



Extended Phase 1 Habitat Survey

Steeple Aston, Oxfordshire

On Behalf of:

Rectory Homes

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1.0 Introduction and Aims

1.1 Southern Ecological Solutions Ltd. (SES) was commissioned by Rectory Homes to undertake an Extended Phase 1 habitat survey of Steeple Aston, Oxfordshire (the site). The development consists of six residential properties with associated hard standing, amenity gardens, and access road (see Appendix 1 for site plan).

1.2 The objectives of this extended phase 1 survey were to:

- Map the main ecological features within the site and compile a plant species list for each habitat type;
- Make an initial assessment of the presence or likely absence of species of conservation concern;
- Identify any legal and planning policy constraints relevant to nature conservation which may affect the development;
- Determine any potential further ecological issues;
- Determine the need for further surveys and mitigation; and
- Make recommendations for minimising impacts on biodiversity and providing net gains in biodiversity where possible in accordance with chapter 11: Conserving and Enhancing the Natural Environment, of the National Planning Policy Framework (NPPF) (DCLG, 2012) and Section 3.3 of the Cherwell Local Plan (2011).

1.3 The site survey was undertaken by suitably qualified ecologist Chris Kelly MSc BSc (Hons) on 25th October 2017 in suitable weather conditions.

2.0 Methods

Desk Study

2.1 SES commissioned a data search for records of protected and notable fauna species and non-statutory designated sites via Thames Valley Environmental Records Centre (TVERC). The data search encompassed the study area, and up to 2km from the boundary for protected species. Furthermore, records of hazel dormouse *Muscardinus avellanarius* were searched for using National Biodiversity Network (NBN) Atlas which holds data from the People's Trust for Endangered Species (PTES).

2.2 A web-based search for statutory designated sites via the MAGIC spatial data resource was undertaken on 31st October 2017 for the following designations: European designated sites (up to 8km from the site boundary); and national (5km from the site boundary).

2.3 An online search was undertaken for waterbodies within 500m of the site boundary utilising Promap and MAGIC.

Extended Phase 1 Habitat Survey

2.4 The field survey comprised of an extended Phase 1 Habitat survey (JNCC, 2010) of the proposed development site. This is a standard technique for obtaining baseline ecological information for areas of land, including proposed development sites.

2.5 The dominant and readily identifiable higher plant species identified in each of the various habitat parcels were recorded and their abundances assessed on the DAFOR scale:

- D Dominant
- A Abundant
- F Frequent
- O Occasional
- R Rare

2.6 These scores represent the abundance within the defined area only and do not reflect national or regional abundances. Plant species nomenclature follows Stace (2010).

Constraints

2.7 Desktop data searches are a valuable tool in evaluating a sites potential to hold rare and protected species, it is not however an absolute in confirming presence or absence of notable species due to the nature of how the records are collected.

3.0 Legislative and Policy Framework

National Planning Policy

3.1 The NPPF (DCLG, 2012) outlines what the planning system should do to contribute to, and enhance the natural and local environment through the following policy statements:

Paragraph 7

There are three dimensions to sustainable development: economic, social and environmental; these give rise to the need for the planning system to perform a number of roles:

- *an environmental role- contributing to protecting and enhancing our natural, built and historic environment; and, as part of this, helping to improve biodiversity, use natural resources prudently, minimise waste and pollution, and mitigate and adapt to climate change moving to a low carbon economy.*

Paragraph 9

Pursuing sustainable development involves seeking positive improvements in the quality of the built, natural and historic environment, as well as in people's quality of life including but not limited to:

- *Moving from a net loss of bio-diversity to achieving net gains for nature.*

Paragraph 109

The planning system should contribute to and enhance the natural and local environment by:

- *recognising the wider benefits of ecosystem services;*
- *minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.*

Paragraph 118

When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:

- *If significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused; and*
- *Opportunities to incorporate biodiversity in and around developments should be encouraged.*

Paragraph 152

Local planning authorities should seek opportunities to achieve each of the economic, social and environmental dimensions of sustainable development and net gains across all three.

- *Protecting and enhancing valued landscapes, geological conservation interests and soils;*
- *Recognising the wider benefits of ecosystem services;*
- *Minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including establishing coherent ecological networks that are more resilient to current and future pressures.*

Local Planning Policy

3.2 The Cherwell Adopted Local Plan (2011) policies related to nature conservation are set out below.

Policy ESD 9: Protection of the Oxford Meadows SAC

Developers will be required to demonstrate that:

- *During construction of the development there will be no adverse effects on the water quality or quantity of any adjacent or nearby watercourse*
- *During operation of the development any run-off of water into adjacent or surrounding watercourses will meet Environmental Quality Standards (and where necessary oil interceptors, silt traps and Sustainable Drainage Systems will be included)*
- *New development will not significantly alter groundwater flows and that the hydrological regime of the Oxford Meadows SAC is maintained in terms of water quantity and quality*
- *Run-off rates of surface water from the development will be maintained at greenfield rates.*

Policy ESD 10: Protection and Enhancement of Biodiversity and the Natural Environment

Protection and enhancement of biodiversity and the natural environment will be achieved by the following:

- *In considering proposals for development, a net gain in biodiversity will be sought by protecting, managing, enhancing and extending existing resources, and by creating new resources*
- *The protection of trees will be encouraged, with an aim to increase the number of trees in the District*
- *The reuse of soils will be sought*
- *If significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or as a last resort, compensated for, then development will not be permitted.*
- *Development which would result in damage to or loss of a site of international value will be subject to the Habitats Regulations Assessment process and will not be permitted unless it can be demonstrated that there will be no likely significant effects on the international site or that effects can be mitigated*
- *Development which would result in damage to or loss of a site of biodiversity or geological value of national importance will not be permitted unless the benefits of the development clearly outweigh the harm it would cause to the site and the wider national network of SSSIs, and the loss can be mitigated to achieve a net gain in biodiversity/geodiversity*

- *Development which would result in damage to or loss of a site of biodiversity or geological value of regional or local importance including habitats of species of principal importance for biodiversity will not be permitted unless the benefits of the development clearly outweigh the harm it would cause to the site, and the loss can be mitigated to achieve a net gain in biodiversity/geodiversity*
- *Development proposals will be expected to incorporate features to encourage biodiversity, and retain and where possible enhance existing features of nature conservation value within the site.*
- *Existing ecological networks should be identified and maintained to avoid habitat fragmentation, and ecological corridors should form an essential component of green infrastructure provision in association with new development to ensure habitat connectivity*
- *Relevant habitat and species surveys and associated reports will be required to accompany planning applications which may affect a site, habitat or species of known or potential ecological value*
- *Air quality assessments will also be required for development proposals that would be likely to have a significantly adverse impact on biodiversity by generating an increase in air pollution*
- *Planning conditions/obligations will be used to secure net gains in biodiversity by helping to deliver Biodiversity Action Plan targets and/or meeting the aims of Conservation Target Areas.*
- *Developments for which these are the principal aims will be viewed favourably*
- *A monitoring and management plan will be required for biodiversity features on site to ensure their long term suitable management.*

Policy ESD 11: Conservation Target Areas

Where development is proposed within or adjacent to a Conservation Target Area biodiversity surveys and a report will be required to identify constraints and opportunities for biodiversity enhancement. Development which would prevent the aims of a Conservation Target Area being achieved will not be permitted. Where there is potential for development, the design and layout of the development, planning conditions or obligations will be used to secure biodiversity enhancement to help achieve the aims of the Conservation Target Area.

Wildlife Legislation

- 3.3** The two principal wildlife statutes are the Conservation of Habitats and Species Regulations (The Habitats Regulations, 2010 as amended) that deals with internationally important sites and species, and the Wildlife and Countryside Act (WCA, 1981 as amended) that deals with nationally important sites and species.
- 3.4** Certain habitats and species within discrete sites are protected as SSSI under the WCA (1981). A proportion of these are more strictly protected as proposed or designated SPA, SAC and Ramsar sites under the Habitats Regulations (2010). These designations protect features and resources listed as being of international importance from both direct and indirect effects arising from a range of issues including proposed development.
- 3.5** Certain species listed on Schedule 5 of the WCA, including all bat species, great crested newt *Triturus cristatus*, hazel dormouse *Muscardinus avellanarius* and otter *Lutra lutra* are also protected under Schedule 2 of the Habitats Regulations (2010) making them European Protected Species (EPS). Taken together it is illegal to:
- Deliberately kill, injure or capture any wild animal of EPS;
 - Deliberately disturb wild animals of any EPS in such a way to be likely to significantly affect:
 - The ability of any significant groups of animals of that species to survive, breed, rear or nurture their young; or
 - The local distribution of that species.
 - Recklessly disturb a EPS or obstruct access to their place of rest;

- Damage or destroy breeding sites or resting places of such animals;
- Deliberately take or destroy the eggs of such an animal;
- Possess or transport any part of a EPS, unless acquired legally; and/or
- Sell, barter or exchange any part of an EPS.

- 3.6** A range of species other than birds, including water vole *Arvicola amphibius*, is protected from disturbance and destruction under the WCA (1981) through inclusion on Schedule 5.
- 3.7** All breeding birds are protected from deliberate destruction under the WCA (1981). Certain species are further protected from disturbance at their nest sites being listed on Schedule 1 of the WCA (1981).
- 3.8** Common reptiles including common lizard *Zootoca vivipara*, slow-worm *Anguis fragilis*, grass snake *Natrix helvetica* and adder *Vipera berus* are protected under the WCA, they are listed as schedule 5 species, therefore part of Section 9(1) and section 9(5) apply; the Countryside and Rights of Way Act 2000 (CRoW) also strengthens their protection.
- 3.9** Badger *Meles meles* is protected from sett disturbance and destruction under the Protection of Badgers Act (1992).
- 3.10** Section 40 of The Natural Environment and Rural Communities Act 2006 (NERC) places a legal duty on Local Authorities to conserve biodiversity. Section 41 (S41) sets out a list of 943 species and habitats of principal importance. These species are known as England Biodiversity Priority (EBP) species and are those identified as requiring action under the former UK Biodiversity Action Plan (BAP) and which continue to be regarded as conservation priorities under the UK Post-2010 Biodiversity Framework.
- 3.11** Native, species-rich hedgerows are protected as being ‘important’ under the Hedgerow Regulations (1997).
- 3.12** Japanese Knotweed *Fallopia japonica*, along with a number of other introduced and invasive species, are listed under Schedule 9 of the WCA (1981). Japanese knotweed is highly invasive and its rhizomes cause damage to built structures. Hence it is also classed as controlled waste under the Environment Protection Act (1990) and has to be removed and disposed of in a licensed landfill or the rhizomes buried to a depth of at least 5m.

4.0 Results

Desk Study

- 4.1** The TVERC data search highlighted a number of protected and notable species records within 2km of the site, and are discussed in section 5.0.
- 4.2** The desk study highlighted a number of designated sites via TVERC and Magic Map within the following designations: European (approx. 8km from the site boundary) and national (approx. 5km from the site boundary (Table 1). A non-statutory site search (approx. 2km from the site boundary) was undertaken with TVERC, the results of which are included in Table 2.

Table 1: Designated protected sites within 2km of the site boundary.

Site Name	Distance and Direction from Site	Size (Ha.)	Reason for Designation
Horsehay Quarries SSSI	1.8km north-west	8.2	Designated for important exposures of Middle Jurassic rock sections and Taynton Limestone Formations.
Middle Barton Fen SSSI	2.3km west	11.3	Designated for its extensive areas of calcareous fen-meadow, and with limestone grassland and hedgerow. The site supports a rich invertebrate assemblage.
Bestmoor SSSI	4.3km north	12.4	A semi-improved floodplain meadow designated for wintering wildfowl populations and one of the largest known British populations of narrow-leaved water-dropwort.
Crecy Hill LNR	4.4km south	0.84	A limestone bank with a varied calcareous grassland flora and rich invertebrate assemblage.

Statutory Designated Sites:

National: SSSI = Site of Special Scientific Interest; LNR = Local Nature Reserve;

Table 2: Non-statutory sites identified within 2km of the site boundary.

Site Name	Distance and Direction from Site	Size (Ha.)	Reason for Designation
Glyme and Dorn Valleys CTA	Nearest point is 0.9km from site.	2496	The CTA is comprised of the whole Glyme Valley from its source near Chipping Norton to Blenheim Park and including some tributary valleys, especially the Dorn. The CTA includes several SSSI and LWS sites, and supports limestone grassland, lowland meadow, fen/swamp/reedbed, woodland, river, and standing water habitats.
Upper Cherwell Valley CTA	Nearest point 1.2km from site.	451	The CTA is comprised of the Cherwell Valley from Lower Heyford to Clifton. It includes several SSSI and LWS sites, and supports species such as otter, water vole, and several BAP bird species.

Non-Statutory Designated Sites:

CTA – Conservation Target Area.

Extended Phase 1 Habitat Survey

4.3 The Phase 1 habitat map of the site is shown within Appendix 1 and the plant species recorded per habitat type are tabled in Appendix 2. Plates are found in Appendix 3.

4.4 The site (circa 0.9Ha.) is situated within the village of Steeple Aston, Oxfordshire. Emergent vegetation is the dominant habitat on the site, with areas of scattered broad-leaved trees, hedgerow, scrub, semi-improved grassland, and bare ground. Immediately north of the site is South Side Road, with residential properties and associated gardens beyond that. Residential properties are found directly east of site. An arable field exists immediately south of site. The west of the site is bordered scattered trees, and a garage.

4.5 There were 11 broad habitat types found within the site:

1. Dense scrub (A.2.1);
2. Scattered broad-leaved trees (A.3.1);
3. Semi-improved grassland (B.2.2);
4. Tall ruderal (C.3.1);
5. Spoil heap (soil) (I.2.2);
6. Emergent vegetation (J.1.3);
7. Species poor hedgerow with trees (J.3.2);
8. Wall (J.3.5);
9. Buildings (J.3.6);
10. Bare ground (J.4);

11. Target note (J.5).

Dense scrub (A.2.1)

4.6 Three areas of dense scrub exist towards the west of the site, all dominated by bramble *Rubus fruticosus*.

Scattered broadleaf trees (A.3.1)

4.7 Several trees were identified on site, the majority occurring along the southern border. Species included elder *Sambucus nigra*, hawthorn *Crataegus monogyna*, hazel *Corylus avellana*, dogwood *Cornus sanguinea*, and dog rose *Rosa canina*. Multiple ash *Fraxinus excelsior* and sycamore *Acer pseudoplatanus* are present near the building on site. Several unidentified *Prunus sp.* exist in the north-eastern corner.

Semi-improved grassland (B.2.2)

4.8 Areas of semi-improved grassland are present around the periphery of the site (Appendix 3; Plate 1). Species included false oat grass, perennial rye grass *Lolium perenne*, white clover *Trifolium repens*, field bindweed, broad leaved dock *Rumex obtusifolius*, and daisy *Bellis perennis*.

Tall ruderal (C.3.1)

4.9 Two small areas of tall ruderal are present on site; in the south-west and north-east corners. These are both dominated by common nettle *Urtica dioica* creeping thistle *Cirsium arvense*, and spear thistle *Cirsium vulgare*.

Spoil heap (soil) (I.2.2)

4.10 Two spoil heaps were observed to the south of the site. Both mounds are comprised of soil/earth, with ephemeral vegetation starting to emerge (Appendix 3; Plate 1).

Emergent vegetation (J.1.3)

4.11 The majority of the site is covered with emergent vegetation, dominated by ribwort plantain *Plantago lanceolata* and ground ivy *Glechoma hederacea*. Other species include dandelion *Taxaracum sp.*, creeping buttercup *Ranunculus repens*, and ivy *Hedera helix*.

Species poor hedgerow with trees (J.3.2)

4.12 Three species poor hedgerows with trees are on site along the north, south, and east boundaries. The north hedgerow is approximately 12m long and is comprised of hazel and hawthorn. The eastern hedgerow forms part of the residential curtilage with the adjoining property, and is comprised of beech *Fagus sylvatica*. The southern hedgerow is comprised of dogwood, hawthorn, and guelder rose *Viburnum opulus*. The hedge becomes less contiguous to the west, and develops into a line of scattered trees (described in section 4.10).

Wall (J.3.5)

4.13 A wall is present along the north boundary of the site. It is covered in a dense layer of ivy.

Buildings (J.3.6)

- 4.14 One building exists on site (Appendix 1). Building 1 is an old dilapidated single storey building located in the north-west corner of the site. It is of stone construction with a slightly pitched and partly collapsed roof (Appendix 3; Plate 2). Generally, it is in a poor state of repair. The southern aspect is open. The building is covered in dense ivy.

Bare ground (J.4)

- 4.15 An area of bare ground, manifested as hardstanding is present along the northern boundary. It is starting to be colonised by moss and species such as common nettle *Urtica dioica*.

Target note (J.5)

- 4.16 Target note 1 indicates the location of a rubble pile to the north of the site (Appendix 3; Plate 3). Target note 2 is a litter pile towards the south of the site.

5.0 Findings and Recommendations

Statutory/Non-statutory Sites

European Designated Sites

- 5.1 European designated sites were not identified within 8km of the site boundary.

Statutory UK Designated Sites

- 5.2 Four statutory designated sites were recorded within 5km of the site; three SSSIs and one Local Nature Reserve (LNR). SSSIs are afforded protection from significant direct and indirect effects upon qualifying features under the WCA (1981). LNRs are usually owned by local authorities, and as such their protection is decided locally, and varies from site to site.

- 5.3 The site does not fall within any SSSI impact risk zone for residential development. The closest designated site to the site boundary is 1.8km. Given this, and the small scale of works, it is considered that the proposed development will not result in significant direct or indirect impacts on any of the designated sites within the local environment.

Non-Statutory Designated Sites

- 5.4 Local wildlife sites were not recorded by the data search. Two conservation target areas (CTA) were identified; Glyme and Dorn Valleys, and Upper Cherwell Valley. These areas are denoted by TVERC as areas of high value habitat and high biodiversity.

- 5.5 Given the small scale of the proposed development, the absence of local wildlife sites in the vicinity, and the distance between the CTA's identified and the site, it is considered that the proposed development will not have a significant impact on any non-statutory designated sites in the surrounding environment, or prevent the aims of the CTA's identified.

Protected Habitats

Hedgerow

- 5.6** The NERC habitat “hedgerow” is present on site; there are hedgerows present along the south, east, and north boundaries. Although each hedgerow is made up of native species, they are of low diversity and ecological value and as such are unlikely to meet the criteria of an ‘important’ hedgerow under the hedgerow regulations 1997. Hedgerows on site are recommended for retention; any loss where possible should be compensated for through additional native species planting. The current development plans include a single punch-through along the northern hedgerow to allow a public footpath (Appendix 1). A planted buffer strip is included in the proposed layout along the southern and eastern boundaries; it is recommended this strip is comprised of native species. It is thought that with the inclusion of native planting to the development plan, removing as little hedgerow as is strictly necessary and buffering works from any remaining hedgerow, the loss of any hedgerow on site can be suitably mitigated.

Species of Conservation Concern

Badger

- 5.7** Five records of badger were returned by the data search, the most recent of which in 2009, 1.9km south of the site. It is considered that this individual is functionally separated from the site by the busy A4260 road.
- 5.8** The habitats on site (semi-improved grassland, hedgerow) provide some foraging opportunities for badger that may be present in the wider landscape. Sett-building opportunities are considered to be negligible; minor opportunities are present within the large spoil heaps on site. Embankments are not present on site. A single mammal run was observed towards the east of the site, along the eastern hedgerow. Several holes were found within the spoil heaps, but are considered to be of rabbit origin. Other field signs such as setts, hairs, snuffle marks etc. were not observed on site.
- 5.9** General precautionary techniques sympathetic to badger (applicable to most sites) are recommended due to the potential for badgers to forage/disperse within the study area:
- Covering trenches at night or leaving a plank of wood leant against the side to ensure badgers can escape if they were to accidentally fall in; and
 - Covering chemicals overnight.
- 5.10** Should a period of more than 12 months elapse between the date of survey 25th October 2017 and construction commencing it is recommended a walkover survey be conducted to establish presence of badger setts within the two spoil piles.

Bats

- 5.11** The data search returned a single record of common pipistrelle *Pipistrellus pipistrellus* in 1997 and three records of brown long-eared *Plecotus auritus*, the closest of which was in 2014, 0.9km north of the site. It is considered that bats in the local environment may utilise the hedgerows on site as part of a commuting corridor.

Roosting

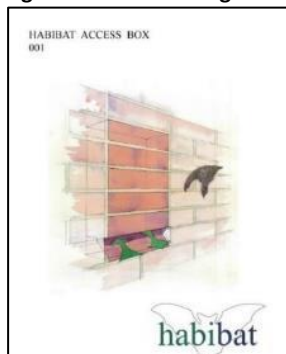
- 5.12** An external and internal inspection of building 1 was undertaken (Appendix 3; Plates 2, 4, and 5). No field signs of bats (staining, droppings, scratch marks) were observed. A few small cracks and crevices were observed, in addition to a dense layer of ivy. None of the cracks/crevices were thought to provide opportunities for roosting bats. Additionally, the southern aspect of the building is open to the elements, which results in draughty conditions. Given the lack of evidence of bats and lack of potential bat roost features present, building 1 is considered to have 'negligible' potential to support roosting bats under best practice guidance (Collins, 2016); consequently no further survey is required.
- 5.13** Trees present on site were subject to an inspection from ground level. Features with the potential to support roosting bats were not identified. Additionally, no field signs were observed. Following best practice guidance (Collins, 2016), these trees are considered to have no potential to support roosting bats. Consequently, no further surveys are required.

Foraging/Commuting

- 5.14** The site is dominated by emergent vegetation, which is not considered to be suitable habitat for foraging/commuting bats. Areas of semi-improved grassland and hedgerows on site are considered to provide some suitable habitat. Connectivity to the wider landscape is represented by hedgerows to the south, and an area of parkland and scattered trees to the north. Following best practice guidelines (Collins, 2016), the habitat on site is considered to be of low suitability for foraging/commuting bats. Given the small size of the site, activity surveys are not considered necessary. It is considered that impacts on foraging/commuting bats can be mitigated through the retention of hedgerows on site, and replacement planting of native species for that which is lost. As part of mitigation of impacts on foraging and commuting bats it is recommended that a sensitive lighting strategy (detailed below) is adopted.
- 5.15** In general, it is recommended that site lighting is kept to a minimum during both the construction and operational phases, especially in areas of potential foraging/commuting corridors such as hedgerows and scattered trees. If lighting is necessary then there are a number of ways to minimise the effect of lighting on bats. The following mitigation strategies have been taken from Bat Conservation Trust Landscape and Urban design for Bats and Biodiversity (Gunnell et al., 2012) and other referenced sources:
- In general, light sources should emit minimal ultra-violet light (Langevelde et al., 2011) and avoid the white and blue wavelengths of the light spectrum, so as to avoid attracting insects and thus potentially reducing numbers in adjacent areas, which bats may use for foraging.
 - Limiting the height of lighting columns to eight metres and increasing the spacing of lighting columns (Fure, 2006) can reduce spill of light into unwanted areas such as the aforementioned habitats. The spread of light should be kept near to or below the horizontal plane, by using as steep a downward angle as possible and eliminating bare bulbs and upward pointing light fixtures. Other ways to reduce light spill include the use of directional luminaires, shields, baffles and/or louvres. Flat, cut-off lanterns are best. Additionally, lights should be located away from reflective surfaces where the reflection of light will spill onto potential foraging/commuting corridors.
 - Lighting that is required for security or access should use a lamp of no greater than 2000 lumens and be PIR sensor activated, to ensure that the lights are only on when required and turned off when not in use (Jones, 2000; Hundt, 2012).

- 5.16** The site could be enhanced for bats through the planting of plant species known to benefit bats (see Appendix 4) and the inclusion of integrated bat boxes within the proposed buildings (away from artificial light) or provision of traditional bat boxes that could be hung on retained trees/new buildings. There are numerous bat box designs but the Habitat 001 Bespoke (www.habibat.co.uk) provides excellent summer roosting conditions for crevice inhabiting species including common pipistrelle *Pipistrellus pipistrellus* and Natterer's bat *Myotis nattereri*. Furthermore, no maintenance is required. See Figure 1 for a diagram.

Figure 1: Habitat Integrated Bat Box



Birds

- 5.17** The data search returned nine records of three schedule 1 species within 2km of the site boundary. Species include red kite *Milvus milvus*, barn owl *Tyto alba*, and kingfisher *Alcedo atthis*. The habitats on site (semi-improved grassland, hedgerow, trees, buildings) are considered to provide minor amounts of foraging/nesting habitat for some of these species. Additionally, the site is considered to provide habitat ubiquitous with the surrounding landscape and suitable for common species recorded outside of the site.
- 5.18** Given the size of the site and the suitability of habitats present, breeding bird surveys are not considered necessary.
- 5.19** Habitat suitable for nesting birds is represented by hedgerows and an area of scrub in the north-west corner of the site, which is to be removed. It is recommended that this, in addition to any hedgerow that is to be removed, should be cleared outside of the nesting season (generally 1st March to 31st August) or after an ecologist has confirmed active nests are not present.
- 5.20** The site may be enhanced for birds by installing a variety of bird boxes on the trees and proposed building. Furthermore, appropriate planting of native species or plant species known to benefit wildlife (see Appendix 5) could be included in the masterplan to provide increased nesting and foraging opportunities.

Great crested newt

- 5.21** The data search returned a single record of great crested newt (GCN) within 2km of the site boundary, in 2002, 1.8km south. It is considered that any individuals in this area would not disperse onto site, given the distance and abundance of suitable habitat nearby the record. The absence of more recent records may reflect the absence of individuals in the local area, or a lack of recording.
- 5.22** The site comprises minimal suitable terrestrial habitat suitable for GCN, in the form of semi-improved grassland, scrub, and hedgerows. Additionally, a rubble pile and litter pile are present, which may act as suitable refugia. However, much of the site is deemed unsuitable for GCN in the form of emergent vegetation and bare ground.

- 5.23** No aquatic habitats are found on site. Nine potential water bodies were identified within 500m of the site boundary using online Ordnance Survey (OS) maps (Appendix 6). Ponds were not accessed during the survey due to access restrictions. Research undertaken by English Nature (Cresswell, 2004), now Natural England, suggests it is most common to encounter GCN within 50m of a breeding pond, with few moving further than 100m unless significant linear features are involved when GCN can be encountered at distances of between 150m – 200m. The closest waterbody is pond 4 located c.200m north of the site. A drainage stream exists directly south of ponds 1-7. The stream was fast flowing and c.0.6m deep. As such, it is considered that the stream represents a suitable barrier to dispersal for GCN. Additionally, the South Side road and residential housing between the ponds and the site represent further barriers to dispersal. It is considered unlikely that GCN would leave suitable terrestrial habitat to disperse on to site. Ponds 8 and 9 are located c.379m and c.454m from the site. It is considered that the North Side road is a barrier to dispersal in addition to the stream and South side road.
- 5.24** Given the presence of suitable dispersal barriers, minimal on-site habitat, and distances involved, it is considered that potential GCN present within these water bodies are reasonably unlikely to disperse onto site; as such, pond surveys are not considered necessary.

Invertebrates

- 5.25** NBN Atlas notable invertebrate records included several species of moth and dragonfly. Areas of scrub and semi-improved grassland grading to emergent vegetation and bare ground on site provide some suitable habitat for invertebrates. Additionally, a single deadwood stump is present towards the north of the site, which may provide suitable habitat for saprophytic organisms. No notable or rare species were recorded during the survey. Given the dominance of emergent vegetation with low floristic diversity (Appendix 2), it is considered unlikely that the site supports any significant assemblages of rare/noted invertebrates. As such, no further surveys are considered necessary to adhere to wildlife legislation and planning policy.
- 5.26** The inclusion of nectar rich plants in the landscaping design would enhance the site post-development for invertebrates. Night-scented plant species such as evening primrose *Oenothera sp.*, honeysuckle *Lonicera sp.* and jasmine *Jasminium officinale* attract moths in the evening, which would in turn attract foraging bats.

Notable mammals

- 5.27** The data search did not return any records of European hedgehog *Erinaceus europaeus* or harvest mouse *Micromys minutus*. A single record of brown hare *Lepus europaeus* was recorded in 2003 2km north of site. It is considered that individuals in this area would not disperse on to site, given the abundance of quality habitat associated with the record.
- 5.28** Habitats on site (emergent vegetation, scrub, semi-improved grassland) are considered to provide suitable foraging and sheltering habitat for European hedgehog. Field signs of hedgehog are difficult to locate, and no field signs were found during the site visit. It is considered that brown hare could utilise some areas of the site (hedgerow margins and areas of grassland), but is more likely to utilise arable fields and field margins in the surrounding environment. No field signs of brown hare were observed during the site visit.
- 5.29** It is recommended that care should be taken when clearing vegetation to avoid killing or injuring hedgehogs throughout the year in their nests (summer, maternity and hibernation). Vegetation clearance should be

undertaken in stages and be excluded during the hibernation period (October to March) when hedgehog is more vulnerable or once a fingertip search by an ecologist has been undertaken.

Plants

- 5.30** The data search returned three records for Schedule 8 species bluebell *Hyacinthoides non-scripta* in 1988, 1.7km west of the site. Bluebell was not observed during the site survey. The survey was not conducted at a good time of year to observe bluebell.
- 5.31** Given the low number of Schedule 8 species returned by the data search, and the general lack of floristic diversity on site, it is not considered necessary to recommend further botanical survey.
- 5.32** Records of invasive species listed under schedule 9 of the WCA (1981) within 2km of the site included orange balsam *Impatiens capensis*, indian balsam *Impatiens glandulifera*. None of these species were recorded within the site boundaries.

Reptiles

- 5.33** A single record of grass snake *Natrix helvetica* was recorded within 2km of the site boundary in 2012, 1.5km south. The individual is associated with an area of woodland surrounding the River Cherwell. It is considered highly unlikely that this individual would leave high quality habitat to disperse onto site. In general the site is ecologically connected to the wider environment through hedgerows and field margins. It is considered that individuals in the wider landscape could disperse onto site using these habitat corridors.
- 5.34** The site is dominated by emergent vegetation, which is not considered to be suitable for the four common reptile species. However, areas of scrub and semi improved grassland provide some suitable sheltering and foraging habitat. The rubble and litter piles on site may be utilised as refugia. It is considered that due to the suitable habitat on site and connectivity to the wider landscape, a seven-visit presence/likely absence reptile survey (typically carried out Mid-March to September) should be undertaken during 'suitable' days for reptile activity; a 'suitable' survey day is determined by the weather with temperature being the preeminent factor (10°C-17°C). Reptile refugia (0.5m x 0.5m) should be used to observe reptiles basking. Refugia should be laid at a density of 10 per hectare. This survey methodology is recognised as best practice by Froglife (1999) and the Herpetofauna Worker's Manual (Gent and Gibson, 2003).
- 5.35** The majority of suitable habitat for reptiles are located around the periphery of the site. If reptiles were to be found during the recommended surveys, it is considered that an onsite mitigation plan will be able to be delivered.

Otter and Water Vole

- 5.36** 39 records of otter *Lutra lutra* were identified during the data search, the most recent record occurring 1.5km away in 2011. A single record of water vole *Arvicola amphibius* was identified during the data search, 1.8km away in 1981. The majority of records were associated with the River Cherwell. It is considered unlikely that individuals associated with this river would not leave its suitable habitat to disperse to site, through residential areas associated with Steeple Aston.
- 5.37** No aquatic habitat exists on site. It is considered that the habitats on site (emergent vegetation, semi-improved grassland, scrub and hedgerow) provide negligible rest and sheltering habitat. Research indicates

that otter and water vole will disperse using small ditches, streams, or even directly over ground (Chanin, 2003; Anderson & Raynor, 2007). A stream is present to the north of site, and a main river 1.2km east of site. It is considered that individuals are unlikely to utilise the site for rest/shelter, given the presence of suitable aquatic habitat elsewhere in the local environment. It is considered unlikely that the site would be utilised as a dispersal route, given the absence of further watercourses to the east and south. No field signs were observed on site (e.g. otter holts/couches, water vole feeding signs, latrines/spraints etc.).

5.38 Given the poor-quality habitat on site and the presence of suitable habitat in the surrounding environment it is considered very unlikely that otter, water vole, or crayfish are utilising the site. Precautionary techniques for badger outlined in section 5.8 will also apply to these species.

Other species

5.39 The following protected species are deemed to be highly unlikely to be present on site due to a lack of local records and habitats present onsite:

- Hazel dormouse *Muscardinus avellanarius*
- White clawed crayfish *Austropotamobius pallipes*

6.0 Conclusion

6.1 Southern Ecological Solutions Ltd. (SES) was commissioned by Rectory Homes to undertake an extended Phase 1 habitat survey of Steeple Aston, Oxfordshire (the site). The proposed development consists of six residential homes with associated hard standing, gardens, and an access road (Appendix 1). The site (c. 0.9ha) is situated within the town of Steeple Aston, Oxfordshire. Emergent vegetation is the dominant habitat on site with areas of hedgerow, scattered trees, scrub and semi-improved grassland. Residential areas are north of the site. Areas of scrub and a garage is found to the west. Arable fields are to the south. The east of the site is bordered by a residential property.

6.2 No significant impacts are predicted upon statutory or non-statutory sites as a result of the proposed development. To adhere to planning policy and relevant wildlife legislation further works have been recommended for the following ecological features:

- Reptiles (presence/absence survey – seven visits between March and September);
- Inclusion of native planting to mitigate for any removal of hedgerow

6.3 The following precautionary methods should also be employed:

- Bat sensitive lighting should be used on the site to mitigate for any adverse effects upon boundary habitats and trees to be retained that are potentially of use to local bat populations;
- Site vegetation clearance should be undertaken outside the bird nesting season (March to August inclusive) and hedgehog hibernation period (October to March) or immediately after an ecologist has confirmed the absence of nesting birds/hedgehogs;
- Precautionary construction techniques sensitive to badger/otter/water vole;
- Pre-construction badger walkover should a period of 12 months elapse between the date of survey (25th October 2017) and construction commencing.

6.4 It is predicted that any potential adverse impacts from the proposed development upon specific protected species/habitats can be mitigated in line with relevant wildlife legislation and planning policy. With appropriate on-site mitigation and targeted enhancements, a positive change in the biodiversity could potentially be achieved, in line with chapter 11: *Conserving and Enhancing the Natural Environment*, of the NPPF (DCLG, 2012) and development control policies as set out in the Cherwell Local Plan (Cherwell District Council, 2011)

7.0 References

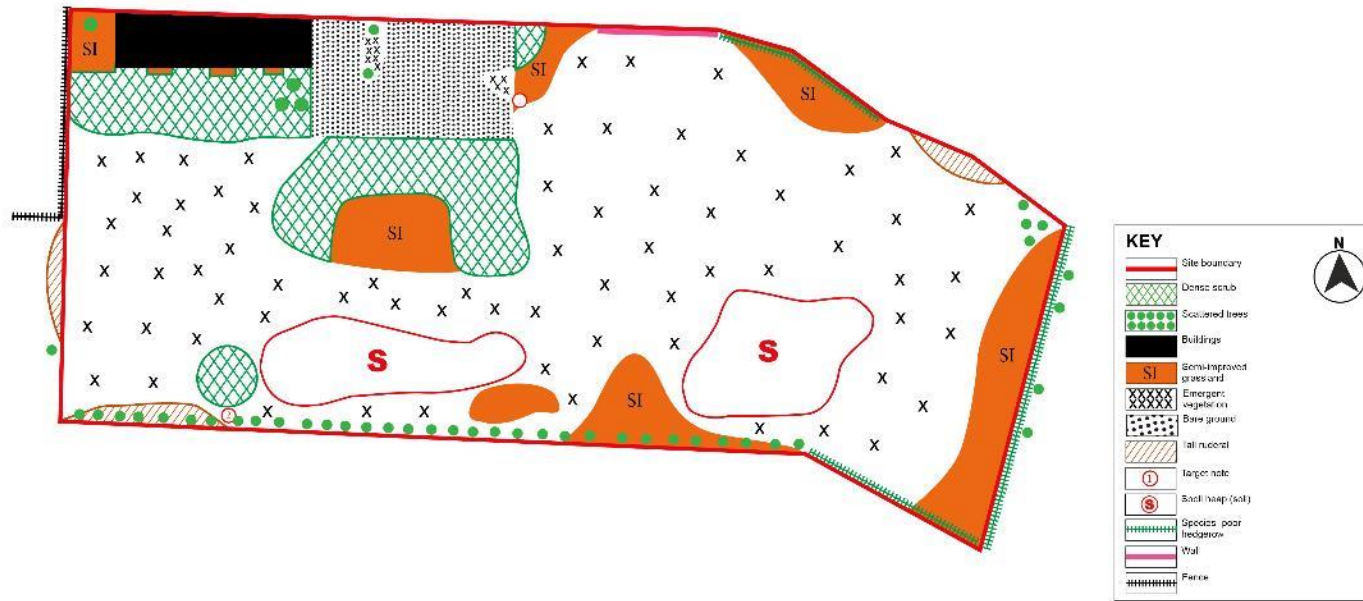
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Appendix 1. Site Plans

Proposed Development Plan



Extended Phase 1 Habitat Map



Site: Staple Acre, Debenham

Drawn by: N. Dainton	Date: 21/10/17	Scale:	File: NA
Ecological Assessment & Management Solutions Southern Shetland Southern Road Downham, Essex CM11 1LE Tel: 01276 711827 Email: info@ecological-solutions.co.uk		Client:	

Appendix 2. Plant Species List and Relative Abundance

Common name	Latin name	Emergent vegetation	Semi-improved grassland	Scrub	Hedgerow with trees	Tall ruderal	Scattered trees
Ash	<i>Fraxinus excelsior</i>						F
Bramble	<i>Rubus fruticosus</i>			D			
Broad-leaved dock	<i>Rumex obtusifolius</i>	F	O				
Buddlejah	<i>Buddlejah davidi</i>						R
Common nettle	<i>Urtica dioica</i>		O	F		F	
Cow parsley	<i>Anthriscus sylvestris</i>		O				
Creeping buttercup	<i>Ranunculus repens</i>	F	F				
Creeping thistle	<i>Cirsium arvense</i>			O		F	
Daisy	<i>Bellis perennis</i>	O	F				
Dandelion	<i>Taraxacum agg.</i>	F	F				
Dogwood	<i>Cornus sanguinea</i>				F		
Dog rose	<i>Rosa canina</i>				F		
Elder	<i>Sambucus nigra</i>				F		
False oat grass	<i>Arrhenatherum elatius</i>		D				
Guelder rose	<i>Viburnum opulus</i>				O	O	
Greater burdock	<i>Arctium lappa</i>			F			
Ground Ivy	<i>Glechoma hederacea</i>	F					
Hawthorn	<i>Crataegus monogyna</i>				F	F	
Hazel	<i>Corylus avellana</i>				O		
Hedge bindweed	<i>Calystegia sepium</i>				F		
Ivy	<i>Hedera helix</i>	F			F		
Perennial rye grass	<i>Lolium perenne</i>		F				
<i>Prunus sp.</i>	<i>Prunus sp.</i>						O
Ribwort plantain	<i>Plantago lanceolata</i>	D					
Spear thistle	<i>Cirsium vulgare</i>			O		O	
Sycamore	<i>Acer pseudoplatanus</i>						F
White clover	<i>Trifolium repens</i>	O					

Appendix 3. Plates

Plate 1: Spoil (soil) heaps on site



Plate 2. Building 1 (View: north)



Plate 3: Rubble pile on site (View: east)



Plate 4: Building 1 interior



Plate 5: Building 1 interior



Appendix 4: Species of known benefit to bats

The following table is reproduced from *Gunnell, K., Grant, G. and Williams, C. (2012). Landscape and Urban Design for Bats and Biodiversity, Bat Conservation Trust*. This suggests plant species that can provide benefit for bats by either providing a food source for insects and/or roost potential. The plants listed are predominately native to Britain. The small group of non-native plants included for their documented value for wildlife. This list has been checked against Natural England's list of invasive non-native plants.

Plant species	Common name	Native (N)	Type	Benefit	Soil	Light	Extensive green roofs	Living walls	Rain gardens	Hedge/ trees	Beds/ borders
<i>Acer campestre</i>	Field maple	N	T/S	C	Any	Sun/ shade				Y	
<i>Acer platanoides</i>	Norway maple		T	S	Well drained/ alkaline	Sun/ shade				Y	
<i>Acer saoocharum</i>	Sugar maple		T	S	Any	Sun/ shade				Y	
<i>Achillea millefolium</i>	Yarrow	N	HP	C,F	Well drained	Sun				Y	
<i>Ajuga reptans</i>	Bugle	N	HP	C,F	Any	Sun/ shade	Y		Y		
<i>Anthyllis vulneraria</i>	Kidney vetch	N	HP	F	Well drained	Sun	Y				
<i>Aubrieta deltoidea</i>	Aubrieta		H	F	Well drained	Sun/shade		Y			
<i>Betula pendula</i>	Sliver birch	N	T	C	Sandy/ acid	Sun				Y	
<i>Cardamine pratensis</i>	Cuckoo- flower	N	HP	F	Moist	Sun/ shade			Y		Y
<i>Carpinus betulus</i>	Hornbeam	N	T	C	Clay	Sun				Y	
<i>Centaurea nigra</i>	Common knapweed	N	HP	C,F	Dry, not acid	Sun	Y				Y
<i>Centranthus ruber</i>	Red valerian		HP	F	Well drained	Sun	Y				Y
<i>Clematis vitalba</i>	Old man's Beard	N	C	F	well drained/ alkaline	Sun				Y	
<i>Corylus avellana</i>	Hazel	N	S	C	Any dry	Sun/ shade		Y		Y	
<i>Crataegus monogyna</i>	Hawthorn	N	S	S,C	Any	Sun/shade				Y	
<i>Daucus carota</i>	Wild carrot	N	Bi	S,C,F	Any	Sun	Y				Y
<i>Dianthus spp.</i>	Pinks	N	A-Bi	F	Well drained	Sun	Y	Y			Y
<i>Digitalis purpurea</i>	Foxglove	N	Bi	C	Well drained	Shade/ partial shade				Y	Y
<i>Erica cinera</i>	Bell heather	N	S	F	Sandy	Full sun					Y
<i>Ersimum cherira</i>	Wallflower		Bi-P	F	Well drained	Sun		Y			Y
<i>Eupatorium</i>	Hemp agrimony	N	H	F	Moist	Sun/ shade			Y		Y
<i>Fagus sylvatica</i>	Beech	N	T	C, R	Well drained alkaline	Sun/shade				Y	
<i>Foeniculum vulgare</i>	Fennel		H	F	Well drained	Sun					Y
<i>Fraxinus excelsior</i>	Common Ash	N	T	C, R	Any	Sun/ shade				Y	
<i>Hebe spp.</i>	Hebe species		S	F	Well drained	Sun /shade				Y	Y

<i>Hedera Helix</i>	Ivy	N	C	F,C	Any	Sun/ shade		Y	Y	Y	Y
<i>Hesperis matronalis</i>	Sweet Rocket		H	F	Well drained/ dry	Sun/ shade					Y
<i>Hyacinthoides non-scripta</i>	Bluebell	N	B	F	Loam	Shade/ partial shade		Y		Y	Y
<i>Ilex aquaifolium</i>	Holly	N	T	C	Any	Sun/ shade				Y	
<i>Jasmine officinale</i>	Common jasmine		C	F	Well drained	Sun		Y			Y
<i>Lavandula spp.</i>	Lavender species		S	F	Well drained / sandy	Sun		Y			Y
<i>Linaria vulgaris</i>	Toadflax	N	HP	C	Well drained/ alkaline	Sun	Y				Y
<i>Lonicera periclymenum</i>	Honeysuckle	N	C	F	Well drained	Sun		Y		Y	
<i>Lotus corniculatus</i>	Bird's foot trefoil	N	HP	F	Well drained/ dry	Sun	Y				Y
<i>Lunaria annua</i>	Honesty		Bi	F	Any	Sun/ partial shade	Y				Y
<i>Malus spp.</i>	Apple		T	C	Any	Sun				Y	Y
<i>Matthiola longipetala</i>	Night - scented stock		A	F	Well drained/ moist				Y		Y
<i>Myosotis spp.</i>	Forget me not species	N	A	F	Any	Sun	Y	Y			Y
<i>Nicotiana glauca</i>	Ornamental tobacco		A	F	Well drained moist	Sun /partial shade			Y		Y
<i>Oneothesa spp.</i>	Evening primrose		Bi	F	Well drained	Sun	Y				Y
<i>Origanum vulgare</i>	Marjoram	N	HP	F	Well drained / dry	Sun				Y	
<i>Populus alba</i>	White poplar	N	T	C	Clay loam	Sun				Y	
<i>Primula veris</i>	Cowslip	N	HP	F	Well drained/ moist	Sun/ partial shade	Y				Y
<i>Primula vulgaris</i>	Primrose	N	HP	F	Moist	Partial shade	Y	Y		Y	Y
<i>Prunus avium</i>	Wild cherry	N	T	C	Any	Sun				Y	Y
<i>Prunus domestica</i>	Plum		T	C	Well drained/ moist	Sun				Y	Y
<i>Prunus spinosa</i>	Blackthorn	N	S	C	Any	Sun/ partial shade				Y	
<i>Quercus petraea</i>	Sessile oak	N	T	C,R	Sandy loam	Sun/ shade				Y	
<i>Quercus robur</i>	Common oak	N	T	R	Clay Loam	Sun/ shade				Y	
<i>Rosa canina</i>	Dog rose	N	S	C	Any	Sun			Y	Y	Y
<i>Salix spp.</i>	Willow species	N	S	S,C	Moist	Sun/ shade			Y	Y	
<i>Sambucus nigra</i>	Elder	N	T	C	Clay loam	Sun				Y	
<i>Saponaria officinalis</i>	Soapwort	N	HP	F	Any	Sun					Y
<i>Saxifraga oppositifolia</i>	saxifage	N	HP	C	Well drained	Sun	Y	Y			Y
<i>Scabiosa columbaria</i>	small scabious	N	HP	F	Well drained/ alkaline	Sun	Y				Y
<i>Sedum spectabile</i>	Ice plant		HP	F	Well drained/ dry	Sun	Y				Y
<i>Silene dioecia</i>	Red campion	N	HP	F	Any	Shade/ partial shade		Y	Y	Y	Y

<i>Sorbus aucuparia</i>	Rowan	N	T	C	Well drained	Sun				Y	
<i>Stachys lanata</i>	Lamb's ear		HP	F	Well drained/ dry	Sun					Y
<i>Symphotrichum spp.</i>	Michalemas daisies		HP	F	Any	Sun					Y
<i>Tages patula</i>	French marigold		A	F	Well drained	Sun					Y
<i>Thymus serpyllum</i>	Creeping thyme	N	HP/S	F	Well drained/ dry	Sun	Y	Y			Y
<i>Tilia x europaea</i>	Common lime		T	C	Any	Sun/ shade				Y	
<i>Trifolium spp.</i>	Clover species	N	H	F	Any	Sun	Y				Y
<i>Valerina spp.</i>	Valerian species	N	HP	F	Moist	Sun/ partial shade			Y		Y
<i>Verbascum spp.</i>	Mulliens	N	Bi, HP	C	Well drained	Sun					Y
<i>Verbena bonariensis</i>	Verbena		HP	F	Well drained/moist	Sun					Y
<i>Viburnum lantana</i>	Wayfaring tree	N	S	C	Any	Sun/ shade				Y	Y
<i>Viburnum opulus</i>	Guelder rose	N	S	C	Moist	Sun/ shade			Y	Y	
<i>Viola tricolor</i>	Pansy	N	A	F	Well drained/ moist		Y	Y			Y

Legend

Type		Benefit	
HP	Herbaceous perennial	C	Moth caterpillar food plant
Bi	Biennial	S	Sap sucking insects (e.g. whiteflies)
BiP	Biennial perennial	F	Flowers attract adult moths
T	Tree	E	Good roost potential
S	Shrub		
H	Herb		
A	Annual		
B	Bulb		
C	Creeper/ climber		

Appendix 5: Species of known benefit to wildlife

Common Name	Scientific Name	Benefits
Blackthorn	<i>Prunus spinosa</i>	Nectar, fruit, larval foodplant, nesting cover
Broom	<i>Cytisus scoparius</i>	Nectar, larval foodplant
Buckthorn #	<i>Rhamnus cathartica</i>	Nectar, berries, larval foodplant, nesting cover
Crab Apple	<i>Malus sylvestris</i>	Nectar, nesting cover, fruit
Dog Rose	<i>Rosa canina agg.</i>	Nectar, fruit, larval foodplant, nesting cover
Dogwood	<i>Cornus sanguinea</i>	Nectar, fruit, larval foodplant
Elder	<i>Sambucus nigra</i>	Nectar, fruit, larval foodplant, nesting cover
Field rose	<i>Rosa arvensis</i>	Nectar, larval foodplant, fruit
Field maple	<i>Acer campestre</i>	Nesting cover,
Gorse	<i>Ulex europaeus</i>	Nectar, larval foodplant, nesting cover
Guelder rose	<i>Viburnum opulus</i>	Nectar, fruit, larval foodplant
Hawthorn (Common)	<i>Crataegus monogyna</i>	Nectar, fruit, larval foodplant, nesting cover
Hawthorn (Midland)	<i>Crataegus laevigata</i>	Nectar, fruit, larval foodplant, nesting cover
Hazel	<i>Corylus avellana</i>	Nuts, larval foodplant, nesting cover, early pollen for bees.
Holly	<i>Ilex aquifolium</i>	Nectar, fruit, larval foodplant, nesting cover
Hornbeam	<i>Carpinus betulus</i>	Year round shelter, roosting nesting & foraging opportunities for birds and small mammals
Oak	<i>Quercus robur/Quercus petraea</i>	Nesting cover, nuts, larval foodplant,
Rosemary *	<i>Rosmarinus officinalis</i>	Nectar
Rowan	<i>Sorbus aucuparia</i>	Fruit, nesting cover
Silver Birch	<i>Betula pendula</i>	Nesting cover
Spindle #	<i>Euonymus europaeus</i>	Nectar, fruits
Wayfaring tree	<i>Viburnum lantana</i>	Nectar, fruit, larval foodplant
Wild Cherry	<i>Prunus avium</i>	Nectar, fruit, nesting cover, larval food plant
Yew#	<i>Taxus baccata</i>	Berries, nesting cover
Wild Service Tree	<i>Sorbus torminalis</i>	Nectar, larval foodplant, fruit
Climbers		
Clematis*	<i>Clematis tangutica</i>	Nectar, seeds
Honeysuckle	<i>Lonicera periclymenum</i>	Nectar, fruit, larval foodplant, nesting cover
Ivy	<i>Hedera helix</i>	Nectar, fruit, larval foodplant, nesting cover
Traveller's joy	<i>Clematis vitalba</i>	Nectar, seeds, larval foodplant

Note:

* Non-native species

poisonous

Appendix 6: Great Crested Newt

Ponds within 500m from the site boundary

