Preliminary Ecological Appraisal (BSG Ecology)

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Silfield Garden Village,
Wymondham, Norfolk

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Contents

1 Summary

This Preliminary Ecological Appraisal (PEA) Report aims to present the results of gathering information through a desk study and extended Phase 1 survey and the carrying out of a preliminary impact assessment of the proposed site of a new settlement to be called Silfield Garden Village. The impact assessment, including identifying opportunities for mitigation and enhancement and a proposed programme of detailed survey work, was based on an Illustrative Masterplan for the proposed development. This ecology work was undertaken to support the promotion of the scheme into the emerging Local Plan.

A data request was made to the Norfolk Biodiversity Information Service in November 2019 and an extended Phase 1 habitat survey was carried out on 31 October and 1 November 2019.

The locations of the wildlife sites, habitats and species (including potential locations of species based on habitat features) identified through the desk study and field survey have been matched to the proposed land uses in the Illustrative Masterplan to identify where potential impacts might occur in the absence of mitigation. Potential mitigation actions have been identified, either to avoid the impact or reduce the extent of impact. Actions to enhance habitats or populations of species are separate to mitigation and are described in this PEA Report.

The Site is predominantly arable land which is of low ecological value and there are no designated sites of wildlife value within its boundary. There are some localised habitat features of value including a large number of ponds, semi-natural deciduous woodland and species rich hedgerows.

The Illustrative Masterplan has been designed to locate the built development predominately within the existing arable fields, the areas of lowest biodiversity value across the Site, and most semi-natural features have been avoided. There are considerable areas of greenspace proposed as part of the development that provides mitigation for the minor losses of grassland and plantation woodland and considerable enhancement of the future biodiversity value of the Site.

It is recommended that further, more detailed, information is gathered on some habitats and species groups by further field survey in order to better understand the ecological value of the Site, to assess potential impacts and to design mitigation and enhancement measures. Those surveys could be appropriately carried out as part of the actions undertaken before an outline planning application is submitted.

It is recommended that as further information on habitats and species is gathered through field survey then the ecological assessment of the proposed development should be updated. Similarly, as the detail of the proposed development progresses toward outline application stage then the ecological assessment should be updated.

As part of the work toward the outline planning application, it is recommended that a biodiversity net gain calculation is undertaken in order to establish the extent to which 10% biodiversity net gain is achieved. With the proposed development occurring primarily on arable land of low biodiversity value and the Illustrative Masterplan identifying considerable areas of greenspace to accompany the development, a 10% net gain on-Site is considered feasible.

The conclusions of this PEA Report are that:

- The Site of the proposed Silfield Garden Village is predominantly arable land which is of low ecological value and there are no designated sites of wildlife value within its boundary. There are some localised habitat features of value including a large number of ponds, semi-natural deciduous woodland and species rich hedgerows.
- An Illustrative Masterplan of the proposed development has been prepared to support the submission of the development as an allocation in the Local Plan. Given the layout of the built development and the extensive greenspace proposed in that Illustrative Masterplan and the knowledge of the Site gained through the desk study, field survey and assessment contained within this PEA Report, it is considered that habitat and species features (biodiversity) do not impose a constraint on the allocation of the Site in the Local Plan.

2 Introduction

Background to commission

2.1 BSG Ecology was contracted by Orbit Group and Bowbridge Land to prepare a Preliminary Ecological Appraisal (PEA) Report for the proposed new settlement to be called Silfield Garden Village based upon a desk study and extended Phase 1 survey that it had carried out in the second half of 2019.

2.2 This PEA Report has been prepared to inform the promotion of the scheme into the emerging Local Plan. The local planning authority is South Norfolk Council.

Site description

2.3 The proposed Silfield Garden Village development occupies approximately 451 ha of land that predominantly is in arable cropping, immediately to the South of the town of Wymondham, South Norfolk. It is located around 13 km south-east of central Norwich and straddles the A11 within easy reach of two railway stations at Wymondham and Spooner Row.

2.4 The historic market town of Wymondham is located to the north and includes significant residential development as well as small industrial areas and a 12th century Benedictine abbey. The wider context of the Site is of agricultural land use with scattered smaller settlements and hamlets, namely; Silfield, Wattlesford, Spooner Row, and Suton, which ring the Site in a clockwise direction. There are also occasional woods, copses, and hedgerows.

2.5 The local soils and geology consists of a clay plateau with deep deposits of seasonally waterlogged chalky glacial till over cretaceous chalk bedrock and river valleys which contain glacial outwash deposits and peat. There are remnants of the medieval landscape however many field systems have undergone 20th century amalgamation. Numerous ponds are a relic of the former importance of dairy farming in the area.

2.6 The land that is the subject of this PEA Report consists of large, amalgamated, arable fields with a network woods, small copses, hedgerows and abundant ponds. Park Farm is an active farmyard and Lower Park Farm is a redundant moated site containing traditional farm buildings. Historic research has identified the location as the site of a mediaeval deer park.

Aims of the Report

2.7 The purpose of this Report is to:

- Review and summarise the designated sites and biological records returned by the desk study.
- Present the findings of the extended Phase 1 habitat survey.
- Classify the habitats present and evaluate those habitats and species records.
- Provide an early indication of potential impacts of the development based on the indicative layout provided in the Illustrative Masterplan.
- Identify opportunities for habitat and species enhancement.
- Make recommendations with regard to further information gathering.
- Outline the legislative and / or policy protection afforded to any habitats or species of importance likely to be associated with the proposed development.

3 Methods

The area subject to study

3.1 The area of land that is the subject of this PEA Report, of the desk study and of the field survey is that illustrated in Appendix 1 and encompasses approximately 420 ha of land. It is that area of land that is referred to the 'Site' in this PEA Report.

3.2 The area of land that is included in the Illustrative Masterplan is illustrated in Appendix 2. That area of land is approximately 451 ha. An additional parcel of land was added to the proposed development (in the north-east corner, south of the A11) after the desk study, field survey and ecological appraisal were conducted. As a consequence this additional parcel of land has not been assessed in this PEA Report.

Desk study

3.3 A desk study was carried out which included a data search to determine the presence of any protected / notable species records or designated non-statutory sites of conservation value (such as Local Wildlife Sites) within the Site or within a 2 km buffer projected from the boundary of the Site. Norfolk Biological Information Service (NBIS) was contacted to supply this information, which was received on 05 November 2019.

3.4 Aerial photographs and mapping (Google Maps and OS Maps, accessed from 18 November 2019 and throughout the project) of the Site and its surroundings were reviewed to identify ponds within 250 m of the Site and assist in the characterisation of buildings and habitats within the Site.

3.5 The MAGIC website (https://magic.defra.gov.uk) that provides geographic information about the natural environment from across Government was consulted for the presence of international statutory designated sites within 5 km, national statutory designated sites and European Protected Licences (EPSL) granted within 2 km of the Site and for previously classified habitats within and adjacent to the Site.

Field survey

3.6 An extended Phase 1 habitat survey of the Site was undertaken on 31 October and 1 November 2019 by Lewis Saunders Ecologist at BSG Ecology. The vegetation and land use types present within the Site were classified with reference to the standard JNCC Phase 1 methodology (JNCC, 2010).

3.7 The survey was also extended to include an assessment of the potential of the habitats present to support protected species. In addition during the Site visit any signs of protected species that were observed were recorded. In particular each pond on Site was visited in order to assess its potential to support great crested newts *Triturus cristatus* (referred to as GCN).

Interpretation

3.8 In this report the habitats found during the survey have been described and interpreted as to their potential to support protected species.

3.9 A GCN Habitat Suitability Index (referred to as an HSI) has been calculated for each of the ponds present on Site according to a methodology published by Oldham *et al*. (2000). An HSI is a helpful measure of evaluating habitat quality for GCN. It is a numerical index between 0 and 1 where 0 indicates unsuitable habitat and 1 indicates optimal habitat. Its calculation is based on 10 individual suitability indices, all of which are factors thought to affect great crested newt presence.

Ecological Appraisal

3.10 The approach to ecological appraisal was based on the guidance published by the Chartered Institute of Ecology and Environmental Management (CIEEM) in the document *Guidelines for Preliminary Ecological Appraisal* (CIEEM, 2017).

Limitations to methods

3.11 The survey was a walkover of a very large site spread over two days, therefore a complete inventory of the species and features present on the Site was not possible. The time spent on Site was considered long enough to assess accurately the potential of the Site to support protected species and to evaluate the habitats.

Personnel Involved

3.12 The survey work and reporting was completed by Lewis Saunders, Ecologist at BSG Ecology. Lewis is an experienced botanist and has four years' professional ecology experience. Further details of his experience and qualifications can be found at https://www.bsg-ecology.com/portfolio_page/lewis-saunders-senior-ecologist-cambridge/.

3.13 The report has been technically reviewed by Dr Roger Buisson, Associate Director at BSG Ecology. Roger has over 30 years' professional ecology experience. Further details of his experience and qualifications can be found at https://www.bsg-ecology.com/portfolio_page/roger-buisson-director-of-ecology-cambridge/.

4 Results and Interpretation

Desk study

Ponds and watercourses

4.1 Use of the MAGIC website indicated that there was a total of twenty-two ponds within the Site. It also indicated that there were two minor watercourses within the Site: The Bays River, which ran through the western part of the Site in a north-south direction and a further un-named watercourse which crossed the centre of the Site from east to west.

4.2 The surrounding landscape contained a further eighteen ponds within 250 m of the Site boundary and minor watercourses including drains and streams.

Desk study - designated sites and habitats

4.3 Within the 2 km desk study area there was a total of two statutory designated sites including one local nature reserve (LNR) (Toll's Meadow LNR, Wymondham) and one site of special scientific interest (SSSI) (Lower Wood, Ashwellthorpe SSSI). In addition there was a total of fifteen designated county wildlife sites (CWS) within the same 2 km desk study area including Toll's Meadow. None of the designated sites was within the boundary of the Site.

Statutory designated sites

4.4 The two statutory designated site within the 2km desk study area were Lower Wood, Ashwellthorpe; SSSI (1.4 km due south-east of the Site at its closest point) and Toll's Meadow, Wymondham LNR (625 m due north of the Site at its closest point).

- Lower Wood, Ashwellthorpe SSSI is a 36 ha ancient woodland located on a poorly drained chalky boulder clay plateau. The wood is predominantly coppice with standards and supports a large proportion of semi-natural stands. The major woodland type is plateau alderwood - a nationally rare stand type. A large number of tree and shrub species are associated with this stand-type, including pedunculate oak *Quercus robur*, ash *Fraxinus excelsior* and hornbeam *Carpinus betula*, and coppiced hazel *Corylus avellana*, field maple *Acer campestre* and sallow *Salix caprea*. The field layer is dominated by dog's mercury *Mercurialis perennis*. A number of uncommon species are present, including herb paris *Paris quadrifolia*, wood spurge *Euphorbia amygdaloides*, early purple orchid *Orchis mascula*, common twayblade *Listera ovata*, ransoms *Allium ursinum,* water avens *Geum rivale* and woodruff *Galium odoratum.*
- Toll's Meadow LNR. The features of this LNR are described in Table 1 below based on the citation for the overlapping designation as CWS - CWS 2131 Toll's Meadow & Friarscroft.

Non-statutory designated sites and habitats

4.5 Use of the MAGIC website indicated that five areas of woodland within the Site were included within the priority habitat inventory as deciduous woodland and that one area was registered as Ancient Woodland. The website indicated that W10 Peasacre Wood (12.4 ha) in the west of the Site was Ancient Woodland. A further four smaller areas were also included within the priority habitats inventory (woodlands W7, W9, W11 and W15).

4.6 The NBIS data return provided information about 15 CWS that were within the 2 km search area. None of the CWS were within the Site boundary. Table 2 lists each of these CWS and includes information about their distance from the boundary of the Site and describes their interest features.

4.7 Two of the CWS identified in the data return are adjacent to the Site - Bays River Meadows South CWS and Railway Pond CWS and one is close to the Site but separated from it by the railway: Bays River Meadow North CWS. The sites presented in Table 1 are listed in order of proximity to the Site.

Table 1: CWS within 2 km of the Site boundary

CWS Number and name	Area (ha)	Distance and direction from the Site boundary (m).	Description
208 Railway Pond	0.1 ha	Less than 10 m due West. Good connectivity with Site.	This is a moderate sized mesotrophic pond with varied aquatic and marginal vegetation. The pond supports abundant water milfoil (*Myriophyllum* spp.) and pondweed (*Potamogeton* spp.) together with frequent duckweed (*Lemna* sp.) and Canadian pondweed (*Elodea canadensis*). The pond is surrounded by semi-natural woodland.
209 Bays River Meadows South	3.6 ha	Less than 10 m due West. Good connectivity with Site.	This site consists of a mosaic of wet basic and neutral grasslands and swamp. Swamp areas are dominated by either pond-sedge (*Carex* sp.) with abundant water mint (*Mentha aquatica*) or by reed (*Phragmites australis*) with frequent meadowsweet (*Filipendula ulmaria*). The site is bordered by an old hedgerow to the east.
210 Bays River Meadow North	9.8 ha	70 m due Northwest. Railway may act as a barrier to dispersal.	A narrow, river valley wetland mosaic, divided into a series of discrete compartments enclosed by tall hedgerows. The Bays River flows northwards and bisects the site which slopes inwards towards it. The site is predominantly unmanaged. The site is separated from CWS 209 Bays River Meadows (South) to the southeast by the Norwich-Thetford rail-line. Rank tall-herb fen, with scattered hawthorn (*Crataegus monogyna*) and grey willow (*Salix cinerea*) scrub, occupies a large proportion of the site west of the river.
59 Upper Wood	3 ha	600 m due East. Limited barriers to dispersal.	This is an ancient woodland site situated near to Ashwellthorpe Lower Wood SSSI. It is now largely an area of conifer plantation although a small remnant of the original coppice woodland remains to the south. The canopy here consists mainly of oak (*Quercus robur*) with occasional alder (*Alnus glutinosa*), especially to the north. Beneath this is a well developed coppice layer of hornbeam (*Carpinus betulus*). Moving westwards the canopy becomes dominated by ash (*Fraxinus excelsior*) and field maple (*Acer campestre*) with suckering elm towards the southern margins of the wood. The southernmost tip of woodland is now a poplar (*Populus* sp.) plantation. The ground flora of the broad-leaved area is dominated by dog's mercury (*Mercurialis perennis*) and bluebell (*Hyacinthoides non-scripta*) with less frequent water avens (*Geum rivale*), early-purple orchid (*Orchis mascula*), ground-ivy (*Glechoma hederacea*) and primrose (*Primula vulgaris*).
2131 Toll's Meadow & Friarscroft	2.8 ha	613 m due North. Multiple barriers to dispersal.	Toll's Meadow, a designated Local Nature Reserve (LNR), is situated on both sides of the River Tiffey, which bisects the site from east to west. The river channel supports water-plantain (*Alisma plantago aquatica*) while the banks support great willowherb (*Epilobium hirsutum*), common reed (*Phragmites australis*), hemp

CWS Number and name	Area (ha)	Distance and direction from the Site boundary (m).	Description
			agrimony (*Eupatorium cannabinum*) and meadowsweet (*Filipendula ulmaria*). The main part of the site, south of the river, is an area of species-rich marshy grassland and fen-meadow with upwelling flushes in places, bisected by a public right of way.
58 Fundenhall Wood	17.7 ha	769 m due Southeast. Limited barriers to dispersal.	Fundenhall is an ancient woodland site on a boulder clay plateau overlain by sandy loam. The wood contains entirely semi-natural stands and has many similarities with the nearby Ashwellthorpe Lower and Hethel woods. The structure is coppice with standards and there is a wide range of stand types present including the uncommon plateau alderwood. The ground flora is diverse and includes a number of locally rare and uncommon species. The ground flora on the heaviest soils under the plateau alderwood is dominated by dog's mercury (*Mercurialis perennis*) and other species of interest include herb paris (*Paris quadrifolia*) enchanter's nightshade (*Circaea lutetiana*) and wood avens (*Geum rivale*). Ramsons (*Allium ursinum*) is locally dominant and forms an extensive, virtually pure cover. The lighter soils are dominated by bramble (*Rubus fruticosus*) and bluebell (*Endymion non-scriptus*) with honey suckle (*Lonicera periclymenum*), wood sorrel (*Oxalis acetosella*) and primrose (*Primula vulgaris*).
215 Wymondham Marshes	4.3 ha	800 m due North. Multiple barriers to dispersal.	This site is an area of marshy grassland crossed by dykes which support pure swamp vegetation. The site is surrounded by hedgerows. The grassland is subject to flooding in places and has a sward dominated by neutral grasses such as Yorkshire fog (*Holcus lanatus*) together with rushes such as jointed rush (*Juncus articulatus*) and sedges (*Carex spp*.). Forbs are abundant and include marsh bird's-foot trefoil (*Lotus uliginosum*), creeping buttercup (*Ranunculus repens*), meadowsweet (*Filipendula ulmaria*) and water mint (*Mentha aquatica*).
213 Wymondham Abbey Meadows	41 ha	890 m due North. Multiple barriers to dispersal.	This site comprises dry neutral grassland around the remains of Wymondham Abbey which exist as low mounds with a few exposed walls. The ground slopes southwards towards a small eutrophic stream. The site is cattle grazed. Much of the turf is tightly grazed and dominated by common bent (*Agrostis capillaris*) with rye-grass (*Lolium perenne*), cock's-foot (*Dactylis glomerata*) and timothy (*Phleum pratense*).
2218 Silfield Newt Reserve	6.1 ha	950 m due Northeast. Some barriers to dispersal.	Five connected fields with ponds, grassland, scattered scrub and hedges. At least part of the site was once mineral workings and as mitigation for the Wymondham bypass, the site was set aside as a nature reserve, largely to support great crested newts *Triturus cristatus* and water voles *Arvicola amphibius*. The

CWS Number and name	Area (ha)	Distance and direction from the Site boundary (m).	Description
			grassland is mostly dry and acidic; Yorkshire fog *Holcus lanatus* is dominant and species in the grassland include abundant yarrow *Achillea millifolium*, ribwort plantain *Plantago lanceolata*, knapweed *Centurea nigra*, and lesser stitchwort *Stellaria graminea*.
211 The Lizard & Wade's Pit	17.4 ha	1,426 m due Northeast. Multiple barriers to dispersal.	This recently extended CWS south-east of Wymondham comprises namely marshy grassland (with patches of fen), an area of acid grassland, a disused railway embankment and a 'leg' of broad-leaved woodland and gravelly scrub stretching out from the south-east corner. The River Tiffey runs east to west through the northern stretch of the site, and the whole area is dissected by several large ditches and areas of standing water. The meadows south of the river comprise mainly neutral grassland sloping to wet fen areas and damp hollows.
216 Tiffey Meadow North	3.3 ha	1,480 m due North. Multiple barriers to dispersal.	This site is a remnant of marshy grassland situated adjacent to a disused railway. The majority of the site is improved pasture with a sward dominated by rye-grass *Lolium perenne* with occasional Yorkshire fog *Holcus lanatus* and crested dog's-tail *Cynosurus cristatus*.
212 Tiffey Meadow South	2.7 ha	1,480 m due North. Multiple barriers to dispersal.	This site is a remnant of marshy grassland situated adjacent to a disused railway line. The majority of the site is improved grassland dominated by rye-grass with occasional Yorkshire fog and crested dog's-tail.
201 Breakers Yard Meadow	1.1 ha	1,600 m due East. Multiple barriers to dispersal.	This site consists largely of improved grassland with small pockets of semi-improved, wet grassland. The site is grazed by sheep although there is an area of tall and unmanaged fen-type vegetation. The marshy grassland pockets contain abundant jointed rush (*Juncus articulatus*) and greater pond-sedge (*Carex riparia*) with frequent soft rush (*Juncus effusus*) and hard rush (*Juncus inflexus*).
214 Moot Hill	1.8 ha	1,758 m due Northeast. Multiple barriers to dispersal.	This site consists of a raised mound of semi-natural woodland surrounded by a moat. Elm (*Ulmus sp*.) forms approximately half of the canopy, the rest being ash (*Fraxinus excelsior*) and oak (*Quercus robur*) with sycamore (*Acer pseudoplatanus*). Horse-chestnut (*Aesculus hippocastanum*) and field maple (*Acer campestre*) are occasionally present.
156 Big Wood Meadow	5.9 ha	1,886 m due Northwest. Multiple barriers to dispersal.	This site consists of three distinct fields of undulating marshy grassland of moderate species diversity with species rich ditches. Tall well-formed hedges surround the site and within it there are a few small areas of scrub.

Field survey - habitats

4.8 In terms of habitats the Site consisted predominantly of large arable fields with a scattering of small woodlands and copses of both plantation and semi-natural origin and a relatively sparse network of hedgerows, however some of these hedges were species rich and of varied structure. There were

a number of small watercourses and ditches including the Bays River in the west. Ponds were a notable feature of the landscape and twenty two were found to be extant during the survey. Buildings and hardstanding were associated with both Park Farm and Lower Park Farm.

4.9 The habitats identified are mapped on Figure 1. That Figure also includes the feature (fields, woods, ponds etc.) reference numbers that are referred to below.

Arable

4.10 Large arable fields were the dominant land-use within the survey area. At the time of survey the majority of the fields south of the A11 (Fields 5-19) were either recently cultivated with bare ground (F5, F6, F7, F8, F9, F10, F12, and F14) or contained crops of parsley *Petrolselinum crispum* (F11, F13, F15, F17 and F19). Two fields contained stubble from a crop which had not been cultivated (F16 and F18). The fields north of the A11 (Fields 1-4) were either recently cultivated with bare ground (part of F4) or contained an autumn sown crop of oilseed rape *Brassica napus.* The fields north of the A11 were noted as having an arable weed flora whereas the fields south were not noted to support many arable weeds. The arable plants encountered in the north included field pennycress *Thlaspi arvense* (very abundant), common poppy *Papaver rhoeas*, hedge mustard *Sisymbrium officinale,* wild radish *Rhaphanus raphanistrum ssp. raphanistrum*, wild pansy *Viola tricolor*, field pansy *Viola arvensis*, and cut-leaved dead-nettle *Lamium hybridum*. The fields were typically bordered by hedgerows, ditches, or watercourses. In places field margins of grassland were present of around 6 m width.

4.11 Photos 1 and 2 depict typical arable cropping within the Site.

Grasslands

4.12 Grassland of any type was very limited in area and highly fragmentary occurring as small patches or strips throughout the Site. This included amenity grassland around Park Farm, improved grassland around Lower Park Farm and in field corners and semi-improved field margins.

4.13 Most of the grassland on Site was of low ecological value consisting of temporary grassland strips and field corners. G6 probably has greatest value acting as a buffer to the adjacent watercourse from agricultural inputs. The most ecologically valuable and floristically interesting grasslands were G1, G2 and G5 however the condition of the sward in G2 and G5 was compromised by frequent use and heavy wear as vehicle trackways and footpaths.

4.14 Appendix 5 provides a brief species list for each of the grasslands. Photos 4-7 depict the range of grasslands within the Site.

Amenity grassland

4.15 Amenity grassland was found around the garden of Park Farm. It was closely managed by mowing and consisted of perennial rye-grass predominantly.

Improved grassland

4.16 Improved grassland was found in two areas in the south of the Site. One area was located immediately to the south of Park Farm around P18 and another area was found at the southern end of F9. This grassland was also species poor and consisted of dominant perennial rye-grass with some cock's-foot.

Poor semi-improved grassland

4.17 Poor semi-improved grassland was found in a block to the east of the farm buildings at Park Farm (G4) and in a long narrow strip, probably designed as a watercourse buffer through the centre of the Site (G6). Grasses included red fescue, cock's-foot and false-oat grass.

Semi improved grassland

4.18 Good quality semi-improved grassland was limited to two narrow strips containing farm tracks / footpaths and a single field corner. G1 was located in the corner of a large arable field and was probably sown with a mixture of grasses and wildflowers including red fescue and black knapweed. To the east a farm track ran beside the A11 (G2) which included red fescue, cock's-foot, common cat's ear and autumn hawkbit. One further strip of semi-improved grassland was located along a public footpath and that also included red fescue and cock's-foot with some common agrimony and ribwort plantain.

Table 2: Summary evaluation of the grasslands on Site

Reference	Size (ha)	Description
G1	0.6	Semi-improved grassland.
G2	0.6	Semi-improved grassland.
G3	2.0	Amenity grassland.
G4	0.6	Poor semi-improved grassland.
G5	0.5	Semi-improved grassland
G6	1.0	Poor semi-improved grassland.
G7	0.6	Improved grassland
G8	1.0	Improved grassland

Woodlands and copses

4.19 Small woodlands and copses were a characteristic feature of the Site and were somewhat varied in character, age and species composition. There were a total of fifteen larger woodlands and copses including Peaseacre Wood, Hempfield Wood and Lawn Wood as well as numerous small copses, many of which contained a central pond. A significant proportion was broadleaved semi-natural woodland including the largest Peaseacre Wood and all of the smaller copses. The remainder of the woodland was often planted and was dominated by either mixed broadleaved trees or mixed broadleaved and coniferous species.

4.20 The woodlands found throughout the Site are of ecological value through providing a network of habitat in combination with the hedgerows. The semi-natural broadleaved woodlands were of particular value as a priority habitat type under the NERC Act 2006. Additionally Peasacre Wood had further value as an ancient woodland retaining some of its original species composition and ground flora.

4.21 The larger woodlands are mapped on Figure 1 and each has a reference number that is used in the descriptions below. The copses fringing the ponds are described as one below under semi-natural woodland since this was universally their character. Photos 7-12 show the range of woodlands present on the Site.

4.22 Appendix 4 provides a plant species list for each woodland.

Semi-natural broadleaved woodland

4.23 Semi-natural woodland was found in three of the larger woods including W7 (Lawn Wood), W10 (Peaseacre Wood) and W11 (Lower Park Farm moat). Peaseacre Wood was the largest woodland on Site and an ancient woodland dominated by ash with some field maple and an understorey of hazel. Dog's mercury was a constituent of the ground flora. Lawn Wood (W7) was also semi-natural in character and was dominated by oak with an understorey of hawthorn. The moat at Lower Park farm had a small area of woodland (W11) dominated by ash adjacent to it.

4.24 Many of the ponds throughout the Site were surrounded by trees and shrubs which, through absence of management, had come to resemble semi-natural woodland. Typically the trees found in these situations were oak, field maple, ash and sometimes other species including elm and hazel. Interesting ground flora was sometimes present including wood false-brome, dog's mercury and greater stitchwort.

Mixed broadleaved plantation woodland

4.25 Mixed broadleaved plantation woodland was the most widespread woodland type on the Site and was found in seven areas including; W1, W2a, W3, W4, W5, W6, W9, and W13. The patches were typically small in area ranging from 0.5 - 2.0 ha. A wide range of trees had been planted including field maple, hornbeam, sweet chestnut, oak, ash, bird cherry and beech. Most stands were judged to be around 20-30 years old. The majority were considered likely to have been planted for the purposes of enhancing the environment of the farm and may have been funded by environmental grants. The main purpose of W9 appeared to be as an area for rearing pheasant - the central clearing was planted with a variety of millet.

Single species broadleaved plantation woodland

4.26 There was one area of single species broadleaved plantation woodland on the Site. W2b was planted entirely with Italian alder *Alnus cordata*. The Site was wet, adjacent to the A11, and the plantation was judged to have been around 20-30 years old. It was surrounded by a relict hedged boundary which contained dog's mercury.

Mixed broadleaved / coniferous plantation woodland

4.27 Mixed broadleaved/ coniferous plantation woodland was found in four stands on the Site including; W8, W12, W14, and W15. The range of broadleaved trees was similar to those listed under mixed broadleaved plantation woodland above. The coniferous trees utilised tended to vary between stands. W8 (Hempfield Wood) included larch *Larix sp.* and sitka spruce *Picea sitchensis* as its coniferous species whereas W12 and W14 contained a variety of cypress *Cupressus sp.* and W15 contained Scot's pine *Pinus sylvestris* Most stands were also considered to be around 20-30 years although Hempfield Wood appeared to be an older, more established plantation woodland used for rearing pheasants.

Table 2: Summary evaluation of the woodlands on Site

Reference.	Size (ha)	Description
W1	0.5	Mixed broadleaved plantation woodland
W2a	0.7	Mixed broadleaved plantation woodland.
W2b	1.0	Single species broadleaved plantation woodland
W3	2.0	Mixed broadleaved plantation woodland.
W4	0.8	Mixed broadleaved plantation woodland.
W5	0.5	Mixed broadleaved plantation woodland.
W6	0.5	Mixed broadleaved plantation woodland.
W7	1.1	Semi-natural broadleaved woodland.
W8	1.8	Mixed coniferous/ broadleaved plantation woodland
W9	1.8	Mixed broadleaved plantation woodland
W10	13.2	semi-natural broadleaved woodland (Ancient woodland)
W11	0.2	Semi-natural broadleaved woodland
W12	0.5	Mixed coniferous/broadleaved plantation woodland.
W13	0.6	Mixed coniferous/broadleaved plantation woodland
W14	0.6	Mixed coniferous/broadleaved plantation woodland
W15	1.3	Mixed coniferous/broadleaved plantation woodland.

Hedgerows and scattered trees

4.28 Although the arable fields were large, with hedgerow removal and field amalgamation having taken place in the past, hedges were still present along a proportion of field boundaries both around the edges of the Site, along road boundaries and internal to the Site. Many of the hedges internal to the Site were carefully managed by cutting to a height of around 2-3 metres but others particularly around the boundaries of the Site were tall and unmanaged. Standard trees, sometimes showing evidence of pollarding, were frequent both along boundaries and sometimes within fields.

4.29 Around a half of the hedgerows were considered species rich and half of the hedgerows considered species poor according to the Defra criteria of consisting of five or more woody species. Sixteen hedgerows were considered species rich and 17 were considered species poor. All the hedgerows would be considered priority habitat under the NERC Act as any native hedgerow is included even when it consists of only one species. Some hedgerows on the Site may qualify as important hedgerows under the Hedgerow Regulations 1998. Species rich hedgerows may well qualify as such under biological or historical criteria.

4.30 The hedgerows are mapped on Figure 1 and each has a reference number that is used in the descriptions below.

4.31 In terms of the species richness of each hedge, Appendix 3 provides a woody plant species (i.e. trees and shrubs) list for each hedgerow.

Species-poor hedgerows

4.32 Species poor hedgerows on the Site were considered to have fewer than 5 woody species recorded along their length. They were typically dominated by hawthorn and/or blackthorn and occasionally with some field maple or dogwood.

Species-rich hedgerows

4.33 Species rich hedgerows on the Site had between 5 and 17 woody species along their entire length. More species rich hedges included a greater frequency of field maple and dogwood as well as hawthorn and blackthorn. Species which indicated the more species rich hedges included hornbeam, hazel, elm, holly, willow, and spindle.

Hedgerow and scattered trees

4.34 Hedgerows across the Site of both species rich and species poor types frequently contained standard trees. These were almost exclusively oak but just occasionally were ash. The historic species rich boundaries in the Northwest and South also contained pollarded oaks.

Table 2: Summary evaluation of the hedgerows on Site

Reference	Length (m)	Woody species	Species rich/ Species poor.
H1	1,815	12	Species rich
H2	343	5	Species rich
H3	400	4	Species poor
H4	100	2	Species poor
H5	100	1	Species poor
H6	270	6	Species rich
H7	270	9	Species rich
H8	430	9	Species rich
H9	156	6	Species rich
H10	510	9	Species rich
H11	169	6	Species rich
H12	365	6	Species rich
H13	166	3	Species poor
H14	168	3	Species poor
H15	180	1	Species poor
H16	307	1	Species poor
H17	582	1	Species poor
H18	715	1	Species poor
H19	636	8	Species rich
H20	173	<5	Species poor
H21	128	<5	Species poor
H22	157	5	Species poor

Reference	Length (m)	Woody species	Species rich/ Species poor.
H23	157	5	Species rich
H24	415	7	Species rich
H25	200	12	Species rich.
H26	230	1	Species poor
H27	155	5	Species rich
H28	411	3	Species poor
H29	280	3	Species poor
H30	228	<5	Species poor
H31	281	>5	Species rich
H32	1,680	17	Species rich
H33	183	2	Species poor

Watercourses and ponds

Ponds

4.35 Ponds were found throughout the Site and will be discussed further under the section on Great Crested Newt Habitat Suitability Index below as they are likely to provide suitable habitat for this protected species.

Watercourses

4.36 Two minor watercourses were present within the Site. Bays River, a headwater stream and tributary of the River Tiffey, itself a tributary of the River Yare, runs for a total of around 2 km through the Site. It flows into the Site at its south-east corner and forms the boundaries between F11 and F10, F9 and F10 and F10 and Peaseacre Wood before turning abruptly west and joining the Site's western boundary where it continuous to flow north. It leaves the Site to enter the Bays River Meadows South CWS.

4.37 A drain runs the width of the Site from circa TM12169820 to TM10459913 forming the boundaries between F13 and F14, F13 and F16, F8 and F6 and F7 and F5. It passes under the A11 and finishes in a minor drain in W2.

Buildings and hard-standing

4.38 The built environment within the Site was represented only by Park Farm in the North and Lower Park Farm to the South. Park Farm remains an occupied dwelling and active farmyard whereas Lower Park Farm was undergoing extensive renovations at the time of survey.

Park Farm

4.39 Park Farm contained active farm building used for storing machinery and harvested crops.

Lower Park Farm

4.40 Park Farm contained the historic remains of farm buildings enclosed within a moat. The building had undergone recent renovations.

Protected species

4.41 A summary of the species, their protection and conservation status and the number of records received from NBIS is included as Appendix 7.

Vascular plants

4.42 The 2 km desk search returned records for protected plant species including mossy stonecrop *Crassula tillea*, small-flowered catchfly *Silene gallica*, and Bird's-nest orchid *Neottia nidus-avis*. None of these records were within the Site.

4.43 The large size of the Site and the presence of some semi-natural habitats, including ancient woodland, means that it is possible that protected plant species could be present within the Site.

Invertebrates

4.44 A range of NERC Act Section 41 invertebrate records were returned for the 2 km area surrounding the Site but not from within the Site. These included more than twenty moth species, mostly caught by light trapping in the urban area of Wymondham. There were also eight records of notable water beetle species from ponds on the Silfield Newt Reserve CWS and records of Section 41 bee species.

4.45 Due to the presence of biodiverse habitats such as ancient woodland, species rich hedgerows and ponds within the Site there is a likelihood that important invertebrates species will be present within the Site boundary.

Amphibians

Great crested newt

4.46 The data search returned a total of one hundred recent records of GCN from the 2 km search area surrounding the Site. Most records were concentrated in the Silfield Newt Reserve CWS to the east of the Site with a scatter of records around Ashwellthorpe to the east. Connectivity between the Site and Silfield Newt Reserve CWS was present in the form of a coarse grassland and woodland strip along the embankment of the A11. Two GCN records were identified less than 50 m from the Site boundary from a pond at TM118998 in 2008. The pond has connectivity to the rest of the Site via habitats beside the A11. A further GCN record was identified at TM10379986 Stalworthy Manor Farm in 2013 around 300 m from the Site boundary. Although a railway line cuts across this area there was otherwise good habitat connectivity via grassland habitats along the valley of the Bays River.

4.47 A total of twenty-two ponds were identified within the Site boundary and these were surveyed in order to calculate a GCN HSI score for each pond.

4.48 A total of five ponds had an HSI considered 'Good'. A further ten had an HSI considered 'average'. Finally a total of seven had an HSI considered 'below average' or 'poor'. The HSI score and pond suitability are summarised in Table 3 below and the results are detailed in full in Appendix 6.

4.49 The widespread occurrence of GCN records with a high concentration at the Silfield Newt Reserve CWS to the east combined with the suitability of the numerous ponds present on the Site means that there is a high likelihood of GCN being present on the Site.

Table 3: Ponds on Site, HSI score and suitability for GCN

Pond reference	HSI Score	Pond suitability
1	0.71	Good
2	0.69	Average
3	0.67	Average
4	0.63	Average
5	0.64	Average
6	0.74	Good
7	0.73	Good
8	0.74	Good
9	0.48	Poor
10	0.61	Average

Pond reference	HSI Score	Pond suitability
11	0.48	Poor
12	0.51	Average
13	0.46	Poor
14	0.51	Below average
15	0.68	Average
16	0.72	Average
17	0.60	Average
18	0.79	Good
19	0.57	Below average
20	0.57	Below average
21	0.65	Average
22	0.49	Poor

Other amphibians

4.50 The data search returned ten recent records of smooth newt *Lissotriton vulgaris* from within 2 km of the survey Site, namely from the Silfield Newt Reserve CWS and Moot Hill CWS. There were also similar numbers of recent records for both common toad *Bufo bufo* and common frog *Rana temporaria*. These records were from the Silfield Newt Reserve CWS as well from around Ashwellthorpe, Suton and from within Wymondham.

4.51 The widespread presence of common amphibians as indicated by the data search suggests that they are highly likely to be present within the Site due to the presence of suitable breeding ponds.

Reptiles

4.52 A total thirteen recent records of reptiles, including grass snake *Natrix natrix*, common lizard *Zootoca vivipara* and slow worm *Anguis fragilis* were returned by the records search. These were mostly located to the east in the area of the Silfield Newt Reserve CWS, The Lizard & Wade's Pit CWS and Moot Hill CWS.

4.53 Suitable habitat exists on Site for common reptile species and it is likely that they are present on Site however the populations might not be especially large due to the fragmented nature of the habitat. Their presence may be reinforced from more suitable habitat adjacent to the Site such as from The River Bay Meadows CWS.

Birds

4.54 More than twenty protected bird species have been recorded from the 2 km search area around the Site including grey partridge *Perdix perdix*, turtle dove *Streptopelia turtur*, barn owl *Tyto alba*, skylark *Alauda arvensis* and yellowhammer *Emberiza citrinella*. These bird species are either Birds of Conservation Concern (BoCC) Red List or Wildlife and Countryside Act Schedule 1 listed species that breed on farmed habitats.

4.55 The Site provides varied habitats for birds including ancient woodland, hedgerows and field margins which may be utilised by a wide range of common and declining species for feeding, roosting or nesting.

Brown hare

4.56 There have been more than twenty records returned for brown hare *Lepus europeaus* from within the 2 km search area showing the species to be widespread and common in the surrounding countryside. A single record was located in the centre of the Site, the remainder were from outside the Site.

Badger

4.57 The records search returned six recent records for Eurasian badger *Meles meles* and these were located both to the east in the area of Ashwellthorpe and the A11 and to the west in the area of Suton.

4.58 During the field survey three small setts were discovered. Two setts of one hole each were found in both Hempfield Wood and in the hedgerow along the southern boundary of the Site. A sett of two holes was found on the southern edge of Peaseacre Wood. Badgers are evidently present within the Site however a main sett was not found.

Water Vole

4.59 A large total of ninety eight recent records of water vole *Arvicola amphibius* were returned by the data search. These were mostly located close to the centre of Wymondham and originating from Toll's Meadow LNR/CWS. A further scattering of records was located to the east of the Site around the Silfield Newt Reserve CWS.

4.60 Although no evidence of water voles was observed during the survey there were several watercourses which were suitable for water vole including the Bays River located in the west of the Site and the drain which crossed the Site. Given the presence of water vole to the north of the Site it is highly likely that water voles are present.

Otter

4.61 The data search returned five recent records for Otter *Lutra Lutra* from the River Tiffey to the North of the Site.

4.62 The watercourses present within the Site are not of sufficient size to support a fish population that is likely to attract resident otters. Any otters present are likely to be passing through only.

Bats

4.63 The data search returned recent records for ten identified bat species including western barbastelle *Barbastella barbastellus*, serotine *Eptesicus serotinus*, whiskered/Brandt's bat *Myotis mystacinus/brandtii*, Daubenton's bat *Myotis daubentonii*, Natterer's bat *Myotis nattereri* noctule bat *Nyctalus noctula*, Nathusius's pipistrelle *Pipistrellus nathusii*, common pipistrelle *Pipistrellus pipistrellus, s*oprano pipistrelle *Pipistrellus pygmaeus* and brown long-eared bat *Plecotus auritus.*

4.64 No direct evidence of bats was found during the survey however some of the trees and buildings within the Site have the potential to support roosting bats. No trees with roost features with high potential were discovered during the survey however some trees with medium potential were observed. Mature willows with peeling bark plates were present in Peaseacre Wood and mature oaks with ivy and sometimes peeling park were present on some boundaries.

4.65 The set of buildings located at Lower Park Farm has high potential to support roosting bats. The buildings have undergone recent renovations however they currently retain openings that would permit the entry and exit of bats. The Park Farm buildings, which were in active use, were considered to have low bat potential.

European hedgehog

4.66 A total of 126 records of hedgehog *Erinaceus europaeus* were returned from within 2 km of the Site. Many of these were located in gardens, especially in Wymondham. Several records were located along the eastern margins of the Site.

4.67 This species is very likely to be present within the Site.

Limitations of the Results

4.68 The area of land that was appraised for the desk study and included in the field survey is that illustrated in Appendix 1 and encompasses approximately 420 ha of land. The area of land that is included in the Illustrative Masterplan is illustrated in Appendix 2 and encompasses approximately 451 ha. The additional parcel of land to the north-east and south of the A11 was not included in those studies.

4.69 The data held by NBIS will largely be limited to locations that are accessible to natural history recorders such as publicly owned land, rights of way and nature reserves whereas the Site is private farmland with limited access.

4.70 The results of the field survey are limited mainly by the time of year of the Site visit. This was outside of the optimal survey season for taxa groups such as plants and invertebrates.

5 Potential Impacts

The approach to identifying potential impacts

5.1 The proposed Silfield Garden Village is at an early stage in its planning with an Illustrative Masterplan having been prepared that informs the consideration of the potential impacts of the proposed development described in this section of the report.

5.2 The locations of the wildlife sites, habitats and species (including potential locations of species based on habitat features) identified in the earlier sections of this report have been matched to the proposed land uses in the Illustrative Masterplan to identify where potential impacts might occur in the absence of mitigation. Where mitigation actions have been identified, either to avoid the impact or reduce the extent of impact, then those actions are included in this section. Actions to enhance habitats or populations of species are separate to mitigation and are described in the section 'Opportunities for Enhancement'.

5.3 The features identified as being the primary ecological constraints and for which actions can be identified at this early stage of the planning for the proposed development are:

i. The presence of a large number and wide geographical spread of ponds with qualities that make them suitable for great crested newt. Some of those ponds are close to an area that is already known to support a high population of great crested newts – the Silfield Newt Reserve County Wildlife Site.
ii. The presence of species rich hedges that would be classified as 'important' hedges under the Hedgerow Regulations, in particular those that mark the boundary of the former deer park.
iii. The presence of an ancient woodland within the Site.

5.4 There are a number of potential types of impact that are common to most large residential developments and relevant to this proposal in South Norfolk. Such impacts can be avoided or reduced in extent by good design in the planning of a new settlement. These potential types of impact include:

- Direct, permanent loss of habitat under the footprint of buildings or infrastructure such as roads.
- Temporary loss of habitat during the construction process such as areas used for materials storage.
- Direct, permanent degradation of habitat through increased public access to sensitive locations.
- Indirect, permanent degradation of habitat through increased air pollution generated by increased traffic.
- Killing or injury of species during the construction process as vegetation is cleared and earth moved.
- Reduction in populations of species through disturbance displacing them from otherwise suitable habitats.

5.5 Targeted species surveys have not been carried out at this stage in the development of the proposal but sufficient information has been gathered to envisage potential impacts on certain species or species groups and that information has been included below. Such targeted surveys are more appropriately carried out when greater detail has been worked up on the proposed development but before an outline application is submitted. Suggestions for such targeted surveys are included in the section 'Recommendations'.

5.6 The sub-sections below are ordered in the same way as the results of the desk study and field survey above.

Designated Sites

5.7 No designated sites lie within the boundary of the Site and hence none will be directly lost under the footprint of the built form of the development (houses or infrastructure).

5.8 There are three CWS which lie close (less than 100 m) from the Site boundary. All three are located to the northwest of the Site and there is the potential for some impact to occur in the limited circumstances that are described below in the sub-sections about these sites.

Railway Pond CWS

5.9 Railway Pond is less than 10 m to the west of the Site boundary. It is separated from the built form of the development by a broad area of open space and sports pitches. Within that open space it is proposed to locate a number of flood attenuation features (SuDS). There is the potential for trespass to occur from the open space and sports pitches but this can be mitigated with suitable fencing and signage. There is the potential for the construction and operation of the SuDS to alter the hydrology of the pond but this can be avoided with suitable design and location of the SuDS.

Bays River Meadows North & South CWSs

5.10 Bays River Meadows South CWS and the Bays River Meadow North CWS are found in the shallow river valley to the west of the Site with the Bays River Meadow North CWS being separated by the railway line. Both CWS are distanced from the built form of the development by a broad area of open space and sports pitches. Within that open space it is proposed to locate a number of flood attenuation features (SuDS). There is the potential for trespass to occur from the open space and sports pitches but this can be mitigated with suitable fencing and signage. There is the potential for the construction and operation of the SuDS to alter the hydrology of the Bays River but this can be avoided with suitable design and location of the SuDS.

Habitats

Ponds

5.11 The Illustrative Masterplan has been designed to retain all twenty two of the ponds that are within the Site with the layout and form of the built development avoiding all the ponds. As a result none will be directly lost under the footprint of the built form of the development.

5.12 Many of the ponds lie in close proximity to areas that will be developed and there is the potential for indirect adverse impacts. Such potential impacts include increased access to the ponds by people and pets potentially damaging the habitat and threatening the populations of animals such as GCN. Some ponds may be left more isolated as a result of existing habitat linkages along natural features such as hedgerows that might be severed by the proposed road network. Ponds which lie in close proximity to roads may potentially suffer a decline in water quality due to pollution run-off.

5.13 Theses impacts could be reduced firstly by improving the condition of many of the ponds where they have become silted and rarely hold water with the aim to restore them to being functional waterbodies. Access to a proportion of the ponds by residents could be discouraged by the planting of dense, thorny vegetation such as blackthorn around the ponds. This would also reduce access by dogs but not discourage cats. The number and extent of the severage of habitat links between ponds should be reduced as far as possible through the design of the road network with the width of breaks in hedges minimised and animal underpasses provided below the roads where severage is unavoidable. Water run-off from the roads should not be directed into any pond but should be contained by an appropriate urban drainage network that has oil and silt traps and the flows directed towards the SuDS before discharge in to natural receiving watercourses.

Watercourses

5.14 The Bays River on the western side of the Site is outside of the built form of the proposed development and as a result direct impacts on it are avoided. There is the potential for the construction and operation of the SuDS to alter the hydrology of the Bays River but this can be

avoided with suitable design and operation of the SuDS. The Bays River lies within, or on the outside boundary of, an extensive area of informal public open space that stretches from north to south along the western side of the Site and this presents significant opportunities to enhance the river that are described below.

5.15 The drain which crosses the Site from east to west runs adjacent to, and through, areas of residential and employment use. Direct impacts can be avoided by not building over and culverting the watercourse except for short stretches where there are road crossings. Any unavoidable culverting can be mitigated by improving the adjacent stretches of watercourse by improving its bed structure and sinuosity and with marginal planting.

Arable

5.16 The large majority of the land to be developed within the Site consists of arable fields and of the habitats present on Site the arable land is of the lowest biodiversity value. The location of the proposed garden village on land which is predominantly arable has avoided alternative locations with greater areas of biodiverse habitats. There are some areas of arable land outside of the built form of the development which are to be converted to open space. This is an enhancement.

Grasslands

5.17 Some small existing areas of grassland will be lost as part of the proposed built form of the development. This includes small areas of semi-improved grassland (G2 and G5), poor semi-improved grassland (G4) and a larger area of amenity grassland (G3) at Park Farm. There are considerable areas of grassland that are created from arable land within the open spaces and this more than offsets the loss of grassland under the footprint of the built development.

Woodlands and copses

5.18 The form of the built development has avoided the ancient woodland Peaseacre Wood, all of the semi-natural broadleaved woodland and all of the other existing areas of plantation woodland with the exception of W4 and a small part of W14. W4 is an even-aged mixed broadleaved plantation woodland on the south side of the A11 which will be completely lost to residential development. W14 is a plantation woodland in the south of the Site and a small part of this is lost to the road infrastructure.

5.19 The retained areas of woodland will have the potential for indirect impacts reduced by placing a buffer around them in which ground works will not occur and will be protected during the construction phase by appropriate fencing. The potential for indirect impacts to the retained ancient woodland Peaseacre Wood will be further reduced by placing a 50 m buffer around it and the potential for impacts on its ground flora as a result of recreational access mitigated through restricting access.

Hedgerow and scattered trees

5.20 Direct impact on the majority of the length of hedgerows across the Site had been avoided. The impact that might occur takes two forms: Complete / partial removal for residential development and the creation of relatively narrow breaks as a result of the layout of the roads.

5.21 There is also the potential for a proportion of the trees found scattered within hedgerows and in fields to be lost.

5.22 The detailed description of potential impacts below is divided in to species-rich hedgerows (five or more 5 woody species) and species poor hedgerows (less than five woody species).

Species-rich hedgerows

5.23 Impact on the longest and the most species rich boundary hedgerows (H1 & H32), which are considered to be the boundaries of the medieval park, has been avoided.

5.24 There is the potential for loss or damage to some species rich hedgerows. H19 in the east of the Site will have ~75% of its length removed as a result of residential and road development. A total of five other species rich hedgerows will have breaks created in them by access roads (H7, H8, H10, H18, & H31). The potential impact on hedgerows should be reduced by minimising so far as possible the length of hedgerow which is removed.

Species-poor hedgerows

5.25 Among the species poor hedges on Site there are four locations where hedges will have breaks created in them by access roads (H4, H17, H18 & H30). The potential impact on hedgerows should be reduced by minimising so far as possible the length of hedgerow which is removed.

Buildings and hard-standing

Park Farm

5.26 The future of the buildings of Park Farm is at present undecided. If demolished this loss would need to be mitigated with respect to bat roosting potential (see below).

Lower Park Farm

5.27 It appears that the buildings of Lower Park Farm will be retained and that there shall be no loss of this habitat.

Protected species

Vascular plants

5.28 The areas that are most likely to support important plant populations are the semi-natural habitats such as the ancient woodland and the layout of the built development avoids such areas. The potential for indirect impacts on the ground flora (e.g. trampling through access) can be mitigated as described under woodland above.

Invertebrates

5.29 The areas that are most likely to support important invertebrate populations are the semi-natural habitats such as the ancient woodland and the layout of the built development avoids such areas.

Great crested newts and other amphibians

5.30 Direct impact on any potential GCN breeding pond has been avoided through the layout of the built development. This also avoids impact on the breeding habitat of other amphibians.

5.31 As described under ponds, indirect impacts to amphibian breeding sites can include damage to the habitat by access, predation by pets, severance of linkages to other ponds and a decline in water quality through road run-off. The mitigation actions for these potential indirect impacts are described under ponds. There is also the potential for the loss of terrestrial feeding habitat but as the majority of the proposed development occurs over arable land that is poor feeding habitat this effect is small and this loss and the loss of small areas of grassland and plantation woodland are mitigated for by the extensive creation of greenspace.

Reptiles

5.32 Direct impact on the large majority of potential reptile habitat has been avoided through the layout of the built development.

5.33 In a similar manner to the amphibians above there is the potential for indirect impacts on reptile populations from disturbance, predation and the fragmentation of habitats but this is mitigated for in a similar manner through the extensive creation of greenspace.

Birds

5.34 The size of the potential impact on bird populations differs significantly between those birds which favour woodland type habitats and those which favour farmland, particularly arable, habitats.

5.35 Since most woody vegetation (woodland, hedgerows and scattered trees) on the Site will be retained any impacts on birds which favour woodland type habitats will be limited. There is the potential for increased disturbance from people which can be mitigated by guiding people away from sensitive areas and the potential for predation from household cats for which little effective mitigation is available.

5.36 The arable habitats on Site will all be lost to the proposed built development or converted to other habitats such as grassland, woodland and wetland (i.e. SuDS). Bird species that depend on open arable habitats will no longer find the Site suitable and consequently there is a large potential impact on such bird populations within the Site. Mitigation for such farmland bird species would, where possible, have to take place off-Site within neighbouring farmland areas.

Brown hare

5.37 Brown hare is a predominantly farmland species and its arable habitats will be lost to the proposed development. Some grassland habitats suitable for brown hare will remain and additional grassland habitat created but this species is sensitive to disturbance by people and dogs and it is likely to be displaced from any grassland habitat. As for farmland bird species, mitigation for brown hare would, where possible, have to take place off-Site within neighbouring farmland areas.

Badger

5.38 Direct impacts on badger breeding sites have been avoided through the layout of the built development. There is the potential for direct impact on badgers through killing or injury as they cross the new roads within and connecting to the proposed development. This can be mitigated by the construction of underpasses where new roads are known to cross existing badger routes.

5.39 There is the potential for indirect impacts on badger populations through loss of grassland feeding habitat but this is mitigated for by the creation of grassland in the proposed open space. There is the potential for indirect impacts on badger populations through the fragmentation of territories and the severance of routes that give access to feeding areas. The underpasses proposed above to avoid road deaths will also avoid such severance from feeding areas.

Water vole

5.40 Direct impact on potential water vole habitat along the Bays River has been avoided through the layout of the built development that is all located away from this watercourse. There is the potential for some limited direct loss of potential water vole habitat along the watercourse which runs east to west across the Site. This can be avoided by the bridges constructed for the access roads that cross the watercourse to be of open span construction rather than built over culverts.

5.41 Indirect impacts such as the potential for increased disturbance of water vole can be mitigated since the Bays River will be retained within a large area of open space and there is the scope to direct people away from the river banks that have the potential to support water vole through the design of the path and cycle way network.

Bats

5.42 Direct impact on potential bat roosts in the Lower Park Farm buildings is avoided by the retention of these buildings. Any direct impact on potential bat roosts in the Park Farm buildings is currently unknown. Any direct impact on potential bat roosts in trees is currently unknown but is not expected to be more than minimal since the areas of woodland lost to the development are all modern plantations with relatively young trees that would not be expected to have cavities and other features that would support roosting bats. The European Protected Species licencing

procedure will require any loss of identified bat roosts to be mitigated by replacement roost creation.

5.43 Potential indirect impact on bats relate primarily to artificial lighting, severance of commuting routes and the loss of foraging habitat. The potential adverse effect of artificial lighting can be mitigated by good lighting design, particularly avoiding light falling on to potential roost sites. The potential adverse effect of severance of commuting routes can be mitigated by minimising so far as possible the length of hedgerow which is removed to enable the road network to pass through existing hedgerows. The potential adverse effect of the loss of foraging habitats is avoided by locating the built development across the arable fields that are poor foraging habitats for bats. The potential effect of the loss of arable land and the loss of small areas of grassland and plantation woodland are mitigated for by the extensive creation of greenspace.

6 Opportunities for Enhancement

6.1 The evaluation of the results of the desk study and field survey and the initial impact assessment has identified a number of potential opportunities for enhancement that can be included within the planning of the proposed new settlement. Where those enhancements relate to the broad scale layout of the proposed development they have already been included within the Illustrative Masterplan. For those enhancements that are at a finer scale or are carried out through detailed design and management then there is the opportunity to include them in the planning that takes place in the preparation of the outline planning application.

6.2 The sub-sections below describing opportunities for enhancement are ordered in the same way as the results of the desk study and field survey and impact assessment above.

Designated Sites

6.3 There is the potential for all three CWS that are close to the Site to be enhanced by improving their quality through additional habitat management.

Habitats

Ponds

6.4 There are opportunities to enhance both the existing ponds on the Site and to enhance the network of ponds across the Site. Many of the existing ponds have become silted and shaded and some rarely hold water. Restorative management could be undertaken. The network of ponds across the Site could be enhanced by creating more ponds at strategic locations and also by creating additional high quality terrestrial habitat which links the ponds together. This would enhance the movement of animals such as amphibians between the ponds.

Watercourses

6.5 The Bays River in the west of the Site is currently a highly artificial channel which is both straight, even profiled, and lacking in natural features. There is great scope to return the Bays River to a more natural state which would provide significant benefits for biodiversity. This would be achieved by sensitively and appropriately re-engineering lost natural features which might include meanders and shallower and more varied bank profiles and would be carried out where both banks of the watercourse are within the proposed development.

Grasslands

6.6 There is a large opportunity for ecological enhancement through grassland creation and management at the Site over and above the offsetting of the loss of small areas of grassland under the footprint of the built development.

6.7 There are extensive areas of open space proposed along the western boundary, centred on the Bays River, and also along the southern boundary that have the potential to become ecologically valuable grassland. Grassland creation should aim for a diverse mixture of grasses and herbs typical of the surrounding area and appropriate to the soils and conditions present on Site. Subsequent management should also aim to maintain a diverse assemblage of grassland species across the grassland area.

Woodlands and copses

6.8 There is a significant opportunity to enhance the network of woodland habitats throughout the Site. By bringing all of the existing woodland in the Site under good management and creating new woody habitat and habitat linkages (including hedgerows) between existing woodland blocks then the Site can be significantly enhanced compared to the existing conditions. Good woodland

management might include the re-establishment of coppicing, particularly in the ancient woodland. Coppicing would need to be accompanied by deer management (fencing and / or culling) for it to be successful. Any new woodland planting which takes place should use locally sourced, disease free stocks, appropriate to the area.

Hedgerow and scattered trees

6.9 New hedgerows should be planned strategically to link existing areas of woody habitat to maximise their benefit and be planted as species rich hedgerows using the range of shrubs already found in species rich hedgerows within the Site. Planting stock should be locally sourced, disease free and appropriate to the area.

Protected Species

Great crested newts and other amphibians

6.10 Enhancement for great crested newts and other amphibians would include creating new ponds surrounded by suitable terrestrial habitat, the improvement of the suitability of the existing ponds and the linking together of the new ponds and the existing ponds with suitable habitat.

Reptiles

6.11 Suitable enhancement for reptiles would include the management of grassland within the open spaces in a way which creates conditions beneficial to reptile populations.

Birds

6.12 The plantation woodlands are relatively young and lack natural cavities for nesting birds and could be enhanced through the erection of nest boxes of various designs suited to the range of bird species nesting in the area.

Badger

6.13 There is the potential to create suitable feeding grounds for badger within the open spaces around the proposed development.

Water vole

6.14 Both the Bays River and the east west running watercourse on Site could be re-designed in a way that increases their naturalness (variation in bed substrate and level, increased sinuosity, leaky dams, marginal planting etc.) that would considerably improve habitat for water vole as well as a range of other riparian (bankside) and aquatic species.

Bats

6.15 The plantation woodlands are relatively young and lack natural cavities for roosting bats and could be enhanced through the erection of roost boxes of various designs suited to the range of bat species present in the area. The conversion of arable land to grassland and the naturalisation of the watercourses will both enhance the foraging opportunities for bats.

7 Recommendations

7.1 The recommendations in this PEA Report are divided in to four categories relating to information gathering, assessment, mitigation and enhancement. Where relevant, timescales are suggested that relate to a future outline planning application process.

Information gathering

7.2 It is recommended that further, more detailed, information is gathered on some habitats and species groups by further field survey in order to better understand the ecological value of the Site, to assess potential impacts and to design mitigation and enhancement measures.

Habitats

7.3 It is recommended that habitat surveys of the ancient woodland (W10), the priority habitat deciduous woodlands (W7 & W11) and the species rich hedgerows are carried out. This would most appropriately be carried out to inform an outline planning application.

Woodland

7.4 The surveys of the woodlands should concentrate on collecting quadrat data in order to relate the habitat to the National Vegetation Classification and to understand better the quality and value of the vegetation including its ground flora, the latter which will be potentially vulnerable to the adverse impacts of recreational access.

Hedgerows

7.5 Those hedgerows which were found to be species rich are considered potentially to qualify as important hedgerows under the Hedgerow Regulations 1997. Further survey will be needed to verify this. The hedgerow surveys should concentrate on collecting information which will allow for a determination to be made as to whether any one hedgerow falls within the definition of an important hedgerow under the Hedgerow Regulations 1997.

Protected species

7.6 It is recommended that surveys for certain protected species are carried out with the timing of those surveys being dependent upon the species.

Great crested newt

7.7 The Site contains a large number of ponds and nearby there are known GCN populations. It is not known to what extent the on-Site ponds support GCN and, based on their location, if any on-Site GCN occupied ponds form part of the same meta-population as that in the Silfield Newt Reserve CWS. Alternatively any on-Site GCN population might form part of one or more additional meta-populations. Understanding this is important to assessing impacts on GCN and, if required, designing appropriate mitigation. This would most appropriately be carried out to inform an outline planning application.

Reptiles

7.8 The presence of any reptile populations on-Site should be identified by a targeted survey of the most suitable habitat. This would most appropriately be carried out to inform an outline planning application.

Farmland birds

7.9 A survey to understand the population of arable habitat dependent farmland birds present on the Site should be carried out. The survey method applied would seek to identify both the range of species present and to estimate their populations. This would most appropriately be carried out to inform an outline planning application.

Badger

7.10 A badger survey should be undertaken in order to identify the locations of any nearby main setts (requiring access to immediately adjacent land given that no main sett has been identified on-Site) and to estimate territory configuration, including an understanding of the relationship between the setts on-Site and feeding areas. This would most appropriately be carried out to inform an outline planning application.

Water vole

7.11 The presence of any water vole populations on-Site should be identified by a targeted survey of the watercourses. This would most appropriately be carried out to inform an outline planning application.

Bats

7.12 An understanding of the population of bats present on-Site and of how they use the site for roosting, commuting and foraging should be established by field survey. This would encompass:

- Establishing presence / absence of bats using either of the two sets of farm buildings as a roost (emergence and / or internal inspection survey).
- A ground level assessment of those trees that are old enough to have developed potential roost features followed up by an aerial inspection or emergence survey(s) as appropriate.
- A combination of transect surveys and static detectors to estimate the nature and scale of commuting and foraging activity.

7.13 This would most appropriately be carried out to inform an outline planning application.

Assessment

Habitats and species

7.14 As the further information on habitats and species is gathered through field survey, as described above, then the assessment contained in this PEA Report should be updated. Similarly, as the detail of the proposed development progresses toward outline application stage then the assessment contained in this PEA Report should be updated.

Biodiversity net gain

7.15 Delivering biodiversity net gain will become an increasingly important part of the development planning process as the Government's Environment Bill passes through its Parliamentary stages and, after Royal Assent, makes the delivery of a 10% biodiversity net gain mandatory.

7.16 As part of the work toward the outline planning application, it is recommended that a biodiversity net gain calculation is undertaken in order to establish the extent to which 10% biodiversity net gain is achieved. With the proposed development occurring primarily on arable land of low biodiversity value and the Illustrative Masterplan identifying considerable areas of greenspace to accompany the development, a 10% net gain on-Site is considered feasible.

Mitigation

7.17 It is recommended that the package of mitigation measures for habitats and species detailed above is included within the proposed development. As the further information on habitats and species is gathered through field survey, as described above, then the mitigation proposals contained in this PEA Report should be updated.

Enhancement

7.18 It is recommended that the package of enhancement measures for habitats and species detailed above is included within the proposed development. As the further information on habitats and species is gathered through field survey, as described above, then the enhancement proposals contained in this PEA Report should be updated.

8 Conclusions

8.1 The Site of the proposed Silfield Garden Village is predominantly arable land which is of low ecological value and there are no designated sites of wildlife value within its boundary. There are some localised habitat features of value including a large number of ponds, semi-natural deciduous woodland and species rich hedgerows.

8.2 An Illustrative Masterplan of the proposed development has been prepared to support the submission of the development as an allocation in the Local Plan. Given the layout of the built development and the extensive greenspace proposed in that Illustrative Masterplan and the knowledge of the Site gained through the desk study, field survey and assessment contained within this PEA Report, it is considered that habitat and species features (biodiversity) do not impose a constraint on the allocation of the Site in the Local Plan.

9 References

CIEEM (2017). *Guidelines for Preliminary Ecological Appraisal* [2nd edition]. Chartered Institute of Ecology and Environmental Management, Winchester.

JNCC (2010). *Handbook for Phase 1 Habitat Survey*. JNCC, Peterborough.

Oldham, R.S., Keeble, J., Swan, M.J.S. & Jeffcote, M. (2000). Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). *Herpetological Journal* 10: 143-155.

10 Figures

F1 Field reference
G1 Grassland reference
W1 Woodland reference
P1 Pond reference
H1 Hedge reference

LEGEND

- Site boundary
- Broadleaved tree
- Ditch / running water
- Species-rich intact hedge
- Species-poor intact hedge
- A — Amenity grassland
- A — Arable
- Broadleaved plantation woodland
- Broadleaved semi-natural woodland
- Building
- Mixed plantation woodland
- SI — Poor semi-improved grassland
- SI — Semi-improved neutral grassland
- Pond
- Pond (dry)

Park Farm

0 1 km

N

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JOB REF: P19-833

PROJECT TITLE
SILFIELD GARDEN VILLAGE

DRAWING TITLE
Figure 1a: Phase 1 Habitat Plan (north of site)

DATE: 05/12/2019 CHECKED: CW SCALE: 1:7,000
DRAWN: COH APPROVED: RB VERSION: 1.3

Sources: BSG Ecology survey data

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F1 Field reference
G1 Grassland reference
W1 Woodland reference
P1 Pond reference
H1 Hedge reference

Lower Park Farm

0 1 km

N

LEGEND

- Site boundary
- Broadleaved tree
- Ditch / running water
- Species-rich intact hedge
- Species-poor intact hedge
- A — Amenity grassland
- A — Arable
- Broadleaved plantation woodland
- Broadleaved semi-natural woodland
- Building
- I — Improved grassland
- Mixed plantation woodland
- SI — Poor semi-improved grassland
- SI — Semi-improved neutral grassland
- Pond
- Pond (dry)
- Tall ruderal

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JOB REF: P19-833

PROJECT TITLE
SILFIELD GARDEN VILLAGE

DRAWING TITLE
Figure 1b: Phase 1 Habitat Plan (south of site)

DATE: 05/12/2019 CHECKED: CW SCALE: 1:7,000
DRAWN: COH APPROVED: RB VERSION: 1.3

Sources: BSG Ecology survey data

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11 Site Photographs

Photo 1: Arable cropping (Parsley), Field 11

Photo 2: Arable cropping (oilseed rape), Field 4

Photo 3: Amenity grassland, Park Farm

Photo 4: Poor semi-improved grass margin, Field

Photo 5: Poor semi-improved grassland, Field 5

Photo 6: Semi-improved grassland, Field 4

Photo 7: Semi-natural ancient woodland, Peaseacre Wood.

Photo 8: Mixed broadleaved plantation woodland, W2a

Photo 9: Single sp. broadleaved plantation woodland, W2b

Photo 10: Mixed broadleaved/ coniferous plantation woodland, W12

Photo 11: Mixed broadleaved plantation woodland, W9

Photo 12: Mixed broadleaved plantation woodland, W9

Photo 13: Species poor hawthorn hedge, H16

Photo 14:Spp. rich hedge on southern boundary, H32

Photo 15:Spp. rich hedge with trees on the NW boundary, H1

Photo 16: Spp. rich closely managed hedgerows, Park Lane (H12 &H6).

Photo 17: Bays River, North of the A11

Photo 18: Watercourse crossing under the main farm track.

Photo 19: Oak pollard with medium bat roost potential, H25

Photo 20: Old oak with high bat roost potential, Peaseacre Wood.

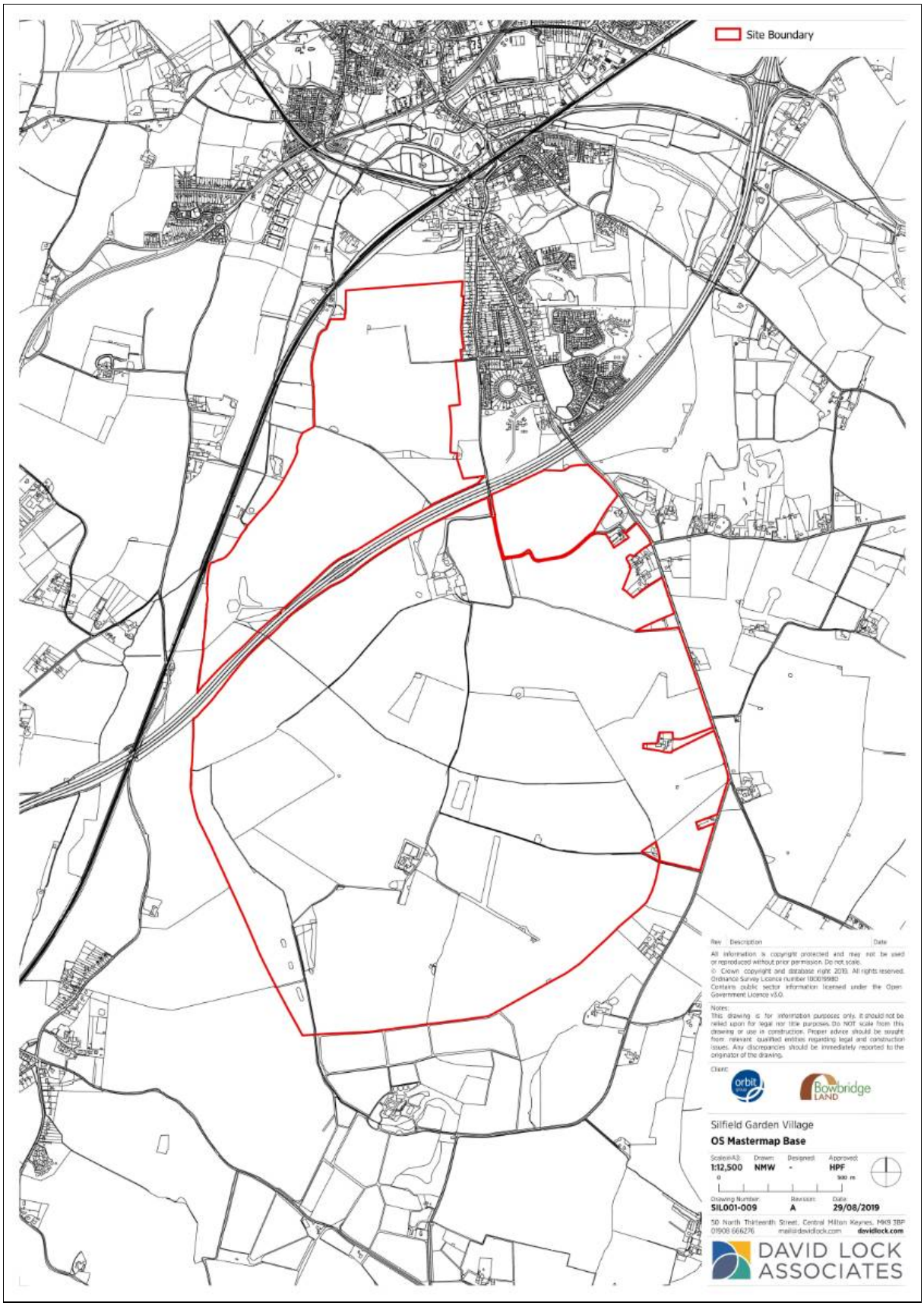
Photo 21: Buildings, Park Farm, Low bat potential

Photo 22: Building, Lower Park Farm, high bat potential.

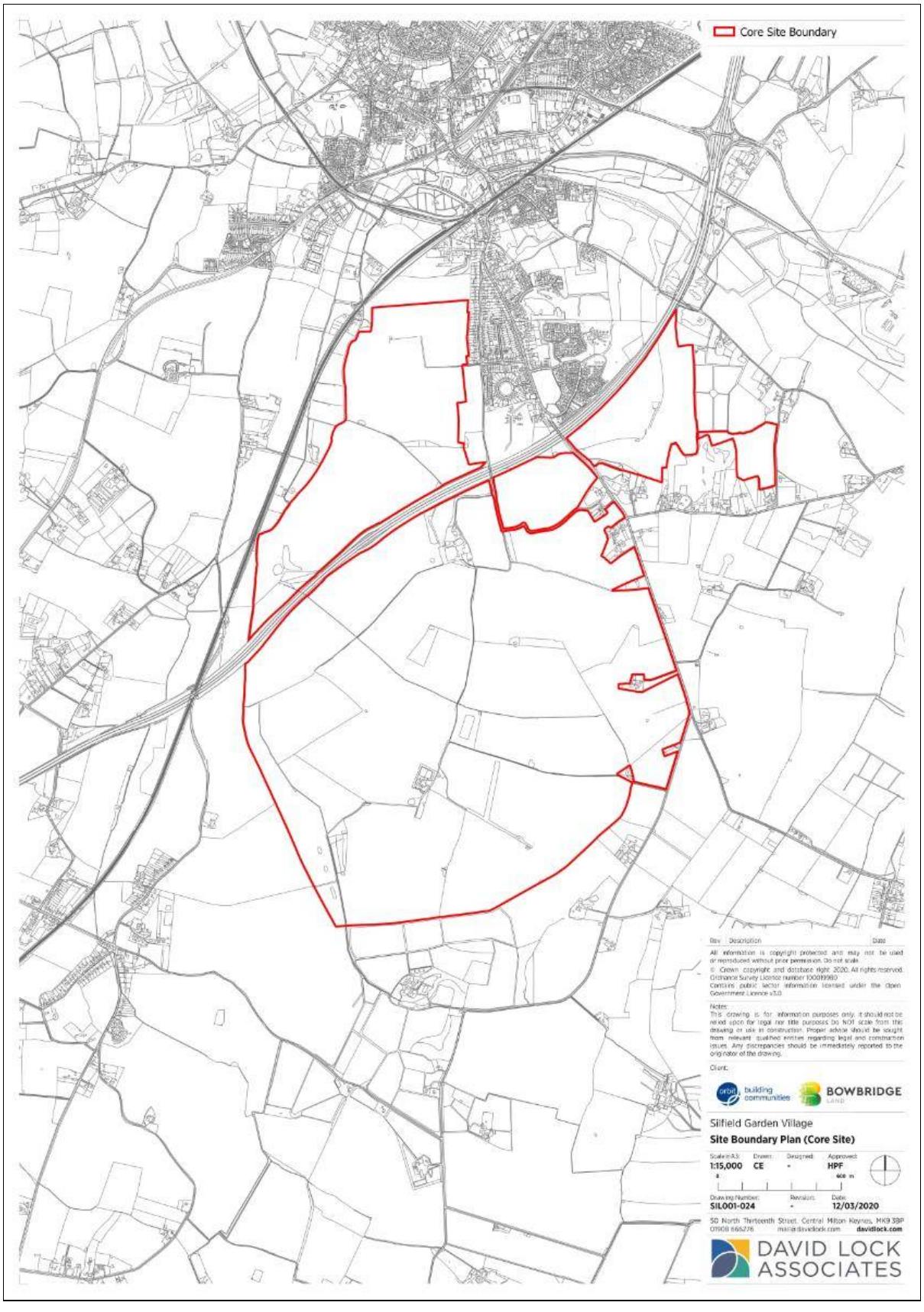
Photo 23: Building, Lower Park Farm, high bat potential.

Photo 24: Building, Lower Park Farm, low bat potential.

Appendix 1: Area of land that is the subject of this PEA Report



Appendix 2: Area of land that is included in the Illustrative Masterplan



Appendix 3: Hedgerow botanical records

The hedgerow reference numbers are identified on Figure 1.

Reference	Length (m)	Woody species	Notable ground flora	Notes
H1	1,815	Acer campestre Acer pseudoplatanus Carpinus betulus Corylus avellana Cornus sanguineus Crateagus mongyna Prunus spinosa Rosa canina agg. Eunonymus europaeus Fraxinus excelsior Quercus robur Ulmus minor aggregate **Number of species: 12**	Humulus lupulus Tammus communis Brachypodium sylvaticum	Species rich hedge forms Eastern boundary of the Site North of the A11. Presumed to be part of the the historic boundary of the former deer park. Contained old oak pollards. Would have been continuous with H25 before construction of the A11.
H2	343	Cornus sanguinea Corylus avellana Crateagus monogyna Prunus spinosa Quercus robur **Number of species: 5**		Spp. rich hedge with standard oaks formed part of the boundary between F1 and F2.
H3	400	Carpinus betulus Corylus avellana Crateagus monogyna Quercus robur **Number of species: 4**		Spp poor hedge with standard oaks formed part of the boundary of F2.
H4	100	Corylus avellana Quercus robur **Number of species: 2**	Mercurialis perennis	Spp hedge formed part of the boundary between F2 and F3.
H5	100	Crateagus monogyna **Number of species: 1**		Isolated section of spp. poor hedge beside Strayground Lane.
H6 Park Lane	270	Acer campestre Carpinus betulus Cornus sanguineus Corylus avellana Ilex aquifolium Ulmus agg. **Number of species: 6**	Hedera helix	Spp rich, well managed hedge beside public road.
H7 Vernons Lane	270	Acer campestre Carpinus betulus Cornus sanguineus Corylus avellana Crateagus monogyna Eunonymus europaeus Ilex aquifolium Prunus spinosa Ulmus agg. **Number of species: 9**		Spp. rich, regularly cut, but gappy hedge by public road.

Reference	Length (m)	Woody species	Notable ground flora	Notes
H8 Vernons Lane	430	Acer campestre Carpinus betulus Cornus sanguineus Corylus avellana Crateagus monogyna Eunonymus europaeus Ilex aquifolium Prunus spinosa Ulmus agg. **Number of species: 9**	Polypodium vulgare	Spp. rich, regularly cut, but gappy hedge by public road.
H9 Park Lane	156	Acer campestre Carpinus betulus Cornus sanguineus Corylus avellana Ilex aquifolium Ulmus agg. **Number of species: 6**		Spp. rich, regularly cut, but gappy hedge by public road.
H10	510	Acer campestre Cornus saguineus Corylus avellana Crateagus monogyna Fraxinus excelsior Ilex aquifolium Quercus robur Prunus spinosa Rosa canina aggregate **Number of species: 9**	Hedera helix	Spp. rich managed hedge with standard oaks beside a PRoW between F17 and F16.
H11 Beside drive to Park Farm	169	Acer campestre Carpinus betulus Cornus sanguineus Corylus avellana Ilex aquifolium Ulmus agg. **Number of species: 6**		Spp. rich hedge managed hedge formed the North boundary of F19.
H12	365	Acer campestre Carpinus betulus Cornus sanguineus Corylus avellana Ilex aquifolium Ulmus agg. **Number of species: 6**		Spp. rich managed hedge beside a public road. Forms West boundary of F19.
H13	166	Crateagus monogyna Fraxinus excelsior Quercus robur **Number of species: 3**		Spp. poor hawthorn hedge with standard oaks/ash. Formed the Southern boundary of F19.
H14	168	Acer campestre Crateagus monogyna Prunus spinosa **Number of species: 3**		Spp. poor section next to the main farm track.
H15	180	Crateagus monogyna **Number of species: 1**		Spp. poor pure hawthorn hedge.
H16	307	Crateagus monogyna **Number of species: 1**		Spp. poor pure hawthorn hedge
H17	582	Crateagus monogyna **Number of species: 1**		Spp. poor pure hawthorn hedge
H18	715	Crateagus monogyna **Number of species: 1**		Spp. poor pure hawthorn hedge

Reference	Length (m)	Woody species	Notable ground flora	Notes
H19	636	Acer campestre A Cornus sanguinea O Corylus avellana F Crateagus monogyna F Fraxinus excelsior O Ilex aquifolium O Prunus spinose O Ulmus procera O **Number of species: 8**		Spp. rich tall hedge outside of the Eastern boundary of the historic deer park.
H20	173	**Number of species: <5**		Isolated fragment of Spp. poor hedge
H21	128	**Number of species:<5**		Isolated fragment of Spp. poor hedge
H22	157	**Number of species:<5**		Isolated fragment of Spp. poor hedge
H23	157	**Number of species:<5**		Isolated fragment of Spp. poor hedge
H24	415	Acer campestre Cornus sanguinea Corylus avellana Crateagus monogyna Eunonymus europaeus Prunus avium Hedera helix **Number of species: 7**		Species-rich managed hedge with ditch beside farm track called Slovenwood Lane.
H25	200	Acer campestre Acer pseudoplatanus Carpinus betulus Corylus avellana Cornus sanguineus Crateagus mongyna Prunus spinosa Rosa agg. Eunonymus europaeus Fraxinus excelsior Quercus robur Ulmus minor aggregate **Number of species: 12**		Species rich hedge presumed to be part of the historic boundary of the former deer park. Contained old oak pollards. Would have been continuous with hedge 1 before construction of the A11.
H26	230	Crateagus monogyna **Number of species: 1**		Spp poor gappy hedge beside farm track and F7 and F8.
H27	155	Acer campestre Acer platanoides Prunus cerasifera Crateagus monogyna Ilex aquifolium **Number of species: 5**		Spp. rich tall hedge beside main farm track. Different spp. composition with several species clearly of planted amenity origin.
H28	411	Crateagus monogyna Prunus spinosa Quercus robur **Number of species: 3**		Spp. poor managed hedge with a ditch a numerous oaks in its southern half.
H29	280	Crateagus monogyna Prunus spinosa Quercus robur **Number of species: 3**		Spp poor managed hedge with gaps.
H30	228	**Number of species: <5**		Spp. poor managed hedge beside farm track.

Reference	Length (m)	Woody species	Notable ground flora	Notes
H31	281	**Number of species: >5**		Spp rich hedge forming part of the boundary between F11 and F12
H32	1,680	Cornus sanguinea Crateagus monogyna Eunonymus europaeus Corylus avellana Prunus spinosa Acer campestre Rosa canina Carpinus betulus Quercus robur Ulmus sp. Viburnum opulus Sambucus nigra Ilex aquifolium Fraxinus excelsior Salix cinerea Salix caprea Acer pseudoplatanus **Number of species: 17**	Mercurialis perennis	Very Spp. rich hedge forming a long sweeping arc at the Southern boundary of the Site. Presumed to be part of the boundary of the historic deer park Set upon a bank and ditch. Old pollard oaks were present.
H33	183	Crateagus monogyna Quercus robur **Number of species 2**		Spp. poor hawthorn hedge with standard oaks forming part of the boundary between F11 and F12.

Appendix 4: Woodland botanical records

The woodland reference numbers are identified on Figure 1.

Reference.	Size (ha)	Woody species	Notable ground flora	Notes
W1	0.5	Acer campestre Corylus avellana Quercus robur	Mercurialis perrenis	Mixed broadleaved planation woodland with relict boundary hedge.
W2a	0.7	Acer campestre Alnus glutinosa Betula pendula Cornus sanguinea Prunus avium Ligustrum ovalifolium Quercus robur Populus tremula		Mixed broadleaved plantation woodland. Probably planted as part of a grant scheme. Circa 20 years old.
W2b	1.0	Alnus cordata	Mercurialis perennis	Single species broadleaved plantation woodland next to the A11 on wet ground. Circa 20-30 years old. Surrounded by an old hedges boundary.
W3 A11	2.0	Acer campestre Alnus cordata Crateagus monogyna Prunus spinosa Rosa canina Quercus robur Viburnum opulus		Mixed broadleaved plantation woodland on the embankments of the A11 which bisects the Site.
W4	0.8	Castanea sativa Crateagus monogyna Ilex aquifolium Prunus avium Quercus robur		Mixed broadleaved plantation woodland. Probably planted as part of a grant scheme. Circa 20 years old.
W5	0.5	Acer campestre Corylus avellana Prunus avium Fagus sylvatica Fraxinua excelsior Quercus robur Tilia sp.		Mixed broadleaved plantation woodland. Probably planted as part of a grant scheme. Circa 20-30 years old.
W6	0.5	Corylus avellana Fraxinus excelsior Prunus avium		Mixed broadleaved plantation woodland. Probably planted as part of a grant scheme. Circa 20 years old.
W7 Lawn Wood	1.1	Querus robur Crateagus monogyna		Semi-natural broadleaved woodland.
W8 Hempfield Wood	1.8	Castanea sativa Sambucus nigra Quercus robur Larix sp. Picea sitchensis	Glechoma hederacea Urtica dioica	Mixed coniferous/ broadleaved plantation woodland used for rearing pheasants.

Reference.	Size (ha)	Woody species	Notable ground flora	Notes
W9	1.8	Carpinus betulus D/A Quercus robur		Mixed broadleaved plantation woodland used for rearing pheasants. Mainly planted with Carpinus betulus with some Quercus robur. Game cover planted in central clearing.
W10 Peaseacre Wood	13.2	Acer campestre Acer pseudoplatanus Corylus avellana Crateagus monogyna Fraxinus excelsior Salix alba	Mercurialis perennis Brachypodium sylvaticum Rubus Fruticosus Glechoma hederacea Alliaria petiolata	The largest woodland block on Site. Registered Ancient woodland. Predominantly semi-natural broadleaved with little evidence of replanting with conifers. Canopy dominated by Fraxinus excelsior with some Acer campestre and a coppice layer of Corylus avellana.
W11 Moat	0.2	Acer campestre O Corylus avellana O Fraxinus excelsior D Salix sp. O		Semi-natural broadleaved woodland from natural regeneration located within the moat at Lower Park Farm. Dominated by Fraxinus excelsior with smaller quantities of other broadleaves.
W12	0.5	Acer campestre Quercus robur Acer pseudoplatanus Cupressus sp.		Mixed broadleaved/ conifer plantation woodland.
W13	0.6	Quercus robur Crateagus monogyna		Mixed broadleaved plantation woodland strip. Less than 20 years old. Relict hedged boundary along one side.
W14	0.6	Acer campestre Quercus robur Cupressus sp.		Mixed broadleaved/conifer plantation woodland .Less than 20 years old. Relict hedged boundary along one side.
W15	1.3	Quercus robur Fraxinus excelsior Cupressus sp.		Mixed broadleaved/conifer plantation woodland. Partial internal felling and replanting.

Appendix 5: Grassland botanical records

The grassland reference numbers are identified on Figure 1.

Reference.	Size (ha)	Species	Notes
G1	0.6	Festuca rubra Arrhenatherum elatius Dactylis glomerata Centaurea nigra Senecio erucifolius Plantago major Galium verum Achillea millefolium Sanguisorba minor Rumex acetosa	Semi-improved grassland. Set aside field corner sown with a mix of grasses and herbs.
G2	0.6	Festuca rubra Dactylis glomerata Hypochearis radicata Scorzoneroides autumnalis Anthriscus sylvestris Plantago lanceolata	Semi-improved grassland. A 6m wide strip following the boundary above the A11 and containing the farm access track. A reasonable range of SI grasses and herbs.
G3	2.0	Lolium perenne Trifolium repens Ranunculus repens	Amenity grassland. Closely mown and managed grassland around the garden of Park Farm.
G4	0.6	Arrhenatherum elatius Dactylis glomerata Holcus lanatus Lolium perenne Agrostis stolonifera Anthriscus sylvestris Lamium album Urtica dioica Glechoma hederacea Cirsium arvense	Poor semi-improved grassland. Relatively species poor with strong ruderal species encroachment.
G5	0.5	Festuca rubra Dactylis glomerata Achillea millefolium Plantago lanceolate Agrimonia eupatorium Linaria vulgaris	Semi-improved grassland with a reasonable range of herbs along a public footpath/ track.
G6	1.0	Festuca rubra Schedonorus arundinacea Heracleum sphondylium	Poor semi-improved grassland. A species poor grassland strip 6m wide running between a watercourse and F6, F6, and F15. Probably designed to buffer the watercourse.
G7	0.6	Lolium perenne Dactylis glomerata	An area of species poor grassland close to Lower Park Farm
G8	1.0	Lolium perenne Dactylis glomerata	An area of species poor grassland at Southern end of F9

Appendix 6: Great crested newt Habitat Suitability Indices per pond

POND 1 TM11269932	
Suitability Index	**Score**
Map location	1.00
Surface area	0.80
Desiccation rate	0.90
Water quality	0.67
Shade	1.00
Waterfowl	1.00
Fish population	0.67
Number of ponds within 1 km	0.33
Terrestrial habitat	0.33
Macrophyte cover (%)	0.31
Mean HSI Score	**0.71**
Pond suitability	**Good**

POND 2-TM11199924	
Suitability Index	**Score**
Map location	1.00
Surface area	0.65
Desiccation rate	0.90
Water quality	0.67
Shade	1.00
Waterfowl	1.00
Fish population	0.67
Number of ponds within 1 km	0.89
Terrestrial habitat	0.33
Macrophyte cover (%)	0.31
Mean HSI Score	**0.69**
Pond suitability	**Average**

POND 3-TM10749855	
Suitability Index	**Score**
Map location	1.00
Surface area	1.00
Desiccation rate	0.90
Water quality	0.33
Shade	1.00
Waterfowl	1.00
Fish population	1.00
Number of ponds within 1 km	1.00
Terrestrial habitat	0.67
Macrophyte cover (%)	0.31
Mean HSI Score	**0.67**
Pond suitability	**Average**

POND 4-TM10879850	
Suitability Index	**Score**
Map location	1.00
Surface area	0.10
Desiccation rate	0.90
Water quality	0.67
Shade	1.00
Waterfowl	1.00
Fish population	0.67
Number of ponds within 1 km	1.00
Terrestrial habitat	0.67
Macrophyte cover (%)	0.36
Mean HSI Score	**0.63**
Pond suitability	**Average**

POND 5 TM10879805	
Suitability Index	**Score**
Map location	1.00
Surface area	0.55
Desiccation rate	1.00
Water quality	0.67
Shade	0.30
Waterfowl	1.00
Fish population	1.00
Number of ponds within 1 km	1.00
Terrestrial habitat	0.33
Macrophyte cover (%)	0.31
Mean HSI Score	**0.64**
Pond suitability	**Average**

POND 6- TM10769793	
Suitability Index	**Score**
Map location	1.00
Surface area	0.45
Desiccation rate	0.90
Water quality	0.67
Shade	1.00
Waterfowl	1.00
Fish population	0.67
Number of ponds within 1 km	1.00
Terrestrial habitat	0.67
Macrophyte cover (%)	0.33
Mean HSI Score	**0.67**
Pond suitability	**Good**

POND 7- TM10759771	
Suitability Index	**Score**
Map location	1.00
Surface area	0.45
Desiccation rate	0.90
Water quality	0.67
Shade	1.00
Waterfowl	1.00
Fish population	0.67
Number of ponds within 1 km	1.00
Terrestrial habitat	0.67
Macrophyte cover (%)	0.33
Mean HSI Score	**0.73**
Pond suitability	**Good**

POND 8- TM11259772	
Suitability Index	**Score**
Map location	1.00
Surface area	1.00
Desiccation rate	1.00
Water quality	0.67
Shade	0.70
Waterfowl	1.00
Fish population	1.00
Number of ponds within 1 km	1.00
Terrestrial habitat	0.33
Macrophyte cover (%)	0.31
Mean HSI Score	**0.74**
Pond suitability	**Good**

POND 9- TM11719767	
Suitability Index	**Score**
Map location	1.00
Surface area	0.10
Desiccation rate	0.50
Water quality	0.67
Shade	0.20
Waterfowl	1.00
Fish population	1.00
Number of ponds within 1 km	1.00
Terrestrial habitat	0.33
Macrophyte cover (%)	0.31
Mean HSI Score	**0.48**
Pond suitability	**Poor**

POND 10- TM 12239 98460	
Suitability Index	**Score**
Map location	1.00
Surface area	0.10
Desiccation rate	0.90
Water quality	0.67
Shade	1.00
Waterfowl	1.00
Fish population	0.67
Number of ponds within 1 km	1.00
Terrestrial habitat	0.33
Macrophyte cover (%)	0.51
Mean HSI Score	**0.61**
Pond suitability	**Average**

POND 11- TM 12183 98917	
Suitability Index	**Score**
Map location	1.00
Surface area	0.10
Desiccation rate	0.50
Water quality	0.67
Shade	0.20
Waterfowl	1.00
Fish population	1.00
Number of ponds within 1 km	1.00
Terrestrial habitat	0.33
Macrophyte cover (%)	0.31
Mean HSI Score	**0.48**
Pond suitability	**Poor**

POND 12- TM 11597 98846	
Suitability Index	**Score**
Map location	1.00
Surface area	0.40
Desiccation rate	0.10
Water quality	0.67
Shade	0.20
Waterfowl	1.00
Fish population	1.00
Number of ponds within 1 km	1.00
Terrestrial habitat	0.67
Macrophyte cover (%)	0.31
Mean HSI Score	**0.51**
Pond suitability	**Below average**

POND 13- TG 10994 00316	
Suitability Index	**Score**
Map location	1.00
Surface area	0.30
Desiccation rate	0.10
Water quality	0.67
Shade	0.20
Waterfowl	1.00
Fish population	1.00
Number of ponds within 1 km	1.00
Terrestrial habitat	0.33
Macrophyte cover (%)	0.31
Mean HSI Score	**0.46**
Pond suitability	**Poor**

POND 14- TM 11342 99805	
Suitability Index	**Score**
Map location	1.00
Surface area	0.90
Desiccation rate	0.10
Water quality	0.67
Shade	0.20
Waterfowl	1.00
Fish population	1.00
Number of ponds within 1 km	0.95
Terrestrial habitat	0.33
Macrophyte cover (%)	0.31
Mean HSI Score	**0.51**
Pond suitability	**Below average**

POND 15- TM 11184 98927	
Suitability Index	**Score**
Map location	1.00
Surface area	0.75
Desiccation rate	0.90
Water quality	0.67
Shade	0.20
Waterfowl	1.00
Fish population	0.67
Number of ponds within 1 km	1.00
Terrestrial habitat	0.67
Macrophyte cover (%)	0.51
Mean HSI Score	**0.68**
Pond suitability	**Average**

POND 16- TM 11121 98193	
Suitability Index	**Score**
Map location	1.00
Surface area	0.80
Desiccation rate	0.90
Water quality	0.67
Shade	1.00
Waterfowl	1.00
Fish population	0.33
Number of ponds within 1 km	1.00
Terrestrial habitat	0.67
Macrophyte cover (%)	0.36
Mean HSI Score	**0.72**
Pond suitability	**Good.**

POND 17- TM 11150 98057	
Suitability Index	**Score**
Map location	1.00
Surface area	0.35
Desiccation rate	0.90
Water quality	0.67
Shade	0.20
Waterfowl	1.00
Fish population	0.67
Number of ponds within 1 km	1.00
Terrestrial habitat	0.67
Macrophyte cover (%)	0.33
Mean HSI Score	**0.60**
Pond suitability	**Average**

POND 18- TM 11097 98061	
Suitability Index	**Score**
Map location	1.00
Surface area	0.35
Desiccation rate	0.90
Water quality	0.67
Shade	0.20
Waterfowl	1.00
Fish population	0.67
Number of ponds within 1 km	1.00
Terrestrial habitat	0.67
Macrophyte cover (%)	0.33
Mean HSI Score	**0.60**
Pond suitability	**Average**

POND 19-TM 11618 97885	
Suitability Index	**Score**
Map location	1.00
Surface area	0.55
Desiccation rate	0.50
Water quality	0.67
Shade	0.20
Waterfowl	1.00
Fish population	1.00
Number of ponds within 1 km	1.00
Terrestrial habitat	0.33
Macrophyte cover (%)	0.31
Mean HSI Score	**0.57**
Pond suitability	**Below average**

POND 20- TM 11659 97843	
Suitability Index	**Score**
Map location	1.00
Surface area	0.50
Desiccation rate	0.50
Water quality	0.67
Shade	0.20
Waterfowl	1.00
Fish population	1.00
Number of ponds within 1 km	1.00
Terrestrial habitat	0.33
Macrophyte cover (%)	0.31
Mean HSI Score	**0.57**
Pond suitability	**Below average**

POND 21- TM11659823	
Suitability Index	**Score**
Map location	1.00
Surface area	1.00
Desiccation rate	0.90
Water quality	0.67
Shade	0.40
Waterfowl	0.67
Fish population	0.67
Number of ponds within 1 km	1.00
Terrestrial habitat	0.33
Macrophyte cover (%)	0.36
Mean HSI Score	**0.65**
Pond suitability	**Average**

POND 22- TM11429849	
Suitability Index	**Score**
Map location	1.00
Surface area	0.30
Desiccation rate	0.10
Water quality	0.67
Shade	0.20
Waterfowl	1.00
Fish population	1.00
Number of ponds within 1 km	1.00
Terrestrial habitat	0.67
Macrophyte cover (%)	0.31
Mean HSI Score	**0.49**
Pond suitability	**Poor**

Appendix 7: Summary of biological records provided by NBIS

Common Name	Scientific Name	Taxon Group	Number of Records	Designation
Bird's-nest Orchid	Neottia nidus-avis	flowering plant	1	CITESB, NRPl, RLENG.VU, RLGB.Lr(NT), WO8i
Mossy Stonecrop	Crassula tillaea	flowering plant	1	NRPl, NS-excludes
Small-flowered Catchfly	Silene gallica	flowering plant	1	FEP7/2, NRPl, NS-excludes, RLENG.EN, RLGB.EN, ScotBL, Sect.41, Sect.42, UKBAP
Scarce Emerald Damselfly	Lestes dryas	insect - dragonfly (Odonata)	1	RLGB.Lr(NT)
Semi-aquatic bugs	Hebrus (Hebrus) pusillus	insect - true bug (Hemiptera)	1	Nb
Gyrinus natator	Gyrinus natator	insect - beetle (Coleoptera)	1	RLGB.RE
Haliplus (Liaphlus) mucronatus	Haliplus (Liaphlus) mucronatus	insect - beetle (Coleoptera)	1	Na, NS-excludes
Enochrus nigritus	Enochrus nigritus	insect - beetle (Coleoptera)	2	Breck_Special, RLGB.Lr(NT)
Enochrus quadripunctatus	Enochrus quadripunctatus	insect - beetle (Coleoptera)	2	Breck_Special, NS-excludes, ScotBL
Black Oil-beetle	Meloe proscarabaeus	insect - beetle (Coleoptera)	1	Sect.41, Sect.42, UKBAP
Black-headed Cardinal Beetle	Pyrochroa coccinea	insect - beetle (Coleoptera)	1	Nb
Ghost Moth	Hepialus humuli	insect - moth	12	ScotBL, Sect.41, Sect.42, UKBAP
White Admiral	Limenitis camilla	insect - butterfly	2	RLGB.VU, Sect.41, Sect.42, UKBAP
White-letter Hairstreak	Satyrium w-album	insect - butterfly	1	RLGB.EN, Sect.41, Sect.42, UKBAP, WCA5/9.5a
Small Blue	Cupido minimus	insect - butterfly	1	FEP7/2, RLGB.Lr(NT), ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.5a, WO5
Bulrush Veneer	Calamotropha paludella	insect - moth	1	Nb
Oak Hook-tip	Watsonalla binaria	insect - moth	1	ScotBL, Sect.41, Sect.42, UKBAP
Blood-vein	Timandra comae	insect - moth	2	ScotBL, Sect.41, Sect.42, UKBAP
Oblique Striped	Phibalapteryx virgata	insect - moth	1	Breck_Special
Shaded Broad-bar	Scotopteryx chenopodiata	insect - moth	7	ScotBL, Sect.41, Sect.42, UKBAP
Small Phoenix	Ecliptopera silaceata	insect - moth	4	ScotBL, Sect.41, Sect.42, UKBAP
Latticed Heath	Chiasmia clathrata	insect - moth	1	ScotBL, Sect.41, Sect.42, UKBAP
Dusky Thorn	Ennomos fuscantaria	insect - moth	8	Sect.41, Sect.42, UKBAP
Brindled Beauty	Lycia hirtaria	insect - moth	1	ScotBL, Sect.41, Sect.42, UKBAP
Buff Ermine	Spilosoma lutea	insect - moth	11	ScotBL, Sect.41, Sect.42, UKBAP
White Ermine	Spilosoma lubricipeda	insect - moth	10	ScotBL, Sect.41, Sect.42, UKBAP

Common Name	Scientific Name	Taxon Group	Number of Records	Designation
Cinnabar	Tyria jacobaeae	insect - moth	7	ScotBL, Sect.41, Sect.42, UKBAP
Knot Grass	Acronicta rumicis	insect - moth	2	ScotBL, Sect.41, Sect.42, UKBAP
Mouse Moth	Amphipyra tragopoginis	insect - moth	3	ScotBL, Sect.41, Sect.42, UKBAP
Sprawler	Asteroscopus sphinx	insect - moth	6	Sect.41, Sect.42, UKBAP
Green-brindled Crescent	Allophyes oxyacanthae	insect - moth	4	ScotBL, Sect.41, Sect.42, UKBAP
Mottled Rustic	Caradrina morpheus	insect - moth	5	ScotBL, Sect.41, Sect.42, UKBAP
Rustic	Hoplodrina blanda	insect - moth	7	ScotBL, Sect.41, Sect.42, UKBAP
Crescent	Helotropha leucostigma	insect - moth	1	ScotBL, Sect.41, Sect.42, UKBAP
Rosy Rustic	Hydraecia micacea	insect - moth	2	ScotBL, Sect.41, Sect.42, UKBAP
Large Wainscot	Rhizedra lutosa	insect - moth	2	ScotBL, Sect.41, Sect.42, UKBAP
Large Nutmeg	Apamea anceps	insect - moth	4	ScotBL, Sect.41, Sect.42, UKBAP
Sallow	Cirrhia icteritia	insect - moth	1	ScotBL, Sect.41, Sect.42, UKBAP
Beaded Chestnut	Agrochola lychnidis	insect - moth	2	ScotBL, Sect.41, Sect.42, UKBAP
Brown-spot Pinion	Agrochola litura	insect - moth	1	ScotBL, Sect.41, Sect.42, UKBAP
Minor Shoulder-knot	Brachylomia viminalis	insect - moth	2	ScotBL, Sect.41, Sect.42, UKBAP
Dark Brocade	Mniotype adusta	insect - moth	1	ScotBL, Sect.41, Sect.42, UKBAP
Powdered Quaker	Orthosia gracilis	insect - moth	3	ScotBL, Sect.41, Sect.42, UKBAP
Dot Moth	Melanchra persicariae	insect - moth	10	ScotBL, Sect.41, Sect.42, UKBAP
Small Square-spot	Diarsia rubi	insect - moth	6	ScotBL, Sect.41, Sect.42, UKBAP
Triglyphus primus	Triglyphus primus	insect - true fly (Diptera)	1	N, NS-excludes
Swollen-thighed Blood Bee	Sphecodes crassus	insect - hymenopteran	1	Nb
Dolichovespula (Dolichovespula) media	Dolichovespula (Dolichovespula) media	insect - hymenopteran	1	Na
Large Garden (Ruderal) Bumblebee	Bombus ruderatus	insect - hymenopteran	1	FEP7/2, Nb, Sect.41, Sect.42, UKBAP
Smooth Newt	Lissotriton vulgaris	amphibian	10	Bern3, WCA5/9.5a, WO5
Great Crested Newt	Triturus cristatus	amphibian	100	Bern2, FEP7/2, HabRegs2, HSD2p, HSD4, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a
Common Toad	Bufo bufo	amphibian	13	Bern3, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.5a
Common Frog	Rana temporaria	amphibian	13	Bern3, HSD5, WCA5/9.5a
Common Lizard	Zootoca vivipara	reptile	2	Bern3, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.1k/l, WCA5/9.5a, WO5
Slow-worm	Anguis fragilis	reptile	3	Bern3, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.1k/l, WCA5/9.5a
Grass Snake	Natrix helvetica	reptile	8	Bern3, Sect.41, Sect.42, UKBAP, WCA5/9.1k/l, WCA5/9.5a

Common Name	Scientific Name	Taxon Group	Number of Records	Designation
Bewick's Swan	Cygnus columbianus subsp. bewickii	bird	3	BAmb, BD1, Bern2, CMS_A2, CMS_AEWA-A2, ScotBL, Sect.41, Sect.42, UKBAP, WCA1i, WO1i
Bewick's Swan	Cygnus columbianus subsp. bewickii	bird	1	BAmb, BD1, Bern2, CMS_A2, CMS_AEWA-A2, ScotBL, WCA1i, WO1i
Whooper Swan	Cygnus cygnus	bird	1	BAmb, BD1, Bern2, CMS_A2, CMS_AEWA-A2, FEP7/2, ScotBL, WCA1i, WO1i
Pink-footed Goose	Anser brachyrhynchus	bird	1	BAmb, BD2.2, CMS_A2, CMS_AEWA-A2
Little Egret	Egretta garzetta	bird	7	BD1, Bern2, CITESA, CMS_AEWA-A2
Great White Egret	Ardea alba	bird	1	Bern2, CITESA, CMS_AEWA-A2
Grey Heron	Ardea cinerea	bird	1	CMS_AEWA-A2, WO1i
Grey Partridge	Perdix perdix	bird	1	BD2.1, BRed, FEP7/2, ScotBL, Sect.41, Sect.42, UKBAP
Quail	Coturnix coturnix	bird	3	BAmb, BD2.2, WCA1i, WO1i
Red Kite	Milvus milvus	bird	3	BD1, CITESA, CMS_A2, FEP7/2, RLGLB.NT, ScotBL, WCA1i
Milvus milvus subsp. milvus	Milvus milvus subsp. milvus	bird	8	BD1, CITESA, CMS_A2, FEP7/2, RLGLB.NT, ScotBL, WCA1i
Marsh Harrier	Circus aeruginosus	bird	1	BAmb, BD1, CITESA, CMS_A2, FEP7/2, ScotBL, WCA1i, WO1i
Sparrowhawk	Accipiter nisus	bird	2	CITESA, CMS_A2, WO1i
Buzzard	Buteo buteo	bird	13	CITESA, CMS_A2, WO1i
Rough-legged Buzzard	Buteo lagopus	bird	2	CITESA, CMS_A2
Hobby	Falco subbuteo	bird	7	Bern2, CITESA, CMS_A2, ScotBL, WCA1i
Peregrine	Falco peregrinus	bird	4	BD1, Bern2, CITESA, CMS_A2, ScotBL, WCA1i, WO1i
Golden Plover	Pluvialis apricaria	bird	2	BD1, BD2.2, CMS_A2, CMS_AEWA-A2, FEP7/2, ScotBL, Sect.42, WO1ii
Snipe	Gallinago gallinago	bird	1	BAmb, BD2.1, CMS_A2, CMS_AEWA-A2, FEP7/2
Woodcock	Scolopax rusticola	bird	2	BD2.1, BRed, CMS_A2, CMS_AEWA-A2, ScotBL
Lesser Black-backed Gull	Larus fuscus	bird	1	BAmb, BD2.2, CMS_AEWA-A2
Yellow-legged Gull	Larus michahellis	bird	3	BAmb
Stock Dove	Columba oenas	bird	2	BAmb, BD2.2
Turtle Dove	Streptopelia turtur	bird	13	BD2.2, BRed, CITESA, FEP7/2, ScotBL, Sect.41, Sect.42, UKBAP, WO1i
Cuckoo	Cuculus canorus	bird	3	BRed, ScotBL, Sect.41, Sect.42, UKBAP
Barn Owl	Tyto alba	bird	35	Bern2, CITESA, FEP7/2, ScotBL, WCA1i, WO1i
Little Owl	Athene noctua	bird	11	Bern2, CITESA
Tawny Owl	Strix aluco	bird	8	BAmb, Bern2, CITESA
Long-eared Owl	Asio otus	bird	1	Bern2, CITESA, WO1i

Common Name	Scientific Name	Taxon Group	Number of Records	Designation
Short-eared Owl	Asio flammeus	bird	2	BAmb, BD1, Bern2, CITESA, FEP7/2, ScotBL, WO1i
Swift	Apus apus	bird	34	BAmb, ScotBL
Kingfisher	Alcedo atthis	bird	31	BAmb, BD1, Bern2, FEP7/2, ScotBL, WCA1i, WO1i
Wryneck	Jynx torquilla	bird	1	Bern2, ScotBL, UKBAP, WCA1i
Green Woodpecker	Picus viridis	bird	9	Bern2
Great Spotted Woodpecker	Dendrocopos major	bird	3	Bern2
Lesser Spotted Woodpecker	Dendrocopos minor	bird	7	Bern2, BRed, FEP7/2
Willow Warbler	Phylloscopus trochilus	bird	1	BAmb
Woodlark	Lullula arborea	bird	1	BD1, Breck_Special, FEP7/2, Sect.41, Sect.42, UKBAP, WCA1i
Skylark	Alauda arvensis	bird	17	BD2.2, BRed, FEP7/2, ScotBL, Sect.41
Swallow	Hirundo rustica	bird	1	Bern2
House Martin	Delichon urbicum	bird	1	BAmb, Bern2
Meadow Pipit	Anthus pratensis	bird	1	BAmb, Bern2
Grey Wagtail	Motacilla cinerea	bird	16	Bern2, BRed
Pied Wagtail	Motacilla alba	bird	4	Bern2
Pied Wagtail	Motacilla alba subsp. yarrellii	bird	3	Bern2
Waxwing	Bombycilla garrulus	bird	22	Bern2
Wren	Troglodytes troglodytes	bird	2	Bern2
Dunnock	Prunella modularis	bird	1	BAmb, Bern2
Robin	Erithacus rubecula	bird	1	Bern2
Black Redstart	Phoenicurus ochruros	bird	5	Bern2, BRed, WCA1i
Ring Ouzel	Turdus torquatus	bird	2	Bern2, BRed, FEP7/2, ScotBL, Sect.41, Sect.42, UKBAP, WO1i
Fieldfare	Turdus pilaris	bird	7	BD2.2, BRed, WCA1i, WO1i
Song Thrush	Turdus philomelos	bird	28	BD2.2, BRed, FEP7/2, ScotBL
Redwing	Turdus iliacus	bird	1	BD2.2, BRed, ScotBL, WCA1i
Mistle Thrush	Turdus viscivorus	bird	2	BD2.2, BRed
Spotted Flycatcher	Muscicapa striata	bird	5	Bern2, BRed, CMS_A2, FEP7/2, ScotBL, Sect.41, Sect.42, UKBAP
Pied Flycatcher	Ficedula hypoleuca	bird	1	BRed, CMS_A2, Sect.42, WO1i
Firecrest	Regulus ignicapilla	bird	3	Bern2, WCA1i, WO1i
Blue Tit	Cyanistes caeruleus	bird	1	Bern2
Great Tit	Parus major	bird	1	Bern2
Coal Tit	Periparus ater	bird	1	Bern2
Marsh Tit	Poecile palustris	bird	3	Bern2, BRed
Nuthatch	Sitta europaea	bird	3	Bern2

Common Name	Scientific Name	Taxon Group	Number of Records	Designation
Treecreeper	Certhia familiaris	bird	1	Bern2
Great Grey Shrike	Lanius excubitor	bird	2	Bern2
Starling	Sturnus vulgaris	bird	6	BD2.2, BRed, FEP7/2
House Sparrow	Passer domesticus	bird	13	BRed, ScotBL, Sect.41, Sect.42, UKBAP
Tree Sparrow	Passer montanus	bird	3	BRed, FEP7/2, ScotBL, Sect.41, Sect.42, UKBAP
Lesser Redpoll	Acanthis cabaret	bird	1	BRed, ScotBL, Sect.41, Sect.42, UKBAP
Greenfinch	Chloris chloris	bird	2	Bern2
Goldfinch	Carduelis carduelis	bird	3	Bern2
Common Crossbill	Loxia curvirostra	bird	3	Bern2, WCA1i, WO1i
Bullfinch	Pyrrhula pyrrhula	bird	13	BAmb, FEP7/2, ScotBL
Yellowhammer	Emberiza citrinella	bird	9	Bern2, BRed, FEP7/2, ScotBL, Sect.41, Sect.42, UKBAP
Reed Bunting	Emberiza schoeniclus	bird	1	BAmb, Bern2, FEP7/2, ScotBL, Sect.41, Sect.42, UKBAP
West European Hedgehog	Erinaceus europaeus	terrestrial mammal	126	Bern3, ScotBL, Sect.41, Sect.42, UKBAP
Bats	Chiroptera	terrestrial mammal	1	Bern2, Bern3, CMS_A2, CMS_EUROBATS-A1, FEP7/2, HabRegs2, HSD2p, HSD4, RLGLB.NT, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a
Western Barbastelle	Barbastella barbastellus	terrestrial mammal	45	Bern2, CMS_A2, CMS_EUROBATS-A1, FEP7/2, HabRegs2, HSD2p, HSD4, RLGLB.NT, Sect.41, Sect.42, UKBAP, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a
Serotine	Eptesicus serotinus	terrestrial mammal	15	Bern2, CMS_A2, CMS_EUROBATS-A1, FEP7/2, HabRegs2, HSD4, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a
Unidentified Bat	Myotis	terrestrial mammal	1	Bern2, CMS_A2, CMS_EUROBATS-A1, FEP7/2, HabRegs2, HSD2p, HSD4, RLGLB.NT, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a
Whiskered/Brandt's Bat	Myotis mystacinus/brandtii	terrestrial mammal	4	CMS_A2, HabRegs2, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a
Daubenton's Bat	Myotis daubentonii	terrestrial mammal	26	Bern2, CMS_A2, CMS_EUROBATS-A1, FEP7/2, HabRegs2, HSD4, ScotBL, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a
Natterer's Bat	Myotis nattereri	terrestrial mammal	28	Bern2, CMS_A2, CMS_EUROBATS-A1, FEP7/2, HabRegs2, HSD4, ScotBL, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a
Noctule Bat	Nyctalus noctula	terrestrial mammal	25	Bern2, CMS_A2, CMS_EUROBATS-A1, FEP7/2, HabRegs2, HSD4, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a

Common Name	Scientific Name	Taxon Group	Number of Records	Designation
Pipistrelle Bat species	Pipistrellus	terrestrial mammal	1	Bern2, Bern3, CMS_A2, CMS_EUROBATS-A1, FEP7/2, HabRegs2, HSD4, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a
Pipistrelle	Pipistrellus pipistrellus sensu lato	terrestrial mammal	151	Bern2, Bern3, CMS_A2, CMS_EUROBATS-A1, FEP7/2, HabRegs2, HSD4, ScotBL, Sect.42, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a
Nathusius's Pipistrelle	Pipistrellus nathusii	terrestrial mammal	1	Bern2, CMS_A2, CMS_EUROBATS-A1, HabRegs2, HSD4, ScotBL, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a
Common Pipistrelle	Pipistrellus pipistrellus sensu stricto	terrestrial mammal	1	CMS_A2, CMS_EUROBATS-A1, HabRegs2, HSD4, Sect.42, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a
Soprano Pipistrelle	Pipistrellus pygmaeus	terrestrial mammal	127	Bern2, CMS_A2, CMS_EUROBATS-A1, HabRegs2, HSD4, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a
Long-eared Bat species	Plecotus	terrestrial mammal	1	Bern2, CMS_A2, CMS_EUROBATS-A1, FEP7/2, HabRegs2, HSD4, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a
Brown Long-eared Bat	Plecotus auritus	terrestrial mammal	45	Bern2, CMS_A2, CMS_EUROBATS-A1, FEP7/2, HabRegs2, HSD4, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a
European Otter	Lutra lutra	terrestrial mammal	5	Bern2, CITESA, FEP7/2, HabRegs2, HSD2p, HSD4, RLGLB.NT, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a
Eurasian Badger	Meles meles	terrestrial mammal	8	Bern3, PBA, WO5
European Water Vole	Arvicola amphibius	terrestrial mammal	98	FEP7/2, ScotBL, Sect.41, Sect.42, UKBAP, WCA5/9.4.a, WCA5/9.4b, WCA5/9.4c
Brown Hare	Lepus europaeus	terrestrial mammal	27	FEP7/2, ScotBL, Sect.41, Sect.42, UKBAP

Appendix 8: Summaries of Relevant Policy, Legislation and Other Instruments

This section briefly summarises the legislation, policy and related issues that are relevant to the main text of the report. The following text does not constitute legal or planning advice.

National Planning Policy Framework (England)

11.1 The Government revised the National Planning Policy Framework (NPPF) on 19 February 2019. Text excerpts from the NPPF are shown where they may be relevant to planning applications and biodiversity including protected sites, habitats and species.

11.2 The Government sets out the three objectives for sustainable development (economy, social and environmental) at paragraphs 8-10 to be delivered through the plan preparation and implementation level and 'are not criteria against which every decision can or should be judged.' At paragraph 8c) the planning system's environmental objective refers to 'protecting and enhancing our natural, built and historic environment' and to 'helping to improve biodiversity'

11.3 In conserving and enhancing the natural environment, the NPPF (Paragraph 170) states that 'planning policies and decisions should contribute to and enhance the natural and local environment' by:

- Protecting and enhancing...sites of biodiversity value... '(in a manner commensurate with their statutory status or identified quality in the development plan)'.
- Recognising the wider benefits from natural capital and ecosystem services including trees and woodland.
- Minimising impacts on and providing net gains 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.

11.4 In respect of protected sites, at paragraph 171, the NPPF requires local planning authorities to distinguish, at the plan level, '…between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value...take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries.'

11.5 Paragraph 174 refers to how plans should aim to protect and enhance biodiversity. Plans should: 'identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity [a footnote refers to ODPM Circular 06/2005 for further guidance in respect of statutory obligations for biodiversity in the planning system], wildlife corridors and stepping stones that connect them and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation;' and to 'promote the conservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.'

11.6 Paragraph 175 advises that, when determining planning applications, '…local planning authorities should apply the following principles:

a. if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;

b. development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments) should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;

c. development resulting in the loss or deterioration of irreplaceable habitats, (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and

d. development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.'

11.7 In paragraph 176, the following should be given the same protection as habitats sites[1]:

i. potential Special Protection Areas and possible Special Areas of Conservation

ii. listed or proposed Ramsar sites; and

iii. sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.'

11.8 In paragraph 177 the NPPF refers back to sustainable development in relation to appropriate assessment and states: 'the presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site'.

11.9 In paragraph 178, the NPPF refers to planning policies and decisions taking account of ground conditions and risks arising from land instability and contamination at sites. In relation to risks associated with land remediation account is to be taken of 'potential impacts on the natural environment' that arise from land remediation.

11.10 In paragraph 180 the NPPF states that planning policies and decisions should ensure that development is appropriate to the location and take into account likely effects (including cumulative) on the natural environment and , in doing so, they 'should limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.'

Government Circular ODPM 06/2005 Biodiversity and Geological Conservation (England only)

11.11 Paragraph 98 of Government Circular 06/2005 advises that "the presence of a protected species is a material consideration when a planning authority is considering a development proposal that, if carried out, would be likely to result in harm to the species or its habitat. Local authorities should consult Natural England before granting planning permission. They should consider attaching appropriate planning conditions or entering into planning obligations under which the developer would take steps to secure the long-term protection of the species. They should also advise developers that they must comply with any statutory species' protection provisions affecting the site concerned..."

11.12 Paragraph 99 of Government Circular 06/2005[2] advises that "it is essential that the presence or otherwise of protected species, and the extent that they may be affected by the proposed

[1] Habitats sites are defined in the glossary as 'Any site which would be included within the definition at regulation 8 of the Conservation of Habitats and Species Regulations 2017 (as amended) for the purpose of those regulations, including candidate Special Areas of Conservation, Sites of Community Importance, Special Areas of Conservation, Special Protection Areas and any relevant Marine Sites.'
[2] *ODPM Circular 06/2005. Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and their Impacts within the Planning System* (2005). HMSO Norwich.

development, is established before the planning permission is granted, otherwise all relevant material considerations may not have been addressed in making the decision. The need to ensure ecological surveys are carried out should therefore only be left to coverage under planning conditions in exceptional circumstances, with the result that the surveys are carried out after planning permission has been granted".

Standing Advice (GOV.UK - England only)

11.13 The GOV.UK website provides information regarding protected species and sites in relation to development proposals: 'Local planning authorities should take advice from Natural England or the Environment Agency about planning applications for developments that may affect protected species.' GOV.UK advises that 'some species have standing advice which you can use to help with planning decisions. For others you should contact Natural England or the Environment Agency for an individual response.'

11.14 The standing advice (originally from Natural England and now held and updated on GOV.UK[3]) provides advice to planners on deciding if there is a 'reasonable likelihood' of protected species being present. It also provides advice on survey and mitigation requirements.

11.15 When determining an application for development that is covered by standing advice, in accordance with guidance in Government Circular 06/2005, Local planning authorities are required to take the standing advice into account. In paragraph 82 of the aforementioned Circular, it is stated that: 'The standing advice will be a material consideration in the determination of the planning application in the same way as any advice received from a statutory consultee…it is up to the planning authority to decide the weight to be attached to the standing advice, in the same way as it would decide the weight to be attached to a response from a statutory consultee.'

Natural Environment and Rural Communities (NERC) Act 2006 – Habitats and species of principal importance (England)

11.16 The Natural Environment and Rural Communities (NERC) Act came into force on 1st October 2006. Section 41 (S41) of the Act require the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England. The list has been drawn up in consultation with Natural England as required by the Act. In accordance with the Act the Secretary of State keeps this list under review and will publish a revised list if necessary, in consultation with Natural England.

11.17 The S41 list is used to guide decision-makers such as public bodies, including local authorities and utilities companies, in implementing their duty under Section 40 of the NERC Act 2006, to have regard to the conservation of biodiversity in England, when carrying out their normal functions, including development control and planning. This is commonly referred to as the 'Biodiversity Duty.'

11.18 Guidance for public authorities on implementing the Biodiversity Duty[4] has been published by Defra. One of the key messages in this document is that 'conserving biodiversity includes restoring and enhancing species populations and habitats, as well as protecting them.' In England the administration of the planning system and licensing schemes are highlighted as having a 'profound influence on biodiversity conservation.' Local authorities are required to take measures to "promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species. The guidance states that 'the duty aims to raise the profile and visibility of biodiversity, clarify existing commitments with regard to biodiversity, and to make it a natural and integral part of policy and decision making.'

11.19 In 2007, the UK Biodiversity Action Plan (BAP) Partnership published an updated list of priority UK species and habitats covering terrestrial, freshwater and marine biodiversity to focus conservation action for rarer species and habitats in the UK. The UK Post-2010 Biodiversity Framework[5], which

[3] https://www.gov.uk/protected-species-and-sites-how-to-review-planning-proposals#standing-advice-for-protected-species
[4] Defra, 2007. *Guidance for Public Authorities on Implementing The Biodiversity Duty*. (http://www.defra.gov.uk/publications/files/pb12585-pa-guid-english-070516.pdf)
[5] JNCC and Defra (on behalf of the Four Countries' Biodiversity Group). 2012. *UK Post-2010 Biodiversity Framework*. July 2012. (http://jncc.defra.gov.uk/page-6189)

covers the period from 2011 to 2020, now succeeds the UK BAP. The UK priority list contained 1150 species and 65 habitats requiring special protection and has been used as a reference to draw up the lists of species and habitats of principal importance in England.

11.20 In England, there are 56 habitats of principal importance and 943 species of principal importance on the S41 list. These are all the habitats and species found in England that were identified as requiring action in the UK BAP and which continue to be regarded as conservation priorities in the subsequent UK Post-2010 Biodiversity Framework.

European protected species (Animals)

11.21 The Conservation of Habitats and Species Regulations 2017 (as amended) consolidates various amendments that have been made to the original (1994) Regulations which transposed the EC Habitats Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Council Directive 92/43/EEC) into national law.

11.22 "European protected species" (EPS) of animal are those which are shown on Schedule 2 of the Conservation of Habitats and Species Regulations 2017 (as amended). They are subject to the provisions of Regulation 43 of those Regulations. All EPS are also protected under the Wildlife and Countryside Act 1981 (as amended). Taken together, these pieces of legislation make it an offence to:

a. Intentionally or deliberately capture, injure or kill any wild animal included amongst these species

b. Possess or control any live or dead specimens or any part of, or anything derived from a these species

c. deliberately disturb wild animals of any such species

d. deliberately take or destroy the eggs of such an animal, or

e. intentionally, deliberately or recklessly damage or destroy a breeding site or resting place of such an animal, or obstruct access to such a place

11.23 For the purposes of paragraph (c), disturbance of animals includes in particular any disturbance which is likely—

a. to impair their ability—

   i. to survive, to breed or reproduce, or to rear or nurture their young, or

   ii. in the case of animals of a hibernating or migratory species, to hibernate or migrate; or

b. to affect significantly the local distribution or abundance of the species to which they belong.

11.24 Although the law provides strict protection to these species, it also allows this protection to be set aside (derogated) through the issuing of licences. The licences in England are currently determined by Natural England (NE) for development works and by Natural Resources Wales in Wales. In accordance with the requirements of the Regulations (2017, as amended), a licence can only be issued where the following requirements are satisfied:

a. The proposal is necessary 'to preserve public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment'

b. 'There is no satisfactory alternative'

c. The proposals 'will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

Definition of breeding sites and resting places

11.25 Guidance for all European Protected Species of animal, including bats and great crested newt, regarding the definition of breeding and of breeding and resting places is provided by The

European Council (EC) which has prepared specific guidance in respect of the interpretation of various Articles of the EC Habitats Directive.[6] Section II.3.4.b) provides definitions and examples of both breeding and resting places at paragraphs 57 and 59 respectively. This guidance states that 'The provision in Article 12(1)(d) [of the EC Habitats Directive] should therefore be understood as aiming to safeguard the ecological functionality of breeding sites and resting places.' Further the guidance states: 'It thus follows from Article 12(1)(d) that such breeding sites and resting places also need to be protected when they are not being used, but where there is a reasonably high probability that the species concerned will return to these sites and places. If for example a certain cave is used every year by a number of bats for hibernation (because the species has the habit of returning to the same winter roost every year), the functionality of this cave as a hibernating site should be protected in summer as well so that the bats can re-use it in winter. On the other hand, if a certain cave is used only occasionally for breeding or resting purposes, it is very likely that the site does not qualify as a breeding site or resting place.'

Competent authorities

11.26 Under Regulation 7 of the Conservation of Habitats and Species Regulations 2017 (as amended) a "competent authority" includes "any Minister of the Crown…, government department, statutory undertaker, public body of any description or person holding a public office.

11.27 In accordance with Regulation 9, "a competent authority must exercise their functions which are relevant to nature conservation, including marine conservation, so as to secure compliance with the requirements of the [Habitats and Birds] Directives. This means for instance that when considering development proposals a competent authority should consider whether EPS or European Protected Sites are to be affected by those works and, if so, must show that they have given consideration as to whether derogation requirements can be met.

Birds

11.28 All nesting birds are protected under Section 1 of the Wildlife and Countryside Act 1981 (as amended) which makes it an offence to intentionally kill, injure or take any wild bird or take, damage or destroy its nest whilst in use or being built, or take or destroy its eggs. In addition to this, for some rarer species (listed on Schedule 1 of the Act), it is an offence to disturb them whilst they are nest building or at or near a nest with eggs or young, or to disturb the dependent young of such a bird.

11.29 The Conservation of Habitats and Species Regulations 2017 (as amended) places duties on competent authorities (including Local Authorities and National Park Authorities) in relation to wild bird habitat. These provisions relate back to Articles 1, 2 and 3 of the EC Directive on the conservation of wild birds (2009/147/EC, 'Birds Directive'[7]) (Regulation 10 (3)) requires that the objective is the 'preservation, maintenance and re-establishment of a sufficient diversity and area of habitat for wild birds in the United Kingdom, including by means of the upkeep, management and creation of such habitat, as appropriate, having regard to the requirements of Article 2 of the new Wild Birds Directive…' Regulation 10 (7) states: 'In considering which measures may be appropriate for the purpose of security or contributing to the objective in [Regulation 10 (3)] Paragraph 3, appropriate account must be taken of economic and recreational requirements'.

11.30 In relation to the duties placed on competent authorities under the 2017 Regulations, Regulation 10 (8) states: 'So far as lies within their powers, a competent authority in exercising any function [including in relation to town and country planning] in or in relation to the United Kingdom must use all reasonable endeavours to avoid any pollution or deterioration of habitats of wild birds (except habitats beyond the outer limits of the area to which the new Wild Birds Directive applies).'

[6] Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC. (February 2007), EC.
[7] 2009/147/EC Birds Directive (30 November 2009. European Parliament and the Council of the European Union.

Badger

11.31 Badger is protected under the Protection of Badgers Act 1992. It is not permitted to wilfully kill, injure, take, possess or cruelly ill-treat a badger, or to attempt to do so; or to intentionally or recklessly interfere with a sett. Sett interference includes disturbing badgers whilst they are occupying a sett, as well as damaging or destroying a sett or obstructing access to it. A badger sett is defined in the legislation as "a structure or place, which displays signs indicating current use by a badger".

11.32 ODPM Circular 06/2005[8] provides further guidance on statutory obligations towards badger within the planning system. Of particular note is paragraph 124, which states that "The likelihood of disturbing a badger sett, or adversely affecting badgers' foraging territory, or links between them, or significantly increasing the likelihood of road or rail casualties amongst badger populations, are capable of being material considerations in planning decisions."

11.33 Natural England provides Standing Advice[9], which is capable of being a material consideration in planning decisions. Natural England recommends mitigation to avoid impacts on badger setts, which includes maintaining or creating new foraging areas and maintaining or creating access (commuting routes) between setts and foraging/watering areas.

Reptiles

11.34 All native reptile species receive legal protection in Great Britain under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Viviparous lizard, slow-worm, grass snake and adder are protected against killing, injuring and unlicensed trade only. Sand lizard and smooth snake receive additional protection as "European Protected species" under the provisions of the Conservation of Habitats and Species Regulations 2017 (as amended) and are fully protected under the Wildlife and Countryside Act 1981 (as amended).

11.35 All six native species of reptile are included as 'species of principal importance' for the purpose of conserving biodiversity under Section 41 (England) of the NERC Act 2006 and Section 7 of the Environment (Wales) Act 2016.

11.36 Current Natural England Guidelines for Developers[10] states that 'where it is predictable that reptiles are likely to be killed or injured by activities such as site clearance, this could legally constitute intentional killing or injuring.' Further the guidance states: 'Normally prohibited activities may not be illegal if 'the act was the incidental result of a lawful operation and could not reasonably have been avoided'. Natural England 'would expect reasonable avoidance to include measures such as altering development layouts to avoid key areas, as well as capture and exclusion of reptiles.'

11.37 The Natural England Guidelines for Developers state that 'planning must incorporate two aims where reptiles are present:

- To protect reptiles from any harm that might arise during development work;
- To ensure that sufficient quality, quantity and connectivity of habitat is provided to accommodate the reptile population, either on-site or at an alternative site, with no net loss of local reptile conservation status.'

Water vole

11.38 Water vole is protected under the Wildlife and Countryside Act 1981 (as amended). This makes it an offence to kill, injure or take any water vole, damage, destroy or obstruct access to any place of shelter or protection that the animals are using, or disturb voles while they are using such a place.

[8] *ODPM Circular 06/2005. Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and their Impacts within the Planning System* (2005). HMSO Norwich.
[9] http://www.naturalengland.org.uk/ourwork/planningdevelopment/spatialplanning/standingadvice/specieslinks.aspx

[10] English Nature, 2004. *Reptiles: guidelines for developers.* English Nature, Peterborough. https://webarchive.nationalarchives.gov.uk/20150303064706/http://publications.naturalengland.org.uk/publication/76006

Water vole is listed as a Species of Principal Importance under the provisions of the NERC Act 2006 in England and under the provisions of the Environment (Wales) Act 2016.

Wild mammals in general

11.39 The Wild Mammals (Protection) Act 1996 (as amended) makes provision for the protection of wild mammals from certain cruel acts, making it an offence for any person to intentionally cause suffering to any wild mammal. In the context of development sites, for example, this may apply to rabbits in their burrows.

Invasive non-native species

11.40 An invasive non-native species is any non-native animal or plant that has the ability to spread causing damage to the environment.

11.41 Under the Wildlife and Countryside Act 1981 (as amended) it is an offence to release, or to allow to escape into the wild, any animal which is not ordinarily resident in and is not a regular visitor to Great Britain in a wild state or is listed under Schedule 9 of the Act.

11.42 It is an offence to plant or otherwise cause to grow in the wild invasive non-native plants listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).

Hedgerows

11.43 Article 10 of the Habitats Directive[11] requires that 'Member States shall endeavour…to encourage the management of features of the landscape which are of major importance for wild fauna and flora. Such features are those which, by virtue of their linear and continuous structure…or their function as stepping stones…are essential for the migration, dispersal and genetic exchange of wild species'. Examples given in the Directive include traditional field boundary systems (such as hedgerows).

11.44 The aim of the Hedgerow Regulations 1997[12], according to guidance produced by the Department of the Environment[13], is "to protect important hedgerows in the countryside by controlling their removal through a system of notification. In summary, the guidance states that the system is concerned with the removal of hedgerows, either in whole or in part, and covers any act which results in the destruction of a hedgerow. The procedure in the Regulations is triggered only when land managers or utility operators want to remove a hedgerow. The system is in favour of protecting and retaining 'important' hedgerows.

11.45 The Hedgerow Regulations set out criteria that must be used by the local planning authority in determining which hedgerows are 'important'. The criteria relate to the value of hedgerows from an archaeological, historical, wildlife and landscape perspective.

[11] Council Directive 92/43/EEC of 2i May 1992 on the conservation of natural habitats and of wild fauna and flora.
[12] Statutory Instrument 1997 No. 1160 – The Hedgerow Regulations 1997. HMSO: London
[13] The Hedgerow Regulations 1997: a guide to the law and good practice, HMSO: London