

Ecological Impact Assessment of land at

Cartway Cottage
Woodbank
Abdon

Craven Arms
Shropshire

SY7 9HX

(SO588.853)

Planning application 21/02248/FUL

By Churton Ecology
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SUMMARY

Background

Churton Ecology was instructed by Sean Graham to carry out an Ecological Impact Assessment, of land proposed for a three bay detached garage, to include change of use of land to domestic curtilage, at Cartway Cottage, Woodbank, Abdon, Craven Arms, Shropshire, SY7 9HX (grid ref. SO588.853).

Method of study

The Ecological Assessment, which will accompany the planning application, has aimed to provide and evaluate ecological information with relevance to the proposed works, based on the results of a field survey and desk study. In addition, impacts, the need to do further surveys, mitigation & enhancements, have been considered.

Baseline ecological conditions

Designated sites and priority habitats in the surrounds

The site lies within the Shropshire Hills Area of Outstanding Natural Beauty.

There are no statutory sites for nature conservation in the 2km surround but the extensive Clee Liberty Local Wildlife Site (and common) lies to the east and south of the site. The site is neither core nor corridor habitat but is part of the buffer zone on the Shropshire Environmental Network.

The MAGIC maps show that the development is of a size and type that would not have any adverse effect on the nearby SSSI.

Site habitats

The site is located in a small gully adjacent to/west of the existing driveway (to Cartway Cottage) which runs on higher ground, retained by a dry stone wall. The gully supports grassland, with a few shrubs and immature trees on the sloping sides. The garage will flank the current fence-line which defines the east boundary of the adjacent grassland field (in the same ownership) i.e. the garage will be erected largely on grassland, partly in the 'garden' and partly in the field.

The grassland is not a priority habitat and is not considered to be of an important ecological feature of the site.

Bats

Although the site supports some trees, none have bat roost features. However, bats may roost in other nearby features (the cottage and/or mature trees) and may forage and commute over the site.

Bats (foraging and commuting) are, therefore, considered to be an important ecological feature of the development site in a site context.

Reptiles

The site, with dry stone walls and intermittent long grass, offers suitable terrestrial habitat for both Slow-worm and Common Lizard.

Slow-worm (and Common Lizard) may be important ecological features of the site.

Birds

Some breeding birds (hedgerow species) are considered to be an important ecological feature of the site in a site context only.

Other species

No other species are considered to be an important ecological feature of the site.

Mitigation and enhancements

Any of the above features identified as being of ecological importance may be susceptible to some form of adverse/negative impact. With avoidance and mitigation measures in place for each of the important features on and near the development site i) providing a sensitive lighting plan in the operational phase, see Section 5.1.1 ii) following a method statement in the construction phase to safeguard reptiles, see Section 5.1.2 and iii) avoiding hedgerow, scrub and tree clearance in the bird breeding season during construction, see 5.1.3, there will be no residual negative effect on biodiversity. With enhancements in place i) planting a native boundary hedgerow along the west side of the garage ii) erecting a bat box on/in the new build iii) erecting bird boxes on trees in the wider surround and iv) controlling Bracken in the north field flanking the driveway, there is likely to be some biodiversity gain on the site and surrounds, and the Shropshire Environmental Network will be enhanced.

1 INTRODUCTION

Churton Ecology was instructed by Sean Graham to carry out an Ecological Impact Assessment, of land proposed for a small development at Cartway Cottage, Woodbank, Abdon, Craven Arms., Longville, Shropshire, SY7 9HX (grid ref. SO588.853).

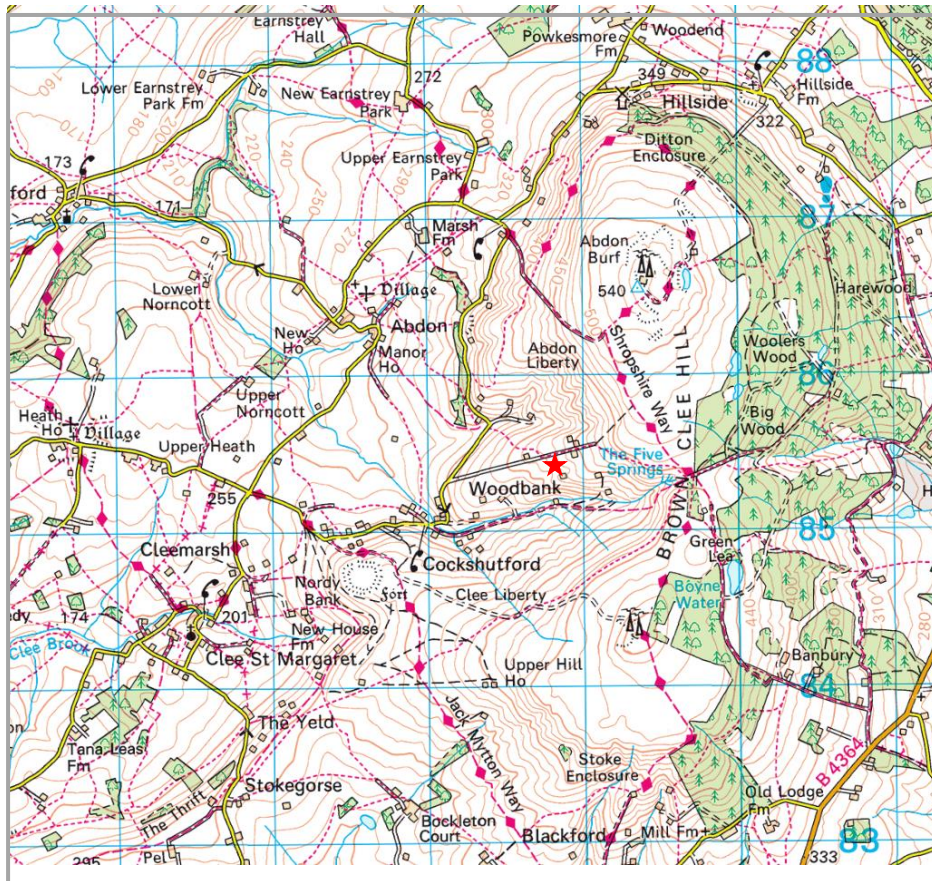


Figure 1: Location of proposed development (red star)
OS map licence no.100048619

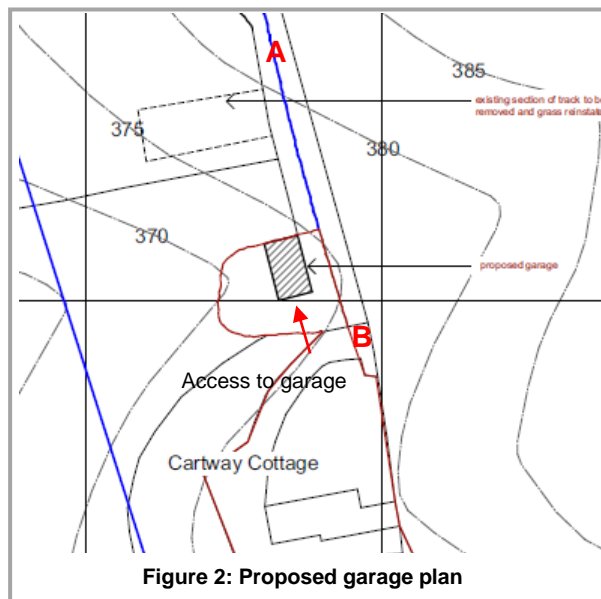


Figure 2: Proposed garage plan

The proposal is for a three bay detached garage, to include change of use of land to domestic curtilage. The garage will be accessed from the driveway to the south of the site.

The Ecological Assessment, which will accompany the planning application, has aimed to i) provide and evaluate ecological information with relevance to the proposed works, based on the results of a field survey and desk study ii) identify and assess any potential significant impacts that might occur if the site is developed (before and after mitigation) iii) identify any further survey work and mitigation measures that might be necessary prior to the validation of a planning application and iv) identify appropriate enhancement measures, and recommendations.

An ecological assessment particularly aims to include features with a higher ecological value e.g. designated sites and protected species.

2 METHODOLOGY

2.1 Desk study

In the desk study the ecological features considered included i) designated sites within 1km of the site ii) presence of priority habitats within 500m of the site and iii) previous records in the 2km surround of relevant protected, priority or notable species.

Searches were conducted using the NBN Gateway and MAGIC maps.

OS maps and aerial photographs were used to identify landscape features of potential ecological interest including ponds, streams and ditches, and areas of apparent (semi-) natural value.

In addition, information on potential impacts on designated sites was sought on the Defra MAGIC maps – this information is largely based on the type of development and the distance of the development from any designated site.

2.2 Field survey

In the field survey, the ecological features considered included i) all habitats within the overall site and the immediate surrounds ii) presence and/or potential for presence of protected, priority or notable species within the site and the immediate surrounds and iii) potential Great Crested Newt breeding habitats within 250m of the development site that might be affected by the development.

2.2.1 Habitat survey

A field survey of the site and surrounds was conducted on 27/10/2021 by Kate Thorne following the JNCC (2010) Phase 1 methodology.

All plant species recorded on site were noted. In the text species are referred to using their English names.

All habitats were assessed, and their importance/value noted based largely on whether i) the site or any part of the site is designated or not for nature conservation ii) any habitat classes as a UK or local priority habitat (the former are included in Section 41 of the NERC Act as 'habitats of principal importance') and iii) the botanic diversity and/or the potential for any habitat present to support uncommon or rare species of flora and fauna (e.g. axiophytes, Red Data Book species).

2.2.2 Protected species survey

A range of protected and priority species surveys was also carried out on 27/10/21. Initial surveys of such species aim to gather information on the presence of or potential for presence of any European Protected Species (e.g. bats, Great Crested Newt, Otter and Dormouse) and other species protected under domestic law only (Water Vole, reptiles, Schedule 1 birds, breeding birds and Badger) as well as UK and local priority species (offered some protection under the NERC Act). Note: there is some overlap between these groups with protection of EPS species implemented through UK law (The Habitat Regulations, amended 2019) and many protected species also having priority status.

Bat species

Roost survey

Features thought suitable to support bat roosts were noted within and/or near the site.

Habitat Assessment

A general habitat suitability assessment of the area was carried out to determine its likely value as foraging and commuting habitat.

Great Crested Newt

Water bodies within 250m of the site were sought using OS maps and aerial photographs. None were found.

Dormouse

The habitats within the site were assessed for their potential to support Dormouse.

A nut search was carried out for a period of around 40 minutes.

Badger

Evidence of site use by Badger, such as latrine pits, paths, snuffle holes, feeding remains and hairs (in burrow spoil or snagged along trails) was also sought. A 30m surround of the site was sought for setts.

Reptiles

The habitats in the survey area were assessed for their potential to support the 'widespread' reptile species. Areas were assessed for their potential to provide permanent, seasonal and/or temporary reptile habitats. Dispersal links and barriers between more abundantly suitable habitats were also considered in relation to mobile species.

Breeding birds

Habitats, with potential to support common, priority or Schedule 1 species of nesting bird were sought within the overall site and surrounds. Birds seen and heard during the survey were recorded and old nests were attributed to species where possible.

Other protected or priority species

Habitats were assessed for their suitability to support other protected and priority species. Where no suitable habitats exist and/or where no impacts can be reasonably predicted, species can be discounted from further survey or assessment (e.g. Otter, Water Vole and White-clawed Crayfish).

3 RESULTS AND EVALUATION

3.1 Designated sites

Statutory sites

The site lies with the Shropshire Hills Area of Outstanding Natural Beauty. There are no statutory sites for nature conservation in the 2km surround.

Non-statutory sites and UK priority habitats

The extensive (225ha) Clee Liberty Local Wildlife Site and area of common land lies to the east and south of the south; this LWS supports heathland, acid grassland, wet flushes, scrub and bracken.

Lowland meadow is present at around 250m to the north-east of the site.

Evaluation and discussion

The designated sites in the surrounds may be important ecological features of the site's zone of influence, and any adverse impact on them must be considered, see Section 4.2.

3.2 Environmental Network

The site is neither core nor corridor habitat but is part of the buffer zone on the Shropshire Environmental Network.

3.3 Site habitats and plants

3.3.1 Overview and evaluation

The site is not a designated site.

The Cartway Cottage site overall is located on high ground with slopes facing both south and east, the latter towards Brown Clee Hill but separated from it by a small stream valley.

Access to the cottage is off a track to the north. The driveway runs across the highest ground through acid grassland and then starts to descend (at approximately point A in Figure 2) across a small gully to reach the house in the south. The driveway is retained by an old dry stone wall across the gully.

Along the east side of the driveway, from point A to B, an old hedgerow runs with the drive. At point B, where the driveway swings to the west, the old hedgerow runs southwards as the boundary of the Cartway Cottage garden.

West of and below the retaining wall, the gully remains but becomes more gentle as it extends westwards across a fence line into the adjacent field. The area proposed for the garage is largely grassland partly in the 'garden' and partly in the field. On the garden side of the fence the slopes down into the gully bear some native shrub (Hazel) and a few immature planted trees.



P1 and P2: site in gully, red arrows indicate the grassland either side of a fence
P1: site viewed from the south-west, **P2:** site viewed from the north-west



P3 and P4: the track crossing the gully area; red arrow indicates the site
P3: track & site viewed from the north, **P4:** track & site viewed from the south at point B (on Fig 2)



P5: garden part of site viewed from the NE

P6: garden and field parts of site viewed from the N
 blue arrow = retaining wall alongside track



P7: garden part of site viewed from the west
 Blue arrow = retaining wall alongside track



P8: purple arrow = plantation through which the garage access will run from the driveway, viewed from the NE



P10: mature Alder along east of driveway



P11: small disturbed area near Point A (in Fig 2)



P12: acid grassland flanking track north of Point A

The grassland on the garage site is not a UK priority habitat and is not considered to be an important ecological feature of the site. Note: the grassland along the highest ground, flanking the driveway north of Point A in Figure 2, see photo 11, is quite a diverse grassland with several species typical of acid grassland [Tormentil, Harebell, Heath Bedstraw, Sheep's Sorrel and Common Bird's-foot-trefoil (also Bracken)] with a few other species more typical of neutral grassland [Knapweed, Lady's Bedstraw, Common Sorrel and Ribwort Plantain].

3.3.2 Habitat descriptions

Grassland

The grassland in the gully on the garden side is long, with coarse grasses dominant [Cock's-foot, False Oat-grass, Common Bent, Red Fescue and Yorkshire-fog] with a few grassland herbs [Common Sorrel, Creeping Buttercup, Germander Speedwell and Wild Strawberry], and shade-loving herbs [Herb Robert, Barren Strawberry and Hedge Woundwort], also some invasive species [Nettle, Bracken, Bindweed, Rose-bay Willowherb and non-native Ground-elder]. A non-native Comfrey and Nettle dominate in a narrow steep zone between the top of the retaining wall and the drive edge.

The grassland on the field side was being grazed on the survey date but the sward was long because grazing had only been in place for about a week. The sward is species poor with some presence of Thistle and Bracken.

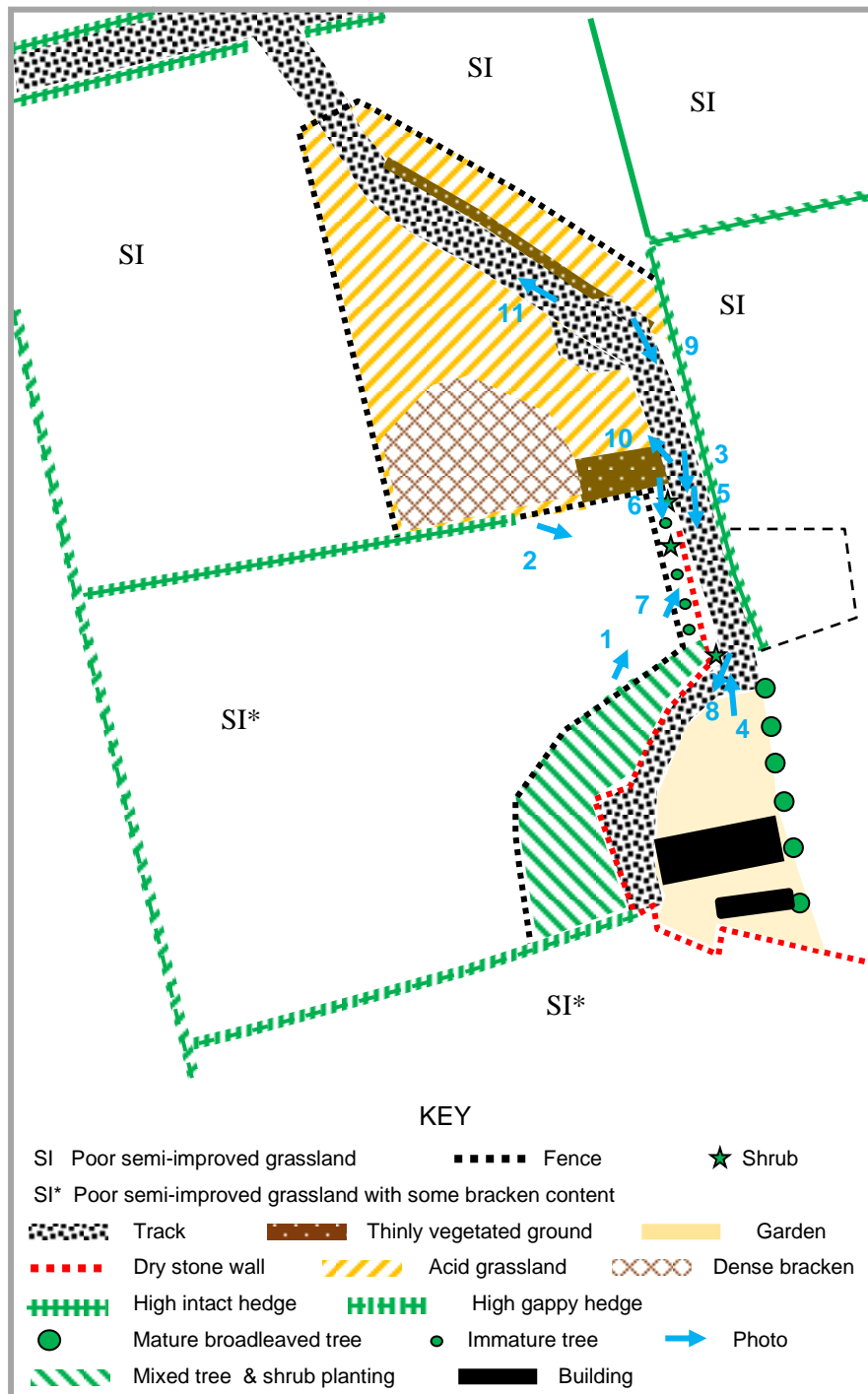


Fig 3: Phase 1 habitat map of land at Cartway Cottage, by Churton Ecology, October 2021

Plantation

Some peripheral mature Hazel and some immature planting [Hawthorn, Ash, Oak, Scot's Pine and Birch] are present in or on the sides of the gully, on the garden side. A very few of

these trees will be lost to the development.

To the south, within the garden, the grassland sward continues under scattered immature planted trees.

This band widens out from the south end of the gully and extends south-westwards around the west side of the main garden. A small area of this will be removed to allow access from the south to the garage.

The planting in the south is patchily denser than in the gully and there are some additional shade-loving herbs [Common Dog-violet, Wood Avens, Foxglove, Male-fern, Bugle and Primrose] and a few non-native species [Mint and Crane's-bill]. There is a wide range of coniferous trees [Sitka Spruce, Norway Spruce, Cypress, Western Red-cedar and Western Hemlock], broadleaved trees [Oak, Ash, Sweet Chestnut, Horse Chestnut, Laburnum, Whitebeam, Norway Maple, Beech, Cherry and Red Oak] and shrub [Buddleia, Redcurrant, Forsythia, Verbena sp., Cotoneaster sp., Broom, Lilac, Cherry Laurel and Garrya elliptica.

3.3.3 Flora

All the plant species found during the survey are common species.

3.4 Protected species survey

3.4.1 Bats

Field survey

None of the immature trees on the development site or the nearby mature Alder along the east side of the track have bat roost features.

However, there is potential for bats to roost in the nearby cottage or in other mature trees east and south of the cottage garden. The development site may, therefore, be used for foraging and commuting.

Evaluation

Bats (foraging and commuting) are considered likely to be an important ecological feature of the development site.

3.4.2 Great Crested Newt

There is a single record only for this species on the nbn.at nearly 2km distance.

There are no pools within 250m of the site.

Great Crested Newt is, therefore, not considered to be an important ecological feature of the site.

3.4.3 Dormouse

Desk survey

There are no records for Dormouse in the 2km surround on the nbn.

Field survey

There appears to be some potentially suitable habitat for Dormouse in and around the site – mature Hazel shrub and hedgerows. However, there is a degree of fragmentation of the hedgerows and the nearest broadleaved woodland is at 740m distance.

A nut search under several of the Hazel produced nuts nibbled by Squirrel and Wood Mouse only.

Evaluation

Dormouse is not considered to be an important ecological feature of the site.

3.4.4 Badger

Field survey

No evidence of Badger was found on or near the site.

Evaluation

Badger is not considered to be an important ecological feature of the site.

3.4.5 Reptiles

Desk survey

There are no records for any reptile species in the 2km surround on the nbn. However, a recent reptile survey of Clee Liberty in 2019 ‘found a small population of Common Lizard (*Zootoca vivipara*), believed to be restricted to deep gully channels which are densely vegetated in the upper reaches of the Common’. Titterstone Clee Hill, which has all of the habitats found on Brown Clee Hill and is at 5km distance, supports all four common British species – Adder, Grass Snake, Slow-worm and Common Lizard.

Field survey

The long grassland areas and the dry stone walls on and close to the development site have the potential to support Slow-worm and Common Lizard.

Evaluation

Reptiles may be an important ecological feature of the site in a site context.

3.4.6 Birds

Field survey

Few bird species were noted using the site habitats – wrong time of year.

The site has no suitability for ground nesting birds but the shrub and trees may be used for nesting by some bird species.

Evaluation

Birds breeding in shrub are considered to be an important ecological feature of the site.

3.4.7 Other protected and priority species

Field survey

There was no evidence of or potential for other protected or priority species on the site.

Evaluation

Given the nature and extent of the habitats present within the site, it is considered highly unlikely that the site provides integral habitat for other species in the locality.

3.5 Survey limitations

There were no significant survey limitations.

3.6 Further survey recommendations

No further surveys are recommended.

4 ASSESSMENT OF IMPACTS AND EFFECTS

4.1 General

This section identifies and describes all the potential impacts (with significant effects) that might arise from the proposed works on the development site, in the absence of avoidance measures and/or mitigation, only on important ecological features (habitats or species) identified in the 'Results and Evaluation' section. Impacts cover those in the construction and operational phases.

The significance of any residual effects is further discussed with mitigation and/or enhancements & recommendations in place.

Bats (foraging and commuting) and birds breeding in shrub are considered to be important ecological features of the site in a site context. Reptiles may also be an important ecological feature of the site.

4.2 Designated sites in the surrounds

Potential (pre-mitigation) impacts

The MAGIC maps show that the development is of a size and type that would not have any adverse effect on the nearby SSSI.

Significance of residual effects after mitigation

Not required.

4.3 Habitats in the site and immediate surrounds

Potential (pre-mitigation) impacts

The permanent loss of a very small area of grassland and immature planting will not have a significant effect on biodiversity.

After enhancement and recommendations

With suggested enhancements - new native hedgerow around the west side of the garage and some Bracken control in the more diverse grassland - there may be a net gain for biodiversity and for the SEN.

4.4 Protected species

4.4.1 Bats

Potential (pre-mitigation) impacts

The permanent loss of a very small area of grassland and immature planting will not have a significant effect on bats. However, illumination of the site in the operational phase, may compromise the area as flyways and this could adversely affect nearby roosts.

Significance of residual effects after mitigation

With mitigation measures in place (a sensitive lighting plan) there will be no significant residual effects.

With enhancement

With installation of a bat box in/on the new building, there may be a positive effect on this species group.

4.4.2 Reptiles

Potential (pre-mitigation) impacts

There may be a (small) permanent loss of suitable reptile habitat – grassland and stone wall. Loss or disturbance of the stone wall retaining the track next to the site is not envisaged but it appears likely that a short section of low stone wall to the south of the garage site will require removal in the process of creating an access.

Negative impacts, resulting through habitat loss, are likely to be temporary and of negligible significance. However, site clearance operations have the potential to injure or kill reptiles, which would constitute an offence.

Significance of residual effects after mitigation

With mitigation in place (following a method statement, see Section 5.1.2) there will be no significant effect on reptile populations and any offence against reptiles will be avoided.

4.4.3 Breeding birds

Potential (pre-mitigation) impacts

Loss of some garden shrub is unlikely to have a significant negative effect on hedgerow/scrub birds.

However, works (in the construction phase) that may damage or destroy a nest of any wild bird whilst it is in use must be avoided during any development as this would constitute an offence.

Significance of residual effects after mitigation

With mitigation in place i) loss of shrub kept to a minimum and ii) removal of shrub and trees outside the breeding season - there will be no significant effect on biodiversity and any offence against breeding birds will be avoided.

After enhancement

The provision of nesting boxes for species associated with gardens and shrub, will enhance the site for breeding birds and could have a positive impact on this species group.

4.5 Protected species legislation

Bats

All UK bat species are protected under both UK and European Law. Essentially this makes it unlawful to; deliberately capture, injure or kill a bat; intentionally or recklessly disturb a bat

whilst it occupies a roost or deliberately cause disturbance to (a bat) or significant group of bats; damage or destroy the roosting site of a bat; intentionally or recklessly obstruct access to a bat roost.

Notably, legal protection gives absolute protection to bat roosts and their continued functionality, regardless of deliberate, intentional or reckless action. Legal protection also extends to seasonal roosts which are not always occupied by bats throughout the year.

Disturbance caused through excessive noise or lighting and/or alterations to the landscape could potentially impact on bat roosting, foraging and/or commuting habitats and may have legal implications with regards European disturbance/roost deterioration laws. It is therefore the duty of the relevant competent authority to take habitat severance, disturbance and land use change issues and their potential for impact on bat populations into consideration when assessing applications for the relevant consent.

Reptiles

The 'widespread' reptile species, namely the Adder, Grass snake, Slow-worm and Common Lizard all receive protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). This makes it an offence to intentionally injure, kill or trade these species.

A defence to the above might be considered '*if the act was the incidental result of a lawful operation and could not have been reasonably avoided*'. However, this defence is unlikely to be relied on where no reasonable avoidance effort had been made to mitigate potential impacts where reptiles were known to occur.

Furthermore, all our native reptiles are listed as species of 'principal importance' under Section 42 of the NERC Act. As a consequence, the Local Planning Authority may request biodiversity enhancement measures as part of its biodiversity duty under the provisions of the NERC Act. This might include the temporary management of a suitable area for exclusive use by reptile species.

Birds

With the exception of Schedule 1 listed bird species, which receive a higher level of protection against disturbance, all common species of bird are protected during their breeding activities under the Wildlife and Countryside Act 1981

Essentially, this makes it an offence to intentionally take, damage or destroy the nest of any wild bird whilst that nest is occupied or being built; intentionally take or destroy the egg of any wild bird.

5 PROPOSED AVOIDANCE MEASURES, MITIGATION AND ENHANCEMENT

5.1 Avoidance measures and mitigation

5.1.1 Bats

As a matter of best practice, external lighting must be minimised or avoided altogether, and a lighting plan drawn up. The lighting plan must take into account the following:

Where used, lighting must be fixed on the lowest column practical with light spread kept well below the horizontal using cowls, hoods, screens or simply by downward directionality. There must be no allowance for permanent security lighting. PIR systems must only be used where absolutely necessary and these must be set on a short timer (one minute maximum) and responsive only to larger moving objects. LED bulbs with a warm white colour spectrum (2700 Kelvins) must be used to reduce the blue light component most disturbing to bats and these must have peak wavelengths higher than 500nm.

Further guidance can be sought in the following:

- Bat Conservation Trust (2018) *Bats and artificial lighting in the UK – Bats and the Built Environment Series* Bat Conservation Trust, London
- Bat Conservation Trust (2014) *Interim Guidance: Artificial lighting and wildlife – Recommendations to help minimise the impact of artificial lighting* Bat Conservation, London
- Institute of Lighting Professionals (2011) *Guidance notes for the reduction of obtrusive light* Institute of Lighting Professionals, London

5.1.2 Reptiles - method statement

Site clearance activities will be carried out in accordance with a method statement as follows:

- The main aim will be to sterilise all suitable habitats present causing reptiles to (largely) vacate the area. To ensure compliance with UK law; all suitable vegetation (largely grassland) within the development footprint should be cut back to a height of 150mm (or grazed) and subsequently treated with glyphosate. This should be carried out between March 1st and November 1st. The area should be maintained free of vegetation until the commencement of works.
- In addition, prior to the commencement of works, a destructive search of any stone wall to be removed or disturbed, as well as any other suitable refugia exposed during the grass cutting process, should be done by hand. This should also ideally be carried out between March 1st and November 1st, thus avoiding the hibernation period.
- Any Slow-worm found will be relocated to nearby hedgerow or garden.

5.1.3 Breeding birds

Construction phase

Any tree or shrub removal will be carried out at certain times of the year, as follows:

- Between September 1st and March 1st - outside the bird breeding season - when birds are unlikely to be nesting. **This is the most suitable or preferred means of mitigation.**
- During the nesting season between March 1st and August 31st after an ecologist has inspected the area for signs of nesting birds. This could result in delays to the project and is not recommended.
- After bird access into the feature has been suitably obstructed prior to March 1st or immediately after a negative nest inspection by a suitably experienced ecologist has been carried out during the breeding season.

Operational/post construction phase

Not applicable

5.2 Enhancements

5.2.1 Habitats

Boundary hedgerow

Native hedgerow planting is recommended along the west boundary of the site. Suggested woody species for hedgerow planting include those typical of the area, as follows:

Note: Blackthorn is best avoided as its suckering habit may cause problems.

Native shrub and tree species recommended for native hedge and tree planting (potential small tree species are starred, larger tree species are in bold type).	
Taxon	Common name
Corylus avellana	Hazel
Crataegus monogyna	Hawthorn
Sorbus aucuparia	Rowan
Ilex aquifolium	Holly

All planting must be carried out within the recognised planting season (November to March). and plants must be of local origin/provenance. Plants should be set out in a double staggered row using a total of 5 plants per linear metre, with rows set 225mm apart. All newly planted stock must be fully protected from rabbit damage by the use of tree/shrub guards.

In the second or third year new hedging plants should be hand trimmed to an even height of approximately 750mm to encourage side shoots and the development of a sound base to the hedge. For the following two or three years, the leaders should be allowed to grow unhindered and the sides trimmed only if necessary. After the first 5 years, mechanical hedge trimming can commence.

Bracken control

Bracken control could be instigated particularly in the more diverse area flanking the north end of the driveway, just north of Point A in Figure 2.

A twice yearly cut of the Bracken is suggested – the idea is to remove the above ground stems as often as possible (by cutting, pulling or bruising) to starve the roots; cutting is a very successful method although noticeable results may take 2 or 3 years.

5.2.2 Species

Bats

Integral or integrated bat boxes can be built into the walls or masonry of a building. Alternatively there are a number of ready-made external bat boxes suitable for buildings. Boxes should be made of durable materials, such as ecostycrete or woodcrete.

The 1FR or 2FR Schwegler bat tube is designed to be built into the masonry. The box does not require any maintenance. Unlike the 1FR, the 2FR has transverse connecting holes which allow several tubes to be placed next to each other in modular form in order to create a much larger space. It is recommended that at least three units are connected together.

Most bat species will use higher positioned boxes (around 4m up). At this site, a single box should be placed high up by the eaves, which can also help shelter the box from the weather. The aspect of the box should capture sun for part of the day (e.g. the south-east to south-west aspect).

Bat boxes should be located close to unlit linear features, such as hedgerow.

The boxes should be checked at least annually and after high winds to ensure they are still securely in place. If a box needs to be opened to check it, a suitably licensed ecologist will need to be present.

Birds

Bird boxes, placed on buildings or in trees around the wider garden, could include ones suitable for small birds. Schwegler bird boxes (or other makes of long-lasting woodcrete construction) of different sizes (to suit different species of small birds) are recommended, as follows, and should be placed at a height of 1.5 – 3m. Unless there are trees or buildings

which shade the box during the day, face the box between north and east, thus avoiding strong sunlight and the wettest winds.

1B Schwegler nest boxes with 26mm hole x 1

1B Schwegler nest boxes with 32mm hole x 1 (2-3m height)

2H Schwegler open fronted boxes x 1 (below 2m, well hidden in vegetation).

6 REFERENCES

Bat Conservation Trust (2016) *Bat Surveys for Professional Ecologists Good Practice Guidelines* 3rd ed. BCT

Bat Conservation Trust (2012) *Bat Surveys Good Practice Guidelines* 2nd ed. BCT

Mitchell-Jones A.J. and McLeish A. (2004) *Bat Worker's Manual* Joint Nature Conservation Committee

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