

Phase 1
Preliminary Ecological
Appraisal
Greenacres, Ashby Road,
Stapleton

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Surveyor: Dr. Stefan Bodnar BSc (Hons) PhD MCIEEM

NE class license: Bats: survey (level 2)

Client:	Report Author:
Ellie Jones MacDonald Planning Consultancy	Dr. Stefan Bodnar BSc (Hons) PhD MCIEEM Wallbrook farm Allensmore Hereford HR2 9BE Tel: 07429 209549 Email: stefan.bodnar01@gmail.com

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SUMMARY

Purpose

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 (2011).

Key Issues & Conclusions

- This Phase 1 Ecology Report confirms that the Development area is of generally 'low to negligible ecological value'.
- Any retained trees or hedges should be protected in accordance British Standard BS5837 (2012) 'Trees in Relation to Design, Demolition and Construction – Recommendations, to ensure require adequate root protection fencing.
- Bats react adversely to intense lighting, to maintain the suitability of the site for roosting and foraging bats, external lighting provision within the development should be as minimal as possible. External lighting should be via directional downlighters, of low lux and where possible, on timers to ensure as little light spill as possible from the development.
- Following development of the site a range of enhancements are recommended,
- During site clearance and construction a range of precautionary measures are recommended.
- There are no protected species on the site at the time of survey, and a HSI evaluation of the adjacent ponds indicated that these were of below average in terms of great crested newt potential.. There are no Statutory or Non-Statutory Designated Nature Conservation Sites within or adjacent to the site. There are no sites at further distances that will be impacted by this development.
- The hedgerow on site are suitable for breeding birds and potentially will have a number of nests during the breeding season. It is recommended that all clearance should take place outside of the bird breeding season.
- No further ecological surveys are recommended.

1. INTRODUCTION

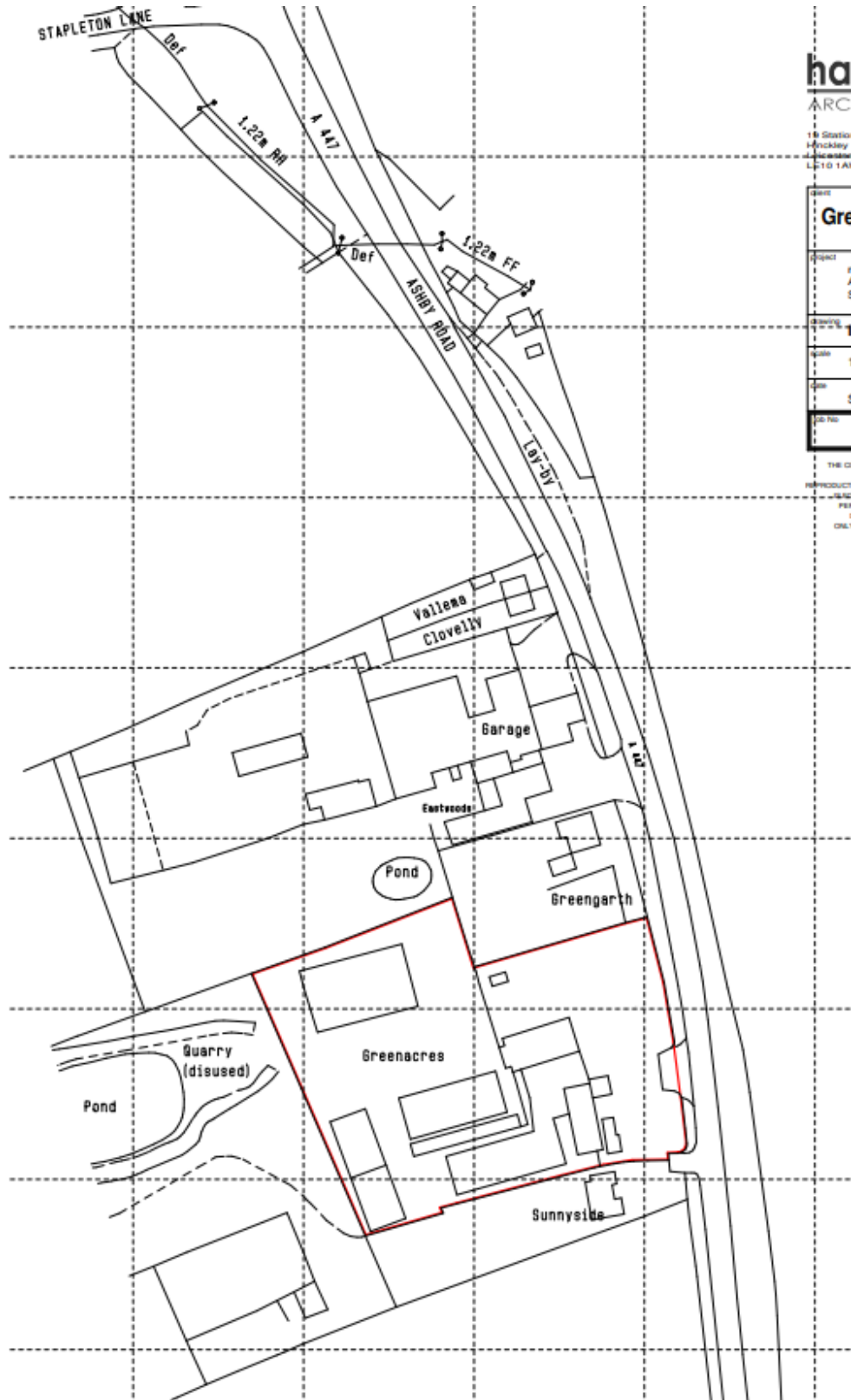
1.1. Background

At the request of Ellie McDonald, a Phase 1 Preliminary Ecological Appraisal was carried out at an area of land at Greenacres Garden Centre, Ashby Road, Stapleton, 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 development zone comprises an area of land Greenacres Garden centre, Ashby Road, Stapleton LE9 8JE. The site location is described on the site plan below.





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Location plan		
Scale: 1: 1250		
Date: Sept 2018	Author: JRH	Sheet: A3
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1.3. Site Description

The development site consists of an area of hardstanding and buildings. On the edges the site is partially bound on its Western edge by a non native Leyland cypress hedge *Cupressus × leylandii* and lines of trees and woodland dominated by spruce plantation bordering a former quarry pool. On the northern edge (off-site) is a partial woodland screen formed by a Leyland cypress hedge, off-site fruit trees and a mixed native/non-native hedge tree line.



Map data 2019 © Google

1.4. Brief Description of Project

The area is subject to a planning application (refer to planning application).

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).

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 2017, the Wildlife & Countryside Act 1981 (as amended), the List of Species & Habitats of Principle Importance for Conservation of Biological Diversity in Wales (Wales Biodiversity Partnership, 2007) and in local Biodiversity Action Plans.

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.

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 sites was also assessed for its actual and potential suitability to support Schedule 1 and Biodiversity Action Plan priority species.

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

Greenacres garden Centre, Ashby Road, Stapleton, Leicester LE9 8JE.

All areas of the site were available for access.

2.4. Date and Time of Survey

The initial site assessment was conducted on 19th August 2019.

2.5. Weather Conditions

The weather conditions during the survey were light showers.

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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.

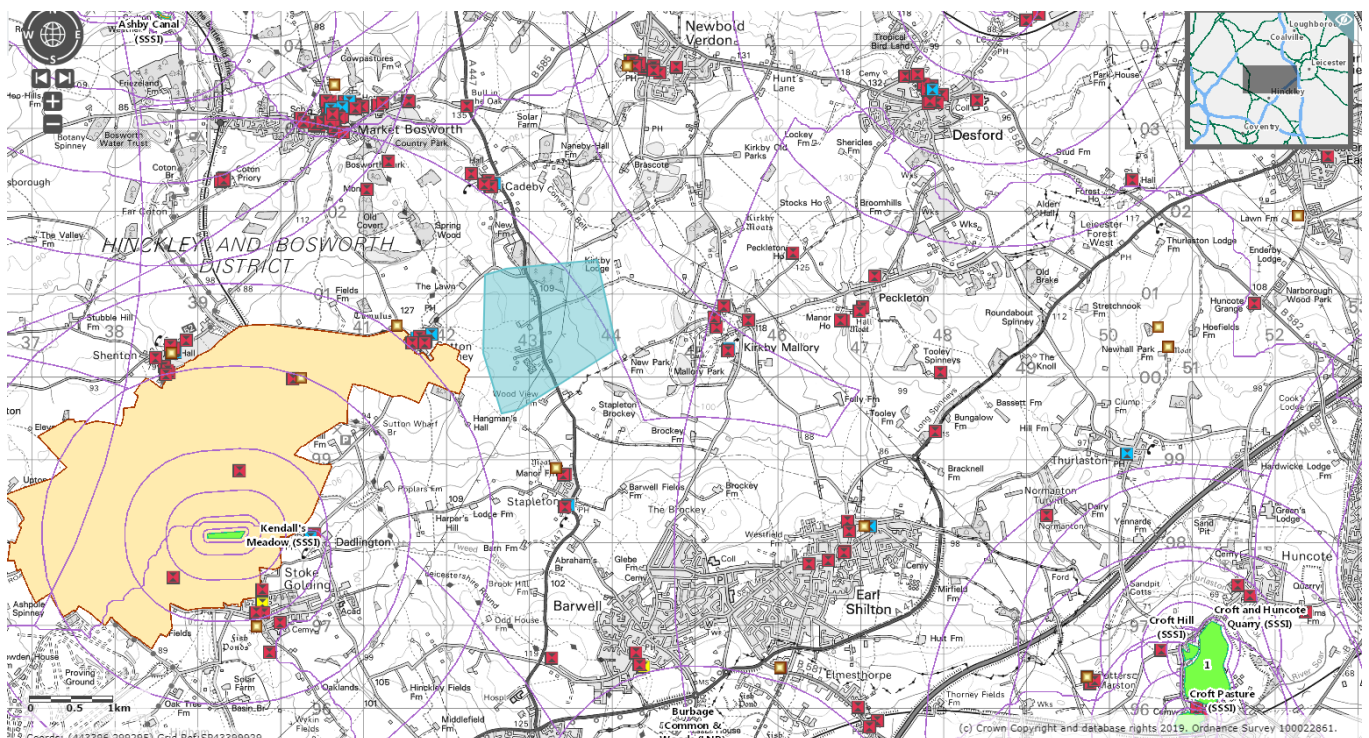
3. RESULTS

3.1. Desk Study Results

3.1a Statutory Nature Conservation Sites

The map below shows all Statutory Nature Conservation Sites (this includes Sites of Special Scientific Interest, Local Nature Reserves, Special Areas of Concern) within 5 km of the proposed development.

A Natural England 'Magic' data search (shown below) reveals that the site lies within a Nitrate Vulnerable Zone for surface water and within the SSSI Impact Zone for Kendall's Meadow SSSI, which is the closest statutory protected site which lies 5 km South-West of the site.

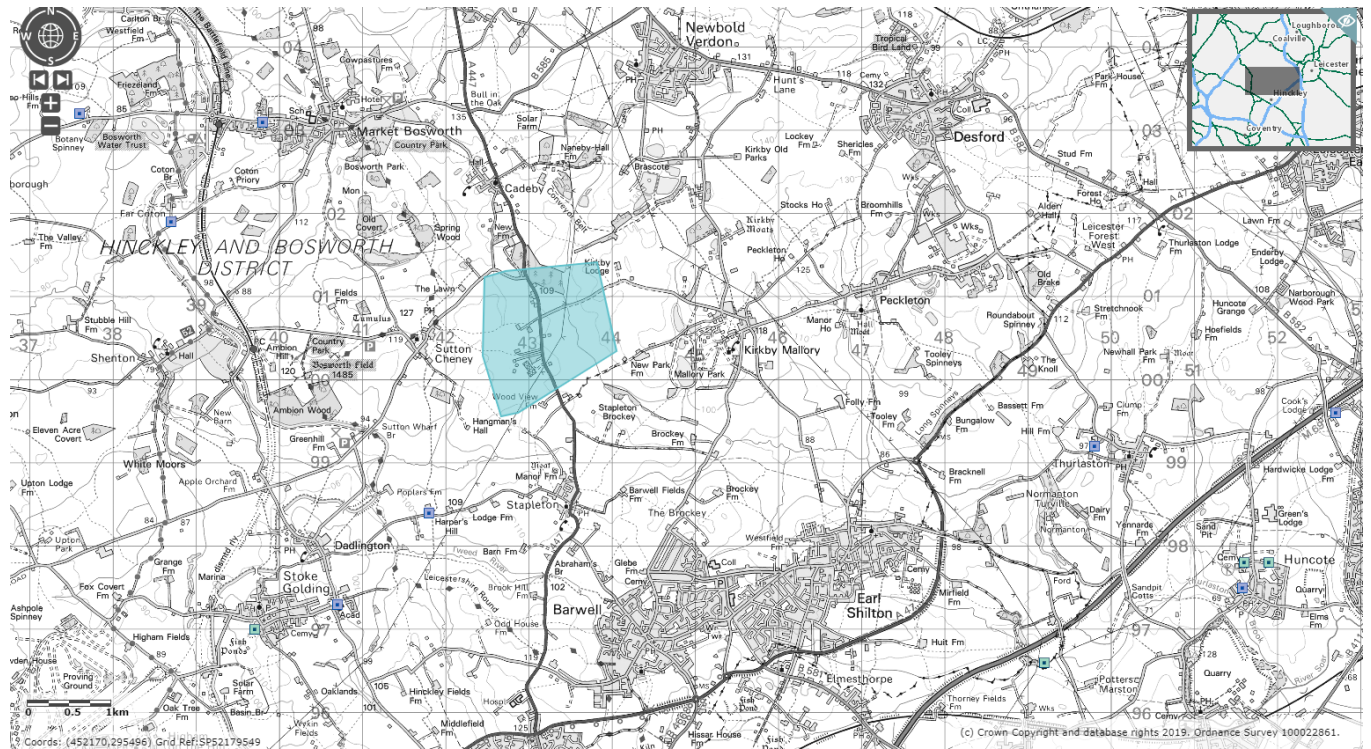


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Abbreviations: SSSI Special Scientific Interest, LNR Local Nature Reserve

3.1b. Protected Species Records

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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In relation to bat 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.

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

In relation to protected species, the following were recorded within 5 km and are presented here with the approximate distances of the nearest record.

Other Statutory Protected Species

Species (Latin Name)	Common Name	Approximate distance of nearest record from the survey site (km)
<i>Meles meles</i>	Badger	Within 2 km.
<i>Triturus cristatus</i>	Great Crested Newt	Within 5 m

3.1c Interpretation of Biological Data from Desk Study

The data search reveals that there are two bat species recorded recently within 2 km radius of the survey site, Badger is also recorded within 2 km of the site. Great Crested Newts are also recorded within 5 km of the site.

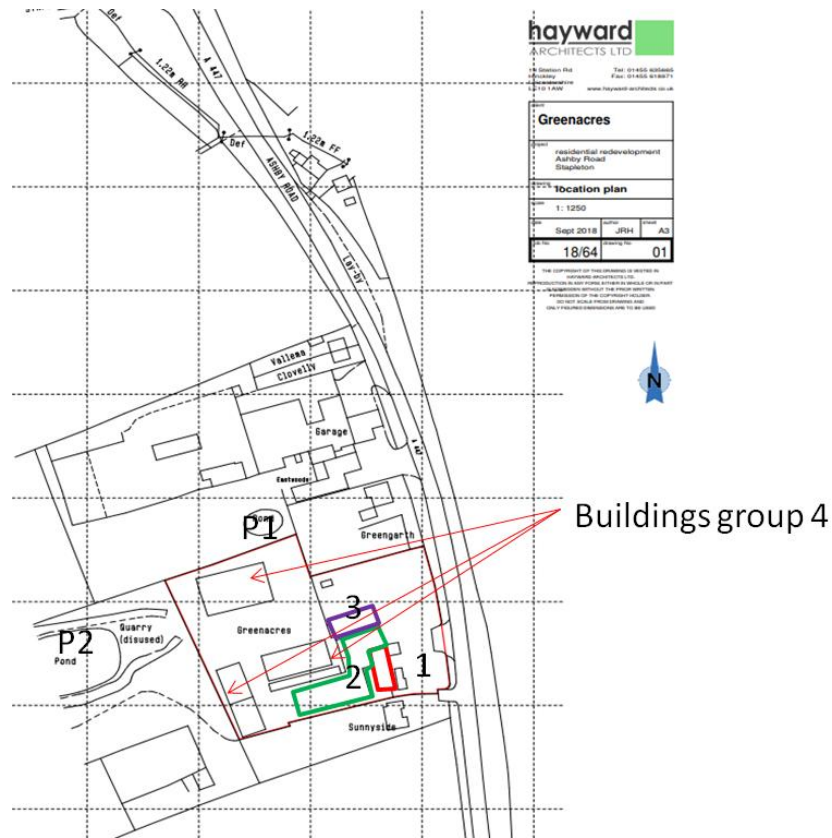
3.2 Survey Results

3.2.1. Habitat Types Present & Baseline Ecological Conditions

The development site consists of an area of hardstanding and buildings. On the edges the site is partially bound on its Western edge by a non native Leyland cypress hedge *Cupressus × leylandii* and lines of trees and woodland dominated by spruce plantation bordering a former quarry pool. On the northern edge (off-site) is a partial woodland screen formed by a Leyland cypress hedge, off-site fruit trees and a mixed native/non-native hedge tree line. (See Phase 1 Habitat Map, appendix 1d). The adjacent woodland and large pond (former quarry) to the West is likely to be the best foraging areas for bats in the immediate area.

Habitats present:

1. **Tall herb:** Dominated by bramble *Rubus fruticosus* agg., Nettle *Urtica dioica* and Rosebay willowherb *Chamerion angustifolium* with other species such as Canadian Goldenrod *Solidago canadensis* also present. Small area within site, target noted on Phase 1 plan
2. **Plantation woodland Fringe:** Dominated by a spruce plantation.
3. **Buildings and hard standing:** There are several buildings and buildings on site. Identified as follows:



Building 1: A single storey 1970/1980s bungalow. Brick built, with a pitched clay tile roof and painted wooden soffits. Intact throughout, with no gaps, cracks or missing tiles.

Building 2: This is the main retail space, primarily steel framed, poly-tunnel, with a false 'ceiling' designed to create a retail space.

Building 3: An unlined wooden chalet type building. The Café. Formed from single thickness wooden boards with no internal enclosed roof space.

Buildings 4: A variety of buildings, mainly steel framed poly-tunnels, glass greenhouses and open poly-tunnel type storage units (large covered structure on the Western boundary).

4. Non native plantings: two sections of leyland cypress hedge. There is a mixed native/non-native partial border to the north, though most of this appears to be a boundary feature not within the site itself.

3.2.2. Protected and Notable Species on Site

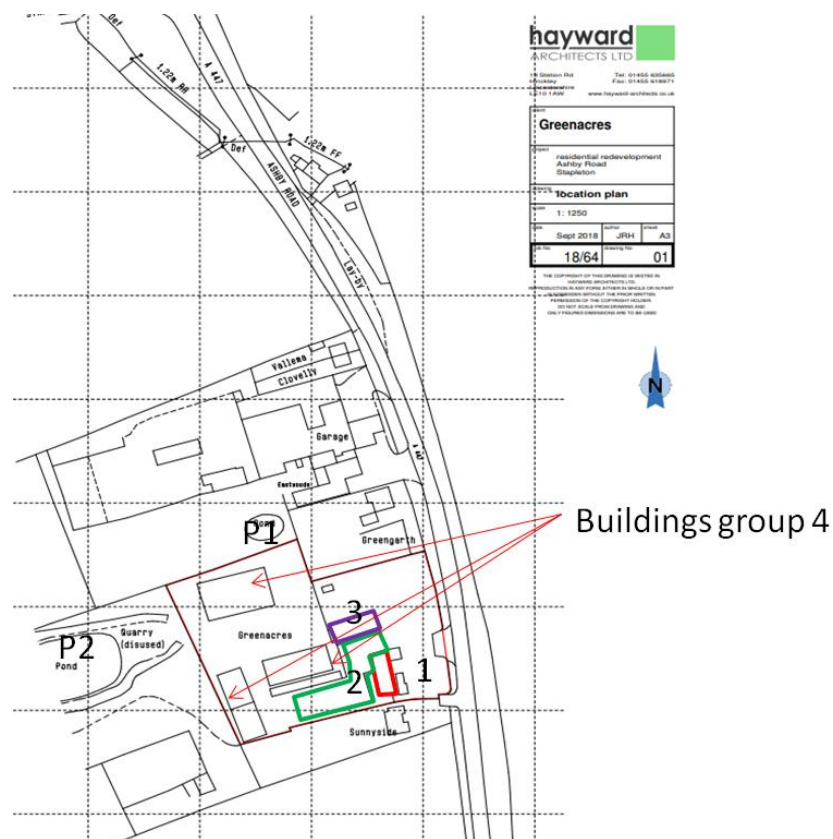
Bats:

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’.

The site has low value for bat foraging and commuting, being almost entirely hardstanding/buildings and well lit. There are no trees on site or to the edges with bat roost potential. Reducing and cowl lighting of the site post-development important to retain the value as a bat foraging site of the adjacent woodland is recommended.

The four on-site buildings have negligible bat roost potential.



Building 1: A single storey 1970/1980s bungalow. Brick built, with a pitched clay tile roof and painted wooden soffits. Intact throughout, with no gaps, cracks or missing tiles.

Building 2: This is the main retail space, primarily steel framed, poly-tunnel, with a false ‘ceiling’ designed to create a retail space.

Building 3: An unlined wooden chalet type building. The Café. Formed from single thickness wooden boards with no internal enclosed roof space.

Buildings 4: A variety of buildings, mainly steel framed ploy-tunnels, glass greenhouses and open poly-tunnel type storage units (large covered structure on the Western boundary).

Each was inspected and no signs of bats were found. There are no droppings, no other signs such as scratching or staining and no use by other mammals. No further bat surveys are recommended.

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.

There were no signs of badger, no trackways, latrines or snuffle holes, although badger are present within 1km. In addition, it can be confirmed there are no badger setts within 30m of the site boundaries. However, woodlands are commonly used by badgers and it is possible there will be badger setts within the adjacent woodland. Badgers range widely and if planning permission is granted, the presence of foraging Badger should be expected on the site, therefore deep excavations should be covered nightly or wooden planks used to provide escape routes, and checked prior to the days' work.

Other mammals

The presence of other specially protected mammals, such as otter, dormice, water shrew, or water vole, was assessed as extremely unlikely due to the lack of suitable habitat on the site for these species.

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>
Collared dove	<i>Streptopelia decaocto</i>
Goldfinch	<i>Carduelis carduelis</i>
Robin	<i>Erithacus rubecula</i>
Swallow	<i>Hirundo rustica</i>
Woodpigeon	<i>Columba palumbus</i>
Wren	<i>Troglodytes troglodytes</i>

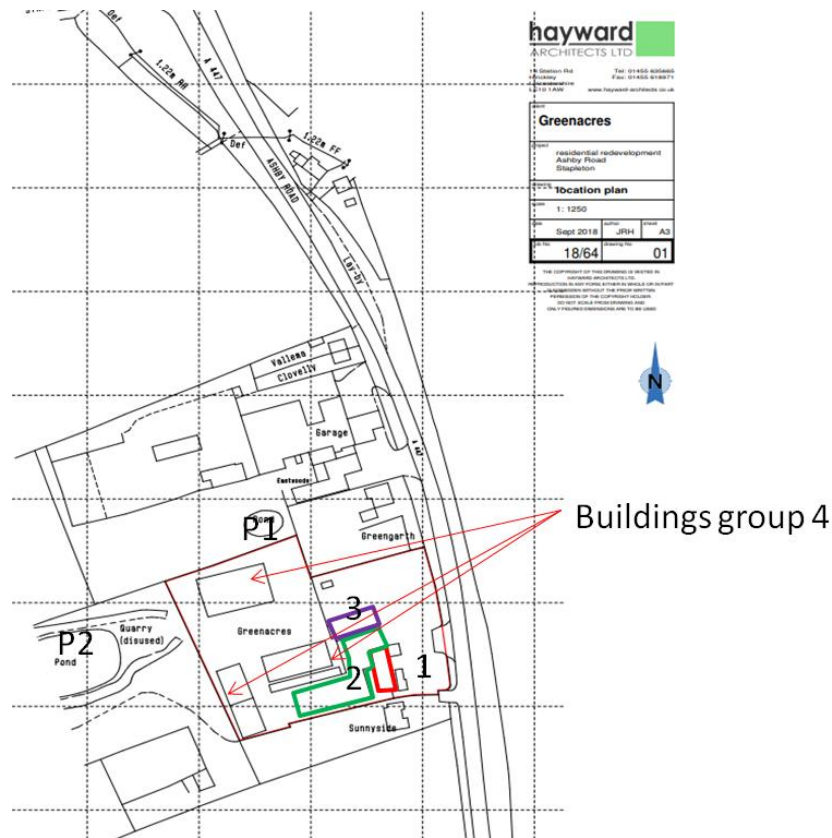
The birds listed above were actually recorded on the site itself. The hedgerows and trees bordering the survey site could also provide suitable for nesting habitat for a number of other common bird species. Therefore these features should be protected and enhanced where possible. It is recommended that any site clearance involving vegetation is undertaken outside of the bird breeding season (mid March to mid July). 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 water-body 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 ponds on site, and the terrestrial habitat is mainly of low suitability for Great Crested Newts, however there are two ponds nearby, one is within 10m of the site boundary to the north, and a second water filled quarry which is approximately 70m from the development area. In addition, the site is surrounded by woodland habitat.

In order to evaluate the presence of newts related to these two ponds, the following Habitat Suitability Assessment (HSI) was undertaken. The ponds are shown below (P1 and P2):



The survey method employed is determined by Natural England’s Standing Advice for Great Crested Newt *Triturus cristatus* (refer to Natural England web-site), recommends the following generic advice:

An initial survey of the terrestrial habitats and quality of the ponds within, and adjacent to, the development footprint is a useful starting point. This should ideally follow the Habitat Suitability Index (HSI) methodology developed by Oldham et al. 2000 which looks at a number of variables including pond size, terrestrial habitat, pond shading and water quality to derive a probability of newts being present within a pond. This is a helpful tool for large schemes as it may help to „scope out some ponds for more detailed surveys. Please note that HSI assessments are not an alternative to carrying out a more detailed survey should one be required

Habitat Suitability Assessment

Any ponds were then assessed for habitat suitability for great crested newts, utilising the modified Great Crested Newt Habitat Suitability Index (Oldham *et al*, 2000). The habitat suitability index provides a means of evaluating habitat quality. The Habitat Suitability Index (HSI) is a numerical index between 0 and 1, where 0 indicates suitable habitat and 1 represents optimal habitat. The HSI score is then utilised to define the suitability of the pond on a categorical scale

(Table below). The system is not precise enough to allow the conclusion that a pond with a high score will support great crested newts whilst those with a low score will not. See Appendix 7 for reference document of the Great Crested Newt Habitat Suitability Index.

HSI Score	Pond Suitability
< 0.5	Poor
0.5 – 0.59	Below average
0.6 – 0.69	Average
0.7 – 0.79	Good
> 0.8	Excellent

Table 2.1: HSI scoring for pond suitability

The survey was undertaken on 19th August 2019 by Dr. Stefan Bodnar MCIEEM, who holds a Natural England Class License CL08 1159, level 2 survey.

Great crested newts are protected under Schedule 5 of the Wildlife and Countryside Act (1981) as amended and Schedule 2 of the Conservation (Natural Habitats etc) Regulations 1994 (Regulation 38). Because of their rarity they are also protected under Annexes IIa and IVa of the Habitats and Species Directive and under the Berne Convention. In 2007, the Conservation (Natural Habitats etc) Regulations 1994 was amended particularly in relation to designated European Protected Species (EPS) which includes great crested newt. In particular, the amendment removes the requirement for actions to be intentional or reckless in order for an offence to be committed.

Langton *et alia* (2001) make the point that:

“The wording in the 1981 Act and 1994 Regulations is slightly different.” “Taken together, the Act and the Regulations (following the CROW Act 2000) make it illegal to:

Intentionally or deliberately capture or kill, or intentionally injure great crested newts.

- *Deliberately disturb great crested newts or intentionally or recklessly * disturb them in a place used for shelter or protection.*
- *Damage or destroy a breeding site or resting place.*
- *Intentionally or recklessly damage, destroy or obstruct access to a place used for shelter or protection.*
- *Possess a great crested newt, or any part of it, unless acquired lawfully.*
- *Sell, barter, exchange or transport or offer for sale great crested newts or parts of them.*

**Reckless offences were added by the Countryside and Rights of Way Act 2000, which applies only to England and Wales”.*

SI1 - Geographic location	A	1	A	1
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SI2 – Pond area to nearest 50m ² (m ²)	30m2	0.1	750m2	1
SI3 - Pond drying (frequency)	Never	0.9	Never	0.9
SI4 – Water quality	Moderate	0.67	Moderate	0.67
SI5 – Pond shading (%)	80%	0.2	100%	0.2
SI6 – Water Fowl	Absent	1	Minor	0.67
SI7 - Fish	Absent	1	Minor	0.33
SI8 – Pond density	4	1	4	1
SI9 – Surrounding terrestrial habitat	Poor	0.33	Poor	0.33
SI10 – Macrophyte (aquatic plant) density(%)	0%	0.3	0%	0.3
HSI SCORE		0.510150422		0.552277213
CATEGORY	Below Average		Below Average	

The survey concluded that of the only nearby ponds, both were holding water at the time and were in the below average category for great crested newts. (Allowing the surrounding habitat to be categorized as low. Raising the surrounding habitat value to ‘moderate’ the category remains as ‘below average’. **In light of Natural England guidance in respect of surveys, it was determined that further surveys for Great Crested Newts will not be required, based on the HSI score.**

The presence of Great Crested Newts on site was assessed as unlikely, however as a minimum a range of precautions following appropriate surveys is recommended. Initial precautionary measures are described fully in section 4.3b Precautionary Measures During Development, though these will be refined and revised in respect of great crested newts as part of the licensing process.

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 majority of the terrestrial habitat is of low suitability for reptiles. The surrounding woodland habitat is moderately suitable for reptiles and there are records of Grass snake within 2km, most likely associated with the large adjacent pool to the West. These highly mobile reptiles are rarely recorded during reptiles surveys, therefore no further reptile surveys are recommended. Instead it should be assumed reptiles may be present on the site and a precautionary approach taken. Therefore, it is recommended that the works are carried out with a series of precautions designed to protect any reptiles on site. These are described fully in section 4.3b Precautionary Measures During Development. In addition, it is recommended that an area of suitable reptile habitat be created along the Western edge of the site, as part of the mitigation for this development.

Other notable species

A small area of Himalayan balsam *Impatiens glandulifera*, was noted on the site, within the Target noted Tall herb area.

4.0 Discussion

It is important that this proposed development should demonstrate no net loss of biodiversity from the site. 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 (2018) 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.

4.0. Ecological Constraints

The value of the majority of the site, in terms of ecological value to wildlife, is low. However, the hedgerow boundary and the maintenance of a dark corridor to support local bat populations, and the in hedge oak tree are of moderate to high ecological importance. The habitats present within the area consists of two elements (see Phase 1 Habitat Map in Appendix 1d) which are not of European importance.

- Non-native hedges
- Building and hard standing

There are no significant constraints identified in terms of the site and protected habitats or species.

4.1. Additional Ecological Surveys Recommended

None identified.

4.2. Minimising Ecological Impact

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

4.2a. Protecting the Ecological Value of the Site.

All trees to be retained 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 where necessary.

The maintenance of dark edges along the adjacent woodland to the West, to support bat populations are the features of importance on this site. Tree lines on the site contribute to commuter routes and foraging areas for local bat populations and these features should therefore be retained and protected. If trees are unavoidably lost to accommodate the scheme, suitable compensation planting should be carried out.

Lighting on the proposed development should be low lux, cowled (directed downwards to prevent light splay), and used on timers or motion sensors.

The hedgerows on suitable for breeding birds and potentially will have a number of nests during the breeding season. If small areas of vegetation are to be removed then it is recommended that all clearance should ideally take place outside of the bird breeding season. Bird breeding season is between mid March and mid July, 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. If clearance is undertaken within the bird breeding season then all site features should preferably be checked immediately prior to clearance by a suitably qualified ecologist.

Following the built development there will be opportunities for enhancement of the site's ecological value by creation of reptile habitat along the Western boundary, and on site landscaping measures designed to encourage wildlife into the site, including native planting, bird and bat boxes on built structures. This is covered more in section 5.3.

4.3b. Precautionary Measures during Development

The hedges on site are suitable for breeding birds and potentially will have a number of nests during the breeding season. It is recommended that all clearance should take place outside of the bird

breeding season. Bird breeding season is between mid March and mid July, 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. If clearance is undertaken within the bird breeding season then all site features should preferably be checked immediately prior to clearance by a suitably qualified ecologist.

Following the advice below will help developers to avoid committing offences. In accordance with the Protection of Badgers Act (1992) precautionary measures that should be taken to minimise disturbance and interference with badgers include:

- 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.
- Trenches and excavations are to be covered at the end of each working day, or include ramps as a means of escape for any animal falling in.
- Any temporary exposed open pipe system should be capped to prevent badgers gaining access.

The following precautions shall be employed in respect of great crested newts and reptiles:

1. 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.
2. 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.
3. Keep duration of groundworks as short as possible.
4. Undertake during the day works that might only affect newts above ground.
5. Backfill trenches and other excavations before nightfall, or leave a ramp to allow newts to easily exit.
6. Raise stored materials (that might act as temporary resting places) off the ground, e.g. on pallets.

Including where possible:

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

4.4 Opportunities for Biodiversity Gain

Following the site re-development there will be opportunities to enhance the site, through selective landscape plantings. Throughout, species should be selected, that are both native and wildlife friendly, focusing on measures to encourage birds and foraging bats, wherever possible. See appendix 4 for detailed information.

Specific opportunities for this site are the creation of reptile habitat along the western boundary.

The other opportunities for enhancement lie in the following main areas:

1. Planting with native nectar rich and berry bearing tree, shrub and plant species.
2. Introduction of bat and bird friendly native planting schemes, bat hibernacula, and wildflower hedgerow edge mix seeding.
3. Bird and bat boxes incorporated within or on the new buildings or other built fabric, in particular should be included.
4. Aquatic habitat creation as part of a Sustainable Urban Drainage System to serve the new development.
5. Use of FSC certified timber within the development.
6. No use of any peat based products within the landscaping of the site.
7. Selection of wildlife-friendly shrub/planting species as part of the terrestrial landscaping scheme within the development. The specification should include 4 elements of landscaping details selected from a palette of species beneficial to wildlife (further information can be found in Appendix 4):
8. Planting of native deciduous specimen tree species.
9. Wildflower seeding areas
10. Hedgehog boxes and gaps at ground level within fencing to allow for hedgehog movement in and out of the site and between new development plots.
11. A number of bird and bat boxes could be attached to the built structures, as follows:

Bird box specifications

Bird boxes can be ordered from NHBS Ecology details can be found in appendix 5. Sufficient mitigation will be required for loss of bird nesting potential .

Bat Box Specifications

It is also suggested that 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.

5.0 Conclusion

- This Phase 1 Ecology Report confirms that the Development area is of generally 'low to negligible ecological value'.
- Any retained trees or hedges should be protected in accordance British Standard BS5837 (2012) 'Trees in Relation to Design, Demolition and Construction – Recommendations, to ensure require adequate root protection fencing.
- Bats react adversely to intense lighting, to maintain the suitability of the site for roosting and foraging bats, external lighting provision within the development should be as minimal as possible. External lighting should be via directional downlighters, of low lux and where possible, on timers to ensure as little light spill as possible from the development.
- Following development of the site a range of enhancements are recommended,
- There are no protected species on the site at the time of survey, and a HSI evaluation of the adjacent ponds indicated that these were of below average in terms of great crested newt potential.. There are no Statutory or Non-Statutory Designated Nature Conservation Sites within or adjacent to the site. There are no sites at further distances that will be impacted by this development.
- The hedgerow on site are suitable for breeding birds and potentially will have a number of nests during the breeding season. It is recommended that all clearance should take place outside of the bird breeding season.
- No further ecological surveys are recommended.

4.5 Opportunities for Biodiversity Gain

Following the site re-development there will be opportunities to enhance the site, through selective landscape plantings. This will be in addition to the habitat buffer created to the East and north designed to maintain habitat connectivity for wildlife. Throughout, species should be selected, that are both native and wildlife friendly, focusing on measures to encourage birds and foraging bats, wherever possible. See appendix 4 for detailed information.

Specific opportunities for this site are the creation of reptile habitat adjacent to the railway line on the Eastern boundary of the site. Creating a strip of reptile habitat adjacent to the railway line along the eastern site boundary, could be as simple as retaining 7m of the site along the Eastern boundary, behind the new fences erected to enclose the development, along the railway line, and allowing the grassland to be unmanaged and leaving a series of log piles aligned east-west, to capture maximum sunlight along their south facing edge.

The other opportunities for enhancement lie in the following main areas:

12. Planting with native nectar rich and berry bearing tree, shrub and plant species.
13. Introduction of bat and bird friendly native planting schemes, bat hibernacula, and wildflower hedgerow edge mix seeding.
14. Bird and bat boxes incorporated within or on the new buildings or other built fabric, in particular should be included.
15. Aquatic habitat creation as part of a Sustainable Urban Drainage System to serve the new development.
16. Green roofs and green walls should be incorporated into the new development.
17. Use of FSC certified timber within the development.
18. No use of any peat based products within the landscaping of the site.
19. Selection of wildlife-friendly shrub/planting species as part of the terrestrial landscaping scheme within the development. The specification should include 4 elements of landscaping details selected from a palette of species beneficial to wildlife (further information can be found in Appendix 4):
20. Planting of native deciduous specimen tree species.
21. Wildflower seeding areas
22. Hedgehog boxes and gaps at ground level within fencing to allow for hedgehog movement in and out of the site and between new development plots.
23. A number of bird and bat boxes could be attached to the built structures, as follows:

Bird box specifications

Bird boxes can be ordered from NHBS Ecology details can be found in appendix 5. Sufficient mitigation will be required for loss of bird nesting.

Bat Box Specifications

It is also suggested that 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.

Bat Box 1RFQ

NHBS Design

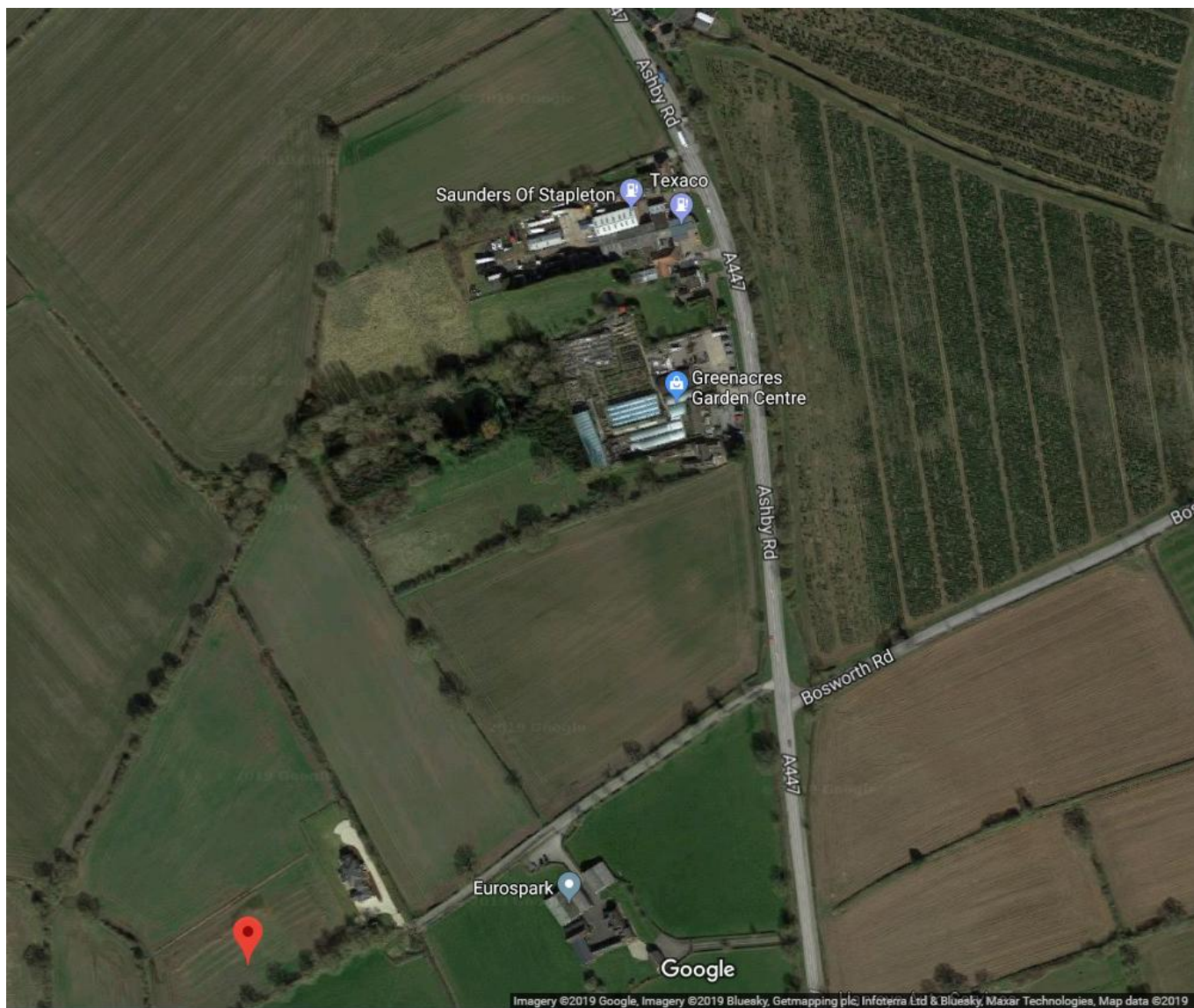
5.0 Conclusion

- This Phase 1 Ecology Report confirms that the Development area is of generally 'low to negligible ecological value'.
- Any retained trees or hedges should be protected in accordance British Standard BS5837 (2012) 'Trees in Relation to Design, Demolition and Construction – Recommendations, to ensure require adequate root protection fencing.
- Bats react adversely to intense lighting, to maintain the suitability of the site for roosting and foraging bats, external lighting provision within the development should be as minimal as possible. External lighting should be via directional downlighters, of low lux and where possible, on timers to ensure as little light spill as possible from the development.
- Following development of the site a range of enhancements are recommended,
- During site clearance and construction a range of precautionary measures are recommended.
- There are no protected species on the site at the time of survey, and a HSI evaluation of the adjacent ponds indicated that these were of below average in terms of great crested newt potential.. There are no Statutory or Non-Statutory Designated Nature Conservation Sites within or adjacent to the site. There are no sites at further distances that will be impacted by this development.
- The hedgerow on site are suitable for breeding birds and potentially will have a number of nests during the breeding season. It is recommended that all clearance should take place outside of the bird breeding season.
- No further ecological surveys are recommended.

Date	Prepared by	Checked and Verified by
1 st September 2019	Dr Louise Sutherland MIALE Ecologist	Dr. Stefan Bodnar MCIEEM Principal Ecologist <i>Dr. Stefan Bodnar</i>

Appendix 1a/1b Area context Satellite Image

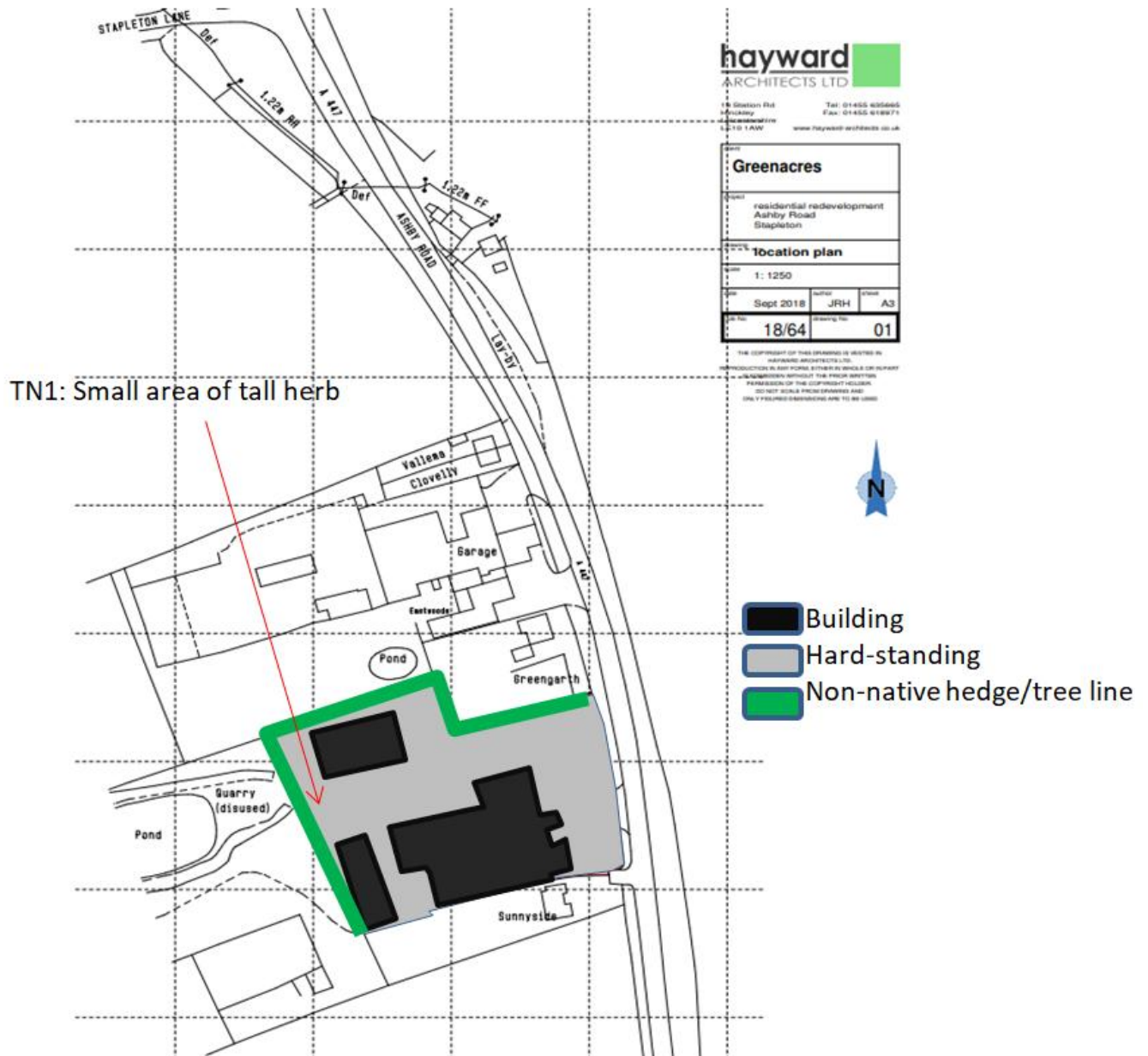




Map data 2019 © Google.

Appendix 1d Phase 1 Habitat Maps

Phase 1 Habitat Map



Appendix 2 Photographs







Pond 1



Pond 2















Appendix 3 Species lists

Appendix 3a: Plant Species List

Trees & Shrubs

Common Name	<i>Scientific Name</i>
Ash	<i>Fraxinus excelsior</i>
Blackthorn	<i>Prunus spinosa</i> ,
Apple	<i>Malus sylvestris</i>
Hawthorn	<i>Crataegus monogyna</i>
Sycamore	<i>Acer pseudoplatanus</i>
Goat willow	<i>Salix caprea</i>
Silver birch	<i>Betula pendula</i>
Leyland cypress	<i>Cupressus × leylandii</i>

Grasses, Sedges & Rushes

Common Name	<i>Scientific Name</i>
Annual meadow grass	<i>Poa annua</i>
Cocksfoot	<i>Dactylis glomerata</i>
Perennial ryegrass	<i>Lolium perenne</i>

Other Flowering Plants and Ferns

Common Name	<i>Scientific Name</i>
Bramble	<i>Rubus fruticosus</i> sp
Broad leaved Dock	<i>Rumex obtusifolius</i>
Dandelion	<i>Taraxacum officinale</i>
Dog Rose	<i>Rosa canina</i>
Himalayan balsam	<i>Impatiens glandulifera</i>
Nettle	<i>Urtica dioica</i>
Ribwort Plantain	<i>Plantago lanceolata</i>
Sow-thistle, Smooth	<i>Sonchus oleraceus</i>
White dead-nettle	<i>Lamium alba</i>
Yarrow	<i>Achemilla millefolium</i>

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 'Lochinch' 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 origanum</i>)	<i>Sub-angled Wave, Lace Border</i>

Marshmallow (<i>althaea 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

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.

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.

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

Climbers

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

Large trees, small trees and shrubs

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

Rock plants for walls

Ivy-leaved toadflax

Cymbana muralis

Wall pennywort

Umbilicus rupestris

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 prise 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*

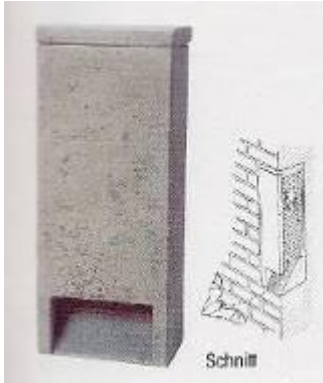
Garden plants for bees

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



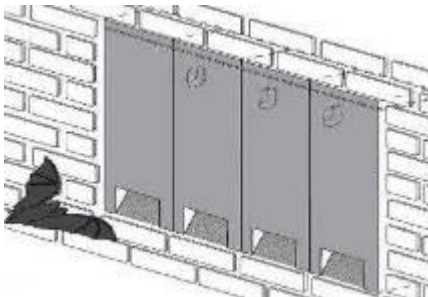
Schwegler 1FR can be installed within brick masonry just leaving the entrance and can be rendered over.



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



Schwegler WI 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.



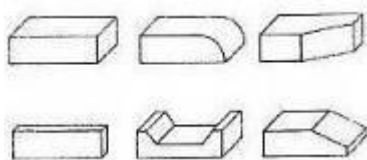
Schwegler 1FE Bat Access Panel can be surface-mounted or integrated. The open back enables bats access through exterior walls.



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, overwintering 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.

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.

Schwegler No 16 Swift Box (Code: 002087D)

The design of this box mimics bell tower louvres. It has a removable

panel



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.

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.

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, 16cm high x 16cm diameter. Available in choice of four colours - brown, red or white. Available with 32mm entrance hole (standard) or with 26mm hole



of
box
23cm
green,
26mm

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: ♦ 44 cm Height: 28 cm Entrance: 11 x 12 cm
Exterior: ca. ♦ 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