

Phase 1
Preliminary Ecological Appraisal
Station Road
Bagworth



Document Reference: **Bag1121_PEA**

Prepared: November 2021

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NE class license: Bats: survey (level 2)

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SUMMARY

The Phase 1 preliminary ecological appraisal is undertaken in order to identify key ecological constraints to the proposed development; inform planning to allow significant ecological effects to be avoided or minimized; identify any further ecological surveys needed to inform an ecological impact assessment and to support the development of mitigation of compensation measures.

Methodology

The survey was conducted by carrying out a systematic walkover of the site by Dr. Stefan Bodnar to record habitats, species, and any notable features of interest with regard to flora & Fauna. This is in accordance with standard Phase 1 survey techniques and is a methodology recommended by the Institute of Environmental Assessment (1995) and guidance from CIEEM (2012, 2018).

Key Issues and Conclusions

This Phase 1 Ecology Report confirms that the development area is of 'low to moderate ecological value' consisting primarily of an improved grassland, buildings with semi mature trees and native and non native hedges. The features of highest ecological value within the development site are the trees and hedges and its location adjacent to a railway line.

- The proposed development should demonstrate Net Biodiversity Gain, in accordance with National Planning Policy Framework 2021.
- The site may require a Biodiversity Net Gain Plan, and off and on site mitigation could be required.
- The trees and hedges should be protected and enhanced with additional tree and hedge planting, within any development of the site.
- A tree protection area and root protection zone should be established to avoid damage during the construction phase around all retained trees and hedges.
- There are no Statutory or Non-Statutory Designated Nature Conservation Sites within or adjacent to the site.
- The Biological Data Search no protected species were recorded within the site.
- There is no evidence of badger presence on the site, therefore no further surveys are required.
- No on site trees have bat roost potential.
- The site is of low suitability for both reptiles and Great Crested Newts, therefore no further surveys are required, although habitat creation post development and a series of precautions should be taken during development, as detailed in section 4.3b.
- The trees and hedges within the survey site are suitable for bird nesting. Site clearance should be undertaken outside of the bird breeding season (mid March to mid August) or undertaken under ecological supervision.
- A tree protection area and root protection zone should be established to avoid damage during the construction phase around all retained trees and hedges.
- Designs works to the gardens should ensure hedgehogs can move between the proposed gardens and the wider landscape, as well as ensure connectivity between the proposed gardens, via habitat creation and suitable gaps to allow hedgehog access within any walls or fences.

1. INTRODUCTION

1.1. Background

At the request of the client, a Phase 1 Preliminary Ecological Appraisal was carried out at a house and area of land at to the rear of 314A Station Road, Bagworth, to evaluate the habitats, describe any further surveys required and indicate the level of required mitigation/ compensation/ enhancement in relation to the proposed development of the site.

1.2. Site Location

The site is an area of land to the rear of 314A Station Road, Bagworth, Leicestershire. The site location is described on the image below. A satellite image and Phase One diagram (see Appendices) also show the areas concerned.

Figure 1. Showing site location





Map data 2021© Google.

1.3. Site Description

The site comprises a 1960's bungalow (B1), constructed of brick, with a pitched roof, UPVC windows and doors. It has a flat roof extension, linkway and garage, constructed of breezeblock, concrete panels and brick. There is also a large garage building (B2), constructed of breezeblock with a flat mineral felt roof. There are also former kennel buildings (B3), constructed of concrete blockwork with flat metal roofs and metal cages. The remainder of the site is an improved grassland paddock, formerly used for exercising dogs. The site is bound by fencing and semi mature and mature tree to the east, adjacent to a railway line. The railway line is dominated by bramble scrub and is succeeding to native woodland, with self set sycamore *Acer pseudoplatanus*, hawthorn *Crataegus monogyna*, willow *Salix sp.* and ash *Fraxinus excelsior*. There is residential housing to the south and west. The northern site boundary is a partial non-native Leyland cypress *Cupressus × leylandii* hedgerow. The improved grassland is dominated by Rough meadow grass *Poa trivialis*, Perennial ryegrass *Lolium perenne* and Common couch grass *Elymus repens*, with Creeping thistle *Cirsium arvense* and Stinging nettle *Urtica dioica* also present. See Phase 1 Habitat Map, appendix 1d and satellite image above and below.

The site is located at the eastern edge of Bagworth, with residential areas to the south and west and a railway line and Bagworth Wood – a coniferous plantation, directly adjacent to the east.



Map data 2021 © Google.

Figure 2. Satellite image of local area around proposed development site.

1.4. Brief Description of Project

No plans were available at the time of survey, however it is understood to involve the retention of the bungalow B1 and the demolition of B2 and B3 and replacement with new residential housing. Refer to planning application for full details.

1.5. Purpose of the Preliminary Ecological Appraisal

The phase 1 preliminary ecological appraisal report identifies key ecological constraints to the proposed development; informs planning to allow significant ecological effects to be avoided or minimized; identifies any further ecological surveys needed to inform an ecological impact assessment and supports the development of mitigation of compensation measures.

It is composed of two parts. A site visit, during which a preliminary ecological appraisal of the site is carried out to identify the major habitat types, plant, bird, reptile, mammal and other species using the site. Also a desk study, which gathers ecological data on the site and its surrounding area, to identify protected species and statutory protected sites in the vicinity of the proposed development site, in order to produce recommendations on the key ecological constraints to the proposed development.

2. METHODOLOGY

2.1 Desk Study Methodology

Information was gathered from a number of web-based data sources, published ecological reports and where appropriate, the authors own records. The ecological data search covers the following areas:

- ☐ Species of particular note
- ☐ Local Nature Reserves
- ☐ Protected species (badger, grass snake, great crested newts, otter, water vole and bats)

2.2. Survey Methodology

The survey was conducted by carrying out a systematic walkover of the site by Dr. Stefan Bodnar to record habitats, species, and any notable features of interest with regard to flora & Fauna. This is in accordance with standard Phase 1 survey techniques and is a methodology recommended by the Institute of Environmental Assessment (1995) and guidance from CIEEM (2013, 2018).

During the survey, emphasis was placed on searching for evidence of and potential of habitats and features supporting protected or notable species, especially those listed under the Conservation of Habitats and Species Regulations 2010, revised 2017, and the Wildlife & Countryside Act 1981 (as amended).

The range of methods used were as follows:

Bats

The trees within the site were appraised for their potential suitability to support breeding, resting and hibernating bats in accordance with survey methods documented in the Bat Surveys: Good Practice Guidelines (Bat Conservation Trust 2016). Features of medium and high potential for bats were searched for signs of use by bats, such as droppings, urine staining and scratches around entrance holes etc.

A visual inspection of the trees from ground level with the aid of binoculars was undertaken to search for evidence of actual bats as well as signs of bats (droppings, feeding remains, urine staining, scratch marks, noise and the remains of dead bats etc.). In addition, the trees were

assessed for the presence of features likely to be attractive to roosting bats, such as cavities or rot holes in the trunk or branches, splits in the timber, delaminating bark, deep bark crevices, dead branches and dense ivy cover etc.

In accordance with the methodology outlined in the Bat Conservation Trust's Bat Surveys: Good Practice Guidelines (2016) trees were assigned to the following categories:

- ☐ **Known or Confirmed Roost** - signs of bats (droppings, etc) or actual bats recorded; or previous records of bats in tree
- ☐ **High (Category 1*)** – trees with multiple, highly suitable features capable of supporting large roosts
- ☐ **Medium (Category 1)** – a tree with definite bat potential; fewer features than category 1* or potential for single bats
- ☐ **Low (Category 2)** – No obvious potential, although tree of size and age that elevated surveys may result in cracks/crevices being found; or tree has some features which have limited potential to support bats
- ☐ **Nil (Category 3)** – no potential to support bats

- ☐ The site was also assessed for potential bat foraging areas and commuting routes.
- ☐ Features of medium and high potential for bats were searched for signs of use by bats, such as droppings, urine staining and scratches around entrance holes etc. The site was also assessed for actual and potential bat foraging areas and commuting routes. Buildings within the site were assessed in accordance with the methodology outlined in the Bat Conservation Trust's Bat Surveys: Good Practice Guidelines (2016)

Reptiles

The site was assessed for its suitability to support reptiles based upon the abundance of suitable habitats such as structurally diverse habitats, hedgerows, scrub, rough grassland, wood piles, rubble, banks and compost heaps etc. The site was assessed with respect to its potential for use for hibernation and spring/summer use based on guidance provided in the Herpetofauna Workers' Manual (Joint Nature Conservation Committee 2003) and the Reptile Management Handbook (Edgar, Foster & Baker 2011).

Badgers

The whole site was searched systematically, with particular attention being paid to features likely to support badger setts (e.g. earth embankments, wooded copses etc.). The location of all badger signs such as runs, dung pits, prints, hair, foraging snuffle holes found during the survey were mapped and all setts characterised as either main, annex, subsidiary or outliers in accordance with guidance given in Surveying Badgers (Harris, Cresswell & Jefferies, 1988).

Birds

All birds observed during the field survey were recorded, in addition to features capable of supporting nesting birds (e.g. trees, hedgerows, buildings, bramble beds, ruderal vegetation and rough grassland etc). The site was also assessed for its actual and potential suitability to support Schedule 1 and Biodiversity Action Plan priority species (now included within Section 41 of the NERC Act).

Other Species

The site was also assessed for its actual and potential suitability to support other protected or notable fauna in accordance with the Guidelines for Preliminary Ecological Appraisal (Chartered Institute of Ecology and Environmental Management, 2013).

2.3. Site Location and Access

314A Station Road, and land to the rear of Bagworth, Leicestershire.

All areas of the site were available for access.

2.4. Date and Time of Survey

The site assessment was conducted on 18th November 2021.

2.5. Weather Conditions

The weather conditions during the survey were cool and dry.

2.6. Survey Constraints

Owing to the time of year the initial survey took place it can be considered to provide a reasonable, though not exhaustive plant list. This survey noted the habitat types on the site, and the dominant vegetation at the time of the survey, which is likely to be constant and a fair reflection of the habitat quality present.

3. RESULTS

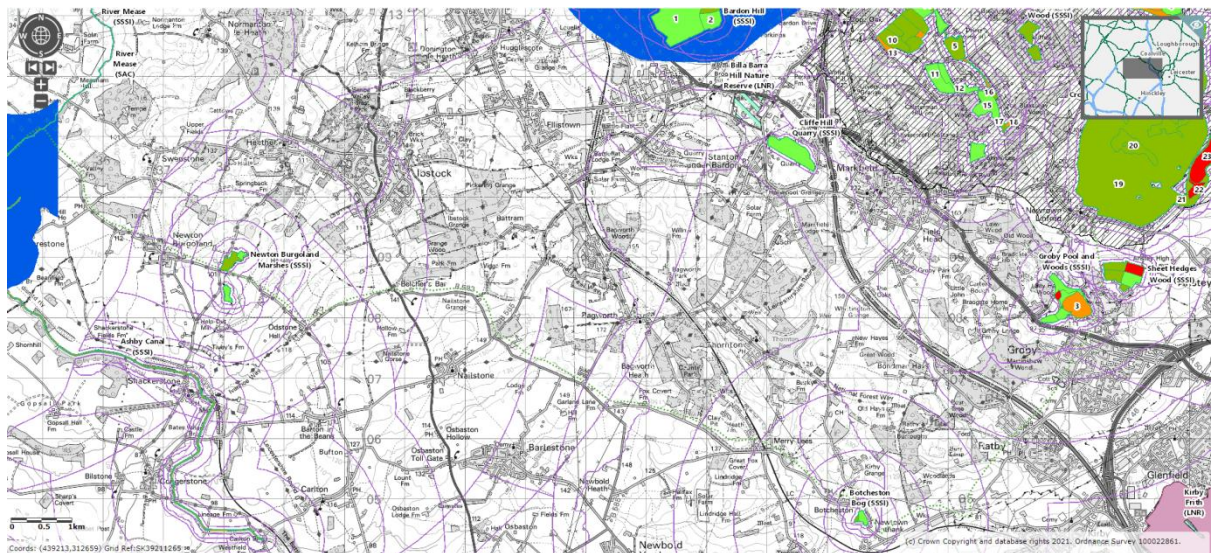
3.1 Desk Study Results

3.1a Statutory & Non Statutory Nature Conservation Sites

The maps below show all Statutory and Non Statutory Nature Conservation Sites (this includes Sites of Special Scientific Interest, Local Wildlife Sites, Local Nature Reserves, Special Areas of Concern) within 5km of the proposed development.

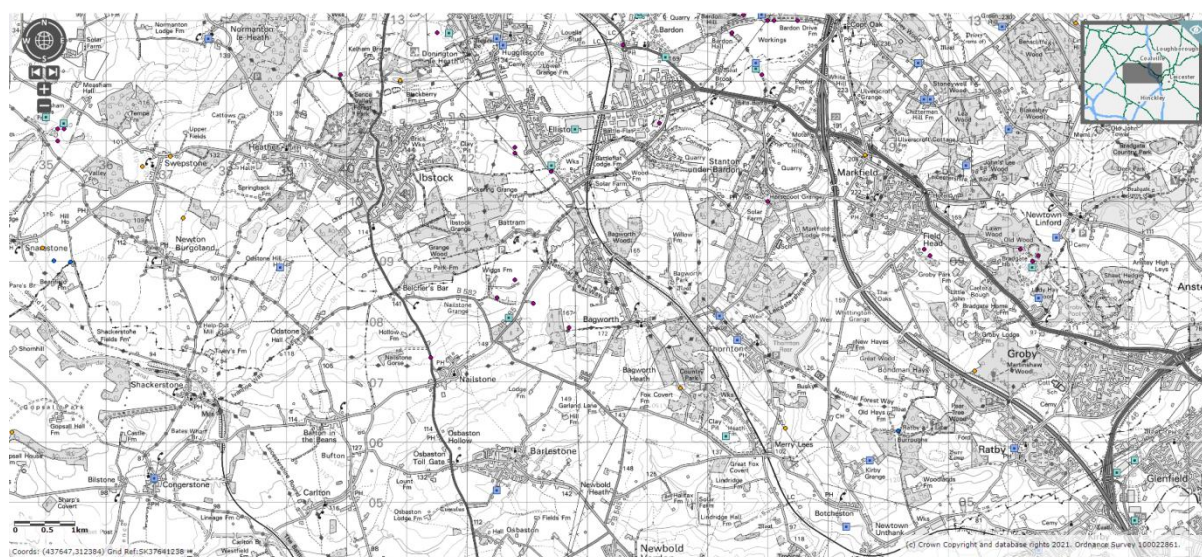
Statutory Protected Sites:

The site lies within Bardon Hill SSSI Impact Risk Zone and a National Forest area. The closest Statutory Protected Site is Cliffe Hill Quarry SSSI which lies 2.5 km East of the site.



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A Natural England 'Magic' data search (shown below) illustrates the locations of all European Protected Species license applications in the locality relating to bat roosts and herpetiles.



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Three species of bats are known to roost within 2km of the site, (Common and Soprano pipistrelle and Brown long eared bat), Great Crested Newts are found within 1km from the site.

3.1b. Protected & Notable Species Records

In relation to protected and notable species, the following were recorded from a variety of online web based resources, and in places, the authors own records, presented here with the approximate distances of the nearest record. In addition, a number of ecological survey reports within the area have been interrogated for protected species records. All records are post-2010 unless otherwise stated.

Protected Bat Species Occurrence Table

Species (Latin Name)	Common Name	Approximate distance of nearest record from the survey site (km)
<i>Pipistrellus pygmaeus</i>	Soprano pipistrelle	Within 2 km
<i>Pipistrellus pipistrellus</i>	Common pipistrelle	Within 2 km
<i>Plecotus auritus</i>	Brown long-eared bat	Within 2 km

Protected & Notable Species Occurrence Tables

Species (Latin Name)	Common Name	Approximate distance of nearest record from the survey site (km)
<i>Triturus cristatus</i>	Great Crested Newt	Within 1 km from site
<i>Bufo bufo</i>	Common toad	Within 1 km
<i>Meles meles</i>	Badger	Within 1 km
<i>Erinaceus europaeus</i>	Hedgehog	Within 1 km

3.1c Interpretation of Available Biological Data

The site is not adjacent to any statutory designated site, and is unlikely to have any impact on those at further distances.

There are three species of bat found within 2 km of the survey site. Badger, Great Crested Newts and Hedgehog are also within 1 km from the site. Badger are found adjacent to the site on the railway line.

3.2 Survey Results

3.2.1. Habitat Types Present & Baseline Ecological Conditions

The site comprises a 1960's bungalow (B1), constructed of brick, with a pitched roof, UPVC windows and doors. It has a flat roof extension, linkway and garage, constructed of breezeblock, concrete panels and brick. There is also a large garage building (B2), constructed of breezeblock with a flat mineral felt roof. There are also former kennel buildings (B3), constructed of concrete blockwork with flat metal roofs and metal cages. The remainder of the site is an improved grassland paddock, formerly used for exercising dogs. The site is bound by fencing and semi mature and mature tree to the east, adjacent to a railway line. With residential housing to the south and west. See Phase 1 Habitat Map.

Habitats present:

- **Native hedgerow:** The southern site boundary is a native Beech *Fagus sylvestris* hedgerow, with some outgrown hedge trees, also Beech adjacent to it.
- **Non-Native hedgerow:** There are two short stretches of non-native Leyland cypress *Cupressus × leylandii* hedgerow along the northern and western site boundaries.
- **Landscape trees:** There are groups of trees along the site boundaries and a small number of scattered trees across the site. Species include apple *Malus sp.*, cherry, beech *Fagus sylvestris*, horse chestnut *Aesculus hippocastanum*, blue fir *Picea pungens*, sycamore *Acer pseudoplatanus*, blackthorn *Prunus spinosa* and cherry *Prunus sp.*.
- **Improved Amenity Grassland:** The improved grassland is dominated by Rough meadow grass *Poa trivialis*, Perennial ryegrass *Lolium perenne* and Common couch grass *Elymus repens*, with Creeping thistle *Cirsium arvense* and Stinging nettle *Urtica dioica* also present.

See Phase 1 Habitat plan (appendix 1d) and images, Appendix 2. A full list of vascular plant species is provided in Appendix 3.

3.2.2. Protected and Notable Species on Site

Bats:

There are 18 species of bat found in the UK, 17 of which are known to breed in the UK. All are small, nocturnal, flying, insectivorous mammals that are under considerable conservation threat and many having undergone severe population declines over the last century. Some species, such as pipistrelle bats (*Pipistrellus* sp) still remain relatively common and widespread in the UK, while others, such as greater horseshoe bats (*Rhinolophus ferrumequinum*), have an extremely restricted distribution. All species of bats and their roosting sites are afforded full protection under both UK and European legislation and are designated as 'European protected species'.

Bat Roost Potential of Trees:

All trees on site are semi-mature, with no bat roost features, although as the site is adjacent to a railway line, with woodland and open countryside beyond this, the site may provide moderate quality foraging potential and the trees serve as temporary feeding perches while foraging bats feed. Due to the importance of the adjacent landscape for bats, the lighting on the site should be minimal, directed downwards, cowled and used on timers, in accordance with The Bats And Artificial Lighting 2018 Guidance by BCT, available here: <https://www.bats.org.uk/our-work/buildings-planning-and-development/lighting>

Bat Roost Potential of Buildings:

B1 is a 1960's bungalow, constructed of brick, with a pitched roof, UPVC windows and doors. It has a cavity wall which has not been filled. It has an internal roofspace which was inspected. It measures 1.6m from floor to apex, with rockwool insulation and bitumen felt lining. There are mice droppings, but no signs of bats, no droppings, scratching or staining. There is a flat roof extension, linkway and garage, constructed of breezeblock, concrete panels and brick. This has no cavity wall and no internal roofspace. B1 is intact, with no damage to brickwork, no missing mortar and no evidence internally of bats or birds.

B2 is a large garage building, constructed of breezeblock with a flat mineral felt roof. It also has a timber frame section with a corrugated metal roof. This has no cavity wall and no internal roofspace. It has no suitable roost features for bats, and after inspection, no evidence internally of bats, however there are two last year's swallow nests in B2.

B3 is a series of former kennel buildings, constructed of concrete blockwork with flat metal roofs and metal cages. There is no cavity wall and no internal roofspace. It has no suitable roost features for bats, the kennels are exposed to the elements, light inside and unsuitable for bats. After inspection, it can be confirmed there is no evidence internally of bats or birds.

Badgers

Badgers (*Meles meles*) are protected in England and Wales 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. Badgers remain comparatively widespread and common throughout the UK..

The adjacent railway line has signs of badgers, with trackways, latrines and foraging signs, the adjacent habitat is ideal for badgers and is likely to have active badger setts. There are trackways on site, these may be due to combination of badgers, foxes and domestic cats. There is no other evidence of foraging badger activity on the site, no snuffle holes or latrines. It can be confirmed that there are no badger setts on site or within 20m of the site edges, however the dense vegetation and lack of access along the spoil heaps adjacent to the site along the adjacent railway line mean it is not possible to confirm there are no badgers within 30m of the site. The adjacent railway represents ideal badger habitat and is likely to support active setts, and has evidence of foraging badger, the topography of the site, means that badger setts on the adjacent land are likely to be tunneled into the spoil heap, and not below the site.

No further surveys are recommended, although precautionary measures are recommended, in case badgers or other mammals enter the working areas at night:

- Ensure that all those in work are aware of the potential for setts or badgers to be encountered, and the actions to be taken if these are discovered at anytime.
- All excavations to be covered over or ramped so that any badgers could get out of an excavated structure. Further measures are detailed below:
- Any ground-works that are to be left open overnight will be provided with a means of escape should a badger enter. This could simply be in the form of a roughened plank of wood placed in the trench as a ramp to the surface. This is particularly important if the trench fills with water.

- Any trenches/pits will be inspected each morning to ensure that no badgers have become trapped overnight. Should a badger become trapped in a trench it will likely attempt to dig itself into the side of the trench, by forming a temporary sett. Should a trapped badger be encountered the Ecologist should be contacted immediately for further advice who, if necessary, will contact Natural England in respect of legislative and licensing issues.
- The storage of topsoil or other 'soft' building materials on site will be given careful consideration. Badgers will readily adopt such mounds as setts; so as to avoid the adoption of any mounds, these will be kept to a minimum and any essential mounds subject to daily inspections (or nightly patrols if 24 hour security is present on site), with consideration given to temporarily fencing any such mounds to exclude badgers.

Other mammals

The presence of other specially protected mammals, such as otter, dormouse and water vole, is assessed as extremely unlikely, due to the unsuitable habitats on this site. Hedgehogs are recorded within 1km and could be present on the site.

Birds

The Wildlife and Countryside Act 1981 (as amended) makes it an offence (with certain limited exceptions) to intentionally kill, injure or take any wild bird, or to damage, take or destroy the nest of any wild bird whilst that nest is being built or in use, or to take or destroy its eggs. Furthermore, the Act affords additional protection to specific species of birds listed in Schedule 1 of the Act. In respect of these species, it is unlawful to intentionally or recklessly disturb such a bird whilst it is nest-building or is in, on or near a nest containing eggs or young; or to disturb their dependent young. Following recent revisions, fifty-nine species are listed on the UKBAP.

The following species were recorded on-site during the visit:

Bird Species:	Latin name:
Blackbird	<i>Turdus merula</i>
Woodpigeon	<i>Columba palumbus</i>
Robin	<i>Erithacus rubecula</i>
Jackdaw	<i>Corvus monedula</i>
Carrion Crow	<i>Corvus corone</i>
Blue Tit	<i>Cyanistes caeruleus</i>
Goldcrest	<i>Regulus regulus</i>

The birds listed above were actually recorded on the site itself. The trees and hedges within the survey site could also provide suitable for nesting habitat for a number of other common woodland bird species.

The trees and hedgerows are ideal habitat for bird nesting. It is recommended that these trees be protected and retained within the proposed development. It is recommended that any site clearance of vegetation such as the hedgerow removal is undertaken outside of the bird breeding season (mid March to mid August). If site clearance is undertaken during these months, a suitably qualified and experienced ecologist should be employed to ascertain the presence of any breeding birds within the site.

Great Crested Newt

The Great Crested Newt (*Triturus cristatus*) is one of the two rarest amphibian species in Britain. It is primarily a terrestrial animal, spending much of its life on land, but returning to the water to breed. Great crested newts will often return to breed in the same waterbody where they were spawned. In addition, they are highly opportunistic and will also colonise suitable new waterbodies rapidly. Great Crested Newt is a 'European protected species' afforded full protection under both UK and European legislation. This protection extends to the habitats which support it. The habitats within 500m of a breeding pond are generally considered to be protected by the legislation. The Great Crested Newt is a priority species and subject to its own Biodiversity Action Plan.

There are no on-site ponds, and the majority of the terrestrial habitat is of low suitability for this species. There are records of GCNs within 1 km from the site, however these are isolated from the site by unsuitable agricultural land and the village of Bagworth itself. It is considered unlikely that GCN's would be present on site and no further survey is recommended.

However, to reduce risk of harm to newts or other amphibians as a result of this development, it is recommended appropriate precautions should be taken during development and habitat for amphibians should be created on site post development, including south facing log piles and areas of long grass and a wildlife pond.

- If Great Crested Newts are discovered at any time during processes involved with the development, work should cease immediately and the advice of a licensed ecologist sought.
- All site staff involved with site clearance and construction works are to be made aware of the potential for encountering Great Crested Newts through a tool kit talk and the appropriate measures to be taken if great crested newts are encountered.
- Keep duration of groundworks as short as possible.
- Undertake during the day works that might only affect newts above ground.
- Backfill trenches and other excavations before nightfall, or leave a ramp to allow newts to easily exit.
- Raise stored materials (that might act as temporary resting places) off the ground, e.g. on pallets.

Reptiles

There are four widespread species of British reptile comprising grass snake (*Natrix natrix*), slow-worm (*Anguis fragilis*), adder (*Vipera berus*) and common lizard (*Zootoca vivipara*). These animals are protected under the Wildlife and Countryside Act 1981 (as amended) and the Countryside and Rights of Way Act 2000. 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.

The on-site habitat is of low suitability for reptiles, such as Grass snake and slow worm, and the site is isolated by low suitability agricultural land, however both slow worm and grass snake are frequent users of railway embankments, such as the one adjacent to the site. Although no further survey is recommended, to reduce risk to reptiles as a result of the proposed development it is recommended appropriate precautions should be taken during development and habitat for reptiles should be created on site post development, including south facing log piles and areas of long grass.

Including where possible:

- Undertaking ground-works along field boundaries when reptiles are active (March to October).
- Ensuring storage of piles of materials and excavated earth on the site should be kept to a minimum.
- Storing piles of materials and excavated earth away from the field boundaries to deter reptiles from using them for temporary cover.

4.0. DISCUSSION

It is important that this proposed development should demonstrate Net Biodiversity Gain with No Net Loss, in accordance with National Planning Policy Framework 2021.

This is a duty placed on Local Authorities in the Natural Environment and Rural Communities Act 2006, Section 40. There are requirements noted for this under The National Planning Policy Framework (2019) which refers to compensation/ mitigation. It is confirmed that the enhancement, mitigation and compensation within this section will comply with all the relevant UK and EU legislation relating to protection and enhancement of ecology.

No plans are available for the site, however a Biodiversity Net Gain Plan may be required, to include a baseline assessment of what is currently present on a site, an estimation how proposed designs will add to that level, and latterly supported by post-construction evidence that a biodiversity gain has been delivered. Measurement of pre and post-construction biodiversity levels should be based on WCS BIA calculator or DEFRA's 'Biodiversity Metric 2.0'. It is likely that the site will require on site mitigation as it is likely to score highly in terms of its Connectivity.

4.1. Ecological Constraints

The value of the majority of the site, in terms of ecological value to wildlife is moderate to low, with the trees and native hedgerow having highest ecological value. The on-site lighting should be carefully chosen to ensure it is low lux, cowled (directed downwards to prevent light splay), and used on timers or motion sensors to minimize the impact on local bat populations. This should conform the BCT lighting guidance, 2018.

Safe working methods for minimising harm to reptiles and amphibians, as described in 4.3b below, with habitat creation on site post development. For reptiles, the creation of south facing log and brash piles, and /or open compost heaps along south facing site edges to create refugia for reptiles.

Should any trees or hedgerow be lost to enable access into the site, it should be replaced, >1:1 ratio, in anticipation of the high failure rate of young trees, and their low ecological value in comparison with mature trees. Additional hedgerow and tree planting is recommended around any new access driveway, around buildings and within proposed gardens.

The habitats present within the area consists of the following elements (see Phase 1 Habitat Map in Appendix 1d).

- Improved grassland
- Non-native hedgerow
- Native hedgerow
- Landscape trees

4.2. Additional Ecological Surveys Recommended

- None

4.3. Minimising Ecological Impact

This section states how the negative impacts of the development can be addressed.

4.3a. Protecting the Ecological Value of the Site

The trees and hedges within the development area should be retained and enhanced. The trees are of high suitability for breeding birds and potentially will have a number of nests during the breeding season.

Any trees/hedges unavoidably lost to accommodate the development should be replaced with appropriate compensation planting at a minimum of 1:1 ratio, preferably 1:2 in anticipation of the high failure rate of young trees. Ensure landscape planting uses species which are beneficial to wildlife. See appendices for recommended species planting lists.

In addition, the on-site lighting should be carefully chosen to ensure it is low lux, cowled (directed downwards to prevent light splay), and used on timers or motion sensors to minimize the impact on local bat populations.

There are swallow nests in B2, therefore demolition must be undertaken outside of the bird breeding season and replacement bird boxes should be installed on each new building once

works are complete. These should include two double swallow nest cups and four hole nesting bird boxes, erected in accordance with the manufacturers recommendations. Generally, this will entail mounting the box between 3 – 4 m above the ground, with a north / northwest aspect. Care should be made to make the nest box inaccessible to predators, and generally, nest boxes should not be sited too close to each other.

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It is also suggested that at least one bat box be attached to each new building. Details can be found in appendix 5.

For reptiles, retention of habitat value can be approached via the creation of south facing log and brash piles, and /or open compost heaps along south facing site edges to create refugia for reptiles.

If possible, for amphibians and invertebrates, a wildlife pond, not stocked with fish, planted with native vegetation and designed with appropriate sloping sides and depth for wildlife, as described in <https://www.froglife.org/wp-content/uploads/2013/07/JAW2014-for-printing-HLF1.pdf> and see appendixes.

4.3b. Precautionary Measures during Development

There are swallow nests in B2, and the trees, hedges and garden planting could all provide suitable nesting structures, therefore demolition of B2 and any site clearance should be carried out outside of the bird breeding season. Bird breeding season is between mid March and mid August, although certain species can breed outside these months and if breeding birds are found then work should cease and the advice of an ecologist sought.

All retained trees should be treated in accordance British Standard BS5837 (2012) *Trees in Relation to Design, Demolition and Construction – Recommendations*, to ensure require adequate root protection fencing.

To protect any reptiles or amphibians which might be using the site, it is recommended appropriate precautions should be taken during development. These include;

- If great crested newts are discovered at any time during processes involved with the development, work should cease immediately and the advice of a licensed ecologist sought.
- All site staff involved with site clearance and construction works are to be made aware of the potential for encountering great crested newts and reptiles through a tool kit talk and the appropriate measures to be taken if great crested newts are encountered.
- Keep duration of groundworks as short as possible.
- Undertake during the day works that might only affect newts above ground.
- Backfill trenches and other excavations before nightfall, or leave a ramp to allow newts to easily exit.
- Raise stored materials (that might act as temporary resting places) off the ground, e.g. on pallets.
- Ensuring storage of piles of materials and excavated earth on the site should be kept to a minimum.
- Storing piles of materials and excavated earth away from the field boundaries to deter reptiles from using them for temporary cover.

Appropriate precautionary measures are recommended, in case badgers enter the working areas at night:

- Ensure that all those in work are aware of the potential for setts or badgers to be encountered, and the actions to be taken if these are discovered at anytime.

- All excavations to be covered over or ramped so that any badgers could get out of an excavated structure. Further measures are detailed below:
- Any ground-works that are to be left open overnight will be provided with a means of escape should a badger enter. This could simply be in the form of a roughened plank of wood placed in the trench as a ramp to the surface. This is particularly important if the trench fills with water.
- Any trenches/pits will be inspected each morning to ensure that no badgers have become trapped overnight. Should a badger become trapped in a trench it will likely attempt to dig itself into the side of the trench, by forming a temporary sett. Should a trapped badger be encountered the Ecologist should be contacted immediately for further advice who, if necessary, will contact Natural England in respect of legislative and licensing issues.
- The storage of topsoil or other 'soft' building materials on site will be given careful consideration. Badgers will readily adopt such mounds as setts; so as to avoid the adoption of any mounds, these will be kept to a minimum and any essential mounds subject to daily inspections (or nightly patrols if 24 hour security is present on site), with consideration given to temporarily fencing any such mounds to exclude badgers.

4.4 Opportunities for Biodiversity Gain and Off-setting Requirements

It is important that this proposed development should demonstrate Net Biodiversity Gain with No Net Loss, in accordance with National Planning Policy Framework 2021.

1. The site is likely to require a Biodiversity Net Gain Plan, and off and on site mitigation may be required.
2. Retention and enhancement of value of existing hedge and trees. To include supplementary planting with native species, additional hedgerow planting.
3. Planting of native deciduous specimen tree species along the river corridor.
4. Creation of reptile habitat features.
5. Creation of amphibian habitat features.
6. Introduction of bat and bird friendly native planting schemes, hibernacula, and wildflower hedgerow edge mix seeding.
7. Bird and bat boxes incorporated within or on the new buildings or other built fabric, in particular should be included.
8. Selection of wildlife-friendly shrub/planting species as part of the terrestrial landscaping scheme within the development. The specification should include elements of landscaping details selected from a palette of species beneficial to wildlife (further information can be found in Appendix 4):
9. Wildflower seeding areas, use of flowering lawn seed mixes.
10. Use of FSC certified timber.
11. No use of peat on site.
12. A number of bird and bat boxes could be attached to the built structures, as follows:

Bird box specifications

Three bird boxes for hole nesting species, can be ordered from NHBS Ecology details can be found in appendix 5.

Bat Box Specifications

It is also suggested that at least two bat boxes be attached to the corners of the built structures or similarly, attached to retained mature trees. Details can be found in appendix 5.

5. CONCLUSION

This Phase 1 Ecology Report confirms that the development area is of 'low to moderate ecological value' consisting primarily of an improved grassland, buildings with semi mature trees and native and non native hedges. The features of highest ecological value within the development site are the trees and hedges and its location adjacent to a railway line.

- The proposed development should demonstrate Net Biodiversity Gain, in accordance with National Planning Policy Framework 2021.
- The site may require a Biodiversity Net Gain Plan, and off and on site mitigation could be required.
- The trees and hedges should be protected and enhanced with additional tree and hedge planting, within any development of the site.
- A tree protection area and root protection zone should be established to avoid damage during the construction phase around all retained trees and hedges.
- There are no Statutory or Non-Statutory Designated Nature Conservation Sites within or adjacent to the site.
- The Biological Data Search no protected species were recorded within the site.
- There is no evidence of badger use of the site, therefore no further surveys are required.
- No on site trees have bat roost potential.
- The site is of low suitability for both reptiles and Great Crested Newts, therefore no further surveys are required, although habitat creation post development and a series of precautions should be taken during development, as detailed in section 4.3b.
- The trees and hedges within the survey site are suitable for bird nesting. Site clearance should be undertaken outside of the bird breeding season (mid March to mid August) or undertaken under ecological supervision.
- A tree protection area and root protection zone should be established to avoid damage during the construction phase around all retained trees and hedges.
- Designs works to the gardens should ensure hedgehogs can move between the proposed gardens and the wider landscape, as well as ensure connectivity between the proposed gardens, via habitat creation and suitable gaps to allow hedgehog access within any walls or fences.

Date	Prepared by	Checked and Verified by
23rd November 2021	Dr Louise Sutherland MIALE Ecologist	Dr Stefan Bodnar MCIEEM Principal Ecologist

Appendix 1a Satellite Image



Map data 2021 © Google.



Appendix 1d Phase 1 Habitat Map



Appendix 2 Photographs

































Appendix 3 Species Lists

Trees & Shrubs

Common name	Scientific name
Apple	<i>Malus sp.</i>
Beech	<i>Fagus sylvestris</i>
Blackthorn	<i>Prunus spinosa</i>
Blue fir	<i>Picea pungens</i>
Cherry	<i>Prunus sp.</i>
Elder	<i>Sambucus nigra</i>
Hawthorn	<i>Crataegus monogyna</i>
Horse chestnut	<i>Aesculus hippocastanum</i>
Ivy	<i>Hedera helix</i>
Leyland cypress	<i>Cupressus × leylandii</i>
Sycamore	<i>Acer pseudoplatanus</i>
Spruce	<i>Picea sp.</i>
Willow	<i>Salix sp.</i>

Grasses, Sedges & Rushes

Common Name	Scientific Name
Rough meadow grass	<i>Poa trivialis</i>
Perennial ryegrass	<i>Lolium perenne</i>
Common couch grass	<i>Elymus repens</i>

Other Flowering Plants and Ferns

Common name	Scientific name
Broad-Leaved Willowherb	<i>Epilobium montanum</i>
Daisy	<i>Bellis perennis</i>
White deadnettle	<i>Lamium alba</i>
Dandelion	<i>Taraxacum officinale</i>
Ivy	<i>Hedera helix</i>
Cleavers	<i>Galium aparine</i>
Sow-thistle, Smooth	<i>Sonchus oleraceus</i>
Stinging nettle	<i>Urtica dioica</i>

Creeping thistle

Cirsium arvense

Creeping Buttercup

Ranunculus repens

Appendix 4: Specifications for Biodiversity Gain

Appendix 4a: British Native Trees to Attract Wildlife

Species	Average mature / ultimate height			Growth rate			Soil/ground conditions					Tolerant of sites that are				Valuable for	
	0.5-5m	6m-15m	16m+	Fast	Medium	Slow	Wet ground	Light sandy soils	Heavy soils	acid	alkaline	Shaded	Polluted	Coastal	Exposed	Birds	Insects
Alder		•		•			■		•		•	•	•		•		•
Ash			•		•		▲	•	•		•	•	•	•	•		
Aspen		•		•					•	•	•		•	•	•		•
Beech			•			•		•			•	•					•
Birch, Downy		•		•			▲			•			•		•		•
Birch, Silver		•		•				•		•			•		•		•
Blackthorn	•			•				•	•	•	•			•	•	•	•
Broom	•				•			•		•	•	•	•	•			•
Buckthorn, Alder	•					•	▲			•							
Cherry, Wild		•			•			•	•		•		•				
Cherry, Bird		•			•			•	•	•		•				•	•
Crabapple		•				•		•	•	•	•	•				•	•
Elder		•		•				•	•	•	•	•	•	•	•		•
Elm, Wych		•			•				•		•	•	•	•	•		•
Gorse	•				•			•		•	•					•	•
Hawthorn	•				•			•	•	•	•		•	•	•	•	•
Hazel		•		•					•		•	•					•
Holly		•				•		•	•	•	•	•	•	•	•	•	•
Lime, small-leaved			•		•				•		•	•					•
Maple, Field		•			•				•		•	•	•				
Oak, Pedunculate			•			•			•		•				•	•	•
Oak, Sessile			•			•	▲	•	•	•		•			•	•	•
Pine, Scots			•		•			•		•					•		•
Poplar, Black			•	•			▲	•	•		•						•
Rose, Dog	•				•			•	•		•	•	•		•		•
Rose, Guelder	•				•		▲		•		•	•					•
Rowan		•		•				•		•			•	•	•	•	
Spindle	•				•				•		•	•					
Whitebeam, Common		•			•			•	•		•						•
Wild Service	•					•			•		•	•		•		•	•
Willow, Crack		•		•			■				•		•	•	•	•	•
Willow, Goat		•		•	•		■		•		•	•	•	•	•	•	•
Willow, White			•	•			■				•	•	•	•	•	•	•
Yew		•				•		•			•	•			•	•	

■ Only species to survive waterlogged sites with anaerobic conditions.

▲ Will tolerate wet ground if there is some seasonality of "flushing (water movement) within the soil.

Appendix 4b: Non-native plants to attract wildlife

Buddleja X weyeriana cultivars

You can plant the orange-flowered B. X weyeriana hybrids with a clear conscience as they don't appear to produce viable seed, they also attract a broad spectrum of insects including both butterflies and bees, and they flower late into the season when nectar is scarce. The beautiful B. x fallowiana 'Lochin' with silver leaves is attractive to butterflies and is also said not to produce seeds. The orange ball Buddleja (B. globosa) from South America seems to attract bees rather than butterflies.

Bupleurum fruticosum ('Shrubby Hare's Ear')

A shrubby evergreen umbellifer from Southern Europe, where it is often cultivated. It has leathery aromatic foliage and umbels of yellowish flowers, a bit like those of Fennel, that are very attractive to hoverflies and other small insects. Well worth growing for this reason.

Ceanothus X 'Gloire de Versailles'

Ceanothus come from the Western United States. Most Ceanothus have bunches of very small flowers that don't seem very attractive to insects. 'Gloire de Versailles' however is a hybrid with loose bunches of pale blue tubular flowers that are very attractive to butterflies and bees.

Caryopteris X clandonensis 'Kew Blue'

A deciduous shrub from China for a sunny position, has small tubular blue flowers attractive to insects.

Clethra alnifolia ('Sweet Pepper Bush')

A deciduous shrub from the Eastern United States that likes damp, acid or woodland soil. Has spikes of small scented white flowers attractive to moths and butterflies.

Hebe X 'Great Orme' and H. X 'Midsummer Beauty'

Hebes are close relatives of the herbaceous genus Veronica, and come from New Zealand. Some are much more attractive to insects than others. 'Great Orme' is a medium-sized hybrid with pale pink flowers that are attractive to butterflies. It is a distinctive cultivar and available true to name in the nursery trade.

'Midsummer Beauty' seems to be more of a generic name for a series of large shrubs with blue or grey-blue flowers in long spikes, attractive to both bees and butterflies. There are a number of other blue and white flowered Hebes that seem very popular with bumblebees.

Myrtus communis ('European Myrtle')

An attractive evergreen shrub from the South of France and Spain with small evergreen aromatic leaves. It has been grown in our gardens for centuries, but is susceptible to hard frost and prefers a site against a warm sunny wall. Fluffy white flowers in early summer are bumblebees' heaven. Purplish berries follow later which are stripped by blackbirds in January.

Amelanchier species ('Shad Bush')

Shrubs with white cherry-like blossoms early in the year, followed by blackish berries in late summer. Valuable for the berries as a source of food for berry-eating birds when most other berries are not yet ripe.

Erica terminalis ('Corsican Heath')

A shrubby heather-like plant popular with bumblebees. The Cornish Heath, Erica vagans, from the Atlantic fringes of Europe is also a good bee plant. Erica manipuliflora, from Southern Europe, and its hybrid Erica X griffithii have fragrant flowers that attract butterflies.

Eupatorium ligustrinum

A late-flowering evergreen bush that looks very like a privet, but has bunches of white fluffy flowers in September and October. These flowers seem very attractive to range of insects, especially hoverflies.

Ribes sanguineum (Flowering Currant)

It is a very good early flower for bumblebees, as indeed are the flowers of the closely related blackcurrants and gooseberries.

Appendix 4c: Plants good for moths, with species of moth they encourage beside

Plant	Moths
Bird's Foot Trefoil (<i>lotus corniculatus</i>)	<i>Burnet, Belted Beauty, Chalk Carpet, Latticed Heather</i>
Bladder Campion (<i>silene vulgaris</i>)	<i>Campion, Marbled Coronet, Nettle Pug, Marbled Clover, Dark Brocade, Sandy Carpet</i>
Borage (<i>borago officinalis</i>)	<i>Crimson Speckled</i>
Wild Clary (<i>salvia horminoides</i>)	<i>Twin-spot Carpet</i>
Biting Stonecrop (<i>sedum acre</i>)	<i>Yellow Ringed Carpet, Northern Rustic</i>
Cowslip (<i>primula veris</i>)	<i>Plain Clary, Northern Rustic</i>
Dropwort (<i>filipendula hexapetala</i>)	<i>Satyr Pug</i>
Evening Primrose (<i>oenothera biennis</i>)	<i>Elephant Hawk</i>
Field Scabious (<i>kanutia arvensis</i>)	<i>Marsh Fritillary, Narrow Bordered Bee Hawk, Lime Speck Pug, Shaded Pug</i>
Foxglove (<i>digitalis purpurea</i>)	<i>Lesser Yellow Underwing, Foxglove Pug</i>
Golden Rod (<i>solidago</i>)	<i>Lime Speck Pug, Bleached Pug, Golden Rod, Wormwood Pug, V Pug</i>
Greater Stitchwort (<i>stellaria holostea</i>)	<i>Dart, Yellow Underwing, Marsh Pug, Plain Clary</i>
Hedge Bedstraw (<i>gallium mollugo</i>)	<i>Ruddy Carpet, Royal Mantle, Common Carpet, Wood Carpet, Water Carpet, Beech Green Carpet, Mottled Grey, Green Carpet</i>
Hedge Woundwort (<i>stachys sylvatica</i>)	<i>Rosy Rustic, Plain Golden Y, Sub-angled Wave</i>
Hemp Agrimony (<i>eupatorium cannabinum</i>)	<i>Wormwood Pug, V Pug, Lime Speck Pug, Marsh Pug, Gem, Scarce Burnished</i>
Herb Bennet (<i>geum urbanum</i>)	<i>Riband Wave</i>
Herb Robert (<i>geranium robertianum</i>)	<i>Barred Carpet</i>
Hollyhock (<i>althaea rosea</i>)	<i>Mallow</i>
Kidney Vetch (<i>anthyllis vulneraria</i>)	<i>6-belted Clearwing</i>
Lady's Bedstraw (<i>gallium verum</i>)	<i>Hummingbird Hawk, Small Elephant Hawk, Gallium Carpet, Plain Wave, Riband Wave, Bedstraw Hawk, Archer's Dart, Red Chestnut, Ruddy Carpet, Royal Mantle, Common Carpet, Water Carpet, Beech Green Carpet, Red Twin Spot Carpet, Wood Carpet, Mottled Grey, Green Carpet</i>
Lady's Mantle (<i>alchemilla mollis</i>)	<i>Red Carpet</i>
Lesser Knapweed (<i>centaurea nigra</i>)	<i>Silver Y, Lime Speck Pug, Satyr Pug</i>
Lesser Meadow Rue	<i>Marsh Carpet</i>
Maiden Pink (<i>dianthus deltoides</i>)	<i>Marbled Coronet</i>
Marjoram (<i>majorana originaum</i>)	<i>Sub-angled Wave, Lace Border</i>

Marshmallow (<i>althea officinalis</i>)	<i>Marshmallow</i>
Meadow Clary (<i>salvia pratensis</i>)	<i>Brown Spot Pinion, Hebrew Character, Powdered Quaker, Emperor</i>
Mullein	<i>Mullein, Striped Lychnis</i>
Navelwort (<i>umbilicus rupestris</i>)	<i>Weaver's Wave</i>
Pink	<i>Hawk</i>
Primrose (<i>primula vulgaris</i>)	<i>Pearl Bordered Yellow Underwing, Double Square Spot, Green Arches, Triple Spotted Clary, Ingrained Clary, Silver Ground Carpet</i>
Purple Loosestrife (<i>lythrum salicaria</i>)	<i>Emperor, Small Elephant Hawk, Powdered Quake</i>
Ragged Robin (<i>lychnis flos cuculi</i>)	<i>Campion, Lychnis, Twin-spot Carpet, Marbled Clover</i>
Red Campion (<i>melandrium rubrum</i>)	<i>Rivulet, Campion, Lychnis, Twin-spot Carpet, Sandy Carpet, Marbled Clover</i>
Red Clover (<i>trifolium pratense</i>)	<i>Latticed Heath, Chalk Carpet, Belted Beauty, Mother Skipton, Shaded Broad Bar, Narrow-bordered 5-spot Burnet</i>
Red Valerian (<i>centranthus ruber</i>)	<i>Elephant Hawk</i>
Rock Rose (<i>helianthemum mummularium</i>)	<i>Amulet, Cistus Forester, Silky Wave, Ashworth's Rustic, Argus, Wood Tiger, Northern Brown</i>
Rosebay Willowherb	<i>Twin-spot Carpet, Small Phoenix, White Banded Carpet</i>
Small Scabious (<i>scabiosa columbaria</i>)	<i>Lime Speck Pug, Shaded Pug</i>
Soapwort (<i>saponaria officinalis</i>)	<i>Marbled Clover</i>
St John's Wort	<i>Treble Bar</i>
Sweet Violet (<i>viola odorata</i>)	<i>Broad Bordered Yellow Underwing, Lesser Broad Bordered Yellow Underwing</i>
Tansy (<i>tanacetum vulgare</i>)	<i>Essex Emerald</i>
Thrift (<i>armeria maritima</i>)	<i>Amulet, Feathered Ranunculus, Thrift Clearwing, Black Banded</i>
Thyme	<i>Thyme Pug, Satyr Pug, Lace Border</i>
Toadflax (<i>linaria vulgaris</i>)	<i>Toadflax Pug, Marbled Clover</i>
Valerian (<i>valeriana officinalis</i>)	<i>Valerian Pug, Lesser Cream Wave</i>
White Campion (<i>silene latifolia alba</i>)	<i>Marbled Coronet, Marbled Clover, Sandy Carpet</i>
Wild Clematis (<i>clematis vitalnba</i>)	<i>Lime Speck Pug, Haworth's Pug, Small Emerald, The Fern, Pretty Chalk Carpet, Least Carpet, Pug, Chalk Carpet, Small Waved Umber</i>
White Clover (<i>trifolium repens</i>)	<i>Cloudy Wing Skipper, Orange, Clouded Sulphur</i>
Wild Pansy (<i>viola tricolor</i>)	<i>Pluvia</i>
Wild Strawberry (<i>fragaria vesca</i>)	<i>Amulet, Yellow Shell, Beautiful Carpet, Dark Marbled Carpet</i>

Wild Wallflower	<i>Flame Carpet</i>
Wormwood (<i>artemesia absinthium</i>)	<i>Wormwood Pug</i>
Yarrow (<i>achillea millefolium</i>)	<i>Essex Emerald, Lime Speck Pug, Straw Belle, Wormwood Pug, Ruby Tiger, Yarrow Pug, V Pug, Sussex Emerald, Grey Pug, Tawny Speckled Pug, Common Pug, Mullein Wave</i>
Yellow Flag Iris (<i>iris pseudacorus</i>)	<i>Belted Beauty, Water Ermine</i>
Barberry	<i>Scarce Tissue, Wheat</i>
Blackthorn/Sloe	<i>March, Common Emerald, Little Emerald, Mottled Pug, Feathered Thorn, Orange, Scalloped Hazel, Scalloped Oak, August Thorn, Brimstone, Early Thorn, Pale Brindled Beauty, Blue Bordered Carpet, Broken Barred Carpet, November, Pale November, Winter, Sloe Pug, Green Pug, Sharp Angled Peacock, The Magpie</i>
Broom	<i>Grass Emerald, The Streak, Broom-tip, Lead Belle, Spanish Carpet, Frosted Yellow</i>
Dog Rose	<i>V Pug, Little Thorn, Shoulder Stripe, Barred Yellow, Streamer</i>
Hawthorn	<i>March, Common Emerald, Little Emerald, November, Pale November, Winter, Mottled Pug, Pinion Spotted Pug, Common Pug, Grey Pug, Peppered, Brindled Beauty, Pale Brindled Beauty, Feathered Thorn, Scalloped Hazel, The Magpie, Scalloped Oak, Large Thorn, Early Thorn, Oak Tree Pug, Broken Barred Carpet</i>
Hazel	<i>Oak Beauty, Small White Wave, The Magpie, Clouded Border, Barred Umber, Winter, Pale November</i>
Oak	<i>Brindled Pug, Oak Tree Pug, Spring Usher, Peppered, Oak Beauty, Brindled Beauty, Pale Brindled Beauty, Small Brindled Beauty, Feathered Thorn, Orange, Lunar Thorn, Purple Thorn, Scalloped Hazel, Scalloped Oak, Scorched Wing, Large Thorn, August Thorn, November, September Thorn, Pale November, Winter, March, Blotched Emerald, Common Emerald, Little Emerald, False Mocha, Maiden's Blush, Marbled ug, Red-green Carpet, Broken Barred Carpet</i>
Rowan	<i>Orange Underwing, Welsh Wave, Mottled Pug, Red-green Carpet</i>
Wild Privet	<i>Lilac Beauty, Barred Toothed Striped, Yellow Barred Brindle,</i>

Appendix 4d: Plants and Habitats to attract Bats

1. Flower Borders and Lawns

Larvae and adults of many insects will be catered for by introducing a wide range of food, in the form of nectar, seeds and fruit as well as vegetation.

- Grow night scented flowers. These attract moths and other night flying insects of particular importance to bats.
- Plant herbs and old fashioned cottage-garden annuals attractive to insects.
- Leave part of your lawn un-mown from about mid-May to encourage insect larvae which feed on grass. Allow to seed before cutting, and rake up the hay afterwards.
- Sow wild flower seed collections in your borders.

2. Trees and Shrubs

At woodland edges space and sunshine combine with the trees to give shelter and warmth, and insects will concentrate there. So even in the smallest garden try to have at least one tree or shrub. Native trees are more attractive to insects than foreign species.

If space is limited, silver birch and goat willow are quick growing and are host to many insect visitors. With a little more space, try to make a bank of vegetation to give your garden a woodland edge structure.

3. Shelter Belts

Rows of bushes or trees can be created or improved, encouraging concentrations of insects and providing a feeding area for bats,

- Plant up gaps in natural hedges,
- A row of fast-growing cypress can be valuable.
- Train climbers using battens against a wall or fence, to provide possible roosting sites.
- Create a sheltered corner by using any combination of walls, fences, hedges or woodland edge at two angles.

Scented herbs

Chives, Borage, Lemon balm, Marjoram, Mint - many varieties

Night scented flowers for the border (in approximate order of flowering)

Bedding Plants

Nottingham catchfly	<i>Silene nutans</i>
Night-scented catchfly	<i>S. noctiflora</i>
Bladder campion	<i>S. vulgaris</i>
Night-scented stock	<i>Matthiola bicornis</i>
Sweet rocket	<i>Hesperis matronalis</i>
Evening primrose	<i>Oenothera biennis</i>
Tobacco plant	<i>Nicotiana affinis</i>
Cherry pie	<i>Heliotropium x hybridum</i>
Soapwort	<i>Saponaria officinalis</i>

Climbers

European honeysuckle	<i>Lonicera caprifolium</i>	July-November
Italian honeysuckle	<i>L. etrusca superba</i>	July-August
Japanese honeysuckle	<i>L. japonica halliana</i>	August-October
Honeysuckle (native)	<i>L. periclymenum...</i>	July-August
White jasmine	<i>Jasminum officinale</i>	
Dogrose	<i>Rosa canina</i>	
Sweetbriar	<i>R. rubiginosa</i>	
Fieldrose	<i>R. arvensis</i>	
Ivy	<i>Hedera helix</i>	
Bramble - many species		

Large trees, small trees and shrubs

Oak	<i>Quercus robur</i> & <i>Q. petraea</i>
Ash	<i>Fraxinus excelsior</i>
Silver birch	<i>Betula pendula</i>
Field maple	<i>Acer campestre</i>
Hawthorn	<i>Crataegus monogyna</i>
Alder	<i>Alnus glutinosa</i>
Goat willow	<i>Salix caprea</i>
Guelder rose	<i>Viburnum opulus</i>
Hazel	<i>Coryllus avellana</i>
Blackthorn	<i>Prunus spinosa</i>
Elder	<i>Sambucus nigra</i>
Buddleia davidii	

Rock plants for walls

Ivy-leaved toadflax	<i>Cymbalaria muralis</i>
Wall pennywort	<i>Umbilicus rupestris</i>

Appendix 4e: Plants and Habitats to Attract Birds

Plants to Feed Birds.

Many shrubs, climbers, trees, garden and 'wild' plants provide food, directly or indirectly, through berries, seeds or the insects they attract.

Berry or fruit bearing trees and shrubs will attract members of the Thrush family, Blackbird, Fieldfare, Mistle and song Thrush, Redwing and Robin. Also Starlings and, in some winters, Waxwing and even some Warblers, e.g., Blackcaps who eat berries in the early autumn before they migrate. Unless mentioned, the berries attract all the above birds plus others as specified.

Shrubs with Berries.

- Aronia arbutifolia (Red Chokeberry) : bright red fruits
- Berberis: most forms have black/purple berries, especially loved by Blackbirds.
- Callicarpa 'Profusion': bright violet coloured berries.
- Cornus (Dogwood): blue tinted white berries (not C.Mas).
- Cotoneaster : prolific red, orange or yellow berries - birds often choose red first, through orange to yellow last. (Note berries are poisonous to humans).
- Euonymus europaeus (spindleberry: large bright red fruits which open to emit orange red seeds.(Note berries are poisonous to humans).
- Ilex (Holy): red, orange or yellow berries - red berries preferred (need partner to fruit).(Note berries are poisonous to humans).
- Mahonia: decorative black berries.
- Rosa rugosa : large red hips, particularly attractive to Greenfinches which pick out the seeds.
- Sambucus (Elder): red or black berries - over 32 species reported eating them, especially Blackcap and, occasionally, Collar Doves.
- Viburnum opulus (Guelder Rose) : translucent berries
- Viscum album (Mistletoe): familiar white globular berries of this parasite that grows in trees, especially apple, are a good food source for Blackbirds.

Climbers with Berries.

- Chaenomeles (Flowering Quince/Cydonia): Autumn Quinces.
- Hedera (Ivy) : shiny black berries
- Lonicera (Honeysuckle: red or black berries attract Thrushes plus Bullfinches and Marsh and Willow Tits. (Note berries are poisonous to humans).
- Pyracantha (Firethorn) :red, orange or yellow berries - choose red for the birds to eat before Christmas usually with orange or yellow to follow in a hard winter.
- Clematis vitalba (Old Man's Beard): seed heads are enjoyed by many birds.

Trees with Berries or Fruits.

- Crataegus monogyna (Hawthorn : red berries.

- Malus (Crab Apple: red fruited varieties are best for birds.
- Prunus (Cherries): fruits quickly picked off.
- Sorbus aucuparia (Mountain Ash/Rowan) :red, orange or pink flushed white berries. The darker the fruits the more attractive they are to birds. Occasionally bring Spotted Flycatchers to the garden.
- Taxus (Yew): sparse red berries attract a wide range of birds. Attractive also to Badgers.(Note berries are poisonous to humans).

Trees with Seed Cones.

- Alnus glutinosa (Alder), and Betula (Birch): seeds from cones enjoyed by Goldfinches, Greenfinches, Redpolls, Siskins and Tits.
- Pinus sylvestris (Scots pine) : pine cones from which Crossbills and Great Spotted Woodpeckers prize seed.

Trees with Blossom.

- Although not always welcome, Bullfinches strip the buds of fruit trees in late winter and early spring.

Garden Plants.

- Crocus: yellow and orange flowers are attractive to Sparrows because they contain yellow pigment carotene to brighten up their plumage for the breeding season.
- Echinops ritro (Globe Thistle: seed heads are eaten by Goldfinches and flower heads attract insects.
- Helianthus (Sunflower: seed heads are eaten by Greenfinches. The nectar attracts a wide range of insects.
- Lavandula (Lavender): flowers going to seed are attractive to Goldfinches.
- Primula (Polyanthus/Primrose): yellow and orange flowers are attractive to Sparrows.

Wild Plants.

You can provide a haven for wild plants to exist in their own right recreating a wild meadow to attract insects which, in turn, attract birds and other wildlife. We sell nursery grown 'wild' plants throughout the year so that you can go wild in a corner of your garden.

- Betony.
- Bird's Foot Trefoil.

- Common Poppy - seeds are favourite food of Finches.
- Field Scabious.
- Greater Knapweed.
- Meadow Cranesbill.
- Musk Mallow.
- Ox Eye Daisy.
- Oxlip.
- Primrose.
- Rough Hawkbit.
- Self Heal.
- Teasel - seed heads are a favourite food of Goldfinches.
- Wild Strawberry

The Lawn.

This is one of the principal sources of food for birds who enjoy feeding on insects including:-Ants eaten by Green Woodpeckers; Leatherjackets by Starlings; Snails by Song thrushes; Slugs by Toads and Worms by Blackbirds, Robins and Thrushes.

Cover and Protection.

By surrounding your garden by thick and often prickly hedging and dotting suitable shrubs around, you can provide safe nesting havens that are protected from marauding cats and even the unwelcome attention of unfriendly humans.

The most successful shrubs and trees for this purpose include:-

- Conifers especially chamaecyparis, Taxus (Yew) and Thuja Placata.
- Crataegus.
- Eleagnus.
- Hedera (Ivy) up a tree.
- Ligustrum (Privet) especially for Blackbirds.
- Lonicera (Honeysuckle).
- Pittosporum.
- Salix caprea (Weeping Kilmarnock Willow).

Appendix 4f: Plants and Habitats to attract Bees

Native Plants for Bees

Native plants should be your first choice to help our native bees. Listed below are some plants that are good sources of nectar or pollen for bees. Both the common and Latin names of the plant genus are given. This list is not exhaustive; there are many other plants good for bees. Individual species have not been included because we hope the list will be useful across the U.S. Not all of these genera will have species in your local area, but they do represent plants that will grow in a variety of environments. Use a wildflower guide or contact local nurseries to find your local species.

- Aster *Aster*
- Black-eyed Susan *Rudbeckia*
- Caltrop *Kallstroemia*
- Creosote bush *Larrea*
- Currant *Ribes*
- Elder *Sambucus*
- Goldenrod *Solidago*
- Huckleberry *Vaccinium*
- Joe-pye weed *Eupatorium*
- Lupine *Lupinus*
- Oregon grape *Berberis*
- Penstemon *Penstemon*
- Purple coneflower *Echinacea*
- Rabbit-brush *Chrysothamnus*
- Rhododendron *Rhododendron*
- Sage *Salvia*
- Scorpion-weed *Phacelia*
- Snowberry *Symphoricarpos*
- Stonecrop *Sedum*
- Sunflower *Helianthus*
- Wild buckwheat *Eriogonum*
- Wild-lilac *Ceanothus*
- Willow *Salix*

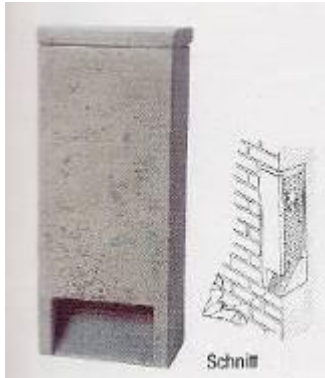
Garden plants for bees

Flower beds in gardens, business campuses, and parks are great places to have bee-friendly plants. Native plants will create a beautiful garden but some people prefer "garden" plants. Many garden plants are varieties of native plants, so this list only includes plants from other countries--"exotic" plants--and should be used as a supplement to the native plant list.

As with the native plants, this list is not exhaustive.

- Basil *Ocimum*
- Cotoneaster *Cotoneaster*
- English lavender *Lavandula*
- Giant hyssop *Agastache*
- Globe thistle *Echinops*
- Hyssop *Hyssopus*
- Marjoram *Origanum*
- Rosemary *Rosmarinus*
- Wallflower *Erysimum*
- Zinnia *Zinnia*

Appendix 5: Bat Boxes and Bat Brick Specifications to Provide Bat Habitat on Buildings



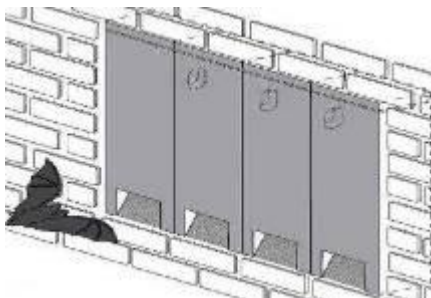
Schwegler 1FR can be installed within brick masonry just leaving the entrance and can be rendered over.



Ibstock Enclosed Bat Box B is designed specifically for the pipistrelle bat.



Schwegler W1 integral Summer & Winter Bat Box.



Schwegler 2FR Bat Tube is the same design as the 1FR but with holes in the sides. Multiple tubes to be placed next to each other to form a much larger roost.



Schwegler 27 wall can be installed within brick masonry. It can be rendered over.



Schwegler 1FQ wall-mounted bat box.



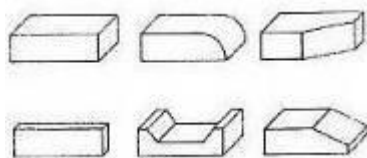
Schwegler 1FE Bat Access Panel can be surface-mounted or integrated. The open back enables bats access through exterior walls.



Ibstock Bat Box with Engraved Motif C is designed specifically for the pipistrelle bat and is available in all brick colours.



Ibstock Free Access Bat Box allows bats to access the cavity wall of the building.



Modified bricks for creating bat access points. A standard brick is shown top left. Purpose made bat bricks can also be used.



Norfolk Bat Brick allows bats to access the cavity wall of the building. The slits are the perfect size for Natterer's bat, Daubenton's bat, Brandt's bat and Brown long-eared.



Marshall's Bat Access Brick (Also available in stone) allows bats access into the cavity wall of the building.

APPENDIX 6: Insect Box Specifications

A variety of insect boxes is recommended to encourage a diversity of insect species and encourage bats.

Wooden Insect House

A general insect habitat for beneficial insects in summer and, later in the year, over wintering ladybirds and lacewings. Locate in a sheltered place near nectar or pollen plants or by a pond. Durable and strong construction in acacia, oak or larch with no maintenance necessary. Dimensions: 22 × 13.5 × 13.5cm.



Woodcrete Insect House

An insect nest made from long-lasting, insulating, woodcrete, with holes of different sizes providing homes for a variety of beneficial insects such as bees and solitary wasps. Dimensions: 14 × 8 × 26cm; Weight: 3.65kg



Insect House with Inspection Tubes

This nesting and hibernation box for insects has a woodcrete exterior with a wooden front panel which can be removed for observation. Through the transparent tubes you can see the usually hidden lifecycle of many solitary types of bees and hymenoptera including egg-laying, development of larvae and sealing of brood chambers. Typical inhabitants are wild bees and thread-waisted wasps. All the species attracted to this box are harmless non-aggressive pollinating insects.

Dimensions: 33 × 21 × 51 cm; Weight: 7.1kg.



Appendix 7. Bird Box Specifications

Schwegler boxes have the highest occupation rates of all box types. They are carefully designed to mimic natural nest sites and provide a stable environment for chick rearing and winter roosting. They can be expected to last 25 years or more without maintenance.

2. Schwegler No 11 House Martin Nest (Code: 002097D)



It is increasingly difficult for swallows and house martins to find suitable nest-building material. The mud they do find, if any, is often poor quality. In addition, the walls of buildings are nowadays often very smooth. As a result, nests tend to fall down, sometimes with the nestlings inside. In many places, the vibration caused by heavy vehicles shakes the nests loose. This nest has been developed to enable House Martins to breed successfully on external facades without overhanging eaves and has proved highly successful.

3. Schwegler No 16 Swift Box (Code: 002087D)

The design of this box mimics bell tower louvres. It has a removable panel for easy inspection of the nest chamber.



4. 2H Robin Box (Code: 002015D)



This box is attractive to robins, pied wagtails, spotted flycatcher, wrens and black redstarts. Best sited on the walls of buildings with the entrance on one side.

5. Sparrow Terrace



House sparrows are gregarious and prefer to nest close to each other, so this woodcrete box provides room for three families under one roof. Made from long-lasting, breathable woodcrete. No maintenance required. Designed for fixing to walls (not suitable for fences or sheds due to the weight of the box). Available in choice of stone colour (pictured) or brown.

6. Schwegler 1B Bird Box

The most popular box for garden birds, the 1B appeals to a wide range of species, and is the official nest box of National Nest Box Week. The box can be nailed to the trunk of a tree, or hung from a branch. Woodcrete, 23cm high x 16cm diameter. Available in choice of four colours - brown, green, red or white. Available with 32mm entrance hole (standard) or with 26mm hole



7. Schwegler Built-in Multi-System Main Cavity Bird Box (Code: 002101D)



The multi-system has exchangeable front panels for kestrels, jackdaws or swifts. The system can be installed in all types of buildings, whether constructed of concrete, brick or timber. To meet the needs of various species of bird, different types of front panel are available for use with the main cavity. The main cavity is supplied without a front panel which should be ordered separately. **Positioning:** At heights of 5m or more on a sheltered external wall. **Suitable for:** Dependant on the type of front panel chosen. **Material:** Woodcrete **Height:**415mm **Width:** 445mm **Depth:**415mm **Weight:**2.8Kg

Appendix 8: Measures specifically for hedgehogs

Hedgehog boxes or domes; a variety of types are shown below:

Hedgehog homes



Hedgehog Dome with insulated base

for use as summer home and hibernation in winter



[Pic. 1]: SCHWEGLER
Hedgehog Dome with
Hedgehog family

Hedgehogs are a protected species.

They usually construct nesting places in hollow tree stumps, piles of wood, dense vegetation and piles of leaves, all of which are becoming harder to find.

They will readily occupy our Hedgehog Dome, which provides year round accommodation, including hibernation quarters. Hedgehogs are welcome visitors to gardens because their diet consists of Snails, Caterpillars, Millipedes, etc.



[Pic. 2]: Hedgehog Dome
(occupied)

Material: SCHWEGLER wood-concrete. Brown protective coating for a balanced temperature

Siting: Choose somewhere protected from wind and rain. Try and avoid placing the Dome where the animals have to cross a lawn because these are mainly damp at night.

Nesting material: Ideally fill with hay (supplied with the Dome) but alternatively use dry leaves and straw, as well as cut up newspaper and wood shavings.

Dimensions:

Interior: $\diamond$ 44 cm Height: 28 cm Entrance: 11 x 12 cm
Exterior: ca. $\diamond$ 50 cm

Colour: Classic Brown

Weight: ca. 17 kg

Detailed instructions are supplied.



[Pic. 3]: Hedgehog Dome

(incl. nesting material, ready to use)

Hedgehog Dome with insulated base

order no.: 00 390 / 4