

**Preliminary Ecological Appraisal
Building Inspection for Bats**

**Land West of Brook Lane and South of
A259
Rustington, West Sussex**

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LIABILITIES:

Whilst every effort has been made to guarantee the accuracy of this report, it should be noted that living animals and plants are capable of migration/establishing and whilst such species may not have been located during the survey duration, their presence may be found on a site at a later date.

This report provides a snap shot of the species that were present at the time of the survey only and does not consider seasonal variation. Furthermore, where access is limited or the site supports habitats which are densely vegetated only dominant species maybe recorded.

The recommendations contained within this document are based on a reasonable timeframe between the completion of the survey and the commencement of any works. If there is any delay between the commencement of works that may conflict with timeframes laid out within this document, or have the potential to allow the ingress of protected species, a suitably qualified ecologist should be consulted.

It is the duty of care of the landowner/developer to act responsibly and comply with current environmental legislation if protected species are suspected or found prior to or during works.

1.0 Introduction

Background

- 1.1 The Ecology Partnership was commissioned by Store Property Investments Limited to undertake a building inspection and update preliminary ecological appraisal (PEA) for land west of Brook Lane and south of the A259 in Rustington, West Sussex. This follows an initial PEA carried out in June 2016.
- 1.2 This report presents the results of The Ecology Partnership's surveys in and around the site, which aims specifically to assess the site's potential to support protected species and protected habitats that may be affected by the proposed development.
- 1.3 Section 2 of this report sets out the methodologies of the Ecology Partnership's surveys. In section 3 the results of the surveys are presented. Discussions and implications for development are found in section 4, including general site enhancements. Conclusions drawn from the report are presented in section 5.

Site Context and Status

- 1.4 The site is located on land immediately south of the A259 and west of Brook Lane in Rustington, West Sussex (TQ 04851 03621). The site covers approximately 5.92ha and includes grassland fields, areas of hardstanding, a road and old stables. There is also a house and gardens and a large horse paddock in the western corner of the site not currently under the ownership of the client. The site is surrounded by a mosaic of agricultural fields and high-density housing with areas of woodland located to the northeast. The site is situated approximately 2.1km south of the South Downs National Park and 3km from the Climbing Beach SSSI and West Beach LNR.
- 1.5 The aerial photograph below (Figure 1) shows the site and its immediate surroundings. The red line depicts the approximate site boundary and survey area.



Figure 1: Approximate location of the red line boundary

Description of Proposed Development

- 1.6 Outline planning permission (with all matters reserved) for demolition of the existing buildings on site and the erection of a mixed-use development comprising residential units, care home (Use Class C2 and C3) and ancillary facilities including railway crossing together with associated access, car parking and landscaping.

Planning Policies

- 1.7 National and local planning policies may have an affect on the proposed development. The following paragraphs identify relevant planning policies and discuss these in the context of the site.
- 1.8 Under the Natural Environment and Rural Communities (NERC) Act 2006, *“Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity”*. In order to comply with

this 'Biodiversity Duty', planning decisions must ensure that they adequately consider the potential ecological impacts of a proposed development.

1.9 In compliance with Section 41 of the NERC Act, the Secretary of State has published a list of species and habitats considered to be of principle importance for conserving biodiversity. These were known as BAP habitats and species. The UK BAP lists of priority species and habitats remain an important and valuable reference certainly at county levels. However, the UK Post 2010 Biodiversity Framework (published 2012) has succeeded BAP. It was produced by JNCC and Defra, on behalf of the Four Countries' Biodiversity Group (4CBG), through which the environment departments of all four governments in the UK work together to achieve the 'Aichi Biodiversity Targets' and the aims of the EU biodiversity strategy.

1.10 National policy guidance is provided by National Planning Policy Framework (NPPF), which sets out the Government's planning policies for England and how they should be applied. Section 11 of the document is entitled 'Conserving and Enhancing the Natural Environment'. This section highlights the following:

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

- 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 by establishing coherent ecological networks that are more resilient to current and future pressures;*
- Preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability; and*
- Remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate."*

1.11 In addition to this the following paragraphs are also considered to be relevant:

“In preparing plans to meet development needs, the aim should be to minimise pollution and other adverse effects on the local and natural environment. Plans should allocate land with the least environmental or amenity value, where consistent with other policies in this Framework.”

“Planning policies and decisions should encourage the effective use of land by re-using land that has been previously developed (brownfield land), provided that it is not of high environmental value. Local planning authorities may continue to consider the case for setting a locally appropriate target for the use of brownfield land.”

- 1.12 The site falls under the jurisdiction of the Arun District Council. A new local plan is currently being produced. In the meantime, the 2003 Local Plan contains policies relating to nature conservation:

Policy GEN28 - Trees and Woodlands

“Development will not be permitted if it would damage or destroy one or more trees protected by a tree preservation order, identified as ancient woodland or in a conservation area unless:

- The removal of one or more trees would be in the interests of good arboricultural practice;*
- or*
- The benefits of the proposed development outweigh the amenity value of the protected trees.*

Conditions may be used to ensure, for any trees which are removed as part of a development, an equivalent number are planted on the site.”

Policy GEN29 - Nature conservation across the district

“Development will only be permitted on sites which contain semi-natural habitats, features of nature conservation interest, or within wildlife corridors, where these can be largely retained and sympathetically incorporated into the scheme. Legal agreements may be used to offset the loss of, or impact on, any nature conservation resource present on the site prior to development.”

Policy AREA13 - Sites of International Importance for Nature Conservation

“Proposals for development in, or likely to affect (directly or indirectly) a site of international importance for nature conservation will be subject to the most rigorous examination. Development not directly connected with or necessary to the management of the site which is likely to have an adverse effect on the site, will not be permitted unless: there is no alternative solution, there are reasons of public health or public safety, or there are benefits of primary importance to the environment.

Where such sites do not host a priority habitat or species, development will not be permitted unless there are imperative reasons of overriding public interest.

Where development is permitted, the use of conditions or planning obligations will be considered in order to avoid and minimise harm to the site, to enhance the site’s nature conservation interest, and to secure any compensatory or mitigation measures and appropriate management that may be required.”

Policy AREA14 - Sites of National Importance for Nature Conservation

“Proposals for development in, or likely to affect (directly or indirectly) Sites of Special Scientific Interest will be subject to special scrutiny. Where such development is likely to have an adverse effect, it will not be permitted unless the reasons for the development clearly outweigh the nature conservation value of the site itself and the national policy to safeguard the national network of such sites.

Where the site concerned is a National Nature Reserve, a site identified by the Nature Conservation Review or Geological Conservation Review, particular regard will be paid to the national importance of that site.

Where development is permitted, harm to the nature conservation interest must be minimised. The use of conditions or planning agreements will be considered to ensure the protection and enhancement of the nature conservation interest, and to provide appropriate compensatory or mitigation measures and site management.”

Policy AREA15 - Sites of Local Importance for Nature Conservation

“Proposals for development in, or likely to have an adverse effect (directly or indirectly) on a Local Nature Reserve, Site of Nature Conservation Importance (including ancient woodlands or wildlife corridors) or Regionally Important Geological/Geomorphological Site will not be permitted unless it can be demonstrated that reasons for the proposal outweigh the need to safeguard the nature conservation value of the site/feature. Where development is permitted which would damage the nature conservation value of the site/feature, such damage should be kept to a minimum.

Conditions or planning obligations will be used to secure necessary compensatory or mitigation measures, enhancement and site management.

Where appropriate, the Authority will consider the use of legal agreements to provide appropriate compensatory measures, enhancement and site management.”

- 1.13 The site was surveyed to assess its ecological value and to ensure compliance with national and local plan policies. The report has been produced with reference to current guidelines for preliminary ecological appraisal (CIEEM 2013) and in accordance with BS 42020:2013 Biodiversity – Code of Practice for Planning and Development.

2.0 Methodology

Desktop Study

- 2.1 A desktop study search was completed using an internet-based mapping service (www.magic.gov.uk) for statutory designated sites and two internet-based aerial mapping services (maps.google.co.uk) were used to understand the habitats present in and around the survey area and habitat linkages and features (ponds, woodlands etc.) within the wider landscape.

Preliminary Ecological Appraisal

- 2.2 An extended preliminary ecological appraisal was undertaken on 17th February 2017 by ecologists Emma Bagguley BSc (Hons) MSc ACIEEM and Natalie Kay BSc (Hons) MSc GradCIEEM. The surveyors identified the habitats present, following the standard

'Phase 1 habitat survey' auditing method developed by the Joint Nature Conservancy Council (JNCC). The site was surveyed on foot and the existing habitats and land uses were recorded on an appropriately scaled map (JNCC 2010). In addition, the dominant plant species in each habitat were recorded. The potential for the site to support protected species was also assessed.

Building Assessment for Bats

2.3 An internal and external examination of the house and garages was undertaken on the day of the survey. This followed recommendations in the 2016 PEA when an internal examination of the house was not possible.

2.4 Buildings that are considered to have a high potential to support roosting bats would include the following:

- Agricultural buildings (e.g. farmhouses, barns and out buildings) of traditional brick or stone construction and/or with exposed beams;
- Buildings with weather boarding and/or hanging tiles that are within 200m of woodland and/or water;
- Pre-1960s detached buildings and structures within 200m of woodland and/or water;
- Pre-1914 buildings within 400m of woodland and/or water;
- Pre-1914 buildings with gable ends or slate roofs regardless of location;
- Buildings which are located within or immediately adjacent to woodland and/or immediately adjacent to water;
- Dutch barns or livestock buildings with a single skin roof and board and gap or Yorkshire boarding if, following a preliminary roost assessment the site, appear to be particularly suited to bats.

2.5 The surveyors assessed the buildings visually and searched for evidence such as:

- Staining beneath or around a hole caused by natural oils in bat fur.
- Bat droppings beneath a hole, roost or resting area.
- Audible squeaking from within a hole.

- Insects (especially flies) around a hole.
- Dead bats.

2.6 The buildings were assessed during the day. An external investigation assessed the tiles, any weatherboarding and structural timber joints of the building. This was undertaken in order to see if there were access points readily available for bats to utilise or crevices that bats could be roosting in.

Tree Assessment for Bats

2.7 The trees on site were assessed for their potential to support roosting bats. The trees were assessed visually for evidence of bats as well as for features that increase the likelihood such as the following:

- Woodpecker holes, natural cracks and rot holes in trunks and branches;
- Frost cracks;
- Trunk and branch splits;
- Hollow sections of trunk and branches;
- Loose bark;
- Cavities beneath old root buttresses and coppice stools;
- Dense epicormic growth;
- Dense ivy cover.

2.8 Veteran trees typically exhibit many of these features and should usually be regarded as sites with clear potential, but any tree possessing one or more such feature, may host bats. Any tree species can be suitable but oak and beech often seem to be the preferred options. However, bats rarely restrict themselves to one tree. They change their roost sites frequently, sometimes every two to three days, looking for small differences in temperature and humidity.

2.9 Roosts of bats in trees may be identified from the following field signs:

- Black stains beneath cracks, splits and other features where bat droppings have fallen;
- Dark marks at entrance points where bats have rubbed against the wood and left natural body oils;

- Feeding remains beneath roosts, such as insect wings;
- Chattering of bats;
- Bat droppings under access points;
- Scratch marks around a feature (cavity or split) caused by bat claws;
- Urine stains below the entrance or end of split;
- Large roosts or regularly used sites may produce an odour;
- Flies around the entrance, attracted by the smell of guano.

2.10 Trees scheduled for arboricultural work should also be assessed, and may be categorised to relate the value of their features to recommended actions (Table 1). This approach allows trees to be graded according to their potential to support bat roosts. Trees may be assessed as having the potential to support bats (from an individual to a larger roost) even if no bats have been found.

Table 1: Protocol for visual inspection of trees to assess their value to bats - taken from Table 4.1 within the 'Bat Surveys for Professional Ecologists: Good Practice Guidelines, 3rd edition' (Bat Conservation Trust 2016)

Suitability	Roosting habitat description
Negligible	Negligible habitat features on-site likely to be used by roosting bats.
Low	A tree of sufficient size and age to contain potential roosting features but with none seen from the ground or features seen with only very limited roosting potential.
Moderate	A tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status.
High	A tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.

Badger Survey

2.11 A badger survey was undertaken at the site to assess if badgers were using the area and if any setts were located on the site and 30m away from the site that might constrain development. The evaluation of badger activity was based on methodology developed for the National Survey of Badgers (Creswell *et al.* 1990) and includes searching for

badger field signs such as setts, badger pathways, tracks (pawprints), dung piles with latrines, badger hairs and feeding signs such as snuffle holes.

2.12 During the survey, all habitats potentially suitable for badgers were systematically examined for evidence of badger activity including:

- Setts: several sett types may be present within a social group territory, ranging from a single hole to numerous interconnecting tunnels. Setts can be categorised into main, annexe, subsidiary and outlier (Wilson *et al.* 1997).
- Latrine sites: badgers characteristically deposit dung in pits, which may be located along the boundaries and within the social group territory. These sites serve as means of inter- and intra-group communication.
- Paths and runs: well used routes between setts and/or foraging areas. Often used by generations of badgers.
- Snuffle holes: areas of disturbed vegetation often formed by badgers foraging for ground dwelling invertebrates such as earthworms and larvae and the underground storage organs of plants.
- Hair: often found among spoil and bedding outside entrances to setts or snagged on fences (such as barbwire) along well-used runs.
- Footprints: easily distinguishable from other large mammal species. Often found along paths and runs or in spoil outside sett entrances.

Habitat Suitability for Reptiles

2.13 Habitat surveys were carried out to assess the potential of the site to hold populations of reptile species. This involved looking for the presence of factors that would increase the suitability of the site for reptiles such as:

- Scrub and grassland (long sward) mosaic across the site;
- Features that can be potential hibernation sites for common reptiles such as log piles;
- Grass tussocks within the grassland that can act as shelter and burrowing sites;
- Water bodies or damp places on site (grass snakes);
- Compost heaps or decaying vegetation (slow worms);
- Features that can act as refugia on the ground such as disused roofing felt.

Other Protected Species

2.14 The site was also inspected for indications of the presence of other protected species, as follows:

- Relevant habitat for dormice such as dense deciduous woodland, coppice and thick shrubbery
- Ponds and associated habitat suitable to support great crested newts
- The presence of ditches for water voles
- The presence of fresh water stream/rivers for otters
- Suitable nesting places for birds
- Other potential protected species

Limitations

2.15 It should be noted that whilst every effort has been made to provide a comprehensive description of the site, no single investigation could ensure the complete characterisation and prediction of the natural environment. . The site was visited over the period of one site visit, as such seasonal variations cannot be observed and potentially only a selection of all species that potentially occur within the site have been recorded. Therefore, the survey provides a general assessment of potential nature conservation value of the site and does not include a definitive plant species list.

2.16 The protected species assessment provides a preliminary view of the likelihood of protected species occurring on-site, based on the suitability of the habitat and any direct evidence on site. It should not be taken as providing a full and definitive survey of any protected species group. The assessment is only valid for the time when the survey was carried out. Additional surveys may be recommended if, on the basis of this assessment it is considered reasonably likely that protected species may be present.

3.0 Results

Desktop Study

- 3.1 The site does not fall within or adjacent to any statutory designated areas. The South Downs National Park is approximately 2.1km north and Climbing Beach Site of Special Scientific Interest (SSSI) and West Beach Local Nature Reserve (LNR) are approximately 3km southwest of site.
- 3.2 There are no non-statutory designations, such as Sites of Importance for Nature Conservation (SINC) or Local Wildlife Sites (LWS), within 2km of the site.
- 3.3 There are approximately 6 units of priority deciduous woodland and 1 unit of ancient semi-natural woodland within 2km of the site (Figure 2). The closest of these is an unnamed patch of priority deciduous woodland approximately 250m north. Decoy Wood and Steyne Wood ancient semi-natural woodland is 1.5km northeast.

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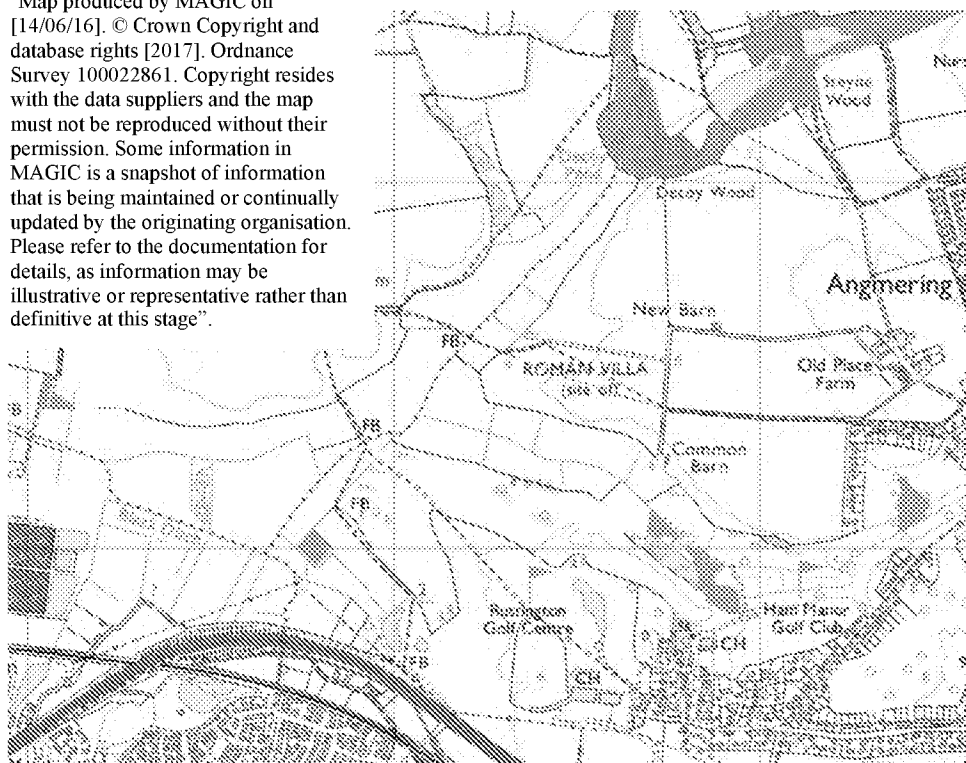


Figure 2: Woodland habitat within 2km of the red line boundary

- 3.4 Satellite imagery revealed three water bodies within a 250m radius of the red line boundary. No ponds were located on site but a brook (part of the Black Ditch) runs along the eastern boundary.
- 3.5 A 2km data search was requested from the Sussex Biodiversity Records Centre in 2016. The records closest to site and recorded within the last 10 years have been included (Table 2). Further information from the data request is included in the appendix.

Table 2: Notable species records within 2km of the site in the last 10 years

Species	Status	Record distance	Record year
Swallowtail Butterfly <i>Papilio machaon</i>	Wildlife and Countryside Act (1981 as amended) Schedule 5	Approximately 1.5km	2014
Stag Beetle <i>Lucanus cervus</i>	Habitats Directive Annex 2; NERC Act (2006); Wildlife and Countryside Act (1981 as amended) Schedule 5	Approximately 600m	2012
Great Crested Newt <i>Triturus cristatus</i>	Bern Convention Appendix 2; European Protected Species; Habitats Directive Annex 2 & 4; NERC Act 2006; Wildlife and Countryside Act (1981 as amended) Schedule 5	Approximately 1.6km	2013
European Eel <i>Anguilla anguilla</i>	NERC Act (2006) Section 41	Within 1km	2012
Slow Worm <i>Anguis fragilis</i>	NERC Act 2006 Section 41; Wildlife and Countryside Act (1981 as amended) Schedule 5	Approximately 1.5km	2011
Common Lizard <i>Zootoca vivipara</i>	NERC Act 2006 Section 41; Wildlife and Countryside Act (1981 as amended) Schedule 5	Approximately 1.4km	2009
European Water Vole <i>Arvicola amphibius</i>	NERC Act 2006 Section 41; Wildlife and Countryside Act (1981 as amended) Schedule 5	Site boundary	2015
West European Hedgehog <i>Erinaceus europaeus</i>	NERC Act (2006) Section 41; Bern Convention Appendix 3	Within 2km	2014
Serotine <i>Eptesicus serotinus</i>	Conservation of Habitats and Species Regulations (2010) Schedule 2; Habitat and Species Directive (1992) Annex 4; Wildlife and Countryside Act (1981 as amended) Schedule 5	Approximately 1.4km	2010
<i>Myotis</i> sp.	Conservation of Habitats and Species Regulations (2010) Schedule 2; Habitat and Species Directive (1992)	Approximately 500m	2013

	Annex 4; Wildlife and Countryside Act (1981 as amended) Schedule 5		
Common Pipistrelle <i>Pipistrellus pipistrellus</i>	Conservation of Habitats and Species Regulations (2010) Schedule 2; Habitat and Species Directive (1992) Annex 4; Wildlife and Countryside Act (1981 as amended) Schedule 5	Approximately 500m	2013
Soprano Pipistrelle <i>Pipistrellus pygmaeus</i>	Conservation of Habitats and Species Regulations (2010) Schedule 2; Habitat and Species Directive (1992) Annex 4; Wildlife and Countryside Act (1981 as amended) Schedule 5	Approximately 500m	2013
Long-eared species <i>Plecotus sp.</i>	Conservation of Habitats and Species Regulations (2010) Schedule 2; Habitat and Species Directive (1992) Annex 4; Wildlife and Countryside Act (1981 as amended) Schedule 5	Approximately 1.6km	2011
Little Egret <i>Egretta garzetta</i>	Bern Convention Appendix 2; Birds Directive Annex 1	Within 2km	2014
Grey Partridge <i>Perdix perdix</i>	Birds Directive Annex 2.1; NERC Act (2006) Section 41	Within 2km	2010
Red Kite <i>Milvus milvus</i>	Birds Directive Annex 1; Wildlife and Countryside Act (1981 as amended) Schedule 1	Within 2km	2015
Hobby <i>Falco subbuteo</i>	Bern Convention Appendix 2; Wildlife and Countryside Act (1981 as amended) Schedule 1	Within 2km	2012
Peregrine <i>Falco peregrinus</i>	Bern Convention Appendix 2; Birds Directive Annex 1; Wildlife and Countryside Act (1981 as amended) Schedule 1	Within 2km	2014
Little Ringed Plover <i>Charadrius dubius</i>	Bern Convention Appendix 2; Wildlife and Countryside Act (1981 as amended) Schedule 1	Within 2km	2011
Lapwing <i>Vanellus vanellus</i>	Birds Directive Annex 2.2; NERC Act (2006) Section 41	Within 1km	2014
Avocet <i>Recurvirostra avosetta</i>	Bern Convention Appendix 2; Birds Directive Annex 1; Wildlife and Countryside Act (1981 as amended) Schedule 1	Within 2km	2012
Barn Owl <i>Tyto alba</i>	Bern Convention Appendix 2; Wildlife and Countryside Act (1981 as amended) Schedule 1	Within 2km	2011
Kingfisher <i>Alcedo atthis</i>	Bern Convention Appendix 2; Birds Directive Annex 1; Wildlife and Countryside Act (1981 as amended) Schedule 1	Within 1km	2012
Cetti's Warbler	Wildlife and Countryside Act (1981	Within 2km	2011

<i>Cettia cetti</i>	as amended) Schedule 1		
Black Redstart <i>Phoenicurus ochruros</i>	Bern Convention Appendix 2; Wildlife and Countryside Act (1981 as amended) Schedule 1	Within 2km	2014
Firecrest <i>Regulus ignicapilla</i>	Bern Convention Appendix 2; Wildlife and Countryside Act (1981 as amended) Schedule 1	Within 2km	2011
Corn Bunting <i>Emberiza calandra</i>	NERC Act (2006) Section 41	Within 2km	2014

Phase 1 Habitat Survey

- 3.6 The site was comprised of fields of semi-improved grassland, an area of hardstanding that previously contained derelict buildings, a house and associated garage and garden. There was also a brook along the eastern boundary of the site. The land containing the house, garden and the horse paddock are not currently under the ownership of the client but the landowner granted permission for their land to be surveyed. The only area that could not be accessed was the field in the southeast corner of the site between the road and the railway due to health and safety reasons (barbed wire fencing).

Neutral semi-improved grassland

- 3.7 All of the semi-improved grassland fields on site, including the horse paddock in the western corner of the site, were of a similar species composition. The predominant grass species was Yorkshire fog (*Holcus lanatus*) but also included perennial rye grass (*Lolium perenne*), cocksfoot (*Dactylis glomerata*), creeping bent (*Agrostis stolonifera*), meadow barley (*Hordeum secalinum*), crested dogstail (*Cynosurus cristatus*), smaller catstail (*Phleum bertolonii*) and annual meadow grass (*Poa annua*). The floral community in these fields also included common nettle (*Urtica dioica*), bramble (*Rubus fruticosus*), meadow buttercup (*Ranunculus acris*), creeping buttercup (*Ranunculus repens*), white clover (*Trifolium repens*), red clover (*Trifolium pratense*), silverweed (*Potentilla anserina*), creeping forget-me-not (*Myosotis secunda*), common field speedwell (*Veronica persica*), cleavers (*Galium aparine*), spear thistle (*Cirsium vulgare*), prickly sow-thistle (*Sonchus asper*), teasel (*Dipsacus sylvestris*), common mouse-ear (*Cerastium fontanum*), cut-leaved cranesbill (*Geranium dissectum*), long-stalked cranesbill (*Geranium columbinum*), curled dock (*Rumex*

crispus), broad-leaved dock (*Rumex obtusifolius*), common ragwort (*Senecio jacobaea*), bugle (*Ajuga reptans*), lesser burdock (*Arctium minus*), common hogweed (*Heracleum sphondylium*), field bindweed (*Convolvulus arvensis*), scarlet pimpernel (*Anagallis arvensis* ssp *arvensis*), redshank (*Persicaria maculosa*), rosebay willowherb (*Chamerion angustifolium*), white campion (*Silene latifolia*), creeping cinquefoil (*Potentilla reptans*), bristly oxtongue (*Helminthotheca echinoides*), ribwort plantain (*Plantago lanceolata*), greater plantain (*Plantago major*), lesser stitchwort (*Stellaria graminea*), lesser trefoil (*Trifolium dubium*) and birdsfoot trefoil (*Lotus corniculatus*). On the day of the update survey, there were also snowdrops (*Galanthus* sp.) and daffodils (*Narcissus pseudonarcissus*) starting to emerge in the garden of the house.

- 3.8 It should be noted that the western corner of the horse paddock field could not be accessed due to a large amount of flooding in the centre of this field.
- 3.9 The field in the southeast corner of the site between the road and the railway line could not be accessed due to a barbed wire gate and therefore a full assessment of the vegetation could not be made. However, the composition appeared to be similar to the other fields on site and the species that could be observed from the road included Yorkshire fog, perennial rye grass, prickly sow thistle, lesser burdock, nettle, bramble, bristly oxtongue, spear thistle, rosebay willowherb, creeping buttercup, creeping forget-me-not, white campion, bugle, cleavers and great mullein (*Verbascum thapsus*).

Tree line and scattered trees

- 3.10 Tree lines marked the site boundary along the northern edge between the site and the A259, particularly along the bridleway which allowed access into the westernmost field. The main species included elder (*Sambucus nigra*), hawthorn (*Crataegus monogyna*), sycamore (*Acer pseudoplatanus*) and field maple (*Acer campestre*).
- 3.11 On site, a tree line demarcates the boundary between the horse paddock currently not owned by the client in the western corner and the grassland field in the centre of site. This was predominantly made up of sycamore with the occasional field maple.

-
- 3.12 There is a small plot of trees to the west of the house on land not owned by the client. This consisted of field maple, ash and hawthorn.
- 3.13 There were also a number of scattered trees throughout the site, both in the garden of the house and in the central grassland field. In the garden, there was a variety of tree species including silver birch (*Betula pendula*), willow (*Salix sp.*), apple (*Prunus sp.*), English walnut (*Juglans regia*), leylandii (*Cupressus x leylandii*), false acacia (*Robinia pseudoacacia*) and other ornamental species. In the central field, there was a mature lime (*Tilia sp.*) at the western end and a collection of oaks, sycamores and limes in the eastern corner.

Hedgerows

- 3.14 Hedgerows run along the road into site and around the house. These hedgerows consist of sycamore, field maple, hawthorn, elder and oak. It should be noted that numerous trees either side of the access road had recently been felled on the day of the update survey.
- 3.15 Vegetation growing underneath the hedgerow and along the road included species such as annual meadow grass, Yorkshire fog, false oat grass (*Arrhenatherum elatius*), ribwort plantain, greater plantain, bramble, common nettle, common hogweed, hedge bindweed (*Catystegia sepium*), bristly oxtongue, red clover, prickly sow thistle, teasel, common fleabane (*Pulicaria dysenterica*), white bryony (*Bryonia alba*), ragwort, willowherb, creeping buttercup, herb Robert (*Geranium robertianum*), bugle, scarlet pimpernel and birdsfoot trefoil.

Buildings

- 3.16 There were 5 buildings on site at the time of the update survey. Three buildings previously surveyed on the old caravan park have been demolished since the 2016 survey. A metal storage building still remains in the old caravan park. The other buildings present on site include the house and associated garage, a small horse shelter in the horse paddock to the west and a disused wooden stable block in the central field opposite the old caravan site.

Hardstanding

- 3.17 The areas of hardstanding on site include the road, the area where the caravan park was once situated and a track leading to the stables in the central field opposite.

Ditches

- 3.18 There are two man-made ditches or trenches which have been dug parallel to the road in the central field and the field adjacent to the brook and north of the access road.

Off-site habitats

- 3.19 To the north of the site is the A259 whilst to the south is a functioning railway line. Tree lines run between the site and these transport routes. Along the eastern boundary of the site is a brook, part of the Black Ditch, which runs under the access road and out under the A259 into the wider landscape.

Protected Species***Bats***

- 3.20 There were five buildings on site at the time of the update survey (Figure 3). Three of the buildings in the old caravan park (yellow) had been knocked down following the 2016 PEA survey. These included a small one-storey brick house with flush tiles and no void; a metal storage shed and a small wooden shed. All three were assessed as unsuitable for roosting bats due to the lack of access, a lack of internal voids or crevices and/or their construction materials.
- 3.21 Only a large metal storage shed (Building 4) remains on the area of hardstanding which made up the old caravan park. It had a corrugated metal roof and walls and no roof void. It was considered unsuitable for roosting bats due to wide temperature fluctuations associated with metal constructions and a lack of an internal void or crevices for roosting. This building was considered to have negligible suitability for roosting bats.



*Figure 3: Location of buildings on site numbered for ease of reference
(yellow buildings knocked down since 2016 survey)*

3.22 The house and garage (Buildings 2 and 3) were assessed internally following recommendations made after the 2016 survey where access was not possible. The cross-shaped void of the house was small, narrow and low; approximately 1m high and 1m wide. This along with the presence of water tanks and large amounts of insulation meant that access into the void was not possible. However, it was possible to see large dense cobswebs throughout the void. No bat droppings or other evidence of bats were observed, however rat droppings and footprints were found.

3.23 Externally, the tiles of the house were flush with each other with moss growing over large areas. It was considered unlikely that bats could enter the void or roost under the tiles. However, there were three small windows coming out of the roof on the second floor. Whilst the tiles for these sections were flush, the sides were covered in weather boarding which had either slipped or warped in places. The small areas of weatherboarding were considered to provide some roosting opportunities for individual

crevice-dwelling bats. Therefore, the house was considered to have low roosting suitability for bats.

- 3.24 The garage was a brick building with a tiled roof and weatherboarding on the front. Again, the tiles were flush with each other and covered in large amounts of moss. However, the weatherboarding on the front of the garage was slightly warped in places. Internally, there was no void and part of the roof at the back of the garage was made of clear corrugated plastic sheeting which let large amounts of light in. The garage was also full of cobwebs. Due to the presence of lifted weatherboarding, the garage was also assessed as having low suitability for roosting bats.
- 3.25 The horse shelter (Building 1) and stable block (Building 5) were not considered suitable for roosting bats due to their construction materials, their open and light nature and a lack of suitable cracks and crevices suitable for roosting.
- 3.26 Many of the trees on site were considered to be immature and not of aged or veteran quality, reducing their potential to support complex growth forms, cracks and crevices, which are traditionally associated with roosting bats.
- 3.27 However, two large trees on site were considered to have low potential for roosting bats. The first was a large English walnut in the garden of the house and a crack was found in the trunk. The second was a large oak at the eastern end of the central field due to its size and the possibility of features being present that are not observable from the ground. These trees are highlighted in the habitat map (Appendix 2) but show approximate locations only.
- 3.28 During the 2016 survey in June, a third tree was identified as having low roosting bat potential. This was a mature lime tree towards the western end of the central field where features were not easily observable from the ground due to dense vegetative growth. However, during the update survey in February when the tree had no leaves, it was possible to see that there were no suitable features for roosting. It was also considered that the shape of the tree and the large amount of vegetation growth made it too

complicated for bats to easily use. Therefore, this tree is now considered to have negligible potential to support roosting bats.

- 3.29 The habitats on site may provide potential foraging opportunities for bats in the local area, particularly the tree lines and hedgerows. These features may also provide connectivity into the wider landscape.

Badgers

- 3.30 No badger setts were located on or within 30m of site where access was possible. No evidence such as latrines or snuffle holes, was identified anywhere on or around site. It should be noted that not all areas of the site could be accessed on the day of the survey, including the western corner of the horse paddocks due to flooding and the eastern corner field due to a barbed wire fence.
- 3.31 Mammal holes were found on the edge of the horse paddock and along the southern edge of the central field but these were thought to be rabbit warrens due to their size and the droppings present. Another burrow was observed along the boundary between the central field and western horse paddock. The shape of one of the entrance holes was D-shaped suggesting it had been created by a badger. However, the numerous droppings around the burrow suggested that it is now used by rabbits.
- 3.32 In 2016 when the vegetation was taller, mammal pathways were found throughout the site including the field adjacent to the brook and to the north of the road. However, no direct evidence of these being made by badgers was identified.

Dormice

- 3.33 The treelines and hedgerows on site have the potential to provide suitable habitat for dormice, however the species assemblage was not considered sufficiently diverse. The location of the site between a busy A road and a busy railway line also means that there is a lack of habitat connectivity on to site. There are no records of dormice within 2km of

the site from the last 10 years. It is considered highly unlikely that dormice are present on site.

Great Crested Newts

- 3.34 No ponds were found on site at the time of the survey, however there was a large body of water where the horse paddock had been flooded. This flooded area was also present in June 2016 and is believed to be created by drains that move the rainwater away from the railway and the A259.

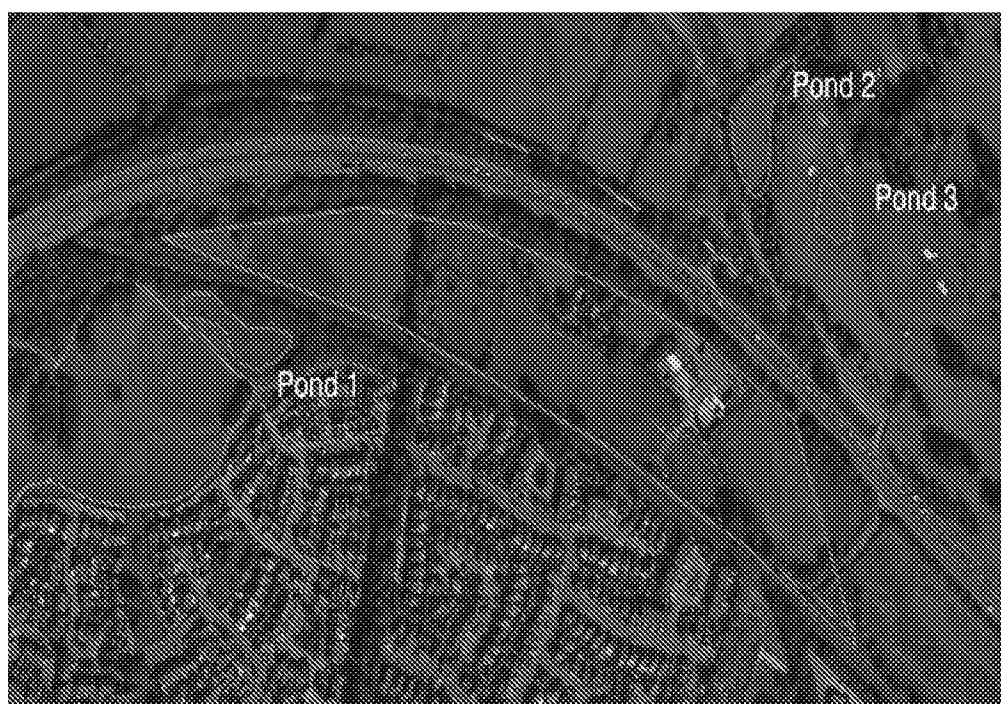


Figure 4: Location of ponds within 250m of the red line boundary

- 3.35 Three ponds were identified within 250m of the red line boundary during the desktop survey. Ponds 2 and 3 could not be accessed as they were located on private property on the other side of the A259. Pond 1 in Brookfield Park was surveyed for its potential to support GCN using the Habitat Suitability Index criteria. The suitability index is calculated for each of the 10 categories. These are then analysed using the equation below to obtain the geometric mean or HSI score of the ten suitability indices.

$$HSI = (SI_1 \times SI_2 \times SI_3 \times SI_4 \times SI_5 \times SI_6 \times SI_7 \times SI_8 \times SI_9 \times SI_{10})^{1/10}$$

However, because Pond 1 is larger than 2000m², factor 2 has to be omitted from the calculation as there are no data for ponds this large. Therefore, the following equation has been used to calculate the habitat suitability.

$$HSI = (SI_1 \times SI_3 \times SI_4 \times SI_5 \times SI_6 \times SI_7 \times SI_8 \times SI_9 \times SI_{10})^{1/9}$$

The calculated score should be between 0 and 1 and will fall within one of several bands, which correspond to a given category for the pond (Table 3).

Table 3: HSI scores and pond suitability

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

- 3.36 Table 4 below shows the Habitat Suitability score for Pond 1. This was calculated as having 'poor' habitat suitability for great crested newts, predominantly due to the presence of large numbers of koi carp and waterfowl which prevent GCNs from successfully breeding through predation and disturbance of eggs.

Table 4: HSI score for pond 1

Suitability Indices No.	Feature	Pond Score
1	Location	1
2	Area	N/A
3	Permanence	0.9
4	Water quality	0.67
5	Shading	1
6	Presence of waterfowl	0.67
7	Presence of fish	0.01
8	Pond density	0.65
9	Suitable newt habitat within 500m	0.33
10	Macrophyte content	0.4
10 th Root		0.41
Pond Suitability		Poor

Reptiles

- 3.37 Semi-improved grassland provides good habitat for foraging reptiles as it offers a wide range of invertebrates as a food source. However, the sward height in the horse paddock, the garden and patches of the central field was short and not considered suitable for reptiles. It appeared to have been heavily grazed by rabbits. However, the update survey was carried out in February when plant growth is limited. During the previous survey in June 2016, the edges of the central grassland and the eastern fields either side of the access road had longer sward heights and were considered to be suitable for reptiles. Both common lizards and slow worms have been recorded within 2km of the site in the last 10 years. It is considered possible that reptiles may be using the edges of the site.

Other Species

- 3.38 The trees and hedgerows on site have the potential to support nesting birds. Several common species were seen and heard on site at the time of the survey, including robin, wren, great tit, goldfinch and buzzard. Indeed, a buzzard was seen perching in the large lime tree in the central field and another was observed flying low over the site. In June 2016, magpie, greenfinch, swallow, mallard and gulls were also observed using the site and a swallow nest was found in the stable block in the central field.
- 3.39 Several small mammal holes were found at the edge of the horse paddock and the central field next to the railway line. Given their size and the droppings and digging in the area, these are likely occupied by rabbits. Another burrow was observed along the boundary between the central field and western horse paddock. The shape of one of the entrance holes suggested it had been made by badgers, however, the droppings around the entrances suggest it is now used by rabbits.
- 3.40 There is a brook immediately adjacent to the eastern boundary of the site. Surveys were carried out for land to the east of site and also adjacent to the brook in 2015 by Urban Edge Environmental Consulting for a neighbouring development. Water vole evidence, including burrows, latrines and feeding stations, was found in this section of the brook (Figure 5). The reeds and vegetation alongside the brook were very tall during both the

update survey and the 2016 survey and so visibility of the water's edge was significantly reduced. However, latrines were identified on logs and pieces of floating rubbish during the update survey and a small feeding station was also observed. Droppings were also identified along the bank next to site during the 2016 survey.

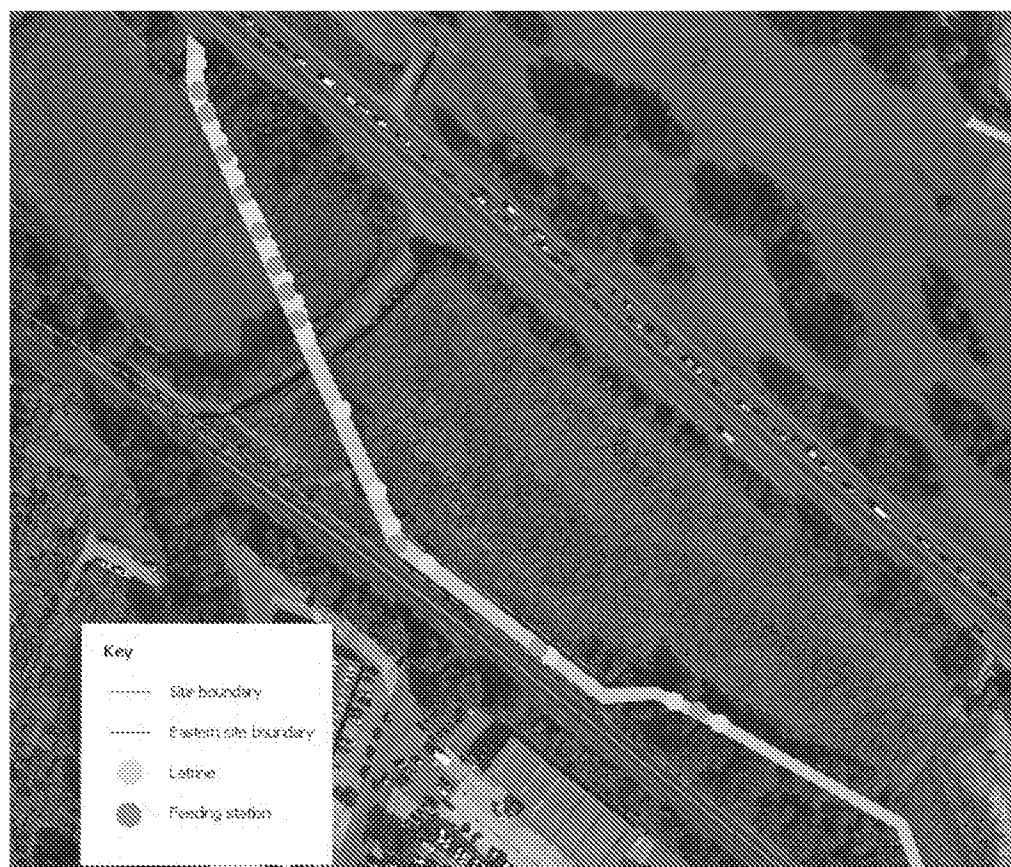


*Figure 5: Water vole evidence found in 2015
(adapted from Urban Edge Environmental Consulting water vole report)*

- 3.41 No signs of otter were found during the same surveys in 2015 along the brook. It was considered to be unsuitable due to the low water level and a lack of suitable fish.
- 3.42 There are records of stag beetles close to site in 2012. Stag beetles are reliant on dead wood for their larval stage, which is present on site in low quantities. Dead wood was found in the small area of woodland adjacent to the garden and along the boundaries of the site where trees had recently been felled.

4.0 Discussion

Site

- 4.1 The site does not fall within or adjacent to any statutory designations. The closest is the South Downs National Park approximately 2.1km north. There are no non-statutory designations such as SSSIs or LWSs within 2km of the site. Given the location of the site and its distance from any designations, it is considered there will be no direct or indirect impacts on protected areas. Therefore, there are no issues regarding local plan policies AREA13, AREA14 and AREA15 and these policies are not considered further within this report.
- 4.2 The habitats on site are common and widespread throughout the local area and the UK as a whole. The site contains areas of semi-improved grassland, tree lines and hedgerows which are considered to be the most ecologically valuable habitat on site, albeit at site level only. The semi-improved grassland dominates the site but it is the areas of taller sward height that are of the most ecological value. The tree lines and hedgerows are patchy and fragmented around the site. The areas of hard standing and buildings are considered to be of low ecological interest. The brook just off-site is an important habitat for water voles and will need to be considered within the design of the scheme.
- 4.3 In terms of off-site habitat, there are approximately 6 units of priority deciduous woodland within 2km of the site, the closest of which is 250m north. This is a habitat of principal importance for the conservation of biodiversity under section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. This means that developments need to take into account impacts on this habitat to prevent its degradation. Given the distance from these woodlands and the presence of significant barriers such as a railway line and the A259, it is not considered that the development will have any direct or indirect impacts on this habitat.
- 4.4 There is also one unit of ancient semi-natural woodland within 1.5km of the site. Natural England's standing advice for development which is close to ancient woodland recommends that a 15m buffer be established between ancient woodland and any forms

of development to ensure trees and associated edge habitats are protected. It is considered that the ancient woodland will not be impacted, directly or indirectly, by the proposed development.

- 4.5 With regard to local planning policy, GEN28 (Trees and Woodlands) identifies the need to protect trees and woodland on site and may condition the planting of equivalent number of trees if significant tree removal is to take place. It has been recommended that as many trees be retained on site as possible in order to maintain linear features important for landscape connectivity. It has also been recommended that tree planting and hedgerow creation take place along the boundaries of the site (see general site enhancements further below).
- 4.6 Policy GEN29 (Nature conservation across the District), outlines that development will only be permitted on sites which contain important habitats, features of nature conservation interest or wildlife corridors if these are largely retained and sympathetically incorporated into the scheme. In this regard, it is important to consider the brook along the eastern boundary of the site as this is an important wildlife corridor and provides habitat for water voles. The linear features such as the hedgerows and tree lines should also be incorporated into scheme and enhanced where possible. Recommendations for these habitats have been outlined further below.

Protected Species

Bats

- 4.7 There were five buildings on site during the update survey. Three had been demolished since the previous PEA survey in 2016. These were a house and outbuildings on the old caravan park which were not considered suitable for roosting bats due to their construction materials and/or their lack of voids and suitable crevices for roosting. A large metal storage shed (building 4) was still present on this part of the site at the time of the update survey but was not considered suitable for roosting bats and it can be demolished without further consideration for bats.

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- 4.8 Internal surveys of the stables and the horse shelter (buildings 1 and 5) found no evidence of bats and these buildings were considered to be unsuitable due to their open environment and lack of suitable roosting features. The horse shelter is located in the western paddock, which is not currently owned by the client. However, no further bat surveys of either building are considered necessary and they can be demolished without further consideration for bats.
- 4.9 The house and garage (buildings 2 and 3) were assessed internally during the update survey as access was not possible during the original 2016 PEA. This was because they are not owned by the client and permission had to be sought. No evidence of bats, such as droppings or feeding remains, was found inside the void of the house. Externally, the tiles were relatively flush with moss growing over areas. However, the weatherboarding around the windows on the second floor had either slipped or warped in places. Because of these external features, it was considered to have low roosting bat potential. The garage had no internal void and was full of cobwebs and very light in places where clear plastic sheeting had been used. Again, the tiles were flush with moss growing but weatherboarding on the front was warped in places. Therefore, the garage was also considered to have low roosting bat potential.
- 4.10 As a precautionary approach, it is recommended that one dusk emergence or dawn re-entry survey be carried out on both the house and garage to determine whether any bats are using the external features identified. Even though no evidence of bats was found in either building, it is considered necessary to survey due to the possibility of these buildings being demolished if the client is able to gain ownership of them. If bats are found to be using either building, then further surveys will be required.
- 4.11 Many of the trees on site were considered unsuitable for roosting bats due to their age and lack of features associated with roosting bats. However, two mature trees found on site were considered to have low potential for roosting bats. The first was a large English walnut in the back garden of the house as it had a large crack in the bark. It is recommended that this tree be retained within the scheme.

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- 4.12 The second tree was a large oak at the eastern end of the central field. No roosting features could be seen however due to its size and age, it had the potential to contain roosting features not observable from the ground. It is recommended that both of these trees be retained within the scheme and buffered from any indirect impacts such as lighting.
- 4.13 The large lime tree in the central field was also classed as having low roosting potential during the 2016 PEA. However, reassessing it in February with no leaves showed there were no potential roosting features present and it was considered too complicated a tree for bats to use easily. Therefore, it is no longer considered to have roosting bat potential and has been reclassified as having negligible potential for bats.
- 4.14 The assessment of trees on site for their suitability for roosting bats was a preliminary one. It is recommended that once the plans have been further developed and any large or mature trees have been identified for removal, then a further inspection of these trees should be carried out by a suitably qualified ecologist.
- 4.15 The tree lines and hedgerows on site are likely to provide some opportunities for foraging and commuting bats. These features also provide some habitat connectivity to the wider landscape. It is recommended that these features are retained where possible.
- 4.16 According to Bat Conservation Trust guidelines, it is important that proportionality is employed when recommending further survey work for bat species on a proposed development site. As stated within section 8.2.7 of the latest survey guidelines (2016), the following points need to be taken into account with regard to planning activity surveys:
- Likelihood of bats being present;
 - Likely species concerned;
 - Number of individuals;
 - Type of habitat affected;
 - Predicted impacts of the proposed development on bats;
 - Type and scale of proposed development.

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- 4.17 The current proposals include the redevelopment of the site with housing and a care home facility. It is considered that the development will result in associated habitat loss of the semi-improved grassland habitats, with some tree lines being affected and some trees already being removed. The habitats in themselves are not considered to be significant in terms of their opportunities to support foraging bats due to the largely grazed nature of the grassland and the resulting lack of a diverse community and structure. It is considered that the tree lines and hedgerows, which are present largely around the edges of the site, are the most significant for bats.
- 4.18 However, it is also considered that the site is rather fragmented from the wider landscape. The A259 runs along the northern edge of the site and the railway line along the southern edge, leading to features which fracture any significant landscape connectivity. As such, whilst the area of the site itself is reasonable in size, the location of the site and its position in the local landscape is relatively poor.
- 4.19 This positioning and the habitats present both provide limited interest in terms of opportunities for bats. Furthermore, biological records (as shown above) only highlight records of the most common species in the UK and no specialist bats, such as horseshoe bats or woodland specialists, such as Barbastelles, are present in the local landscape.
- 4.20 As such, it is considered that the development of the site would not impact upon the functionality of the local landscape and will not sever or fragment landscape links. It is therefore considered that the proposals would not impact upon the favourable conservation status of the bats in the local area.
- 4.21 It is, however, considered necessary that the site is enhanced for bats and that tree lines are retained within the scheme. Certainly, developments which incorporate trees and hedgerows within a scheme would retain ecological features of interest. Linking such features, or providing stepping stones within developments, will provide opportunities within the site for species such as bats to forage and move within the landscape. It is recommended that the landscape plan incorporates habitat edges and ecotones and provides native species planting of interest.

4.22 Any proposed lighting scheme as part of the development will have to take into account bats in the surrounding area as well as the site. All bat species are nocturnal, resting in dark conditions in the day and emerging at night to feed. Bats are known to be affected by light levels, which can affect both their roosting and foraging behaviour. This needs to be taken into account with a sympathetic lighting scheme for the development. Recommendations include:

- Installing lighting only if there is a significant need;
- Using low-pressure sodium lamps or high-pressure sodium instead of mercury or metal halide lamps where glass glazing is preferred due to its UV filtration characteristics;
- Directing light to where it is needed and avoiding light spillage;
- Using baffled lighting where light is directed towards the ground;
- Avoid putting lighting near treelines or hedgerows and angling light away from these linear features which are used by commuting and foraging bats;
- Planting a barrier or using man-made features required within the scheme to form a barrier.

4.23 To enhance the local bat population and provide roosting opportunities, it is recommended that boxes should be hung on mature trees or buildings around the site. Recommended boxes include:

- Schwegler 2F Bat Box – These boxes are attractive to small bats such as pipistrelles and long-eared bats (Figure 6). At least 3 of these should be hung on mature trees around the site.
- Schwegler 2FN Bat Box – This is slightly larger than the 2F and provides opportunities for the larger bats such as noctules. At least 2 of these should be hung on mature trees on site.
- Schwegler 1FD Bat Box - This box has been designed specifically for smaller bats and provides opportunities as a maternity roost (Figure 6). At least 2 of these should be hung on mature trees on site.

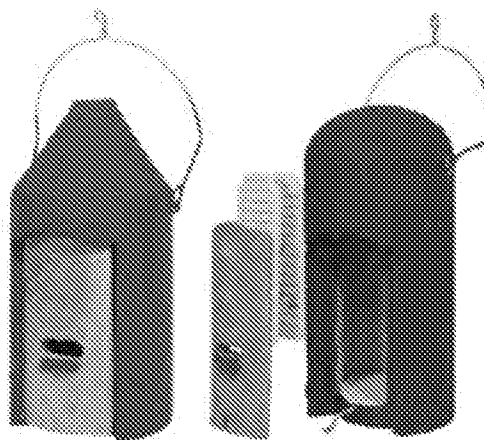
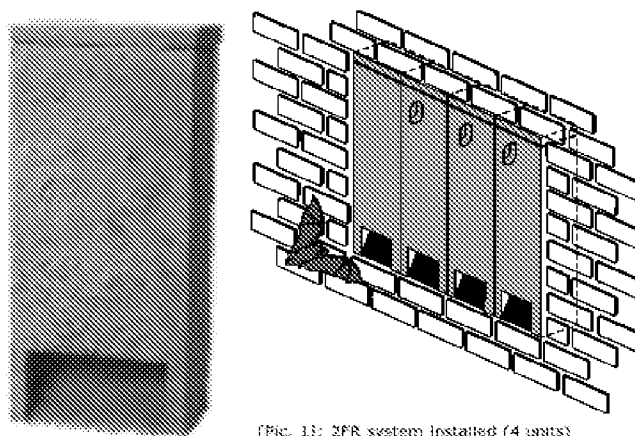


Figure 6: Schwegler 2F (left) and 1FD (right) bat boxes

4.24 Incorporating specially designed bat boxes into the design can enhance the habitat on site for bats. Suitable bat boxes include a variety of wooden bat boxes, such as an improved cavity box, a double chamber bat box and other wood based varieties. Schwegler boxes have been recommended as these are long-lasting and require no maintenance.

4.25 Bat boxes/tubes can also be incorporated into the structure of new buildings. These provide good opportunities for crevice-dwelling species such as pipistrelles. The opening of the bat box/tube will be the only section of the bat box/tube that would be visible. Several of these tubes can be established in a row together providing a good-sized roost space. The bat tubes should be inserted as high up as possible in the brickwork (Figure 7).



[Pic. 1]: 2FR system installed (4 units)

Figure 7: Bat tubes incorporated into the wall of a building to provide roosting space

Badgers

- 4.26 No evidence of badgers, such as setts, latrines or snuffle holes, was identified on site at the time of the survey. Areas of dense vegetation which could not be previously accessed during the 2016 survey, such as the thick nettle cover, were checked for badger setts during the update survey. Only small rabbit holes were identified along the southern boundaries of the site. A burrow was identified along the tree line between the central field and western paddock which had a D-shaped hole. This may have been created by badgers but due to the presence of rabbit droppings surrounding the hole, it is now believed to be used by rabbits.
- 4.27 Whilst no evidence of badgers actively using the site was found on the day of the survey, they may reside in the surrounding habitats and may visit the development site to forage. Foraging and commuting habitat is not legally protected, however safety measures can be taken to ensure no badgers are harmed during the development process.
- 4.28 It is recommended that any excavations and trenches associated with construction are either covered at night or supplemented with a means of escape for any badgers that may fall into the excavation whilst foraging. Any open pipes or conduits laid should be blocked off each night to prevent badgers from entering them. If possible, construction work should only take place between dawn and dusk with no late evening work to reduce possible disturbance.
- 4.29 It is always recommended that badger update surveys are undertaken across the site prior to any development works and/or if there is a lapse in time between the survey and development as badgers may move onto the site in the intervening period.

Dormice

- 4.30 The site was considered to offer some suitable habitat for dormice, however the species assemblage was not very diverse. There are no records of dormice within 2km of the site in the last 10 years. There is also a lack of connective habitat with the surrounding area

due to the railway line and A259 bordering the site. It is considered unlikely that dormice are present on site and no further surveys are recommended.

Great Crested Newts

- 4.31 There were no ponds on site at the time of the survey. However, there was a large body of water in the horse paddock field as a result of flooding and drainage from the railway line and road. A drain can be seen at the edge of the field coming from the direction of the railway line. This was not considered suitable for GCNs due to the shallow depth and the likelihood of fluctuating water levels.
- 4.32 There are a total of three ponds within 250m of the red line boundary. Ponds 2 and 3 were located on the other side of the A259 on private property and therefore could not be assessed for their habitat suitability. However, the A259 acts as a significant barrier to dispersal. As such, both ponds 2 and 3 are not considered further and it is not required that these ponds be surveyed for this development.
- 4.33 Pond 1 lies within 50m of the horse paddock and 150m of the central field. However, this pond was assessed as having poor habitat suitability for GCNs due to the presence of large numbers of koi carp and waterfowl, which significantly reduces GCN breeding success due to predation and egg disturbance. Therefore, it is considered that the site is not constrained by GCNs and no further surveys are required.

Reptiles

- 4.34 Semi-improved grassland provides good habitat for foraging reptiles, however the sward height throughout the site at the time of the update survey was very short due to rabbit grazing and the time of the year. Reptiles prefer tussocky grassland with longer sward heights for foraging and cover from predators. During the June 2016 survey, the areas with longer sward heights on site were the margins of the central field and the smaller fields either side of the road.

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- 4.35 It is considered likely that reptiles may be using the edges of the fields on site where longer grass, scrub and ruderal vegetation grow up during the spring and summer. It is recommended that a reptile presence/likely absence survey be carried out to establish if a population of reptiles is present on site. Reptile surveys should be carried out between April and September (inclusive) on suitable dry days with temperatures between 8°C and 18°C.

Water voles

- 4.36 Immediately adjacent to site along the eastern boundary is a brook, which supported evidence of water voles, including latrines and feeding stations, found in 2015 by Urban Edge Environmental Consulting. During the 2016 survey, the reeds and waterside vegetation were very tall so searching for evidence was difficult. However, droppings were found on the bank adjacent to site. This update survey identified latrines on a log and pieces of floating rubbish in the channel as well as a small feeding station.
- 4.37 The habitat on the day of the survey was still considered to be of good quality for water voles due to lots of vegetative cover, steep bank sides for burrowing, stable water levels and good habitat connectivity to the wider landscape.
- 4.38 As the brook and associated water vole habitat is directly adjacent to the eastern boundary of site, it is recommended that a buffer zone be maintained between the development and the brook. According to Natural England guidelines, this should be 5-10m from the top of the bank to protect the water voles from any direct impacts and to minimise disturbance. All construction activities and access by personnel and machinery should be prohibited in this buffer zone. Any ground works that are to take place near the brook should be completed as quickly as possible to reduce disturbance and should be avoided between late April and late August when water voles are likely to have young.
- 4.39 The development plans are yet to be finalised but the current access road crosses the brook with a single-track bridge. Given the scale of the development, it is considered

highly likely that this road will need to be widened. Furthermore, plans for the development directly to the east of site (A/23/15/OUT) outlined a need to widen a section of this road and create a new culvert. However, recent plans for the eastern site have proposed a new access route (A/11/17/OUT) which might lessen the impact on this bridge. Either way, works to the bridge would lead to direct impacts on the water voles in terms of habitat loss, disturbance and possible injury or death as burrows may be affected.

- 4.40 The water vole report by Urban Edge Environmental Consulting in 2015 outlines a mitigation strategy that should be followed on this site should road widening or works on the bridge need to take place. This strategy needs to avoid killing or injuring water voles, disturbing them in a place of shelter and damaging or blocking access to their place of shelter as they are protected under Schedule 5 of the Wildlife and Countryside Act (1981 as amended). Therefore, the mitigation strategy focuses on displacing the water voles from the construction zone immediately prior to commencement and subsequent compensation of habitat loss. The strategy proposed by Urban Edge Environmental Consulting is outlined below:

“As proposals for the site have not yet been finalised, the following recommendations provide an indicative outline of what it likely to be necessary as part of the agreed Method Statement to protect the water vole population known to be using the ditch:

- Displacement of water voles and subsequent engineering works to create a new culvert to widen Brook Lane should be carried out between 15 February and 15 April inclusive.*
- Manipulation of bankside habitat along the stretch of ditch to be affected by construction to encourage water voles to leave the area. Vegetation should be cleared within the working area, plus 3m up and downstream, as well as 3m from the bank top. Vegetation should be trimmed down to bare earth, and emergent aquatic vegetation cut back to water level. As the area to be cleared is relatively small, it is unlikely that compensatory habitats will need to be in place prior to displacement.*
- Following clearance, arisings should be raked-off and burrow entrances checked to ensure they have not become blocked. The cleared area should be left bare of vegetation for 3 to 5 days to allow any remaining animals to relocate.*

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- *Following habitat manipulation, the cleared area should be re-surveyed for signs of water vole activity. Assuming there is no evidence that water voles are still present, a destructive search of burrows with the construction zone should be undertaken by a suitably experienced ecologist.*
 - *Following the destructive search, construction works should be undertaken within 2 to 3 days. If this is not possible, it will be necessary to maintain the working area as bare ground until the work is complete.*
 - *It may be necessary to erect exclusion fencing in order to prevent animals from moving back into the construction zone from adjacent areas. The fencing will need to exclude terrestrial and aquatic habitat, with mesh being used across the ditch channel to prevent damming the watercourse. It is important to ensure that any mesh used does not have the potential for water voles to become entrapped. Fencing should be 1.2m high and buried to a depth of at least 50cm.*
 - *Displacement of animals is suitable only if the works will affect less than 50m of the watercourse. If more extensive works become necessary, a translocation may be required. This would involve the erection of exclusion fencing and the trapping of animals within the construction zone. Trapped animals would then be removed to a suitable receptor for the duration of construction. Due to the limited nature of works proposed, water voles could then be released back into the area following completion or allowed to recolonise naturally.*
 - *In order to achieve conservation benefits, it will be necessary to implement a habitat creation or enhancement strategy. This could include creating new areas of wetland linked to the main channel of Black Ditch. Within the application site, the area to the west of Brook Lane could provide a suitable area as this is not currently proposed for development. Enhancements could include areas of reedbed planting east of Brook Lane to increase vegetation cover, as this part of the site currently has fewer signs for water vole activity.*

For the remainder of the site, impacts will need to be prevented by implementing a fenced buffer zone at least 5m from the top of the bank of Black Ditch. Within the buffer zone, construction activities and access by site personnel and machinery should be prohibited and enforced through appropriate fencing and signage."

- 4.41 For the majority of the length of the ditch, the construction zone will be located more than 10m from the top of the bank. Therefore, significant indirect impacts are not predicted so long as at least a 5m buffer from the top of the bank is maintained. However, pollution from site run-off is a possibility. To ensure this does not happen, standard site procedures as recommended by the Environment Agency should be adopted to ensure that no contaminants or effluent, such as oil, fuel or chemical spills, are released into the Black Ditch.
- 4.42 It is recommended that additional habitat be created for the water voles in the form of a pond or wet ditch on site. This would help to mitigate against any potential habitat loss related to roadworks but also provides additional habitat for a species which is the fastest declining mammal in the UK and is vulnerable to extinction. Indeed, one of their biggest threats is habitat loss and fragmentation from unsympathetic riverside management. This additional habitat should be linked with the existing brook to provide connectivity to the wider landscape.
- 4.43 The banks should be stable and stepped with good vegetation cover and should use substrate that voles can easily dig into (Figure 8). There should be some depth to the water immediately in front of the bank to allow the voles to escape quickly. The watercourse should contain water at all times of the year.

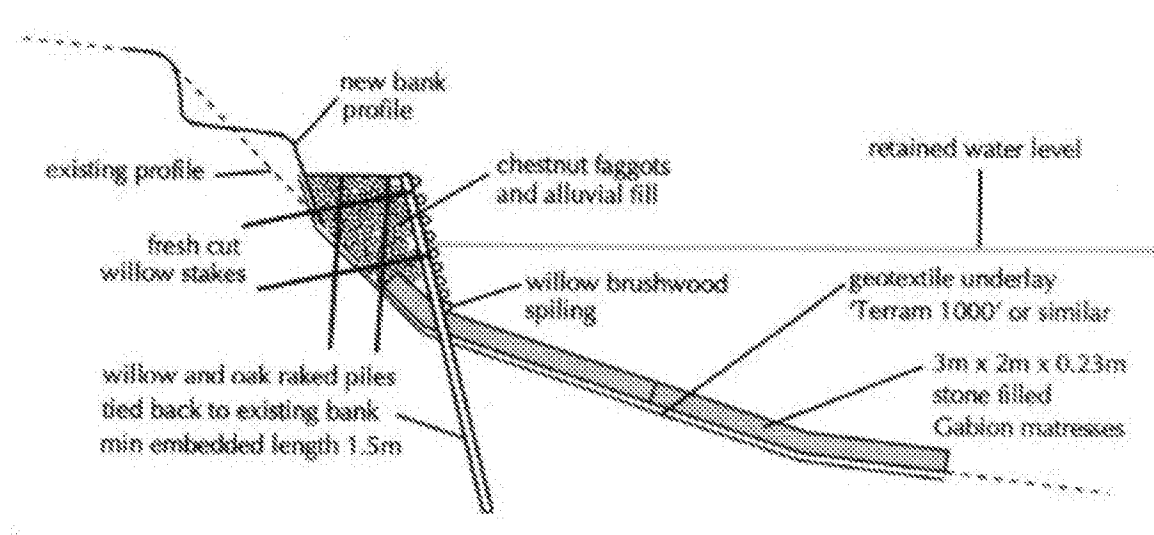


Figure 8: Example of water vole bank design (Strachan 1998)

4.44 The water's edge should be planted with tall wetland plants of local provenance, which are used for foraging and protection from predators. Reedbed planting should also take place along the Black Ditch running east of the site as this area had signs of water vole activity in 2015. Species should include:

- Sedges (*Carex sp.*) e.g. Greater tussock sedge (*Carex paniculata*)
- Branched bur-reed (*Sparganium erectum*)
- Reed sweet-grass (*Glyceria maxima*)
- Reed-canary grass (*Phalaris arundinacea*)
- Yellow flag iris (*Iris pseudacorus*)
- Meadowsweet (*Filipendula ulmaria*)
- Willowherb (*Epilobium sp.*)
- Soft rush (*Juncus effusus*)

4.45 Current plans for the site close to the brook include the creation of a new balancing pond in the southeast corner of the site, which was not accessible on the day of the survey. The creation of this pond should follow guidelines outlined above and it should be connected to the ditch to allow water voles access to the pond. The current plans also include a new ditch being created at a 90° angle from Black Ditch which would run through the centre of the field adjacent to it. This would increase the habitat available for water voles so long as the guidelines outlined above are followed. However, as this would involve losing some of the existing bank and therefore some habitat loss, this will need to follow a similar mitigation strategy as that outlined for works to the bridge and road.

4.46 Once the development plans have been finalised, further water vole surveys or mitigation measures may be required.

Other Species

4.47 Birds are likely to use the trees and hedgerows on site and along the boundaries for foraging and breeding. It is recommended that trees and hedgerows be retained where possible or replaced. Any scrub or tree removal should be implemented outside the breeding bird season (March-September) or immediately after a nesting bird check by a

suitably qualified ecologist. If active nests are identified, works in the vicinity of the nest must cease until the birds have fledged the nest.

- 4.48 A swallow nest was found in the stable building in the central field, although it did not appear to be in use during the 2016 survey. It is recommended that this building be demolished outside of the breeding bird season.
- 4.49 Rabbit warrens were found at the edge of the horse paddock adjacent to the railway line. It is likely that there may be more in the dense vegetation at the edge of the central field especially since there are numerous patches of short grass in this area. It is recommended that any mammal burrows found on site be cleared sensitively and excavated by hand. This is to ensure that any mammals that may be using this area are not harmed as it is an offence under the Mammals Protection Act 1996 to crush or cause asphyxiation to mammals.
- 4.50 The habitats on site and immediately adjacent to site were not considered suitable for otter and no evidence of otters was found along the brook in 2015. The development is not considered to be constrained by otters.
- 4.51 Stag beetles have been recorded within 600m of the site. Small piles of dead wood on site may provide opportunities for the species to forage and reside within as well as lay their eggs. It is always recommended that areas of existing deadwood and the surrounding soil are left undisturbed if possible, as larvae can be found in the soil also.
- 4.52 Where removal of existing deadwood is necessary, it is recommended that this be carefully removed by hand and placed within areas of adjacent woodland off site or edge habitats on site. It is further recommended that ground works in the vicinity of deadwood and log piles be carried out under ecological watching brief with any identified stag beetle larvae relocated to off-site woodland or a suitable receptor site. In addition to this, the practice of stump grinding should be avoided where possible.

- 4.53 Furthermore, existing deadwood should be supplemented with log piles or loggeries that allowed to rot naturally providing additional habitat suitable for egg laying (Figure 9).

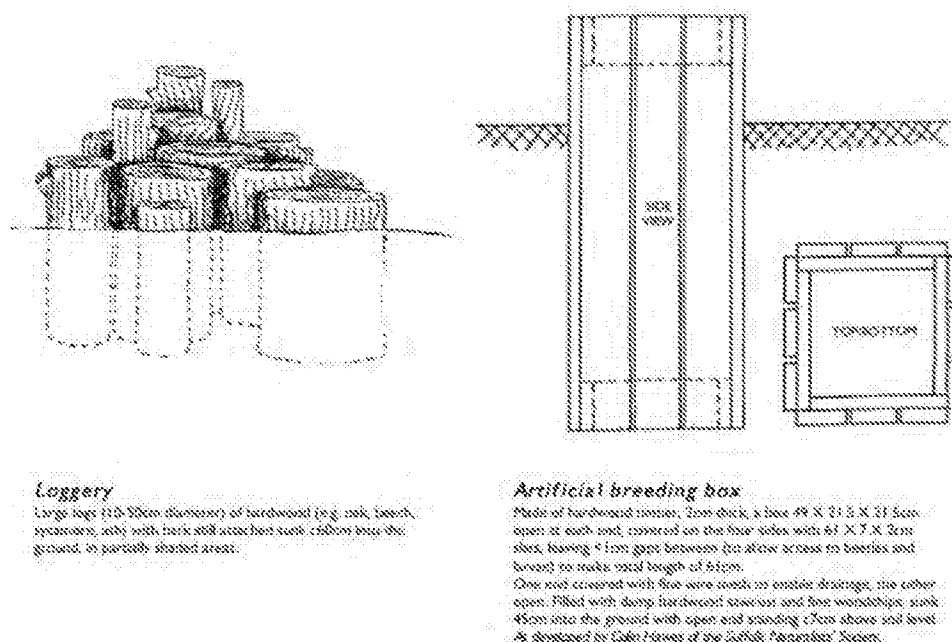


Figure 9: Loggeries and artificial breeding boxes for stag beetles

General Site Enhancements

- 4.54 Any trees removed on site need to be replaced elsewhere with an equivalent number in line with local planning policy (Gen28). These should be replaced with native species of value to wildlife and can include oak (*Quercus sp.*), ash (*Fraxinus excelsior*), hazel (*Corylus avellana*), beech (*Fagus sylvatica*), cherry (*Prunus sp.*), hornbeam (*Carpinus betulus*) and rowan (*Sorbus aucuparia*). It is also recommended that additional tree planting be carried out along the boundaries of the site, particularly between the railway line and A259. Not only will this improve the aesthetics of the site but will help to provide green corridors. Fruit trees can also be incorporated into the scheme with species such as apples, pears, gages and damsons. Fallen fruit provides good foraging opportunities for a range of species, including birds, badgers and hedgehogs.

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- 4.55 The hedgerows on site should also be enhanced or replaced if they are to be removed. Hedgerows can also be incorporated into garden boundaries to help delineate the gardens from each other and the street. They help to provide a layering of different habitats that can be utilised by a wide variety of species. Species that can be planted include blackthorn (*Prunus spinosa*), hawthorn (*Crataegus monogyna*), hazel (*Corylus avellana*), holly (*Ilex aquifolium*), elder (*Sambucus nigra*), alder buckthorn (*Frangula alnus*), guelder rose (*Viburnum opulus*), dog rose (*Rosa canina*), dogwood (*Cornus sanguinea*), yew (*Taxus baccata*) and privet (*Ligustrum vulgare*).
- 4.56 Newly formed areas of amenity grassland, boundaries and vacant spaces post-development could be supplemented by integrating a variety of native plant species. Patches of bare soil can be sown with wildflower seed mixes to increase the biodiversity of the site and also offer aspects of aesthetic appeal. Some of the open areas on site could also be left to form wildflower meadows through an appropriate management scheme.
- 4.57 Shrub and herb planting can also be carried out in gardens to provide understorey vegetation and a layering of habitats. Species which are recommended include those which produce flowers and berries such as box (e.g dwarf sweet box *Sarcococca hookeriana*), bilberry (*Vaccinium myrtillus*), various hebes and cotoneaster species. Herbs should include species which provide nectar opportunities for invertebrates such as lavender, jasmine, chamomile, fennel, oregano, evening primrose, thyme, mint and heather.
- 4.58 Log and rubble piles can be built to provide hibernacula and refuge habitats for potential species such as amphibians, reptiles, small mammals and invertebrates. These should be incorporated into the boundaries of open areas and within the tree lines along the north and south of the site.
- 4.59 Additional habitats may be provided for species including birds and insects in the form of green walls. Green walls can be created by planting climbing plants in the ground and training these either directly onto external walls/fences or on to trellis. Alternatively, it is possible to create an instant green wall using established climbing plants rooted in

containers and grown onto frames. Insect boxes can then be incorporated into the green walls. Species could include:

- Honeysuckle (*Lonicera japonica*, *L. fragrantissima*, *L. standishii*)
- Clematis sp. (*Clematis vitalba*, *C. armandii*, *C. alpina*, *C. montana*, *C. tangutica*)
- Ivy (*Hedera helix*)
- Climbing hydrangea (*Hydrangea petiolaris*)
- Dog rose (*Rosa canina*)

4.60 A wildlife corridor has been proposed along the southern boundary of the site in the current plans. This can be created through tree planting as recommended above but should also include native understorey vegetation to provide a robust edge habitat which will provide new and enhanced opportunities for a range of native species such as birds and bats. Log piles, bird and bat boxes can also be incorporated into this corridor.

4.61 Nest boxes should be installed in order to provide new nesting opportunities for birds and to achieve ecological enhancements in line with policies set out by Arun District Council. These can be hung on the buildings or surrounding mature trees post development. Recommended boxes include:

- Schwegler Swallow Nest 10 – A specially designed nest box system to attract swallows and house martins
- Schwegler 1N Deep Nest Box – give added nest protection from predators
- Schwegler 1B Bird Box – general purpose bird box, suitable for many species
- Schwegler Bird House – This is suitable for all common garden birds and may be attached to a building or wall so is suitable for siting behind climbing plant.

5.0 Conclusions

5.1 The site does not lie within or adjacent to any statutory or non-statutory designated sites. It is considered unlikely that the development will cause adverse effects to these areas or the surrounding landscape.

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- 5.2 The majority of the habitats on site are common and widespread throughout the local area and the UK as a whole. The site is dominated by semi-improved grassland, treelines and hedgerows.
- 5.3 Of the five buildings now present on site, three were considered to be unsuitable for roosting bats and the buildings under the ownership of the client can be demolished without further consideration for bats. The house and garage, however, were considered to have low roosting bat potential and one dusk emergence/dawn re-entry survey is recommended as a precautionary approach.
- 5.4 Two mature trees found on site (walnut and oak) were considered to have low suitability for roosting bats as they had the potential to support features associated with roosting bats not visible from the ground. These should be retained within the scheme. Bats are also likely to use the treelines and hedgerows on site for foraging and commuting; therefore, bat activity and automated surveys are recommended.
- 5.5 No evidence of badgers was found on site at the time of the survey. Badgers may use the site for foraging and so should be considered during construction works. A badger update survey is recommended before works begin and once dense vegetation has been cleared.
- 5.6 There were sections of long grass identified in the central grassland and in the fields either side of the road which were considered optimal habitat for reptiles in 2016. A presence/likely absence reptile survey is recommended between April to September in these areas.
- 5.7 Water voles are known to use the brook immediately adjacent to the eastern boundary of the site. Further surveys or mitigation work may be required once the development plans have been finalised, particularly with regards to the access road and bridge. It is recommended that 5-10m buffer zone be maintained between the development and the brook and that additional habitat for water voles be created on site.

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- 5.8 The site is not considered to be constrained by dormice, great crested newts or any other protected species such as otters. It is considered that no further survey work for these species is required.
- 5.9 Nesting birds may use the trees on site and a swallow nest was found in the stables in the central field. It is recommended that clearance work on site be undertaken outside of the breeding bird season (March-September inclusive) or immediately after a nesting bird check by a suitably qualified ecologist.
- 5.10 Rabbit warrens were found along the edges of the horse paddock and the southern boundary of the central field. Any mammal burrows should be excavated by hand to prevent any harm under the Mammals Protection Act 1996.
- 5.11 Stag beetles have been recorded close to site and deadwood is present on site in small quantities. It is recommended that deadwood be kept in situ where possible or moved by hand under ecological watching brief and placed in edge habitats or in the offsite woodland. Deadwood piles may be supplemented to provide additional habitat.
- 5.12 Recommendations for enhancements have been made within this report, aimed at improving the ecological value of the site post-development.

6.0 References

Arnott, D.A. (2001) *Water Vole Mitigation Techniques*. English Nature, Peterborough.

Bat Conservation Trust (2016). *Bat Surveys – Good Practice Guidelines*. Bat Conservation Trust, London.

Hundt, L. (2012) *Bat Surveys: Good Practice Guidelines*, 2nd edition, Bat Conservation Trust. London

Mitchell-Jones, A.J. (2004) *Bat Mitigation Guidelines*. English Nature, Peterborough.

Natural England (2011) *Badgers and Development: A guide to best practice and licensing*. Natural England, Bristol

Neal, E. & Cheeseman, C. (1996) *Badgers*. T & A D Poyser Ltd. London.

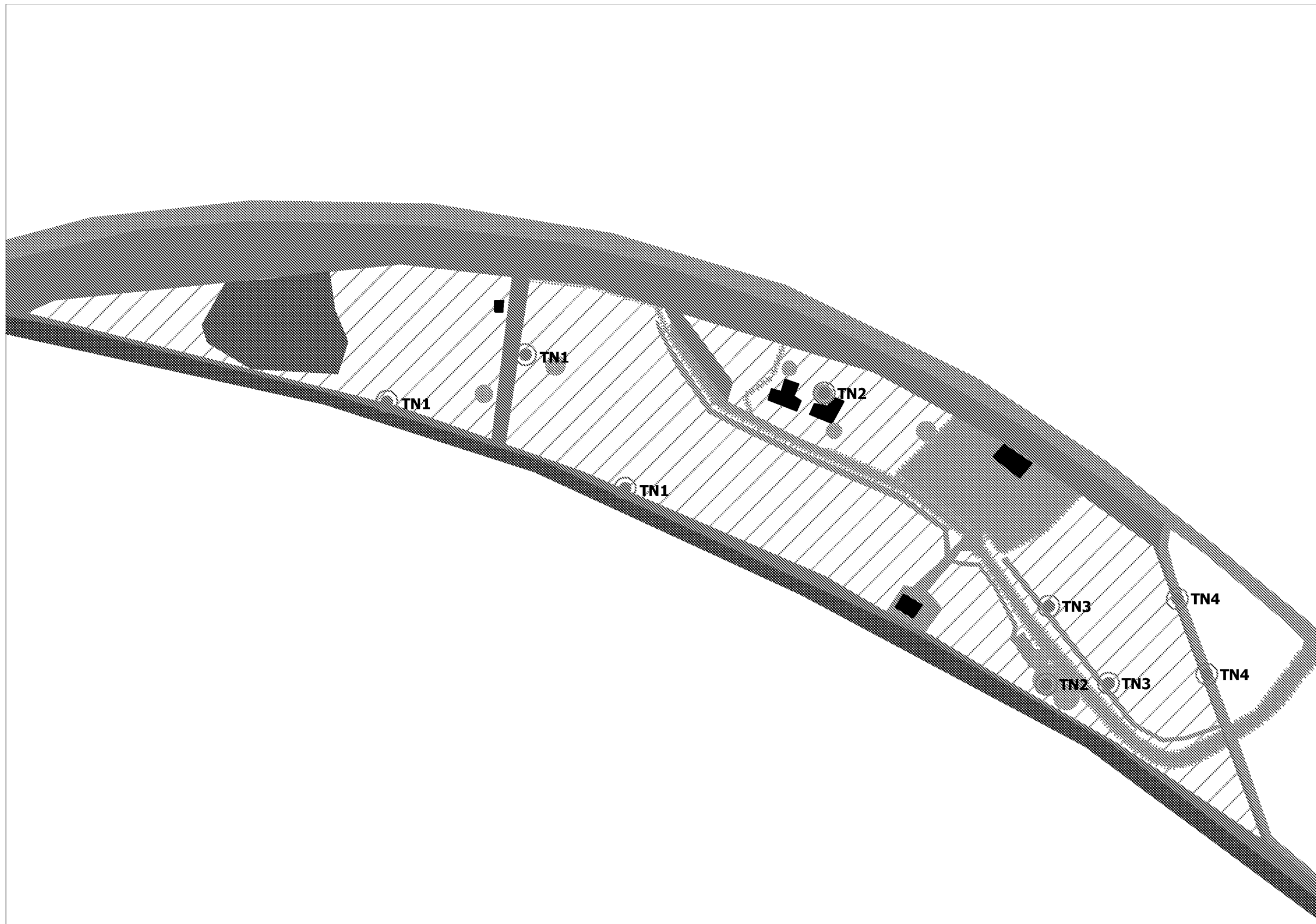
Strachan, C. (1998) *Water vole conservation handbook*. English Nature, Environment Agency and Wildlife Conservation Research Unit, Oxford.

Internet resources:

Google Maps: www.google.co.uk/maps

Magic Interactive Map: www.magic.gov.uk

Appendix 1: Phase 1 Habitat Map



Key

- Tree line
- Scattered trees
- Hedgerow
- Semi-improved grassland
- Brook
- Flooded field
- Buildings
- Hardstanding
- Ditch
- TN1 Target note 1: Mammal hole
- TN2 Target note 2: Low bat potential tree
- TN3 Target note 3: Mammal path
- TN4 Target note 4: Water vole droppings
- Survey boundary

Site: Land west of Brook Lane
Client: Store Property
Surveyors: N. Kay, E. Bagguley
Survey Date: 17th February 2017
Drawing Title: Habitat Map

the
 ecology
 partnership

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Appendix 2: Photos

Photograph 1:
The front of the house with flush tiles and slipped weatherboarding.



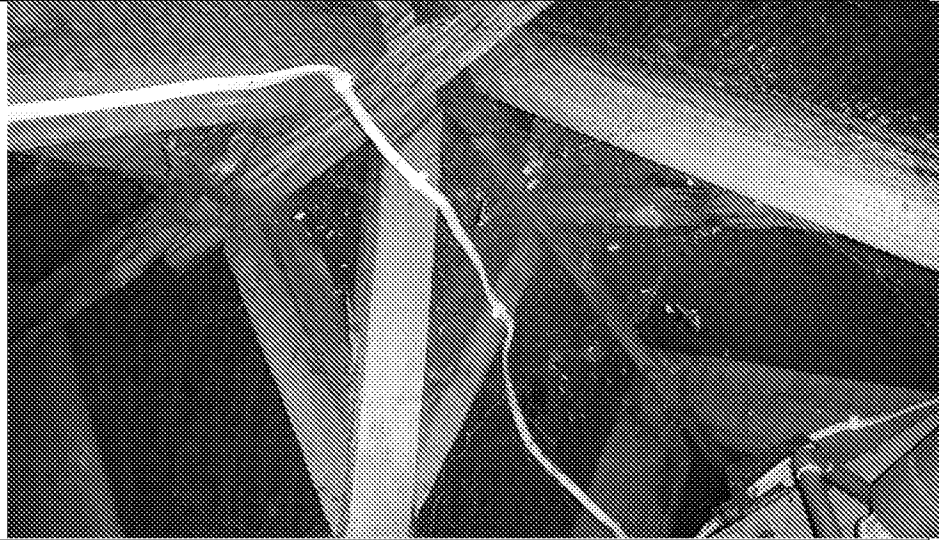
Photograph 2:
The back of the house with flush tiles but slightly warped weatherboarding.



Photograph 3:
The back of the house again with flush tiles but some warped weatherboarding.



Photograph 4:
Dense cobwebs
throughout the
void of the house.



Photograph 5:
The small void
filled with
insulation and
dense cobwebs.



Photograph 6:
Another section
of the roof void
with no evidence
of bats.



Photograph 7:

Rat footprints visible in the dust in the roof void.

**Photograph 8:**

The garage with flush tiles and large areas of moss growing over the tiles.

**Photograph 9:**

The front of the garage with slightly warped weatherboarding – low roosting bat suitability.



Photograph 10:
The inside of the
roof which is well
sealed and full of
cobwebs.



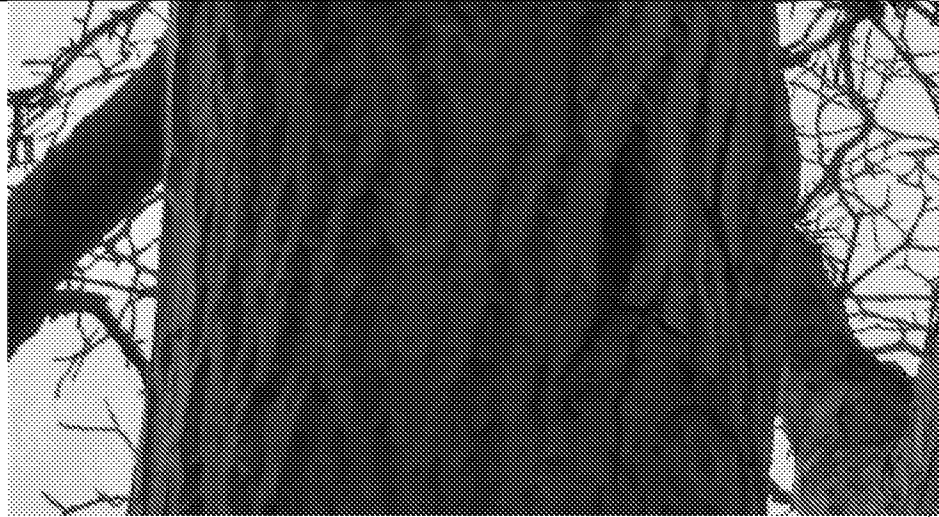
Photograph 11:
The back of the
garage with clear
plastic sheeting
on the roof letting
lots of light
inside.



Photograph 12:
The garden of the
house with short
semi-improved
grassland.



Photograph 13:
The crack in the trunk of the walnut tree in the back garden of the house – low roosting bat potential.



Photograph 14:
The access onto site from the A259.



Photograph 15:
The access route onto site running past the railway line in the eastern part of the site.



Photograph 16:
The area of semi-improved grassland and ruderal vegetation in the southeast corner of the site which could not be accessed due to the barbed wire fencing.



Photograph 17:
The northeast field adjacent to the brook.



Photograph 18:
The northeast field as seen from beside the brook looking towards to access road.



Photograph 19:

The dense vegetation growing in the brook which runs along the eastern boundary of the site.

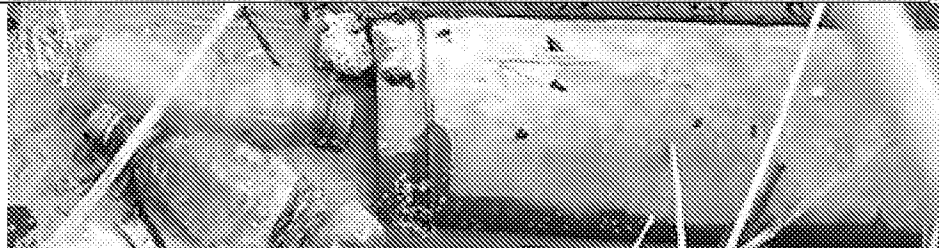
**Photograph 20:** A log in the brook with a well-used water vole latrine.**Photograph 21:** A piece of rubbish in the brook with two large water vole latrines and a small feeding station.

Photograph 22:

Another piece of rubbish with a large water vole latrine close to the previous latrines.

**Photograph 23:**

Another piece of rubbish with a small number of water vole droppings.

**Photograph 24:**

The access road and mature oaks at the eastern end of the central field.



Photograph 25:

The large oaks next to the eastern end of the central field, one of which had been recently felled. The largest oak was considered to have low roosting bat potential.

**Photograph 26:**

The area of hardstanding in the eastern corner of the central field.

**Photograph 27:**

The central field as seen from the eastern corner looking towards the southern boundary.



Photograph 28:

The central field as seen from the western end of the field. Large area of semi-improved grassland regularly grazed by rabbits but the edges grow tall in the spring and summer.

**Photograph 29:**

The central field as seen from the centre of the field close to the stable block. In the background is the tree line separating this field from the horse paddock in the western corner of the site.

**Photograph 30:**

The southern boundary of the site which was overgrown during the previous survey in 2016.

