



Preliminary Ecological Appraisal
Water Orton Primary School,
Warwickshire

ISSUE RECORD

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EXECUTIVE SUMMARY

Overview

This report has been prepared by Peak Ecology Ltd on behalf of Willmott Dixon. It details a Preliminary Ecological Appraisal (PEA) carried out on 22nd August 2016, in relation to a proposed new primary school on land at Water Orton, North Warwickshire (OS grid: SP 1755 9090).

As part of the PEA the broad habitat types were identified, mapped and assessed for their ecological importance and the potential of the site to support protected species was assessed.

Designated Sites

There was one statutory designated site within 2km from the site, a Local Nature Reserve (LNR). A number of non-statutory designations were also present within 2km. These were four Local Wildlife Sites (LWS), six Potential LWSs and six Ecosites.

The nearest designated site was a Potential Local Wildlife Site, Water Orton Sidings approximately 0.52km NW. Due to the distance of these sites to the proposed development, no impacts are anticipated.

Habitats

The survey area was dominated by a large improved grassland field surrounded by linear broadleaved woodland, a hedgerow and fencing. The field was considered to be of low ecological value given the improved grassland species assemblages.

A hedgerow formed the northern boundary of the field, along with linear woodland along half of the southern and the entire western boundary. These habitats were considered to be of higher ecological value, providing habitat suitable for breeding birds and opportunities for roosting, commuting and foraging bats. The linear woodland and hedgerow will be retained and site access will be through an existing gap on the northern boundary, through fencing.

Protected and notable species

The site has potential to be used by passerine bird species and provided good nesting opportunities especially along the boundaries. There was also potential for foraging and roosting bats. The River Tame is located approximately 500m to the north of the site which could provide habitat for riparian mammals.

The desk study data revealed records of bats and otters within 2km to the site.

Implications/Recommendations

Feature	Recommendations	Further survey required?
Habitats		
Trees	Tree removal should be minimised and new tree planting should be incorporated where possible.	Further survey in relation to bats may be required.
Hedgerows	Hedgerows and trees that are being retained should be adequately protected during the works, following BS5837: 2012.	N/A
Protected and Notable species		
Birds	Vegetation clearance should be timed to avoid the bird nesting season (March – August, inclusive).	If vegetation clearance is undertaken in the bird nesting season, a survey for active nests will be required.
Bats	A sensitive lighting scheme must be designed to ensure a dark corridor remains around the site perimeter, suitable for foraging and commuting bats.	If the trees identified as having features potentially suitable for roosting bats are to be affected, they must be subjected to further survey work.
Badgers	General good working practices with regards to hedgehogs and terrestrial mammals should be implemented.	No
Hedgehogs	General good working practices with regards to hedgehogs and terrestrial mammals should be implemented	No

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1 INTRODUCTION

1.1 Scope of Report

This report has been prepared by Peak Ecology Ltd on behalf of Willmott Dixon Construction Ltd. It provides the results of a Preliminary Ecological Appraisal associated with a proposed new primary school. The purpose of this report is to:

- Describe the existing habitat types present within the site;
- Provide an assessment of habitat suitability for protected and/or notable species;
- Identify key ecological constraints to the proposed development;
- Provide outline recommendations for mitigation and/or avoidance measures where appropriate;
- Highlight opportunities for ecological enhancement where appropriate; and
- Confirm any further ecological surveys required, for example to confirm presence / likely absence of a specific protected species.

In relation to the proposals, this report should be read in conjunction with the reports for any additional ecological surveys that are recommended as a result of the findings of this appraisal, see Section 5 for details.

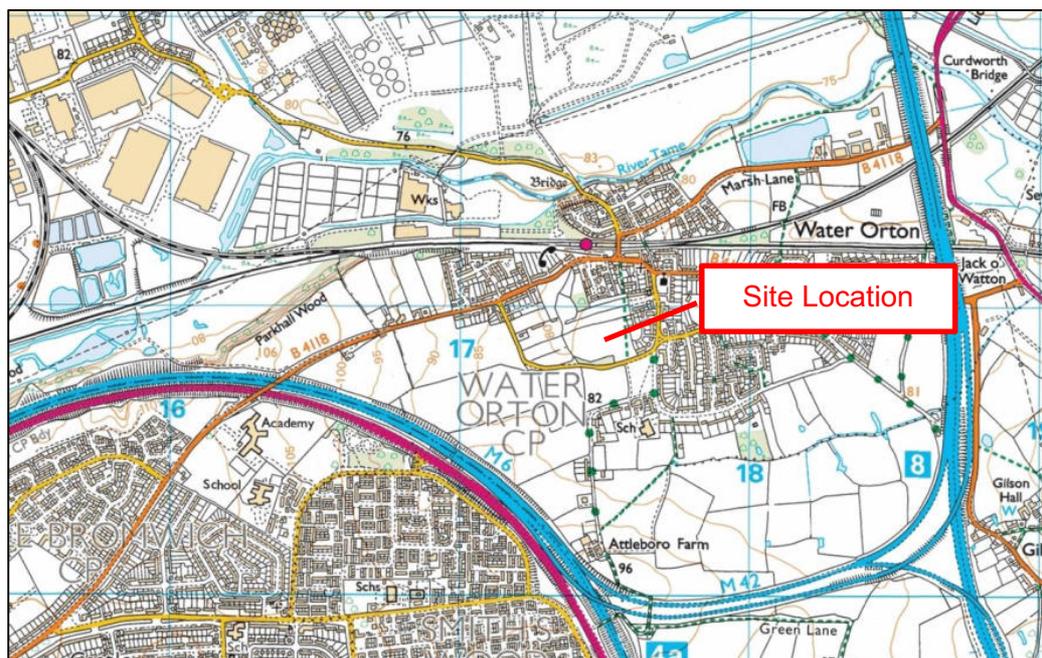
The approach to this ecological appraisal follows best practice published by the Chartered Institute of Ecology and Environmental Management (CIEEM 2013) and the British Standards Institution (BSI 2013). Details of individual survey methods and associated supporting information are provided in Section 2.

1.2 Site Description

The survey area was dominated by a large improved grassland field with linear broadleaved woodland, a hedgerow and fencing. The hedgerow formed the northern boundary of the field, along with the linear woodland along half of the southern and the entire western boundary. The eastern boundary was delineated by fencing from residential housing. The western boundary of the proposed site was within the field surveyed and as such had no physical boundary, although the area surveyed included the vegetation along the edge of the surveyed field on its western boundary

The survey boundary was as per the map provided by the client. The site location is illustrated overleaf.

Figure 1: Location plan*



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1.3 Planning Context

The National Planning Policy Framework 2012 requires that when assessing a planning application all Local Planning Authorities (LPAs) must consider potential impacts on biodiversity that may result from the proposals. In addition to this, county and borough councils typically have biodiversity policies within their Local Development Frameworks that they must also comply with.

In practice, this means that potential impacts on designated sites, notable species and habitats such as those listed on the UK Post-2010 Biodiversity Framework (formerly the UK Biodiversity Action Plan) and species that receive legal direct protection (typically via the Conservation of Habitats and Species Regulations 2010 (as amended) and/or the Wildlife and Countryside Act 1981 (as amended)) are all material planning considerations.

In relation to European Protected Species, the LPA requires sufficient information about likely impacts and mitigation or compensatory measures to satisfy the three Habitats Directive tests, the most relevant to ecological reports being that which relates to the Favourable Conservation Status of the species in question.

2 METHODOLOGY

2.1 Desk Study

The desk study comprised a review of existing information held by the local biological records centre and other specialist groups, as appropriate. Warwickshire Biological Records Centre (WBRC) were contacted to obtain locations of designated sites and any existing records of protected or priority species within 2km of the site and a Site Check Report was also carried out using the online interactive mapping tools on the Magic (Multi-Agency Geographic Information for the Countryside) website to identify any statutory designated sites within the search radius.

2.2 Phase 1 Habitat Survey

A daytime site visit was carried out on the 22nd August 2016. Following standard methodology (JNCC, 2010) the survey comprised a walkover of the site to classify and map the extent of individual habitat types, based on the identification of individual plant species. Any evidence of invasive plants such as Japanese knotweed *Fallopia japonica* was also noted.

The extent of the habitats recorded is illustrated on the Phase 1 Habitat Plan in Figure 2, with target notes to provide supplementary information regarding any particular features of ecological interest in Appendix A. Photographs of the site have been provided in Appendix B and a botanical species list (non-exhaustive) is provided in Appendix C.

Nomenclature for vascular plant species follows Stace (2010).

2.3 Hedgerows

Species-rich hedgerows are included within the UK BAP and all hedgerows were assessed under the criteria outlined within the Hedgerow Regulations 1997. Additionally, the Hedgerow Evaluation and Grading System or HEGS (Clements and Tofts 1992) was used to evaluate the ecological importance of the hedgerows within the site. The full results of the survey are given in Appendix D. The location of each hedgerow is shown in Figure 2.

Three principal categories are used within the HEGS survey:

- Attributes which are intrinsic to the hedgerow itself, such as structure and species composition;
- Attributes derived from associated features, such as banks and ditches; and
- Attributes arising from the function of the hedgerow as part of the wider landscape.

The procedure only takes account of the woody species within the hedgerow. Once the attributes have been surveyed each hedgerow is graded for its nature conservation value as follows:

- Grade 1: High to very high value

- Grade 2: Moderately high to high value
- Grade 3: Moderate value
- Grade 4: Low value

The scale is a continuum, although the transition points (+ and -) have been set so as to ensure a reasonably robust grade position for most hedges. Hedgerows grading 2 and above are specified as being of conservation priority.

2.4 Scoping for Protected / Notable Species

The habitats present were assessed for their potential to support any legally protected or otherwise notable species; any incidental sightings or field signs discovered during the surveys were recorded.

All British wildlife and countryside legislation, policy and guidance were taken into consideration including;

- The Wildlife and Countryside Act 1981 (as amended);
- The Conservation of Habitats and Species Regulations 2010 (as amended);
- EC Council Directive on the Conservation of Wild Birds 79/409/EEC;
- The Protection of Badgers Act 1992;
- The Countryside and Rights of Way Act 2000;
- The Hedgerow Regulations 1997;
- The Natural Environment and Rural Communities Act 2006; and
- The UK Post-2010 Biodiversity Framework (formerly known as UK BAP). However, UK BAP Priority Habitats and Species lists are still relevant within the new framework.

Appendix E provides greater detail on the legislation context relevant to this site.

In the case of bats, a specific assessment method has been adopted as the industry standard and this was followed during the survey; see Appendix F for detailed methodology.

2.5 Surveyors

The habitat survey was carried out by Carole Boon BSc MCIEEM. Carole has been a professional ecologist for over twelve years and is experienced in the use of the Phase 1 Habitat Survey methodology, identification of vascular plants and scoping assessments for protected species.

2.6 Limitations

2.6.1 *Survey Methods*

Based on the identification of individual plant species, the Phase 1 Habitat Survey provides sufficient information to enable classification of broad habitat types; however, it does not constitute a detailed botanical survey. Plant species lists compiled by this type of survey should not be considered definitive as not all species will be apparent at all times of year.

The scoping assessment for protected species highlights habitats and features suitable for protected species and notes any incidental sightings or field signs discovered; however, it should not be interpreted as providing a comprehensive presence / likely absence survey for any individual species.

2.6.2 *Access*

All areas of the site were fully accessible to the surveyor. Access was not available to land surrounding the site but this could be easily viewed from the boundaries of the site.

2.6.3 *Survey Timing and Conditions*

The survey was carried out in good weather conditions within the plant growing season. Therefore, enough information could be gathered to allow the surveyor to make an assessment of the broad habitat types and their potential to support protected or notable species.

2.6.4 *Lifespan of Data*

The results and recommendations contained within this report are considered to be valid for up to two years from the date of survey, assuming that there are no significant changes to the site condition or management within this period. After this period, or should the site conditions change, an update may be required in order to inform ecological constraints to development proposals and/or accompany a planning submission.

3 **RESULTS**

3.1 **Desk Study**

3.1.1 *Designated Sites*

There was one statutory designated site, a Local Nature Reserve (LNR) within 2km of the site. A number of non-statutory designations were also present within 2km. These were four Local Wildlife Sites (LWS), six Potential LWSs (pLWS) and six EcoSites. Details supplied by WBRC are outlined below:

Table 1: Statutory and non-statutory Designations

Site Name	Approximate distance in relation to Site (km)	Approximate direction in relation to Site	Reason for Designation
Water Orton Sidings, pLWS	0.52	NW	Linear railway sidings
River Tame, pLWS	0.59	N	River corridor and associated habitats.
Purple Hairstreak <i>Neozephyrus quercus</i> Tree, pLWS	0.83	NE	Tree with good population of purple hairstreak
Water Orton Grasslands, LWS	0.96	NE	Large area of marshy grassland
Pools at Marsh Lane/Water Orton Gravel Pit, EcoSite	0.97	NE	Former gravel workings now a lake, scrub
Two Veteran Oaks, EcoSite	0.98	WSW	Two oaks in a parkland setting
The Belt, LWS	1.06	SSE	Plantation woodland
Jock o'Walton Rough Ground, EcoSite	1.42	E	Unmanaged grassland with trees
Coleshill Sewage Works Grassland, LWS	1.46	ENE	Unmanaged floodplain
Coleshill Road, pLWS	1.63	NE	Belt of trees of local interest for birds
Veteran Oak, pLWS	1.65	ESE	Oak with a very large trunk diameter
Smith Wood, LNR	1.71	S	Deciduous woodland
Three Spinneys, EcoSite	1.79	SW	Three blocks of deciduous broadleaved woodland
Curdworth Paddocks, EcoSite	1.80	NNE	Two areas of semi-improved grassland
Curdworth Parish Churchyard, EcoSite	1.93	N	Churchyard
Sludge Beds, LWS	2.01	ENE	Disused sludge lagoons, swamp
Curdworth Canal Cutting, pLWS	No location supplied		Recreational canal

LNR – Local Nature Reserve

LWS – Local Wildlife Site

pLWS – Potential Local Wildlife Site

EcoSite – Of nature conservation locally

3.1.2 **Protected/notable Species**

WBRC supplied numerous records for protected species within 2km of the site. Some of these records were dated pre-2005 and due to the age these records have been omitted from this report, but can be supplied upon request. Due to the low number of bat records all of these have been included in the table below for relevance. Details of records considered relevant to the site are outlined within Table 2, below;

Table 2: Protected/notable species

Date	Latin Name	Common Name	Distance from site (km)	Direction
2002	<i>Pipistrellus pipistrellus</i>	Common pipistrelle	1.91	SSE
2002	<i>Plecotus auritus</i>	Brown long-eared bat	1.91	SSE
2015	<i>Lutra lutra</i>	Otter	1.35	NE
2010	<i>Lutra lutra</i>	Otter	1.35	NE
2008	<i>Lutra lutra</i>	Otter	1.35	NE
2011	<i>Lutra lutra</i>	Otter	1.43	NE
2011	<i>Lutra lutra</i>	Otter	1.43	NE

3.2 Phase 1 Habitat Survey

The individual habitat types recorded at the site are described under the sub-headings below, with the location and extent of each illustrated on the Phase 1 Habitat map (Figure 2). The western boundary of the site was within the field surveyed and as such had no physical boundary, although the area surveyed included the vegetation along the edge of the surveyed field on its western boundary.

3.2.1 **Deciduous Broadleaved Woodland**

Half of the southern boundary was defined by a wide belt of broadleaved woodland. The woodland canopy layer was dominated by poplar *Populus tremula*, English oak *Quercus robur*, ash *Fraxinus excelsior* and willow *Salix sp.* The shrub layer contained species such as elder *Sambucus nigra* and holly *Ilex aquifolium*, with a field layer dominated by common nettle *Urtica dioica* and bramble *Rubus fruticosus* (Photograph 1).

3.2.2 **Scattered Trees**

Within the field were several scattered trees mainly English oak and ash (Photograph 2), with six Scots pine *Pinus sylvestris* along the southern boundary (Photograph 3). In the far north-western corner of the site, slightly beyond the western site boundary was a single standing deadwood trunk.

All the trees were mature and three (TN1, TN2 and TN3) displayed features which could be considered suitable for roosting bats (see Section 3.3.4). The other additional scattered trees did not show any suitable features for roosting bats.

3.2.3 **Tall Ruderal**

Located at the eastern end of the belt of woodland on the southern boundary was a small area of tall ruderal within an old enclosure created by wooden fencing (Photograph 4).

Species which dominated this area included creeping thistle *Cirsium arvense*, bramble and broad-leaved dock *Rumex obtusifolius*, with occasional spear thistle *Cirsium vulgare*.

3.2.4 **Improved Grassland**

The site was dominated by an improved grassland field (Photograph 5). The grassland had a sward height of approximately 50cm and was dominated by perennial ryegrass *Lolium perenne*. Additional frequently seen species included false oat-grass *Arrhenatherum elatius*, common bent *Agrostis stolonifera*, Yorkshire fog *Holcus lanatus* and rough meadow-grass *Poa trivialis*. Herbaceous species noted mainly around the field edges included creeping thistle, meadow buttercup *Ranunculus acris*, white clover *Trifolium repens* and occasional ragwort *Senecio jacobaea*.

3.2.5 **Standing Water**

Just beyond the western boundary, approximately 160m from the nearest proposed new building, was located a small field pond, approximately 50m². It was within a hollow next to a fence line to the adjacent field and was fed by, at the time of the survey, a dry ditch. Shallow standing water was present in its southern corner but this was only a few centimetres deep. The rest of the pond was dry. It was dominated by floating pennywort *Hydrocotyle ranunculoides*, with occasional watercress *Nasturtium officinale* (Photograph 6) which would suggest the water levels within the pond fluctuate throughout the year.

3.2.6 **Hedgerow**

Hedgerow 1 – HEGS Grade 2+

Hedgerow 1 was located along the northern boundary (Photograph 7). Its height was approximately 4-5m, with a width of over 3m; the hedgerow did not appear to be managed. Dominant species included hawthorn *Crataegus monogyna* and blackthorn *Prunus spinosa* with occasional elder, holly and crab apple *Malus sylvestris*. Occasional standard trees included English oak and ash.

3.2.7 **Dry Ditch**

A short dry ditch was located in the south-western corner of the site, within the belt of woodland (Photograph 8). The ditch was approximately 1.5m wide by 60m long. The ditch was overgrown by bramble and common nettle and blocked with fallen branches.

Figure 2: Phase 1 Habitat Plan



3.3 Protected / Notable Species Assessment

3.3.1 *Amphibians*

There were limited habitats for amphibians in the form of the small area of tall ruderal and the ground flora within the woodland. The pond was almost dry at the time of the survey so a Habitat Suitability Index could not be undertaken on it to assess its potential for great crested newts *Triturus cristatus*. The habitat surrounding the pond could be considered suitable with it being located near to the woodland and within a boundary between fields.

3.3.2 *Reptiles*

No reptiles were seen within the survey area.

The habitats present were considered too homogenous to support a population of reptiles, with a lack of structural diversity in the main body of the site and in particular, a lack of open areas typical of those used by reptiles for basking.

3.3.3 *Birds*

The mature trees, woodland and hedgerow offered potential for nesting birds, although no evidence of nesting was seen at the time of this survey. Birds noted flying over site included wood pigeon *Columba palumbus* and carrion crow *Corvus corone*.

3.3.4 *Bats*

There were no buildings present on site, although three trees were identified as having features potentially suitable for roosting bats. The trees are described further in Table 3 below and shown as Target Note 1, 2 and 3 on the Phase 1 map and photographs in Appendix B.

Table 3: Trees with features potentially suitable for roosting bats

Reference	Description	Assessed Roost Status	Photograph number
TN1	Standing deadwood trunk, displayed several features suitable for potential bat roosting sites, including a number of holes and big gaps in the top	High	11
TN2	English oak – split in trunk, split in branch, missing branches, lifted bark	High	12
TN3	English oak - had a large trunk split and lifted bark	Moderate	13

The site offered potential for foraging bats, within the woodland on the southern boundary and the hedgerow on the northern boundary.

3.3.5 *Badger Meles meles*

There was no evidence of badgers or their setts within the site boundary at the time of the survey. The woodland belt was surveyed and no evidence of badger presence was noted.

3.3.6 ***Other Protected and/or Notable Species***

The habitat was considered suitable to support hedgehogs *Erinaceus europaeus*, due to the presence of woodland, hedgerow and tall ruderal suitable for cover and foraging.

The River Tame is located approximately 500m to the north of the site which could provide habitat for riparian mammals, this is supported by the desk study highlighting otters within the river. The river was located outside of the site boundary and with a busy main line railway between the river and the site which would act as a barrier to dispersal. Therefore, the site was considered unlikely to support otters.

Due to a lack of suitable habitats, the site was not considered likely to support any other protected or notable species.

4 EVALUATION

4.1 Designated sites

The surveyed site itself is not designated for its nature conservation interest. The nearest designation was a pLWS, Water Orton Sidings 0.52km to the north west.

Due to these sites being located some distance outside of the site boundary it is not anticipated that these will be affected by the proposed development.

4.2 Habitats & Botanical Interest

The dominant habitat that would be affected by the proposed development would be one improved grassland field, which was not considered to be of high conservation concern, given its abundance in this part of Warwickshire and the UK as a whole, as well as the management regime implemented on the land.

Habitats with higher ecological value that could be impacted by the proposed development include the hedgerow which is listed as a UK BAP Priority Habitat and listed under the local BAP. The hedgerow's conservation importance under HEGS was 2+, indicating that it has moderately high to high value conservation importance.

From the Indicative Potential Layout of the site (map supplied by the client), it indicates that there will not be any affect to the woodland, hedgerow or scattered trees. The hedgerow and scattered trees would be incorporated into the proposed development, whilst the woodland will remain unaffected.

4.3 Protected / Notable Species

4.3.1 *Amphibians*

Great crested newts are fully protected under the Conservation of Habitats and Species Regulations 2010 (as amended) and under the Wildlife and Countryside Act 1981 (as amended). Great crested newts are also UK BAP priority species.

One waterbody was present just beyond the site's boundary and it will not be affected by the proposed new primary school. The pond was linked to the surrounding habitat by the nearby hedgerow and dry ditch but these will also remain unaffected by the development. No additional ponds were noted within 2km therefore this pond is relatively isolated in terms of breeding habitat for amphibians.

No amphibians were highlighted during the desk study and the habitat directly affected by the development was considered unsuitable for great crested newts, due to it being open grassland habitat. Therefore it is concluded that no further surveys are required regarding amphibians.

4.3.2 **Reptiles**

No reptiles were highlighted during the desk study, and due to the homogenous nature of the habitats on site, the presence of reptiles is considered extremely unlikely and no specific mitigation will be required.

4.3.3 **Birds**

There will be vegetation loss due to the proposals for the site, therefore there could be impacts on nesting birds either through damage to nests, or loss of potential nesting habitats.

Further mitigation measures are discussed in detail in Section 5.2.2

4.3.4 **Bats**

If the three trees identified (T1, T2 and T3) as having potential for roosting bats are to be removed, further surveys will be required.

There is also the potential for disturbance of bat foraging and commuting routes around the site perimeters, both during and after construction.

Further survey work and mitigation measures are discussed in detail in Section 5.1.1

4.3.5 **Badgers**

Given the lack of badger setts, or evidence of badger activity, within the site, impacts to this species are considered unlikely. The farmland to the south of the site could provide suitable habitat for badgers and it cannot be ruled out that they could access the site occasionally.

4.3.6 **Other Protected Species**

The site contains habitat suitable for hedgehog with the presence of hedgerows and woodland. This species was included within the UK BAP as a priority conservation species in 2007 for its declining population. Research suggests that since 2000 rural populations have declined by half (PTES, 2015).

No evidence of any other protected species was identified during the survey. Furthermore, given the nature of the habitats on the site it is considered extremely unlikely that they will be present on the site. Therefore, no further surveys or additional mitigation is recommended.

5 RECOMMENDATIONS

5.1 Additional Surveys

5.1.1 *Bats*

If any of the three trees highlighted as having features potentially suitable for roosting bats are to be affected by the proposals, then they should be subject to an aerial inspection. This would be carried out by a qualified climber, who would also be licensed to survey for bats using a torch and an endoscope. The aerial survey can be carried out at any time of year and would allow the climber to confirm whether or not the feature viewed from ground level did provide conditions suitable for roosting bats. They would also search for evidence of roosting bats, although this is not always conclusive in trees as evidence can degrade quickly, or be located out of reach of the surveyor.

The aerial inspection method is recommended for ruling out potential bat roosting features, although if they are still found to be suitable after an aerial inspection, it may be necessary to carry out dawn re-entry surveys to watch for bats entering the features. Surveys of this nature can only be conducted between April and September.

If bats were found to be using the tree and the scheme could not be amended to avoid impacts, it would be necessary to apply for a mitigation licence from Natural England. This would likely involve the provision of bat boxes as replacement roosts and timing of the work to avoid the period when bats are most likely to be present.

5.2 Avoidance Measures / Mitigation

5.2.1 *Habitats*

Mature tree removal should be minimised. Any trees lost should be replaced using native species of local provenance, although ash should not be used due to the prevalence of ash dieback disease.

Retained trees and the hedgerow should be protected during the works, following the guidance in BS5837: 2012 Trees in relation to design, demolition and construction – recommendations which includes maintaining a root protection area, beneath the tree canopy, within which no work can take place and no storage of plant and machinery.

5.2.2 *Birds*

As there will be some vegetation loss as part of the proposals for the site, there could be impacts on nesting birds either through damage to nests, or loss of potential nesting habitats. Timing of the vegetation clearance would minimise the chance of direct damage to the nests. Vegetation clearance should be timed to avoid the bird nesting season, which typically runs from March – August (inclusive).

Any vegetation removal during the bird nesting season would need to be preceded by an ecologist's survey for active nests and any active nests, at any time, must remain unaffected until all chicks have fledged. The ecologist would be able to provide details on an appropriate exclusion distance around any active nests.

5.2.3 **Bats**

A dark corridor should be retained around the site perimeter to maintain suitable foraging and commuting habitat for bats. Any lighting, either during or post-construction, must be angled away from the retained woodland and hedgerow using light shrouds if necessary to prevent light spillage into the woodland edges.

5.2.4 **Badger**

Any trenches dug as part of the construction work must be left with a ramp or sloping end and any pipes should be capped off overnight, in order to prevent mammals from becoming stuck.

5.2.5 **Hedgehog**

Hedgehogs can be found in urban and suburban areas. Woodland and hedgerows provide hedgehogs with a plentiful supply of food, as well as potential sites for breeding, resting and hibernation. For these reasons urban and suburban areas have become a stronghold for hedgehogs in recent years. Therefore, any vegetation clearance should take this into consideration. Should any contractor come across a hedgehog, it should be carefully removed to a place of safety within the vicinity.

General good working practices with regards to hedgehogs and other terrestrial mammals should be implemented with any trenches left over night with a ramp or sloping end to allow mammals to escape if they fall in. Any pipes over 200mm in diameter should also be capped off at night to prevent mammals using them for shelter

5.3 **Ecological Enhancement**

National planning policy recommends that all developments incorporate ecological enhancement where possible therefore consideration should be given to the following suggestions.

- Any post-construction landscaping should seek to use native plants and should contain natural habitats, such as hedgerows, wildflower meadows, or areas of scrub and trees;
- Bird boxes could be positioned on trees around the site perimeters. It is recommended that nest boxes of various design be placed along the woodland edge by the Keswick Beck. These should be sited in sheltered locations, over 2m in height and away from perches that could be used by potential predators; and
- Bat boxes could also be positioned on trees around the site perimeters. It is recommended that boxes be placed on trees. Boxes should be located in groups of three per tree, with each box having a different facing aspect and a clear flight line to their entrance.

6 CONCLUSIONS

Table 4 provides an overview of the potential mitigation measures, recommendations and/or further survey work that may be required with regard to the proposals associated with the development

Table 4. Summary of Recommendations

Feature	Recommendations	Further survey required?
Habitats		
Trees	Tree removal should be minimised and new tree planting should be incorporated where possible.	Further survey in relation to bats may be required.
Hedgerows	Hedgerows and trees that are being retained should be adequately protected during the works, following BS5837: 2012.	N/A
Protected and Notable species		
Birds	Vegetation clearance should be timed to avoid the bird nesting season (March – August, inclusive).	If vegetation clearance is undertaken in the bird nesting season, a survey for active nests will be required.
Bats	A sensitive lighting scheme must be designed to ensure a dark corridor remains around the site perimeter, suitable for foraging and commuting bats.	If the trees identified as having features potentially suitable for roosting bats are to be affected, they must be subjected to further survey work.
Badgers	General good working practices with regards to hedgehogs and terrestrial mammals should be implemented.	No
Hedgehogs	General good working practices with regards to hedgehogs and terrestrial mammals should be implemented	No

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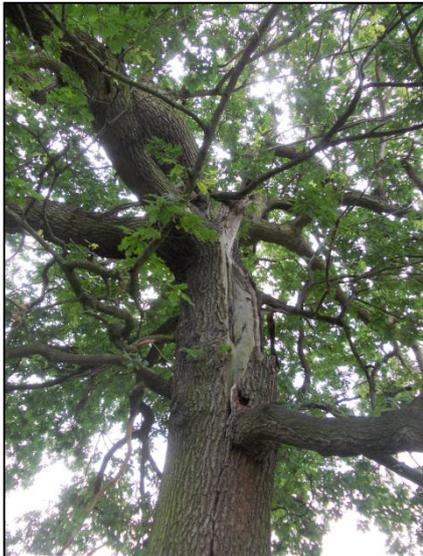
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APPENDIX A : Target Notes

Reference	Description	Photograph
TN1	Standing deadwood	
TN2	English Oak	

Reference	Description	Photograph
TN3	English Oak	

APPENDIX B : Site Photographs

No	Description	Photograph
1	Deciduous woodland	
2	Scattered Trees	
3	Scots Pine	

No	Description	Photograph
4	Tall ruderal	 A photograph showing a dense thicket of tall, green, leafy plants, likely ruderal species, growing in a field. The plants are reaching upwards and appear to be in a natural, uncultivated state.
5	Improved grassland	 A photograph of a wide, open field of tall, golden-brown grasses. The grasses are dense and appear to be in a well-maintained or improved state. In the background, there are trees and a clear sky.
6	Pond	 A photograph of a pond area. The foreground is dominated by a dense patch of green, leafy plants, possibly a type of pondweed or similar aquatic vegetation. The pond itself is partially visible in the background, surrounded by trees and a fence.

No	Description	Photograph
7	Hedgerow	
8	Dry ditch	

APPENDIX C : Botanical List

Common Name	Latin Name
Ash	Fraxinus excelsior
Aspen	Populus tremula
Bramble	Rubus fruticosus agg.
Broad-leaved Dock	Rumex obtusifolius
Broad-leaved Willowherb	Epilobium montanum
Cherry sp.	Prunus sp.
Cleavers	Galium aparine
Cock's-foot	Dactylis glomerata
Common Bent	Agrostis capillaris
Common Ivy	Hedera helix ssp. helix
Common Nettle	Urtica dioica
Common Ragwort	Senecio jacobaea
Crab Apple	Malus sylvestris
Creeping Thistle	Cirsium arvense
Elder	Sambucus nigra
False Oat-grass	Arrhenatherum elatius
Floating Pennywort	Hydrocotyle ranunculoides
Hawthorn	Crataegus monogyna
Hogweed	Heracleum sphondylium
Holly	Ilex aquifolium
Honeysuckle	Lonicera periclymenum
Lords-and-ladies	Arum maculatum
Meadow Buttercup	Ranunculus acris
Pedunculate Oak	Quercus robur
Perennial Rye-grass	Lolium perenne
Privet sp.	Ligustrum sp.
Raspberry	Rubus idaeus
Rough Meadow-grass	Poa trivialis
Round-leaved Dog-rose	Rosa obtusifolia
Scots Pine	Pinus sylvestris
Spear Thistle	Cirsium vulgare
Water-cress Spp	Nasturtium officinale agg.
White Clover	Trifolium repens
Willow sp.	Salix aurita x cinerea (S. x multinervis)
Yorkshire-fog	Holcus lanatus

APPENDIX D : HEGS Results

HEDGEROW 1		
Hedgerow Attribute	Results	Score
recently laid or coppiced	no	0
height	4m+	4
width	3m+	4
average cross section	sheep-proof	4
mature standards/100m	1<3	2
young standards/100m	0	0
structural score		14
percentage gaps	30-10%	2
no. end connections	4+	4
connectivity score		6
native species dominant	1-2 spp	2
total no. tree & shrub spp	5-7	2
diversity score		4
hedgebank/lynchet	no	0
ditch	no	0
grass verge	no	0
associated features score		0
HEGS Grade		2+

APPENDIX E : Relevant Legislation

The following text provides information on the key legislation, which is applicable to this survey.

The main wildlife legislation in the UK is as follows:

European Legislation

The relevant sections of the EC Directives and international conventions are summarised below:

- EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitat Directive 1992) as amended (92/43/EEC)

The Directive requires Member States to introduce a range of measures including the protection of species listed in the Annexes. The 189 habitats listed in Annex I of the Directive and the 788 species listed in Annex II, are to be protected by means of a network of sites. Once adopted, these are designated by Member States as Special Areas of Conservation (SACs), and along with Special Protection Areas (SPAs) classified under the EC Birds Directive. The Habitats Directive introduces the precautionary principle; that disturbance to the designated sites can only be permitted having ascertained no adverse effect on the integrity of the site.

- EC Directive on the Conservation of Wild Birds (Birds Directive 1979) as amended (79/409/EEC)

The main provisions of the Directive includes; the maintenance of the favourable conservation status of all wild bird species across their distributional range.

- Bern Convention on the Conservation of European Wildlife and Natural Habitats (1979)

The Convention imposes legal obligations on contracting parties, protecting over 500 wild plant species and more than 1000 wild animal species.

UK Legislation

The sections of UK legislation considered to be of relevance include:

- The Conservation (Natural Habitats, and c.) Regulations 2010 (as amended)

This transposes the Habitats Directive into national law. The Regulations provide for the designation and protection of 'European sites', and the protection of 'European protected species'.

- The Wildlife and Countryside Act 1981 (as amended) (WCA)

This consolidates and amends existing national legislation to implement the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and Council Directive 79/409/EEC on the Conservation of Wild Birds (Birds Directive) in Great Britain.

- The Countryside and Rights of Way Act 2000 (CRoW)

This act strengthens wildlife enforcement legislation.

- The Protection of Badgers Act 1992

Species-Specific Legislation

Species specific legislation is provided in Table 4 below:

Table 5: Species-Specific Wildlife Legislation

Feature/Species	Legislation	It is an offence to:
Hedgerows	Hedgerow Regulations 1997.	<p>Outlines a number of criteria for designation of 'important' hedgerows.</p> <p>'Important' hedgerows cannot be removed without notifying the relevant body.</p>
Breeding birds	Wildlife and Countryside Act 1981 (as amended). Countryside and Rights of Way Act 2000.	<ul style="list-style-type: none"> • Kill; • Injure; • Take; <p>any wild bird, their eggs or nest (with the exception of those on Sch. 2).</p>
Specially protected birds	Sch. 1 Wildlife and Countryside Act 1981 (as amended).	<p>As above but includes:</p> <ul style="list-style-type: none"> • Disturbing birds at their nest, or their dependent young.

Feature/Species	Legislation	It is an offence to:
Badgers	The Protection of Badgers Act 1992	<ul style="list-style-type: none"> • Wilfully kill, injure, take, or cruelly ill-treat a badger, or attempt to do so; • Possess any dead badger or any part of, or anything derived from, a dead badger; • Intentionally or recklessly interfere with a sett by disturbing badgers whilst they are occupying a sett, damaging or destroying a sett, causing a dog to enter a sett, or obstructing access to it. <p>A badger sett is defined in the legislation as “<i>any structure or place, which displays signs indicating current use by a badger</i>”.</p>
Bats	Sch. 5 Wildlife and Countryside Act 1981 (as amended). Conservation of Habitats and Species Regulations 2010 (as amended).	<ul style="list-style-type: none"> • Intentionally or deliberately kill, injure or capture (or take) bats: • Deliberately disturb bats (whether in a roost or not); • Recklessly disturb roosting bats or obstruct access to their roosts; • Damage or destroy bat roosts.
Common reptiles	Sch. 5 Wildlife and Countryside Act 1981 (as amended). Countryside and Rights of Way Act 2000.	<p>Deliberate or reckless:</p> <ul style="list-style-type: none"> • Killing; • Injuring • Sale.
Common amphibians	Sch. 5 and Sch. 9 Wildlife and Countryside Act 1981 (as amended). Countryside and Rights of Way Act 2000.	<ul style="list-style-type: none"> • Sell; • Transport; and • Advertise for sale.

Feature/Species	Legislation	It is an offence to:
Great crested newt	Sch. 5 Wildlife and Countryside Act 1981 (as amended). Conservation of Habitats and Species Regulations 2010 (as amended).	<ul style="list-style-type: none"> • Kill; • Injure; • Disturb • Destroy any place used for rest or shelter.

In addition, species and habitats listed on the UK Post-2010 Biodiversity Framework (formally the UK BAP) are also considered. Details on these species and habitats can be found at: <http://jncc.defra.gov.uk/page-5705>.

Protected Sites

A network of protected sites, at varying levels, have been put in place across the UK. Further details are provided below;

International importance

- Natura 2000

Natura 2000 is the name of the European Union-wide network of nature conservation sites established under the EC Habitats and Birds Directives. This network will comprise Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

- Special Areas of Conservation (SAC)

SACs are designated under the EC Habitats Directive. The Directive applies to the UK and the overseas territory of Gibraltar. SACs are areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs in terrestrial areas and territorial marine waters out to 12 nautical miles are designated under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). New and/or amended Habitats Regulations are shortly to be introduced to provide a mechanism for the designation of SACs and SPAs in UK offshore waters (from 12-200 nm).

National importance

- Sites of Special Scientific Interest (SSSI)

The SSSI series has developed since 1949 as the national suite of sites providing statutory protection for the best examples of the UK's flora, fauna, or geological or physiographical features. Most SSSIs are privately-owned or managed; others are owned or managed by public bodies or non-government organisations. The SSSIs designation may extend into intertidal areas out to the jurisdictional limit of local authorities, generally Mean Low Water in England and Northern Ireland; Mean Low Water of Spring tides in Scotland. In Wales, the limit is Mean Low Water for SSSIs notified before 2002, and, for more recent notifications,

the limit of Lowest Astronomical Tides, where the features of interest extend down to LAT. There is no provision for marine SSSIs beyond low water mark. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs have been renotified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and the Nature Conservation (Scotland) Act 2004.

Regional/local importance

- Wildlife Sites

Local authorities for any given area may designate certain areas as being of local conservation interest. The criteria for inclusion, and the level of protection provided, if any, may vary between areas. Most individual counties have a similar scheme, although they do vary. These sites, which may be given various titles such as 'Listed Wildlife Sites' (LWS), 'County Wildlife Sites' (CWS), 'Local Nature Conservation Sites' (LNCS), 'Sites of Importance for Nature Conservation' (SINCs), or Sites of Nature Conservation Importance' (SNCIs), together with statutory designations, are defined in local and structure plans under the Town and Country Planning system and are a material consideration when planning applications are being determined.

APPENDIX F : Assessment Method for Bats

Following current good practice guidelines (Collins (ed) 2016), the assessment comprised a visual inspection of each of the trees.

An assessment was undertaken from ground level, using binoculars, to determine whether any features of the type known to be used by roosting bats, were present.

Based on the number, location and type of any potential roost features, trees were categorised as having negligible, low, moderate or high potential for roosting bats, or confirmed roost where direct evidence of bat presence was encountered. Evaluation of roost potential is necessarily subjective and relies on the professional judgment of the surveyor; however, the tables below provides a useful guide to how this is informed.

Table 6: Examples of characteristics that inform assessment of roost potential

Status	Typical characteristics
Negligible potential	<ul style="list-style-type: none"> • Modern construction / immature trees • Lack of access points for bats • Situated within very poor quality foraging habitat • High levels of external lighting
Low potential	<ul style="list-style-type: none"> • Small number of minor hole / crevice features suitable for opportunistic roosting • Lack of roof voids or small cluttered roof spaces • Features obscured by dense cobwebs • Unlikely to support breeding or hibernating bats • Situated within poor quality foraging habitat
Moderate potential	<ul style="list-style-type: none"> • One or more hole / crevice features suitable for roosting, e.g. damaged soffits, uneven roof tiles • Access into large, dark internal spaces such as roof voids • Trees with small fissures and crevices in dead wood suitable for day roosting • Situated within or near to moderate/good quality foraging habitat
High potential	<ul style="list-style-type: none"> • Old buildings / mature or veteran trees • Trees with woodpecker holes or deep fissures and crevices in dead wood • Structures with large, uncluttered roof voids • Traditional brick, stone or timber framed barns • Features suitable for large numbers of bats and/or several different species • Types of structure suitable for hibernation, e.g. caves, tunnels, ice houses etc • Low level of disturbance by humans • Little / no external lighting • Situated within good quality foraging habitat

Status	Typical characteristics
Confirmed Roost	<ul style="list-style-type: none"> Bats seen or heard within the roost feature during the survey Bat droppings, particularly if piled rather than scattered Feeding remains such as moth wings Existing record of roost at that location

Table 7: Guidance for assessing the overall value of potential development sites for bats (Collins (ed), 2016)

Site Status	Description
<div style="text-align: center;">  <p style="writing-mode: vertical-rl; transform: rotate(180deg);">Increasing site value for bats</p> </div>	<ul style="list-style-type: none"> • No features likely to be used by bats • Small number of potential roost sites but unlikely to be suitable for maternity roosts or hibernacula • Isolated habitat that could be used by foraging bats • Isolated site not connected by prominent linear features to suitable other/adjacent foraging habitats • Several potential roost sites in buildings, trees or other structures • Habitat suitable for foraging bats (e.g. trees, water, scrub, grassland present) • Site is connected with the wider landscape by features that could be used by foraging/commuting bats (e.g. gardens backed by scrub or line of trees) • Buildings, trees or other structures (e.g. caves or underground structures) of particular significance for roosting bats • Site includes high quality foraging habitat (e.g. broadleaved woodland, tree-lined watercourses, parkland with mature trees and rough grass) • Site is connected with the wider landscape by strong linear features that could be used by commuting bats (e.g. hedgerows, river valleys) • Site is close to known roosts • Bats recorded or observed using an area for foraging or commuting close to a potential roost