PRELIMINARY ECOLOGICAL APPRAISAL

TREESTACKS FARM, OAKLEY ROAD, WIX, ESSEX
for
HAMFORD FARMING LTD

(March 2022)
(Contract number 376)

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PROJECT DATA

Site Address	Treestacks Farm, Oakley Road, Wix, Essex CO11 2SF
Project Proposed	Poultry unit expansion
Boundary as Specified by Client	Yes
Site Area (Hectares)	Approximately 1.9 ha
Central Ordnance Survey Grid Reference	TM 18163 28434
Survey Date	22 March 2022
Date Report Issued	24 March 2022
Report Version	Version 1

SUMMARY

The site on land at Treestacks Farm, Oakley Road, Wix, Essex and its immediate surroundings were surveyed for their ecological interest by means of a desk study and field survey on 22nd March 2022. An expansion of the poultry unit on the site is proposed. The walk over survey was carried out to characterise the habitats and identify any fauna or habitats requiring further assessment or protection as a result of the proposed development.

The site is part of a farm and is, for the most part, surrounded by arable land. Habitats on and adjacent to the site include arable land, arable field margins, grassland, a hedgerow and a small recently planted woodland. There are no ponds on the site and five ponds within 500m of the site marked on Ordnance Survey maps. Two of the ponds were not accessible and one was no longer a pond.

An annotated Phase 1 Habitat Map is provided for the site. As a whole the survey revealed that the site's habitats which will be affected by works are common and widespread and are considered to be of low intrinsic biodiversity value. The site is not of sufficient ecological value to warrant whole-scale protection from development. However, an impact assessment of the potential atmospheric ammonia and nitrogen deposition on sensitive ecological receptors may be required following consultation with Natural England.

Recommendations

Recommendations which will reduce the risk of harm to any wildlife in the lead up to construction on the site and during the development itself are provided.

Proposed biodiversity enhancements for wildlife include the creation of a new attenuation pond, the placement of hedgehog boxes in the bases of hedgerows and the erection of bird and bat boxes on suitable trees within the curtilage of the farm.

Once applied and carried out, the recommended ecological protection and enhancements will provide assurance that there is no net loss to biodiversity and no unacceptable adverse impact on ecosystem services.

INTRODUCTION

This report has been prepared by Craig Emms and Linda Barnett who were contracted by Hamford Farming Ltd to undertake a preliminary ecological appraisal of land at Treestacks Farm, Oakley Road, Wix, Essex, hereafter referred to as 'the site'. The area considered by this assessment includes the land within the red line boundary as well as adjacent areas of land where relevant.

Hamford Farming Ltd intends to submit a planning application to expand a poultry unit. The purpose of the survey was to identify any ecological constraints to and opportunities for the development in order to inform master planning, so that any adverse ecological effects can be avoided or minimised wherever possible.

The survey and ecological assessment of the site follows the approach set out in guidance published by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2017).

PLANNING POLICY AND LEGISLATION

The regulatory context of this survey and report includes the Wildlife & Countryside Act (1981) as amended, the Environmental Protection Act (1990), the Countryside and Rights of Way Act (2000), the Protection of Badgers Act (1992), the Hedgerows Regulations (1997), the Habitats Directive (1992), the Birds Directive (2009), the Berne Convention (1982), Bonn Convention (1985), Natural Environment and Rural Communities (NERC) Act (2006), the Environment (Wales) Act (2016), the Wildlife and Natural Environment (Scotland) Act (2011), the Convention on Biological Diversity (1992) and the Conservation of Habitats and Species Regulations (2017).

Please note that there is complex and strict legislation protecting many species and habitats in the United Kingdom. For European Protected Species (including bats, great crested newt, dormouse and otter) there is no longer a clear defence against harm being caused as an incidental result of an otherwise lawful operation. If you are in any doubt about the status of species or habitats on your site, please be sure to contact us before undertaking any site work.

METHODOLOGY – DESK STUDY

A public records search was not commissioned as a part of this survey. Due to the restricted scale of the development proposals, the low potential for protected species to be present within the construction area and limited potential for impacts to arise outside the site this aspect was not considered to be a major constraint to the project. A search for ponds and other water bodies within 500m and sites with statutory protected site designations within a 2 km radius of the development was conducted using MAGIC (Multi-Agency Geographic Information for the Countryside - www.magic.gov.uk). MAGIC was also used to establish whether any European Protected Species (EPS) licences have been granted within 2 km of the proposed scheme and whether Natural England have surveyed ponds containing great crested newts within a 2 km radius.

METHODOLOGY – FIELD SURVEY

A preliminary ecological appraisal, comprising an extended Phase 1 habitat survey and a protected species assessment was undertaken by appropriately licenced, qualified and experienced personnel during March 2022. It followed the methodology contained in the Handbook for Phase 1 Habitat Survey (JNCC, 2010) and the current guidance on survey methods from the Chartered Institute of Ecology and Environmental Management (CIEEM, 2017).

Extended Phase 1 Habitat Survey

An extended Phase 1 habitat survey was undertaken to assess the ecological value of the site. During this survey the site and its immediate surroundings were evaluated by walking over them at a uniform pace, whilst making a note of the habitats and species present. Habitat descriptions for each habitat type are provided in this report as well as target notes (if applicable) to identify areas of interest or concern.

In addition, a search was made for evidence of native weeds (*e.g.* common ragwort), non-native invasive species (*e.g.* Japanese knotweed and muntjac) and serious plant diseases/pathogens (*e.g.* ash dieback). Any hedgerows present on the site were assessed for their importance under the Hedgerows Regulations, 1997.

Protected Species Assessment

As part of the preliminary ecological assessment, the site was also evaluated for its potential to contain protected or notable species, and any incidental evidence of such species was recorded if encountered. The evaluation of the site was made based on the habitats present and their suitability for protected species including, but not limited to, the species listed below:

- Badgers;
- Bats;
- Dormice;
- Great crested newts;
- Nesting birds (including barn owls);
- Otters;
- Reptiles;
- Water voles.

A preliminary daytime ground level bat assessment of all trees and bushes on the site was undertaken as a part of this survey.

Badgers

The following badger field signs were searched for on the development site and up to 30m from the boundaries of the site, where accessible, following Kruuk (1978), Thornton (1988), Scottish Badgers (2018) and Lewns *et al* (in press):

- Sett entrances, *e.g.* entrances that are normally 22 - 25cm in diameter and shaped like a 'D' on its side;
- Large spoil heaps outside sett entrances;
- Bedding outside sett entrances;
- Day beds (above ground areas where badgers sleep, characterised by flattened vegetation or bundles of grass);
- Badger footprints;
- Badger paths;
- Badger dung pits and latrines (a group of 5 or more dung pits);
- Badger hairs on fences or bushes;
- Scratching posts;
- Signs of digging for food (snuffles).

If evidence of a badger sett is found further field signs are sought to decide whether the sett is currently in use. The sett is protected from disturbance or damage if there are signs of badgers, even if they are not occupying it at the time. If badger setts are found further surveys may be necessary. A full badger survey was not undertaken.

Bat Roosts

There is one recently constructed building, a large generator and a tank on the site. None of the structures were assessed for their potential to support roosting bats as they will remain undamaged and *in situ* during the project.

A preliminary daytime ground level assessment of all trees and bushes on the site was undertaken when potential bat roosting features (adapted from BTHK, 2018) were searched for, including:

- Woodpecker-holes
- Squirrel-holes
- Knot-holes
- Pruning-cuts
- Tear-outs
- Wounds
- Cankers
- Compression-forks
- Butt-rots
- Lightning-strikes
- Hazard-beams
- Subsidence-cracks
- Shearing-cracks
- Transverse-snaps
- Welds
- Lifting-bark
- Desiccation-fissures
- Frost-cracks
- Fluting
- Ivy
- Bat, bird or dormouse boxes

Any trees and bushes were then attributed a grade of negligible, low, moderate or high suitability to support roosting bats according to Bat Conservation Trust guidelines criteria following Collins (2016). Appendix 3 provides a more detailed explanation of the bat roost assessment criteria. If evidence of bats is found further surveys may be necessary.

Dormice

The habitats within the site's boundaries were assessed for their suitability for dormice based on vegetation structure, connectivity and species composition following both Bright *et al* (2006) and Chanin and Woods (2003). In addition, direct evidence of dormice was searched for, including:

- Gnawed hazel nuts
- Nests
- Dormice nest boxes

If direct evidence of dormice is found, or the habitats on the site (if they are to be removed/damaged/disturbed as a result of the development) are assessed as suitable for dormice, further surveys may be necessary. A full dormouse survey was not undertaken.

Great Crested Newts

There are no ponds on the site and five ponds within 500m of the site marked on Ordnance Survey maps. The relative suitability of the ponds for great crested newts was evaluated using the Habitat Suitability Index (HSI) methodology (ARG UK, 2010). If the ponds are found to be suitable for breeding great crested newts further surveys may be necessary.

The relative value of the terrestrial habitats within the site's boundaries for great crested newts and other amphibians was noted, although a detailed assessment was not carried out. A full great crested newt survey was not undertaken.

Nesting Birds (including Barn Owls)

The relative value of the habitats within the site's boundaries for nesting birds and foraging barn owls was noted, although a detailed assessment was not carried out. A full breeding bird survey was not undertaken.

Potential barn owl nesting/roosting sites and barn owl field signs were searched for in any trees on the site following the guidelines in Barn Owl Trust (2012). If nesting/roosting sites or evidence of barn owls is found further surveys may be necessary. A full barn owl survey was not undertaken.

Otters

There are no waterways/waterbodies on the site. A full otter survey was not undertaken.

Reptiles

The relative value of the terrestrial habitats within the site's boundaries, including potential basking areas, refugia and hibernation places for reptiles was noted, although a detailed assessment was not carried out. A full reptile survey was not undertaken.

Water Voles

There are no waterways/waterbodies on the site. A full water vole survey was not undertaken.

Hedgerows

Any hedgerow adjacent to land in agricultural/horticultural use on the site which will be directly affected by the development proposals was assessed for its importance under the Hedgerows Regulations. This is because if a hedgerow is classed as 'important', Local Planning Authorities have the power to either prevent the removal of a hedgerow, or to require appropriate mitigation/compensation to replace lost 'important' hedgerow habitat.

The assessment considers several factors including the age of the hedge and number of woody species present, its location, the physical structure of the hedge (including the number of gaps and proximity of nearby features such as ditches, banks and connectivity to woodland and ponds) and the number of valuable ground flora species it supports (Defra, 2007).

Details of the hedgerow assessment methodology which include a list of the woody species, features and valuable ground flora recognised by the Hedgerows Regulations are provided in Appendix 2.

A hedgerow may also be classified as 'important' due to the presence or recorded presence of a protected animal and plant species (Schedules 1, 5 and 8 of the Wildlife and Countryside Act, 1981) within the last five years, and archaeological/historical features.

LIMITATIONS

It should be noted that a single visit to a site will inevitably miss species not visible on the date of survey by reason of seasonality, mobility, habits or chance. The month of March is a sub-optimal survey period for many taxa of nature conservation interest in this part of the United Kingdom. This ecological survey may not be sufficient on its own for planning application purposes where notable habitats/species are present or potentially present, especially regarding European Protected Species.

The survey was undertaken during the winter months which can limit botanical identification as it is outside of the main plant growing season. However, what remains of vegetative growth is generally sufficient to allow an experienced surveyor to make a general assessment about the habitat composition and quality of a site and identify the potential for any notable or protected species. Similarly, some fauna is less active/dormant at this time of the year. Again, this constraint can be addressed by an experienced surveyor identifying potential presence from the habitat composition of the site and neighbouring landscape, and the identification of any field signs present. Nonetheless, the surveyor cannot guarantee that all invasive plant species, such as Japanese knotweed or Himalayan balsam, will be observed at the time of the site visit. A full survey of invasive species potentially present on the site should be commissioned separately and conducted during the growing season when any invasive plants which may be present will be visible.

A full data search was not commissioned for this preliminary ecological appraisal. However, because of the small scale of the proposals and the limited risk of impacts in the immediate surroundings and away from the site, this aspect was not considered to be a major constraint to the project (CIEEM, 2017).

No constraints were such that they affect the overall conclusions and recommendations made in the report.

BASELINE ECOLOGICAL CONDITIONS – DESIGNATED SITES

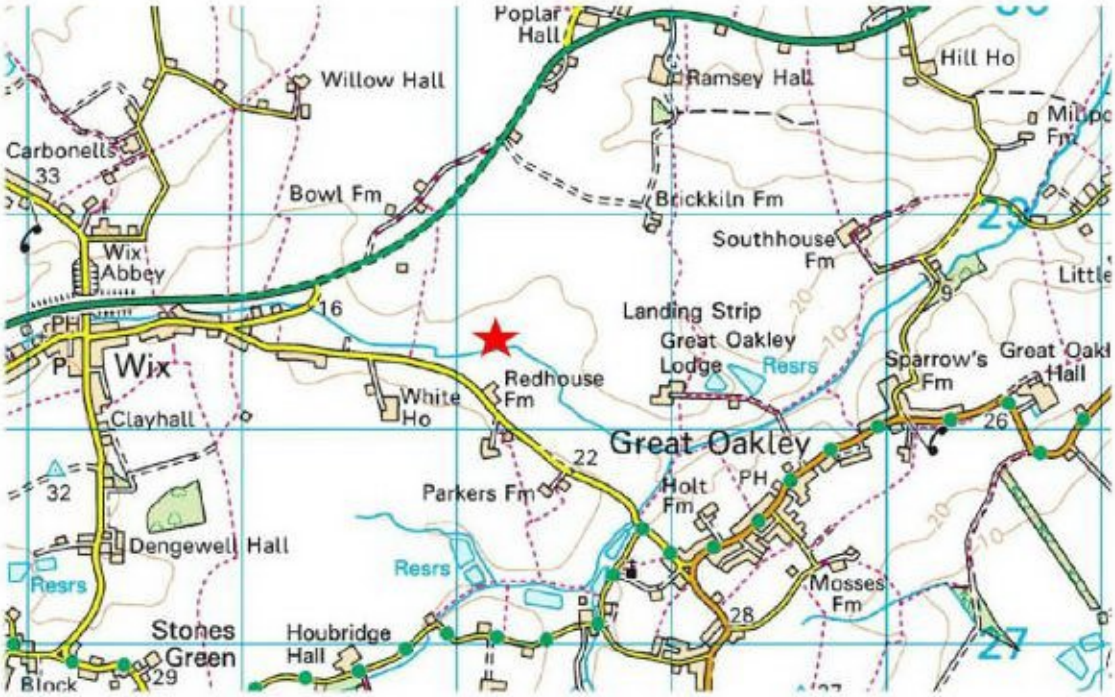
The desk study showed that there are no known sites with statutory protected site designations within a 2 km radius of the development.

BASELINE ECOLOGICAL CONDITIONS - HABITATS

GENERAL DESCRIPTION

The site (central OS Grid Ref: TM 18163 28434) is part of a farm located in Essex (see Figure 1).

FIGURE 1: LOCATION OF THE SITE



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It is approximately 1.9 ha in extent and situated within an agricultural landscape dominated by arable land (see Plate 1). Habitats on and adjacent to the site include arable land, arable field margins, grassland, a hedgerow and a small recently planted woodland. There are no ponds on

the site and five ponds within 500m of the site marked on Ordnance Survey maps. Two of the ponds were not accessible during the survey and one was no longer a pond.

Plate 1: Aerial photograph of the site and surrounding land

HABITAT DESCRIPTIONS

A list of all plant species recorded during this survey, their scientific names and where relevant their DAFOR scale of abundance is presented in Table 1 in Appendix 1.

Access to the Site: The project will use the existing farm access road (see Plates 1, 2 and 3) which joins the highway (Oakley Road) to the south-west of the site. The current access road consists of hard-core along its full length.

Plate 2: the junction of the existing farm access road and Oakley Road. Photograph taken from the south-east.

Plate 3: a section of the current farm access road to the south-west of the site. Photograph taken from the west.

Arable Land: This habitat is present over most of the site (see Figure 2 and Plates 4 and 5). At the time of survey, it was under a cereal crop.

Plate 4: a view of the arable land which covers most of the site. Photograph taken from the south-east corner of the site looking north-west.

Plate 5: another view of the arable land on the site. Photograph taken from the north-east corner of the site looking south-west.

Arable Field Margins: This habitat is present as a narrow margin (c0.5m) on the site's eastern boundary (too narrow to map, see Plate 6). Plant species recorded in the margin are shown in Table 1 in Appendix 1. They include only widespread and common species.

Plate 6: a view of the narrow arable field margin on the site's eastern boundary. Photograph taken from the south.

Improved Grassland: this habitat is present in the north-western part of the site and has been recently sown (see Figure 2 and Plates 7 and 8). Plant species recorded in the grassland are shown in Table 1 in Appendix 1. They include only widespread and common species.

Plate 7: a view of the recently sown improved grassland in the north-western part of the site. Photograph taken from the east.

Plate 8: another view of the improved grassland in the north-western part of the site. Photograph taken from the north.

Broadleaved Plantation Woodland: This habitat is found on a small part of the site's southern boundary (see Figure 2 and Plate 9). The woodland has been recently planted. Tree and bush species recorded in the woodland are shown in Table 1 in Appendix 1. They include only widespread and common species. It has been judged to have negligible potential to support roosting bats as no bat roosting features were observed. All of the woodland will remain undamaged and *in situ* during the project.

Plate 9: a view of the small recently planted area of plantation woodland on the site. Photograph taken from the west. It has been judged to have negligible potential to support roosting bats as no bat roosting features were observed. All of the woodland will remain undamaged and *in situ* during the project.

Native Species-rich Hedge and Trees: This hedgerow is found on the site's eastern boundary (see Figure 2 and Plate 10). It is approximately 2.5m in height and 2.5m in width at the base,

with a ditch. The woody species present in this hedge include blackthorn, elder, goat willow, hawthorn, pedunculate oak and dog rose. Plant species recorded in the hedge are shown in Table 1 in Appendix 1. They include only widespread and common species. The hedge has been assessed as 'not important' according to the Hedgerows Regulations, 1997 (see Table 2 in Appendix 1). It has been judged to have negligible potential to support roosting bats as no bat roosting features were observed. All of the hedgerow will remain undamaged and *in situ* during the project.

Plate 10: a view of the hedgerow on the site's eastern boundary. Photograph taken from the south. It has been assessed according to the Hedgerows Regulations, 1997 as 'not important'. It has also been judged to have negligible potential to support roosting bats. All of the hedgerow will remain undamaged and *in situ* during the project.

Ponds: There are no ponds on the site and five ponds within 500m of the site marked on Ordnance Survey maps. Two of the ponds were not accessible during the survey. One other pond is no longer a pond, being dry and overgrown. The remaining two ponds (see Plates 11 and 12) have been assessed to have 'poor' habitat suitability for great crested newts (refer also to the Great Crested Newts section below and Table 4 in Appendix 1 for details of the survey results).

Plate 11: Pond 1, located approximately 192m south-east of the development site and assessed to have 'poor' habitat suitability for great crested newts, mainly because it is obviously polluted by agricultural run-off.

Plate 12: Pond 2, located approximately 214m south of the development site and assessed to have 'poor' habitat suitability for great crested newts, mainly because it is located next to a road and has poor habitats around it.

TARGET NOTES:
Target Note 1: These are two badger entrance holes in current use (forming an outlying sett which is off-site) (see Plate 13)

Plate 13: One of the two badger entrance holes which form an outlying sett and are in current use. The sett is located outside of the site boundary and will not be damaged or disturbed by construction on the site, which will take place at a distance of approximately 90m from the sett.

BASELINE ECOLOGICAL CONDITIONS – SPECIES AND SPECIES GROUPS

PLANTS

Only widespread and common species were observed on the site. A list of all plant species recorded during this survey, their scientific names and where relevant their DAFOR scale of abundance is presented in Table 1 in Appendix 1.

MACRO-INVERTEBRATES

Small Tortoiseshell butterflies were observed on the site.

FISH

No fish were observed during the survey. There are no aquatic habitats on the site.

GREAT CRESTED NEWT

No great crested newts were observed on the site. There are no ponds on the site and five ponds within 500m of the site marked on Ordnance Survey maps. Based on the terrestrial range of individual great crested newts (generally less than 250m, occasionally more than 500m, and rarely up to 1 km from their breeding site), it was considered reasonable to conclude that only ponds within 500m of the site are relevant to the survey. Two of the ponds (located at OS Grid References TM 18188 27960 – 388m south of the development site and TM 17661 28100 – 492m south-west of the development) were not accessible during the survey. One other pond (located at TM 17644 28311) is no longer a pond, being dry and overgrown. The remaining two ponds (see Plates 11 and 12) have been assessed to have 'poor' habitat suitability for great crested newts (refer also to the Great Crested Newts section below and Table 4 in Appendix 1 for details of the survey results).

The habitats covering most of the development site (hard standing, bare earth, recently sown improved grassland, and intensively managed arable land) are considered to be very poor habitats for great crested newts during their terrestrial phase.

It is generally accepted that where suitable habitat is present the majority of a great crested newt population will use terrestrial habitats within 50m of the breeding pond (Jehle, 2000). English Nature (Natural England's predecessor) published findings of a research report into great crested newt mitigation schemes (Cresswell and Whitworth, 2004) which states that:

"*The most comprehensive mitigation, in relation to avoiding disturbance, killing or injury is appropriate within 50m of a breeding pond. It will also almost always be necessary to actively capture newts 50-100m away. However, at distances greater than 100m, there should be careful consideration as to whether attempts to capture newts are necessary or the most effective option to avoid incidental mortality. At distances greater than 200-250m, capture operations will hardly ever be appropriate.*"

According to MAGIC no great crested newt development licences have been granted within 2 km of the proposed scheme.

However, MAGIC also indicated that class licence returns to Natural England in 2015 showed that waterbodies containing great crested newts are present 1.27 km south-east of the site.

As the habitats covering the majority of the site are considered to be very poor for terrestrial great crested newts and the surveyed ponds within 500m of the site are considered to have poor habitat suitability for great crested newts, it is recommended that no further surveys are required. However, if great crested newts are discovered during site preparation, clearance, enabling or construction phases of the project, then all works must stop until the advice of a professional/suitably qualified ecologist and Natural England is obtained, including the need for a licence (see Recommendations below).

OTHER AMPHIBIANS

No amphibians were observed during the survey. There are no aquatic habitats on the site. No further surveys are required.

REPTILES

The vegetation in the base of the hedgerow and in the arable field margin on the site are suitable habitats for low numbers of common lizard *Zootoca vivipara* and slow worm *Anguis fragilis*. All British reptiles are protected from killing or injury (though their habitat is not specially protected) and this could occur as an incidental result of construction. During the survey the above habitats were searched for evidence or indication of reptiles. The habitats are considered to be of limited value to reptiles due to the paucity of potential basking areas, refugia and hibernacula though it is possible that some reptiles are present. However, it is considered unlikely that there is a significant population given the limitations of the habitats that are present. Barred grass snakes *Natrix helvetica* and adders *Vipera berus* may hunt within the site as part of much wider home ranges.

Mitigation activities to reduce the risk of harm to any reptiles in the lead up to construction are given in the Recommendations section. After mitigation, significant impacts to reptiles are unlikely. No further surveys are required.

BIRDS

A typical range of birds commonly associated with the above habitats were recorded during the survey. These included no Red Listed species and two Amber Listed species. The Red and Amber Lists refer to Birds of Conservation Concern (Stanbury *et al*, 2021). Red Listed birds are of high conservation concern and Amber Listed birds are of medium conservation concern.

Bird species recorded during the survey included woodpigeon, carrion crow, wren, robin, blackbird, pheasant and pied wagtail.

Red-listed Birds
None were observed on site.

Amber-listed Birds
Woodpigeons and wrens were observed on the site.

Whilst some Amber listed species are present on site, the breeding assemblage is considered to be typical of the habitats present in the geographic location.

Active Nests Found
None were observed on site (the survey was conducted very early in the breeding season).

There were no potential barn owl roosting places or nest sites observed on the site. The habitats covering the majority of the site (improved grassland and arable land) are not suitable habitats for foraging barn owls as they do not contain a litter layer.

It is likely that a number of common farmland and woodland birds may breed each year in the hedgerow on the site.

The addition of bird nesting boxes on suitable trees within the curtilage of the farm (see Recommendations below) will provide new potential nesting places for birds.

BATS
There is one recently constructed building, a large generator and a tank on the site. None of these structures were assessed for their potential to support roosting bats as they will remain undamaged and *in situ* during the project.

All trees and bushes in the hedgerow on the site were considered to have negligible potential to support roosting bats as no bat roosting features were observed during the survey.

Common species of bats are likely to forage within the site to some extent, especially along the hedgerow. However, this habitat is remaining *in situ* and will be undamaged during the project. Thus the development is unlikely to have a significant impact on the local bat population, especially given that bats are highly mobile animals.

Nonetheless, since a bat's movement across a landscape can be affected and possibly impaired by artificial light spillage certain aspects of the construction will require controls and constraints. These are described in the Constraints section to minimise such impacts.

According to MAGIC two bat development licences has been granted within 2 km of the proposed scheme. The first licence was issued to destroy a resting place of common pipistrelle, soprano pipistrelle, brown long-eared bat and Natterer's bat located approximately 1.9 km north-west of the development site. It was issued to cover the period 2014 – 2019 and the licence

number was 2014-2484-EPS-MIT. The second licence was issued to destroy a resting place of common pipistrelle and brown long-eared bat located approximately 1.75 km south-east of the development. It was issued to cover the period 2018 – 2028 and the licence number was 2017-32904-EPS-MIT-1.

The addition of bat roosting boxes on suitable trees within the curtilage of the farm (see Recommendations below) will provide new potential roosting places for bats.

No further bat surveys are required.

OTTERS

No otters or field signs of otters were observed on the site. There are no aquatic habitats present. No further surveys are required.

WATER VOLES

No water voles or field signs of water voles were observed on the site. There are no aquatic habitats present. No further surveys are required.

DORMICE

No dormice or field signs of dormice were observed on the site. Dormice may possibly use the hedgerow on the eastern boundary of the site. However all of this hedgerow is remaining *in situ* and will be undamaged during the project. Thus the development is unlikely to have an impact on the local dormouse population. It is recommended that no further surveys are required.

BADGERS

No badger setts were observed on the site. Two badger entrance holes in current use and forming an outlying sett were however observed within 30m of the site's north-eastern perimeter (see Target Note 1 and Plate 13). No field signs that could be attributed to badgers were observed on the site. As this badger sett will not be disturbed or damaged during the project (it is located approximately 90m from the area where the construction will take place) no further surveys are required.

OTHER MAMMALS

Brown Hare (droppings present) and muntjac (footprints) are present on the site. Red foxes, stoats, weasels, hedgehogs, rabbits, grey squirrels, mice, voles, shrews and moles probably use the habitats on site. The placement of hedgehog nesting boxes in the base of hedegrows within the curtilage of the farm (see Recommendations below) will provide new potential nesting places for hedgehogs.

INVASIVE PLANTS

There were none observed on the site. <u>However, please also refer to the section within Limitations above</u>.

WEEDS ACT NATIVES

Broad-leaved dock, creeping thistle and spear thistle were observed on site.

INVASIVE ANIMALS

Muntjac are present and rabbits and grey squirrels probably use the site.

SERIOUS PLANT DISEASES/PATHOGENS

None observed on the site.

FEATURES THAT SHOULD BE RETAINED IF POSSIBLE

All of the hedgerow on the eastern boundary of the site and the plantation woodland on the southern boundary should and will be retained *in situ* within the project.

CONSTRAINTS

To comply with national planning policy framework paragraph 125, unnecessary negative impacts of new lighting at night should be avoided *e.g.* on plants, bats, invertebrates and astronomy. Possible negative impacts of new lighting should also be minimised by keeping the hours when lighting is used as short as possible, avoiding light spillage by using directional down-lighting, reducing the brightness of necessary illumination and keeping light from shining on bat roost entries, bat flyways and foraging areas, and other mammal holes. Luminaires (lighting enclosures, lanterns, or units designed to distribute light from a lamp or lamps) come in a myriad of different styles, applications and specifications which a lighting professional can help to select. The following should be considered when choosing luminaires (BCT and ILP, 2018):

- All luminaires should lack UV elements when manufactured. Metal halide, fluorescent sources should not be used;
- LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability;
- A warm white spectrum (ideally <2700Kelvin) should be adopted to reduce blue light component;
- Luminaires should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats;
- Internal luminaires can be recessed where installed in proximity to windows to reduce glare and light spill;
- The use of specialist bollard or low-level downward directional luminaires to retain darkness above can be considered. However, this often comes at a cost of unacceptable glare, poor illumination efficiency, a high upward light component and poor facial recognition, and their use should only be as directed by the lighting professional;
- Column heights should be carefully considered to minimise light spill;
- Only luminaires with an upward light ratio of 0% and with good optical control should be used – (see ILE, 2011);

- Luminaires should always be mounted on the horizontal, *i.e.* no upward tilt:

- Any external security lighting should be set on motion-sensors and short (1min) timers:

- As a last resort, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed.

Ecological impacts during construction should also be minimised by generally avoiding unnecessary disturbance and pollution. If there are any steep-sided excavations created during construction, they should be covered/filled/provided with ramps to prevent any mammals becoming trapped.

OPPORTUNITIES

Native planting (preferably of local origin) should be used in all landscaping if possible. Where exotic ornamental species are planted, invasive species should always be avoided. Wildlife friendly species and varieties which provide food (seeds, berries, fruit and nectar) or shelter should be chosen. Trees and woodlands have the potential to recapture ammonia emissions from animal housing units, with associated benefits for the environment. These benefits include:

- contributing to carbon and nitrogen sequestration and playing a role in achieving the UK's emission reduction targets for greenhouse gases (including carbon dioxide, methane and nitrous oxide):

- improving visibility impacts as trees can break up and soften the look of the geometric shape of a building or hide it completely:

- reducing on-farm emissions and helping to satisfy the requirements of an Environment Agency permit: and

- providing new or increased woodland habitat can increase biodiversity.

Trees and woodlands can also be used to disperse emissions and reduce atmospheric nitrogen deposition reaching sensitive habitats. Existing, established woodland and the planting of new woodland (*e.g.* as farm tree shelterbelts) can therefore be used to reduce ammonia emissions and the associated environmental and social impacts. The Centre for Ecology and Hydrology, and the Forest Research Agency have developed planting guidance for farmers, planners and tree planters, so they can maximize the benefits of planting tree shelterbelts for ammonia recapture (Centre for Ecology and Hydrology, 2019). This guidance includes information on a number of important aspects of planting, such as recommended planting distances and configurations, species which are better at ammonia capture and other aspects of design so that

new planting for this purpose can optimize potential benefits and units located near existing woodland can be situated to capitalize on potential benefits.

In line with best practice and in order to comply with government policy on biodiversity protection and enhancement, habitats and features of ecological interest and wildlife value should generally be retained within the site. New wildlife habitats should be created in these areas that are appropriate to the site's context, *e.g.* through the use of log piles, "wild" corners and native planting.

RECOMMENDATIONS FOR MITIGATION AND FURTHER SURVEY

RECOMMENDATIONS

- To reduce the risk of harm to reptiles in the lead up to construction the vegetation in the construction and planting zones on the site should be kept short in accordance with the precautionary methods outlined below (adapted from Forest of Dean District Council, 2012). This will reduce the amount of favourable habitat within the site where the works will take place and passively move any reptiles into suitable habitat outside of the development footprint. If the land falls out of management before the commencement of construction on the site, consideration should be made for actively managing the above habitats to prevent them becoming more suitable for these species.

  In general:

  1) The site owner/site manager will ensure that anyone undertaking construction works on the site (including sub-contractors) is made aware of the potential for the site to support common reptiles, where to expect them, their protected status and the procedure (see 2 below) to follow in the unlikely event that common reptiles are discovered during works. Where applicable this advice will be given through site inductions, tool box talks or similar. A copy of this precautionary method of working will be kept on site and available for inspection at all times;
  2) Should any common reptiles be discovered during construction, which are likely to be affected by the development, works will cease immediately. The owner/site manager will then seek the advice of a suitably qualified and experienced ecologist and works will only proceed in accordance with the advice they provide.

  Within the development's construction and planting zones the following methods of working will be adopted:

  3) All clearance works will be undertaken when common reptiles are likely to be fully active *i.e.* during the April to September period;
  4) Clearance of rock piles, logs, brash, stones, rocks or piles of similar debris will be undertaken carefully and by hand;
  5) Clearance of tall vegetation should be undertaken using a strimmer or brush cutter with all cuttings raked and removed the same day. Cutting will only be undertaken in a phased way which may either include:
     5a) Cutting vegetation to a height of no less than 30mm, clearing no more than one third of the site in anyone day or;
     5b) Cutting vegetation over three consecutive days to a height of no less than 150mm at the first cut, 75mm at the second cut and 30mm at the third cut.

6) Following removal of tall vegetation using the methods outlined in 5 the remaining vegetation will be maintained at a height of 30mm through regular mowing or strimming to discourage common reptiles from returning;
7) Ground clearance of any remaining low vegetation (if required) and any ground works will only be undertaken following the works in 5 above;
8) Any trenches left overnight will be covered or provided with ramps to prevent common reptiles from becoming trapped;
9) Any building materials such a bricks, stone *etc.* will be stored on pallets to discourage reptiles from using them as shelter. Any demolition materials will be stored in skips or similar containers rather than in piles on ground.

- A pre-clearance finger-tip search of the development site using a suitably licenced, qualified and experienced ecologist should be conducted immediately prior to site stripping and any vulnerable taxa removed to safety.

- If great crested newts are discovered during site preparation, clearance, enabling or construction phases, then all works must stop until the advice of a professional/suitably qualified ecologist and Natural England is obtained, including the need for a licence.

- It is possible that birds nest in the hedgerow on the site. As a precaution, appropriate and pragmatic measures should be taken to avoid committing the offence of killing or injuring a wild bird or damaging or destroying an active nest: all birds, their nests and eggs are protected by the Wildlife & Countryside Act of 1981. This makes it an offence, with certain exceptions, to deliberately take, damage or destroy the nest of any wild bird while it is in use or being built. It is also illegal to take or destroy the egg of any wild bird.

- Any operations that may disturb nesting habitat should be conducted outside the main bird nesting season. The main bird nesting season is usually taken as the beginning of March to the end of August inclusive in this part of Britain. If this is unavoidable, a pre-clearance inspection by a suitably experienced ornithologist will be required immediately prior to construction works to identify whether any nests are present, and ensure appropriate action is taken. If the latter approach is taken and nesting is encountered there is a risk of delay since an 'exclusion zone' may need to be set up around active nests until the young have fledged. Please be aware that some species of bird may occasionally be found nesting outside of the main bird nesting season as detailed above (*e.g.* barn owl, tawny owl, long-eared owl, mistle thrush, robin, yellowhammer, corn bunting, stock dove, feral pigeon, woodpigeon and collared dove *etc.*). Always check potential nesting habitat for signs of nesting birds (*e.g.* look for singing males or birds making strident alarm calls) before disturbing potential nesting habitat when outside of the main nesting season. If you believe that nesting birds *may* be present, instruct a suitably experienced ornithologist to conduct an inspection.

- To enhance the site for hedgehogs, three hedgehog nesting boxes should be placed in the bases of hedgerows within the curtilage of the farm.

- To enhance the site for birds, eight bird nesting boxes of mixed designs should be erected on suitable trees within the curtilage of the farm.

- To enhance the site for bats, eight bat roosting boxes of mixed designs should be erected on suitable trees within the curtilage of the farm.

FURTHER SURVEYS

- No further surveys are required. However, an impact assessment of the potential atmospheric Ammonia and Nitrogen deposition on sensitive ecological receptors may be required following consultation with Natural England.

CONCLUSIONS

As a whole the survey revealed that the site's habitats which will be affected by works are common and widespread and are considered to be of low intrinsic biodiversity value. The site is not of sufficient ecological value to warrant whole-scale protection from development, although an impact assessment of the potential atmospheric ammonia and nitrogen deposition on sensitive ecological receptors may be required following consultation with Natural England.

Providing the recommendations noted herein are fully implemented, there are no obvious ecological counter indications to the proposed project at this stage. The recommended biodiversity protection and enhancements, including the creation of a new attenuation pond, the placement of hedgehog nesting boxes and the erection of bird nesting boxes and bat roosting boxes will provide assurance that there is no net loss to biodiversity and no unacceptable adverse impact on ecosystem services.

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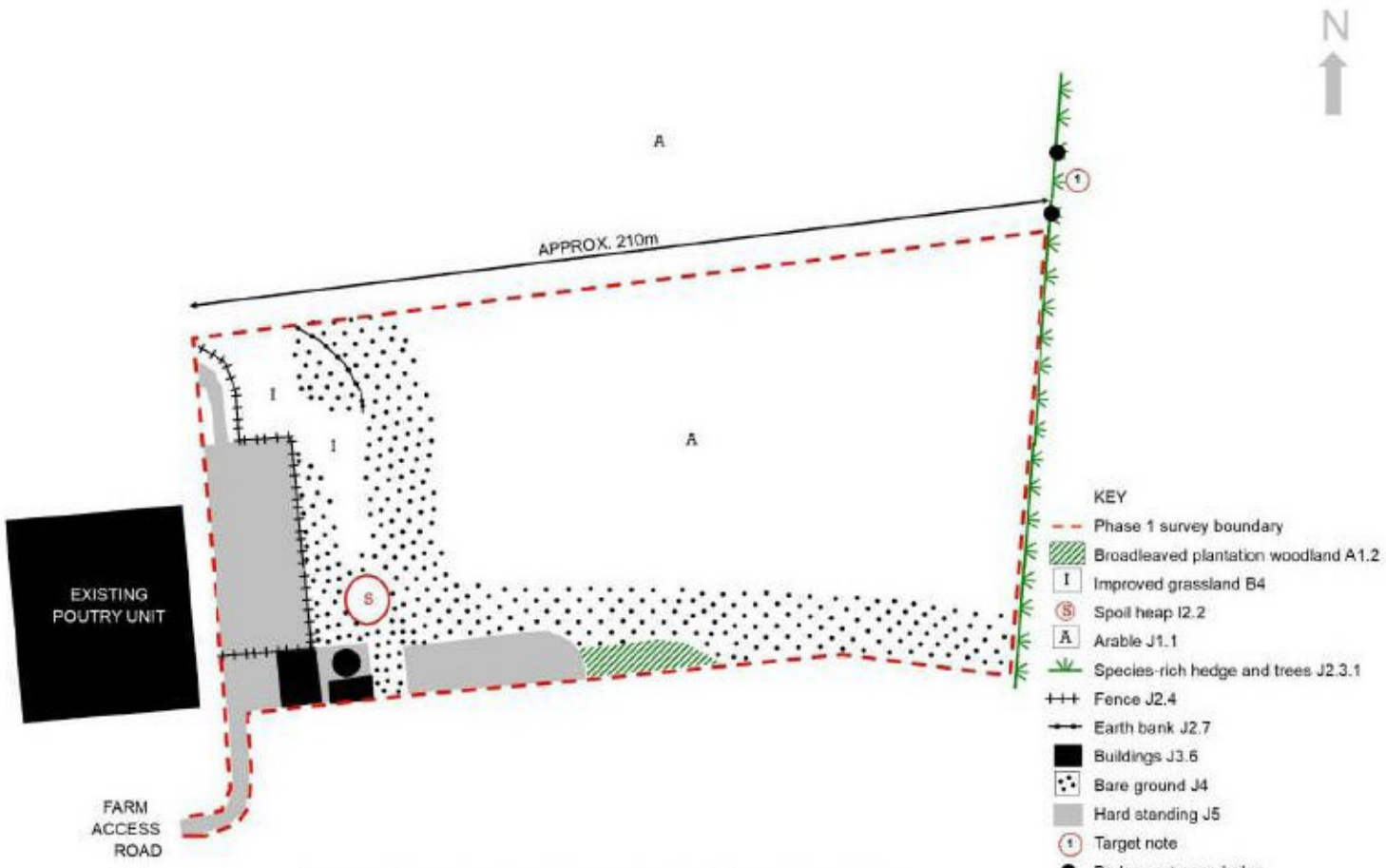
FIGURE 2: SITE PLAN



Please note: This plan is intended to indicate the approximate location of features and should therefore, not be treated as an accurate scale plan.

APPENDICES

APPENDIX 1 - SURVEY DATA

Table 1: Botanical Species List on 22nd March 2022
Weather conditions: sunny (Max. 17˚C)

Common Name	***Status***	**Scientific Name**	**Improved grassland**	**Arable field margin**	**Hedgerow**	**Broadleaved plantation woodland**
Blackthorn	Native species	*Prunus spinosa*			X	
Bramble	Native (Apomictic species)	*Rubus fruticosus* agg.			X	
Bristly Oxtongue	Archaeophyte	*Helminthotheca echioides*	R	X		
Broad-leaved Dock	Native species	*Rumex obtusifolius*		X		
Cleavers	Native species	*Galium aparine*		X	X	
Cock's-foot	Native species	*Dactylis glomerata*		X		
Coltsfoot	Native species	*Tussilago farfara*	R			
Common Field Speedwell	Neophyte	*Veronica persica*	O			
Common Mouse-ear	Native species	*Cerastium fontanum*	R			
Common Nettle	Native species	*Urtica dioica*		X	X	
Cow Parsley	Native species	*Anthriscus sylvestris*		X		
Creeping Thistle	Native species	*Cirsium arvense*		X		

Dandelion	Apomictic (most species native, some Neophyte)	*Taraxacum officinale* agg.	R			
Dog Rose	Native species	*Rosa canina* agg.			X	
Elder	Native species	*Sambucus nigra*			X	
False Oat-grass	Native species	*Arrhenatherum elatius*		X		
Field Maple	Native species	*Acer campestre*				X
Field Pennycress	Archaeophyte	*Thlaspi arvense*	R			
Flax	Archeophyte	*Linum usitatissimum*	R			
Goat Willow	Native species	*Salix caprea*			X	
Ground-ivy	Native species	*Glechoma hederacea*			X	
Groundsel	Native species	*Senecio vulgaris*	R	X		
Hawthorn	Native species	*Crataegus monogyna*			X	X
Hazel	Native species	*Corylus avellana*				X
Hogweed	Native species	*Heracleum sphondylium*		X		
Ivy	Native species	*Hedera helix*			X	
Lesser Burdock	Native species	*Arctium minus*		X		
Lords-and-Ladies	Native species	*Arum maculatum*			X	
Pedunculate Oak	Native species	*Quercus robur*			X	X
Perennial Rye-grass	Native species	*Lolium perenne*	D			
Red Campion	Native species	*Silene dioica*		X		
Red Dead-nettle	Archaeophyte	*Lamium purpureum*		X		
Rowan	Native species	*Sorbus aucuparia*				X
Scarlet Pimpernel	Native species	*Anagallis arvensis*	R			
Scentless Mayweed	Archaeophyte	*Tripleurospermum inodorum*	F			
Spear Thistle	Native species	*Cirsium vulgare*	R			
Wavy Bittercress	Native species	*Cardamine flexuosa*	R			
Wild Radish	Archeophyte	*Raphanus raphanistrum*	O			
Key to Margin/Hedgerow/Woodland	X present					

DAFOR scale	**D**ominant, **A**bundant, **F**requent, **O**ccasional, **R**are (**L** locally)

Note 1: the above status refers to (Preston *et al*, 2002): native species – a species present in Britain as the result of only natural processes, with no human intervention; archaeophyte – a species that was introduced in 'ancient' times (*i.e.* before 1500), but is now considered to be fully naturalised; neophyte – a species that was introduced in 'recent' times (*i.e.* after 1500); apomicte – a species that produces viable seed without fertilisation, these germinating into seedlings that are identical to the parent. These often have large numbers of 'micro-species' and no attempt has been made to identify these; hybrid – a result of mixing, through sexual reproduction, of two different species.

Note 2: the above vegetation coverage descriptions make reference to the DAFOR scale (Dominant, Abundant, Frequent, Occasional or Rare); this scale describes the coverage in the area being studied and is not a reference to the national status of the species in question (*i.e.* a 'rare' attribute above refers to the species being uncommon on the proposed development site, not that it is of national conservation value).

Table 2: Summary of Hedgerows Regulations assessment for the hedgerow on the eastern boundary of the site

Protected species present	**Number of Woody species per 30m**	**Associated Features**									**Qualifies as important?**
Yes/No	Number	a	b	c	d	e	f	g	h	i	Yes/No
No	3	N	Y	Y	N	N	Y	N	N	Y	No

ASSOCIATED FEATURES

a) Bank/wall
b) Intact
c) Trees
d) Rare trees
e) 3 valuable ground flora species
f) Ditch
g) Parallel hedge
h) Bridleway/Public Footpath
i) Connections (≥4 points)

Notes
This hedgerow assessment has been calculated using ecological criteria only and does not include archaeological or historical features that may or may not be present. A detailed description of how Hedgerows Regulations assessments are conducted is presented in Appendix 2.

Habitat Suitability Index

A Habitat Suitability Index (HSI) is a numerical score where 0 indicates unsuitable habitat and 1 represents optimal habitats. The HSI for the great crested newt incorporates ten suitability indices, all of which are factors believed to affect this species.

Categorisation of HSI Scores and proportion of ponds occupied by newts taken from: ARG UK advice note 5 (Amphibian and Reptile Groups of the United Kingdom, 2010):

Table 3: HSI scores and suitability of ponds for great crested newts

HSI Score	Classification of Pond Suitability for Great Crested Newts	Proportion of Ponds Occupied by Great Crested Newts
<0.5	Poor	0.03
0.5 – 0.59	Below average	0.20
0.6 – 0.69	Average	0.55
0.7 – 0.79	Good	0.79
> 0.8	Excellent	0.93

Table 4: Habitat Suitability Indices for Great Crested Newts

Pond ref	Pond 1	Pond 2
OS Grid ref	*TM 18468 28291*	*TM 18132 28141*
Size of pond (m^2)	*788*	*63*
Distance from site	*192m south-east*	*214m south*
SI1 - Location	1.0	1.0
SI2 - Pond area	0.97	0.1
SI3 - Pond drying	0.9	0.9
SI4 - Water quality	0.01	0.67
SI4 - Shade	1.0	1.0
SI6 - Waterfowl	0.01	1.0
SI7 - Fish	1.0	0.33
SI8 - Ponds	1.0	1.0
SI9 - Terrestrial habitat	0.33	0.01
SI10 - Macrophytes	1.0	0.8
HSI	*0.35*	*0.42*
	Poor	*Poor*

APPENDIX 2 – HEDGEROW ASSESSMENTS WITH REGARD TO THE HEDGEROWS REGULATIONS, 1997 (DEFRA, 2007)

ASSESSING HEDGEROWS

These Regulations only apply to hedgerows adjacent to land in agricultural/horticultural use.

A hedgerow can be defined as any boundary line of trees or shrubs that is more than 20m long and less than 5m wide between major woody stems at the base. Hedgerows can be classified as 'important' for archaeological/historical reasons or according to wildlife and landscape criteria. If a hedgerow is classed as 'important', local planning authorities have the power to prevent the removal of the hedgerow (Hedgerows Regulations, 1997).

To be classified as 'important' under the wildlife and landscape criteria, the hedgerow must be over 30 years old, completely in a rural setting and should comprise one of the following:

- Contain at least 7 woody species per 30m;
- Contain at least 6 woody species per 30m and have at least 3 features present;
- Contain at least 6 woody species per 30m, including any one of the following: Black Poplar, Wild Service Tree, Small-leaved Lime or Large-leaved Lime;
- Contain at least 5 woody species per 30m and have at least 4 features present;
- Or, if adjacent to a bridleway/public footpath, contain at least 4 woody species per 30m and have at least 2 features present.

Table 5: The woody species recognised by the Hedgerows Regulations:

English name	Scientific name
Alder	*Alnus glutinosa*
Alder Buckthorn	*Frangula alnus*
Ash	*Fraxinus excelsior*
Aspen	*Populus tremula*
Beech	*Fagus sylvatica*
Bird Cherry	*Prunus padus*
Black Poplar	*Populus nigra* ssp *betulifolia*
Blackthorn	*Prunus spinose*
Box	*Buxux sempervirens*
Broom	*Cytisus scoparius*
Buckthorn	*Rhamnus catharticus*
Butcher's-broom	*Ruscus aculeatus*
Common Juniper	*Juniperus communis*
Crab Apple	*Malus sylvestris*
Dogwood	*Cornus sanguinea*
Downy Birch	*Betula pubescens*
Dwarf Gorse	*Ulex minor*
Elder	*Sambucus nigra*
Elm	*Ulmus* sp(p)
Field maple	*Acer campestre*

Gooseberry	*Ribes uva crispa*
Gorse	*Ulex europaeus*
Grey Poplar	*Populus x canescens*
Guelder Rose	*Viburnum opulus*
Hawthorn	*Crataegus monogyna*
Hazel	*Corylus avellana*
Holly	*Ilex aquifolium*
Hornbeam	*Carpinus betulus*
Large-leaved Lime	*Tilia platyphyllos*
Midland Hawthorn	*Crataegus laevigata*
Osier	*Salix viminalis*
Pear	*Pyrus communis*
Pedunculate Oak	*Quercus robur*
Rose	*Rosa* sp(p)
Rowan	*Sorbus aucuparia*
Sea-buckthorn	*Hippophae rhamnoides*
Sessile Oak	*Quercus petraea*
Silver Birch	*Betula pendula*
Small-leaved Lime	*Tilia cordata*
Spindle	*Euonymus europaeus*
Spurge-laurel	*Daphne laureola*
Walnut	*Juglans regia*
Wayfaring-tree	*Viburnum lantana*
Western Gorse	*Ulex gallii*
White Poplar	*Populus alba*
Whitebeam	*Sorbus* sp(p)
Wild Cherry	*Prunus avium*
Wild Privet	*Ligustrum vulgare*
Wild Service-tree	*Sorbus torminalis*
Willow	*Salix* sp(p)
Yew	*Taxus baccata*

Note 1: To count the number of woody species in a hedgerow, a 30m section should be selected:

- If the hedgerow is less than 100m long, the middle 30m should be selected:
- If it is between 100-200m, the middle 30m of each half should be surveyed and the number of woody species divided by two.
- Where the hedgerow exceeds 200m, the number of woody species in the middle 30m of each third of the hedgerow should be counted and the total divided by three.

Note 2: If the hedgerow is situated wholly or partly in one of the following areas of northern England (and upland Wales and Scotland) the number of woody species required for the hedgerow to be classed as important should be reduced by one:

- City of Kingston upon Hull:
- Cumbria:
- Darlington:
- Durham:
- East Riding of Yorkshire:

- Hartlepool;
- Lancashire;
- Middlesbrough;
- North East Lincolnshire;
- North Lincolnshire;
- Northumberland;
- North Yorkshire;
- Redcar and Cleveland;
- Stockton-on-Tees;
- Tyne and Wear;
- West Yorkshire, or
- York

Table 6: Features recognised by the Hedgerows Regulations

Feature	Notes
Bank/wall	The hedgerow must be supported along at least half of its length by a bank/wall
Intact	The hedgerow must contain less than 10% gaps in total along its length
Trees	The hedgerow must support at least one standard tree per 50m length of hedgerow (standard trees are defined as those which when measured at 1.3m above ground level have a diameter of at least 20cm, or 15cm for multi-stemmed trees)
Rare trees	The hedgerow must support one of the following species of rare tree: Black Poplar, Wild Service Tree, Small-leaved Lime or Large-leaved Lime
3 valuable ground flora species	The hedgerow must support at least three of the valuable ground flora species defined by the Regulations. The hedgerow is considered to support a plant if it is rooted within 1m (in any direction) of the hedgerow
Ditch	There is a ditch along at least half of the length of the hedgerow
Parallel hedge	A parallel hedgerow is present within 15m
Bridleway/Public Footpath	This does not normally include roads
Connections (≥4 points)	A hedgerow must score 4 or more 'connection points', where connections with an adjoining hedgerow(s) score 1 point each, and a connection with a pond or woodland (in which the majority of the trees are broad-leaved) scores 2 points each. A hedgerow is considered to be connected if it meets the feature, or if it has a point within 10m of it and would meet if the line of the hedgerow continued

A hedgerow may also be classified as 'important' due to the presence or recorded presence of a protected animal and plant species (Schedule1, 5 and 8 of the Wildlife and Countryside Act, 1981) within the last 5 years and archaeological/historical features.

Table 7: Valuable ground flora species recognised by the Hedgerows Regulations

English name	Scientific name
Barren Strawberry	*Potentilla sterilis*
Bluebell	*Hyacinthoides non-scripta*
Broad-leaved Helleborine	*Epipactis helleborine*
Bugle	*Ajuga reptans*
Common Cow-wheat	*Melampyrum pratense*
Common Dog-violet	*Viola riviana*
Dog's Mercury	*Mercrialis perennis*

Early Dog-violet	*Viola reichenbachiana*
Early-purple Orchid	*Orchis mascula*
Enchanter's Nightshade	*Circaea lutetiana*
False Brome	*Brachypodium sylvaticum*
Giant Bellflower	*Campanula latifolia*
Giant Fescue	*Festuca gigantea*
Goldilocks Buttercup	*Ranunculus auricomus*
Greater Wood-rush	*Luzula sylvatica*
Hairy Brome	*Bromopsis ramosa*
Hard Shield-fern	*Polystichum aculeatum*
Hard-fern	*Blechnum spicant*
Hart's-tongue	*Phyllitis scolopendrium*
Heath Bedstraw	*Galium saxatile*
Herb Paris	*Paris quadrifolia*
Herb-robert	*Geranium robertianum*
Lady-fern	*Athyrium filix femina*
Lord's-and-Ladies	*Arum maculatum*
Male-fern	*Dryopteris filix mas*
Moschatel	*Adoxa moschatelina*
Narrow Buckler-fern	*Dryopteris carthusiana*
Nettle-leaved Bellflower	*Campanula trachelium*
Oxlip	*Primula elatior*
Pignut	*Conopodium majus*
Polypody	*Polypodium vulgare*
Primrose	*Primula vulgaris*
Ramsons	*Allium ursinum*
Sanicle	*Sanicula europaea*
Scaly Male-fern	*Dryopteris affinis*
Small Cow-wheat	*Melampyrum sylvaticum*
Soft Shield-fern	*Polystichum setiferum*
Sweet Violet	*Viola odorata*
Toothwort	*Lathraea squamaria*
Tormentil	*Potentilla erecta*
Wild Strawberry	*Fragaria vesca*
Wood Anemone	*Anemone nemorosa*
Wood Avens	*Geum urbanum*
Wood Horsetail	*Equisetum sylvaticum*
Wood Meadow-grass	*Poa nemoralis*
Wood Melick	*Melica uniflora*
Wood Millet	*Milium effusum*
Wood Sage	*Teucrium scorodonia*
Wood Sedge	*Carex sylvatica*
Wood Sorrel	*Oxalis acetosella*
Wood Speedwell	*Veronica montana*
Wood Spurge	*Euphorbia amygdaloides*
Woodruff	*Galium odoratum*
Yellow Archangel	*Lamiastrum galeobdolon*
Yellow Pimpernel	*Lysimachia nemorum*

APPENDIX 3 – BAT ROOST ASSESSMENTS

Table 8: Bat Roost Assessment Criteria.

Suitability	Description of Roosting habitats	Commuting and foraging habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation). A tree of sufficient size and age to contain Potential Roost Features (PRFs) but none seen from the ground or features seen with only very limited roosting potential.	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or un-vegetated stream or lone tree (not in a parkland situation) or a patch of scrub, but isolated, *i.e.* not very well connected to the surrounding landscape by another habitat.
Moderate	A structure or tree with one or more PRFs that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat, but unlikely to support a roost of high conservation status (with respect to roost type only - the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected with the wider landscape that could be used by bats for commuting such as lines of trees, scrub, grassland or water or linked back gardens.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, tree-lined watercourses, grazed parkland, hedgerows, lines of trees, broad-leaved woodland and woodland edge. Site is close to and connected to known roosts.

Note: Adapted from Collins, 2016.

APPENDIX 4 - RELEVANT LEGISLATION AND POLICY

LEGISLATION

The Natural Environment & Rural Communities (NERC) Act 2006 (replaced by the Environment (Wales) Act, 2016 in Wales) places a duty on authorities to have due regard for biodiversity and nature conservation during the course of their operations.

BADGERS

In the British Red List badgers are categorised as 'Least Concern' (Mammal Society, 2018). Badgers are protected in the UK under the Protection of Badgers Act (1992), making it an offence to:

- Kill, injure or take a badger;
- To cruelly ill-treat badgers;
- To dig for a badger;
- Possess a badger or any part of a dead badger;
- Intentionally or recklessly damage, destroy, or obstruct access to any part of a sett;
- Disturb a badger whilst it is occupying a sett.

However, this legislation is welfare based. It is not based upon conservation needs as badgers are considered to be a widespread and common species throughout most of the UK.

BATS

There are 18 resident species of bat in Britain (Mammal Society, 2018). All species of bat in Britain are 'European Protected Species' and are protected under the Conservation of Habitats and Species Regulations 2017, and the Wildlife and Countryside Act 1981, as amended by the Environmental Protection Act 1990 and the Countryside & Rights of Way Act 2000. These pieces of legislation combine to give substantial protection to bats and their habitats, making it an offence to:

- Deliberately capture, injure or kill a bat;
- Intentionally or recklessly disturb a bat in its roost or deliberately disturb a group of bats;
- Damage or destroy a bat roosting place (even if bats are not occupying the roost at the time);
- Possess or advertise/sell/exchange a bat (dead or alive) or any part of a bat;
- Intentionally or recklessly obstruct access to a bat roost.

COMMON REPTILES

In Britain there are four relatively widespread native species of reptile: the adder; grass snake; common lizard and slow worm. These species are protected via part of Section 9(1) of the Wildlife & Countryside Act 1981 (as amended) against:

- Intentional killing and injuring;
- Selling, offering or exposing for sale.

Two other species of reptile: the sand lizard and smooth snake are 'European Protected Species'. It is illegal to injure, kill, disturb, capture, keep or sell them, or to damage or destroy the habitats in which they live.

DORMICE

In the British Red List dormice are categorised as 'Vulnerable' in England and Wales and are not recorded in Scotland (Mammal Society, 2018). The hazel dormouse is a 'European Protected Species' and is fully protected under national and European legislation. It is listed on Annex IVa of the Habitats Directive and the Directive is transposed into UK law through the Conservation of Habitats and Species Regulations 2017. They are also protected by the Wildlife and Countryside Act 1981, as amended by the Environmental Protection Act 1990 and the Countryside & Rights of Way Act 2000. Dormice are also listed as a Species of Principal Importance under the Natural Environment and Rural Communities (NERC) Act (2006). These pieces of legislation combine to give substantial protection to dormice and their habitat, making it an offence to:

- Intentionally kill, injure or take a dormouse;
- Possess or control any live or dead specimen or anything derived from a dormouse (unless it can be shown to have been legally acquired);
- Intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection by a dormouse;
- Intentionally or recklessly disturb a dormouse while it is occupying a structure or place which it uses for that purpose.

GREAT CRESTED NEWTS

The great crested newt is a 'European Protected Species' and is listed on both Annex II and IV of the EC Habitats Directive. The Directive is transposed into UK law through the Conservation of Habitats and Species Regulations 2017. They are also protected by the Wildlife and Countryside Act 1981, as amended by the Environmental Protection Act 1990 and the Countryside & Rights of Way Act 2000. These pieces of legislation combine to give substantial protection to great crested newts and their breeding ponds and terrestrial habitat, making it an offence to:

- Deliberately capture, injure or kill a great crested newt;
- Intentionally or recklessly disturb a great crested newt in a structure or place that they use for shelter or protection or deliberately disturb a group of a great crested newts;
- Damage or destroy a great crested newt resting place/shelter (even if they are not occupying it at the time);
- Possess or advertise/sell/exchange a great crested newt (dead or alive) or any part of a great crested newt (including eggs and all life-stages);
- Intentionally or recklessly obstruct access to a great crested newt resting place/shelter.

HEDGEHOGS

In the British Red List hedgehogs are categorised as 'Vulnerable' in the UK (Mammal Society, 2018). The population of hedgehogs in Britain is suffering from a serious decline. The most recent analysis of the research done through the combined work of the British Hedgehog

Preservation Society and the People's Trust for Endangered Species indicates that urban populations have fallen by up to 30% and rural populations by at least 50% since the turn of the century. The Mammal Society have estimated that the population of hedgehogs in the UK have declined by as much as 73% between 1995 and 2010 (Mammal Society, 2018).

Currently, hedgehogs have only limited legal protection in the UK. They are listed on schedule 6 of the Wildlife and Countryside Act (1981) which makes it illegal to kill or capture wild hedgehogs. They are also listed under the Wild Mammals Protection Act (1996), which prohibits cruel treatment of hedgehogs.

New planning guidelines state that small holes (of 13cm²) must be included in the base of all fences in new developments, creating 'highways' that enable hedgehogs to roam freely between properties to forage.

NESTING BIRDS

All wild bird nests are protected under The Wildlife and Countryside Act 1981 (as amended), making it an offence to:

- Intentionally kill, injure or take any wild bird or their eggs or nests (with certain exceptions) and disturb any bird species listed under Schedule 1 to the Act, or its dependent young while it is nesting.

BARN OWLS

The barn owl is included in the list of strictly protected fauna and appears in Appendix II of the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats). They are also afforded protection under Schedule One of the Wildlife and Countryside Act (1981). This act has been amended on several occasions, most recently by the Countryside and Rights of Way (CRoW) Act 2000, the Natural Environment and Rural Communities (NERC) Act 2006 and by the Conservation of Habitats and Species Regulations 2010 and 2017, making it an offence to:

- Intentionally and recklessly disturb barn owls whilst they are building a nest or are in, on or near a nest containing eggs or young, or to disturb their dependent young.

OTTERS

The European otter is the only native UK otter species. In the British Red List otters are categorised as 'Least Concern' in England, and 'Vulnerable' in Wales and Scotland (Mammal Society, 2018). Otters are a European protected species (EPS) and are also fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). It is an offence to:

- Capture, kill, disturb or injure otters (on purpose or by not taking enough care):
- Damage or destroy a breeding or resting place (deliberately or by not taking enough care):
- Obstruct access to their resting or sheltering places (deliberately or by not taking enough care):

- Possess, sell, control or transport live or dead otters, or parts of otters.

WATER VOLES

In the British Red List water voles are categorised as 'Endangered' in England, 'Critically Endangered' in Wales, and 'Near Threatened' in Scotland (Mammal Society, 2018). Water voles are protected in the UK under the Conservation of Habitats and Species Regulations, 2017 and Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). This legislation makes it an offence to:

- Intentionally kill, take or injure a water vole;
- Possess or control any live or dead water vole, or any part or derivative (not including water voles bred in captivity under licence);
- Intentionally or recklessly damage, destroy or block access to a water voles place of shelter or protection (on purpose or by not taking enough care);
- Intentionally or recklessly disturb a water vole whilst it is occupying a structure or place which it uses for shelter or protection (on purpose or by not taking enough care).

POLICY

NATIONAL PLANNING POLICY FRAMEWORK (NPPF)

The National Planning Policy Framework (NPPF) states that the planning system should contribute to and enhance the natural and local environment by:

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

Other key principles of the NPPF relating to biodiversity are:

- The conservation of International and National statutorily designated sites;
- Protection of ancient woodland and veteran trees;
- The creation, protection, enhancement and management of networks of biodiversity and green infrastructure;
- The preservation, restoration and recreation of priority habitats and ecological networks;
- The recovery of priority species populations.

HABITATS AND SPECIES OF PRINCIPAL IMPORTANCE

The NERC Act, 2006 requires the Secretary of State to publish lists of habitats and species which are of principal importance for the conservation of biodiversity in England, Wales and Scotland. The lists replace the UK Biodiversity Action Pans (UK BAP) and have been drawn up in consultation with Natural England, Natural Resources Wales and NatureScot as required by the Act. Section 7 of the Environment (Wales) Act, 2016 has now replaced the duty in section 41 of the NERC Act in relation to Wales, with a duty on public authorities to seek to maintain and enhance biodiversity.

The lists are used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under section 41 of NERC Act and section 7 of the Environment (Wales) Act, 2016, to have regard to the conservation of biodiversity when carrying out their normal functions.

HABITATS OF PRINCIPAL IMPORTANCE

Habitats of principal importance (HPI) are included on the lists. These are all the habitats in England, Wales and Scotland that were identified as requiring action in the UK Biodiversity Action Plan (UK BAP) and continue to be regarded as conservation priorities in the subsequent UK Post-2010 Biodiversity Framework.

SPECIES OF PRINCIPAL IMPORTANCE

Species of principal importance (SPI) are included on the lists. These are the species found in England, Wales and Scotland which were identified as requiring action under the UK BAP and which continue to be regarded as conservation priorities under the UK Post-2010 Biodiversity Framework.

QUALITY ASSURANCE

This report format is designed to comply with statutory authority (*e.g.* Natural England, Natural Resources Wales and NatureScot) and the Chartered Institute of Ecology and Environmental Management relevant standing advice. Further studies may be required where there is evidence of protected species or if other notable ecological factors are found.

Craig Emms MSc, MCIEEM
Linda Barnett BSc (Hons), PhD, MCIEEM
Craig and Linda are professional ecologists with over 65 years of combined practical experience in nature conservation, wildlife research and management and ecological consultancy, gained from working in the UK and overseas. Craig has a MSc. in Ecosystems Analysis and Governance and Linda has a PhD in Genetics. Together they have carried out original academic research on a broad range of wildlife; insects, amphibians, reptiles, birds and mammals (including bats), and published the results as scientific papers in a number of international peer-reviewed journals. Linda co-authored the Species Action Plans for Britain's eight most endangered butterflies while working for Butterfly Conservation, and has supervised students in research projects on hazel dormouse, great crested newts and moths whilst she was co-ordinating and lecturing on a Masters course in Analytical Biology at the University of Warwick. Craig was also a lecturer in ecological methods on two Masters courses at the University of Warwick. Linda and Craig are skilled and practiced field ecologists, especially regarding wildlife and countryside management. They are licenced by Natural England as bat and great crested newt surveyors (and are volunteer bat roost visitors/handlers for Natural England, and former registered bat carers for the Bat Conservation Trust with 15 years of experience) and have an extensive and broad experience of a great variety of field surveys including mammals (otter, badger, water vole, hedgehog, small mammals and bats), birds, reptiles, amphibians, dragonflies, butterflies and moths. Both have undergone training in the use of eDNA methodology and field sample collection. Craig is also licenced by Natural Resources Wales as a bat and great crested newt surveyor, by the British Trust for Ornithology as a bird nest recorder and has been the named ecologist and clerk of works on many bat mitigation and compensation (development) licences.

Please be aware that ecological reports generally have a limited period of currency. Many statutory authorities now regard one year as the maximum time that should elapse before a report will need to be updated. Where a European Protected Species licence is to be applied for once planning permission has been granted, a walk-over of the site should be carried out within three months of an application being submitted to check that the habitats have not changed significantly since the survey was carried out.

It is a requirement under the CIEEM code of practice to provide recorded data to biological record centres. For certain records (*i.e.* data obtained under a government survey licence) we also have a legal obligation to forward such data.

If you have special cause to restrict the distribution of this data (which will be in the public domain), please contact us to discuss this further within one month of the issue of this report.

Any information relating to legal matters, designs, specifications, advice, suggestions, or comments written or verbal in this report is provided in good faith and for consideration only and does not purport in any way to give any advice on or interpretation of the law whatsoever. Professional legal advice should always be sought.

Note. Whilst all due and reasonable care is taken in the preparation of reports, Craig Emms and Linda Barnett accept no responsibility whatsoever for any consequences of the release of this report to third parties. Please be aware that site surveys inevitably miss species not apparent on the date of visit(s) by reason of seasonality, mobility, habits or chance. Results are indicative and given in good faith but they are not a guarantee of presence or absence of any particular taxa.