



Wisloe Green, Gossington, Gloucestershire.

## Ecological Appraisal



September 2019

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Every endeavour has been made to identify the presence of protected species on site, where this falls within the agreed scope of works.

The flora and fauna detailed within this report are those noted during the field survey and from anecdotal evidence. It should not be viewed as a complete list of flora and fauna species that may frequent or exist on site at other times of the year.

Up to date standard methodologies have been used, which are accepted by Natural England and other statutory conservation bodies. No responsibility will be accepted where these methodologies fail to identify all species on-site.

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# 1.0 Introduction

## Background

- 1.1 In August 2019, All Ecology Ltd was commissioned to undertake an Ecological Appraisal of a site known as Wisloe Green, Gossington, Gloucestershire. The site is approximately 80 ha in size and consists of a number of arable and grassland fields with some areas of hard standing, woodland and buildings. The fields are connected and bound by a number of hedgerows, some with trees; ditches and running water are also present and a small part of the site meets the River Cam. The site is situated alongside the M5 and railway line to the north of Cam, and east round to the south of Slimbridge. The general landscape is one of intensive agriculture, solar farms and small to medium size settlements. The nearest extensive areas of woodland are along the Cotswold escarpment approximately 4 km to the east; the Severn Estuary is almost 4 km to the northwest.
- 1.2 The site is the subject of a scoping survey to determine the feasibility of a new settlement consisting of up to 1500 houses and 5 ha of commercial land.

## Objectives and Aim

- 1.3 The main objectives and aim of the survey were to identify features of ecological interest, undertake a basic search of habitats present for evidence of use, or potential use, by protected species as well as more general wildlife, and to identify possible ecological constraints to the proposed development, the need for specialist surveys, and potential opportunities for enhancement.

## Site Location

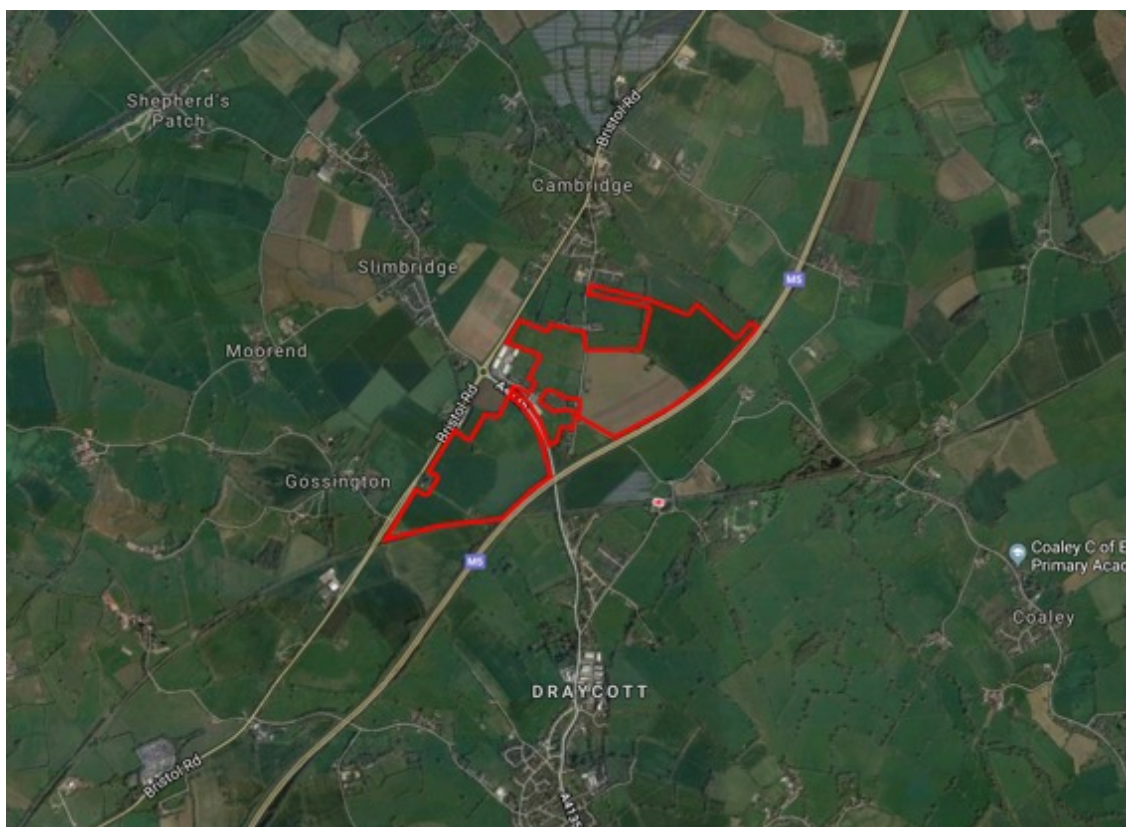


Figure 1: Site location plan.

## 2.0 Methodology

### Personnel

- 2.1 The survey was carried out by Laura Cuming BSc Hons Grad CIEEM, an ecologist with over four years' experience working as a consultant who holds a Class 2 Bat Licence (all species, all counties, Class Licence Registration No. 2017-32855-CLS-CLS) and James Godbeer BSc Hons MCIEEM, an ecologist with over 12 years' experience working as a consultant. James has extensive experience of managing environmental contracts, and particular experience in surveying, assessment and mitigation for rare and protected species. He has considerable knowledge of the development and planning process including Ecological Impact Assessments, sustainable ecological design and he has completed ecology chapters of Environmental Statements. James holds a number of protected species licences including bats (all species, all counties, Class Licence Registration No. 2015-12313-CLS-CLS), and Great Crested Newts (Class Licence Registration No. 2016-20363-CLS-CLS). He has successfully obtained European Protected Species mitigation licences for a number of bat species including Lesser Horseshoe, Greater Horseshoe, Serotine, Brown Long-eared, Common Pipistrelle and Natterer's bats, for a number of roost types including maternity and hibernation sites.

### Desk Study

- 2.2 In order to compile background information on the site and immediate surroundings, Gloucestershire Centre for Environmental Records (GCER) was contacted.
- 2.3 Information requested was as follows:
- Non-statutory site designations on or within 2 km of the site.
  - Statutory designated sites on or within 2 km of the site.
  - Records of protected species within the 2 km of the site from 2000 onwards.
  - Records of rare or notable species within the 2 km of the site from 2000 onwards.
- 2.4 Additionally, MAGIC (Multi-Agency Geographic Information for the Countryside, 2019) was used to establish the distance and direction of designated sites and species records within the search area.

### Habitat Survey

- 2.5 The site was visited on the 28<sup>th</sup> – 30<sup>th</sup> August 2019 and surveyed in accordance with the Joint Nature Conservation Committee (JNCC) Phase I Habitat Survey methodology (JNCC, 2010). This technique provides an inventory of the basic habitat types present and allows identification of areas of greater potential that might warrant further study.

### Fauna

- 2.6 The habitats present on the site were searched for signs of animal activity. The trees were assessed for their potential to support bat roosts by visually inspecting them from the ground using binoculars and high-powered torches where appropriate. Potential features such as holes, cavities or splits were recorded and then inspected where possible for signs of bats, which including grease/urine stains, scratch marks, droppings or the bats themselves.

- 2.7 The site and surroundings, for a minimum distance of 30 m where access was available, were searched for signs of Badgers. These include setts, latrines, dung pits, snuffle marks or hairs caught in hedges or on fencing.
- 2.8 A casual search for evidence of Dormice such as nests and/or gnawed nuts was also carried out.
- 2.9 Incidental observations of invertebrates and birds were recorded and a search made for any signs of current or previous nesting.
- 2.10 Any refugia on site such as logs or other debris were lifted and inspected for reptiles and amphibians. There were a number of ponds on site and within 500 m of the site that were subject to the Great Crested Newt Habitat Suitability Index (HSI) Assessment to determine their suitability for this species.

## Equipment

- 2.11 Equipment used to aid the survey included a high-powered torch, binoculars and a camera.

## Valuation of Ecological Features

- 2.12 The valuation process used in this report follows the Guidelines for Ecological Impact Assessment in the UK and Ireland from the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018).
- 2.13 The value of areas of habitat and plant communities has been measured against published criteria where available. Biodiversity Action Plans (BAPs) have been searched to identify whether action has been taken to protect all areas of a particular habitat and to identify current factors causing loss and decline of particular habitats. The presence of injurious and legally controlled weeds has also been taken into account.
- 2.14 When assigning a level of value to a species, its distribution and status (including a consideration of trends based on available historic records) has been taken into account. Other factors influencing the value of a species are: legal protection, rarity and Species Action Plans (SAPs). Guidance, where it is available, for the identification of populations of sufficient size for them to be considered of national or international importance has also been taken into account.

## Nomenclature

- 2.15 The English name only of flora and fauna species is given in the main text of this report; however, scientific names are used for invertebrates where no English name is available. Vascular plants and charophytes follow the nomenclature of The Botanical Society for the British Isles (BSBI) 2007 database (BSBI, 2007) with all other flora and fauna following the Nameserver facility of the National Biodiversity Network Species Dictionary (<http://www.nhm.ac.uk/nbn/>), which is managed by the Natural History Museum.

## Limitations

- 2.16 A number of ponds within 500 m of the site could not be accessed to carry out the Great Crested HSI Assessment. With the exception of a small number of buildings, the site was otherwise fully accessible for the survey.



## 3.0 Desk Study Results

- 3.1 There are no statutory designated sites within 2 km of the site.
- 3.2 The site falls within 7.7 km of the Severn European Marine Site (EMS) and is therefore within the zone where Stroud District Council's 2016 Visitor Survey concluded that any new residential development is likely to contribute to a significant effect on the EMS.
- 3.3 The site is also approximately 5.1 km west of Woodchester Park SSSI for which bats are a primary or significant factor in its selection as a SSSI. These habitats are exploited by a nationally important breeding colony of Greater Horseshoe bats centred on the mansion near the western end of the site. A breeding colony of Lesser Horseshoe bats is also present. The site falls 300 m outside of the impact risk zone of the SSSI but may be utilised by bats moving between their summer and winter roosts east of the site and in the Forest of Dean.
- 3.4 There are 11 non-statutory designated sites within 2 km of the site. The majority of these are Unconfirmed Sites (U) which have potential Local Wildlife Site (LWS) quality and toad patrol locations:
- Cambridge Old Canal LWS (667 m N)
  - Gossington Hall U (252 m W)
  - Cam (Co-op field) U (1632 m S)
  - George Inn Fields Cambridge U (522 m N)
  - River Cam (part of unite 5) U (677 m N)
  - Wickster Brook Meadow U (1727 m NW)
  - Wicksters' Brook, Capehall Farm U (1605 m N)
  - Coaley – Coaley Mill U (519 m E)
  - Cam – Woodend Lane U (924 m S)
  - Cam – Field Lane U (1196 m S)
  - Peter's Street, Frocester Conservation Road Verge (CRV) (1786 m NE)
- 3.5 Cambridge Old Canal LWS is designated for its watercourse and Water Vole population. Gossington Hall U is designated for its orchard site. Cam (Co-op field) U and George Inn Field Cambridge U are designated for their semi-improved grazed meadows. River Cam (part of unit 5) U is designated for its water course and Wickster's Brook, Capehall Farm U is designated for its Water Vole population. Wickster Brook Meadow U is designated for neutral and marshy meadows. Coaley – Coaley Mill U, Cam – Woodend Lane U and Cam – Field Lane U are all designated for their toad patrol locations and breeding ponds.
- 3.6 GCER provided the following records for protected and notable species within 1 km of the site boundary:
- **Mammals** – Unidentified bats, Common Pipistrelle, long-eared sp., *Myotis* sp., Noctule, Pipistrelle, Soprano Pipistrelle, Badger, Otter, Water Vole, Polecat, Hedgehog.

- **Birds** – Barn Owl, Black-headed Gull, Brambling, Bullfinch, Cetti's Warbler, Common Gull, Common Sandpiper, Crane, Cuckoo, Curlew, Dipper, Dunnock, Fieldfare, Gadwall, Green Sandpiper, Grey Wagtail, Greylag Goose, Herring Gull, Hobby, House Martin, House Sparrow, Kestrel, Kingfisher, Lapwing, Lesser Black-backed Gull, Lesser Redpoll, Lesser Spotted Woodpecker, Linnets, Mallard, Meadow Pipit, Mediterranean Gull, Mistle Thrush, Mute Swan, Nightjar, Peregrine, Pied Flycatcher, Red Kite, Redwing, Reed Bunting, Shelduck, Skylark, Snipe, Song Thrush, Spotted Flycatcher, Starling, Stock Dove, Swift, Tawny Owl, Teal, Tree Pipit, Whimbrel, White-fronted Goose, Willow Warbler, Woodcock, Yellow Wagtail, Yellowhammer.
- **Reptiles** – Slow-worm, Grass Snake.
- **Amphibians** – Great Crested Newt, Palmate Newt, Smooth Newt, Common Frog, Common Toad.
- **Fish** – European Eel, Brown Trout.
- **Invertebrates** – Lepidoptera: Beaded Chestnut, Blood-vein, Buff Ermine, Cinnabar, Dark-barred Twin-spot Carpet, Dot Moth, Double Dart, Figure of Eight, Ghost Moth, Grass Rivulet, Green-brindled Crescent, Knot Grass, Large Wainscot, Mottled Rustic, Powdered Quaker, Rosy Minor, Rustic, September Thorn, Shaded Broad-bar, Small Emerald, Small Phoenix, Small Square-spot, Spindle Knot-horn, Sprawler, White Ermine.

## 4.0 Habitat Survey Results

4.1 The site comprised 10 fields.



Figure 2: Field locations.

Field A



Figure 3: Field A aerial view.

4.2 Field A contained:

- Arable

- Improved grassland
- Tall ruderal
- Broad-leaved plantation woodland
- Dense scrub
- Species-poor hedge and trees
- Species-poor hedge
- Species-rich hedge and trees
- Standard trees
- Fence

#### Arable

- 4.3 The field consisted of a Sweetcorn/Maize monoculture which had very narrow grass margins along the edges.



Photograph 1: General view of site showing the arable crop.

#### Improved grassland

- 4.4 The east corner of the field consisted of tall grassland dominated by Couch Grass with abundant Creeping Bent with this area appearing to be disturbed ground. There was frequent False Oat-grass and occasional Common Ragwort, Creeping Thistle, Hogweed, Bristly Ox-tongue and Meadow Crane's-bill.
- 4.5 The narrow field margins along the south, northeast and northwest of the field were dominated by False Oat-grass with abundant Fescue, occasional Couch Grass, Yorkshire-fog and Cock's-foot. There was abundant Hedge Bindweed, frequent Common Nettle and Bramble, and occasional Cow Parsley, Creeping Thistle, Ribwort Plantain and Common Ragwort.



Photograph 2: East corner of the field where grassland was present.

#### Tall ruderal

- 4.6 A band of tall ruderal habitat surrounded the disturbed area of grassland in the east of the field. This was dominated by Spear-leaved Orache with frequent Common Nettle and Chamomile.



Photograph 3: Tall ruderal area in the east of the field.

#### Broad-leaved plantation woodland

- 4.7 There was a small area of broad-leaved woodland in the west corner of the field. This was dominated by Wild Cherry with frequent Field Maple, Elder and Hawthorn. There was occasional Common Lime and rare occurrences of Ash and Pedunculate Oak. The ground flora was dominated by Common Ivy with abundant Wood Avens and frequent Common Nettle.





Photograph 4: Broad-leaved plantation woodland in the west corner.

#### Dense scrub

- 4.8 Sections of the south boundary were defined by dense scrub that had overgrown the boundary fence. These areas were dominated by Bramble with occasional Elder, Blackthorn and Hawthorn.



Photograph 5: Dense scrub along the south boundary.

#### Species-poor hedge and trees

- 4.9 There were two sections of species-poor hedge and trees along the south boundary. Near the east corner of the field this was dominated by Ash trees with frequent Hawthorn and Bramble (H1). The section along the western half of the boundary was dominated by Hawthorn with abundant Bramble and English Elm, occasional Elder and rare occurrences of Goat Willow (H2).



Photograph 6: Species-poor hedge and trees H1.

#### Species-poor hedge

- 4.10 The northeast and northwest boundaries were defined by species-poor hedge. The northeast hedge was dominated by English Elm with occasional Elder and Blackthorn and rare occurrences of Field Maple (H3). The northwest boundary hedge was dominated by Hawthorn with abundant English Elm and Bramble (H4).



Photograph 7: Species-poor hedge H4.

#### Species-rich hedge and trees

- 4.11 The northeast section of hedge was dominated by Elm with abundant Bramble, Blackthorn, Hawthorn, Elder, occasional Dogwood and Crack Willow and rare occurrences of Ash trees (H5).



Photograph 8: Species-rich hedge and trees H5.

#### Standard trees

- 4.12 There were a small number of standard trees along the boundaries. These consisted of two Ash trees, a Goat Willow and a Pedunculate Oak tree.



Photograph 9: Pedunculate Oak tree.

#### Fence

- 4.13 Timber post and rail fencing defined the south boundary along the stretches of dense scrub and also behind the hedge and trees along the railway line. There were also two gates within the northwest boundary hedge.



Field B



Figure 4: Field B aerial view

4.14 Field B contained:

- Arable
- Improved grassland
- Species-rich hedge and trees
- Species-poor hedge
- Running water

Arable

4.15 The field consisted of a Sweetcorn/Maize monoculture which had a grassland track running along the southwest edge of the field with narrow grass margins along the remaining edges.



Photograph 10: General view of the arable field.

#### Improved grassland

- 4.16 There was a grass track that ran along the southwest of the arable crop which was dominated by Perennial Rye-grass with abundant Common Nettle, Ribwort Plantain, Greater Plantain, Cock's-foot, White Clover and frequent Scentsless Chamomile. There was occasional Bird's-foot Trefoil, Red Clover, Dandelion agg., and Broad-leaved Dock.
- 4.17 The field had narrow margins along the northwest and southeast edges of the field. There was a wider margin in the west corner of the field which was dominated by Cock's-foot with abundant False Oat-grass, frequent Ribwort Plantain and occasional Timothy, Bird's-foot Trefoil, and Broad-leaved Dock. There were rare occurrences of Rough Hawkbit, Hogweed and Great Willowherb.
- 4.18 The grass margin along the northeast boundary was dominated by False Oat-grass with frequent perennial Rye-grass and Fescue sp., with occasional Wall Barley, Horsetail sp., Hogweed, Cow Parsley, and Common Nettle.



Photograph 11: Improved grassland track.

### Species-rich hedge and trees

- 4.19 Species-rich hedge and trees defined the southeast boundary. This was dominated by English Elm with frequent Blackthorn, occasional Elder and Hawthorn and rare occurrences of Crab Apple and Ash (H6).



Photograph 12: Species-rich hedge and trees H6.

### Species-poor hedge and trees

- 4.20 Species-poor hedge and trees were present along the boundary in the west corner of the field, which was a shared boundary of a neighbouring residential property. This was dominated by Leyland Cypress with frequent Hawthorn and rare occurrences of Fig, English Elm, and Walnut (H7).

### Species-poor hedge

- 4.21 The northwest boundary was defined by species-poor hedge half of which was dominated by Hawthorn with occasional English Elm and Hedge Bindweed and the other half dominated by Elm with rare occurrences of Elder (H8). There was also a short section of Leyland Cypress hedge along part of the track at the entrance of the field (H9). The southwest boundary hedge is H3 described above.



Photograph 13: Species-poor hedge H8

## Running water

- 4.22 A small stream ran along the southeast hedge from Field C before passing back into Field C and then back along the northeast boundary of Field B. This then ran along the boundary dividing Field B and Field D.



Photograph 14: Small stream within bank vegetation.

## Field C



Figure 5: Field C aerial view

### 4.23 Field C contained:

- Improved grassland
- Broad-leaved plantation woodland
- Species-rich hedge and trees
- Species-rich hedge
- Species-poor hedge
- Standard tree
- Running water
- Fence
- Dense scrub

### Improved grassland

4.24 The field was grassland with a relatively short sward. The field was dominated by Perennial Rye-grass with frequent Dandelion agg., and rare occurrences of Creeping Buttercup, Germander Speedwell, Common Ragwort, Self-heal, Creeping Thistle and Bristly Ox-tongue. There was also frequent False Oat-grass at the edges of the field. There was also one area of invasive Giant Hogweed along the east boundary of the field.

4.25 There was a small area of tall grassland along the south boundary. This was dominated by False Oat-grass with abundant Creeping Thistle, Common Ragwort and Hogweed.





Photograph 15: General view of Field C.



Photograph 16: Area of taller improved grassland.

#### Broad-leaved plantation woodland

- 4.26 A band of broad-leaved woodland bound the east side of the field, which was planted along the main road. This was dominated by Hawthorn with abundant Elder and Field Maple, frequent Alder and Goat Willow, and occasional Hazel and Blackthorn. This woodland could not be fully accessed to survey the ground flora.



Photograph 17: Broad-leaved plantation woodland along the northeast boundary.

#### Species-rich hedge and trees

- 4.27 Species-rich hedges defined the southwest and most of the northwest boundary which are H5 and H6 described above.



Photograph 18: Species-rich hedge and trees H5.

#### Species-rich hedge

- 4.28 The central hedge section of the northwest boundary was dominated by Blackthorn with frequent Elder, occasional Field Maple and English Elm and rare occurrences of Dog-rose (H10).



Photograph 19: Species-rich hedge H10.

#### Species-poor hedge

- 4.29 The last section of northwest boundary hedge was dominated by English Elm with abundant Blackthorn and frequent Elder and Dog-rose (H11).



Photograph 20: Species-poor hedge H11 looking from Field D.

#### Standard tree

- 4.30 There was one Ash tree set within H10.





Photograph 21: Ash tree within Field C.

#### Running water

4.31 A small stream ran along the southwest hedge which then passed into Field B.



Photograph 22: Small stream along the southwest edge of Field C.

#### Fence and dense scrub

4.32 The south and southeast boundaries were defined by timber post and rail fencing. Dense bramble scrub with abundant Hedge Bindweed was growing over the boundary fencing.



Photograph 23: Fence covered in dense scrub.

## Field D



Figure 6: Field D aerial view.

### 4.33 Field D contained:

- Arable
- Improved grassland
- Broad-leaved plantation woodland
- Species-rich hedge and trees
- Species-rich hedge
- Species-poor hedge
- Defunct hedge
- Dense scrub
- Standard tree
- Dry ditch
- Other habitat

### Arable

4.34 The field had recently been harvested and only stubble remained.



Photograph 24: General view of field.

#### Improved grassland

- 4.35 There was a corner of the field that consisted of improved grassland, with some areas mown short and some taller areas of grass. These areas were dominated by Perennial Rye-grass with abundant White Clover and frequent False Oat-grass, Dandelion agg., Creeping Buttercup with the longer areas of grass also having frequent Creeping Thistle and occasional Hogweed.
- 4.36 There was a grass track running along the northeast of the field which was dominated by Perennial Rye-grass with frequent False Oat-grass and occasional Timothy, and Common Bent. There was also abundant White Clover, occasional Yarrow and rare occurrences of Teasel. There were also narrow margins of grass surrounding the dry ditch which were dominated by False Oat-grass.



Photograph 25: Areas of short and taller improved grassland in the field corner.

#### Broad-leaved plantation woodland

- 4.37 There was a small pocket of broad-leaved plantation woodland, which was dominated by English Elm with abundant Hawthorn and Elder and frequent Wayfaring-tree and Dogwood. There was also occasional Hazel, Field Maple and Wild Cherry.

- 4.38 Along the northeast boundary of the field was the same band of woodland described for Field C. This was dominated by Hawthorn with abundant Field Maple, occasional Blackthorn and Hazel and rare occurrences of apple, Elder and Ash.
- 4.39 There was another small pocket of woodland along the southwest boundary of the field which was dominated by Crack Willow with abundant Elder and frequent Hawthorn.



Photograph 26: Band of woodland.



Photograph 27: Small pocket of woodland along southwest boundary.

#### Species-rich hedge and trees

- 4.40 Species-rich hedge and trees were present along the northwest edge of the site. This was dominated by English Elm with abundant Elder and frequent hawthorn. There was occasional Blackthorn and Sycamore and rare occurrences of Common Lime (H12).





Photograph 28: Species-rich hedge and trees H12.

#### Species-rich hedge

4.41 Species-rich hedge formed part of the southeast boundary, this is H10 described above.

#### Species-poor hedge

4.42 The field had two boundaries defined by species-poor hedge. Part of the southeast boundary is described above as H11. Part of the northeast boundary consisted of a short section of Hawthorn hedge with abundant Hedge Bindweed (H13).



Photograph 29: Species-poor hedge H13.

#### Defunct hedge

4.43 There was a short section of defunct hedge along the southwest boundary which was dominated by Hawthorn with occasional Elder (H14).



Photograph 30: Defunct hedge H14.

#### Dense scrub

- 4.44 There was an area of dense scrub surrounding the small pocket of woodland which was dominated by Bramble with abundant Sycamore and frequent Elder, Blackthorn, English Elm and Hedge Bindweed.



Photograph 31: Dense scrub and standard tree

#### Standard tree

- 4.45 There was an Ash tree amongst the area of dense scrub.

#### Dry ditch

- 4.46 A dry ditch was present along the southeast boundary hedgerows and also along the north woodland pocket edge.



Photograph 32: Dry ditch along southeast boundary.

#### Other habitat

4.47 There was a dried pond within the woodland; it may hold water during wetter periods.



Photograph 33: Dried pond (Pond 1).



## Field E



Figure 7: Field E aerial view.

### 4.48 Field E contained:

- Improved grassland
- Broad-leaved plantation woodland
- Species-rich hedge and trees
- Species-rich hedge
- Species-poor hedge
- Species-poor hedge and trees
- Dense scrub
- Tall ruderal
- Ephemeral/short perennial
- Dry ditch
- Buildings
- Hard standing
- Fence

### Improved grassland

4.49 The majority of this section of site was a horse-grazed grassland field separated into 10 paddocks. The field was locally dominated by Fescue sp., or Perennial Rye-grass with abundant Creeping Buttercup, White Clover, Dandelion agg., and occasional Spear Thistle, Cock's-foot, broad-leaved Dock, Yorkshire-fog, Ribwort Plantain, and rare occurrences of Hogweed, Timothy, Common Flax and Red Clover.

- 4.50 There was a small area of improved tall grass next to the yard which was dominated by Cock's-foot with frequent False Oat-grass and occasional Broad-leaved Dock, Cow Parsley, White Clover and Greater Plantain and rare occurrences of Teasel. There was also a bank of tall grassland adjacent to the riding arena which was dominated by False Oat-grass with frequent Common Nettle and Hogweed.



Photograph 34: General view of the paddocks.

#### Broad-leaved plantation woodland

- 4.51 There was a length of broad-leaved woodland along the southwest boundary of the field which separated the field from the adjacent road. This was dominated by Hawthorn with abundant Blackthorn and frequent English Elm, Ash and Hazel. There was occasional Goat Willow and rare occurrences of Sycamore.
- 4.52 There was a small area of woodland in the northwest corner of the site that was dominated by Sycamore with occasional Wild Cherry and rare occurrences of Common Lime.



Photograph 35: Broad-leaved woodland along the southwest boundary.



Photograph 36: Broad-leaved woodland in the northwest corner.

#### Species-rich hedge and trees

- 4.53 A section of species-rich hedge with trees was present along the southwest boundary which then merged into the woodland. This was dominated by Hawthorn with abundant Bramble and rare occurrences of *Prunus* sp., Elder, Ash and Field Maple (H14).



Photograph 37: Species-rich hedge and trees H14.

#### Species-rich hedge

- 4.54 The majority of the northeast boundary was defined by species-rich hedge. This was dominated by English Elm with abundant Blackthorn and Bramble. There was frequent Hawthorn, occasional Elder and Dogwood and rare occurrences of Dog-rose (H15).



Photograph 38: Species-rich hedge H15.

#### Species-poor hedge

- 4.55 There was a short section of species-poor hedge along the northeast boundary which was dominated by Hawthorn with frequent Wild Privet and Elder (H16).



Photograph 39: Species-poor hedge H16.

#### Species-poor hedge and trees

- 4.56 Species-poor hedge with trees was present in the southeast corner of the site along the boundary. This was dominated by Hawthorn with frequent Elder and rare occurrences of Dog-rose and apple (H17). There was also Hedge Bindweed and Bramble growing through the hedge.





Photograph 40: Species-poor hedge and trees H17.

#### Dense scrub

- 4.57 There were patches of dense Bramble scrub adjacent to the buildings in the north of the site as well as along the northeast and east boundaries.



Photograph 41: Dense scrub along the east boundary.

#### Tall ruderal

- 4.58 There were a number of tall ruderal patches in the north of the site as well as a patch within one of the disused paddocks. The patch in the disused paddock was dominated by Common Nettle with occasional White Goosefoot, Shepherd's Purse and Common Ragwort. The areas in the north were dominated by Hedge Bindweed with abundant Common Nettle, frequent Hogweed and occasional Great Willowherb.



Photograph 42: Area of tall ruderal in the north of the site.

#### Ephemeral/short perennial

- 4.59 Areas of the yard were being colonised by ephemeral/short perennial vegetation which was dominated by Scentless Chamomile with occasional Spear-leaved Orache and White Clover and rare occurrences of Willowherb sp.



Photograph 43: Ephemeral/short perennial vegetation colonising around the buildings.

#### Dry ditch

- 4.60 A dry ditch ran alongside the hedge H16.



Photograph 44: Dry ditch.

### Buildings

4.61 There were seven buildings, which are described in detail further below.



Photograph 45: Typical building.

### Hard standing

4.62 Areas surrounding the building consisted of compacted hardcore and concrete hard standing. The riding arena was sand.



Photograph 46: Hard standing car park/yard.

#### Fence

- 4.63 Timber post and rail fencing defined part of the site boundaries and also surrounded the riding arena. Temporary and permanent fencing also divided the field into paddocks.



Photograph 47: Fencing surrounding the arena and paddocks.



Field F



Figure 8: Field F aerial view

4.64 Field F contained:

- Arable
- Improved grassland
- Tall ruderal
- Dense scrub
- Standard trees
- Species-rich hedge
- Species-rich hedge and trees
- Building
- Fence

Arable

4.65 The field had recently been harvested with only stubble remaining.



Photograph 48: General view of the field.

#### Improved grassland

- 4.66 The field margins were dominated by Cock's-foot with frequent False Oat-grass and Yorkshire-fog. There was occasional Broad-leaved Dock, Greater Plantain, Creeping Thistle, Common Ragwort, Bramble, Creeping Bent, Hedge Bindweed and Hogweed.



Photograph 49: Improved grassland field margin.

#### Tall ruderal

- 4.67 There was an area of tall ruderal habitat in the west of the site surrounding the agricultural barn. This was dominated by Common Nettle with frequent Field Bindweed, Creeping Buttercup, Common Burdock, Scentless Mayweed, Creeping Thistle. There was also occasional Elder, Goosefoot, Greater Plantain, Perennial Rye-grass, Cock's-foot, False Oat-grass and Bramble.
- 4.68 There was also a strip of tall ruderal vegetation separating the field from Field G along the north boundary. This was dominated by Common Nettle with frequent Bramble, False Oat-grass and Field Bindweed.



Photograph 50: Tall ruderal surrounding farm building.

#### Dense scrub

4.69 Dense Bramble scrub covered sections of the southeast boundary fence.



Photograph 51: Dense scrub growing over fence.

#### Standard trees

4.70 There were a number of Silver Birch trees along the north boundary of the field near a residential house with a smaller number of Leyland Cypress and Beech trees also surrounding the house. A Pedunculate Oak tree was present within the north boundary hedge.

4.71 There were also a number of off-site Ash, Oak, Sycamore and Elder trees overhanging the fence along the southeast boundary.



Photograph 52: Standard trees along north boundary.

#### Species-rich hedge

- 4.72 Species-rich hedge defined the southwest, west and part of the north boundaries. The southwest and part of the west boundary were dominated by English Elm with frequent Field Maple and occasional Hawthorn, Ash and Hazel with abundant Ivy growing through (H18). The remainder of the west boundary was dominated by Field Maple with abundant Blackthorn and occasional Ash, Dogwood and Hazel (H19). The north boundary hedge was dominated by Blackthorn with abundant Hazel and occasional Ash, Elder, Field Maple and English Elm (H20).



Photograph 53: Species-rich hedge H18.

#### Species-rich hedge and trees

- 4.73 A section of the north boundary was defined by species-rich hedge and trees which was dominated by Hawthorn with frequent Elm and occasional Elder, Sycamore, Common Lime and Bramble (H21).





Photograph 54: Species-rich hedge and trees (H21).

### Building

4.74 There was a large agricultural barn near the west boundary. This is described in further detail below.



Photograph 55: Agricultural building.

### Fence

4.75 Timber post and rail fencing defined the southeast boundary, which was largely covered with dense Bramble scrub.



Field G



Figure 9: Field G aerial view

4.76 Field G contained:

- Arable
- Improved grassland
- Tall ruderal
- Species-rich hedge and trees
- Species-rich hedge
- Species-poor hedge and trees
- Species-poor hedge
- Semi-natural broad-leaved woodland
- Running water
- Dry ditch
- Dense scrub
- Fence

Arable

4.77 The field had been planted with a winter barley type crop.



Photograph 56: General view of the field.

#### Improved grassland

- 4.78 The field had narrow margins that were dominated by False Oat-grass with abundant Cock's-foot and Common Nettle and occasional Common Comfrey, Perennial Sow-thistle, Common Couch and Creeping Thistle.

#### Tall ruderal

- 4.79 Tall ruderal was present along the field margins, as described above for the southwest boundary and also a patch in the north corner of the site, which was dominated by Common Comfrey with frequent False Oat-grass and Common Hogweed.



Photograph 57: Area of tall ruderal in the northeast corner.

#### Species-rich hedge and trees

- 4.80 Species-rich hedge and trees defined part of the southwest boundary, as described above (H21).

#### Species-rich hedge

- 4.81 Species-rich hedge defined the two short sections of hedge along the northwest boundaries. One of these was dominated by Field Maple, with frequent English Elm and occasional

Blackthorn, Hawthorn, Elder and Dogwood (H22). The other was dominated by Blackthorn with abundant Hawthorn, occasional Hazel and rare occurrences of Field Maple and Elder (H23).



Photograph 58: Species-rich hedge H23.

#### Species-poor hedge and trees

4.82 Species-poor hedge and trees defined the majority of the northeast boundary and the west boundary. The northeast boundary was dominated by Hazel with occasional Hawthorn, Pedunculate Oak and Willow sp. (H24). The west boundary was dominated by Willow sp., trees with frequent Hawthorn and occasional Poplar sp., Field Maple and Elder (H25).



Photograph 59: Species-poor hedge and trees H25.

#### Species-poor hedge

4.83 Two sections of species-poor hedge was present along the north boundary. One section was dominated by Elder with occasional Ash, Field Maple and Dogwood (H26). The other section was dominated by Hawthorn with occasional Field Maple and Elder (H27).

### Semi-natural broad-leaved woodland

- 4.84 A band of semi-natural broad-leaved woodland was present on the far northeast boundary separating the field from the River Cam. The formed mainly by Alder with occasional trees of Willow sp. and Sycamore. The understorey was patches of Bramble with ground flora consisting of Common Nettle, Ground-ivy, Butterbur and Common Comfrey.



Photograph 60: Band of semi-natural broad-leaved woodland.

### Running water

- 4.85 The River Cam ran adjacent to part of the northeast boundary. It was a steep drop down to the shallow, fast-flowing water and the bank was mostly overgrown with Common Nettle and Bramble. Himalayan Balsam was also noted.



Photograph 61: River Cam.

### Dry ditch

- 4.86 Dry ditches were present along the west, north and northeast edges of the field.



## Fence and dense scrub

- 4.87 The southeast boundary was defined by post and rail fencing that was mostly overgrown with Bramble and Hedge Bindweed with overhanging trees from the adjacent motorway corridor.



Photograph 62: Southeast boundary overgrown fence.



## Field H



Figure 10: Field H aerial view.

### 4.88 Field H contained:

- Arable
- Standard trees
- Species-rich hedge
- Species-poor hedge
- Dry ditch

### Arable

### 4.89 The field consisted of a Sweetcorn/Maize crop with narrow margins.



Photograph 63: General view of arable field.

### Standard trees

### 4.90 There were a number of standard trees along the field boundaries which consisted of Ash, frequent Willow sp., and occasional Pedunculate Oak.



Photograph 64: Large Ash on the west boundary.

#### Species-rich hedge

- 4.91 The south and west boundaries were defined by species-rich hedges. The south boundary was dominated by Hawthorn with frequent Field Maple and occasional Ash, Elder, Hazel and Bramble (H28). The west hedge was dominated by Hazel with abundant Hawthorn and occasional Pedunculate Oak, Elder, Willow sp., and Ash (H29).



Photograph 65: Species-rich hedge along the south boundary H28.

#### Species-poor hedge

- 4.92 The north and east hedgerows were species-poor. The north hedgerow was dominated by Blackthorn with occasional Field Maple, Ash and Hazel with Hedge Bindweed and Bramble growing through the hedge (H30). The east hedge was dominated by Hawthorn with occasional Elder and Blackthorn (H31).



Photograph 66: Species-poor hedge along the north boundary.

#### Dry ditch

- 4.93 Two sections of dry ditch were present along the south and east hedgerows. These were overgrown with Common Nettle with frequent False Oat-grass, Common Ragwort, Red Campion. There was occasional Curled Dock, White Dead-nettle, Hedge Bindweed, Butterbur, Burdock, Poa sp., Yorkshire-fog, Cock's-foot, Creeping Buttercup, Common Hogweed, Bittersweet, Traveller's-joy.



Photograph 67: Dry ditch along south hedgerow.

## Field I



Figure 11: Field I aerial view.

### 4.94 Field I contained:

- Improved grassland
- Standard trees
- Species-rich hedge and trees
- Species-rich hedge
- Species-poor hedge
- Fence

### Improved grassland

4.95 The field consisted mostly of grazed grassland with some areas of taller grassland; the field was divided into 13 paddocks.

4.96 The field was mostly dominated by Perennial Rye-grass with abundant Fescue sp., and False Oat-grass, occasional Cock's-foot and rare occurrences of Timothy. There was also abundant Dandelion agg., White Clover and occasional Self-heal, Hogweed. There were rare occurrences of Spear Thistle, Red Clover and Common Ragwort.

4.97 The tall grassland started in the top north paddock and extended down into the two east paddocks. The tall grassland in the north paddock and central east paddock was dominated by False Oat-grass with abundant Timothy, Perennial Rye-grass and Cock's-foot and rare occurrences of Common Ragwort. This extended into the southeast paddock which was dominated by False Oat-grass with abundant Fescue sp., and Cock's-foot. There was frequent Perennial Rye-grass and occasional Timothy and Creeping Bent. There was also abundant Red Clover, frequent Dandelion agg., occasional Creeping Thistle and Broad-leaved Dock and rare occurrences of Creeping Buttercup and Meadow Vetchling.





Photograph 68: General view of paddocks.



Photograph 69: Tall grassland within the north paddock.

#### Standard tree

4.98 There was one Ash tree next to the east boundary.



Photograph 70: Standard Ash tree



### Species-rich hedge and trees

- 4.99 Species-rich hedge and trees defined half of the north boundary, with half of this backing onto off-site woodland. This was dominated by Blackthorn with abundant Hawthorn and frequent Field Maple and English Elm. There was occasional Elder and rare occurrences of Dog-rose (H32).



Photograph 71: Species-rich hedge and trees H32.

### Species-rich hedge

- 4.100 Species-rich hedge defined part of the south boundary vegetation and this was dominated by Hawthorn with abundant Blackthorn and frequent Elder. There was also occasional Dogwood and rare occurrences of Dog-rose (H33).



Photograph 72: Species-rich hedge H33.

### Species-poor hedge

- 4.101 Species-poor hedge defined the remainder of the north and south boundaries and also the west boundary. The remainder of the north boundary was dominated by Hawthorn with abundant English Elm and Bramble and rare occurrences of Elder and Dog-rose (H34). The south boundary hedge was dominated by Hawthorn with abundant Bramble, frequent Elder and rare occurrences of Dog-rose (H35). The west boundary hedge was also dominated by Hawthorn with occasional

Blackthorn and Elder and rare occurrences of English Elm (H36). The east boundary was dominated by Hawthorn with abundant English Elm and rare occurrences of Ash (H37).



Photograph 73: Species-poor hedge (H36)

#### Fence

4.102 Post and wire fencing divided the paddocks within the field.



Photograph 74: Fencing between paddock.

## Field J



Figure 12: Aerial view of Field J.

### 4.103 Field J contained:

- Improved grassland
- Tall ruderal
- Dense scrub
- Standard trees
- Species-rich hedge
- Species-poor hedge
- Dry ditch
- Buildings
- Hard standing
- Fence

### Improved grassland

4.104 The majority of the field consisted of grazed horse paddocks. These were mostly dominated by Perennial Rye-grass with abundant False Oat-grass and Fescue sp., and occasional Cock's-foot, Yorkshire-fog, Timothy, Poa sp., and Common Bent. There was also abundant White Clover, Ribwort Plantain, Dandelion agg., and frequent Common Nettle, Creeping Buttercup and occasional Yarrow, Creeping Thistle and rare occurrences of Shepherd's Purse and Germander Speedwell. The two most easterly paddocks were dominated by False Oat-grass with abundant Fescue sp., and Perennial Rye-grass and occasional Yarrow, Red Clover, Common Nettle, Broad-leaved Dock and Spear Thistle. There were rare occurrences of Bird's-foot Trefoil, Hogweed, Creeping Buttercup and White Champion.



Photograph 75: General view of the paddocks.

#### Tall ruderal

4.105 There was a bank of Common Nettle along the dry ditch and also another patch of Common Nettle within the field.



Photograph 76: Stretch of Common Nettle along the dry ditch.

#### Dense scrub

4.106 There were two areas of dense Bramble in the southeast corner of the field; Aspen saplings were also recorded here.





Photograph 77: Dense scrub in southeast corner of the field.

#### Standard trees

4.107 The field contained one Ash tree, one Sycamore, one Apple tree and a Prunus tree.



Photograph 78: Apple tree at the edge of paddock.

#### Species-rich hedge

4.108 Species-rich hedge defined the northwest boundary and east boundary. The northwest hedge was dominated by Hawthorn with abundant Elder, frequent Blackthorn and rare occurrences of Sycamore and Dog-rose (H38). The east boundary hedge was dominated by Blackthorn with frequent Hawthorn and Ash, occasional Elder and rare occurrences of Field Maple (H39). The north boundary hedge separating the field from Field I was also species rich; this is described above (H33).





Photograph 79: Species-rich hedge (H38).

#### Species-poor hedge

4.109 Species-poor hedge defined sections of the southwest boundary and boundaries around the adjacent residential houses. One section of the southwest boundary was dominated by Hawthorn with occasional Blackthorn, Sycamore and Bramble (H40). The other section was dominated by Blackthorn with frequent Field Maple and Hawthorn and occasional Dog-rose (H41). One section of the residential hedges was dominated by Hawthorn with occasional Elder and rare occurrences of Guelder-rose (H42). The other residential hedge consisted of Wild Privet and Common Ivy (H43).



Photograph 80: Species-poor hedge (H40)

#### Dry ditch

4.110 A dry ditch ran alongside the north boundary hedge.



Photograph 81: Dry ditch.

### Buildings

4.111 There were two buildings on this part of the site, a barn with lean-to and a smaller outbuilding. These are described in further detail below.



Photograph 82: Barn

### Hard standing

4.112 There was an area of tarmac car parking adjacent to the barn.



Photograph 83: Car park area

## Fence

4.113 Post and wire fencing divided the paddocks within the field.



Photograph 84: Fencing dividing the paddocks.

## 5.0 Fauna Survey Results

### Bats

- 5.1 GCER provided a number of bat records within 2 km of the site:
- Common Pipistrelle, 2002, bat droppings, 780 m W.
  - Unidentified bat, 2007, 1.56 km S.
  - Common Pipistrelle, *Myotis* sp., Soprano Pipistrelle and Long-eared sp., 2014, 345 m SE.
  - Common Pipistrelle, maternity roost and day roost, 2015, 1.35 km S.
  - Noctule and Soprano Pipistrelle, 2015, 1.35 km S.
  - Common Pipistrelle and *Myotis* sp., 2008, 1.19 km S.
  - Soprano Pipistrelle, 2015, 570 m SE.
  - Common Pipistrelle, 2015, 100 m SE.
- 5.2 Nine buildings were found on site. The majority of these were modern steel agricultural barns but there were also more traditional timber and brick barns with tiled roofs. The buildings may provide potential day and night roosting spaces for bats.
- 5.3 There were a number of trees on site either as standard trees or within the hedgerows that provided potential roosting features (PRF's) for bats. These include dense lvy, woodpecker holes, rot holes, flaking bark etc. (Target Notes 1 – 11). Trees in the areas of woodland may also have PRFs for bats..



Photograph 85: PRF in a tree on the boundary of Field G.

- 5.4 The majority of the site is open improved grassland or arable fields, which are generally poor foraging habitats although the grazed areas will be of higher value and the extensive networks of hedges and small areas of woodland provide foraging habitat and may be important for bats commuting to and from roosts, or through the landscape.



## Badgers

- 5.5 GCER provided 13 Badger records within 2 km of the site. Three of these are Badger sett records, two of which are from 2009; these were only supplied with a four-digit grid reference. The third sett record is from 2014 approximately 1.2 km southwest of the site.
- 5.6 The grassland on site provides good foraging habitat for Badgers and the site provides the potential for construction of Badger setts within the woodland areas, areas of dense scrub and boundary hedgerows. A Badger footprint was found along the bank of the stream between Fields B and D (Target Note 12) but no other evidence of Badgers such as setts, dung pits, latrines, or snuffle marks was found on site. It is likely Badgers are mostly absent from site but they will probably be present on occasion.



Photograph 86: Badger footprint

## Otters and Water Voles

- 5.7 GCER provided 47 Otter records and 24 Water Vole records within 2 km of the site, the majority of which are related to the River Cam. The closest Water Vole record is from 2008 approximately 45 m E of Field G. The closest Otter record is a spraint record from 2008 immediately adjacent to Field G.
- 5.8 The River Cam runs along part of the northeast boundary of Field G. This section of river had steep sided banks that were overgrown preventing a detailed inspection. The water channel was narrow and fast flowing and so did not appear to be optimal habitat for Water Voles. However, given the number of records of Water Voles and Otters it can be assumed that they are present either here or in close proximity to the site along this stretch of the river
- 5.9 The narrow stream that ran along Field C and B then along Field D doesn't appear to connect to a major watercourse such as the River Cam so is unlikely to provide connecting habitat for these species. On brief inspection no evidence of these species such as latrines, feeding remains, spraints etc were found but not all of the areas could be inspected due to time constraints of the survey. However, overall it is likely that only the short stretch of the River Cam next to the site provides any potential for these species.



## Dormice

- 5.10 There are no Dormouse records within 2 km of the site. Large areas of woodland are absent from the site and immediate surrounding landscape. However, the network of hedges and small areas of woodland provide habitat for Dormice and while these do not appear to be optimal for this species, networks of hedges alone can support a Dormouse population and their presence cannot be entirely ruled out.

## Other mammals

- 5.11 GCER provided one Polecat record and 14 Hedgehog records within 2 km of the site.
- 5.12 The site provides a range of opportunities for common mammal species within the field margins, hedgerows, dry ditches, scrub, tall ruderal and woodland. The site is likely to be frequented by deer, Rabbits, Hedgehogs and more notable species such as Brown Hare. Rabbit burrows were found within the woodland pocket in Field D (Target Note 13). No Brown Hare forms were found within the areas of taller grassland in Field I or within the other field margins however, this species may be present on site. polecats may also frequent the site to hunt species such as Rabbits. However, any potential for other protected species of mammals is minimal.



Photograph 87: Rabbit hole in woodland

## Birds

- 5.13 GCER provided a number of bird records within 2 km of the site including Fieldfare, Barn Owl, Lapwing and House Sparrow. The site provides a range of habitat types for birds. The site is expected to support a range of farmland and garden bird species. The trees, hedgerows, dense scrub and woodland providing nesting habitat, with these and the remaining habitats on site providing potential foraging opportunities. The potential for ground nesting birds is dependent on the management of the fields in any given year. The fields may also be utilised by overwintering birds and the site is relatively close to the Severn Estuary.
- 5.14 The site provides limited optimal Barn Owl foraging habitat within the small areas of tall grassland of Field I and the margins throughout; however, the site is immediately adjacent to the M5 limiting the suitability of the site for this species.

## Reptiles

- 5.15 GCER provided 19 reptile records which consisted of five Grass Snake records and 14 Slow-worm records. Four out of the five Grass Snake records are associated with the village of Cam with the closest record made in 2001, approximately 1 km east of the site. The majority of the Slow-worm records are also from Cam, with some also from the village of Coaley. The closest Slow-worm record is from 2008 approximately 1.2 km southeast of the site.
- 5.16 The site provides potential reptile habitat along the arable field margins, within the long grassland in Field I, within the tall ruderal and scrub habitats and the hedgerows and woodland also provide areas of cover for reptiles. The site covers a large area and is also adjacent to the M5 motorway which has large banks which usually provide good reptile habitat in the form of tussocky grassland and scrub and also the railway line. Whilst the majority of the site consists of arable crops, which provide poor reptile habitat, at least some reptiles are expected to be present in the areas of more suitable habitat.

## Amphibians

- 5.17 GCER provided nine Common Frog records, 14 Common Toad records, two Palmate Newt records, one Smooth Newt record and six Great Crested Newt records within 2 km of the site. The Great Crested Newt records consisted of:
- 2008, no description provided, 1.8 km SW
  - 2008, no description provided, 1.2 km SW
  - 2016, one juvenile, 750 m NW
  - 2008, no description provided, 380 m S
  - 2015, one adult male in ditch, 870 m NW
  - 2008, no description provided, 1.8 km SE
- 5.18 The site provides potential terrestrial amphibian habitat along the arable field margins, within the tall grassland in Field I, within the tall ruderal and scrub habitats, the hedgerows and woodland, with the dry ditches also providing potential habitat for amphibians. There were three ponds on site but these were all dry on inspection.
- 5.19 With regards to the specially protected Great Crested Newt there were the three dry ponds on site and another 13 ponds within 500 m of the site that were not isolated by major barriers such as the M5. Of these 13 ponds, six were inspected and of these six, three were dry. Therefore, the remaining three ponds were subject to the Great Crested Newt Habitat Suitability Index (HSI) Assessment. In summary, Pond 2 scored 0.58 a rating of 'below average' for this species, Pond 6 scored 0.36 and Pond 14 scored 0.47 ratings of 'poor' for their suitability for this species. Pond 2 scored above the 0.5 threshold at which further surveys are required and further consideration is required. The inaccessible ponds may also be suitable.

Table 1: HSI Calculations

HSI Calculator		Pond 2	Pond 6	Pond 14
SI1 - Location	1	1	1	1
SI2 - Pond area	2	0.06	0.06	0.06

SI3 - Pond drying	3	0.5	0.9	0.1
SI4 - Water quality	4	0.67	0.33	0.33
SI5 - Shade	5	0.85	1	1
SI6 - Fowl	6	1	1	1
SI7 - Fish	7	0.67	0.01	1
SI8 - Ponds	8	0.97	0.91	1
SI9 - Terr'l habitat	9	1	0.33	0.33
SI10 - Macrophytes	10	0.4	0.7	0.8
<b>HSI Score</b>	<b>Score</b>	<b>0.58</b>	<b>0.36</b>	<b>0.47</b>

#### 5.20 Pond 1: Dry on inspection



Photograph 88: Pond 1.

5.21 Pond 2: This was approximately 330 m northwest of the site and approximately 55 m<sup>2</sup> in size. The pond is likely to dry sometimes and it had moderate water quality. The pond may contain fish but no water fowl were present. The pond had partial macrophyte cover and was partially shaded. The pond was located within a hedge as part of a field boundary.



Photograph 89: Pond 2.

#### 5.22 Pond 5: Dry on inspection



Photograph 90: Pond 5.

- 5.23 Pond 6: This was approximately 65 m northwest of the site and approximately 60 m<sup>2</sup> in size. The pond was densely stocked with fish but had no waterfowl. The pond had good macrophyte cover but poor water quality. The pond was partially shaded and located within a garden.



Photograph 91: Pond 6.

- 5.24 Pond 10: Dry on inspection
- 5.25 Pond 11: Dry on inspection
- 5.26 Pond 12: Access not available but appeared to be dry when viewed through the roadside hedge.
- 5.27 Pond 13: Access not available but appeared to be dry when viewed through the roadside hedge.
- 5.28 Pond 14: Pond 14 was approximately 130 m north of the site and approximately 55 m<sup>2</sup> in size. The pond had 100 % macrophyte cover but is likely to dry regularly as it appears to be an attenuation pond for a residential area. The pond was unshaded and had no waterfowl or fish. The pond was surrounded by amenity grassland.





Photograph 92: Pond 14.



Figure 13: Pond location plan (south)



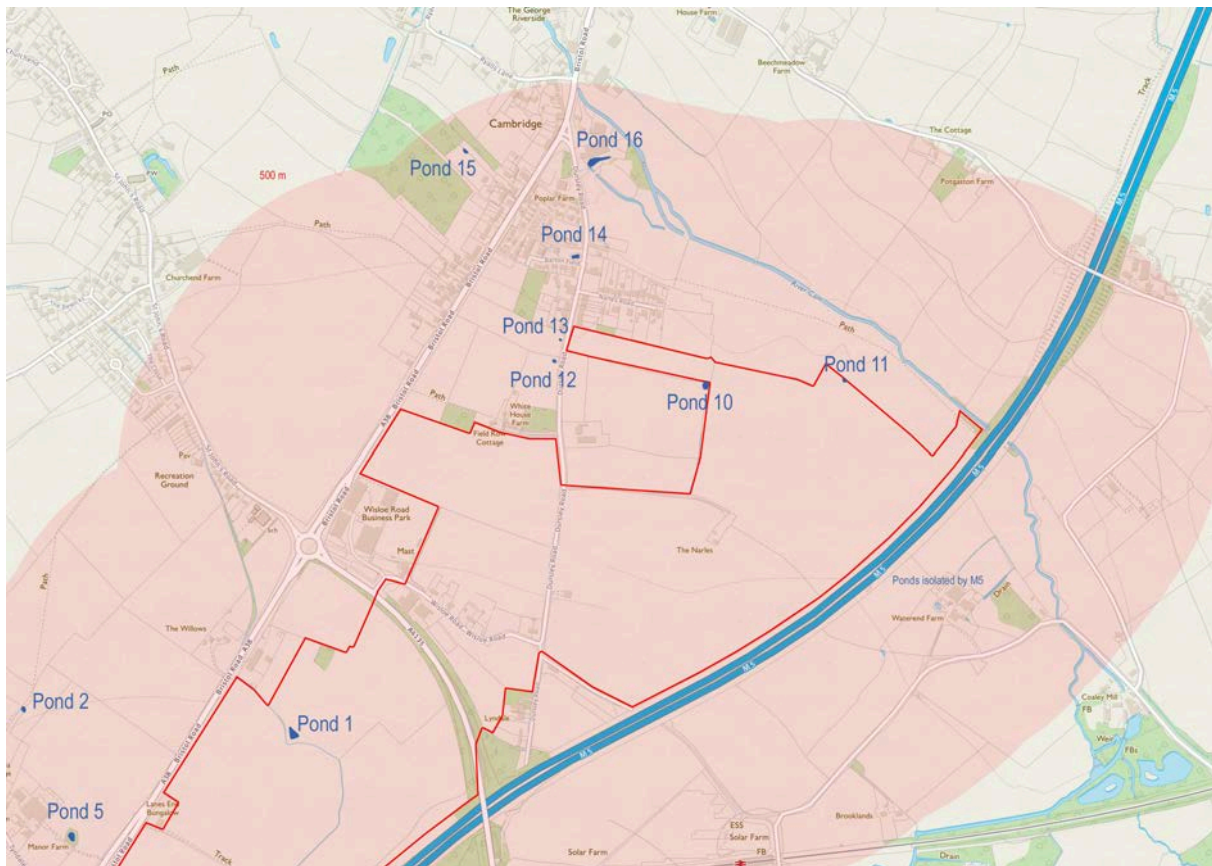


Figure 14: Pond location plan (north).

#### Invertebrates

5.29 GCER provided a number of Lepidoptera records within 2 km of the site. The woodland, trees, field margins and hedgerows provide good potential habitat for a range of invertebrate species but the arable fields and grazed pasture fields provide poor habitat. It is mainly common assemblages of invertebrates that are expected to be present with only limited area with the potential for more notable species.

#### Fish

5.30 GCER provided five European Eel records within 2 km of the site. Three of these records are associated with Wicksters Brook and two are from the River Cam. The River Cam runs along the boundary of Field G and this species may be present here.

## 6.0 Development Constraints and Recommendations

### Development Proposals

- 6.1 At present, the site is the subject of a scoping survey to determine the feasibility of a new settlement consisting of 1500 houses and 5 ha of commercial land. This section of the report identifies possible ecological constraints to any development of the site, details on further surveys likely to be required for a future planning submission, and opportunities for enhancement.

### Designated Sites

- 6.2 The site falls within 7.7 km of the Severn European Marine Site (EMS) and is therefore within the zone where Stroud District Council's 2016 Visitor Survey concluded that any new residential development is likely to contribute to a significant effect on the EMS.
- 6.3 Any impacts to the EMS can be addressed through Stroud District Council's Severn Estuary Recreation & Mitigation Strategy (SE RAM) for Avoidance of Likely Significant Adverse Effects on Severn Estuary Special Area of Conservation (SAC), Special Protection Area (SPA) and Ramsar site. This gives the option to make a financial contribution on a per dwelling basis in order to fund the strategy. Due to the large scale of the proposals it is will also be likely that on site mitigation will also be required. Public open space, circular walks etc can all help to reduce the impact on the Severn EMS by providing alternatives to new residents for walking, dog walking etc.
- 6.4 The SE RAM addresses impacts of increased recreational pressure but indirect impacts may also arise should the site support any of the qualifying species of the SAC/SAC. This is discussed in further below.
- 6.5 The site is also approximately 5.1 km west of Woodchester Park SSSI which bats are a primary or significant factor in its selection as a SSSI. These habitats are exploited by a nationally important breeding colony of Greater Horseshoe bats centred on the mansion near the western end of the site. A breeding colony of Lesser Horseshoe bats is also present. The site falls 300 m outside the impact risk zone of the SSSI and any direct impacts to the SSSI would be unlikely. However, bats from this SSSI may pass through the site when migrating between their summer roost in the mansion, and their known hibernation roosts in the Forest of Dean Bat SAC. This is discussed in further below.
- 6.6 The site is well separated from the majority of the non-statutory designated sites; however, the River Cam runs adjacent to the north boundary of the site which is upstream of the River Cam (part of unit 5) U. Maintaining the integrity of this river corridor would be an important consideration in any landscape scheme and retaining, possibly extending the woodland buffer could form the basis of this. Provision will also need to be made to address the long-term potential impacts to this river by providing sufficient measures to ensure that the hydrology of the site is not changed to the detriment of the river and that potential pollutants from new residents (detergents, nutrient enrichment etc.) can be avoided.

## Habitats

- 6.7 The NERC Priority Habitats include all hedgerows with at least 80% cover of at least one woody UK native species (JNCC, 2019). The majority of the hedgerows on site were dominated by UK native species and so qualify as NERC Priority Habitat. If any new entrances are to be created, or hedgerows or sections of hedgerow removed, which is highly likely, a Hedgerow Assessment will be required to determine if the hedges are classified as 'important' under the Hedgerow Regulations 1997. The hedges that form part of adjacent residential curtilage cannot be classed as 'important' under the Hedgerow Regulations 1997.
- 6.8 Notwithstanding the above, in order to mitigate any loss of hedges and or generally enhance the site, It is recommended that any new hedges to be planted around the site be created as species-rich hedges. The following mix is suggested to encourage wildlife: Hawthorn 40%, Blackthorn 15%, Hazel 10%, Field Maple 10%, Holly, Dog-rose, Spindle, Wild Privet and Wych Elm, all 5%.
- 6.9 The grasslands were surveyed within the optimal period for grasslands which found them to be improved grassland, the majority of which was heavily grazed. In order to qualify as a NERC Priority Habitat, grassland typically has to be unimproved (good semi-improved grassland can also qualify) and would have to be examples of grasslands such as lowland calcareous grassland or lowland dry acid grassland, habitats not found on site. A large portion of the grassland will inevitably be lost to any development of the site so the aim should be to enhance retained areas.
- 6.10 The remaining habitats e.g. the arable, woodland, standard trees, tall ruderal, dense scrub etc do not qualify as NERC Priority Habitats. The arable field margins do not meet the criteria to qualify and the woodland areas are too small to meet the criteria for qualification. The aim should be to retained the woodland areas and where other new areas of habitat are to be created, consideration should be given to the seeding of these areas using appropriate seed mixes. Where possible these seeds should be locally sourced to support the genetic integrity of local wild plant populations. Where new trees or shrubs are to be planted, native tree and shrub species should be used as these are most beneficial to invertebrates, and many also produce seeds, nuts and berries that are food for native mammals and birds. Planting of non-native plant species should be limited to those that are not invasive and should prioritise those that provide a good source of nectar for invertebrates e.g. Jasmine.

## Protected and Notable Species

### Bats

- 6.11 The site provides a network of hedgerows and woodland pockets that are likely to be used by foraging and commuting bats, with the grazed grassland also providing foraging habitat. The proposed development is likely to result in the loss of some hedgerows but also permanent loss of grazed grassland and a change in overall nature of the site. As described above, the site may be used by bats migrating between hibernation sites in the Forest of Dean and maternity sites of Lesser and Greater Horseshoe bats at Woodchester SSSI. Therefore, further surveys will be required to determine the status of the site with regard to bats. In accordance with the Bat Conservation Trust (BCT) Good Practice Guidelines (Collins, 2016), habitats regarded as high quality habitat should be subject to two survey visits per month (April to October) in appropriate weather conditions and at least one of the surveys should comprise a dusk and pre-dawn survey within one 24-hour period. Automated data collection is also required.

- 6.12 A number of trees on site were found to have PRF's such as woodpecker holes, rot holes etc. If these trees are to be removed, subject to lighting, or subject to tree surgery works further surveys to determine the presence/absence of roosting bats will be required. A preliminary assessment of features from the ground followed by detailed aerial inspections, where required, are usually carried out in the first instance; further dusk and dawn surveys are carried out on features that can't be fully inspected or if evidence of bats is found.
- 6.13 There were a number of buildings on site which may provide potential day and night roosting potential for bats. If any of these buildings are to be demolished, an Inspection Survey for Bat Roost Potential will be required to determine whether the buildings have any potential for roosting bats. This can occur at any time of year but if the building is deemed to have roosting potential or evidence of bats if found, further surveys will be required in the form of dusk emergence and pre-dawn re-entry surveys, which can only be carried out from May to September.
- 6.14 A specific lighting strategy would be informed by the bat activity surveys. However, in general an appropriate lighting strategy should be put in place to ensure that any impacts, both during construction and residual impacts, are minimised or avoided altogether. Measures include the use of low UV lights such as warm white LED lamps with a wavelength of 590 nm for external lighting using column lighting with full cut-off directional shielding to ensure that lighting is directed only where required and light spill into adjacent areas is minimised. The areas of woodland, the adjacent river and any retained hedgerows and trees must remain unlit and ideally dark continuous corridors through the site should be retained or created.
- 6.15 Any development provides an opportunity to significantly enhance the site for roosting bats. The provision of a large open roof spaces for species such as long-eared and horseshoe bats could be a significant enhancement if the design and location were appropriate. There are also many ways in which buildings could be enhanced for crevice-dwelling species without inconveniencing prospective occupants. Bat panels such as Schwegler Bat Access Panel 1FE, or bat tubes such as the Schwegler 1FR Bat Tube can be incorporated into the building exterior, or roosts such as the Schwegler Bat Roost 1FQ can be erected after building completion. Bat boxes could also be installed on retained mature trees.

#### Water Voles and Otters

- 6.16 The River Cam runs along the boundary of Field G with records of these species using this stretch of river. It is likely that an appropriate buffer would be retained within any landscape design and provided this is the case then further surveys for these species are unlikely to be required.

#### Dormice

- 6.17 The site contains a network of hedgerows and woodland pockets which provide potential Dormouse habitat. Larger areas of woodland are generally absent and the M5 isolates the site from habitats to the southeast. However, networks of hedges can support a Dormouse population and their presence can't be ruled out.
- 6.18 It is likely some hedgerows will be removed or new entrances will be created which could result in the death or injury of Dormice and overall the nature of the site will change dramatically. Therefore, further surveys are required to determine their presence or likely absence. Surveys

can take place between April to November using Dormouse nest tubes/boxes. The site should also be the subject to a nut search to search for gnawed Hazel nuts from Dormice.

#### Badgers and other mammals

- 6.19 The site provides opportunities for the construction of Badger setts within the woodland, dense scrub and hedgerows on site. However, none were discovered and the only evidence of Badgers was a single footprint.
- 6.20 The potential for other species of protected or notable mammal species to use the site is deemed to be low. No constraints are predicted as a result of the presence of passing Badgers and other small mammals. As a precaution it would be recommended that during the construction phase of the project any trenches and other excavations are back-filled before nightfall or a ramp left to allow animals to easily exit, and any open pipes larger than 150 mm should be capped off overnight.

#### Birds

- 6.21 The site provides nesting and foraging opportunities for birds within the hedgerows, trees, dense scrub and buildings, with the fields also providing potential for ground nesting, migratory and wintering birds.
- 6.22 The scale of the potential proposals for the site would significantly alter the character of the site, resulting in the loss of fields as well impacts on hedgerows and trees. The proximity of the site to the Slimbridge Wetland Centre and the Severn Estuary, the farmland character of the site, and the large size of the site would mean that any development of the site would need to be supported by a full assessment of the site to establish its value for various birds. Therefore, it is likely that wintering/migrant bird surveys would be needed as well as farmland/breeding bird surveys in order to inform a suitable mitigation strategy.
- 6.23 More generally, new buildings would provide a good opportunity to provide new nesting opportunities for some species of birds. In order to compensate for any loss of foraging habitat and/or enhance the site, it would be recommended that any new planting concentrate on species that are native to the area and ideally produce a range of seeds and berries at varying times of the year. Nectar rich plants could also be used encourage invertebrates on to the site, which in turn provide food for birds as well as other species such as bats.

#### Reptiles

- 6.24 The site provides potential reptile habitat along the arable field margins, within the tall ruderal and scrub habitats, and the hedgerows and woodland also provide areas of cover for reptiles. The site covers a large area and is also connected to the motorway embankments banks which usually provide good reptile habitat in the form of tussocky grassland and scrub. Whilst the majority of the site consists of arable crops, which provide poor reptile habitat, reptiles are still likely to be present on site.
- 6.25 Common reptiles receive partial protection under the Wildlife and Countryside Act 1981 (and amendments) whereby it is an offence to intentionally kill or injure any of the four common species.



- 6.26 A reptile survey would be required to determine presence or likely absence and in line with Natural England's current guidance the survey should be carried out by introducing artificial refugia to all suitable areas and left to bed down for two weeks. These are then checked for seven days to establish presence or likely absence, usually extending to 15 days if reptiles are found so that an accurate assessment of the population can be made.

#### Great Crested Newts

- 6.27 The site provides terrestrial Great Crested Newt habitat in the form of tall grassland, scrub, tall ruderal, hedgerows, woodland and dry ditches. There were also three dry ponds on site and a number of other ponds within 500 m of the site. A number of the ponds were dry on inspection and some were inaccessible at the time of survey. Pond 2 scored 0.58 and was rated as 'below average' for its suitability for this species. The remaining ponds that were inaccessible at the time of survey will need to be assessed at a later date if possible and it may be found that the ponds that were dry hold water at other times of the year, in particular the breeding season.
- 6.28 The general proposal for the site would result in the loss of large areas of habitat and while the majority does not appear to provide permanent optimal habitat, the extensive network of hedges, small areas of woodland, and field margins all provide optimal habitat.
- 6.29 Great Crested Newts and their places of breeding or rest are protected under the Wildlife and Countryside Act 1981 (and amendments) and The Conservation of Habitats and Species Regulations 2010 making it illegal to kill, injure, capture or disturb a Great Crested Newt and to damage or destroy a breeding or resting site of this species. All activities that would otherwise constitute an offence under The Conservation of Habitats and Species Regulations 2010 must be licensed by Natural England. Great Crested Newts are also a NERC Priority Species.
- 6.30 Pond 2 scores above 0.5 and so further surveys would be required. The remaining inaccessible ponds may also score above this survey threshold and ponds that were dry at the time of the survey may be suitable at other times or in wetter years.
- 6.31 Presence/absence can be determined with either a single visit to collect water samples for eDNA analysis, or four visits using traditional survey techniques such as bottle trapping, torching, egg search and/or netting. If found, an additional two visits are required to enable a population assessment. These surveys must be timed between mid-March and mid-June with 50% of the surveys timed between mid-April and mid-May. If the eDNA method is used it should be carried out as soon as possible after the 15<sup>th</sup> April in order to leave sufficient time for a population assessment using traditional methods in the event of a positive result.

#### Fish

- 6.32 The River Cam runs alongside Field G which has records of European Eel. It is likely that an appropriate buffer would be retained within any landscape design and provided the river is not negatively impacted by any changes in hydrology, no impacts to eels or other aquatic wildlife are predicted.

#### Invertebrates

- 6.33 The site as a whole provides a range of habitats, and the invertebrate assemblage is expected to reflect this. The majority of the site is intensely farmed and the loss of these habitats is unlikely

to be significant. The aim should be to retain the more interesting habitats, woodland, hedges, etc., and there would be scope to improve the site for invertebrates by providing pollinator homes, invertebrate towers etc. together with an appropriate landscape design.

## 7.0 References

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## 8.0 Plans

### Hedgerow Location Plan





### Habitat Survey Results

