleared, the benign nature of the proposals and the fact that no other suitable dormice habitats will be affected by the proposed works, no further

survey is considered necessary. However, due to the potential for adverse impacts to occur, precautionary measures for dormice will need to be adopted, as detailed in Section 4.

3.4.5. Great Crested Newt

Desk Study Results

BRERC returned no GCN records from within 1km of the site. Additionally, no records of common amphibians were received from within this search radius.

Field Survey Results

No direct observation or evidence of great crested newt was recorded on site although a targeted survey was not undertaken for this species.

Aquatic Habitat

A single, small pond was located in the southern half of the site which was subject to a Habitat Suitability Index assessment (Oldham et al., 2000) to determine the likelihood of great crested newt being present, the results of which are given below. The location of the waterbody is shown in Plan 6.

Table 9: Pond 1 HSI Scores

Pond Reference	**Water Body 1**
SI1 Field location	1
SI2 Pond area	0.05
SI3 Pond drying	0.5
SI4 Water quality	0.33
SI5 Shade	1
SI6 Fowl	1
SI7 Fish	1
SI8 Ponds	1
SI9 Terrestrial habitat	0.33
SI10 Macrophytes	0.6
HSI SCORE:	**0.53**
Pond Suitability:	**Below average**

Photo 31: Extent of pond present on site

Photo 32: Pond 1

Terrestrial Habitats

During the terrestrial stage of their lifecycle, great crested newt can make use of a range of habitats including woodland, hedgerows, scrub and rough grassland for foraging, shelter and hibernation. The terrestrial habitats within the development footprint generally provide a mosaic of sub-optimal habitats for newts. In addition, the area surrounding the pond for a minimum of 50m in all directions is managed poor-semi-improved grassland providing little physical protection for this species and is considered to be generally unsuitable.

Photo 33: Grassland surrounding pond, from north

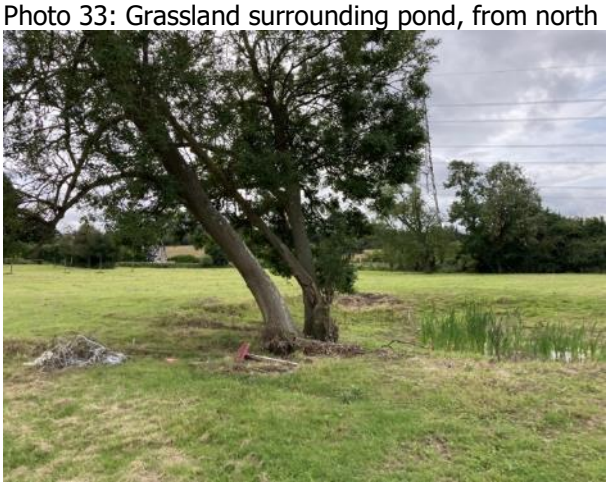
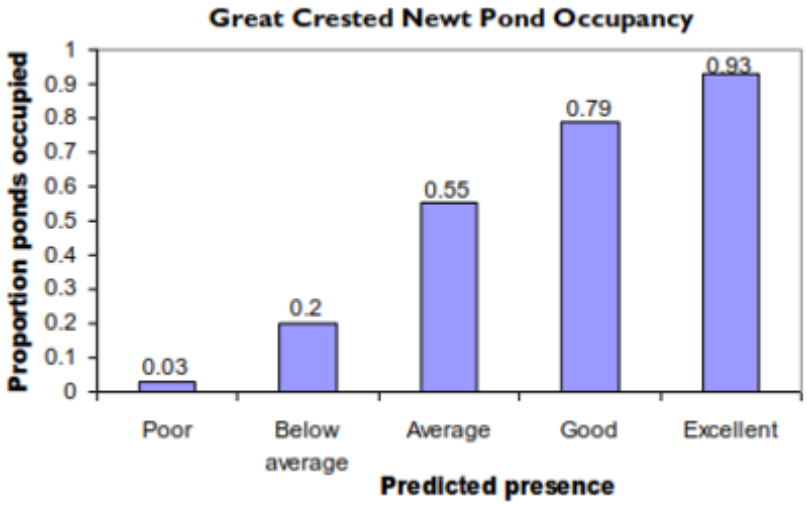


Photo 34: Grassland surrounding pond

Assessment of Ecological Value of Site for Great Crested Newt

One water body was identified within the site (see Plan 6). The water body (Pond 1) scored 'Below Average' in the HIS assessment. The figure below (ARG, 2010) shows that the proportion of GCN presence in ponds that scored 'Below Average' is 0.2 or 20%.



The results of the Habitat Suitability Index indicate Pond 1 has 'below average' potential to support breeding great crested newts. Therefore, the pond does have some potential to support this species, however various factors reduce the survey areas suitability to support great crested newts.

When considering the heavily managed nature and low structural diversity of the surrounding habitats extending to any ponds offsite, in addition to the lack of published records of GCN, the likelihood of GCN being present on site is considered to be very low and the site is generally considered unsuitable potential for GCN and other common amphibians for terrestrial, aquatic, foraging, commuting and over wintering purposes.

Impact Assessment of Proposed Development on Great Crested Newt

The likelihood of GCN being present on site is considered to be very low, although cannot be ruled out completely. However, when considering the poor value terrestrial habitat surrounding the pond, the localised and small-scale nature of the development in the context of the wider site, and that the current development proposals will retain and likely enhance the pond for wildlife and the wider grassland (see Plan 7) as part of the development (see Section 4), no direct impacts to great crested newts are anticipated as part of the development.

It is however possible that indirect impacts could occur to great crested newts during the construction stage of the development through pollution incidents, therefore pollution prevention measures are outlined in Section 4.

3.4.6. Badgers

Desk Study Results

BRERC did not return any badger records from within 1km of the site.

Field Survey Results

No setts or other signs of badgers were recorded on site. The presence of badgers as a resident species on site was assessed as being unlikely due to the absence of any obvious signs. Furthermore, the site is mainly open in nature, making it generally unsuitable for sett building. However, the hedgerows, scrub and semi-improved grassland provide potential foraging habitat for badgers.

Assessment of Ecological Value of Site for Badgers

Although no evidence of badgers was recorded on site, there is considered to be some potential for them to venture onto the site from the surrounding landscape to forage sporadically.

Impact Assessment of Proposed Development on Badgers

As badgers are nocturnal, it is considered unlikely that any foraging or commuting badgers will be encountered on site during works. Considered in addition to the absence of any obvious signs of badger presence and the lack of local records, no adverse impacts are anticipated. Good construction practices are

recommended in Section 4 to ensure that no badgers moving through the site are injured during the construction phase of the development.

3.4.7. Reptiles

Desk Study Results

BRERC returned one reptile record within 1km of the site. This was a record of slow-worm (*Anguis fragilis*), approximately 0.86km away to the south of the site.

Field Survey Results

No reptiles or evidence of reptiles were incidentally recorded during the survey, although a targeted reptile survey was not undertaken. Whilst the majority of the site offers little value for reptiles, due to the short nature of the sward, the edges of the site are more suitable. For example, the interfaces between the semi-improved grassland and hedgerow and scrub understoreys, as well as between the tall ruderal vegetation and spoil.

Assessment of Ecological Value of Site for Reptiles

The site is considered to provide low to moderate quality reptile habitat. While the majority of the site comprises short-sward poor semi-improved grassland which is largely unsuitable for reptiles, the peripheral habitats (the hedgerow, scrub habitats and tall ruderal-spoil interfaces) are favourable for these species. These habitats provide a range of transitional zones or ecotones, due to the varying sward heights, offering opportunities for refuge and basking.

Impact Assessment of Proposed Development on Reptiles

The proposed works to the semi-improved grassland and hardstanding will not result in the loss of potential reptile habitat. However, any clearance to the tall ruderal vegetation and spoil at the north-west of the site, or any unintended damage to the hedgerow and scrub habitats during construction, may result in the accidental killing or injury of reptiles, as well as losses to optimal habitat. The anticipated risk of adversely affecting reptiles during such works will be low, provided that suitable precautionary measures are implemented (see Section 4).

3.4.8. Other Mammals

Desk Study Results

BRERC did not return any other mammal species records from within 1km of the site.

Field Survey Results

It is highly likely that a range of common small mammals are present on the site, including hedgehogs (*Erinaceus europaeus*), shrews (*Sorex sp.*), voles (*Microtus/Myodes sp.*), mice (*Apodemus sp.*), fox (*Vulpes vulpes*) and mole (*Talpa europaea*) etc., occurring either as resident species or whilst foraging and/or

commuting. The hedgerows and scrub habitats are considered to provide optimal refugia for day-resting hedgehogs and hibernacula during the winter months.

Assessment of Ecological Value of Site for Other Mammals

Hedgehogs are considered likely to forage within the site and could potentially nest and hibernate within the peripheral habitats. The loss of or damage to these habitats could lead to negative impacts upon this species, if present.

Impact Assessment of Proposed Development on Other Mammals

The impact of the proposed development on potential hedgehog habitat is considered to be relatively low. The peripheral habitats which are suitable for hedgehogs are proposed for retention; however, any clearance of grassland or unintentional damage to the hedgerows and scrub habitats during construction, may result in the accidental killing or injury of hedgehogs. Measures to avoid such impacts are provided in Section 4.

4. Recommendations and Conclusions

The following recommendations have been developed based on the development proposals available at the time of writing. It should be noted that they may be subject to change upon receipt of the final design. The implementation of these recommendations will ensure compliance with the National Planning Policy Framework (2019)[22], the Conservation of Habitats and Species (Amendment) (EU Exit) ['CHSAEU'] Regulations 2019 and help to avoid or minimise adverse impacts on the environment and protected species, mitigate and compensate for losses where damage is unavoidable and promote opportunities to enhance biodiversity. There is a requirement that developments must provide net benefit for biodiversity.

4.1. Discussion of Proposed Design

The current development proposals include several ecological enhancements that have the opportunity to benefit the site and produce a positive ecological outcome, these are discussed in detail below in Section 4.4.

4.2. Precautionary Measures

4.2.1. Birds

To avoid adverse impacts to nesting birds, the clearance of vegetation including any trees or scrub will be undertaken from September to February outside of the bird breeding season (March to August inclusive). Alternatively, any works undertaken from March to August will be subject to a check for nesting birds by a suitably qualified ecologist immediately prior to removal of such habitats. If any active nests are found these will be protected, along with an appropriate buffer zone of 10m, until the nesting is complete, and the young have fledged[23].

4.2.2. Bats

Trees

No trees assessed as having low, moderate or high potential for roosting bats are proposed for removal to facilitate the development. Trees 23 and 24 are assessed as having low potential for roosting bats but are to be retained as part of the development. In addition, a tree protection zone, outlined in Plan 5 will be put in place before the construction phase of the development commences. Protective fencing should be erected before any plant is brought to site to ensure that no accidental damage is caused to these trees.

[22] Planning authorities must seek to maintain and enhance biodiversity in the exercise of their functions … and in so doing promote the resilience of ecosystems. Development should not cause any significant loss of habitats or populations of species, locally or nationally and must provide a net benefit for biodiversity.

[23] Some bird species, especially raptors and owls remain dependent upon the nesting site after fledging and so depending upon the species the nest site may need to be protected for a period of time after fledging.

Buildings

Prior to any works, including re-pointing commencing involving Barns 1 and 2, it is recommended that all cracks and crevices be inspected using an endoscope. This will ensure that no bats that could potentially be using the barn over winter are disturbed or become entombed as a consequence of the development. Acer Ecology Ltd. could be retained to provide this service.

4.2.3. Dormice

Works are understood to require minor clearance of vegetation on the north-eastern section of the site. If the working area is kept to a minimum, it is considered that the works can proceed without the need for a full dormouse survey. The works should be undertaken following a precautionary non-licensed method statement for dormice, which would include conditions such as:

- The vegetation clearance should be kept to the absolute minimum required to facilitate the development;
- The clearance should be undertaken under the direct supervision of a licensed ecologist (this could be undertaken at the same time as the nesting bird check);
- If dormice are found during the proposed works, all works should cease as soon as it is safe to do so. At this point, a European Protected Species Mitigation Licence from NE may be required; and
- Vegetation should be allowed to revert to its pre-works condition as much as is possible.

If significant areas of vegetation, including the woodland/scrub adjacent to the site are to be affected, more detailed surveys may be required to establish the presence or likely absence of dormice and inform the appropriate mitigation.

4.2.4. Pollution Prevention Measures to Protect Pond

Pollution Prevention Measures

Pollution prevention measures will be implemented in both the construction and operational phases of the development in order to protect the pond and wider site. The measures to be implemented are partly outlined in the Environment Agencies[24] guidance document 'Working at construction and demolition sites: PPG6 Pollution Prevention Guidelines[25] and 'Guidance for Pollution Prevention Works and maintenance in or near water: GPP 5'. In addition, the following measures have been adapted from the best practice guidelines for pollution prevention (GPP) full list[26/27] .

[24] Environment Agency guidelines are recommended as no equivalent guidance has been produced by Natural Resources Wales.
[25] Available online at http://bit.ly/1K1l17H. Note these guidelines were withdrawn on the 14th December 2015 but are still considered relevant.
[26] Available online at: https://bit.ly/2paIDRF
[27] A review plan for the PPGs is currently underway, replacing them with a replacement guidance series, Guidance for Pollution Prevention (GPPs)

Works Compounds

Works compounds will not be sited near to the pond on the site.

Contingency Measures

Contingency measures for unforeseen incidents such as spillages will be set in place prior to commencement of construction works. Such procedures and measures will cover atmospheric, aquatic or land pollution and procedures in the event of fire. Contingencies to control and contain hydrocarbon spillages from, for example parked vehicles, once the area is developed will also be implemented.

Spill Response

If an accidental spill occurs on site, a quick response is needed to contain the spilled material (e.g. fuel, hazardous material etc.). Spill kits and a staff induction will be provided prior to the start of works so that a quick response by staff on site is ensured if a spill occurs.

Deliveries

Deliveries to site can be a common cause of pollution. Vehicles can cause water, noise and dust pollution as they enter and exit the site, for example by spreading mud or contaminated material on neighbouring roads. Pollution can also be caused at the point of delivery, especially with fuels, oils and hazardous materials; for example, a fuel hose not correctly connected. Measures to prevent pollution caused by deliveries include:

- Identifying an area where all deliveries will be completed, and communicate the requirements to suppliers and those working on site;
- Ensure all deliveries are made as far away from the pond and any drains as possible;
- Defining times for deliveries to site and communicate these to suppliers and those working on site. Make sure these delivery times are suitable for neighbours, i.e. after 9am;
- Ensure any tanks, drums or containers coming to site are in a satisfactory condition. These will be regularly checked for damage or leaks;
- Clearly defining delivery and material storage areas;
- Make sure that deliveries of polluting materials are delivered directly to a safe storage area, and not left anywhere else on site; a safe storage area may need secondary containment depending on the material to be stored e.g. oil and hazardous chemicals;
- Ensure that all material deliveries will be supervised, especially hazardous materials;

Fuel Storage

- Ensure fuel storage areas are secured and protected from vandals;
- Locate fuel storage areas away from sensitive receptors such as drains or waterways;
- Remove interconnecting hoses at night or protect hoses further by using a scaffold tube with kee klamp fittings; and
- Ensure that fuel storage is bunded in accordance with the British Standard.

The above measures will help ensure the continued viability of the pond, protecting any GCN that may be present, although the likelihood of their presence on site is very low. If the enhancement measures discussed below are implemented, these could contribute to a valuable ecological feature in the context of the site.

4.2.5. Badgers

In line with good practice, any open trenches and excavations associated with the development will either be closed at night or a means of escape provided (e.g. plank at no greater angle than 45º) to help any badgers, hedgehogs or other trapped animals escape.

4.2.6. Reptiles

Measures to prevent direct impact to reptiles should concentrate primarily on minimising the risk of causing death and injury to individuals during any site clearance and construction operations. This should be achieved through the use of 'species deterrence' measures in the run-up to the commencement of works on-site.

Firstly, the development will seek to retain as much vegetation as possible in order to preserve the habitat for any wildlife that may utilise the site.

Secondly, any areas of vegetation (grassland or scrub and including vegetation on spoil piles) to be cleared will be strimmed or brush cut to a height of approximately 300mm during the period before construction, to make the area less suitable for reptiles or sheltering hedgehogs. Arisings should be removed immediately from site. The remaining vegetation will be left for at least 48 hours and then cut down to near ground level and left for another 48 hours prior to works commencing. This should make the areas unattractive to reptiles prior to development, thus encouraging them to leave the area. Mechanical clearance methods (e.g. gang-mowing, flail-cutting etc.) must not be used (to avoid killing wildlife and committing an offence).

4.3. Mitigation Measures

To compensate for the loss of a small amount of nesting bird nesting habitat, bird nesting opportunities should be provided by installing three artificial bird boxes on suitable features around the site. A variety of durable, woodcrete bird boxes, including maintenance free boxes suitable for trees, are available from Schwegler.

Bird boxes can be installed on trees or on the new house on the site. They should be located in secluded positions, ideally within dense cover and at a minimum height of 3m from ground level. There are an abundance of trees around the periphery of the site that provide suitable locations for such boxes.
Specialised boxes that cater for specific bird species could be deployed as detailed below:

- Open fronted – Open fronted nest boxes cater for a range of bird species, including robin (*Erithacus rubecula*), dunnock, wren (*Troglodytes troglodytes*), pied wagtail (*Motacilla alba*) and redstart (*Phoenicurus phoenicurus*). Due to the more exposed nature of these nest boxes, it is especially

important to ensure that they are located in dense cover in order to avoid the attention of potential predators. Suitable locations could be within ivy coverage on trees; and

- Standard nest boxes – An entrance hole of 32mm will attract species such as great, blue and coal tits, along with nuthatch (*Sitta europaea*), flycatchers (*Muscicapa striata* and *Ficedula hypoleuca*) and sparrows. These nest boxes can be sited in a wide range of locations throughout the site. Typical places would be on trees within the areas of scrub and woodland. Alternatively, boxes could be placed externally on building walls.

4.4. Compensation and Enhancement Measures

Provision for biodiversity will form an integral part of the development, and as such, compensation and enhancement measures should not simply be viewed as ways in which impacts to the site can be mediated, but as fundamental parts of the development itself which aims to maximise the potential for wildlife within the site.

4.4.1. Grassland Enhancement

As part of the development's landscaping plan, grassland habitat on site is to be retained and have its wildlife value improve as part of the development (see Plan 7). As part of these improvements, it is recommended that the semi-improved grassland will be enhanced, adopting appropriate meadow management techniques, thus making it more valuable for invertebrates and therefore birds, bats and reptiles. These measures that would help reach the desired grassland enhancement as part of the development are discussed below.

Appropriate wild flower seed mixes could be sown to enhance the floristic diversity of this habitat. They provide a source of food and shelter for a host of insects, which in turn benefits species higher up the food chain. If possible, to ensure the success of the seedlings, planting will be carried out by hand. Subsequent aftercare and site management will be required. All plant stock will be of British native origin. Planting is recommended to be undertaken during the autumn to allow seedling roots to establish over the winter and have a greater chance of competing with the existing sward in the spring and summer.

The grassland habitat should ideally be mown in autumn as this timing allows plants to flower and set seed which will not only increase the floristic diversity of the site, but will also benefit invertebrates that require nectar sources and roosting locations during the spring and summer. Ideally, the sward should be cut to a height of 8 to 10cm. The grassland should be divided into two areas and each area mown on rotation in every second year in late summer (September), by hand or with a small-scale mowing machine (i.e only half of grassland area will be cut each year). Arisings should be collected and removed from site. In addition, further wildlife friendly mowing practices, such as cutting the field from the centre outwards, or mowing from one side of the grassland to the other, may benefit late season ground nesting birds.

The use of herbicides, pesticides and artificial fertilisers on site should generally be avoided, although pernicious weeds may need to be spot-treated with herbicide.

The provision of log and rubble piles could be sited in shaded areas across the site. These will provide valuable habitats for invertebrates which in turn provide a food source for birds, bats, amphibians, reptiles and hedgehogs.

4.4.2. Green Roof

The majority of the land to be cleared for the development is a mixture of hard standing and spoil habitats that are of limited ecological value. A portion of these habitats will be replaced by the multi-level 'green roofs' that are to be incorporated within the development. The new dwelling will incorporate areas of vegetated 'green roof', to provide additional habitat of value for plants, foraging birds and invertebrates.

The addition of green roofs as part of the development will provide many benefits such as improving air quality, providing a good habitat for wildlife, slowing water runoff, preventing gutters from overflowing, increased thermal insulation of the building, decreasing flood risk and aesthetic impact.

A degree of maintenance will be required to avoid excessive colonisation of scrub and congestion of rainwater goods such as drainpipes. Specific measures concerning the installation of a green roof will be sought from a specialist contractor. It is outside the scope of this report.

4.4.3. Compensatory Planting

The small number of trees cleared to facilitate the development will be compensated for through planting of additional native trees and shrubs on site. Chosen shrubs/ trees must be indigenous to the locality and of UK provenance. Berry and nut producing species should be included which will increase foraging opportunities for a range of faunal species.

Suitable species for use in any new tree or shrub planting include holly, common hawthorn, wild cherry (*Prunus avium*), rowan (*Sorbus aucuparia*) and guelder rose (*Viburnum opulus*). Alternatively, plant species that provide a rich source of nectar could be used. Suitable species include flowering herbs such as lavender (*Lavandula sp.*) and violets (*Viola* sp.), and shrubs such as flowering currant (*Ribes sanguineum*), privet (*Ligustrum vulgare*), forsythia (*Forsythia* sp.), dogwood (*Cornus sanguinea*), berberis (*Berberis sp.),* pyracantha (*Pyracantha sp.*) and ceanothus (*Ceanothus sp.*).

This will provide compensatory nesting habitat as well as compensatory foraging habitat for invertebrates and birds.

4.4.4. SuDs Feature

As part of the development, a SuDs feature is to be created in the north-western section of the site. There is scope to incorporate ecological enhancement measures into the design of the SuDs features, without compromising its core function. These measures could also be applied to the pond in the central part of the site that should be enhanced as part of the development.

To further enhance the ecological value of the SuDs feature, the periphery of the feature could be planted with a native species-rich marginal seed mix, and a selection of native shrubs, which will serve several

purposes: to shield the basin, creating an aesthetically pleasing screen; to enhance ground-water absorption; and to increase the ecological value of the features.

In order to prevent the gradual encroachment of scrub, an active management regime will be required, in which thinning, and the removal of scrub occurs every three years. In order to avoid the risk of adversely affecting nesting bird species, the management will take place during November to February inclusive.

4.4.5. Pond

Although there is a small pond located within the centre of the site, it is of limited value to wildlife. The improvement of this pond into a larger regular water source would greatly add to the ecological value of the site. The pond could be as small or as large as feasible, but a larger water body will offer greater scope for biodiversity. The pond is already located adjacent to the semi-improved grassland, when this grassland habitat is enhanced it will help animals migrate across the site to the pond.

Ideally, the pond would have an irregular ovoid shape, of at least 7m in diameter, be at least 50m^2 in area, and have a gently sloping bank profile, to a maximum depth at the centre of about 1m. It is important that at least one side of the pond would have a sloped edge so that any animals that fall in could escape easily.

If the pond was to be enhanced, it would be allowed to fill naturally. New planting would be undertaken as soon as it has filled with rainwater. The planting of the pond would include native aquatic and emergent species which are indigenous to the region and of UK provenance. In addition, fish would not be introduced at any time, as these can have a significant adverse effect on amphibian and invertebrate species.

The spoil arising from digging the pond (if required) could be left on site as un-compacted mounds or banks. If mixed with other materials such as clean rubble, this can provide a good shelter/hibernation site for reptiles and amphibians, with cracks, fissures and, in time, small mammal burrows and tussocky vegetation, further enhancing the site for wildlife.

The condition of the pond should be monitored annually to ensure that it does not become colonised and congested with terrestrial vegetation. Peripheral vegetation should be periodically cut back to prevent congestion within the pond. Furthermore, de-silting and removal of leaf litter should be undertaken when necessary.

4.5. Longevity of Report

If development works do not begin within eighteen months to two years of the date of this report of this report, an update survey is likely to be required in accordance with guidance from Natural England (CIEEM, 2019) and BS 42020:2013[28], to determine if conditions have changed since those described in this report.

[28] As set out in Section 6.2.1, point 7 which states that ecological information should not normally be more than two/three years old, or as stipulated in good practice guidance).

4.6. Conclusions

Provided the precautionary and mitigation measures detailed in Section 4 are implemented, the development is not anticipated to result in adverse impacts to any protected sites, habitats or species.

The site's ecological value is not considered to represent a fundamental in-principal constraint to the proposed development.

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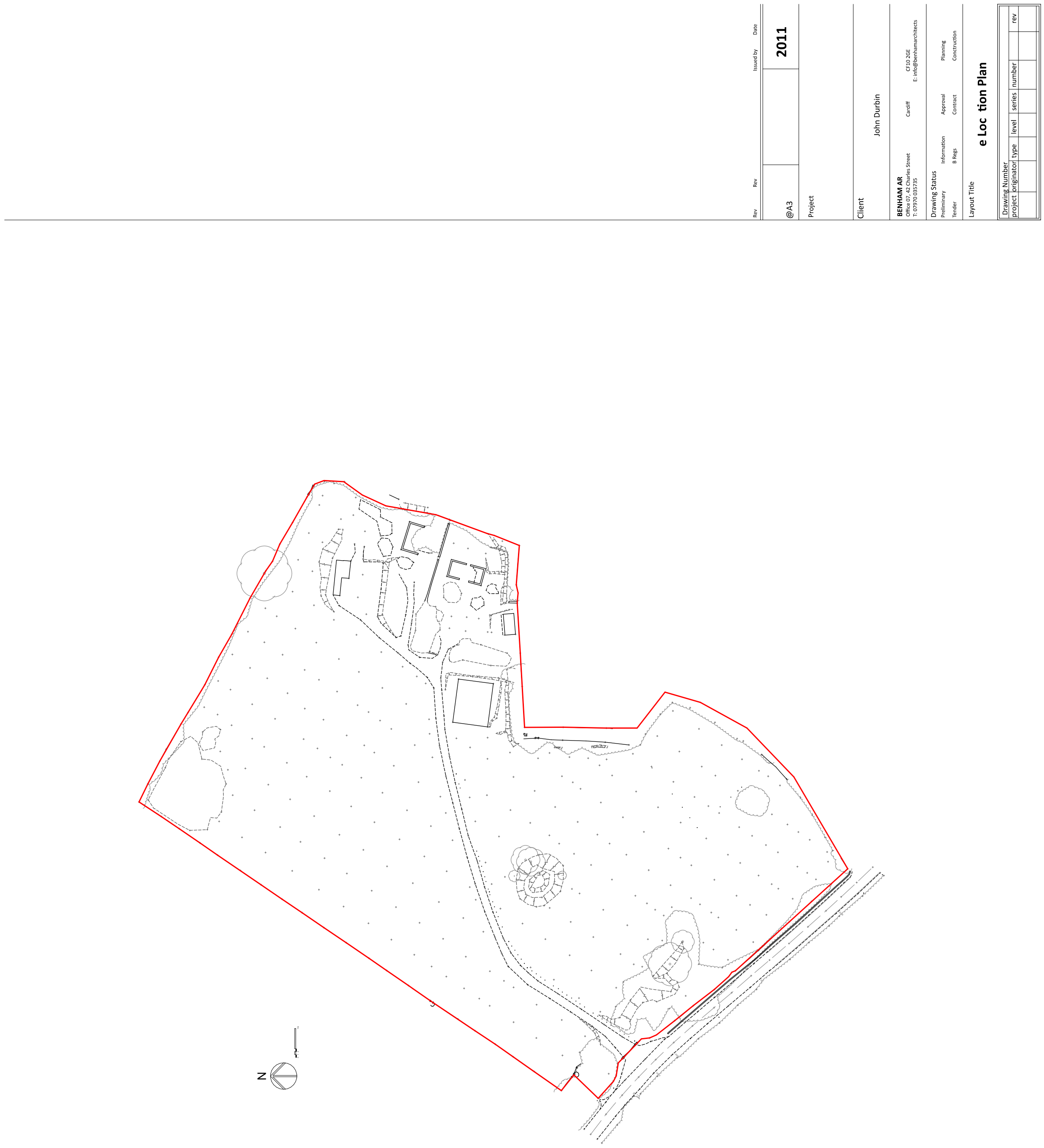
Plan 1: Site Location Plans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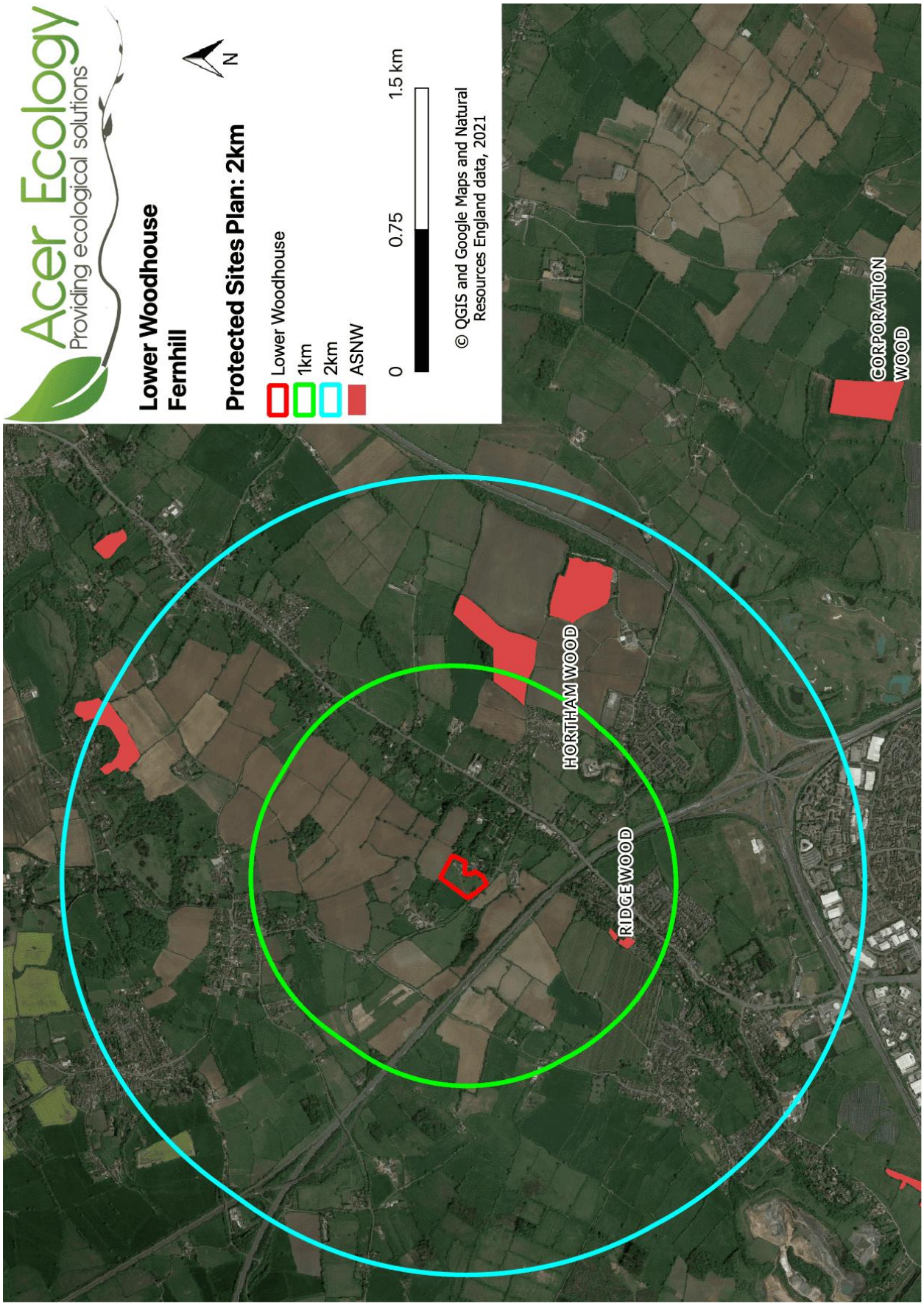
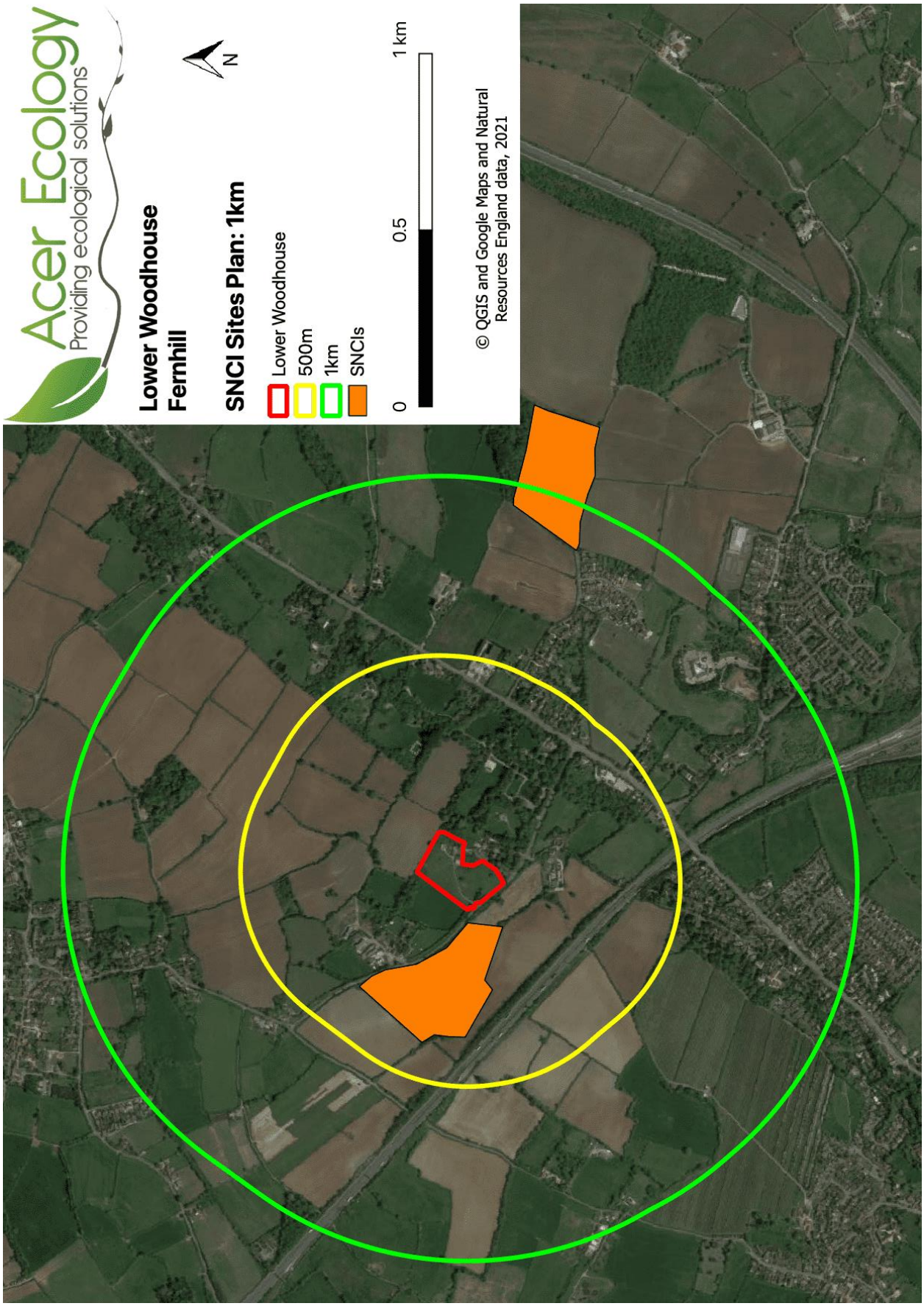
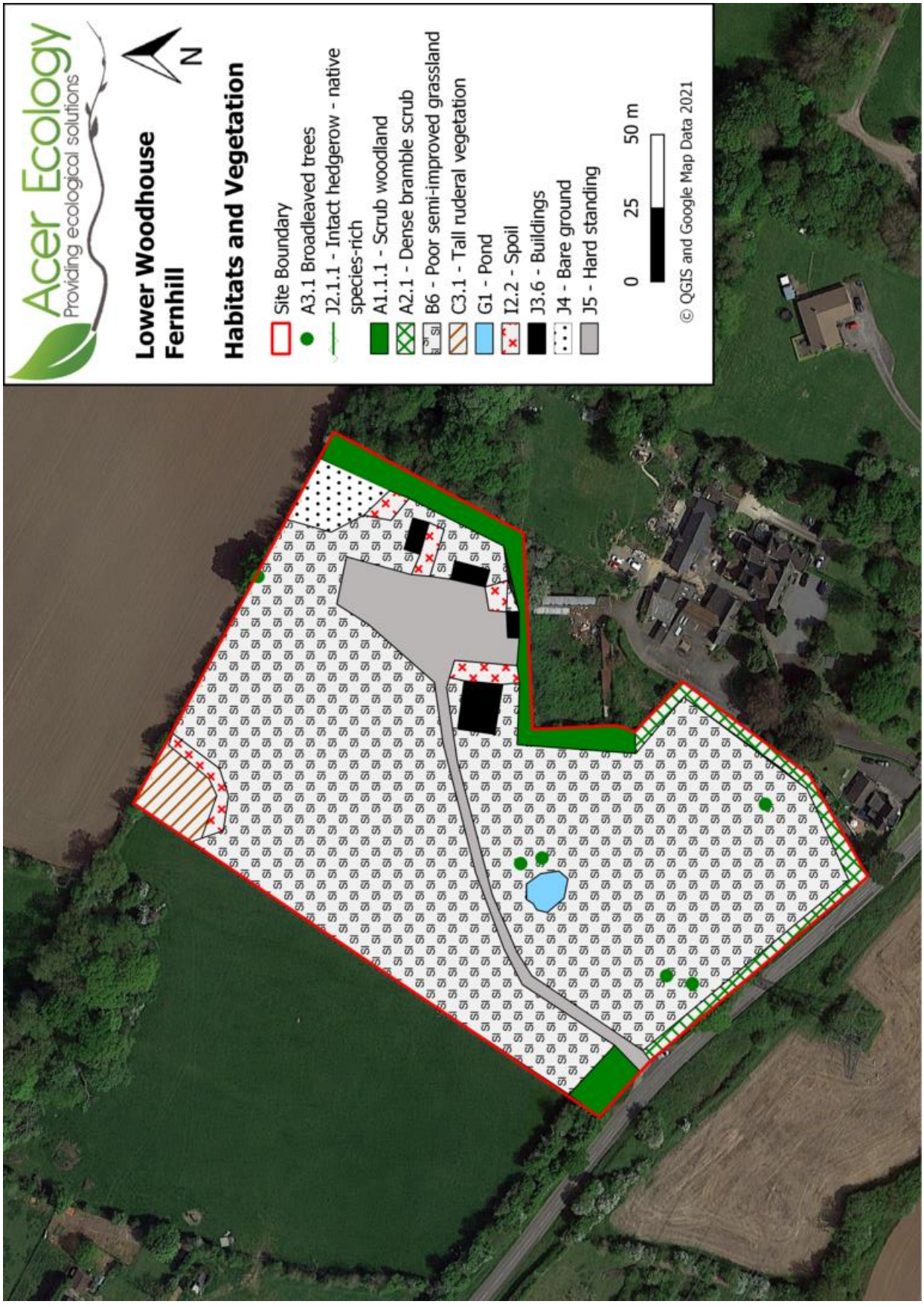
Plan 2: Site Location and Protected Sites (2km Buffer)



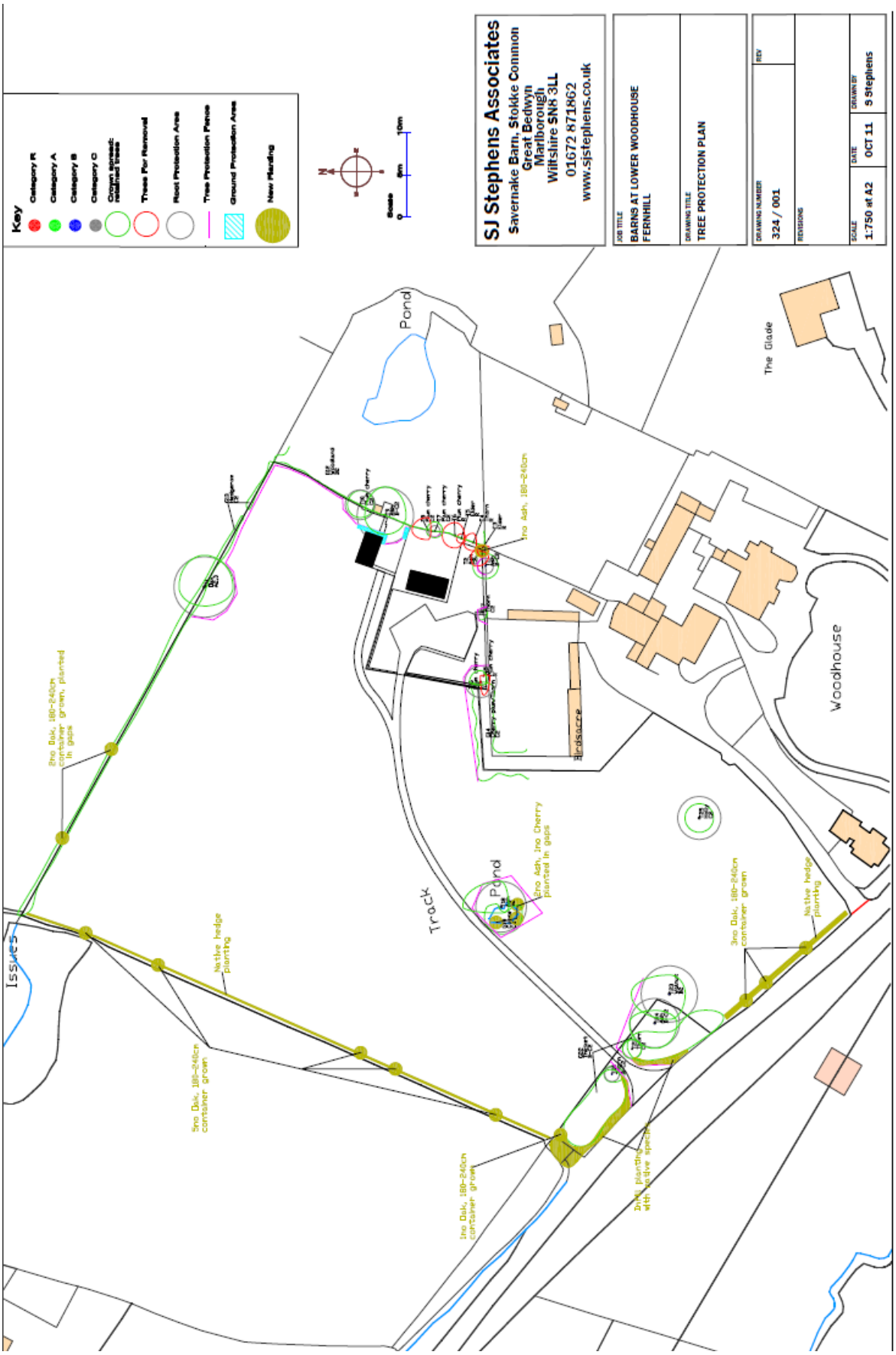
Plan 3: Site Location and SNCIs (1km Buffer)



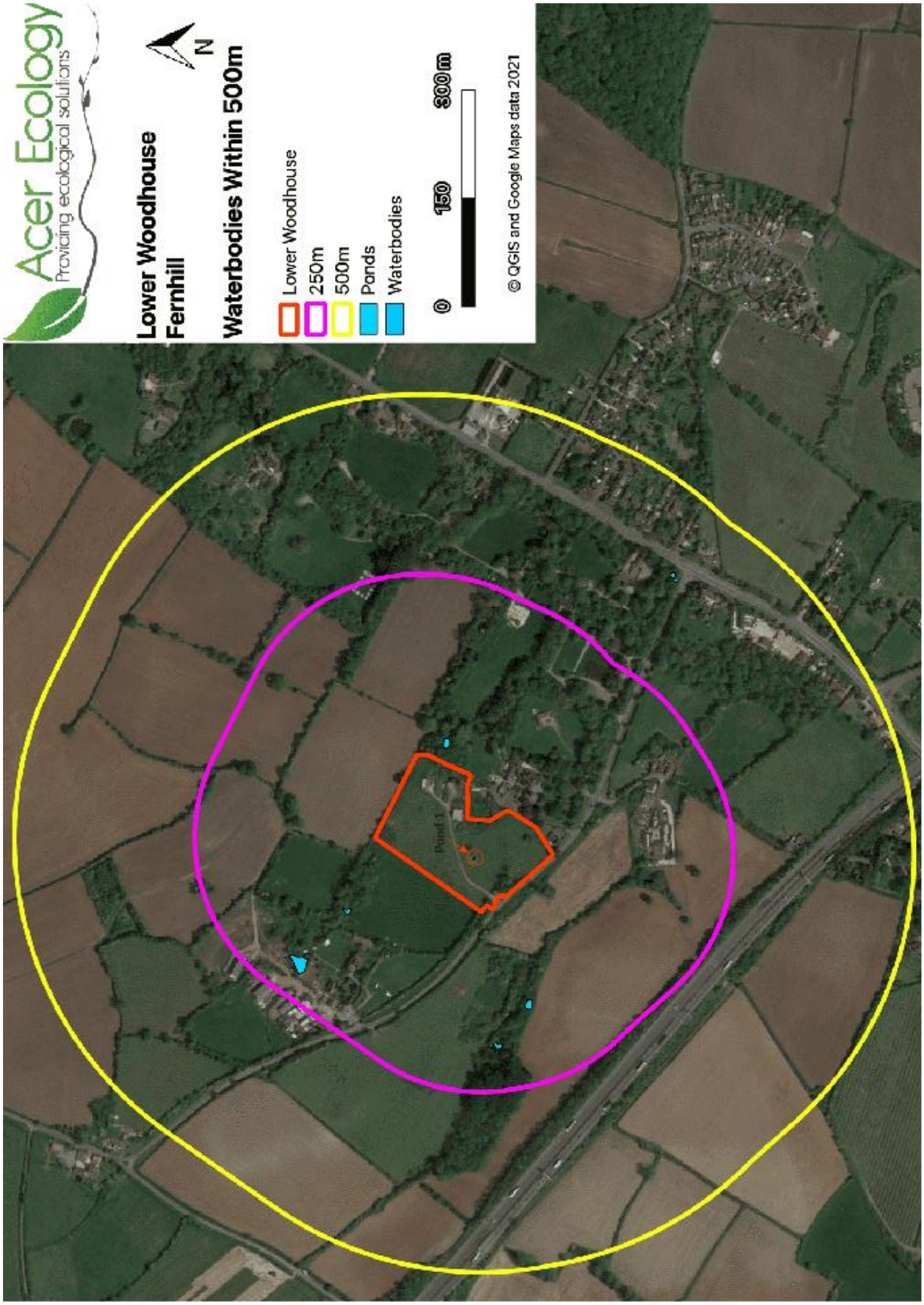
Plan 3: Habitats and Vegetation



Plan 4: Tree Inspection Plan

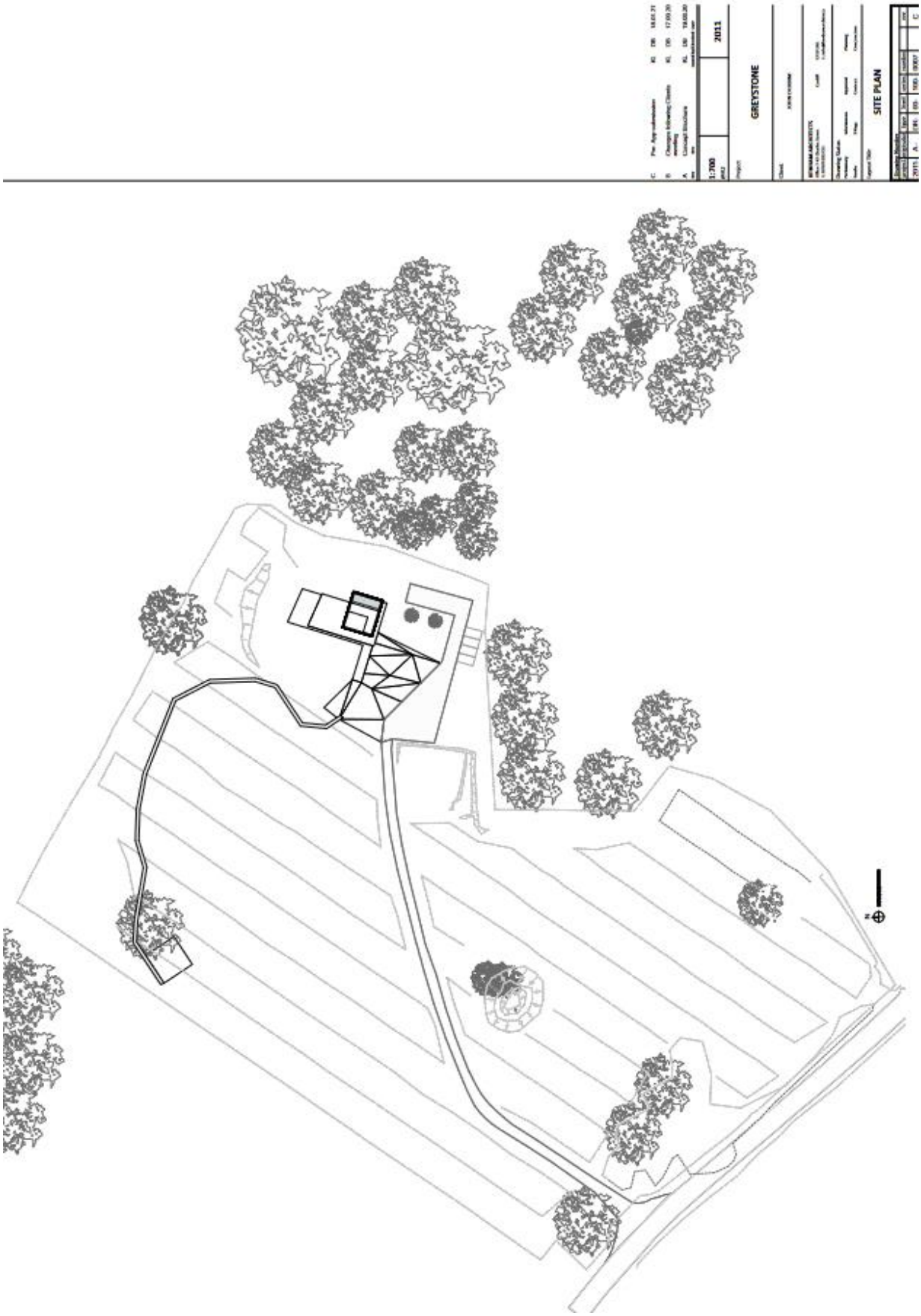


Plan 5: Location of Water Bodies within 0.5km of Site



Plan 7: Mitigation Plan

Appendix 1: Proposed Development Works



Appendix 2: Legislation and Policy Relating to Statutory and Non-Statutory Designated Sites and Planning Policy Relevant to Site

SNCIs

SNCIs are one of a class of nature conservation designations collectively referred to as 'Wildlife Sites'. Wildlife Sites are so-called 'third tier' sites, generally ranked below sites which are of international (first tier) or national (second tier) biodiversity significance, but which are considered to have substantive nature conservation value at the regional or district level. They are usually designated at the county or county borough level by the relevant local planning authority, and are recognised as a planning constraint in the relevant statutory development plan.

The framework for the identification and designation of 'Wildlife Sites' is set out in various Government documents, and is referred to in *Planning Policy Wales* (2021) *and Technical Advice Note (Wales)* 5: *Nature Conservation & Planning*.

ASNW and Woodland

The UK is a sparsely wooded country: 11.5% of Great Britain is covered with trees. Only 1.2% of the UK is ancient semi-natural woodland, a valuable and irreplaceable natural resource. Ancient semi-natural woodland, and plantations on ancient woodland sites, are a priority for conservation (JNCC).

Natural Environment and Rural Communities (NERC) Act 2006 Under Section 40 of the Natural Environment and Rural Communities Act (2006), Local authorities have a duty to have regard to the conservation of biodiversity in exercising their functions. The duty affects all public authorities and aims to raise the profile and visibility of biodiversity, to clarify existing commitments regarding biodiversity, and to make it a natural and integral part of policy and decision making.

National Planning Policy Framework (2019)

The National Planning Policy Framework (2019) states that the presence of a protected species should be a material consideration when considering a development proposal which, if carried out, would be likely to result in harm to the species or its habitat.

Appendix 3: Protected Species Legislation

Birds

All wild British birds (while nesting, building nests and sitting on eggs), their nests and eggs (with certain limited exceptions) are protected by law under Section 1 of the Wildlife and Countryside Act 1981 (as amended) and the Countryside and Rights of Way Act 2000. Included in this protection are all nests (at whatever stage of construction or use) and all dependent young until the nest is abandoned and the young have fledged and become independent. Particularly rare species such as barn owl (*Tyto alba*) are listed on Schedule 1 which gives them additional protection from disturbance whilst nest building, whilst near a nest with eggs or young, or from disturbing the dependent young.

Bats

All species of bats and their roosting sites are protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species (Amendment) (EU Exit) ['CHSAEU'] Regulations 2019 All species of UK bats are designated as 'European protected species'. Seven species of bat (soprano pipistrelle, barbastelle (*Barbastella barbastellus*), Bechstein's (*Myotis bechsteinii*), noctule, brown long-eared, lesser horseshoe (*Rhinolophus hipposideros*) and greater horseshoe bats (*Rhinolophus ferrumequinum*)) are listed under under the Natural Environment and Rural Communities (NERC) Act 2006 as being of principal importance for maintaining and enhancing biodiversity in England.

Great Crested Newt

GCN is a 'European protected species' afforded full protection under both UK and European legislation. This protection extends to the habitats which support GCN and it is generally assumed that the species might be present in terrestrial habitats up to 0.5km[29] of a breeding pond, depending on habitat quality, connectivity and population size. The GCN newt is a priority under the Natural Environment and Rural Communities (NERC) Act 2006 as being of principal importance for maintaining and enhancing biodiversity in England.

It is also included in the South Gloucestershire Council Local Biodiversity Action Plan.

Dormice

Dormice are a 'European protected species' and afforded full protection under both UK and European legislation. Dormice are listed under the Natural Environment and Rural Communities (NERC) Act 2006 as being of principal importance for maintaining and enhancing biodiversity in England. Since 2000, the UK

[29] Great Crested Newts have been recorded travelling long distances: 1.3km within a 7-week period by an immature individual GCN (Kupfer 1998, detailed in Jehle et al 2011); 250m in a study by Beebee and Griffiths (2000) and 120-360m in a study by Arntzen and Tenuis (1993). In addition, a study by Duff (1989) found that over half of a population overwintered in an area more than 120m away from the main breeding pond. However, long-distance movement of GCN is rare and most studies indicate that much shorter distances are typical (Jehle et al 2011). As a general rule, suitable habitats within 250m of a breeding pond are likely to be used most frequently (English Nature 2001).

population has declined by over a half (51%), decreasing on average by 3.8% per year (PTES, 2019). It is included in the South Gloucestershire Council Local Biodiversity Action Plan.

Badgers

Badgers are protected under the Protection of Badgers Act 1992. Protection applies both to the animal itself and to its nesting burrows (setts), and current interpretation of the Act also confers some protection to key foraging areas.

Reptiles

With the exception of smooth snake (*Coronella austriaca*) and sand lizard (*Lacerta agilis*) (which are afforded greater protection), common reptiles are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). They are given so-called 'partial protection', which prohibits the deliberate killing or injury of individuals. The habitats of common reptiles are not specifically protected. These species are listed as being of principal importance for maintaining and enhancing biodiversity under the Natural Environment and Rural Communities (NERC) Act 2006.

Hedgehogs

Hedgehogs are listed as a Red List mammal species in Britain and are afforded partial protection under the Wildlife and Countryside Act (1981) and are listed as priority species under the Natural Environment and Rural Communities (NERC) Act 2006 as being of principal importance for maintaining and enhancing biodiversity in England. Additionally, hedgehogs are listed a priority species listed under the UK Biodiversity Action Plan in light of dramatic population declines. The legislation afforded to hedgehogs in the Countryside and Rights of Way (CRoW) Act 2000 and National Planning Policy Framework (2019) means that every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity[30]. In effect, 'conserving biodiversity' includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat.

They are also listed in the South Gloucestershire Council LBAP in light of dramatic population declines.

[30] Biodiversity conservation in respect to hedgehogs is interpreted as a commitment to restoring or enhancing their population.

Appendix 4: Species Recorded

All species recorded by Acer Ecology, 2021

Taxonomic Name	Common Name	W	LM	CG	LDA	PMG	PIL	TF	Status
Trees and Shrubs									
Buddleja davidii	Buddleia								Alien
Corylus avellana	Hazel								
Crataegus monogyna	Common hawthorn								
Fraxinus excelsior	Ash								
Ilex aquifolium	Holly								
Juglans regia	Walnut								Alien
Prunus domestica	Plum								
Quercus robur	Pedunculate oak								
Rubus fruticosus agg	Bramble								
Sambucus nigra	Elder								
Ulmus procera	English elm								
Herbaceous Plants									
Agrostis stolonifera	Creeping bent								
Calystegia sepium	Hedge bindweed								
Cirsium arvense	Creeping thistle								
Epilobium hirsutum	Great willowherb								
Geranium dissectum	Cut-leaved crane's-bill								
Geranium robertianum	Herb-robert								
Hedera helix	Ivy								
Heracleum sphondylium	Hogweed								
Holcus lanatus	Yorkshire fog								
Holcus mollis	Creeping soft-grass								
Lolium perenne	Perennial rye-grass								
Malva sylvestris	Common mallow								
Helminthotheca echioides	Bristly oxtongue						PIL		
Ranunculus repens	Creeping buttercup								
Rumex crispus	Curled dock								
Rumex obtusifolius	Broad-leaved dock								
Senecio jacobaea	Common ragwort								
Taraxacum officinale agg.	Dandelion								
Trifolium repens	White clover								
Urtica dioica	Common nettle								
'Habitat Indicator Species' Totals (Wales Biodiversity Partnership 2008[31])		0	0	0	0	0	1	0	
		W	**LM**	**CG**	**LDA**	**PMR**	**PIL**	**TF**	
Note: Indicator species have been devised for use in Wales but are considered relevant for English sites too.									

Appendix 5: Definitions of Site Value

[31] Wales Biodiversity Partnership (2008) Wildlife Sites Guidance Wales: A Guide to Develop Local Wildlife Systems in Wales. Wales Biodiversity Partnership/Welsh Assembly Government.

International Value

Internationally designated or proposed sites such as Ramsar Sites, Special Protection Areas, Biosphere Reserves and Special Areas of Conservation, or non-designated sites meeting criteria for international designation. Sites supporting populations of internationally important species or habitats.

National Value

Nationally designated sites such as Sites of Special Scientific Interest (SSSIs), or non-designated sites meeting SSSI selection criteria (NCC 1989), National Nature Reserves (NNRs) or Nature Conservancy Review (NCR) Grade 1 sites, viable areas of key habitats within the UK Biodiversity Action Plan. Sites supporting viable breeding populations of Red Data Book (RDB) species (excluding scarce species), or supplying critical elements of their habitat requirements.

Regional Value

Sites containing viable areas of threatened habitats listed in a regional Biodiversity Action Plan, comfortably exceeding Site of Importance for Nature Conservation (SINC) criteria, but not meeting SSSI selection criteria. Sites supporting regionally significant areas of BAP habitats or large and viable populations Nationally Scarce species, or those included in the Regional Biodiversity Action Plan on account of their rarity, or supplying critical elements of their habitat requirements.

County Value/District Value

Site identified as a Site of Importance to Nature Conservation (SINC) at the district level; meeting the Department for the Environment, Food and Rural Affairs (DEFRA) 2006 published guidance on the identification, selection and management of local sites, but falling short of SSSI designation criteria, whether designated as a SINC or not. Ancient woodlands and sites supporting regionally significant areas of UK BAP habitat. Large scale examples of BAP habitats or areas supporting small populations of protected, UK BAP/ LBAP or threatened species (other than badger).

High Local

Habitats which just fail to meet Regional value criteria, but which appreciably enrich the ecological resource of the locality. Sites supporting species which are notable or uncommon in the county; or species which are uncommon, local or habitat-restricted nationally, and which might not otherwise be present in the area. Moderate scale examples of BAP habitats or areas supporting small populations of protected, UK BAP/LBAP or threatened species.

Local Value

Old hedges, woodlands, ponds, significant areas of species-rich grassland, small scale examples of BAP habitats or areas supporting small populations of protected, UK BAP/LBAP or threatened species. Undesignated sites or features which appreciably enrich the habitat resource in the context of their immediate surroundings, parish or neighbourhood (e.g. a species-rich hedgerow). Rare or uncommon species may occur but are not restricted to the site or critically dependent upon it for their survival in the area.

Site Value (within the immediate zone of influence)

Low-grade and widespread habitats. Woodland plantations, structured planting, small areas of species-rich grassland and other species-rich habitats not included in the UK or Local BAP.

Negligible

No apparent nature conservation value.

Appendix 6: Guidelines for Assessing Proposed Development Site for Bats

Suitability	Commuting and Foraging Habitat
Negligible	Negligible habitat features on-site likely to be used by commuting and foraging bats.
Low	Commuting Habitat Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or un-vegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Foraging Habitat Suitable but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	Commuting Habitat Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Foraging Habitat Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	Commuting Habitat Continuous high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. Foraging Habitat High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Proximity to Known Bat Roosts Site is close to and connected to known roosts.

Suitability	Description of Roosting Habitat
Negligible	Negligible habitat features on site likely to be used by roosting bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection appropriate conditions[32] and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity) or hibernation[33].
Moderate	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 unlikely to support a roost of high conservation status[34] (with respect to roost type only) the assessments in this table are made irrespective of conservation status, which is established after presence is confirmed.
High	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.

[32] For example, in terms of temperature, humidity, height above ground levels, light levels or levels of disturbance.
[33] Evidence from the Netherlands, shows mass swarming events of common pipistrelle bats in the autumn followed by mass hibernation in a diverse range of building types in urban environments (Korsten *et al.*, 2015). This phenomenon requires some research in the UK but ecologists should be aware of the potential for large numbers of this species to be present during the autumn and winter in large buildings in highly urbanised environments.
[34] 'High roost status' is not defined within Collins, 2016. Acer Ecology Ltd. interpret maternity, hibernation, swarming sites, mating sites, and satellite roosts as being of 'high roost status' and exclude day roosts, night roosts, feeding roosts, transitional/occasional roosts from this definition.

Appendix 7: Bat Survey Protocol for Trees Affected by Arboricultural Work

The trees were assigned to the following categories:

Suitability	Description of Roosting Habitat	Commuting and Foraging Habitat
Negligible		Negligible habitat features on site likely to be used by commuting and foraging bats.
Low	A tree of sufficient size and age to contain PRFs but with none seen from the ground[35].	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only) the assessments in this table are made irrespective of conservation status, which is established after presence is confirmed.	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	A tree 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.	Continuous high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.

[35] This system of categorisation aligns with BS 8596:2015 Surveying for bats in trees and woodland (BSI, 2015).